

Prepared for

**Kam Luk Investment Company Limited**

Prepared by

**Ramboll Hong Kong Limited**

**PROPOSED PUBLIC RESIDENTIAL HOUSING / STARTER  
HOMES DEVELOPMENT AT UDWYT LOT 14RP AND  
ADJOINING GOVERNMENT LAND (SITE A) & PROPOSED  
PRIVATE RESIDENTIAL DEVELOPMENT AT UDWYT LOT 11  
RP AND ADJOINING GOVERNMENT LAND (SITE B), WONG  
YUE TAN, TAI PO**

**ENVIRONMENTAL ASSESSMENT**

Date **February 2025**

Prepared by **Coco Ma**  
**Assistant Environmental Consultant**

Signed



---

Approved by **Calvin Chiu**  
**Technical Director**



---

Signed

Project Reference **NFDUDWYTEI00**

Document No. **R8995\_V1.6.docx**

No part of this document may be reproduced or transmitted, in any form or by any means electronic, mechanical, photographic, recording or otherwise, or stored in a retrieval system of any nature without the written permission of Ramboll Hong Kong Ltd, application for which shall be made to Ramboll Hong Kong Ltd, 21/F, BEA Harbour View Centre, 56 Gloucester Road, Wan Chai, Hong Kong.

Disclaimer: This report is made on behalf of Ramboll Hong Kong Ltd. No individual is personally liable in connection with the preparation of this report. By receiving this report and acting on it, the client or any third party relying on it accepts that no individual is personally liable in contract, tort or breach of statutory duty (including negligence).

Ramboll Hong Kong Limited

21/F, BEA Harbour View Centre  
56 Gloucester Road, Wan Chai, Hong Kong

Tel: (852) 3465 2888  
Fax: (852) 3465 2899  
Email: [hkinfo@ramboll.com](mailto:hkinfo@ramboll.com)

Q:\Projects\NFDUDWYTEI00\04 Deliverables\01 EA Report\R8995\_V1.6.docx



## CHAPTERS

	Page
<b>1. INTRODUCTION .....</b>	<b>1</b>
1.1 Background .....	1
1.2 Subject Site and its Environ .....	1
1.3 Proposed Development.....	1
1.4 Organisation of this Report .....	2
<b>2. AIR QUALITY IMPACT ASSESSMENT .....</b>	<b>3</b>
2.1 Relevant Legislation, Standards and Background Air Quality .....	3
2.2 Buffer Separation Requirement under HKPSG.....	5
2.3 Surrounding Environment.....	5
2.4 Air Sensitive Receivers of the Proposed Development.....	5
2.5 Appraisal of Vehicular Emission Impact on the Proposed Development .....	5
2.6 Appraisal of Odour, Chimney Stack and Dust Emission Impact on the Proposed Development .....	6
2.7 Appraisal of Air Quality Impact Arising from the Proposed Development .....	6
2.8 Air Quality Impact during Construction of the Project .....	7
2.9 Conclusion .....	9
<b>3. NOISE IMPACT ASSESSMENT .....</b>	<b>10</b>
3.1 Noise Environment .....	10
3.2 Assessment for Road Traffic Noise .....	10
3.3 Assessment for Industrial Noise.....	13
3.4 Conclusion .....	16
<b>4. PRELIMINARY LANDFILL GAS HAZARD ASSESSMENT .....</b>	<b>17</b>
4.1 Background and Scope of Work .....	17
4.2 Landfill Gas Hazard Assessment Criteria .....	17
4.3 Evaluation of Potential Landfill Gas Migration Hazard.....	18
4.4 Precautionary Measures during Construction Phase.....	21
4.5 Passive Control of Gas for Permanent Development .....	26
4.6 Active Control of Gas for Permanent Development.....	27
4.7 Detection System for Permanent Development.....	27
4.8 Further Recommendations .....	27
4.9 Conclusion .....	29
<b>5. WATER QUALITY IMPACT ASSESSMENT.....</b>	<b>30</b>
5.1 Introduction.....	30
5.2 Relevant Environmental Standard and Guidelines .....	30
5.3 Water Sensitive Receiver .....	32
5.4 Construction Phase Wastewater Water Quality Impacts .....	33
5.5 Construction Phase Mitigation Measures .....	33
5.6 Operational Phase Wastewater Water Quality Impacts.....	35
5.7 Summary .....	37

<b>6.</b>	<b>LAND CONTAMINATION REVIEW .....</b>	<b>38</b>
6.1	Current and Historic Land Uses .....	38
6.2	Information from Government Departments.....	39
6.3	Discussion and Site Observation .....	40
6.4	Conclusion .....	40
<b>7.</b>	<b>EIAO IMPLICATION .....</b>	<b>41</b>
7.1	Background .....	41
7.2	Air Quality Impact .....	42
7.3	Noise Impact .....	44
7.4	Conclusion .....	45
<b>8.</b>	<b>OVERALL CONCLUSION.....</b>	<b>46</b>

## TABLES

Table 2.1	Hong Kong Air Quality Objectives (AQOs)
Table 2.2	EPD Air Quality Monitoring Data in Tai Po AQMS and PATH-v3.0 (Grid 42, 49 & Grid 43, 49)
Table 2.3	Summary of Representative Air Sensitive Receivers for Construction Phase
Table 3.1	Summary of Identified Potentially Noisy Facilities (Site A)
Table 4.1	Classification of Risk Category
Table 4.2	Summary of General Categorisations of Risk
Table 4.3	Classification of Targets
Table 4.4	Source-Pathway-Target Analysis
Table 4.5	Categorisations of Risk
Table 4.6	Action Plan – LFG Monitoring during the Construction Stage
Table 4.7	Action Plan – LFG Monitoring during the Operational Stage
Table 5.1	Summary of Water Quality Objectives (WQOs) for Tolo Harbour and Channel WCZ (Harbour subzone)
Table 5.2	Summary of Water Quality Objectives (WQOs) for Watercourses in Tolo Harbour and Channel WCZ (Other Watercourses)
Table 5.3	Identified Water Sensitive Receiver within 500m from and within Application Site Boundary
Table 5.4	Summary of Water Quality in Tolo Harbour
Table 6.1	Land Use Summary on the Subject Site
Table 6.2	Enquires and Responses on Land Contamination Related Records in the Subject Site
Table 7.1	Summary of the Junction Improvement Work
Table 7.2	Summary of Representative Air Sensitive Receivers for Road Junction Work
Table 7.3	Summary of Representative Noise Sensitive Receivers for Road Junction Work

## FIGURES

Figure 1	Location of Site A and Site B and its Environs
Figure 2	Buffer Separation between Kerb Side of Road Carriageway and Nearest Air Sensitive Uses in Site A and Site B
Figure 3	200m Study Area and Identified Nearest Chimney Stacks
Figure 4	Nearby Air Sensitive Receivers for Construction Air Quality Impact Assessment
Figure 5	Location of Selected Representative Noise Sensitive Receivers for Road Traffic Noise Impact Assessment
Figure 6	Proposed Road Traffic Noise Mitigation Measures
Figure 7	Location of Fixed Noise Sources
Figure 8	Consultation Zone of Shuen Wan Landfill
Figure 9	Typical Section of Enclosed Room in Contact with Soil showing Landfill Gas Migration Mitigation Measures
Figure 10	Natural Cut-Off Barrier for Utilities entering Building Structure from Street Side Mains and Water Seal
Figure 11	Location of Water Sensitive Receivers within 500m from Site A and Site B
Figure 12	Location of the Exhaust Outlet of the Ventilation System for Carpark
Figure 13	Nearby Air Sensitive Receivers for Road Junction Work
Figure 14	Nearby Noise Sensitive Receivers for Road Junction Work

## APPENDICES

Appendix 1	Proposed Master Layout Plan
Appendix 2	Traffic Forecast for Year 2048 Provided by Project Traffic Consultant
Appendix 3	Predicted Traffic Road Noise Level ( $L_{10}(1\text{-hr})$ ) at Selected NSRs under Base Case and Mitigated Scenarios
Appendix 4	Example of configuration of acoustic window (baffle type) and enhanced acoustic balcony (baffle type) referenced
Appendix 5	Site Visit Noise Measurement for the Noise Source
Appendix 6	Detailed Calculation of Fixed Source Noise Impact Assessment
Appendix 7	Catalogue of Fixed Source Variable Refrigerant Volume (VRV)
Appendix 8	Landfill Gas Monitoring Data at Nearest Monitoring Locations for 24-Month Period (5/2019-4/2021)
Appendix 9	Historic Aerial Photos
Appendix 10	BRAVO Record for Site A and Site B
Appendix 11	Walkover Checklist and Photo Records
Appendix 12	Correspondence with Various Departments
Appendix 13	Confirmation on Road Types of Ting Kok Road and Lo Fai Road from Transport Department

Appendix 14	Correspondence from Environmental Protection Department
Appendix 15	Locations of Road Junction Work
Appendix 16	Historic Aerial Photos in 1997
Appendix 17	Sensitivity Test for Road Traffic Noise
Appendix 18	Site Survey Photo Record of Road Junction Work
Appendix 19	Predicted Traffic Road Noise Level ( $L_{10}(1\text{-hr})$ ) at Selected NSRs under 5m high Vertical Barrier Scenario

## 1. INTRODUCTION

### 1.1 Background

- 1.1.1 Referring to the Lands Sharing Pilot Scheme ("LSPS") application at Lo Fai Road/ Ting Kok Road with application no. LSPS/001 on 19 July 2021, the applicant has revised the submission.
- 1.1.2 The application involves two private lots, namely Lot 14 RP and Lot 11 RP in Unserved District at Wong Yue Tan ("UDWYT") and adjoining Government Lands ("GL"). Lot 14 RP and adjoining Government Land (Site A) would be designated for public housing / Starter Homes Housing development, whereas Lot 11 RP and adjoining Government Land (Site B) would be designated for proposed private residential development.
- 1.1.3 Ramboll Hong Kong Limited has been commissioned by the Applicant to provide environmental consultancy services for the Proposed Development at Site A and Site B. This Environmental Assessment will include assessment of environmental noise and air quality impact on the proposed development and a preliminary landfill gas hazard assessment with respect to the restored Shuen Wan Landfill on the opposite side of Ting Kok Road.
- 1.1.4 Architectural drawings and other technical information on the Proposed Development are provided by the Project Architect (DLN). Traffic forecasted data is provided by the Project Traffic Consultant (MVA).

### 1.2 Subject Site and its Environ

- 1.2.1 The existing use of Site A and Site B is vacant.
- 1.2.2 Site A and Site B are located at Ting Kok Road in Tai Po with residential developments and Tai Po Industrial Estate nearby. The area on opposite side of Ting Kok Road to the south is the restored Shuen Wan Landfill for which afteruse consists of a golf driving range.
- 1.2.3 Site A is bounded by Ting Kok Road to the south, and Lo Fai Road to the west. The area to the north to east is vegetated slope area zoned Green Belt. In addition to the restored landfill (50m apart), other uses nearby within 300m from nearest site boundary include Casa Marina I (60m apart), Richwood Park (190m apart), Forest Hill (220m apart), Tai Po East Fire Station (140m apart), DSD Ting Kok Road Pumping Station No. 5 (155m apart), Kee Wah (180m apart), Meyer (200m apart) and Transtech (250m apart).
- 1.2.4 Site B is bounded by Ting Kok Road to the south. The area to the south to east is vegetated slope area zoned Green Belt. In addition to the restored landfill (75m apart), other uses nearby within 300m from nearest site boundary include Fortune Garden (40m apart) and Tycoon Place (100m apart).
- 1.2.5 Site A and Site B are separated by around 400m apart. The location and its environs are shown in **Figure 1**.

### 1.3 Proposed Development

- 1.3.1 Site A will consist of public residential housing / SH housing with 5 residential towers and total of 1,290 flat units while Site B will have 1 private residential tower with about 460 flat units. In addition, GIC uses and retail facilities will be included in Site A as well. For GIC uses, residential care home for elderly (RCHE) is tentatively proposed. The expected year for completion of the development is assumed as 2033 tentatively.

- 1.3.2 Layout and floor plans of the proposed development are provided by Project Architect and included in **Appendix 1**.

#### **1.4 Organisation of this Report**

- 1.4.1 This report includes to address environmental noise and air quality impact on the proposed development. Since a restored Shuen Wan Landfill is located on the opposite side of Ting Kok Road and the Sites are within the 250m consultation zone of the said landfill, a preliminary landfill gas hazard assessment is also included.
- 1.4.2 The organisation of remaining chapters of this report is:
- Section 2 – Air Quality Impact Assessment
  - Section 3 – Environmental Noise Impact Assessment
  - Section 4 – Preliminary Landfill Gas Hazard Assessment
  - Section 5 – Water Quality Impact Assessment
  - Section 6 – Land Contamination Review
  - Section 7 – EIAO Implication
  - Section 8 - Concluding Summary

## 2. AIR QUALITY IMPACT ASSESSMENT

### 2.1 Relevant Legislation, Standards and Background Air Quality

- 2.1.1 Air quality is affected by such factors as the emission rate of air pollutants, the separation distance between emission sources and receptors, height and width of buildings as well as meteorology.
- 2.1.2 The Air Pollution Control Ordinance (APCO) provides the statutory authority for controlling air pollutants from a variety of sources. The Hong Kong's Air Quality Objectives (AQOs), which stipulate the maximum allowable concentrations over specific periods for typical pollutants, should be met. AQOs of these pollutants are listed below in **Table 2.1**.

**Table 2.1 Hong Kong Air Quality Objectives (AQOs)**

Pollutants	Averaging Time	Concentration Limit ( $\mu\text{g} / \text{m}^3$ ) <sup>(1)</sup>	Number of Exceedance Allowed
Sulphur Dioxide	10-minute	500	3
	24-hour	50	3
Respirable Suspended Particulates (PM10) <sup>(2)</sup>	24-hour	100	9
	Annual	50	Not Applicable
Fine Suspended Particulates (PM2.5) <sup>(3)</sup>	24-hour	50	35
	Annual	25	Not Applicable
Nitrogen Dioxide	1-hour	200	18
	Annual	40	Not Applicable
Ozone	8-hour	160	9
Carbon Monoxide	1-hour	30,000	0
	8-hour	10,000	0
Lead	Annual	0.5	Not Applicable

*Note:*

- 1) 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 293K and a reference pressure of 101.325kPa.
- 2) Respirable suspended particulates means suspended particles in air with a nominal aerodynamic diameter of 10 $\mu\text{m}$  or less.
- 3) Fine suspended particulates means suspended particles in air with a nominal aerodynamic diameter of 2.5 $\mu\text{m}$  or less.

- 2.1.3 In addition, the following legislations, technical circulars and guidelines are relevant and should be observed and complied with or followed as practicably possible.
- Air Pollution Control (Construction Dust) Regulation
  - Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation
  - Air Pollution Control (Fuel Restriction) Regulations (i.e. using liquid fuel with a sulphur content of less than 0.005% by weight)
  - Recommended Pollution Control Clauses for Construction Contracts
- 2.1.4 With the implementation of sufficient dust suppression measures as stipulated under the APCO, Air Pollution Control (Construction Dust) Regulation (Cap 311R), limiting emission by following Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation and relevant Air Pollution Control (Fuel Restriction) Regulations, as well as adoption of good site practices, fugitive dust emission arising from the earthworks,

etc. can be effectively suppressed. Good site practices will be implemented through contractual clauses and close enforcement of the resident engineers. The Contractor(s) shall be required to follow the requirements of the Air Pollution Control (Construction Dust) Regulation which requires notification before carrying out demolition works or construction works and to adopt dust reduction measures while carrying out demolition activities or construction activities.

- 2.1.5 Under the Air Pollutant Control (Non-road Mobile Machinery) (Emission) Regulation, only approved or exempted non-road mobile machineries (including mobile generator, air compressor, crawler crane, bulldozer, and etc.) with a proper label are allowed to be used in the construction site.
- 2.1.6 For SO<sub>2</sub> emission, under Air Pollution Control (Fuel Restriction) Regulations, only liquid fuel with a sulphur content of less than 0.005% by weight are allowed to be used in the construction site.
- 2.1.7 The Recommended Pollution Control Clause for Construction Contracts is available on the EPD website which set out the recommended air pollution control measures to be implemented by the contractor(s) during the construction stage of the Project.
- 2.1.8 The Subject Site is situated in Tai Po district. The tentative completion year is 2033. Therefore, the latest year of 2030 background concentrations extracted from the PATH-v3.0 released by EPD in January 2024 (Grid 42, 49 and Grid 43, 49 respectively for Site A and Site B) has been adopted. The nearest air quality monitoring station (AQMS) is located at Tai Po at over 3km to the west to southwest. The five most recent years of air quality monitoring data, 2019 to 2023, from this station are summarized in **Table 2.2**.

**Table 2.2 EPD Air Quality Monitoring Data in Tai Po AQMS and PATH-v3.0 (Grid 42, 49 & Grid 43, 49)**

Pollutant	Averaging time	Parameter	AQO (µg/m <sup>3</sup> )	Concentration <sup>[1]</sup> (µg/m <sup>3</sup> )						
				2019	2020	2021	2022	2023	PATH in Year 2030 (42, 49)	PATH in Year 2030 (43, 49)
RSP (PM <sub>10</sub> )	24-hour	10 <sup>th</sup> highest	100	65	58	60	48	53	53	54
	Annual	Maximum	50	31	24	26	21	25	20	21
FSP (PM <sub>2.5</sub> )	24-hour	36 <sup>th</sup> highest	50	35	28	27	25	26	27	27
	Annual	Maximum	25	20	15	16	14	15	12	13
NO <sub>2</sub>	1-hour	19 <sup>th</sup> highest	200	142	106	115	93	95	42	41
	Annual	Maximum	40	36	30	32	27	27	10	10
SO <sub>2</sub>	10-minute	4 <sup>th</sup> highest	500	20	19	15	12	27	24	24
	24-hour	4 <sup>th</sup> highest	50	10	7	8	5	4	7	7
O <sub>3</sub>	8-hour	10 <sup>th</sup> highest	160	<b>197</b>	<b>165</b>	<b>168</b>	<b>188</b>	<b>163</b>	<b>170</b>	<b>173</b>



## 2.2 Buffer Separation Requirement under HKPSG

- 2.2.1 According to Table 3.1 in Chapter 9 of Hong Kong Planning Standards and Guidelines (HKPSG), minimum buffer separation is recommended for air sensitive uses from different types of pollution sources including road and industrial areas.
- 2.2.2 For industrial areas, buffer separation depends on relative difference in height of chimney exit and the site, and up to 200m is recommended. For dusty uses, a buffer distance of at least 100m is required as recommended in para. 3.3.10 of Chapter 9.
- 2.2.3 For road and highways, buffer separations (measured from road kerb side to air sensitive use) of 20m, 10m and 5m are recommended respectively for trunk road and primary distributor, district distributor and local distributor.

## 2.3 Surrounding Environment

- 2.3.1 As mentioned, the surrounding development includes residential, GIC, recreational and industrial uses. As observed in field surveys on 20/9/2021 and 8/3/2023, there is no air pollution source identified in close vicinity of Site A and Site B. There is no odour and fluff observed. The nearest major road is Ting Kok Road. Lo Fai Road adjacent to Site A is of lower traffic flow.

## 2.4 Air Sensitive Receivers of the Proposed Development

- 2.4.1 Site A comprises residential towers, GIC such as RCHE and retail facilities whereas Site B comprises residential tower and clubhouse which are considered air sensitive in nature. Other associated facilities such as car park, plant room, etc. are non-air sensitive in nature. This is in early planning stage and there is no detailed design including outdoor recreational area, GIC layout and uses, etc. If outdoor recreational uses such as ball court is to be provided, they are considered air sensitive as well. Among the air sensitive uses described above, retail and clubhouse facilities will be provided with central air conditioning system with fresh air intake provision. For GIC uses, it is preliminarily assumed that openable window will be relied upon for ventilation purpose as residential uses. The fresh air intake, openable window for ventilation purpose and future outdoor recreational area will be located outside the air quality buffer zone area.

## 2.5 Appraisal of Vehicular Emission Impact on the Proposed Development

- 2.5.1 **Figure 2** shows the buffer separation between kerb side of Ting Kok Road and Lo Fai Road to the nearest block of the Proposed Development. According to the reply by Transport Department, Lo Fai Road is also classified as rural road, which is same as Ting Kok Road. However, according to the TIA report for the traffic flow in year 2033 along Lo Fai Road and Ting Kok Road, Lo Fai Road will have only approximately 1100 vehicles (two-way) per hour during AM peak hour and Ting Kok Road will have approximately 3000 vehicles (two-way) per hour during AM peak hour, which is almost three times of Lo Fai Road. According to Annual Traffic Census from Transport Department, roads with around 1100 vehicles per hour are mainly classified as Local Distributor and District Distributor. Lo Fai Road should also be classified as Local Distributor or District Distributor from traffic engineering point view. In addition, the section of Ting Kok Road under concern serves to connect Tai Po to Tai Mei Tuk whereas Lo Fai Road serves to connect from Ting Kok Road to some scattered development in same district. Therefore, despite that both Ting Kok Road and Lo Fai Road are classified as rural road, the traffic flow and function of Ting Kok Road is more like a district distributor (i.e. buffer area of 10m from kerb side required under HKPSG) whereas Lo Fai Road is more like a local distributor (i.e. buffer area of 5m from kerb side required

under HKPSG). TD also has no objection on the classification of Lo Fai Road as a Local Distributor. (see **Appendix 13**).

- 2.5.2 Based on block disposition of the latest scheme, only a small portion of residential block at Site B are found within the buffer area (10m from Ting Kok Road). To avoid any adverse impact, the portion of residential façade within the buffer area will be provided with blank façade (wall or glazing) without any opening. In addition, all future fresh air intake points of retail facilities, clubhouse, any other air sensitive uses, and outdoor recreational area will be located outside the buffer area and to be determined in detailed design stage as well.
- 2.5.3 Based on the proposed mitigation measures, the buffer separation from openable window can meet the buffer separation requirement. No excessive air quality impact due to vehicular emission is anticipated.

## **2.6 Appraisal of Odour, Chimney Stack and Dust Emission Impact on the Proposed Development**

- 2.6.1 According to the survey conducted on 20/9/2021, 8/3/2023 and 30/8/2023 which also covered the sewage pumping station (SPS) nearby Site A (more than 90m to the west), there was no noticeable odour observed at the SPS (i.e. observed at accessible locations immediate to the SPS). The temperature and humidity on 20/9/2021, 8/3/2023 and 30/8/2023 are 30.6°C and 75%, 22.9°C and 69%, and 30.3°C and 62%. Also, the enquires on the odour-related complaints against the Drainage Services Department Ting Kok Road Pumping Station No.5 have been made to Environmental Protection Department (EPD). According to the reply from EPD, no odour nuisance compliant records were found in their record. (See **Appendix 14**)
- 2.6.2 According to the field survey, there is no chimney stack identified within 200m from the Sites so that the horizontal buffer distance requirement is deemed complied with (see **Figure 3**).
- 2.6.3 Among Tai Po Industrial Estate exists, one industrial undertaking (Kee Wah) is partially within 200m from nearest boundary of Site A. There is no chimney observed at Kee Wah. The nearest chimney stack observed is at Meyer and has horizontal separation of about 240m from nearest boundary of Site A. Tai Po Sewage Treatment Works is located over 400m to the south and separated by the restored Shuen Wan Landfill.
- 2.6.4 For Site B, the surrounding uses are residential in nature. There is no chimney stack within 200m from Site B. The identified chimney stack, sewage treatment works are well separated by more than 500m.
- 2.6.5 The buffer separation distance with respect to industrial use is considered satisfied. Therefore, no excessive air quality impact due to chimney stack is anticipated. In addition, no dusty source can be identified within 100m from Site A and Site B.

## **2.7 Appraisal of Air Quality Impact Arising from the Proposed Development**

- 2.7.1 The nature of the Proposed Development is not environmental polluting. The need of refuse collection point (RCP) will also be studied in later stage that may arise concern on odour emission. Caution should be taken during detailed stage of the Proposed Development. RCP will be provided with separate exhaust and scrubber system for odour control. The exhaust location will be carefully decided to avoid/minimise any residual odour impact. With the provision above, no significant odour impact is anticipated due to future operation of the Project.
- 2.7.2 For the future car parks within the Proposed Development, the applicant will observe and follow EPD's ProPECC PN2/96 on Control of Air Pollution in Car Parks for the design

and operation of the car parks. Car Parks will be designed such that the air quality guidelines set out in the PN are met under all conditions. The basement carpark will only locate on Site B. Location of exhaust outlet of the ventilation system indicated in **Figure 12**. This is tentatively designed so that it is away from all existing and planned air sensitive receivers.

## 2.8 Air Quality Impact during Construction of the Project

### Legislation

- 2.8.1 Assessment criteria for aerial emission is based in the Hong Kong Air Quality Objectives (AQOs).

### Representative Air Sensitive Receivers

- 2.8.2 There are a number of residential developments in the surrounding of the Proposed Development. The representative ASRs are shown in **Figure 4** and **Table 2.3** below.

**Table 2.3 Summary of Representative Air Sensitive Receivers for Construction Phase**

Location	Height	Land Use	Distance from Nearest Boundary of the Sites
Casa Marina I (Residential)	3 storeys	Residential	67m to the north to northeast of Site A
Hong Kong Landfill Restoration Group Ltd (Office)	1 storey	Other Specified Use (Golf Course)	75m to the southwest of Site A
麗華花園有限公司 (Office)	1 storey	Green Belt	77m to the west of Site A
Fortune Garden (Residential)	3 storeys	Residential	35m to the south of Site B
Tycoon Place (Residential)	3 storeys	Residential	76m to the north of Site B

### Identification of Potential Air Quality Impacts

- 2.8.3 Earthworks (excavation and backfilling) for the construction of the basements (for onsite sewage treatment works only), infrastructure works, foundation works and road formation work would be required for the construction of the project.
- 2.8.4 Fugitive dust will be the potential major source of air quality impact during the construction phase. Based on current proposal, the construction will involve site formation work, basement excavation, foundation work, superstructure construction, etc. Most earthworks will be conducted during site formation and basement excavation stages.
- 2.8.5 Both Site A and Site B rest on sloping area so that site formation work would involve significant excavation work. It is estimated that about 36900m<sup>3</sup> and 18600m<sup>3</sup> of excavated material will be generated from Site A and Site B with the approximate site formation and excavation areas of 5600m<sup>2</sup> and 3400m<sup>2</sup>. Both sites are generally undeveloped, so no demolition is required. Assuming a period of 1 year for site formation and excavation, Site A and Site B will respectively generate around 16 and 8 truckloads per day, equivalent to about 2 and 1 truckload per hour. Other than dump truck, mechanical equipment such as excavator, piling rig and drilling rig will also be used for site formation and excavation work.
- 2.8.6 Best management practice will be implemented for the Proposed Development. Fugitive dust emission arising from construction activities can be effectively suppressed by incorporating proper mitigation measures into work procedures through contractual clauses with reference to EPD's Recommended Pollution Control Clauses for Construction Contracts, where applicable, good site management, and close

monitoring by the resident engineers. The contractor shall be required to follow the requirements of the Air Pollution Control (Construction Dust) Regulations. With the adoption of good practices, it is expected that emission of construction dust can be kept at an acceptable level. Emission from diesel trucks for the haulage of materials and construction plants will contain high percentage of smoke particulate and unburned hydrocarbons in comparison with petrol driven vehicles. Ultra-low sulphur diesel (ULSD) with sulphur content not exceeding 0.005% by weight will be used as fuel to minimize SO<sub>2</sub> emission. In all circumstances, the contractor will be required to observe all relevant regulations and maintain all equipment in good condition to avoid any excessive emission. Under the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation, only approved or exempted non-road mobile machineries (including mobile generator, air compressor, excavator, crawler crane, bulldozer and etc.) with a proper label are allowed to be used in the construction site. In addition, availability of electricity supply during construction of the project will be explored and such requirement will be specified in future contract. If available, contractor should maximise use of electricity and with least reliance of diesel fuelled equipment (e.g. for electricity powered stationary equipment such as pump instead of using generator).

- 2.8.7 Since Site A and Site B are located about 400m apart, cumulative construction dust impact is unlikely significant. There is no other concurrent construction work identified in the vicinity of the Sites.

#### Mitigation Measures for Fugitive Dust Emission

- 2.8.8 With the implementation of sufficient dust suppression measures as stipulated under the APCO, Air Pollution Control (Construction Dust) Regulation (Cap 311R) and good site practices, fugitive dust emission arising from the earthworks, etc. can be effectively suppressed through contractual clauses and close enforcement of the resident engineers. The Contractor(s) shall be required to follow the requirements of the Air Pollution Control (Construction Dust) Regulation which requires notification before carrying out demolition works or construction works and to adopt dust reduction measures while carrying out demolition activities or construction activities.
- 2.8.9 The recommended dust mitigation measures for protection of nearby ASRs are described below:
- Use of regular watering, to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather;
  - Use of frequent watering for particularly dusty construction areas close to ASRs;
  - Open temporary stockpiles should be avoided or covered. Prevent placing dusty material storage plies near ASRs;
  - Dusty material stockpiled onsite, if any, should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3-sides;
  - Where this is not practicable owing to frequent usage, watering should be applied to aggregate fines;
  - Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations;
  - Establishment and use of vehicle wheel and body washing facilities at the exit points of the site;
  - Imposition of speed controls for vehicles on unpaved site roads. 8 km/hr is the recommended limit;

- Routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs;
- Provide hoarding along site boundary which is next to the ASRs to further protect the ASRs.

2.8.10 "Recommended Pollution Control Clauses for Construction Contracts" is available on the EPD website which set out the recommended air pollution control measures to be implemented by the contractor(s) during the construction stage of the Project.

2.8.11 In addition, availability of electricity supply during construction of the project will be explored and such requirement will be specified in future contract. If available, contractor should maximise use of electricity and with least reliance of diesel fuelled equipment (e.g. for electricity powered stationary equipment such as pump instead of using generator). With the adoption of good practices, it is expected that emission of construction fugitive dust can be kept to an acceptable level.

## **2.9 Conclusion**

2.9.1 As confirmed in field survey, there is no chimney identified within 200m from the Sites. The air sensitive uses in the MLP will be designed in such a way that the portion of residential façade within the buffer area will be provided with blank façade (wall or glazing) without any opening, so the openable window location can meet the buffer separation requirement with respect to nearest existing/future carriageways. Carpark is proposed at Site B. EPD's ProPECC PN 2/96 will be observed and followed for the design and operation of carpark. No significant vehicular emission impact is anticipated. There is no fluff, odour and other air pollutant emission identified in the surrounding. Therefore, it is envisaged that the proposed development at the Sites would not be subject to significant air quality impact.

2.9.2 Likewise, the Proposed Development would unlikely induce significant air quality impact on the surroundings with proper mitigation measures in place and to be recommended during detailed design of the project.

2.9.3 Best management practice will be adopted during construction of the project. Necessary mitigation measures as stated above and in "Recommended Pollution Control Clauses for Construction Contracts" where applicable will be applied so that emission during construction stage should be kept to an acceptable level.

### 3. NOISE IMPACT ASSESSMENT

#### 3.1 Noise Environment

- 3.1.1 Site A and Site B are surrounded by mainly residential, GIC, recreational and industrial uses. To be specific, there are residential uses on south and north sides of Site B while other uses are more than 300m apart. For Site A, it is surrounded by residential uses on northeast side, GIC and industrial uses on southwest side.
- 3.1.2 There is no railway line in the vicinity.
- 3.1.3 As observed in site survey on 8/3/2023, the noise environment of the sites is dominated by road traffic along Ting Kok Road.

#### 3.2 Assessment for Road Traffic Noise

- 3.2.1 The nearest major road is Ting Kok Road to the south of the Sites.

##### Road Traffic Noise Impact Assessment Criteria

- 3.2.2 Noise standards are recommended in the HKPSG for planning against noise impact from sources such as road traffic, railway and aircraft etc. The Proposed Development includes noise sensitive uses such as residential dwelling and residence of RCHE which are residential in nature. According to the guidelines, the maximum noise level from road traffic, measured in terms of  $L_{10}$  (1-hr) is recommended to be 70 dB(A) at typical facades. Tentatively, RCHE is proposed for GIC use. It is understood that only dormitories of RCHE requires to provide openable window for ventilation while other uses (e.g. common room, dining area, office) can be air conditioned and ventilated by other means. Similarly, retail uses are assumed to be central air conditioned and not rely on openable window for ventilation as well. Therefore, for GIC use, the standard for dwelling (i.e.  $L_{10}$ (1-hr) 70dB(A)) will be applied (i.e. assuming that only dormitory needs to be provided with openable window).
- 3.2.3 Should other noise sensitive facilities be provided for the proposed development and rely on opened window for ventilation in future, the relevant noise standards (such as 65 dB(A) for educational institutions and 55 dB(A) for diagnostic rooms and wards of residential care home for the elderly) shall be applied in the re-assessment and appropriate noise measures should be incorporated.

##### Road Traffic Noise Impact Assessment Methodology

- 3.2.4 The assessment approach and methodology involved the prediction of future noise impacts on Noise Sensitive Receivers (NSRs) arising from traffic flows on existing and future road carriageways situated in the vicinity of the Subject Site.
- 3.2.5 The U.K. Department of Transport's procedure "Calculation of Road Traffic Noise" (CRTN) was used to predict the hourly  $L_{10}$  noise levels generated from road traffic at selected representative NSRs.
- 3.2.6 Traffic forecast for year 2048, representing the worst situation within 15 years from the tentative completion year of the proposed development is provided by project traffic consultant and included in **Appendix 2**. Referring to the forecasted data, AM peak traffic flow is considered worse representative of the traffic noise impact when compared to PM peak traffic flow. The road alignment is with respect to existing road and proposed road upgrading works. Project traffic consultant is liaising with Transport Department (TD) and any reply from TD in relation to the traffic forecast will be provided promptly.
- 3.2.7 The section of Ting Kok Road fronting the site is assumed of traffic speed limit of 70kph while other road segments are of speed limit of 50kph.



### Noise Sensitive Receivers

- 3.2.8 NSRs within the sites have been selected to represent the ventilation opening of noise sensitive uses of the proposed development. Locations of the representative NSRs are shown in **Figure 5**. It is noted that there is no details on the GIC layout (at Site A) at this stage and exact location of dormitory of RCHE which is noise sensitive in nature is subject to detailed design. For assessment purpose, location that cannot meet air quality buffer separation requirement will be assumed of blank façade/fixed glazing (as recommended in last chapter). Therefore, only location that comply with the requirement will have openable window (assumed for dormitory uses) and is selected as NSR.
- 3.2.9 The assessment points have been taken to be situated at 1.2 m above floor slabs and at 1 m away from the external façade of openable windows of habitable room of the residential area.

### Predicted Road Traffic Noise Level under Base Case Scenario

- 3.2.10 The predicted road traffic noise level ( $L_{10}(1\text{-hr})$ ) under base case scenario for the Proposed Development (without any noise mitigation measures such as barrier, architectural fin) is presented in **Appendix 3**.
- 3.2.11 According to the assessment result, the highest predicted noise level is  $L_{10}(1\text{hr})$  77 dB(A). 634 out of 1750 flat units would have noise exceedance. The compliance level is 64%.
- 3.2.12 For GIC, the predicted noise level the highest predicted noise level is  $L_{10}(1\text{hr})$  79 dB(A).

### At-Source Noise Mitigation Measures

- 3.2.13 The effectiveness of at-source noise mitigation measures to protect noise sensitive receivers for public rental housing development at Site A have been explored in this context. It is identified that the major road traffic noise source is traffic along Ting Kok Road to the south. At-source noise mitigation measures include low noise road surfacing and at-source noise barrier.

### Low Noise Road Surfacing

- 3.2.14 A hypothetical sensitivity test is done to assess the effect of applying both LNRS on Ting Kok Road and noise barriers, ie cantilever barrier along Ting Kok Road, roadside barrier along Lo Fai Road and noise barrier at central divider of Ting Kok Road. The result of the sensitivity test is presented in **Appendix 17**. According to the result, there are still exceedance at residential towers of Site A after applying LNRS and noise barriers. The application of other noise mitigation measures is still required. Therefore, LNRS is not recommended.

### Noise Barrier

- 3.2.15 To evaluate the effectiveness of at-source noise barrier, a 5m height vertical noise barrier is assumed along the section of Ting Kok Road in front of Site A. According to the assessment result with 5m height vertical noise barrier assumed (approximate alignment and result shown in **Appendix 19**), the predicted noise level at 1/F of the residential tower is slightly reduced by around 1 dB(A) while the noise level at higher floors remain the same as the Base Case. The number of exceedance is reduced by 1 only. In other words, even an at-source noise barrier of as high as 5m cannot effectively reduce the noise impact on the public rental housing development.
- 3.2.16 In addition, in terms of visual aspect, the proposed noise barrier in front of Site A is visually incompatible to the context of Ting Kok Road. Ting Kok Road is a major access connecting Tai Po New Town and the Ting Kok and Tai Mei Tuk area at the fringe of

Tai Po New Town. Along most sections of Ting Kok Road, there are natural greenery of road side tree plantings. An at-source noise barrier, if being proposed, will become a dominating visual element to the area leading to adverse visual impact. It will also be in conflict with the proposed tree planting along Ting Kok Road which aims for recreating a greenery along Ting Kok Road.

- 3.2.17 Given the ineffectiveness to reduce noise impact and its potential visual impact and conflict with proposed tree planting along Ting Kok Road, at-source noise barrier along Ting Kok Road in front of Site A is not recommended.

Proposed Noise Mitigation Measures and Predicted Road Traffic Noise Level under Mitigated Case Scenario

- 3.2.18 To ameliorate road traffic noise impact, both conventional noise mitigation measures (e.g. fixed glazing with/without maintenance window) and innovative noise mitigation measures including acoustic window (baffle type) and enhanced acoustic balcony (baffle type) as stated in the Practice Note on Application of Innovative Noise Mitigation Designs in Planning Private Residential Developments against Road Traffic Noise Impact (ProPECC PN 5/23) and past project reference (e.g. ex-North Point Estate redevelopment) have been considered.

Blank façade/fixed glazing (with or without maintenance window)

- 3.2.19 For location that is subject to higher noise impact and not necessary provided with prescribed ventilation opening, it will be designated as blank façade/fixed glazing (with or without maintenance window). In case maintenance window is provided, it should be normally closed and need not to be opened for ventilation. Such design intent will be documented in various documents including future NIA report, sale brochure and Deed of Mutual Covenant so that the future occupants will be aware of its function.

Acoustic Window (Baffle Type) and Enhanced Acoustic Balcony (Baffle Type)

- 3.2.20 Referring to ProPECC PN 5/23 on Application of Innovative Noise Mitigation Designs in Planning Private Residential Developments against Road Traffic Noise Impact, reference cases of acoustic window and enhanced acoustic balcony (baffle type) are presented which can attenuate noise by at least 6 dB(A) and 8 dB(A) respectively. The configuration and noise reduction effectiveness of reference case in ProPECC PN 5/23 is adopted for private residential development at Site B. For assessment purpose, it is assumed that the noise reduction for NSR locations at Site B is 6 dB(A).
- 3.2.21 On the other hand, it is understood that Housing Authority's project has the standardised acoustic window system adopted for its modular flats. The relative noise reduction of the standardised acoustic window system was derived by onsite measurement of mock-up units and further projection. The noise reduction can be directly adopted. Improvement measures such as sound absorptive lining can be applied where necessary. With improvement measures in place, the noise attenuation can be up to around 4.2 to 7.1 dB(A) generally. The noise reduction of standardized acoustic window system for modular flats is directly adopted for Site A.
- 3.2.22 For the purpose of assessment in this early planning stage, it is assumed that the acoustic window (baffle type) and enhanced acoustic balcony (baffle type) to be adopted in the proposed private housing development of Site B would have noise attenuation of 6dB(A), while the standardised acoustic window system in Housing Authority's project to be adopted in the proposed public housing development of Site A would have noise attenuation of 4.2 to 7.1dB(A).
- 3.2.23 On the other hand, for GIC area (dormitory of RCHE), the room size is much larger so that the acoustic window system mentioned above may not be applicable. In this case, the noise attenuation performance is made reference to the redevelopment project of



ex-North Point Estate (hereafter referred as "NPE"). A road traffic noise sound attenuation of 8.8dB(A) for living rooms determined based on onsite field test is adopted. The system has gap width of 100mm, overlapping length of 275mm, opening area of 3.2m<sup>2</sup> and no micro-perforated absorber applied. It can serve dormitory of up to around 50m<sup>2</sup>.

- 3.2.24 **Figure 6** shows the location of proposed road traffic noise mitigation measures.
- 3.2.25 According to the assessment result under the mitigated scenario in the **Appendix 3**, no road traffic noise exceedance is found. Full compliance with the HKPSG road traffic noise standard can be achieved.

### 3.3 Assessment for Industrial Noise

- 3.3.1 Industrial noise is not considered a concern for Site B as it is separated from nearest industrial undertakings (Tai Po Industrial Estate) and GIC (Sewage Treatment Works) by more than 500m. Regarding Site A, assessment is as follows.

#### Industrial Noise Impact Assessment Criteria

- 3.3.2 Site A is separated from Tai Po Industrial Estate by around 180m. The location that Site A resides is not considered an urban area, rural area or low density residential area. Referring to S2.3.4 of the Technical Memorandum for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites (IND-TM), Area Sensitivity Rating "B" is considered appropriate assuming not affected by influencing factor. That is, the applicable acceptable noise level (ANL) should be 65 dB(A) during day and evening time, and 55 dB(A) during night time.
- 3.3.3 The Proposed Development contains residential tower, RCHE and retail facilities. It is mainly residential in nature. There may be associated facilities such as ventilation exhaust for carparking area, ventilation fans for plant rooms or air conditioning system for retail facilities which are potential noisy facilities. According to the HKPSG, the design of any noisy facilities should fulfil the standard of ANL-5dB(A) or the prevailing background whichever is lower. In later stage of the project, such requirement will be specified in contract so that future BS consultant and contractor will strictly follow.

#### Identification of Industrial Noise Sources in the Surrounding

- 3.3.4 According to the additional site survey on 12 Apr 2023, road traffic noise is dominant at both Site A and Site B. There is no noticeable noise other than from road traffic.
- 3.3.5 No noisy facility can be identified nearby Site B. The following uses and associated potentially noisy facilities nearby Site A were identified and discussed:

**Table 3.1 Summary of Identified Potentially Noisy Facilities (Site A)**

Potential noisy facility	Horizontal separation between the premises and nearest boundary	Observation
WSD Tai Po East Fresh Water Pumping Station	>65m	The station is fenced off. Louvers are observed on its south and west facades which are away from Site A. No noticeable noise can be observed generated from the station.

Tai Po East Fire Station	>150m	There are AC units located at the roof of the fire station. No noticeable noise can be observed.
DSD Ting Kok Road Pumping Station No.5	>150m	The station is fenced off. The facilities are not accessible by public. No significant noise source can be observed.
Kee Wah Group Limited	>190m	<p>There are total of six numbers of refrigerated containers at-grade on the open space near the bicycle lane along Ting Kok Road. It is observed that the containers are emitting noise out when standing at the boundary of the factory site. On-site measurement has been taken at the site boundary. The deduced SWL is 100.7 dB(A).</p> <p>There are 2 VRVs located on west side of one building roof nearest to Ting Kok Road at over 300m from nearest boundary of Site A.</p> <p>There are 2 chillers found at the roof (northwest corner) of another building and at over 300m from nearest boundary of Site A. In addition, there are 2 VRVs located near to southeast side at the roof of same building and at about 260m from nearest boundary of Site A. Since they are not accessible, assumption is made on the permissible noise level.</p>
Meyer Aluminium Limited	>200m	There are 8 VRVs located at the roof of the industrial building and at about 270m from nearest boundary of Site A.. No noticeable noise can be observed along Dai Kwai Street and Ting Kok Road from the AC units. Since they are not accessible, assumption is made on the permissible noise level.
Transtech Optional Communication Company Limited	>270m	There are 2 AC units located at the roof of the industrial building and at over 300m from nearest boundary of Site A. No noticeable noise can be observed along Dai Kwai Street and Ting Kok Road from the AC units.

- 3.3.6 While industrial noise sources further apart (some of them sited more than 300m apart) would also be identified, the assessment focused on identified industrial noise sources within 300m from Site A boundary. Other noise sources over 300m away are considered with minor contribution to the overall noise impact due to long separation. According to the site survey, it is found that fixed noisy equipment of refrigerated containers in Kee Wah Group Limited can be observed when walking closer. Noise emitted by the refrigerated containers are noticeable when standing nearby the bicycle lane at Ting Kok Road just outside Kee Wah. The on-site measurement has been taken for the identified fixed noise source is shown in **Appendix 5**.
- 3.3.7 Other facilities within 300m study area of the nearest site boundary cannot be accessible (e.g. AC at rooftop) and no noticeable noise can be observed in the survey. Since the facility is not accessible, request was made to Kee Wah Group and Meyer

Aluminium Limited to collect information of the identified noise source (e.g. equipment model, noise data) and to request for access to conduct onsite measurement, and the copies of letters of request are shown in **Appendix 6**. Kee Wah Group and Meyer Aluminium Limited advised by tele-conversation that the requested information of the identified fixed noise source could not be provided and on-site noise measurement was not permitted. Assumption of permissible noise level of these noise sources has therefore been made for the purpose of fixed noise impact assessment. It is confirmed that there is no other noisy equipment identified as fixed noise sources other than what described above.

#### Industrial Noise Impact Assessment Methodology

3.3.8 The methodology for the industrial noise impact assessment follows the methodology in IND-TM and standard acoustical principle.

- Identify fixed plant noise sources;
- Assign sound power levels (SWLs) to the noise sources with reference to noise measurements or other sources;
- Calculate the distance correction factors based on the horizontal distance between the NSRs and the noise sources;
- Calculate the corrected noise levels after taking into account other corrections such as potential façade reflection, screening effects, if any, by adopting standard acoustic principles;
- Tonality of 3dB(A) has been assumed for all fixed noise sources (except those with direct measurement conducted and confirmed with no tonality effect) as a conservative assessment approach; and
- Present the results in terms of LAeq, 30min dB(A), as specified in IND-TM.

3.3.9 Regarding calculation, standard acoustical principle is adopted. The identified noise sources are generally distant apart from the NSRs so that they can be regarded as point sources. The following corrections have been applied:

- Distance Correction to convert SWL to SPL:  $-10 \times \log(Q/4\pi D^2)$ . E.g. for noise sources rest on ground or mounted on wall, the equivalent formula is  $-20 \times \log(D) - 8$  (i.e.  $Q=2$ ) where  $Q$  is directivity factor
- Façade correction of +3 dB(A) is applied to all NSRs.
- Tonality correction of +3 dB(A), where applicable.
- No barrier shielding is assumed. No impulsive and intermittent noise correction is considered necessary. Only horizontal separation distance is accounted.

#### Noise Sensitive Receivers

3.3.10 Representative NSRs within Site A have been selected to represent the worst impacted noise sensitive uses of the proposed development. Since potential noise source was identified on southwest side, NSR nearest to noise source on southwest side is selected for assessment purpose (N5-01 & GIC-01 shown in **Figure 5**).

3.3.11 The assessment points have been taken at 1 m away from the external facade of openable windows of habitable room of the residential unit.

#### Predicted Industrial Noise Level under Unmitigated Scenario

3.3.12 The predicted industrial noise level (Leq(30min)) for the proposed development (without any noise mitigation measures) is presented in **Appendix 6**. The catalogue of the reference VRV unit is presented in **Appendix 7**.

- 3.3.13 According to the assessment result, the predicted noise level is 47 dB(A) and well within the standard during day and evening time (65 dB(A)) and during night time (55 dB(A)). No adverse industrial noise impact is anticipated.

### **3.4 Conclusion**

- 3.4.1 As observed onsite, the noise environment is dominated by road traffic noise from along Ting Kok Road.
- 3.4.2 All NSRs of the proposed development would be within the road traffic noise standard stipulated under HKPSG with mitigations in place. The noise mitigation measure includes blank wall/fixed glazing, acoustic window (baffle type), enhanced acoustic balcony (baffle type).
- 3.4.3 According to the industrial noise impact assessment result, there is no exceedance of relevant standard under unmitigated scenario.
- 3.4.4 The development will be designed so that potentially noisy facilities onsite will need to meet the standard stipulated in the HKPSG. No unacceptable fixed noise impact on the surrounding and the Proposed Development is anticipated.
- 3.4.5 NIA and Environmental Assessment Study would be required for private and public residential development respectively in the detailed design stage, to identify appropriate noise mitigation measures for the proposed developments and to address the potential noise impact in accordance with the requirement under HKPSG.

## 4. PRELIMINARY LANDFILL GAS HAZARD ASSESSMENT

### 4.1 Background and Scope of Work

#### Background

- 4.1.1 Both Site A and Site B fall within 250m consultation zone of the restored Shuen Wan Landfill (SWL) (see **Figure 8**). A preliminary qualitative landfill gas hazard assessment in respect of the SWL is conducted to identify all potential landfill gas (LFG) problems and hazards, and propose all precautionary and protection measures to mitigate any potential LFG problems or hazards during both construction and operation of the project at this stage to demonstrate the feasibility.
- 4.1.2 Since this study for the Proposed Development is commenced in 2021, landfill gas monitoring data has been acquired at that time. It is envisaged that during detailed design of the project and with further scheme evolution, a detailed landfill gas hazard assessment adopting latest landfill gas monitoring data and the refined scheme should be conducted.

#### Scope of Work

- 4.1.3 According to the Professional Person Environmental Consultative Committee (ProPECC) *Practice Note PN 3/96, "Landfill Gas Hazard Assessment for Developments adjacent to Landfill"* (ProPECC PN 3/96), and the corresponding Landfill Gas Hazard Assessment Guidance Note (June 1997) (*Guidance Note*) published by Environmental Protection Department of the government of HKSAR (EPD), the assessment sets out the following scope of works:
- To review the updated information related to SWL;
  - To identify the sources and nature of hazardous LFG emissions which may potentially affect the Subject Site within 250 m consultation zone of the SWL;
  - To identify the viable pathways through the ground, utilities and the conditions of these pathways through which the hazardous emissions must pass if they are to reach the proposed residential development;
  - To identify the elements (targets) within the Subject Site during ground investigation of the project which are sensitive to the hazardous emissions;
  - To assess qualitatively the risk which the hazardous LFG emissions may pose to the target for each of the source-pathway-target combinations; and
  - To propose the suitable type of protection measures to mitigate the identified hazards to an acceptable level.

### 4.2 Landfill Gas Hazard Assessment Criteria

- 4.2.1 The source risk level raised by the landfill may be classified as "Minor", "Medium" or "Major" based on the definition given in Section 3.9 of the *Guidance Note*.
- 4.2.2 The pathway may be classified as "Very short/direct", "Moderately short/direct" or "Long/indirect" depending on the path length, permeability of the soils, spacing, tightness and direction of the fissures/joints, depth and thickness of the medium through which the gas can migrate, topography, and presence of any conduits, etc.
- 4.2.3 The targets may be classified as "High sensitivity", "Medium sensitivity" or "Low sensitivity" depending on the combination of various categories of the source, pathway and target. The associated risk on target sensitivity are categories in **Table 4.1**, whilst **Table 4.2** summarises the implication regarding each category of risk.

**Table 4.1 Classification of Risk Category**

Source	Pathway	Target Sensitivity	Risk Category
Major	Very short/direct	High	Very High
		Medium	High
		Low	Medium
	Moderately short/direct	High	High
		Medium	Medium
		Low	Low
	Long/indirect	High	High
		Medium	Medium
		Low	Low
Medium	Very short/direct	High	High
		Medium	Medium
		Low	Low
	Moderately short/direct	High	High
		Medium	Medium
		Low	Low
	Long/indirect	High	Medium
		Medium	Low
		Low	Very Low
Minor	Very short/direct	High	High
		Medium	Medium
		Low	Low
	Moderately short/direct	High	Medium
		Medium	Low
		Low	Very Low
	Long/indirect	High	Medium
		Medium	Low
		Low	Very Low

**Table 4.2 Summary of General Categorisations of Risk**

Level of Risk	Implications / mitigation Measures Required
Very high (Undesirable)	The type of development being proposed is very undesirable and a less sensitive form of development should be considered. At the very least, extensive engineering measures, alarm systems and emergency action plans are likely to be required.
High	Significant engineering measures will be required to protect the planned development.
Medium	Engineering measures will be required to protect the planned development.
Low	Some precautionary measures will be required to ensure that the planned development is safe.
Very low (Insignificant)	The risk is so low that no precautionary measures are required.

### 4.3 Evaluation of Potential Landfill Gas Migration Hazard

4.3.1 The evaluation of risk source, migration pathway and target is presented below.

#### Source – Landfill Gas Monitoring Data

4.3.2 Landfills, whether completed or still in operation, may have potential hazards to nearby land uses due to lateral migration of LFG. Typical LFG, with a majority of methane (CH<sub>4</sub>) and carbon dioxide (CO<sub>2</sub>), may have the potential to cause asphyxiation, fire or explosion as it migrates into and accumulates in confined spaces during the excavation and foundation works, basement construction and maintenance of drains or other underground services. Other susceptible locations include site huts, basements and

similar poorly ventilated enclosures that exist during construction and those eventually in fully operational buildings.

- 4.3.3 The LFG mixture usually has a density similar to that of air, although it varies according to the exact composition. Upward movement of LFG is usually a result of excess pressure over the ambient rather than buoyancy. Bulk gas movements may be caused by changes in atmospheric pressure or by the pumping effect of a rising water table, whereas sub-surface lateral diffusion through semi-porous strata, cracks and faults may be predominately due to concentration gradients. Every effort has to be made either to stop the migration or to have it vented to avoid accumulation in undesirable locations of the development. LFG is particularly hazardous in the following aspects:
- CH<sub>4</sub> forms explosive mixtures in air at concentrations in the approximate range of 5 -15% v/v. If allowed to accumulate in voids of buildings, ignition of the gas can lead to an explosion capable of causing significant structural damage.
  - CO<sub>2</sub> is an asphyxiant. The long-term occupational exposure limit (OEL), specified in the Health and Safety Executive (HSE) Environmental Hygiene Guidance Note (EH)40 for CO<sub>2</sub> is 0.5% v/v and the short-term OEL is 1.5% v/v. Therefore, sufficient accumulations of LFG exceeding lower explosive limit (LEL, 5% v/v) for CH<sub>4</sub> could also pose a severe asphyxiation hazard to humans or animals.
- 4.3.4 The area of the SWL amounts to about 55 ha. The total waste received during operation was approximately 15 Mt and was closed in 1995 and restored in late 1997. The afteruse facility includes a golf driving range.
- 4.3.5 Off-site measurements of LFG were conducted by EPD at boreholes created along the boundary of the SWL. The locations of the monitoring points are shown in **Appendix 8**. Gas monitoring data at the monitoring wells, probes and manholes for the 24-months period between May 2019 and April 2021 at the time of commencement of this study were obtained from EPD. Among the monitoring locations shown which are scattered on all side of SWL, there are monitoring locations nearby the Subject Site (including GMP27-29, GMP35-37, M1, M13a, M13-16, M13, M14, M15, M16, P30a, P47a, P48, P49, P50a, P51a, P52a).
- 4.3.6 According to the result at all nearest monitoring locations, the monitored CH<sub>4</sub> content is negligible with no detectable CH<sub>4</sub> found. This suggests that risk of explosion due to LFG migration is unlikely.
- 4.3.7 Regarding the monitored CO<sub>2</sub> and oxygen (O<sub>2</sub>) level of these nearest monitoring locations, some concentrations were higher than 0.5% v/v for CO<sub>2</sub> and below 19% v/v for O<sub>2</sub> (which is the trigger level).
- 4.3.8 Gas monitoring data of the nearest monitoring locations are extracted and included in **Appendix 8**.
- 4.3.9 It is understood that LFG generated from the SWL is collected and transported to the plant of Hong Kong and China Gas Company Limited (Towngas) by the underground connection pipeline for Towngas's use, which acts as an active measure for LFG treatment.
- 4.3.10 Despite that only few past monitoring results of CO<sub>2</sub> and O<sub>2</sub> exceed the trigger level, it is noted that SWL would somehow rely on active measure (extraction and transfer of LFG to Towngas plant). Therefore, the source risk level due to the SWL is conservatively classified as "Medium".



### LFG Migration Pathways

- 4.3.11 LFG is generated under positive pressure as a result of microbial degradation of organic matters in the buried waste. This will create a pressure gradient, causing migration of the gas to points of lower pressure. Migration pathways will therefore be determined by zones of lowest resistance to gas movement. For example, soil of higher permeability would allow LFG migration easier. With no soil composition data in hand, it is conservatively assumed that soil is permeable.
- 4.3.12 Apart from soil, utilities are another possible pathway of concern. There are existing drainage and sewerage systems along Ting Kok Road. But migration along utilities is considered less direct when compared to migration through soil and not the dominant pathway.
- 4.3.13 Site A and Site B are respectively located about 50m and 75m to the north of SWL (measured from waste boundary to site boundary). The pathway of potential migration of the LFG to the proposed development is classified as "Moderate short/direct".

### Sensitive Target

- 4.3.14 The focus of sensitive targets are those enclosed room in touch with soil so that LFG migration and entry to these enclosed room and its accumulation is possible.
- 4.3.15 As it is in early planning stage of the project, detailed design is not available. The study in this report is based on tentative master layout plan. It is considered necessary to review the use and evaluate the impact in detailed design stage.
- 4.3.16 Regarding Site A, enclosed facilities in touch with soil would include E&M room, GIC uses & residential block lobby in Site A; carpark in Site B.
- 4.3.17 During the construction of the proposed development, activities including piling and excavation will be carried out. Confined space in touch with ground, deep excavation and shallow excavation may exist due to the provision of underground facilities. The classification of target during construction and operation of the project is based on the *Guidance Note* as **Table 4.3** below.

**Table 4.3 Classification of Targets**

Target ID	Target Description	Level of Sensitivity
C1	Confined space in contact with ground	Highly Sensitive
C2	Deep excavation but not confined	Medium Sensitivity
C3	Shallow excavation but not confined	Low Sensitivity
T1	Carpark at Site B	Highly Sensitive
T2	E&M room at Site A	Medium Sensitive
T3	Lift lobby at Site A	Highly Sensitive
T4	GIC at Site A	Highly Sensitive

- 4.3.18 E&M rooms (with source of ignition) are assumed with restricted access to staff/workers only. Regarding carpark (with source of ignition), lift lobby and GIC, it is assumed generally accessible. Enclosed rooms in touch with soil either with source of ignition and generally accessible are considered highly sensitive.

### Source-pathway-target analysis

- 4.3.19 After identification of the source, pathway and target, an analysis as showed in **Table 4.4** indicates the overall risk impact associated with the proposed development.



**Table 4.4 Source-Pathway-Target Analysis**

Source	Pathway	Target ID	Description	Level of Sensitivity	Level of Risk
<b>S1. SWL</b>  The landfill was closed in 1995 and restored in late 1997. Monitoring results in 24 months indicated no significant migration of LFG towards the direction of the proposed development. LFG to be transferred to Towngas. In other words, SWL has some dependence on active measure <b>(Medium Source)</b>	<b>P1. Intervening Soil</b>  Source – Target distance (between 50 to 100 m) <b>(Moderate short/direct)</b>	C1	Confined space in contact with ground	High	High
		C2	Deep excavation	Medium	Medium
		C3	Shallow excavation	Low	Low
		T1	Carpark	High	High
		T2	E&M room	Medium	Medium
		T3	Lift lobby	High	High
		T4	GIC	High	High

4.3.20 The overall level of risk is Low to High. According to *the Guidance Note*, it is equivalent to categories B to D, which are shown in **Table 4.5**.

**Table 4.5 Categorisations of Risk**

Category	Level of Risk	Implication
B	High	Significant engineering measures will be required to protect the proposed development.
C	Medium	Engineering measures will be required to protect the proposed development.
D	Low	Some precautionary measures will be required to ensure that the proposed development is safe

4.3.21 Category B requires active control of gas, including barriers and detection systems in general. Category C requires use of 'semi active' or enhanced passive gas control, and detection systems in some situation. Category D requires passive control of gas only.

4.3.22 With respect to the nature of the target during the construction phase, active control in terms of mechanical ventilation as usually required for the works in confined space is recommended for the confined space in touch with soil and deep/shallow excavation.

4.3.23 Regarding the operational phase, a permanent installation in terms of an impermeable lining & a provision of permanent mechanical ventilation system is recommended based on Category B & C; and with additional detection system recommended based on Category B.

#### 4.4 Precautionary Measures during Construction Phase

4.4.1 Safe working practices to reduce gas related hazards such as asphyxiation, fires and explosions have been listed below for incorporation into a construction contract. The working practices are:-

- 1) Mechanical ventilation (as active control measure) should be provided to ensure the confined space and the deep (more than 3m) / shallow (around 1 to 3m) excavation area (with high to low risk) should be well ventilated.
- 2) A Safety Officer or an appropriately qualified person, who is trained in the use of gas detection equipment, landfill gas related hazards, shall be present on the site throughout the works. He/she should be provided with an intrinsically safe portable instrument, which is appropriately calibrated and capable of measuring the following gases in the ranges indicated:

CH <sub>4</sub>	0-100% LEL and 0-100% v/v
CO <sub>2</sub>	0-100%; and

O<sub>2</sub>

0-21%

- 3) All personnel who work on the site and all visitors to the site should be made aware of the possibility of ignition of gas in the vicinity of excavations. Safety notices should be posted warning of the potential hazards.
- 4) Those staff who work in, or have responsibility for "at risk" areas, including all excavation workers, supervisors and engineers working within the area of the proposed development, should receive appropriate training on working in areas susceptible to landfill gas, fire and explosion.
- 5) An excavation procedure or code of practice to minimise landfill gas related risk should be devised and carried out by the Project Proponent.
- 6) No workers should be allowed to work alone at any time in or near to any excavation. At least one other worker should be available to assist with a rescue if needed.
- 7) Smoking, naked flames and all other sources of ignition should be prohibited within 15m of any excavation or ground-level confined space. 'No smoking' and 'No naked flame' notices should be posted prominently on the construction site and, if necessary, special areas designated for smoking.
- 8) Welding, flame-cutting or other hot works should be confined to open areas at least 15m from any trench or excavation.
- 9) Welding, flame-cutting or other hot works may only be carried out in trenches or confined spaces when controlled by a 'permit to work' procedure, properly authorised by the Safety Officer or other appropriately qualified person.
- 10) The permit to work procedure should set down clearly the requirements for continuous monitoring for CH<sub>4</sub>, CO<sub>2</sub> and O<sub>2</sub> throughout the period during which the hot works are in progress. The procedure should also require the presence of an appropriately qualified person, in attendance outside the 'confined area', who shall be responsible for reviewing the gas measurements as they are made, and who shall have executive responsibility for suspending the work in the event of unacceptable or hazardous conditions. Only those workers who are appropriately trained and fully aware of the potentially hazardous conditions which may arise should be permitted to carry out hot works in confined areas.
- 11) Ground level construction plant should be fitted with vertical exhausts at least 0.6m above ground level and with spark arrestors.
- 12) Any electrical equipment, such as motors and extension cords, should be intrinsically safe.
- 13) During piping assembly or conduiting construction, all valves/ seals should be closed immediately after installation. As construction progresses, all valves/seals should be closed as installed to prevent the migration of gases through the pipeline/conduit.
- 14) Avoid unnecessary erection of enclosed storage container/sheds on site. Alternatively, the enclosed storage container/ sheds etc., if needed, should be raised clear of the ground. A minimum, clear separation distance (as measured from the highest point on the ground surface to the underside of the lowest floor joist) of 500mm should be provided.
- 15) Adequate instructions and training to be given to construction workers on site.
- 16) Safety equipment to be available in serviceable condition.
- 17) No smoking signs to be available on site.

- 18) During construction adequate fire extinguishing equipment, fire resistant clothing and breathing apparatus (BA) sets should be made available on site. Moreover, the Project Proponent should formulate a health and safety policy, standards and instructions for site personnel to follow.
- 19) Gas measurement recommended to be made at the ground surface before excavation commences, at the beginning of each working day for the entire period the excavation remains open and for excavations in excess of 1 m before any worker enter the excavation and periodically through the working day.
- 20) Level of flammable gas to be checked at places where ventilation is poor.
- 21) Entry into any space where there is a risk of asphyxiation should be prohibited unless the precautions detailed in relevant guidance notes such as "Safe work in confined spaces" and "Confined spaces – A brief guide to working safely" published by the Health and Safety Executive, "Code of Practice – Safety and Health at Work in Confined Spaces" published by the LD and "Working in confined Spaces" published by the Occupational Safety & Health Council have been followed under the supervision of a competent safety supervisor. In addition, equipment like respirator, rescue sets, safety harness and breathing apparatus are necessary.
- 22) Stop all works and improve ventilation if gas is detected to be in excess of 1% v/v of CH<sub>4</sub> or 1.5% v/v of CO<sub>2</sub> in trenches, wells, caissons or any other areas with poor ventilation. All measurements should be carried out using intrinsically safe instrument capable of measuring CH<sub>4</sub> gas mixtures in the range of 0% to 100% of the LEL of CH<sub>4</sub>.
- 23) "Specific Advice Relating to the Drilling of Boreholes" in Section 8 of the *Guidance Note* (extracted below) should be followed.

*Supervision and Safety Management of Drilling Operations*

- Drilling should only proceed with adequate care and precautions against the potential hazards which may be encountered.
- Before site works begin, the drilling contractor should devise a 'method-of-working' statement covering all normal and emergency procedures and the site supervisor and all operatives must be familiar with this statement.
- The method-of-working statement should cover, inter alia:
  - number of operatives;
  - experience and special skills of operatives;
  - normal method of operations;
  - emergency procedures, including fire fighting;
  - supervisors responsibilities;
  - storage and use of safety equipment;
  - safety procedures; and
  - signs, barriers and guarding.

*Safety Equipment and Clothing*

- Any intrinsically safe, portable methane meter should be available at all times.
- Other safety equipment should include:

- No smoking signs to be placed prominently adjacent to the drilling areas;
- Portable fire extinguisher;
- High visibility clothing to be worn by all drilling operatives; and
- Additional protective clothing should include stout industrial boots (with steel toe cap and insole), plastic hard hats, heavy duty waterproof industrial gloves.

#### Working Procedures

- On arrival at site the drilling rig should be set-up up-wind of the borehole location, 'No smoking' signs set out and the working area should be roped or coned-off.
- Suitable guards or barriers should be placed around the excavation or borehole to prevent access by unauthorised persons.

#### Safety Procedures

- One person should be present at all times during drilling operations, with the sole responsibility of assuring the observance of all safety procedures. This person should be trained in the use of all recommended safety equipment.
- Smoking should be prohibited anywhere on a landfill site and within 15m of a boring or excavation at any locations within the Consultation Zone.
- For large diameter boreholes, a working platform should be placed over the hole which will prevent accidental entry into the hole by operatives.
- No worker should be allowed to work alone at any time near the edge of the well under construction. Another worker should always be present, beyond the area considered to be subject to the possible effects of landfill gas or cave-in.
- Periodically during the well construction, the work areas should be monitored for levels of methane.
- If the well construction is not completed by the end of the working day, the hole should be covered with a plate of sufficient overlap to prevent access to the hole and sufficient structural strength to support expected loads. The plate should be weighted down to discourage removal and, on landfill sites, the edges of the plate should be covered with sufficient depth of wet soil to prevent escape of gas.
- All pipes or casings should be capped at the end of each working day.
- Engine-driven rigs should have vertical exhaust stacks discharging not less than 1.5m above ground level and should have overspeed limits to prevent engine run away on ingested gas.
- Diesel engine air-intakes should also be located not less than 1.5m above ground level.
- Any electrical equipment should be intrinsically safe.
- Additional safety advice and guidance may be found in 'Investigation into Establishing an Effective Practical Safe Working Practice When Drilling in Landfill Sites and Adjacent Areas and Contaminated Ground and Adjacent Areas' compiled by the British Drilling Association (1993).

Installation of Vertical Wells

- To prevent uncontrolled gas release and to protect personnel from the risk of falling into the borehole, the open borehole should be covered with a sheet or plate strong enough to support personnel and having an overlap all round the borehole.
  - The drilling rig, boring machine or excavator should remain in place over the borehole and could be used as a support to assist placement of the casing.
  - The upper end of the well casing should be sealed, preferably with a fused or screwed end cap or alternatively with an inflatable bag type flow stopper, until the permanent headworks/monitoring tap is fitted. Landfill gas must not be allowed to vent freely at the site surface.
- 24) Any chamber, manhole or culvert which is large enough to permit access to personnel should be subject to entry safety procedures. Such work in confined spaces is controlled by *the Factories and Industrial Undertakings (Confined Spaces) Regulations of the Factories and Industrial Undertakings Ordinance*. Following the *Safety Guide to Working in Confined Spaces* ensures compliance with the above regulations.
- 25) For the work in the confined spaces, the following practices should be followed: -
- The entry or access point should be clearly marked with a warning notice (in English and Chinese) which states that there is the possibility of flammable and asphyxiating gases accumulating within.
  - The warning notice should also give the telephone number of an appropriate competent person who can advise on the safety precautions to be followed before entry and during occupation of the manhole.
  - Personnel should be made aware of the dangers of entering confined spaces potentially containing hazardous gases and, where appropriate, should be trained in the use of gas detection equipment.
  - Prior to entry, the atmosphere within the chamber should be checked for oxygen, methane and carbon dioxide concentrations. The chamber may then only be entered if oxygen is greater than 18% by volume, methane is less than 10% of the LEL, which is equivalent to 0.5% by volume (approximately), and carbon dioxide is less than 0.5% by volume.
  - If either carbon dioxide or methane are higher, or oxygen lower, than the values given above, then entry to the chamber should be prohibited and expert advice sought.
  - Even if conditions are safe for entry, no worker should be permitted to enter the chamber without having another worker present at the surface. The worker who enters the chamber should wear an appropriate safety/recovery harness and, preferably, should carry a portable methane, carbon dioxide and oxygen meter.
- 26) In general, when work is being undertaken in confined spaces sufficient approved resuscitation equipment, breathing apparatus and safety torches should be available. Persons involved in or supervising such work should be trained and practised in the use of such equipment. A permit-to-work system for entry into confined spaces should be developed by an appropriately qualified person and consistently employed.

### **LFG Monitoring during the Construction Phase**

- 4.4.2 The objective of gas monitoring during the construction phase of the proposed development is to ensure that LFG does not accumulate in the work areas (e.g. trial pit) likely to pose a risk of explosion or hazards to the workers.
- 4.4.3 It has to ensure that any levels of LFG can be readily detected and that timely remedial measures and actions can be taken to bring the LFG level down to a safe level so that works can be resumed.
- 4.4.4 The level of LFG shall be checked immediately before excavation commences and periodically throughout the working day with portable measuring instrument, which is intrinsically safe and capable of measuring, the following gases in the range indicated:-
- |                 |                           |
|-----------------|---------------------------|
| CH <sub>4</sub> | 0-100% LEL and 0-100% v/v |
| CO <sub>2</sub> | 0-100%; and               |
| O <sub>2</sub>  | 0-21%                     |
- 4.4.5 In addition, routine monitoring should be carried out in all excavations, manholes and chambers, and any other confined spaces that may have been created by, for example, the temporary storage of building materials on the site surface of the proposed development.
- 4.4.6 All measurements in excavation areas should be made with the monitoring tube located not more than 10mm from the exposed ground surface.
- 4.4.7 The monitoring frequency and areas to be monitored should be set down prior to the commencement of the any ground-works of the proposed development either by the Safety Officer or an appropriately qualified person.
- 4.4.8 An action plan given in **Table 4.6** below and shall be incorporated in the construction contract.

**Table 4.6 Action Plan – LFG Monitoring during the Construction Stage**

Parameter	Measurement	Action
O <sub>2</sub>	< 19%	Ventilate trench/void to restore O <sub>2</sub> level to > 19%
	< 18%	Stop works. Evacuate personnel/prohibit entry Increase ventilation to restore O <sub>2</sub> to > 19%
CH <sub>4</sub>	> 10% LEL	Post "No Smoking" signs Prohibit hot works Ventilate to restore CH <sub>4</sub> to < 10% LEL
	> 20% LEL	Stop works Evacuate personnel/prohibit entry Increase ventilation to restore CH <sub>4</sub> to < 10% LEL
CO <sub>2</sub>	> 0.5%	Ventilation to restore CO <sub>2</sub> to < 0.5%
	> 1.5%	Stop works Evacuate personnel/prohibit entry Increase ventilation to restore CO <sub>2</sub> to < 0.5%

### **4.5 Passive Control of Gas for Permanent Development**

- 4.5.1 For identified target areas of high risk level, passive control, active control and detection system are recommended. For identified target areas of medium risk level, passive control and active control system are recommended.

#### **Passive Control**

- 4.5.2 For identified target areas of high/medium risk level, it is recommended that the structure in contact with soil (including base slab and wall) should be lined with high-



density polyethylene (HDPE) geo-membrane (usually 1 to 1.5mm) with hydraulic conductivity of  $10^{-12}$ m/s or lower, or any other equivalent measures.

- 4.5.3 If geo-membrane is applied, it aims to curb and divert the permeation of gas into these enclosed areas. The geo-membrane should have strong resistance to environmental attack and to possible chemical attack, and has long stability, durability and reliability. The gas membranes shall extend to be protected for at least 1,000mm or beyond the walls of the target service room to bend upward as a skirt for at least 300mm. **Figure 9** illustrate the concept using HDPE geo-membrane. In addition, all penetration from ground should be properly sealed such as using collar seals welded to make it air tight. The HDPE lining is recommended to cover the envelope of the building in touch with ground. The envelope design of the building would unlikely create any void area which would retain landfill gas and result in gas build up. With presence of gas barrier recommended, it is anticipated that landfill gas, if any, will diffuse through the soil and migrate around the building to elsewhere including escaping to the atmosphere. Moreover, according to the monitoring results in **Appendix 8**, there is negligible methane detected and suggests that gas migration rate, if any, is on the low side. The chance of gas build up is low. No venting facility is proposed for attenuating gas build up due to gas barrier applied to the building envelope. In addition, natural cut-off barrier and water seal is recommended for utilities entry to the Subject Site to minimise chance of LFG migration along the utilities (see **Figure 10**).

#### 4.6 Active Control of Gas for Permanent Development

- 4.6.1 Mechanical ventilation is recommended for target with high/medium risk level. Mechanical ventilation of not less than 5 ACH will be provided and in continuous operation or upon demand if integrated and triggered using detection system.

#### 4.7 Detection System for Permanent Development

- 4.7.1 With both active and passive control in place as multiple defence, the risk of landfill gas migration and accumulation is very unlikely.
- 4.7.2 In addition, detection system will be installed to cover all high risk areas. The mechanical ventilation for these target areas will be controlled based on the continuous landfill gas detection level if practicable and subject to detailed design. In case a pre-set level (tentatively 0.3% v/v of CH<sub>4</sub>, 0.3% of CO<sub>2</sub>, 19.5% of O<sub>2</sub>) is reached, ACH of mechanical ventilation will be triggered and increased to not less than 5 ACH. (see following section).
- 4.7.3 The system should be able to indicate at least three levels of concentration of CH<sub>4</sub>, CO<sub>2</sub> and O<sub>2</sub>, including the pre-set level (aforementioned), trigger level and action level (see **Table 4.6**). The signal will be fed to the control/guard room.

#### 4.8 Further Recommendations

- 4.8.1 Upon detailed design of the project, the landfill gas hazard assessment and respectively recommended mitigation measures should be reviewed and updated where necessary.
- 4.8.2 The future operator is responsible to maintain the precautionary and protection measures during the operation of the proposed development.
- 4.8.3 Upon the completion of the construction works (including implementation of mitigation measures), a competent professional person representing the project proponent shall confirm in writing to EPD that above-mentioned recommended landfill gas protection measures for the proposed development have been properly incorporated into the proposed development. This could be in form of a short report with photo records

showing the installation of membrane etc. as well as the relevant as-built drawings related to landfill gas protection measures.

- 4.8.4 Prior to and during the first 2 years of the operation of the proposed development, it is proposed to conduct the landfill gas monitoring in a regular manner to cover all identified targets with high risk level and accessible (one-off monitoring prior to occupation, monthly monitoring for the first year, and quarterly monitoring for the second year) using separate detection system. The level of landfill gas should be measured with appropriately calibrated portable measuring instrument supported by valid calibration certificates, which is intrinsically safe. Monitoring and reporting should be prepared by competent persons with a good knowledge on LFG migration issue (e.g. an environmental consultant with experience in LFG hazard assessment and monitoring). A monitoring programme should be submitted to EPD for agreement before the commencement of the monitoring exercise.
- 4.8.5 In case trigger level is reached, a frequency of the monitoring will be increased to weekly. The frequency will be resumed to normal provided that 3 consecutive monitoring results indicates that concentration levels are within trigger level.
- 4.8.6 An action plan is given in **Table 4.7** to specify the actions to be taken at different levels of gases detected during the operation phase. Results of the operational phase gas monitoring programme, if required, shall be reported to and recorded by the operator.

**Table 4.7 Action Plan – LFG Monitoring during the Operational Stage**

Parameter Conc. % v/v	Actions
All detectable level of CH <sub>4</sub>	Investigate to ensure that the monitoring result is correct
0.5 % v/v (10% LEL) of CH <sub>4</sub> or 0.5% of CO <sub>2</sub> or <19% of O <sub>2</sub> whichever is reached	<p><u>Trigger Level:</u></p> <p>Further investigation* within 7 days to be undertaken within the development. Monitoring frequency increased to once per week until the level falls below trigger level in 3 consecutive monitoring exercise</p> <p>Temporary active control measures such as using movable exhaust fan for rooms under concern to increase the air change rate.</p>
1 % v/v (20% LEL) of CH <sub>4</sub> or 1.5% of CO <sub>2</sub> or <18% of O <sub>2</sub> whichever is reached	<p><u>Action Level:</u></p> <p>Report to EPD;</p> <p>Gas detection to be made at the lowest floor of the development and enclosed rooms on the next day where possible and no more than 3 days from the date with exceedance of action level detected. Monitoring frequency increased to once a day until the level falls below trigger level in 3 consecutive monitoring exercise;</p> <p>Operator to be kept informed of the remediation works to be done at the landfill;</p> <p>Further gas detection at the designated rooms/areas. If the same level of gas is detected at the designated rooms/areas, the operator shall notify the police and fire services of the potential risk involved.</p>



	<p>Temporary active control measures such as using movable exhaust fan for rooms under concern to increase the air change rate.</p> <p>In emergency situations, building users (including the workers) shall be immediately noticed who shall be evacuated to a safe distance to avoid significant impact due to explosion/asphyxiation.</p>
<p>* Further investigation to be carried out by management company, contractor and if necessary, an environmental consultant in the field. Expert advice should be sought where necessary.</p>	

## 4.9 Conclusion

- 4.9.1 The proximity of the proposed development to the restored SWL has necessitated this preliminary qualitative landfill gas hazard assessment to investigate the likelihood of LFG migration problems, and to propose subsequent LFG mitigation measures.
- 4.9.2 It is envisaged that during detailed design of the project and with further scheme evolution, a detailed landfill gas hazard assessment adopting latest landfill gas monitoring data and the refined scheme should be conducted.
- 4.9.3 A source–pathway–target analysis in accordance with the guidelines in the *Guidance Note* was conducted, which identified sensitive areas during the construction and operation of the proposed development.
- 4.9.4 Active control measures in terms of mechanical ventilation is recommended for the construction phase target. In addition, safe design and working practices at the proposed development have been recommended. It is also recommended to carry out LFG monitoring, to ensure safe working environment.
- 4.9.5 For the operation of the proposed development, passive control of gas in terms of impermeable lining for envelope in touch with ground, sealing for penetration with respect to utilities entry (high/medium risk); active control of gas in terms of mechanical ventilation (high/medium risk); and detection system (high risk) are recommended.
- 4.9.6 In conclusion, hazards arising from LFG should be mitigated by the proposed measures and hence no unacceptable risk is envisaged after mitigation. Upon the operation of the proposed development (after substantial completion of the construction and before the operation of the proposed development), a landfill gas monitoring programme should be submitted to EPD for agreement and the landfill gas monitoring will be carried out accordingly.

## 5. WATER QUALITY IMPACT ASSESSMENT

### 5.1 Introduction

5.1.1 In this assessment, potential water quality impact for the proposed development at Site A and Site B is assessed, and mitigation measures, where required, are recommended. The relevant legislation, standards and guidelines include Water Pollution Control Ordinance (Cap. 358), HKPSG, and other subsidiary regulations, technical memorandum and practice notes.

### 5.2 Relevant Environmental Standard and Guidelines

5.2.1 The Water Pollution Control Ordinance (WPCO) provides the major statutory framework for the protection and control of water quality in Hong Kong. According to the WPCO and its subsidiary legislation, Hong Kong waters are divided into ten water control zones (WCZs). Corresponding statements of Water Quality Objectives (WQOs) are stipulated for different water regimes (marine waters, inland waters, bathing beaches subzones, secondary contact recreation subzones and fish culture subzones) in each of the WCZ based on their beneficial uses. The Application Site is located in inland area and catchment from the Application Site will be discharged to within the Tolo Harbour and Channel WCZ (Harbour subzone). Respective WQOs should be observed. WQOs relevant to this Project are given in **Table 5.1**.

**Table 5.1 Summary of Water Quality Objectives (WQOs) for Tolo Harbour and Channel WCZ (Harbour subzone)**

Parameter	Water Quality Objective
Aesthetic Appearance	There should be no objectionable odours or discoloration of the water. Tarry residues, floating wood, articles made of glass, plastic, rubber or any other substances should be absent. Mineral oil should not be visible; Surfactants should not give rise to a lasting foam; There should be no recognisable sewage derived debris; Floating, submerged and semi-submerged objects of a size likely to interfere with the free movement of vessels or cause damage to vessels should be absent; The waters should not contain substances which settle to form objectionable deposits.
Dissolved Oxygen (bottom)	Not less than 2 mg/L
Dissolved Oxygen (Surface to 2m above bottom)	Not less than 4 mg/L
E.coli	Annual geometric mean not to exceed 610 cfu/100mL
pH	Change due to waste discharge not to be greater than $\pm 0.5$
Salinity	Change due to waste discharge not to be greater than $\pm 3$ ppt
Temperature	Change due to waste discharge not to exceed 1°C
Toxicants	Not to be present at levels producing significant toxic effect
Chlorophyll-a	Not to exceed 20mg/m <sup>3</sup> (µg/L) calculated as running arithmetic mean of 5 daily measurements for any location and depth
Light Penetration	No changes in turbidity, suspended material, colour or other parameters arising from waste discharges shall reduce light transmission by more than 20 per cent of the normal level in the subzone at any location or any time.
Settleable Material	Waste discharges shall give rise to no bottom deposits or submerged objects which adversely influence bottom-living communities, alter the basic Harbour geometry or shipping channels, present any hazard to shipping or diving activities, or affect any other beneficial use of the waters of the subzone.

5.2.2 According to the WPCO and its subsidiary legislation, Water Quality Objectives (WQOs) are stipulated for watercourses in the subzones of Tolo Harbour and Channel WCZ.

Since the Application Site is not located within the subzones of the catchments of Shing Mun Rivers Subzones, Tai Po River Subzones and Lam Tsuen River Subzones of the Tolo Harbour and Channel WCZ. WQOs for other watercourses should be observed. WQOs relevant to this Project are given in **Table 5.3**.

**Table 5.2 Summary of Water Quality Objectives (WQOs) for Watercourses in Tolo Harbour and Channel WCZ (Other Watercourses)**

Parameter	Water Quality Objective
Aesthetic Appearance	Waste discharges shall not cause waters of the subzone to contain substances that – (a) settle to form objectionable deposits; (b) float as debris, scum, oil or other matter to form nuisances; (c) produce objectionable colour, odour, taste or turbidity; (d) injure or are toxic or produce adverse physiological responses in humans, animals or plants; or (e) are conducive to undesirable aquatic life or a nuisance to aquatic life.
Bacteria	Waste discharges shall not cause the level of <i>Escherichia coli</i> to exceed 1000 per 100mL in waters of the subzone, levels to be calculated as a running median of the most recent 5 consecutive samples taken at intervals of between 7 and 21 days (or 14 and 42 days).
Colour	Waste discharges shall not cause the colour of waters of the subzone to exceed 50 Hazen units at any time.
pH	Waste discharges shall not cause the pH of waters of the subzone to exceed the range of 6.0 to 9.0 at any time.
Temperature	Waste discharges shall not cause the natural daily temperature range in waters of the subzone to be extended by greater than $\pm 2.0^{\circ}\text{C}$ at any location or time.
Suspended Solids	Waste discharges shall not cause the annual median of suspended solids in waters of the subzone to exceed 25mg/L.
Dissolved Oxygen	Waste discharges shall not cause the level of dissolved oxygen in waters of the subzone to be less than 4mg/L or 40% saturation (at $15^{\circ}\text{C}$ ) at any time.
5 Days Biochemical Oxygen Demand	Waste discharges shall not cause the 5 days biochemical oxygen demand in waters of the subzone to exceed 5mg/L at any time.
Chemical Oxygen Demand	Waste discharges shall not cause the chemical oxygen demand in waters of the subzone to exceed 30mg/L at any time.
Ammoniacal Nitrogen	Waste discharges shall not cause the ammoniacal nitrogen in waters of the subzone to exceed 0.5mg/L at any time.
Toxicants	Waste discharges shall not cause the toxicants in waters of the subzone to attain such a level as to produce significant toxic effects in humans, fish or any other aquatic organism, with due regard to biologically cumulative effects in food chains and to toxicant inter-actions with each other.

- 5.2.3 The Practice Note (PN) for Professional Persons on Construction Site Drainage (ProPECC PN 2/24) issued by EPD provides good practice guidelines for dealing with various types of discharge from a construction site. Practices outlined in the PN should be followed as far as possible during construction to minimise the water quality impact due to construction site drainage. The practices outlined in ETWB TC (Works) No. 5/2005 "Protection of Natural Streams / Rivers from Adverse Impacts arising from Construction Works" should also be adopted where applicable to minimise the water quality impacts upon any natural streams or surface water systems. Best Management Practices (BMPs) should be implemented to control erosion and run-off quantity.
- 5.2.4 On the other hand, the design of mitigation measures of the development should make reference to the Practice Note for Professional Persons on Drainage Plans subject to Comment by the Environmental Protection Department (ProPECC PN 1/23).

### 5.3 Water Sensitive Receiver

- 5.3.1 Both Site A and Site B are situated in the slope area covered by dense vegetation currently and on northern side of Ting Kok Road. **Figure 11** shows identified water sensitive receivers (WSRs) within the 500m radius from Site A and Site B. It is noted that according to information such as GeoInfo Map (<https://map.gov.hk/gm/>), there are natural stream onsite at Site A, expected to collect surface runoff and convey to surface drain along Ting Kok Road then. Yet, according to the onsite surveys in both dry and wet seasons (14/8/2023, 23/8/2023, 5/9/2023, 23/1/2024 & 21/2/2024), no natural stream can be identified. Therefore, it is anticipated that it is not a permanent stream and may only have water flow only under very heavy storm. As a conservative approach, a natural stream is assumed present in Site A in this submission.

**Table 5.3 Identified Water Sensitive Receiver within 500m from and within Application Site Boundary**

ID	Description	Type	Status	Distance to Site
WSR1	Natural stream within Site A	Natural Stream	Active	Within Site A ~410m from Site B
WSR2	Tolo Harbour	Marine Water	Active	Over 500m from Site A ~120m from Site B
WSR3	Marshland	Wetland	Active	Over 500m from Site A ~480m from Site B
WSR4	Other watercourses outside Site A and Site B	Natural Stream/ Channel	Active	~80m from Site A ~60m from Site B

- 5.3.2 A natural stream is located within Site A. Other than this, there is no WSR immediate to both Site A and Site B. Tolo Harbour and a marshland are within 500m from Site B only. Some watercourses are also located outside Site A and Site B. In other words, the development at Site A would have direct interface with existing WSR onsite (stream water flow will be diverted and drained to surface drain nearby) while Site B development apparently has no direct interface with any WSRs.
- 5.3.3 Summary statistics of EPD's monitoring data in 2023 is extracted from "Marine Water Quality in Hong Kong in 2023" published by EPD. Among the monitoring station in Tolo Harbour, location TM3 is nearest to the project site.

**Table 5.4 Summary of Water Quality in Tolo Harbour**

Parameters		TM3 (Harbour Subzone)
Temperature (°C)		24.9 (18.0 – 30.3)
Salinity (ppt)		30.5 (20.9 – 32.7)
Dissolved Oxygen (DO) (mg/L)	Depth-average	7.0 (4.8 – 8.6)
	Bottom	5.9 (2.3 – 10.4)
Dissolved Oxygen (DO) (% Saturation)	Depth-average	101 (76 – 135)
	Bottom	85 (34 – 164)
pH		7.8 (7.3 – 8.3)
Secchi disc Depth (m)		2.4 (1.1 – 3.7)
Turbidity (NTU)		1.6 (0.4 – 3.8)
Suspended Solids (SS) (mg/L)		5.3 (2.5 – 16.3)

5-day Biochemical Oxygen Demand (BOD <sub>5</sub> ) (mg/L)	1.7 (0.4 – 3.3)
Ammonia Nitrogen (NH <sub>3</sub> -N) (mg/L)	0.027 (0.005 – 0.086)
Unionised Ammonia (UIA) (mg/L)	0.001 (<0.001 – 0.004)
Nitrite Nitrogen (NO <sub>2</sub> -N) (mg/L)	0.005 (<0.002 – 0.017)
Nitrate Nitrogen (NO <sub>3</sub> -N) (mg/L)	0.035 (0.003 – 0.237)
Total Inorganic Nitrogen (TIN) (mg/L)	0.07 (0.01 – 0.33)
Total Kjeldahl Nitrogen (mg/L)	0.47 (0.26 – 0.89)
Total Nitrogen (TN) (mg/L)	0.51 (0.27 – 0.92)
Orthophosphate Phosphorus (PO <sub>4</sub> -P) (mg/L)	0.004 (<0.002 – 0.009)
Total Phosphorus (TP) (mg/L)	0.05 (0.03 – 0.07)
Silica (as SiO <sub>2</sub> ) (mg/L)	1.08 (0.06 – 5.33)
Chlorophyll-a (µg/L)	7.6 (3.3 – 23.3)
<i>E. coli</i> (cfu/100 mL)	11 (<1 – 210)
Faecal Coliforms (cfu/100 mL)	43 (2 – 1700)

**Notes:**

cfu – colony forming unit

- (1) Except as specified, data presented are depth-averaged values calculated by taking the means of three depths: surface, mid-depth, bottom.
- (2) Data presented are annual arithmetic means results except for *E.coli* and faecal coliforms that are annual geometric means.
- (3) Data in brackets indicate the ranges.

## 5.4 Construction Phase Wastewater Water Quality Impacts

5.4.1 The construction of the proposed development at Site A would involve removal of a downstream section of natural stream within site. Water flow will be diverted to surface drain nearby. Temporary drain will be constructed in prior to divert the flow before major construction work so that there will not be any significant water quality impact due to the natural stream removal work. Construction works would inevitably have the potential to generate wastewater. Works should be carried out in such a manner as to minimise adverse impacts on local water bodies. Activities that are likely to cause water pollution include:

- Construction runoff and drainage;
- Sewage effluent from the workforce; and
- Liquid spillage, e.g. oil, diesel, solvents etc.

5.4.2 Construction runoff contains increased loads of sediments, other suspended solids and contaminants. Potential sources of pollution include runoff and erosion from the site surfaces, and drainage from dust suppression sprays, fuel, oil and lubricants from vehicles and other equipment.

5.4.3 Site A and Site B will be properly fenced off either with hoarding or with sandbag stockpiled along the site boundary. The effects on water quality from these construction activities are likely to be minimal provided that site boundaries are well maintained and good site practice is implemented to ensure that litter and fuels are managed, stored, and handled properly. Below are some mitigation measures to avoid adverse water quality impacts.

## 5.5 Construction Phase Mitigation Measures

- 5.5.1 The good practices given in the Practice Notes for Professional Persons on "Construction Site Drainage" (ProPECC PN 2/24) in controlling water pollution at construction site shall be implemented during the construction phase of the Project. Soil erosion from the sites can be minimized through good on-site management practices by implementing viable erosion control measures which should be incorporated in contract clauses. The main practices provided in the aforementioned document (i.e. ProPECC PN 2/24) are also summarized in the following paragraphs, which should be enforced to prevent unacceptable construction stage impacts and for compliance with the statutory criteria.
- 5.5.2 The future contractor is responsible for temporary drainage arrangement during construction.
- 5.5.3 Should any temporary blockage or diversion of the flow path be necessary for construction (e.g. drainage upgrading work), the work must be carried out within the dry seasons and the contractor must have appropriate mitigation measures in place.
- 5.5.4 Flow diversion should be designed in accordance with standards and recommendations established in the Drainage Service Department (DSD) Stormwater Drainage Manual (SDM), DSD Technical Circular No. 1/2017 – Temporary Flow Diversions and Temporary Works Affecting Capacity in Stormwater Drainage System, and DSD Practice Note No. 1/2017 – Design Rainfall Depth for Temporary Works within the Dry Season. Construction works in streams should be in accordance with standards and recommendations established in Environment, Transport and Works Bureau Technical Circular (Works) No. 5/2005 – Protection of natural streams/rivers from adverse impacts arising from construction works.
- 5.5.5 Regarding potential water quality impact arising from within the Subject Site, considerations are as follows.

Construction Site Runoff

- Exposed soil surfaces should be protected from rainfall through, for example, by covering temporarily exposed slope surfaces or stockpiles with impervious tarpaulin and protect temporary access roads by crushed stone or gravel;
- Exposed soil areas should be minimized to reduce the potential for increased siltation and contamination of runoff;
- Minimise the time that soil surfaces are exposed;
- Slow down water run-off flowing across exposed soil surfaces;
- Channels, earth bunds or sand bag barriers should be provided on-site to properly direct surface runoff through drainage systems. The construction runoff will be controlled in such a way that there will be no spillage of site runoff into adjacent areas or into the nearby bay;
- Oil interceptors are also recommended to be provided for stormwater drains near plant maintenance/repair areas, where necessary;
- Manholes (including newly constructed ones) should be adequately covered or temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system;
- Construction works should be programmed to minimise soil excavation works where practical during rainy conditions; and
- Drainage facilities must be adequate for the controlled release of storm flows.



#### Wastewater from Construction Sites

- Sewage generated from the workforce should be contained by chemical toilets before connection to public foul sewer can be provided. The facility should be serviced and cleaned by a specialist contractor at regular intervals. Licensed collector will be arranged to collect and dispose sewage from the on-site chemical toilet;
- Foul water from canteens on-site, if any, should also be contained by chemical toilets before connection to public foul sewer can be provided;
- Vehicle wheel washing facilities should be provided at every site exit such that mud, debris, etc. deposited onto the vehicle wheels or body can be washed off before leaving the sites. Water used for wheel washing will be re-used after treatment. Wash-water should have sand and silt settled out and removed to ensure the continued efficiency of the process; and
- Section of the site road between the wheel washing bay and the public road should be paved with backfall to reduce vehicle tracking of soil and to prevent site runoff from entering public road drains.

#### Oil and Solvents

- Spillage of fuel oils or other polluting fluids should be prevented at source. It is recommended that all stocks should be stored inside proper containers and sited on sealed areas, preferably surrounded by berms; and
- Regular site inspections to ensure the proper implementation of the above measures shall be carried out.

5.5.6 In addition, sufficient silt removal facilities shall be installed to settle out sediment prior to discharge. Channels or earth berm or sand bag barriers should be provided on site to properly direct surface runoff to such silt removal facilities. Sediment traps, channels and manholes should be maintained and the deposited silt and grit should be removed on regular basis. For any discharge from the construction site, discharge license under WPCO would be applied for discharge. All site discharges will be pre-treated as necessary, in accordance with the WPCO, the conditions of the WPCO discharge license and the relevant standards listed in the Technical Memorandum Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters.

### **5.6 Operational Phase Wastewater Water Quality Impacts**

- 5.6.1 Under ProPECC PN 1/23 "Drainage Plans subject to Comment by the Environmental Protection Department", drainage plans submitted to the Building Authority should be referred to EPD for comment whenever there is a concern for pollution control.
- 5.6.2 Sewage from the proposed development will be discharged to public sewerage system by gravity sewer.
- 5.6.3 Surface water will be collected via rainwater pipes and diverted to stormwater drains or other water body such as marshland onsite as the existing flow regime does.
- 5.6.4 The recommendations in clause 5 of ProPECC PN 1/23 will be followed for design and implementation where applicable.



### Foul Water Generation

#### **Impact**

- 5.6.5 The Proposed Development at Site A and Site B will be connected to public sewerage system. There will be no wastewater discharge to the surrounding WSRs.
- 5.6.6 Based on the sewerage impact assessment results, the existing sewerage from FMH1065323 to FMH1065322 (S22-S23) and FMH1005270 to FMH1027333 (N1-N2 and N2-S14) contributes to over 90% (and below 100%) capacity. Based on further analysis, there is adequate freeboard of the existing sewerage pipe (S22-S23) so that no adverse sewerage impact is anticipated.
- 5.6.7 Two of existing dia. 300mm sewerage pipe (N1-N2 and N2-S14) will be upgraded to dia. 375mm sewerage pipes. New dia. 225mm and dia. 300mm sewerage pipes and manhole will be proposed to connect the existing pipe.
- 5.6.8 TKRSPS No.5 and TPSTW that the sewerage system would be connecting to has adequate capacity for the expected daily flows from the Proposed Development based on the assessment results.
- 5.6.9 With the proposed new connection and upgrading works in place, the SIA confirms the feasibility of the Proposed Development with no adverse impacts imposed to the public sewerage system. For the design of the proposed sewerage system to be handed over to DSD, reference will be made to DSD Practice Note No. 1/2019 - Design Checklists on Operation & Maintenance Requirements where applicable.

### Surface Runoff

#### **Impact**

- 5.6.10 Surface runoff may be contaminated and eventually cause water pollution to the water sensitive receivers receiving the flow if no appropriate mitigation measures are provided.
- 5.6.11 In addition, similar to most residential development in Hong Kong, landscape area will be provided. The use of fertilizer and pesticides may also cause water pollution.

#### **Mitigation**

- 5.6.12 Proper drainage system will be constructed at Site A and Site B to intercept flow from surrounding catchment and from within site. There will be provision of oil interceptors (for loading/unloading bay) and desilting facilities such as silt trap, sedimentation tank, etc. before discharge to public drainage system nearby. There will be underground pipeline or surface channel constructed all around the site to collect surface runoff and then discharged to marshes. The exact connection locations are subject to detailed design of drainage system. The drainage facilities will be subject to regular maintenance.
- 5.6.13 With respect to the application of fertilizers and pesticides for future landscape area, the following mitigation measures are recommended:
- The use and application of fertilizers and pesticides will follow normal practices in LCSD's prevailing code of practice and the Pesticides Ordinance (Cap. 133);
  - Using organic fertilizers and biological pesticides are to be considered;
  - The types of fertilizers and pesticides to be used will make reference to the guidelines published by the Agriculture, Fisheries and Conservation Department ("AFCD") including "Good Agricultural Practices General Guidelines: Production of Local Vegetables", "Good Agricultural Practices for Crop Production: Farm Operation – Use of Fertilizers" and "Safe Use of Pesticides on Turf and Landscapes"; and

- Application of fertilizer and pesticide during or right before heavy rainfall is prohibited.

## **5.7 Summary**

- 5.7.1 With the adoption of appropriate mitigation measures, no adverse water quality impact due to the proposed development is anticipated.

## 6. LAND CONTAMINATION REVIEW

### 6.1 Current and Historic Land Uses

- 6.1.1 Site A and Site B are both located in Tai Po. The entire sites are currently covered with dense vegetation.
- 6.1.2 Historic aerial photos taken in year 1949 to 2022 are shown in **Appendix 9** to present the land use status (**Table 6.1** also refers). It was generally composed of vegetation in 1949 to 1979. Since year 1979, the site is mainly being used as plant nursery, a patch of land was paved and can be accessed from Ting Kok Road. There are also scattered village houses all around as revealed from all aerial photos provided.

**Table 6.1 Land Use Summary on the Subject Site**

Period / Year	Land Use / Description	Owner / Occupier	Source of Information	Off-site Property Affected?
1949	Site A and Site B were covered by dense vegetation without any building structure and trace of any disturbance.	N/A	Aerial Photos available from Lands Department	No
1979	Site A was undeveloped area with vegetation covered the site. Site B was generally undeveloped but with 2 structures observed	N/A	Aerial Photos available from Lands Department	No
1990	Site A was mainly vacant land with some vegetation cleared. The structure in Site B was covered by vegetation and it was abandoned.	N/A	Aerial Photos available from Lands Department	No
1995	Site A was undeveloped area with vegetation covered the site. Site B was with vegetation covered. No structure exists.	N/A	Aerial Photos available from Lands Department	No
2000	No change in landuse comparing to year 1995	N/A	Aerial Photos available from Lands Department	No
2008	No change in landuse comparing to year 2000	N/A	Aerial Photos available from Lands Department	No
2022	No change in landuse comparing to year 2008	- Government - Applicant	Aerial Photos available from Lands Department	No

## 6.2 Information from Government Departments

- 6.2.1 Apart from the historic aerial photos, the following Hong Kong Special Administration Region (HKSAR) Government Departments have been enquired on the latest update on the availability of land use status and records of land contamination and/or spillage of the Subject Site. The summary of correspondences is tabulated in **Table 6.2** below. Copy of letters which the Consultant sent to various Government Department and relevant replies are shown in **Appendix 12**.
- 6.2.2 Building Records Access and Viewing On-line (BRAVO) of Building Departments (BD) was visited in July 2023 to obtain records for completed private buildings. There is neither records of building, structure, drainage, alternation & additions, site formation, minor works nor any existing building available at Site A & Site B. The captured screen of BRAVO is provided in **Appendix 10**. There were only slope works conducted at portion of Site A and Site B.
- 6.2.3 As advised by Planning Department, the Subject Site fall within an area zoned "Green Belt" since the first Tai Po Outline Zoning Plan No. LTP/47 gazetted in 1980.
- 6.2.4 As advised by Environment Protection Department (EPD), the Consultant visited the territory-wide register of chemical waste producers (CWPs) maintained at the Territory Control Office. The register record as of 17 August 2023 has record no valid CWP at the Subject Site.

**Table 6.2 Enquires and Responses on Land Contamination Related Records in the Subject Site**

Consultant's Letter Ref.	Department	Response Letter Ref.	Response Date	Summary
NFDUDWYTEI00_0_0016L.23 & NFDUDWYTEI00_0_0023L.23	Planning Department	() in PD/TP 1/30/1 (L)	31/07/2023	The Subject Sites fall within an area zoned "Green Belt" since the first Tai Po Outline Zoning Plan No. LTP/47 gazetted in 1980.
NFDUDWYTEI00_0_0019L.23	EPD	() in EP550/W2 /4	09/08/2023	There is no record of chemical spillage accident and submission relating to land contamination assessment at the Subject Site in the past 3 years.  A visit to the Territorial Control Office for chemical waste producer registry inspection was performed.  According to the register record as of 17/08/2023, no valid CWP is found at the Subject Site.
-	Lands Department	Topographic Map available from Lands Department was reviewed. Site A and Site B were covered by dense vegetation in record 1949. Site A was undeveloped and vacant area from 1979 to 2022. From year 1979 to 1990,		

		Site B was an undeveloped area and structure was observed and subsequently abandoned.
--	--	---

### 6.3 Discussion and Site Observation

- 6.3.1 Based on the above, the desktop review of historic information indicates that the Site A and Site B are characterized by dense vegetation slope areas. Site A has not been disturbed and covered by dense vegetation from 1949 up to present. Site B has been covered by dense vegetation generally except that structures did exist according to aerial photos in 1979/1990. Based on the zoning and absence of building record, the site was likely used temporarily (e.g. site office).
- 6.3.2 As most of the site is grown with dense vegetation, the Consultant could only have limited access at the periphery of Site A and Site B. There was no observation of any works done before within site. Walkover checklist and photo records for the accessible area were shown in **Appendix 11**. There were no sign of obvious/ suspected contamination such as oil staining, abnormal odour, distress vegetation, dangerous goods storage and/ or chemical storage.
- 6.3.3 It is therefore considered that the risk of land contamination problem arising from the historical and current use is unlikely.

### 6.4 Conclusion

- 6.4.1 According to the historical and existing use observed in site survey, the risk of land contamination problem is unlikely. Further investigation of potential land contamination problem is not considered necessary.

## 7. EIAO IMPLICATION

### 7.1 Background

- 7.1.1 The proposed development is not environmental polluting in nature. To facilitate the development, there will be drainage (and sewerage) connection work, drainage upgrading work and road junction improvement work recommended. All related construction works are land-based. There are no construction works to be conducted within environmentally sensitive areas such as country park, conservation area, etc.
- 7.1.2 Updated proposal of physical junction improvement work (with alternative options at J5) has been proposed at eight locations as stated in Traffic Impact Assessment report to enhance the junction performance. Whether the improvement works incurs material change to the environmental impact of the exempted project under Cat A.1, Part I, Schedule 2 of the EIAO is evaluated below.
- 7.1.3 For some road junction improvement works, the associated road carriageways are primary distributor (e.g. Ting Kok Road, Yuen Shin Road, Tai Po Tai Wo Road). The locations of the junctions are shown in **Appendix 15**. Summary of the junction improvement work is also shown in **Table 7.1** below.
- 7.1.4 The change usually involves addition of one to two lanes at location near to the junction only so that the road is widened locally and would only affect the capacity near the junction. As advised by project traffic consultant, the improvement works would not alter the road type, traffic mix, traffic flow, etc. All these related carriageways are existent before the enactment of EIAO in 1998.

**Table 7.1 Summary of the Junction Improvement Work**

ID	Associate Road Junction	Road Type	Work
J1	Ting Kok Road	Primary Distributor	1. Providing an additional lane for right-turn traffic at Ting Kok Road eastbound 2. Providing two and a half lanes for ahead traffic at Ting Kok Road southbound
	Yuen Shin Road	Primary Distributor	
	Dai Fuk Street	Local Distributor	
J2	Yuen Shin Road	Primary Distributor	1. Widening the Yuen Shin Road northbound and southbound 2. Widening the Yuen Shin Road northbound to provide two and a half lanes for right-turn movement 3. Widening Yuen Shin Road southbound to provide two and a half lanes for ahead traffic and half lane for left-turn traffic
	Dai Fat Street	Local Distributor	
J3	Tai Po Tai Wo Road	Primary Distributor	1. Converting the Tai Po Tai Wo Road eastbound left turn lane into free flow lane 2. Widening the Tai Po Tai Wo Road eastbound to provide 3 right turn lanes 3. Widening Yuen Shin Road southbound to have total 5 traffic lanes with 2 lanes for right-turn traffic and 3 lanes for ahead traffic
	Yuen Shin Road	Primary Distributor	
J4	Ting Kok Road	Primary Distributor	1. Widening Ting Kok Road eastbound to provide 3 traffic lanes 2. Converting the existing bus layby at Ting Kok Road into an on-street bus stop
	Dai Fat Street	Local Distributor	

J5	Ting Kok Road	Primary Distributor/Rural Road	1. Widening Ting Kok Road eastbound to provide one lane for right turn traffic 2. Widen Ting Kok Road westbound to provide 2 ahead traffic lanes and 1 left turn lane.
	Dai Kwai Street	Local Distributor	
J6	Ting Kok Road	Rural Road	1. Connecting the access road to Site B to form a 4-arm junction 2. Widening the Ting Kok Road westbound traffic to provide 3 traffic lanes including 1 additional shared lane for ahead traffic and right-turn traffic to Site B
J7	Ting Kok Road	Rural Road	1. Adding a free flow left turn lane at Ting Kok Road eastbound with a cautionary crossing 2. Widening Ting Kok Road westbound to provide 2 ahead traffic lanes and 1 right turn lane
	Lo Fai Road	Rural Road	
J8	Ting Kok Road	Primary Distributor	1. Widening the road into 3 traffic lanes with 2 full lanes for ahead-traffic at Ting Kok Road westbound 2. Converting the left-turn nearside lane into a shared lane at Fung Yuen Road southbound
	Fung Yuen Road	Rural Road	

## 7.2 Air Quality Impact

- 7.2.1 According to Table 3.1 in Chapter 9 of Hong Kong Planning Standards and Guidelines (HKPSG), minimum buffer separation is recommended for air sensitive uses from different types of pollution sources including road and industrial areas.
- 7.2.2 For road and highways, buffer separations (measured from road kerb side to air sensitive use) of 20m, 10m and 5m are recommended respectively for trunk road and primary distributor, district distributor and local distributor.
- 7.2.3 There are several air sensitive uses such as school, office, recreational open space, and residential developments in the surroundings of the road junction work. Additional site survey is conducted on 18 July 2024 to identify nearby representative ASRs of the road junction work. The photo record of the site survey and summary of development land use near the junction improvement work are shown in **Appendix 18**. The representative ASRs and separation from road carriageway after road improvement works are shown in **Figure 13** and **Table 7.2** below.
- 7.2.4 All identified air sensitive uses nearby the road junction to be improved have separation distance of over 20m (i.e. more than the buffer separation required for all types of carriageways) from it except for Ting Kok Road at J4 and J8.
- 7.2.5 For junction J8, only Lee Kum Kee is located nearby the road junction to be improved. According to the advice from operator during survey, the western building of Lee Kum Kee is for industrial use whereas the office is located at eastern portion which is farther away from the road junction to be improved. Moreover, the separation distance from the road kerb and the industrial building is not changed after the road junction improvement work. Thus, any worsen air quality impact to the nearby development is not expected.



7.2.6 On the other hand, some houses are found along Ting Kok Road near J4. The area is fenced off and there is no occupants or operator that can be approached in survey. Most of them are found to be abandoned house or likely for storage purpose. There is no sign of activity during the site survey conducted on 18 July 2024. Therefore, the abandoned structure and structure for storage purpose are considered as non-air sensitive. On the other hand, a vacant house is found close to Ting Kok Road. The separation from this vacant house to the area for junction improvement work is about 6m both before and after the junction improvement work. The proposed junction improvement work would not result in any worsened air quality impact.

7.2.7 Therefore, all nearby air sensitive uses after road improvement works are considered of adequate air quality buffer separation as required in Table 3.1, Chapter 9 of the HKPSG or with no worsened impact. Therefore, no adverse air quality impact is found due to the vicinity of the junction improvement.

**Table 7.2                      Summary of Representative Air Sensitive Receivers for Road Junction Work**

ID	Road Junction	Nearest ASR (Recommended Separation under HKPSG)	Uses	Distance between Road Kerb and ASR before road improvement work, m	Distance between Road Kerb# and ASR after road improvement work, m	Distance Difference, m	Reference Figure
J1	Ting Kok Road westbound	Kau Yan College (20m)	School	29	27	-2	13a
	Ting Kok Road southbound	KMB Depot Office (20m)	Office	32	29	-3	
J2	Yuen Shin Road northbound	Hong Kong and Kowloon Kaifong Women's Association Sun Fong Chung Primary School (20m)	School	27	27	0	13b
	Yuen Shin Road southbound	South China Morning Post office (20m)	Office	217	215	-2	
	Yuen Shin Road southbound	Tai Po Waterfront Park Bowling Greens (20m)	Recreational Open Space	40	37	-3	
	Dai Fat Street	South China Morning Post office (5m)	Office	158	158	0	
J3	Yuen Shin Road northbound	Yuen Shin Park Gateball Court (20m)	Recreational Open Space	44	44	0	13c
		Yuen Shin Park Playground (20m)	Recreational Open Space	44	40	-4	
	Tai Po Tai Wo Road westbound	Kwong Yee House (20m)	Residential	211	210	-1	
	Yuen Shin Road southbound	Tai Po Waterfront Gateball Court (20m)	Recreational Open Space	25	24	-1	
J4	Ting Kok Road eastbound	Village House at Tin Sum (20m)	Residential	184	181	-3	13d
		Vacuous House (20m)	Unknown	18	18	0	
J5	Ting Kok Road eastbound	Village House at Ha Hang Tsuen (20m)	Residential	72	69	-3	13e
		Play Area of Proposed Public Park (20m)	Recreational Open Space	23	22	-1	
		Kee Wah Group Limited Office (10m)	Office	56	55	-1	
J6	Ting Kok Road eastbound	Tycoon Place (10m)	Residential	177	175	-2	13f
J7	Lo Fai Road northbound	Office of 麗華花園有限公司 (5m)	Office	64	63	-1	13g

	Lo Fai Road westbound	Casa Marina I (5m)	Residential	264	260	-4	
	Ting Kok Road eastbound	Casa Marina I (10m)	Residential	281	275	-6	
	Ting Kok Road eastbound	Office of 麗華花園有限公司 (10m)	Office	56	56	0	
J8	Ting Kok Road westbound	Lee Kum Kee Industrial Building (20m)	Industrial	17	17	0	13h

**\*bold rows represent either Primary or District Distributors**

# The section of road kerb with respect to road improvement

### 7.3 Noise Impact

- 7.3.1 While no increase of traffic flow is anticipated due to road project, road kerb of some segments near to the road junction will be closer to the nearby NSR. The nearest representative NSRs near the road junction work are shown in **Figure 14** and **The change** of the horizontal distance separation is at most 14%. So, the correction due to distance would be at most  $10 \log (1-14\%)$  which is 0.7dB(A) and less than 1.0dB(A). Therefore, it is concluded that no significant change of road traffic noise impact on nearby NSRs due to the proposed road junction improvement work is anticipated.
- 7.3.2 The change of the horizontal distance separation is at most 14%. So, the correction due to distance would be at most  $10 \log (1-14\%)$  which is 0.7dB(A) and less than 1.0dB(A). The traffic noise impact is considered to be insignificant as the traffic noise level with the road junction work would not be greater than that without the road junction work at the design year by 1.0 dB(A) or more.

**Table 7.3 Summary of Representative Noise Sensitive Receivers for Road Junction Work**

ID	NSR Nearby	Distance between Road Kerb and NSR before road improvement work, m	Distance Difference, m	Percentage Change	Increase in Noise level, dB(A)
<b>J1</b>	<b>Kau Yan College</b>	<b>29</b>	<b>-2</b>	<b>-7%</b>	<b>0.3</b>
J2	Hong Kong and Kowloon Kaifong Women's Association Sun Fong Chung Primary School	51	-7	-14%	0.6
<b>J3</b>	<b>Ming Cheong House</b>	<b>122</b>	<b>-1</b>	<b>-1%</b>	<b>0.0</b>
J4	Village House at Tin Sum	184	-3	-2%	0.1
J5	Casa Brava	81	-4	-8%	0.3
J6	Tycoon Place	177	-2	-1%	0.0
J7	Office of 麗華花園有限公司	65	-2	-3%	0.1
<b>J8</b>	<b>Lee Kum Kee Industrial Building</b>	<b>27</b>	<b>-3</b>	<b>-11%</b>	<b>0.5</b>

**\*bold rows represent either Primary or District Distributors**

**7.4 Conclusion**

- 7.4.1 There are no construction works to be conducted within environmentally sensitive areas such as country park, conservation area, etc. due to the proposed development.
- 7.4.2 Referring to the 8 numbers of road junction improvement works proposed for this project, some of the works involve primary distributor. Locally, there will be addition or one to two lanes near the junction. However, the improvement works would not alter the road type, traffic mix, traffic flow, etc. The surrounding air sensitive uses are located with adequate air quality buffer separation after road junction improvement works. No adverse air quality impact is resulted by the road junction work.
- 7.4.3 The traffic noise impact is considered to be insignificant as the traffic noise level with the road junction work would not be greater than that without the road junction work at the design year by 1.0 dB(A) or more.
- 7.4.4 Therefore, no material change to the exempted DPs under item A.1 of Part I, Scheduled 2 of the EIAO is anticipated due to the proposed junction improvement works.

## 8. OVERALL CONCLUSION

- 8.1.1 An environmental assessment has been conducted to address potential environmental noise, air and landfill gas hazard impacts.

### Air Quality

- 8.1.2 As confirmed in field survey, there is no chimney identified within 200m from the nearest boundary of Site A and Site B. The air sensitive uses in the MLP will be designed in such a way that the portion of residential façade within the buffer area will be provided with blank façade (wall or glazing) without any opening, so that there is no opening, fresh air intake for air sensitive uses and no outdoor recreational area within the buffer zone measured 10m from kerb side of Ting Kok Road and 5m from kerb side of Lo Fai Road. Carpark is proposed at Site B. EPD's ProPECC PN 2/96 will be observed and followed for the design and operation of carpark. No significant vehicular emission impact is anticipated. There is no fluff, odour and other air pollutant emission identified in the surrounding. Therefore, it is envisaged that the proposed development at the Sites would not be subject to significant air quality impact.
- 8.1.3 Likewise, the Proposed Development would unlikely induce significant air quality impact on the surroundings with proper mitigation measures in place and to be recommended during detailed design of the project.
- 8.1.4 Best management practice will be adopted during construction of the project. Necessary mitigation measures as stated above and in "Recommended Pollution Control Clauses for Construction Contracts" where applicable will be applied so that emission during construction stage should be kept to an acceptable level.

### Noise

- 8.1.5 As observed onsite, the noise environment is dominated by road traffic noise from along Ting Kok Road.
- 8.1.6 All NSRs of the proposed development would be within the road traffic noise standard stipulated under HKPSG with mitigations in place. The noise mitigation measure includes blank wall/fixed glazing, acoustic window (baffle type), enhanced acoustic balcony (baffle type).
- 8.1.7 According to the industrial noise impact assessment result, there is no exceedance of relevant standard under unmitigated scenario.
- 8.1.8 The development will be designed so that potentially noisy facilities onsite will need to meet the standard stipulated in the HKPSG. No unacceptable fixed noise impact on the surrounding and the Proposed Development is anticipated.

### Landfill Gas Hazard

- 8.1.9 The proximity of the proposed development to the restored SWL has necessitated this preliminary qualitative landfill gas hazard assessment to investigate the likelihood of LFG migration problems, and to propose subsequent LFG mitigation measures.
- 8.1.10 It is envisaged that during detailed design of the project and with further scheme evolution, a detailed landfill gas hazard assessment adopting latest landfill gas monitoring data and the refined scheme should be conducted.
- 8.1.11 A source-pathway-target analysis in accordance with the guidelines in the *Guidance Note* was conducted, which identified sensitive areas during the construction and operation of the proposed development
- 8.1.12 Active control measures in terms of mechanical ventilation is recommended for the construction phase target. In addition, safe design and working practices at the

proposed development have been recommended. It is also recommended to carry out LFG monitoring, to ensure safe working environment.

- 8.1.13 For the operation of the proposed development, passive control of gas in terms of impermeable lining for envelope in touch with ground, sealing for penetration with respect to utilities entry, natural cut-off barrier; active control of gas in terms of mechanical ventilation; and detection system are recommended depending on the risk level.
- 8.1.14 In conclusion, hazards arising from LFG should be mitigated by the proposed measures and hence no unacceptable risk is envisaged after mitigation. Upon the operation of the proposed development (after substantial completion of the construction and before the operation of the proposed development), a landfill gas monitoring programme should be submitted to EPD for agreement and the landfill gas monitoring will be carried out accordingly.

#### Water Quality

- 8.1.15 A natural stream is located within Site A. Other than this, there is no WSR immediate to both Site A and Site B. Tolo Harbour and a marshland are within 500m from Site B only. Some watercourses are also located outside Site A and Site B. In other words, the development at Site A would have direct interface with existing WSR onsite (stream water flow will be diverted and drained to surface channel nearby) while Site B development apparently has no direct interface with any WSRs. With the adoption of appropriate mitigation measures, no adverse water quality impact due to the proposed development is anticipated.

#### Land Contamination Review

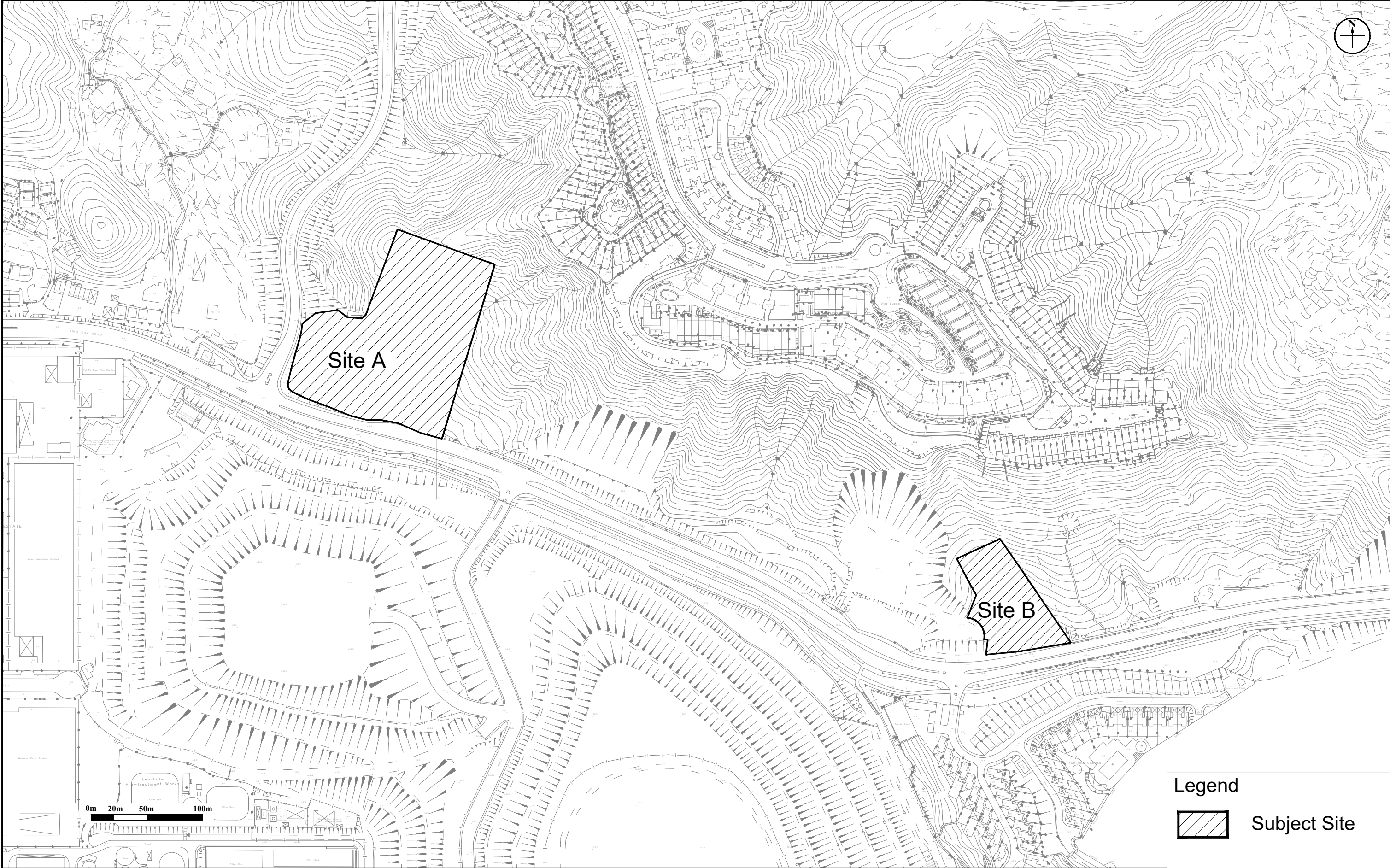
- 8.1.16 According to the historical and existing use observed in site survey, the risk of land contamination problem is unlikely. Further investigation of potential land contamination problem is not considered necessary.

#### EIAO Implication

- 8.1.17 The surrounding air sensitive uses are located with adequate air quality buffer separation. No adverse air quality impact is resulted by the road junction work.
- 8.1.18 According to the distance correction, the increase of noise level due to the proposed road junction work is less than 1.0 dB(A). No significant traffic noise impact on nearby NSRs is anticipated.

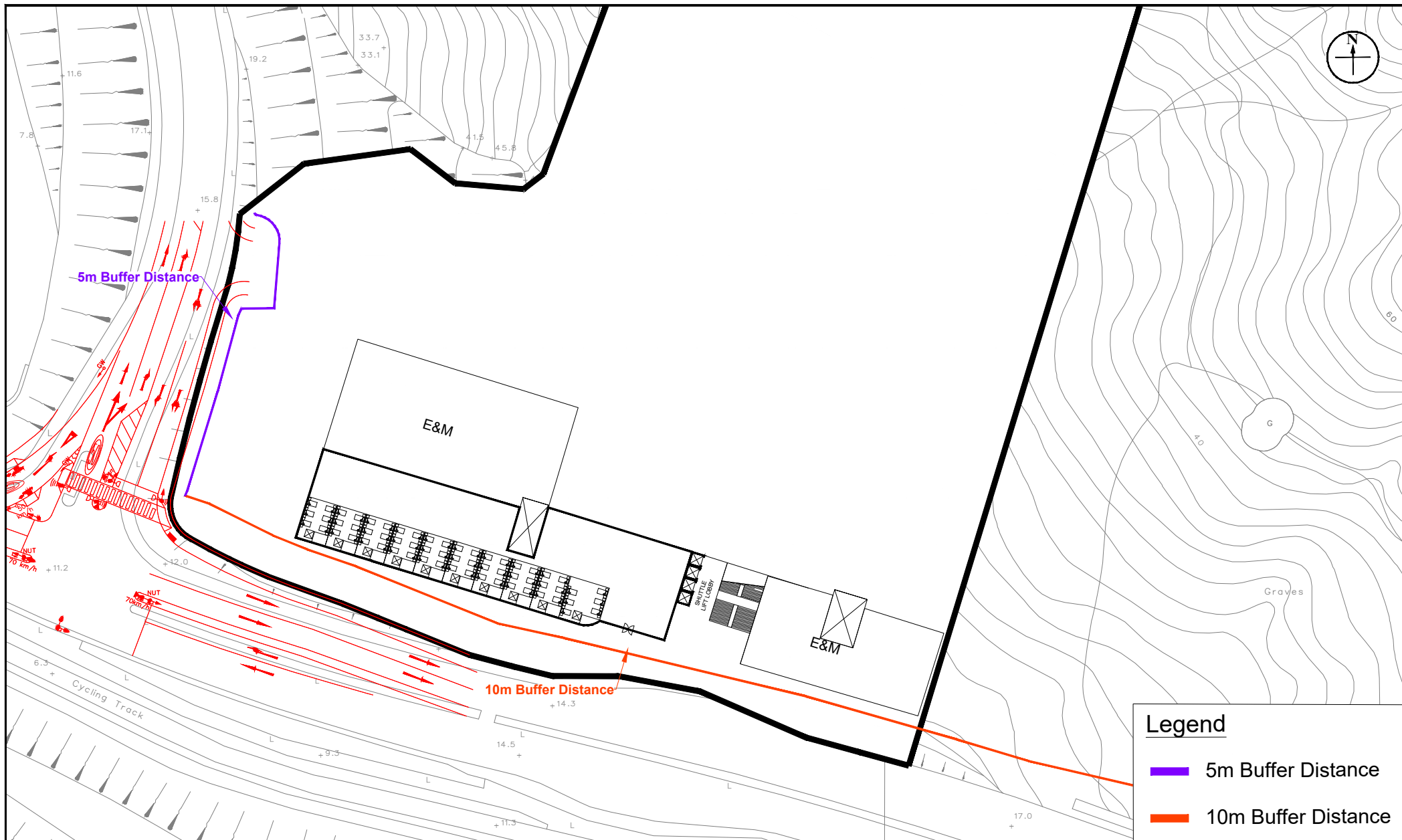
**Figure**





<b>Figure:</b> 1		RAMBOLL	
<b>Title:</b> Location of Site A and Site B and its Environs		Drawn by: CM	
<b>Project:</b> Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po		Checked by: CC	
		Rev.: 1.3	
		Date: Oct 2024	





**Figure:** 2a

**Title:** Buffer Separation between Kerb Side of Road Carriageway and Nearest Air Sensitive Uses in Site A and Site B (GIC LG-Site A)

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

**RAMBOLL**

Drawn by: CM

Checked by: CC

Rev.: 1.4

Date: Jan 2025



**Figure:** 2b

**Title:** Buffer Separation between Kerb Side of Road Carriageway and Nearest Air Sensitive Uses in Site A and Site B (GIC GF-Site A)

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

**Legend**

- 5m Buffer Distance
- 10m Buffer Distance

**RAMBOLL**

Drawn by: CM

Checked by: CC

Rev.: 1.4

Date: Jan 2025



**Figure:** 2c

**Title:** Buffer Separation between Kerb Side of Road Carriageway and Nearest Air Sensitive Uses in Site A and Site B (Residential Tower-Site A)

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

**Legend**

- 5m Buffer Distance
- 10m Buffer Distance

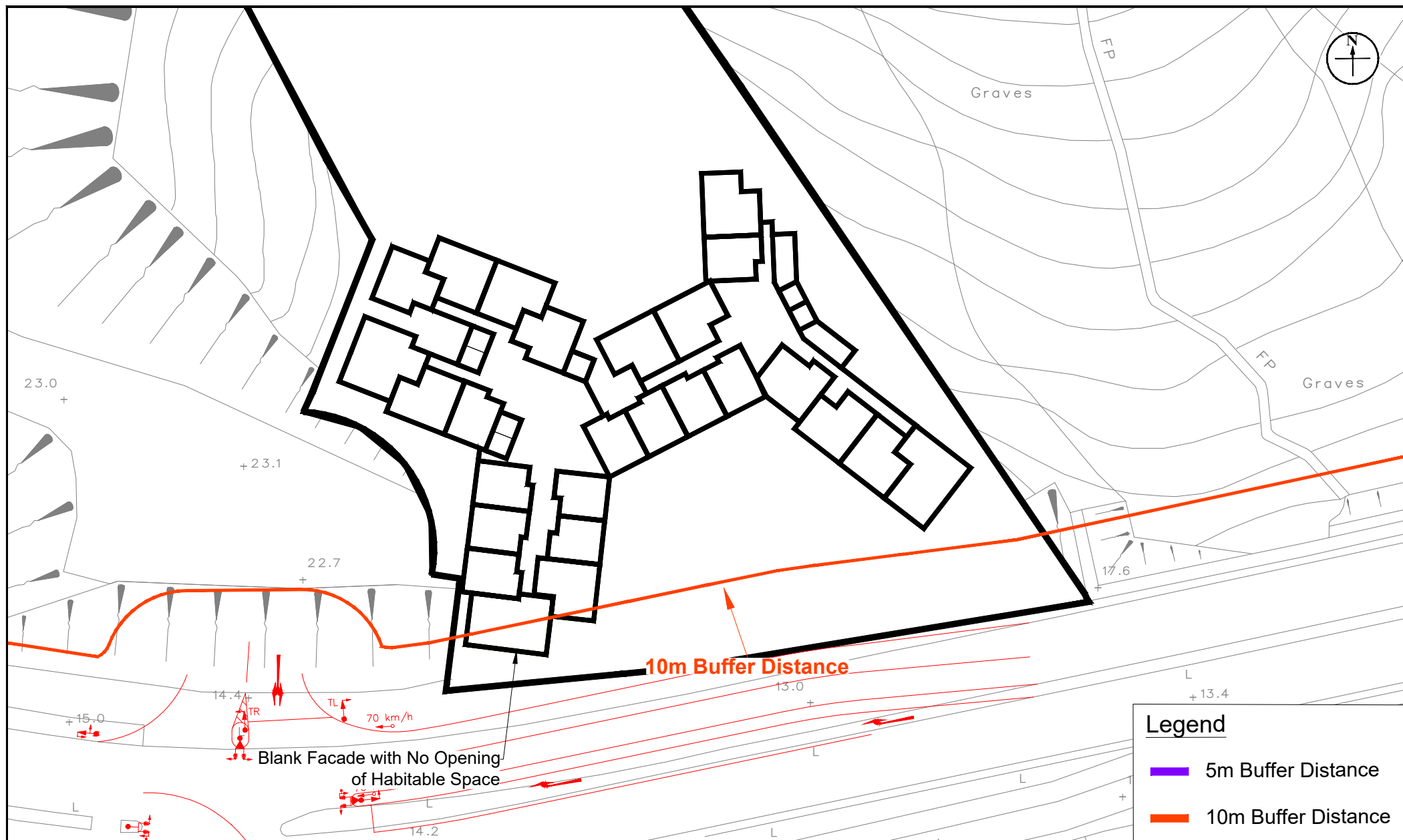
**RAMBOLL**

Drawn by: CM

Checked by: CC

Rev.: 1.4

Date: Jan 2025



**Figure:** 2d

**Title:** Buffer Separation between Kerb Side of Road Carriageway and Nearest Air Sensitive Uses in Site A and Site B (Site B)

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

**RAMBOLL**

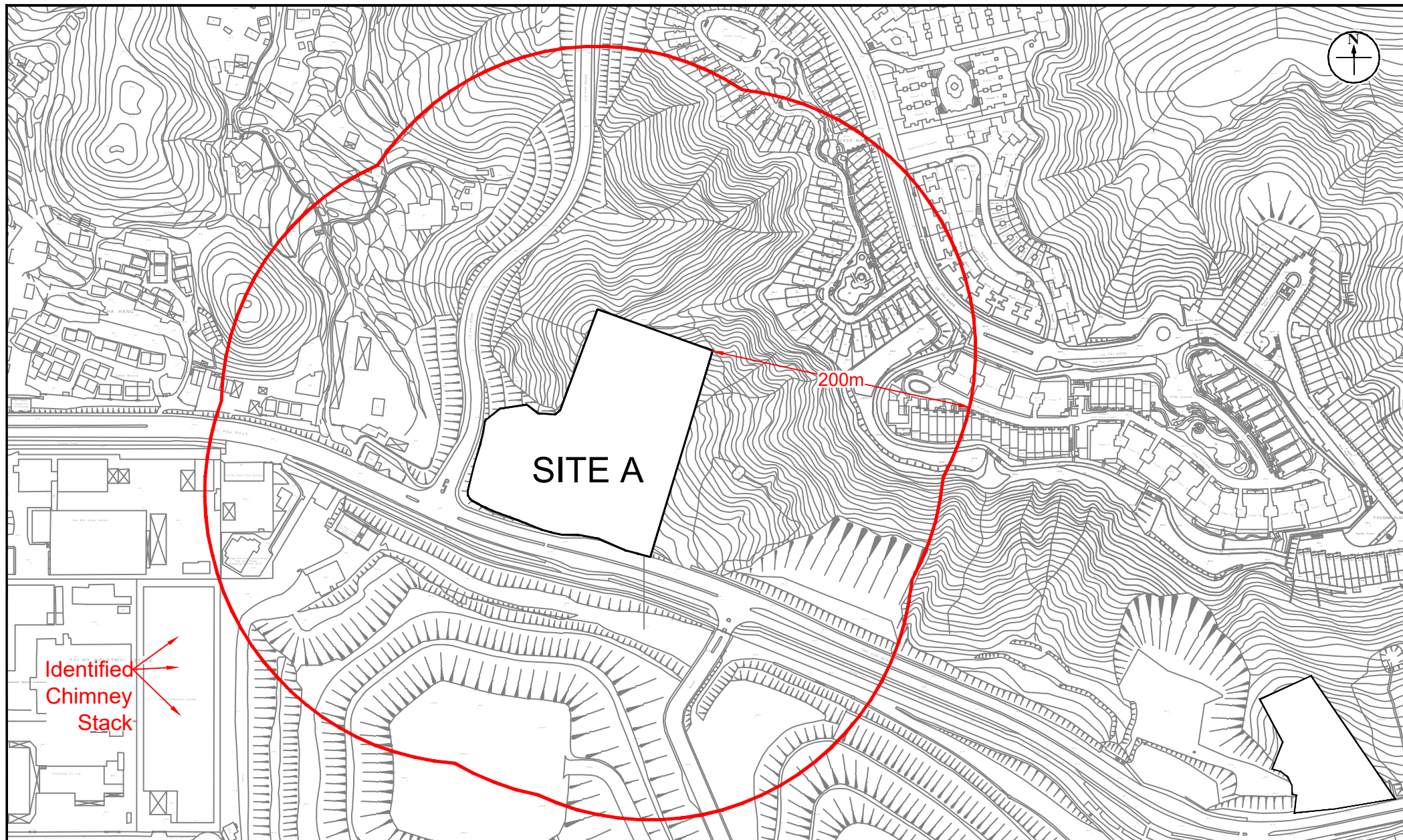
Drawn by: CM

Checked by: CC

Rev.: 1.2

Date: Jan 2025





**Figure:** 3a

**Title:** 200m Study Area and Identified Nearest Chimney Stacks (Site A)

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

**RAMBOLL**

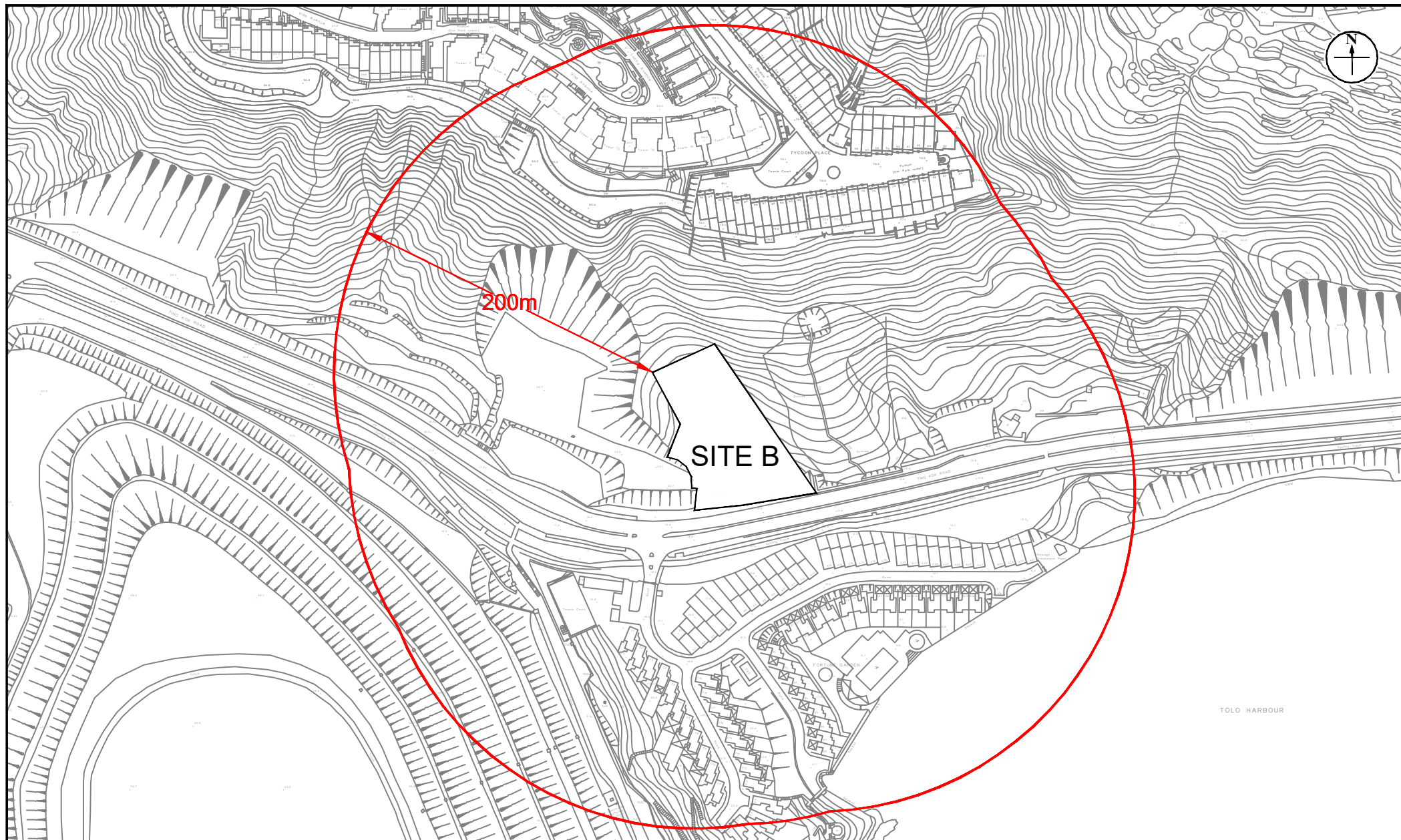
Drawn by: CM

Checked by: CC

Rev.: 1.1

Date: Oct 2024





**Figure:** 3b

**Title:** 200m Study Area and Identified Nearest Chimney Stacks (Site B)

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

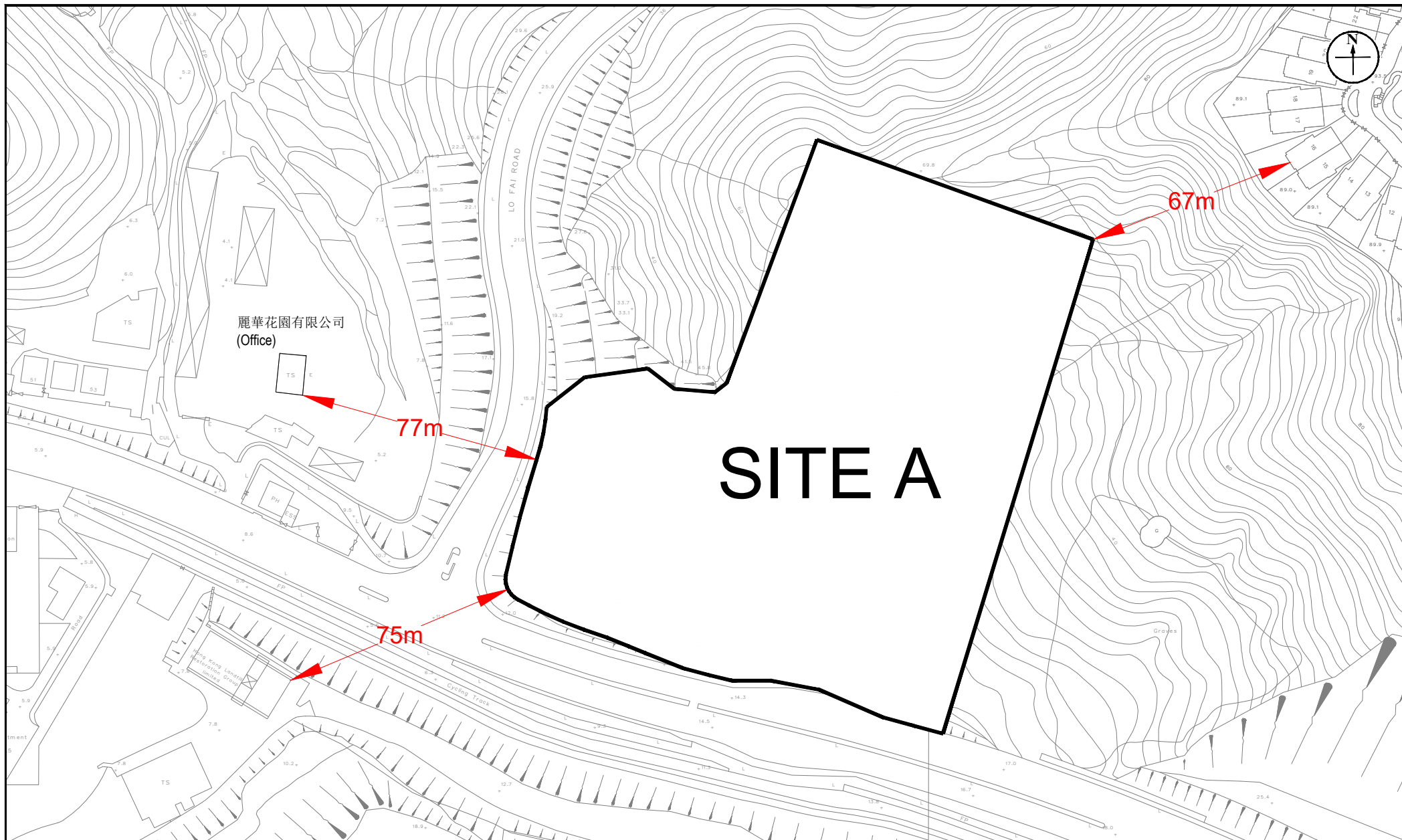
**RAMBOLL**

Drawn by: CM

Checked by: CC

Rev.: 1.0

Date: Apr 2023



**Figure:** 4a

**Title:** Nearby Air Sensitive Receivers for Construction Air Quality Impact Assessment (Site A)

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

**RAMBOLL**

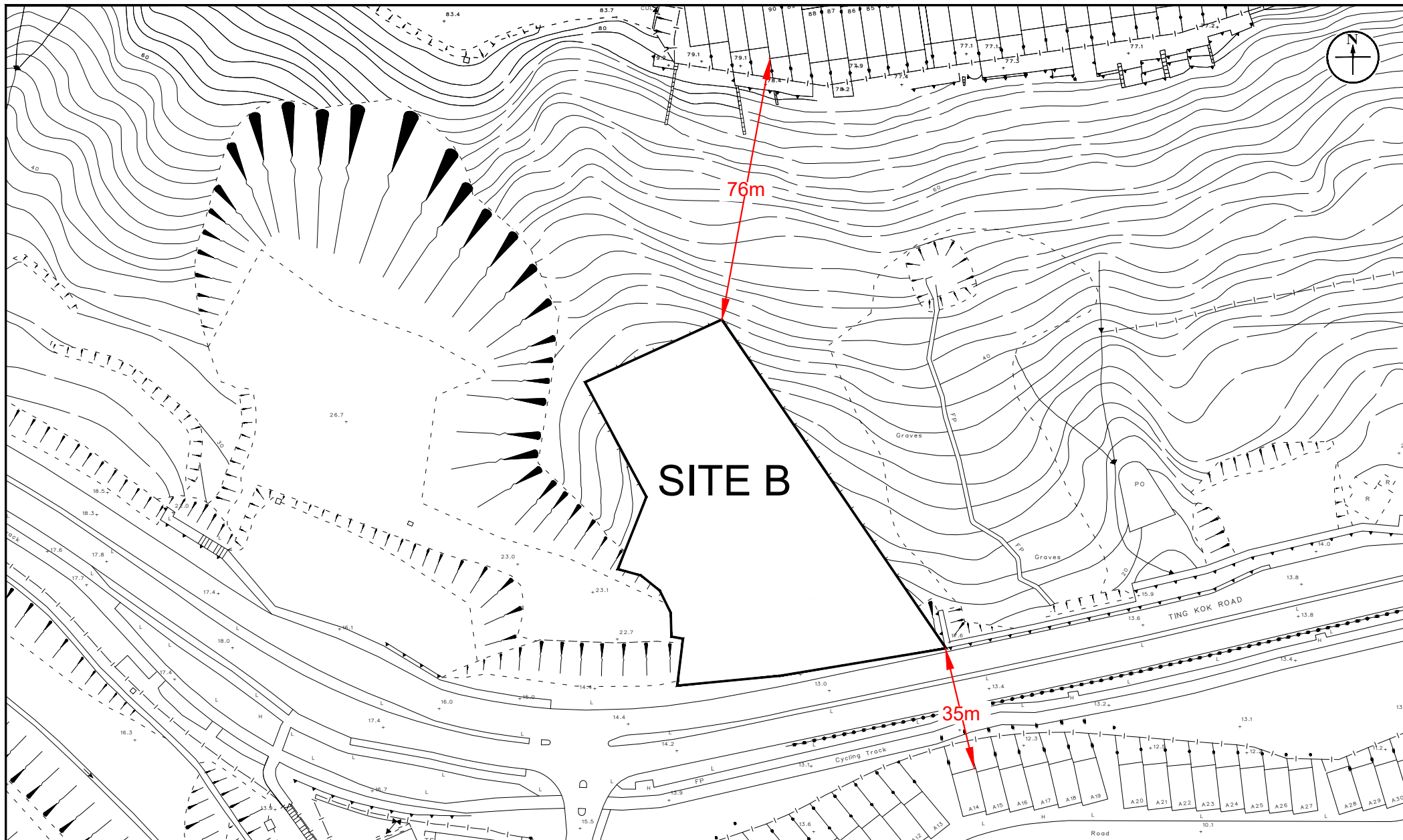
Drawn by: CM

Checked by: CC

Rev.: 1.1

Date: Oct 2024





**Figure:** 4b

**Title:** Nearby Air Sensitive Receivers for Construction Air Quality Impact Assessment (Site B)

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

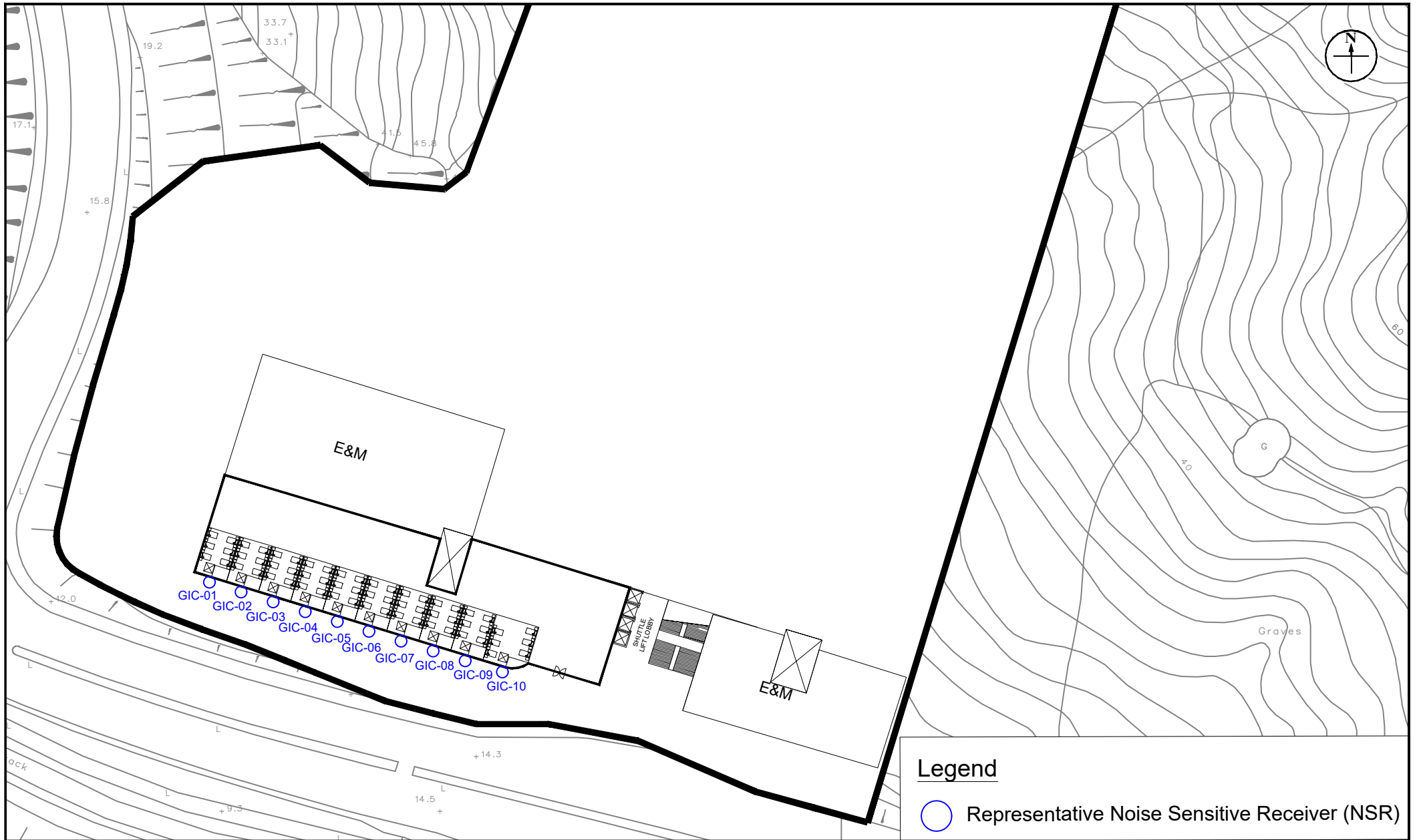
**RAMBOLL**

Drawn by: CM

Checked by: CC

Rev.: 1.0

Date: Apr 2023



### Legend

○ Representative Noise Sensitive Receiver (NSR)

**Figure:** 5a

**Title:** Location of Selected Representative Noise Sensitive Receivers for Road Traffic Noise Impact Assessment (GIC LG-Site A)

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

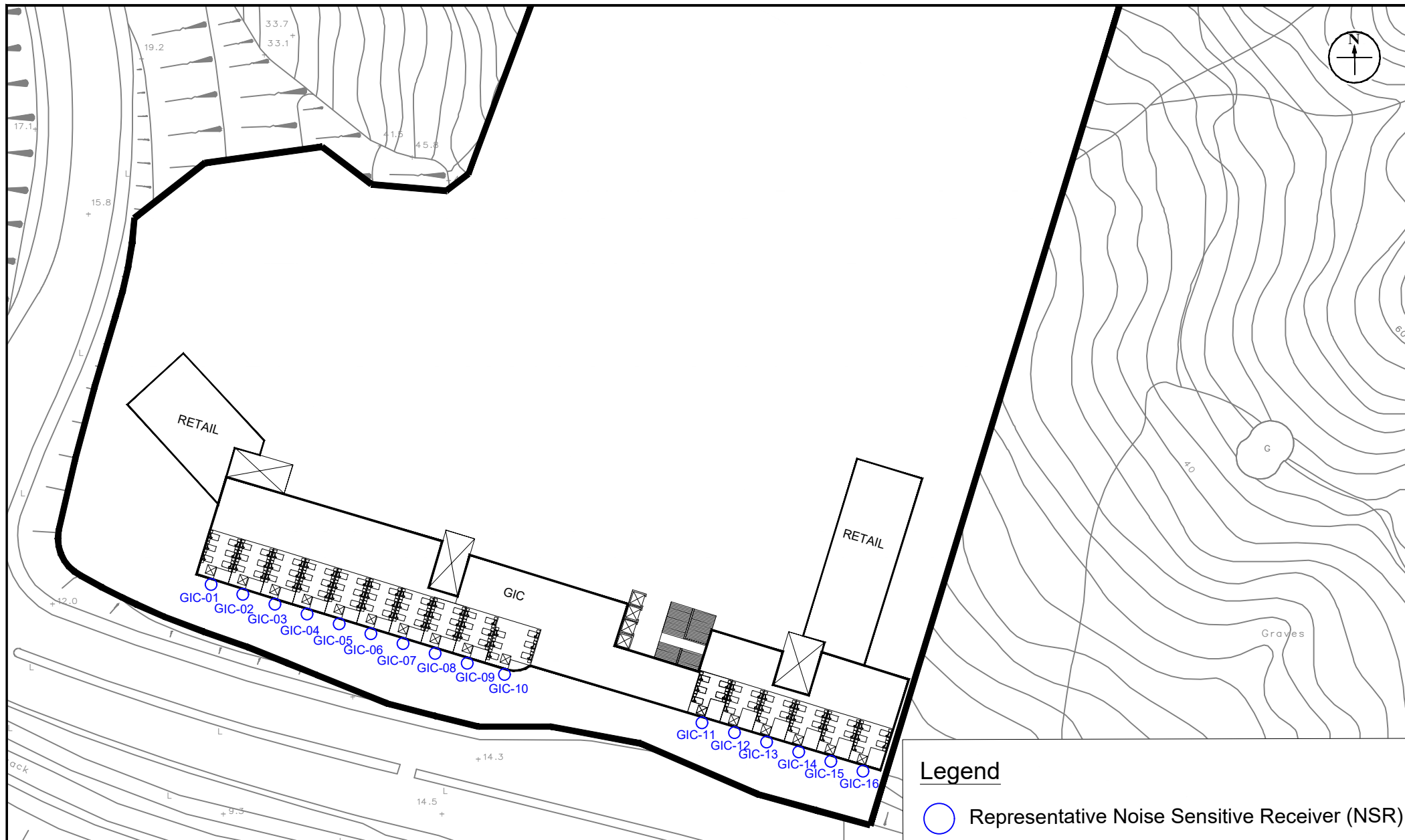
**RAMBOLL**

Drawn by: CM

Checked by: CC

Rev.: 1.3

Date: Oct 2024



### Legend

○ Representative Noise Sensitive Receiver (NSR)

**Figure:** 5b

**Title:** Location of Selected Representative Noise Sensitive Receivers for Road Traffic Noise Impact Assessment (GIC GF-Site A)

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

**RAMBOLL**

Drawn by: CM

Checked by: CC

Rev.: 1.3

Date: Oct 2024



**Figure: 5c**

**Title:** Location of Selected Representative Noise Sensitive Receivers for Road Traffic Noise Impact Assessment (Residential Tower-Site A)

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

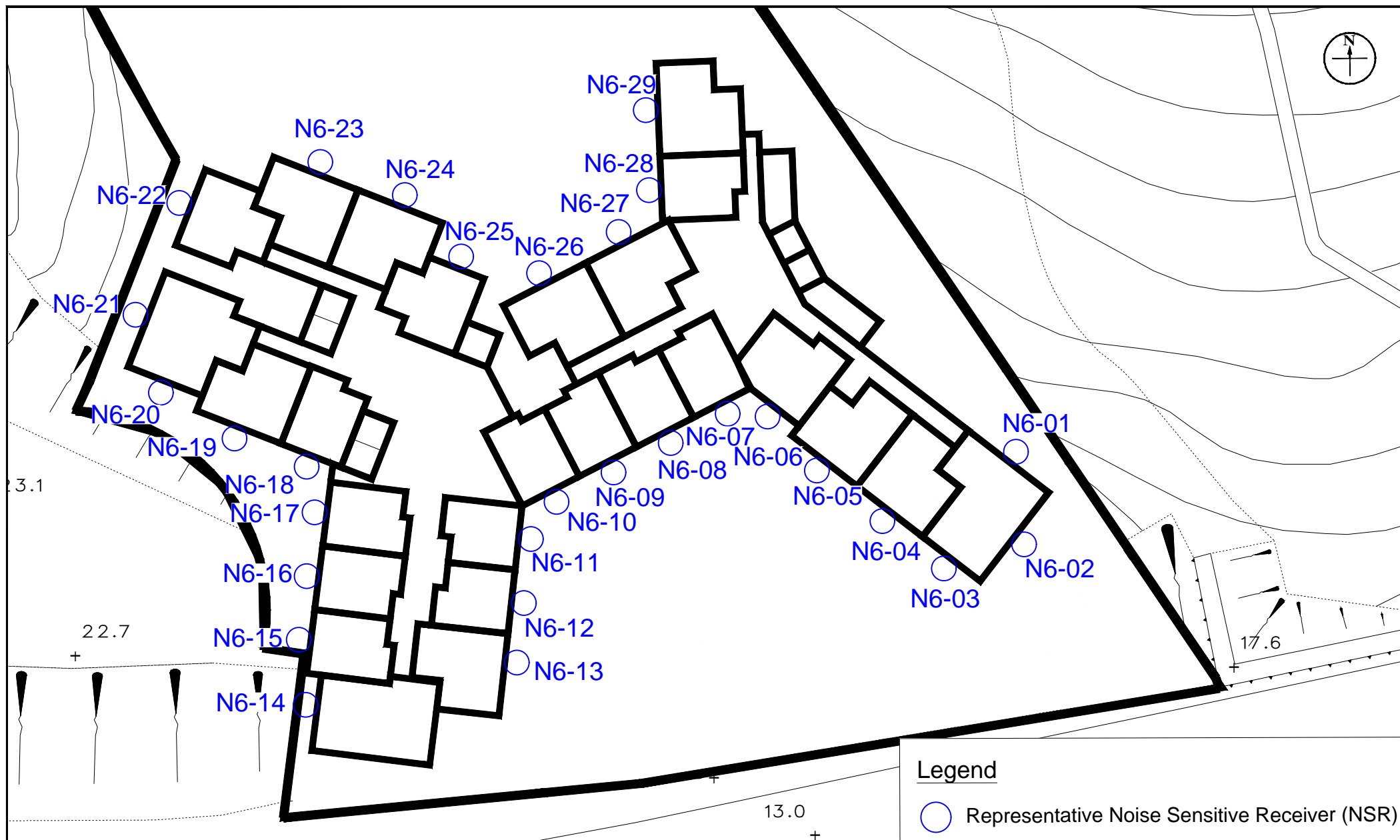
**RAMBOLL**

Drawn by: CM

Checked by: CC

Rev.: 1.3

Date: Oct 2024



**Figure:** 5d

**Title:** Location of Selected Representative Noise Sensitive Receivers for Road Traffic Noise Impact Assessment (Site B)

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

**RAMBOLL**

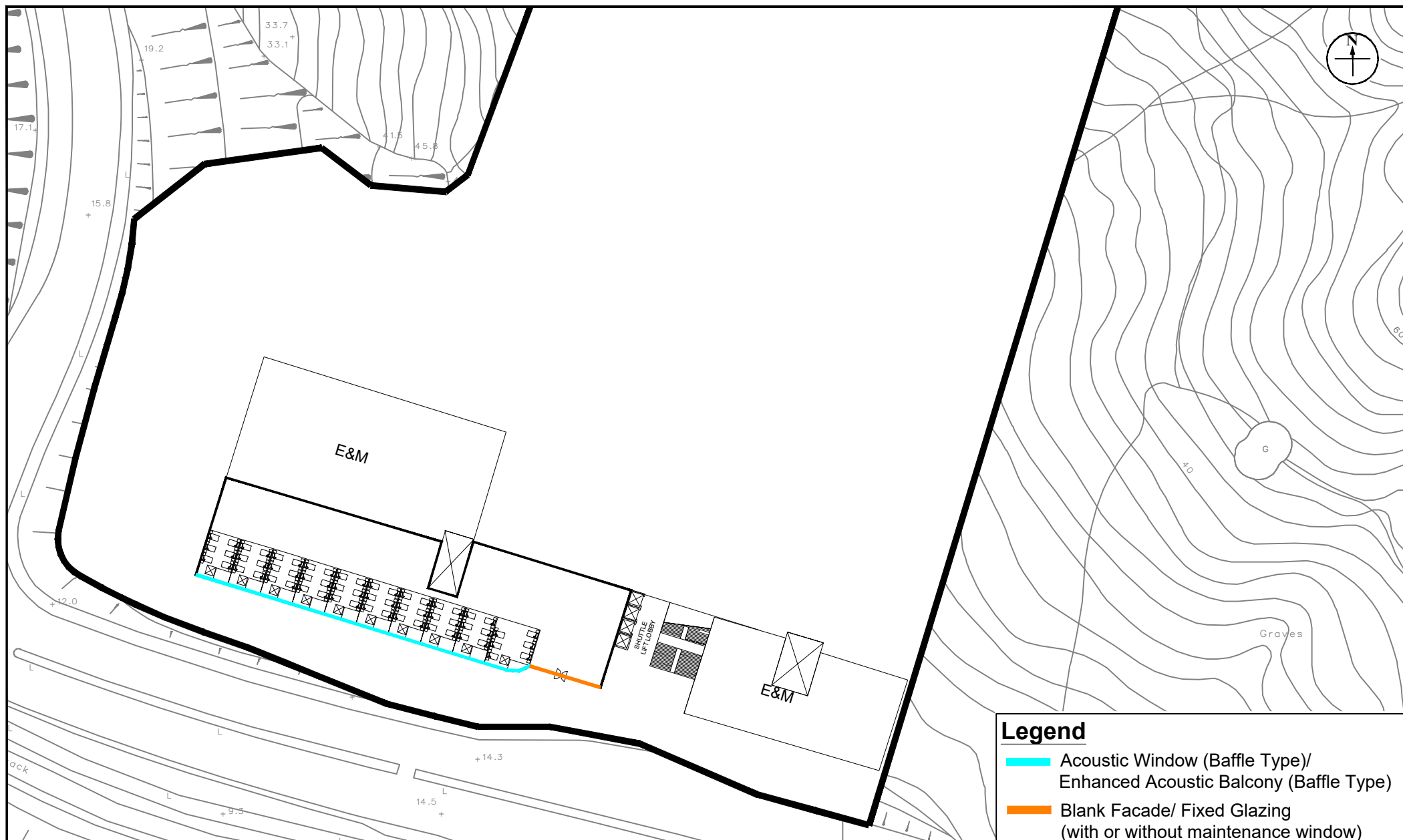
Drawn by: CM

Checked by: CC

Rev.: 1.1

Date: Aug 2023





**Figure:** 6a

**Title:** Proposed Road Traffic Noise Mitigation Measures (GIC LG-Site A)

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

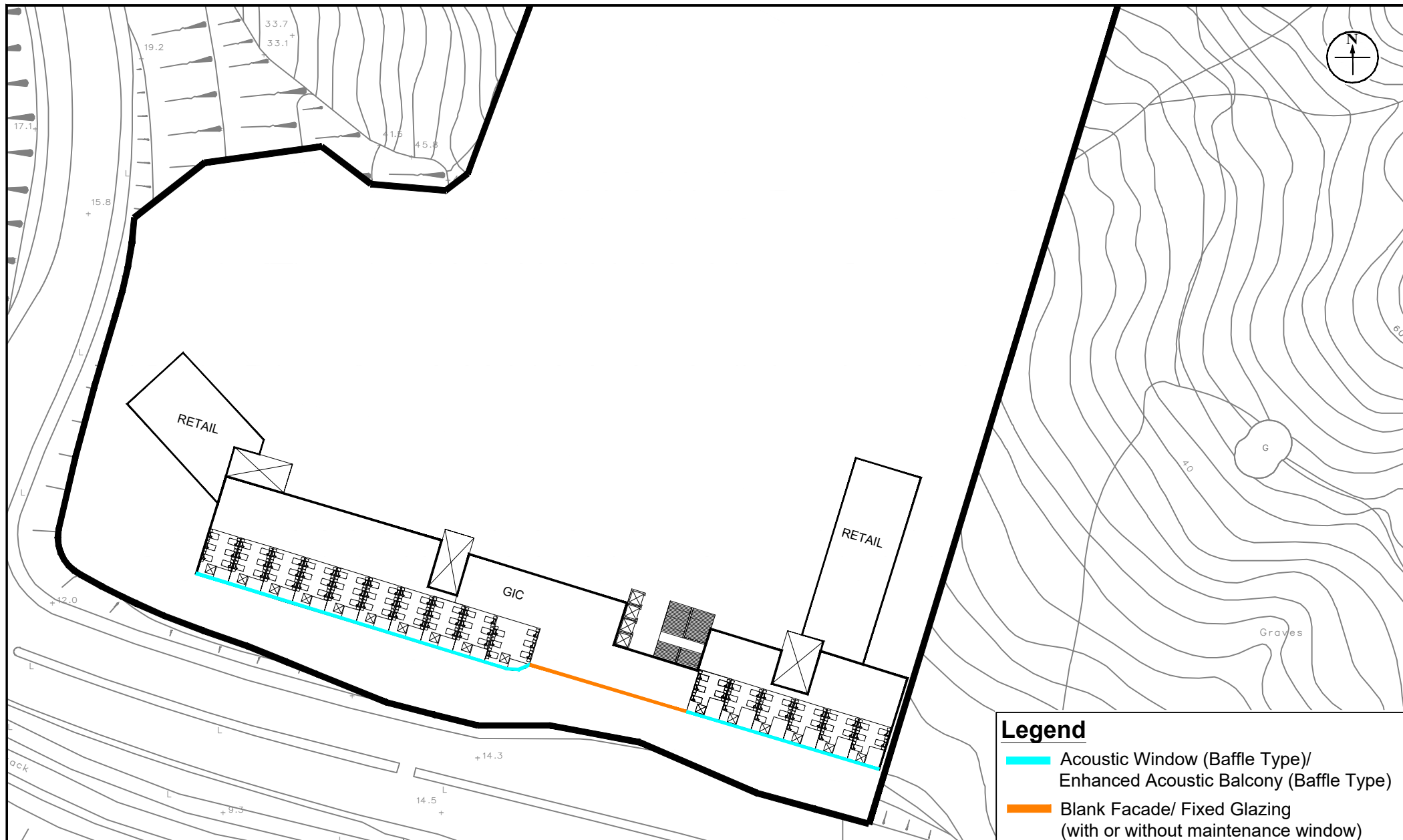
**RAMBOLL**

Drawn by: CM

Checked by: CC

Rev.: 1.3

Date: Oct 2024



**Figure: 6b**

**Title:** Proposed Road Traffic Noise Mitigation Measures (GIC GF-Site A)

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

**RAMBOLL**

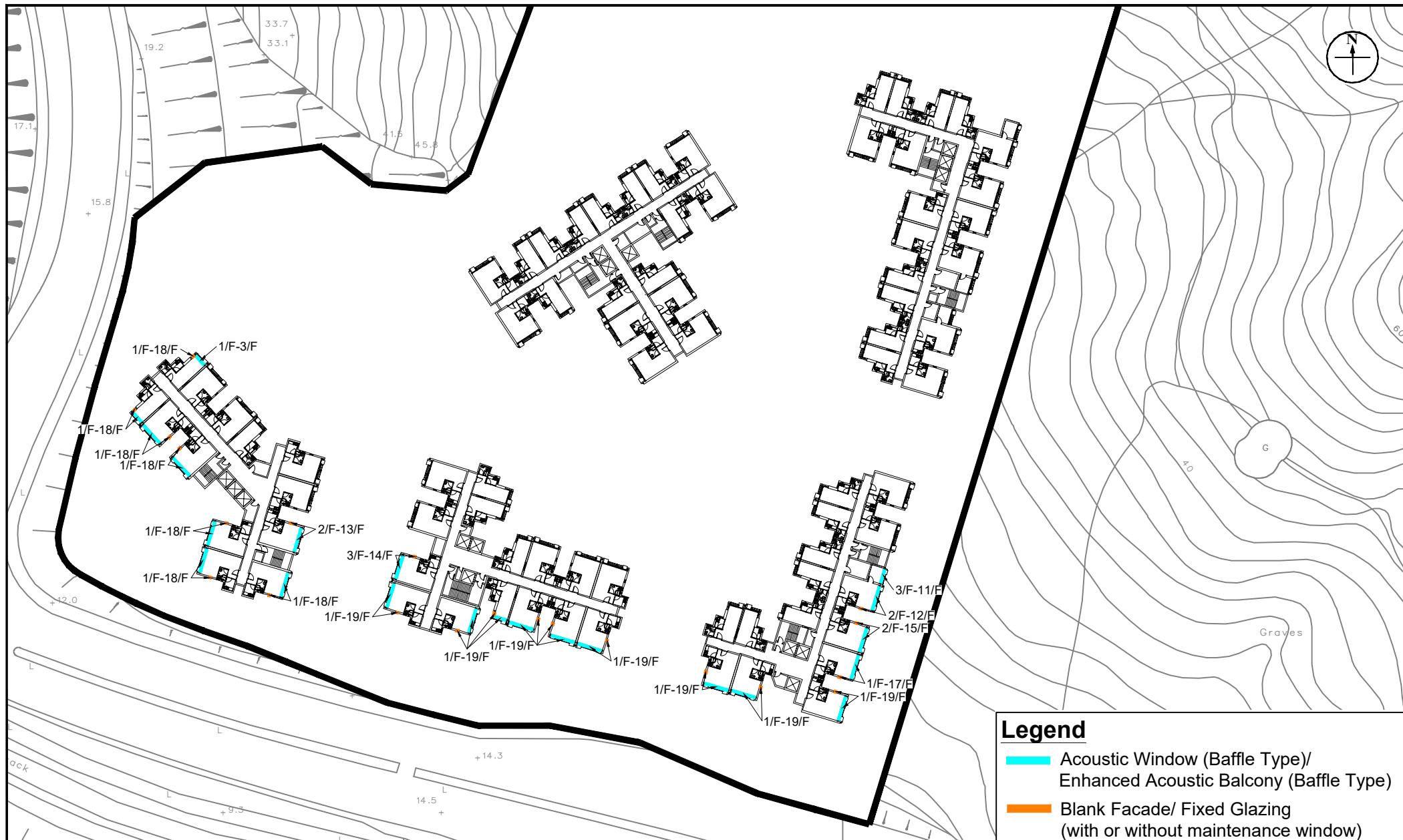
Drawn by: CM

Checked by: CC

Rev.: 1.3

Date: Oct 2024





**Figure:** 6c

**Title:** Proposed Road Traffic Noise Mitigation Measures (Residential Tower-Site A)

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

**RAMBOLL**

Drawn by: CM

Checked by: CC

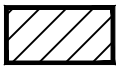
Rev.: 1.3

Date: Oct 2024





Legend



Subject Site



Fixed Noise Sources

**Figure: 7**  
**Title:** Location for the Fixed Noise Sources  
**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

**RAMBOLL**

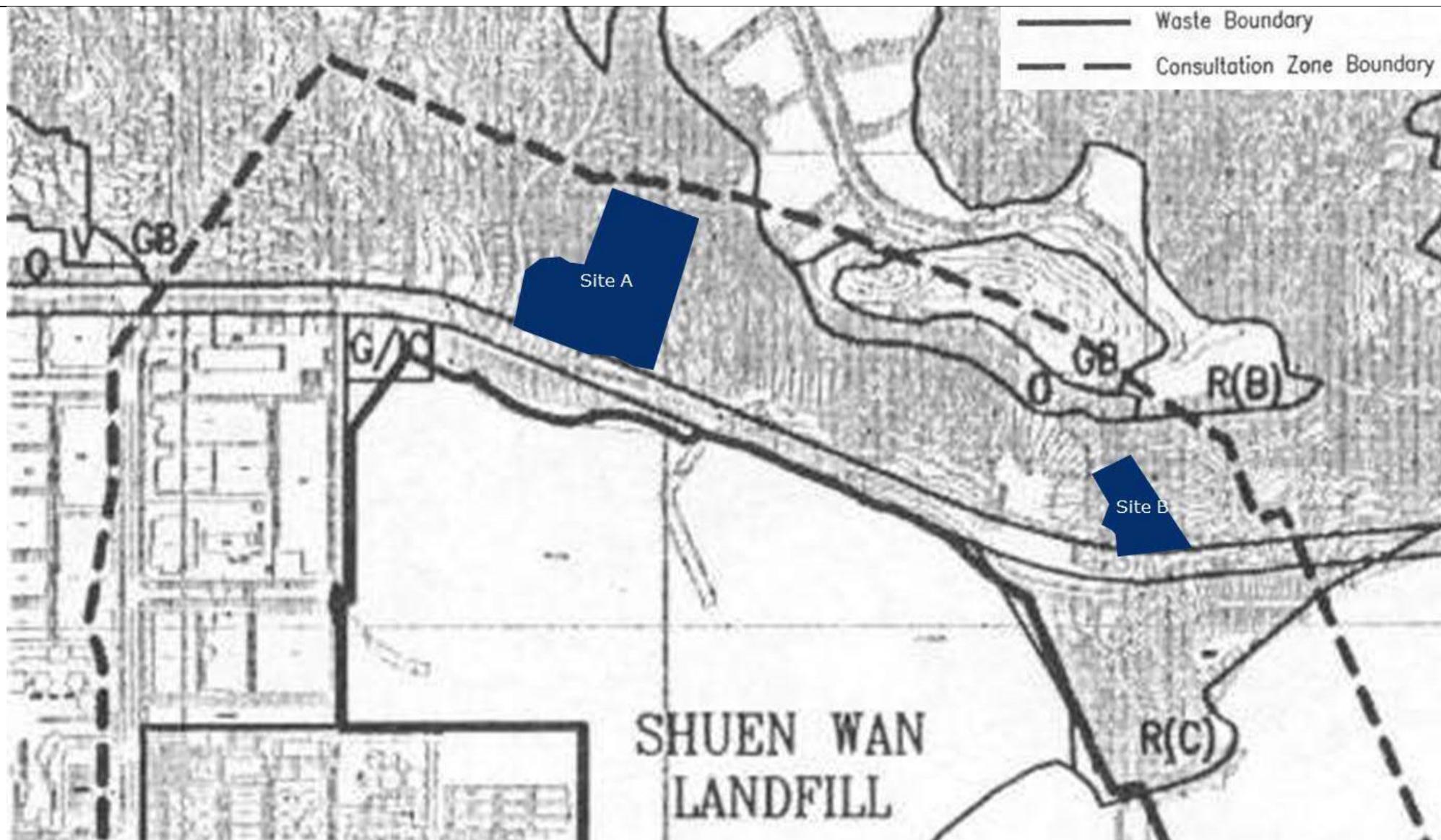
Drawn by: MK

Checked by: CC

Rev.: 1.2

Date: Oct 2024





**Figure: 8**

**Title:** Consultation Zone of Shuen Wan Landfill

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

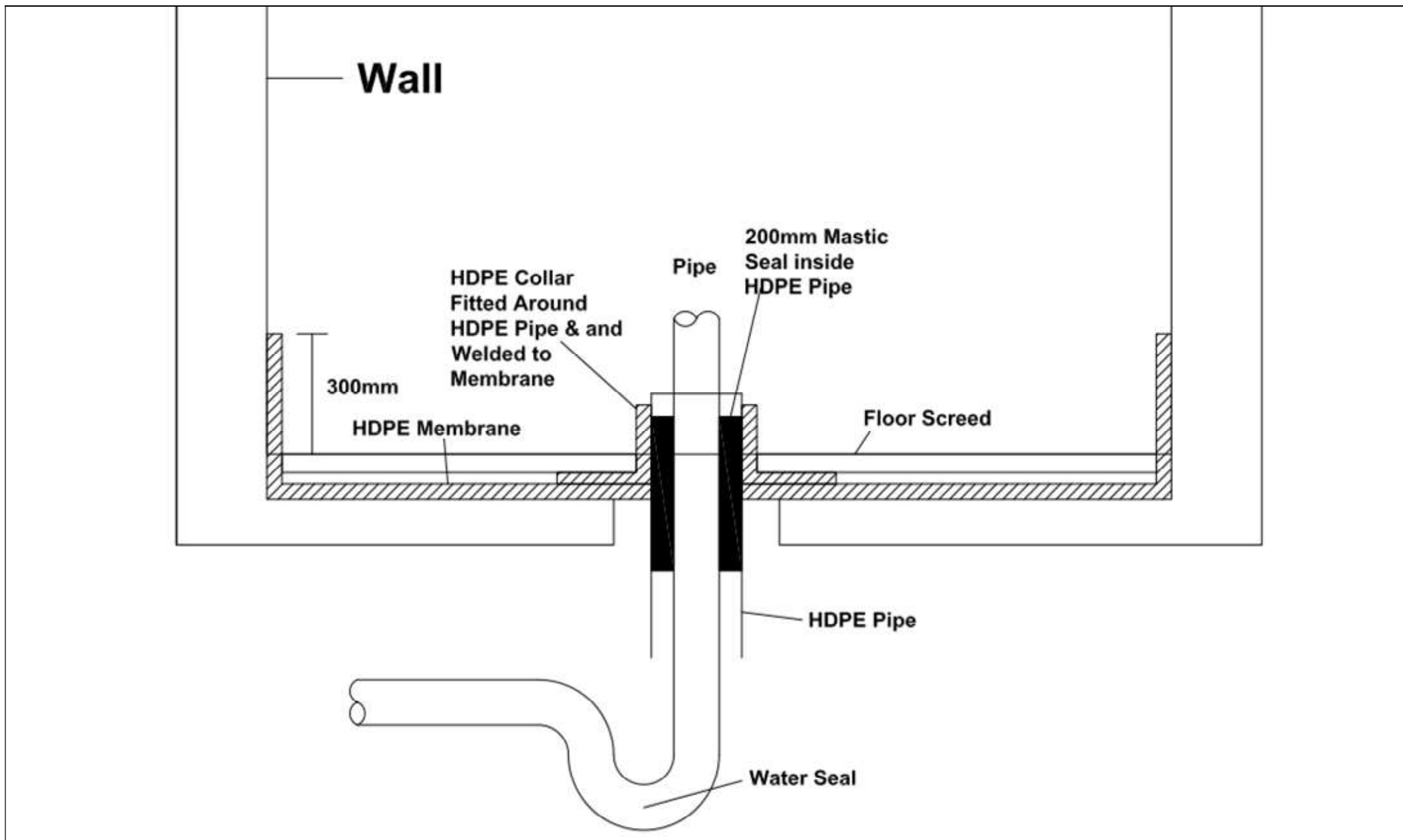
**RAMBOLL**

Drawn by: CM

Checked by: CC

Rev.: 1.1

Date: Oct 2024



**Figure: 9**

**Title:** Typical Section of Enclosed Room in Contact with Soil showing Landfill Gas Migration Mitigation Measures

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

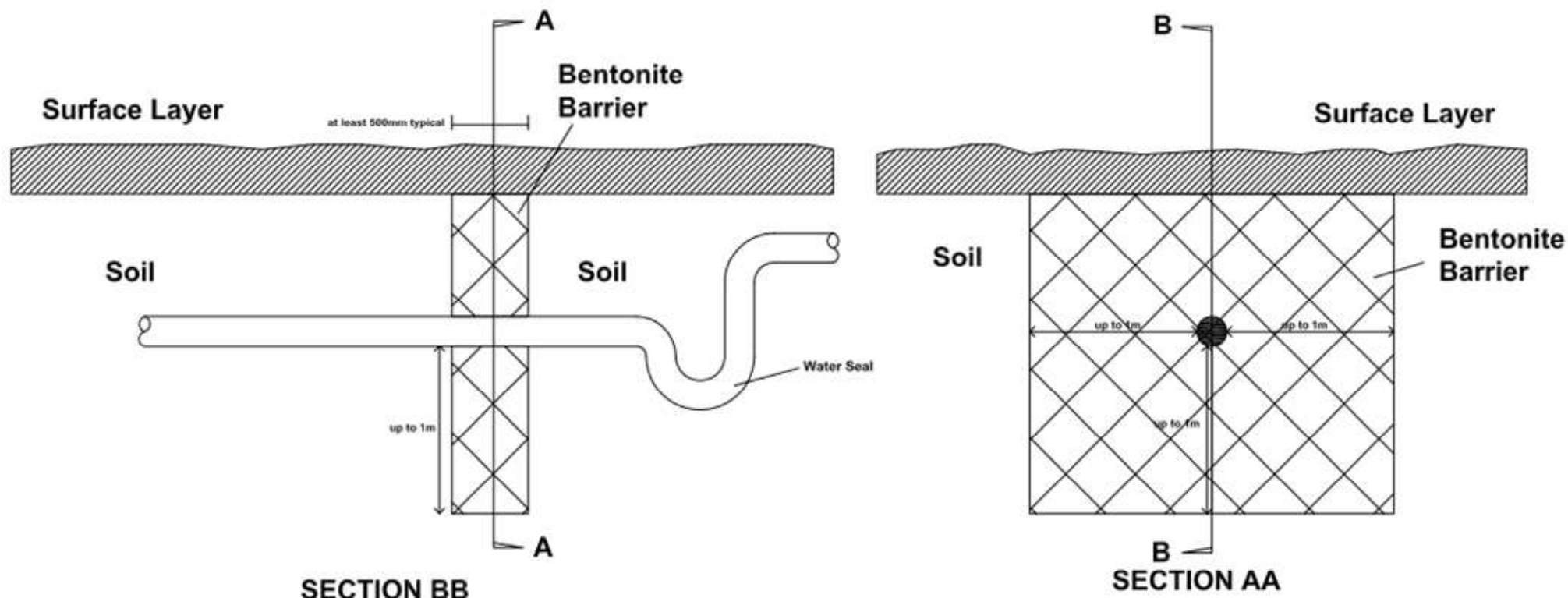
**RAMBOLL**

Drawn by: CM

Checked by: CC

Rev.: 1.0

Date: Apr 2023



## SECTION SHOWING THE BENTONITE BARRIER

**Figure: 10**

**Title:** Natural Cut-Off Barrier for Utilities entering Building Structure from Street Side Mains and Water Seal

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

**RAMBOLL**

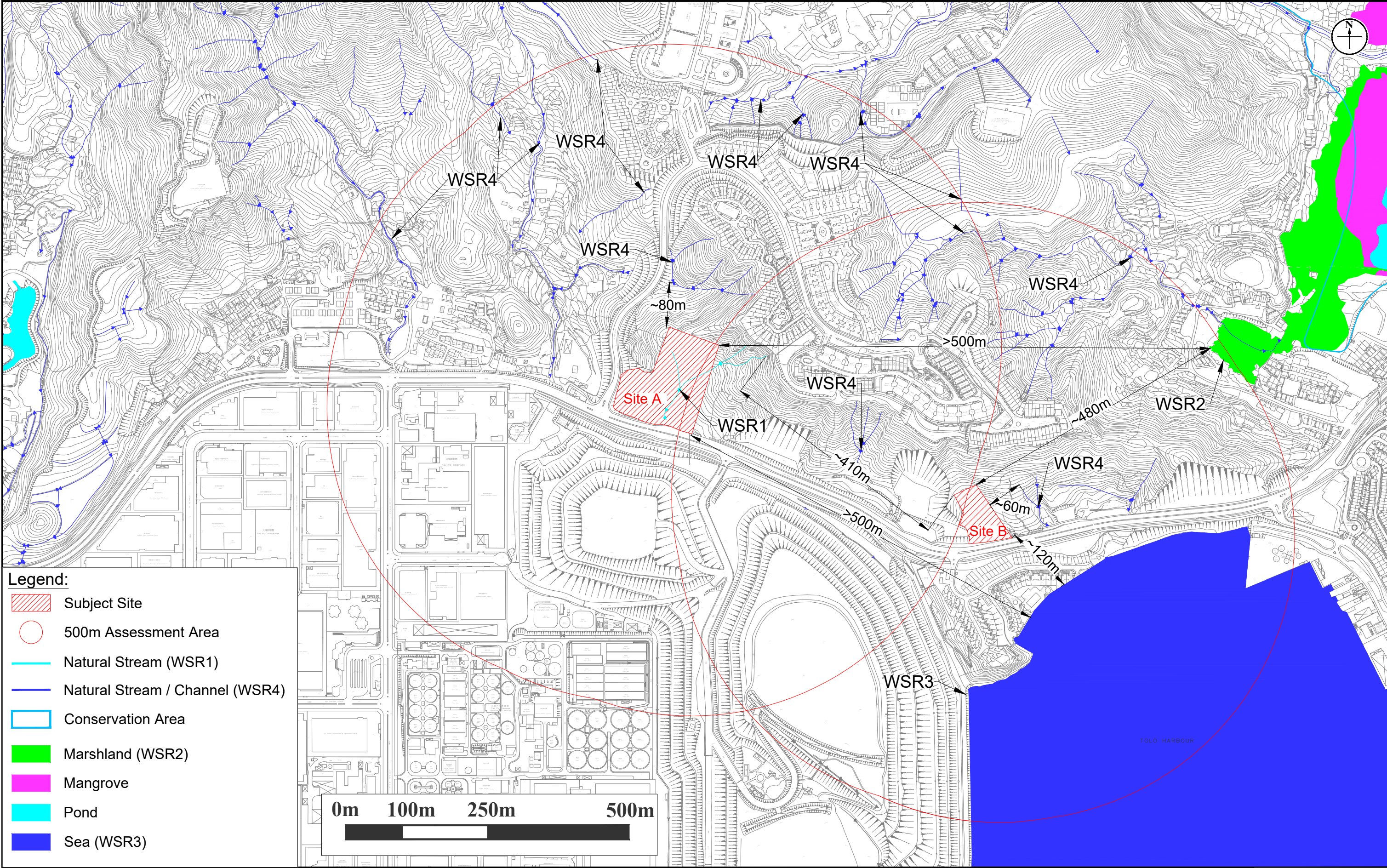
Drawn by: CM

Checked by: CC

Rev.: 1.0

Date: Apr 2023





<b>Figure:</b> 11		RAMBOLL	
<b>Title:</b> Location of Water Sensitive Receivers within 500m from Site A and Site B		Drawn by:	CM
<b>Project:</b> Proposed Public Residential Housing/ Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po		Checked by:	CC
		Rev.:	1.3
		Date:	Oct 2024









**Figure:** 13a  
**Title:** Nearby Air Sensitive Receivers for Road Junction Work (J1)

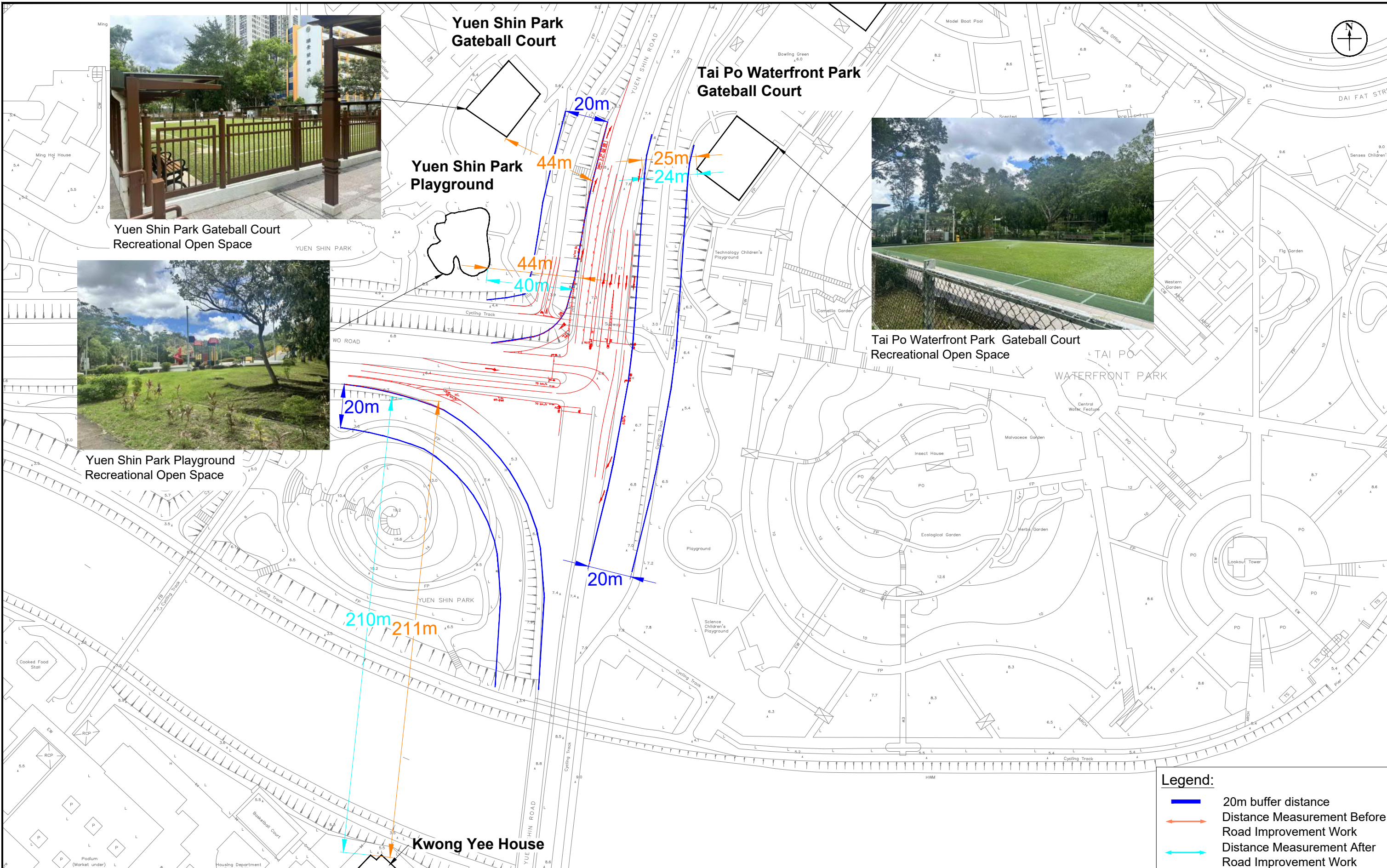
**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

RAMBOLL	
Drawn by:	MK
Checked by:	CC
Rev.:	1.6
Date:	Feb 2025



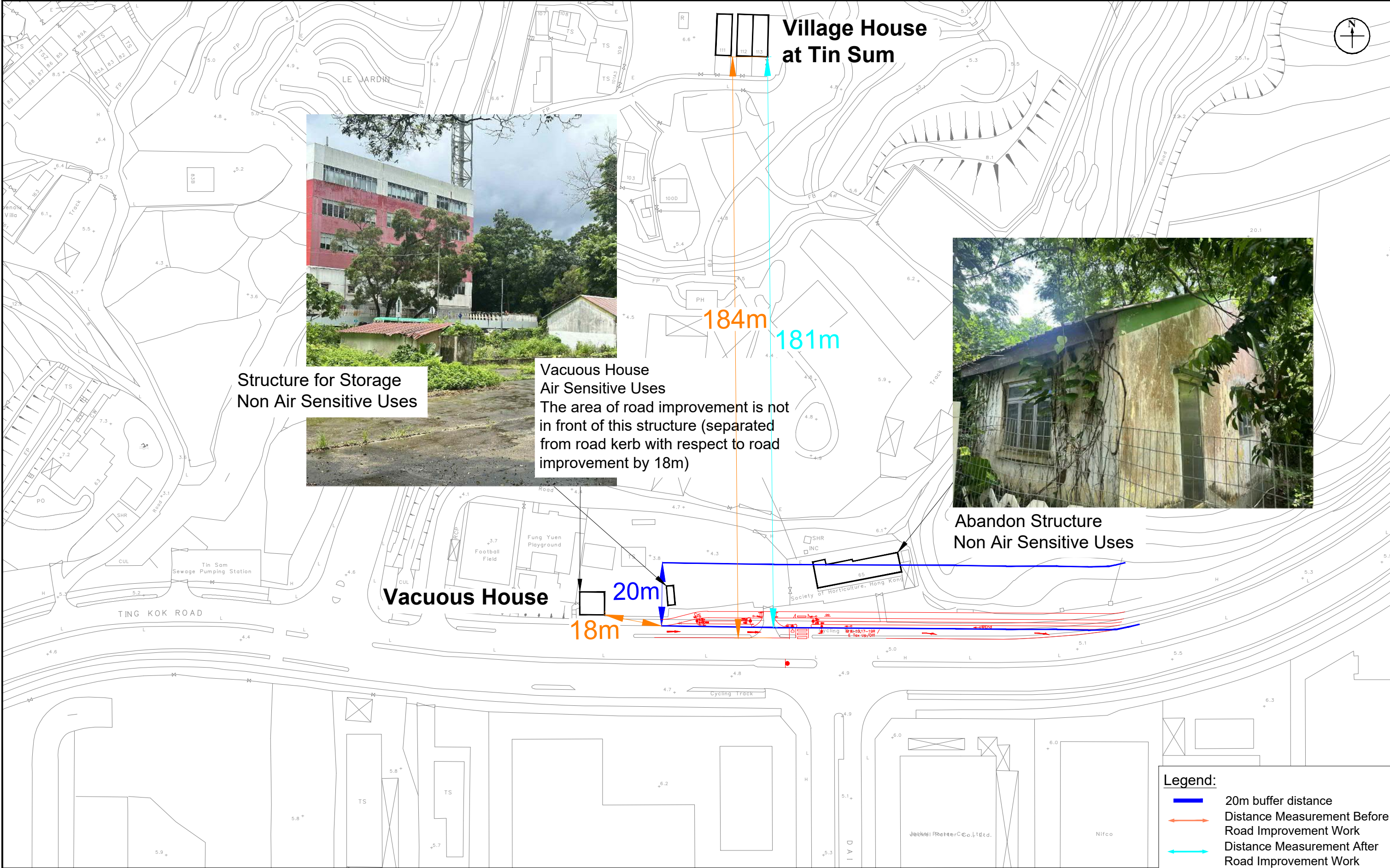






<b>Figure:</b> 13c	<b>RAMBOLL</b>
<b>Title:</b> Nearby Air Sensitive Receivers for Road Junction Work (J3)	Drawn by: MK
<b>Project:</b> Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po	Checked by: CC
	Rev.: 1.6
	Date: Feb 2025





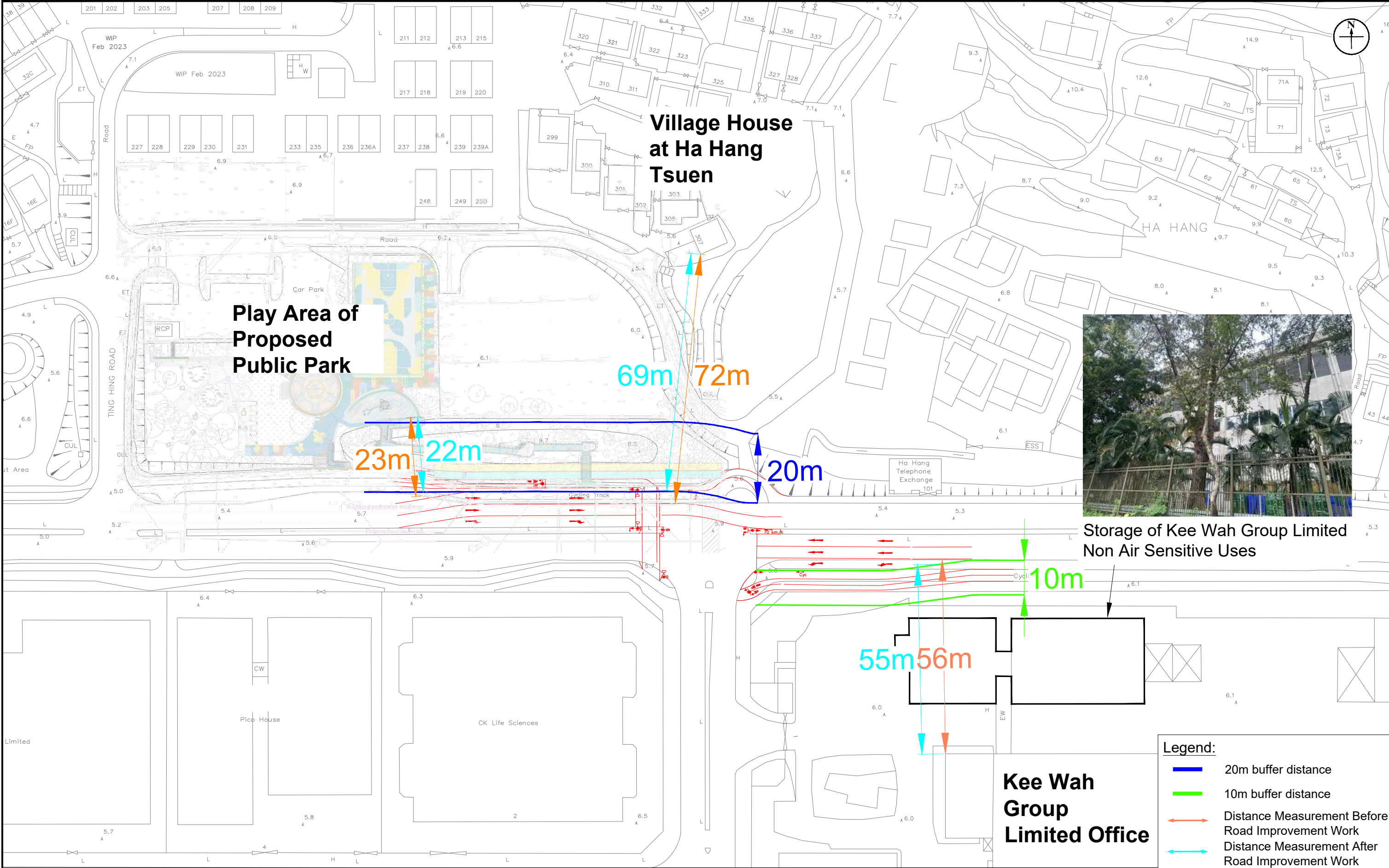
**Figure:** 13d

**Title:** Nearby Air Sensitive Receivers for Road Junction Work ( J4)

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

RAMBOLL	
Drawn by:	MK
Checked by:	CC
Rev.:	1.2
Date:	Jan 2025





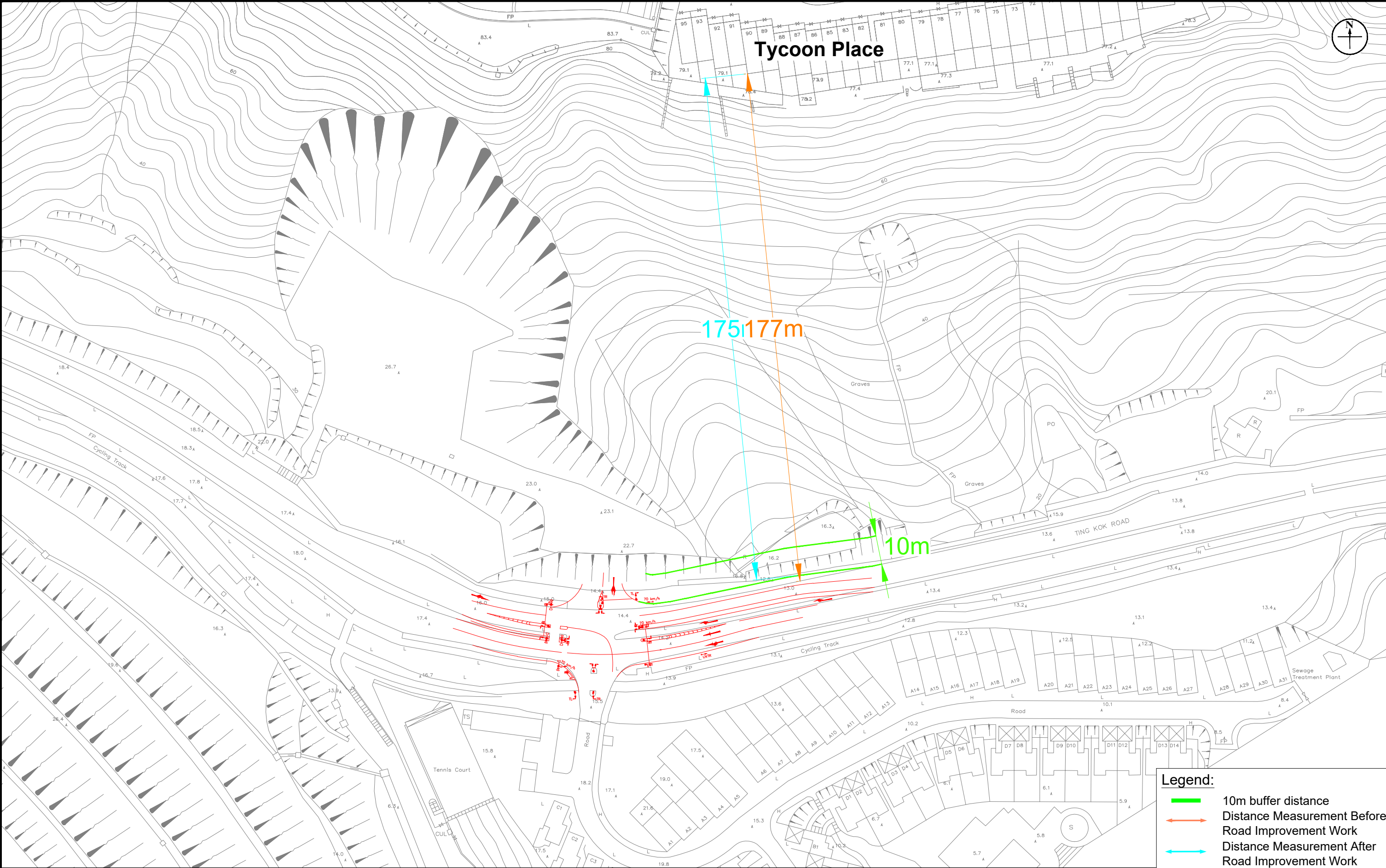
**Figure:** 13e

**Title:** Nearby Air Sensitive Receivers for Road Junction Work (J5)

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

RAMBOLL	
Drawn by:	MK
Checked by:	CC
Rev.:	1.6
Date:	Feb 2025





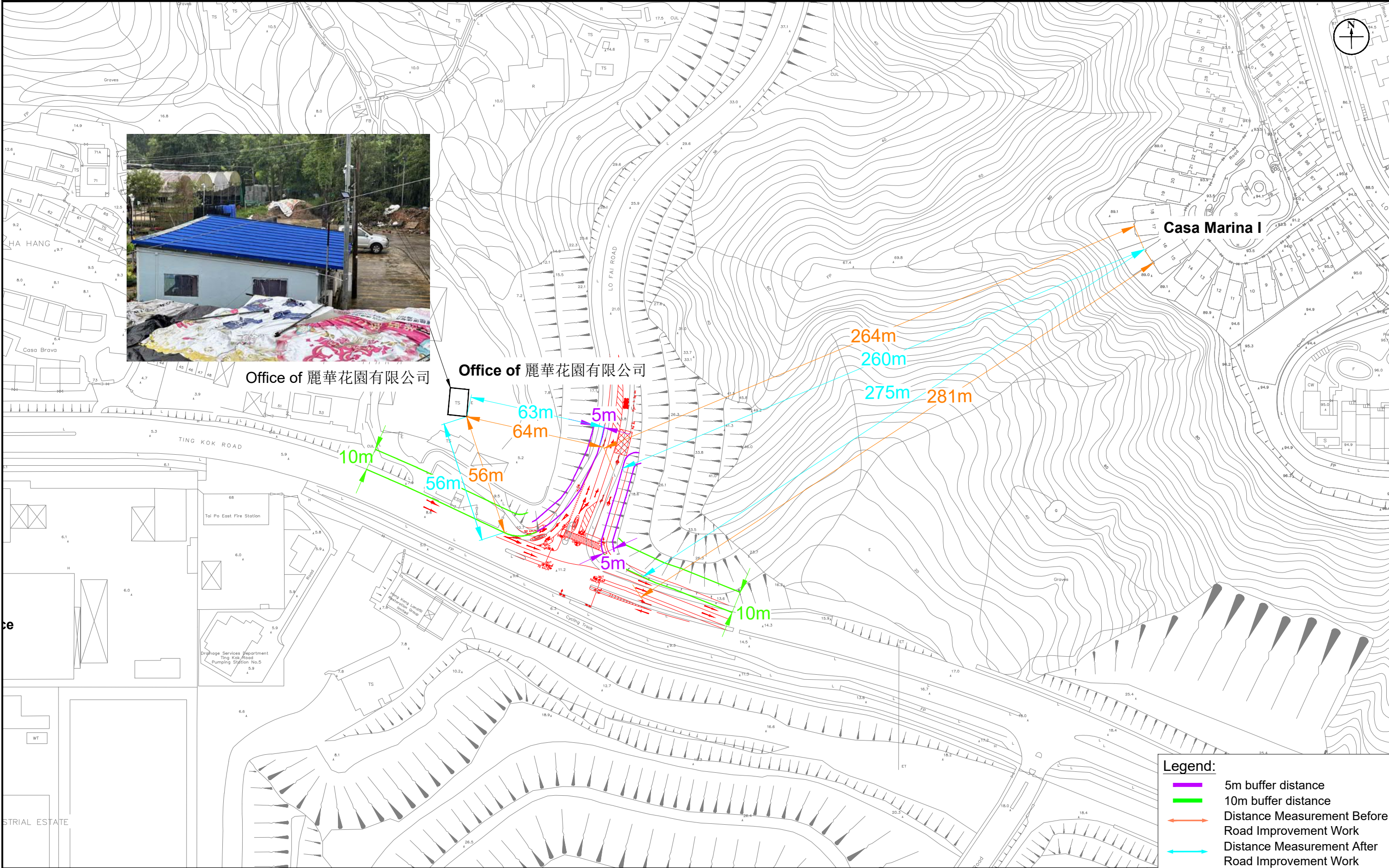
**Figure:** 13f

**Title:** Nearby Air Sensitive Receivers for Road Junction Work (J6)

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

RAMBOLL	
Drawn by:	MK
Checked by:	CC
Rev.:	1.6
Date:	Feb 2025



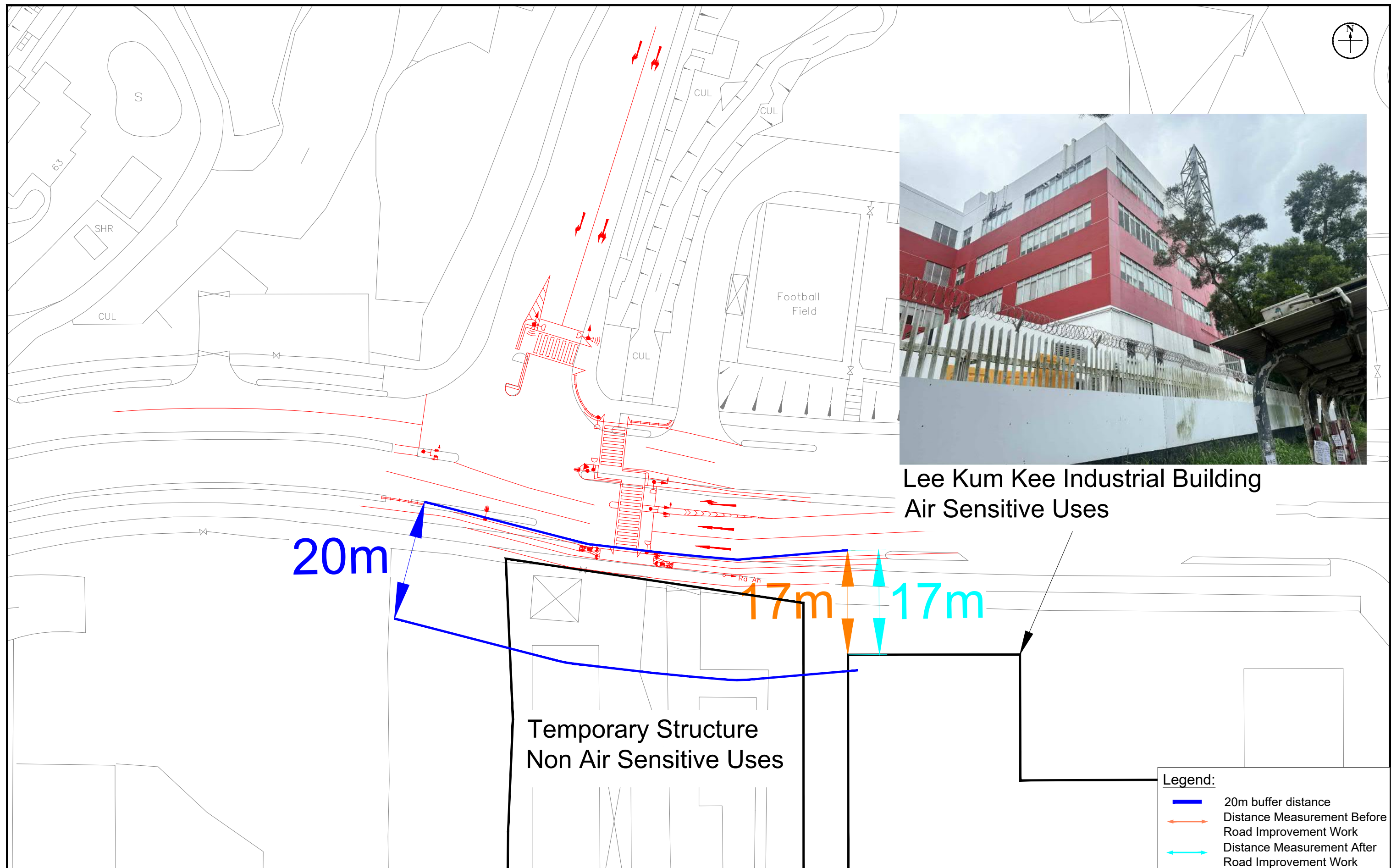


**Figure:** 13g  
**Title:** Nearby Air Sensitive Receivers for Road Junction Work (J7)

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

RAMBOLL	
Drawn by:	MK
Checked by:	CC
Rev.:	1.6
Date:	Feb 2025





**Figure:** 13h

**Title:** Nearby Air Sensitive Receivers for Road Junction Work ( J8)

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

**Legend:**

- 20m buffer distance
- ↔ Distance Measurement Before Road Improvement Work
- ↔ Distance Measurement After Road Improvement Work

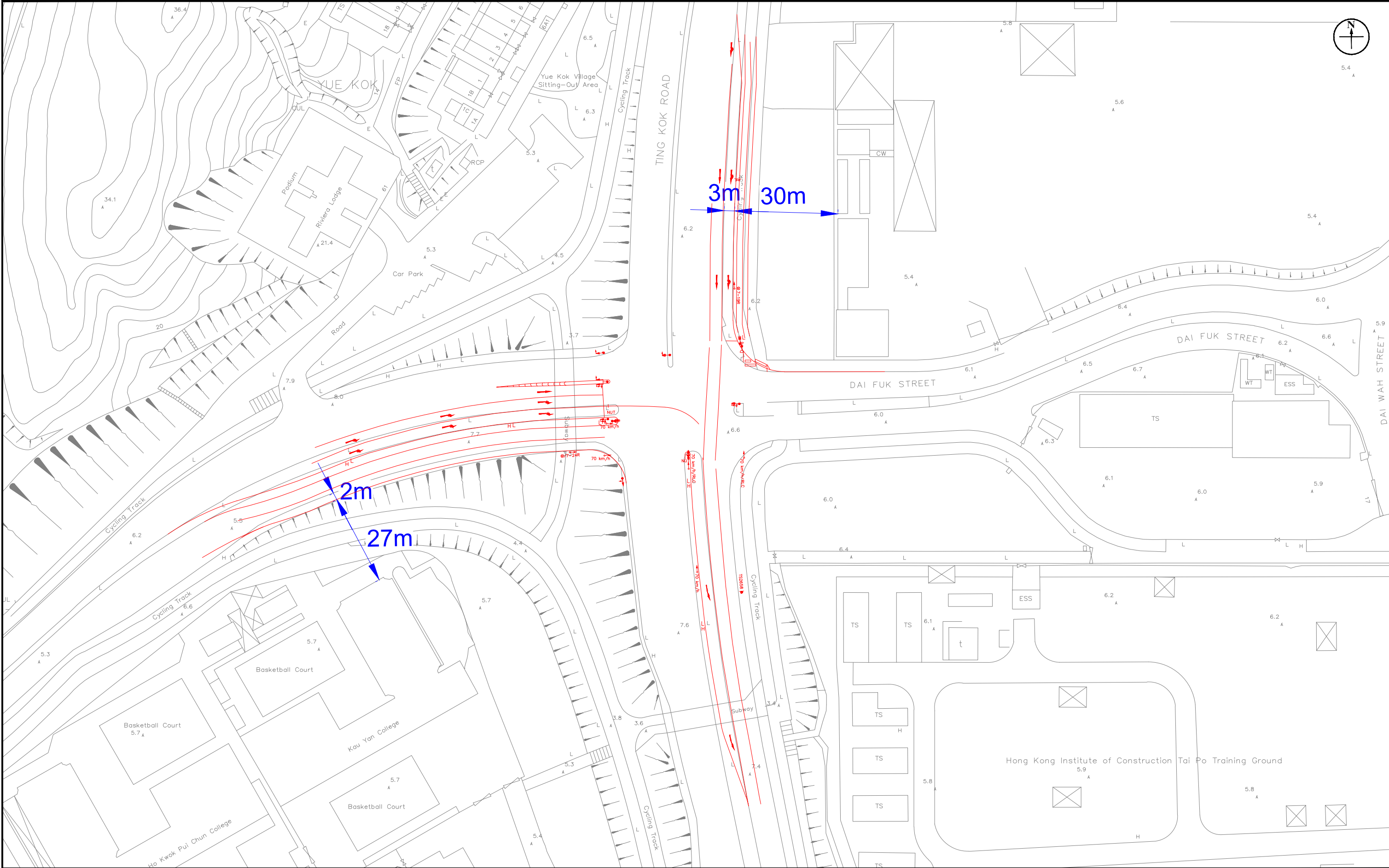
**RAMBOLL**

Drawn by: MK

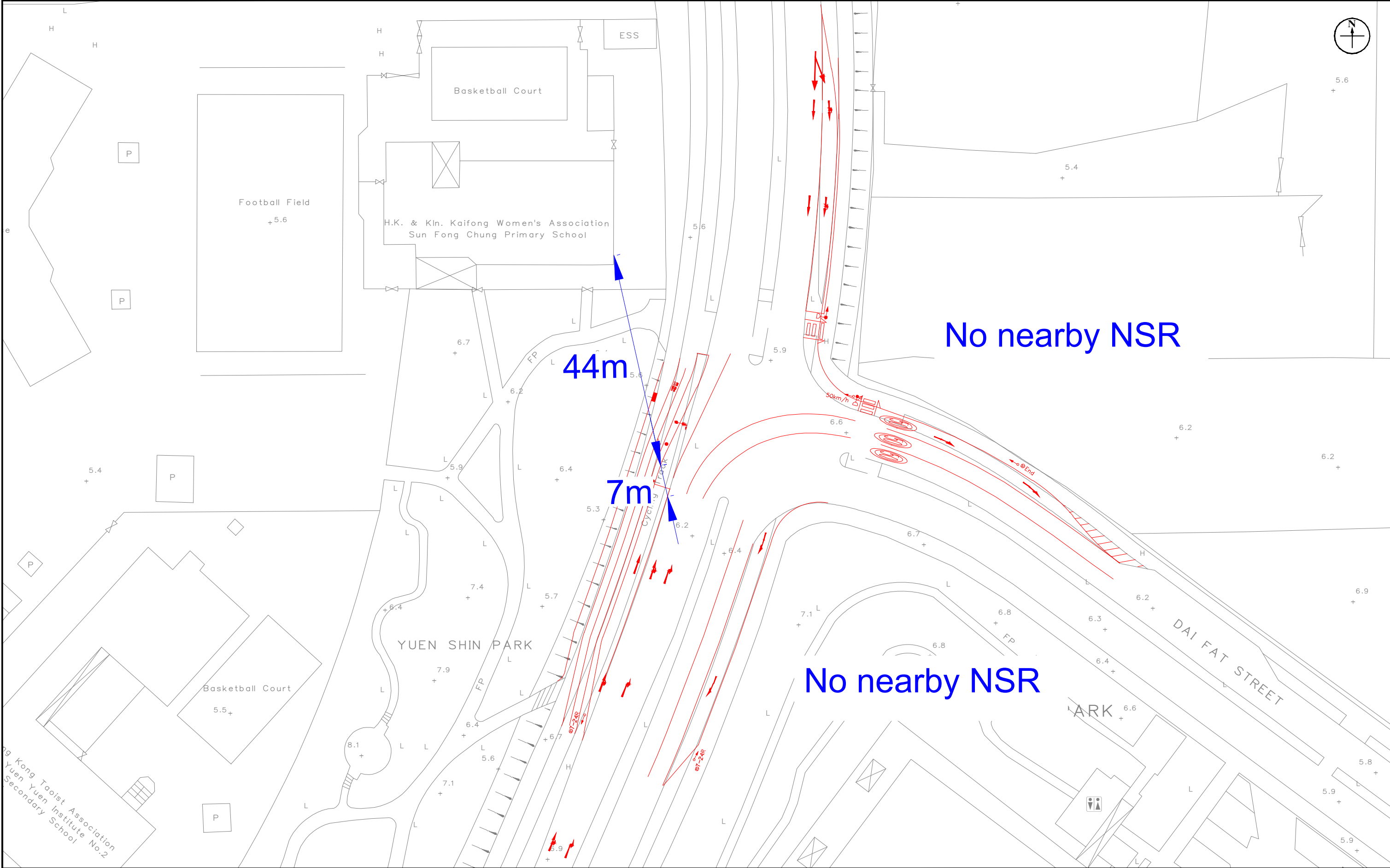
Checked by: CC

Rev.: 1.3

Date: Jan 2025

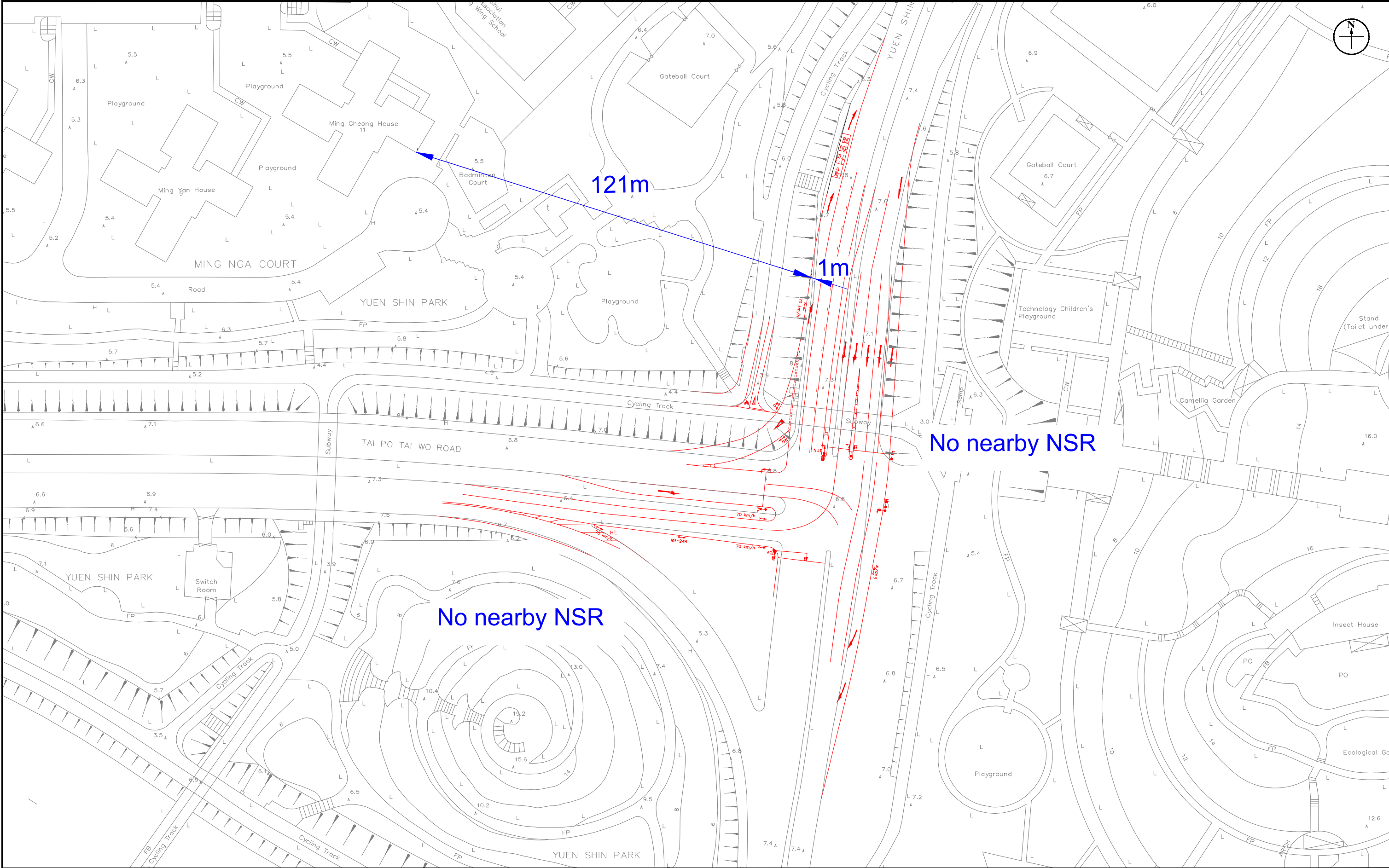


<b>Figure:</b> 14a		<b>RAMBOLL</b>	
<b>Title:</b> Nearby Noise Sensitive Receivers for Road Junction Work (J1)		Drawn by: CM	
<b>Project:</b> Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po		Checked by: CC	
		Rev.: 1.6	
		Date: Feb 2025	



<b>Figure:</b> 14b		RAMBOLL	
<b>Title:</b> Nearby Noise Sensitive Receivers for Road Junction Work (J2)		Drawn by:	CM
<b>Project:</b> Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po		Checked by:	CC
		Rev.:	1.2
		Date:	Jan 2025





**Figure:** 14c

**Title:** Nearby Noise Sensitive Receivers for Road Junction Work (J3)

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

**RAMBOLL**

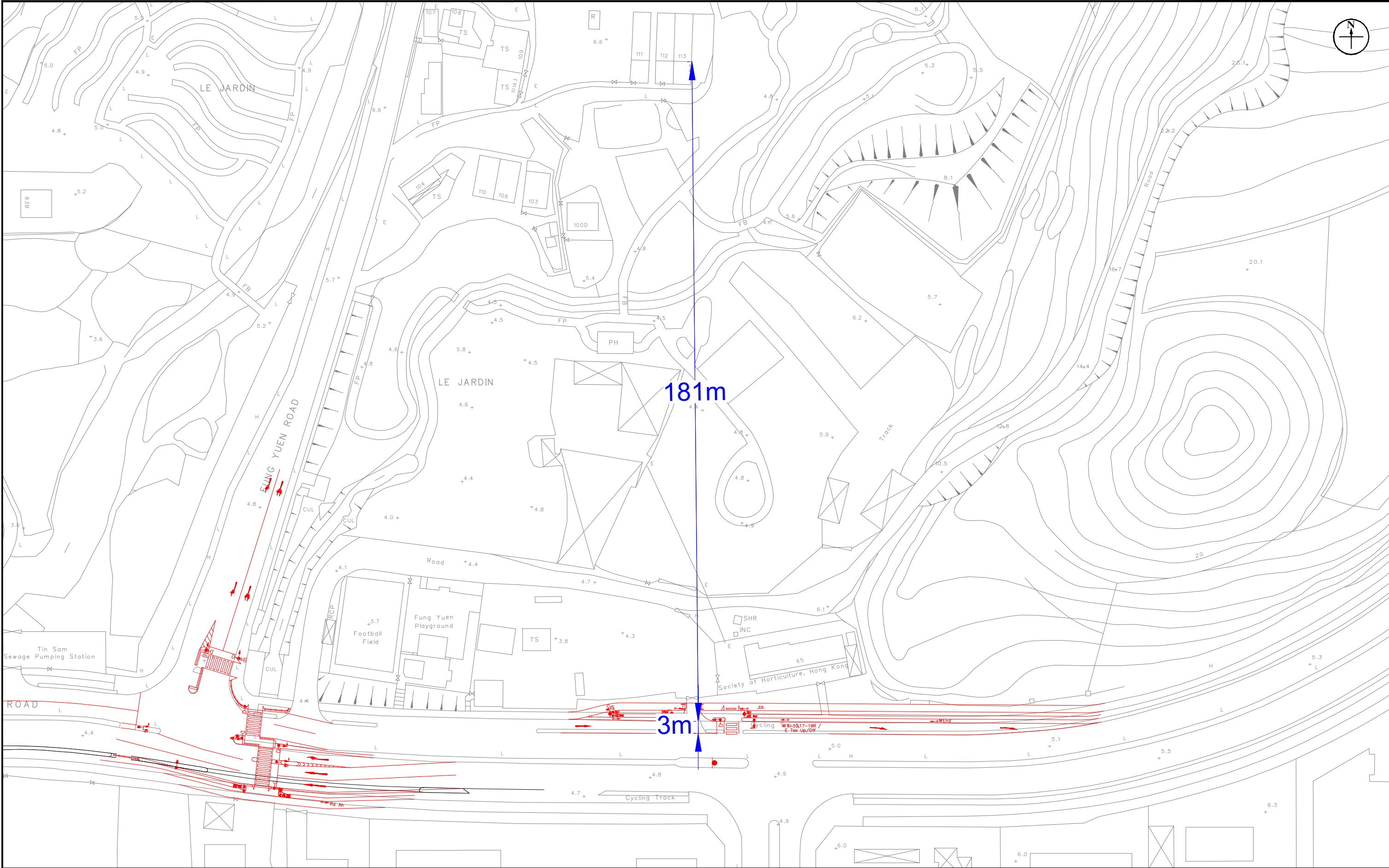
Drawn by: CM

Checked by: CC

Rev.: 1.6

Date: Feb 2025





**Figure:** 14d

**Title:** Nearby Noise Sensitive Receivers for Road Junction Work (J4)

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

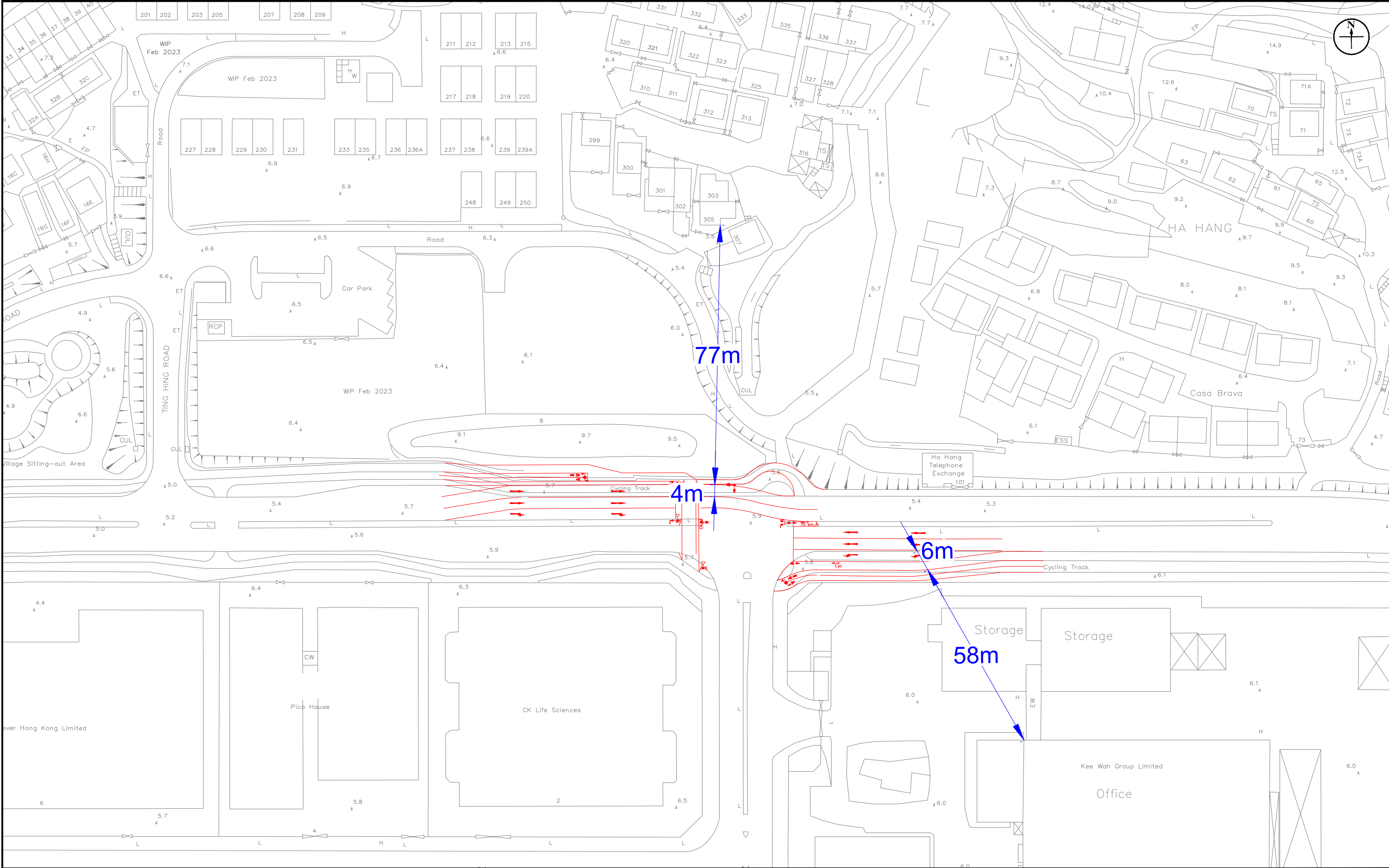
**RAMBOLL**

Drawn by: CM

Checked by: CC

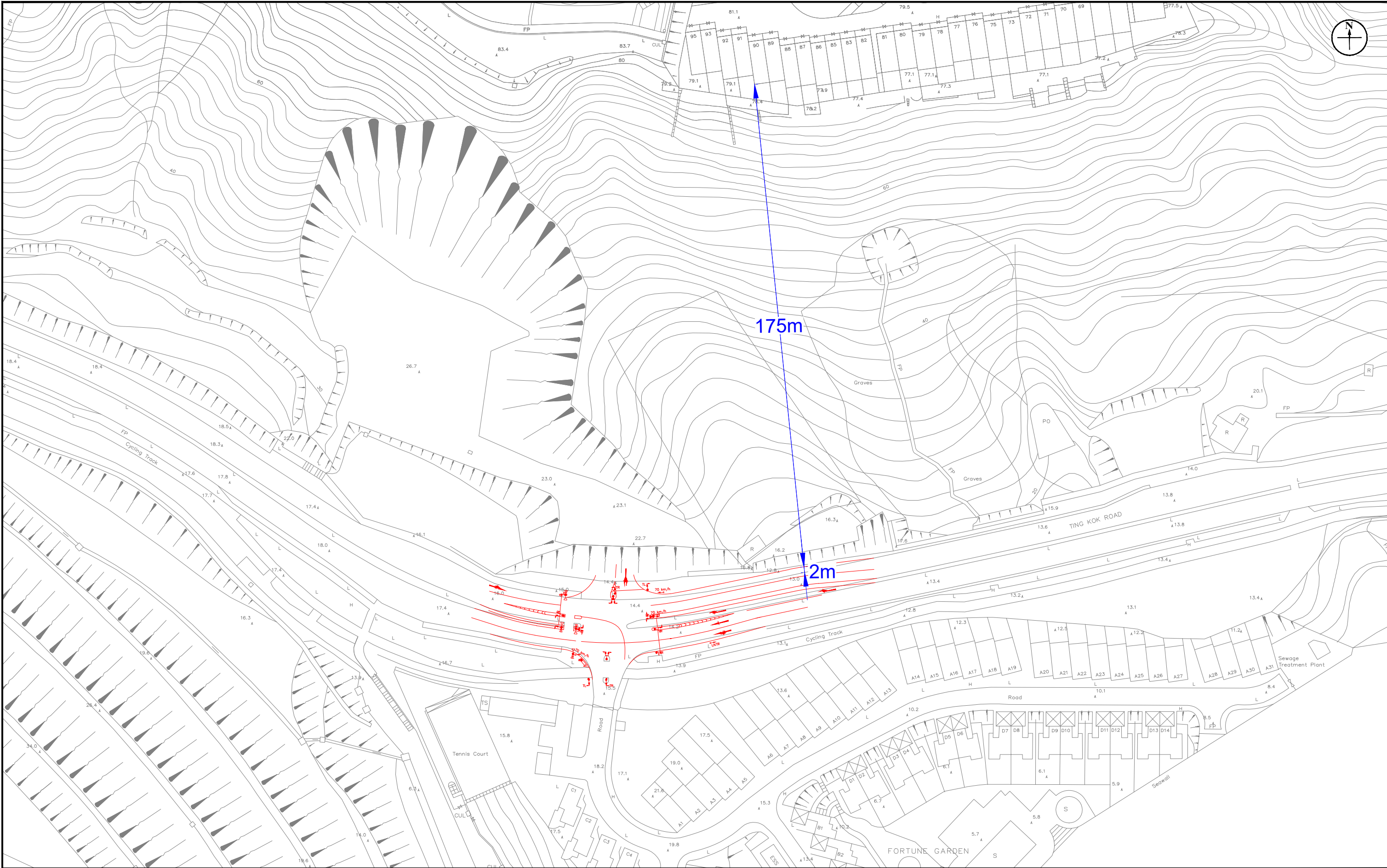
Rev.: 1.2

Date: Jan 2025

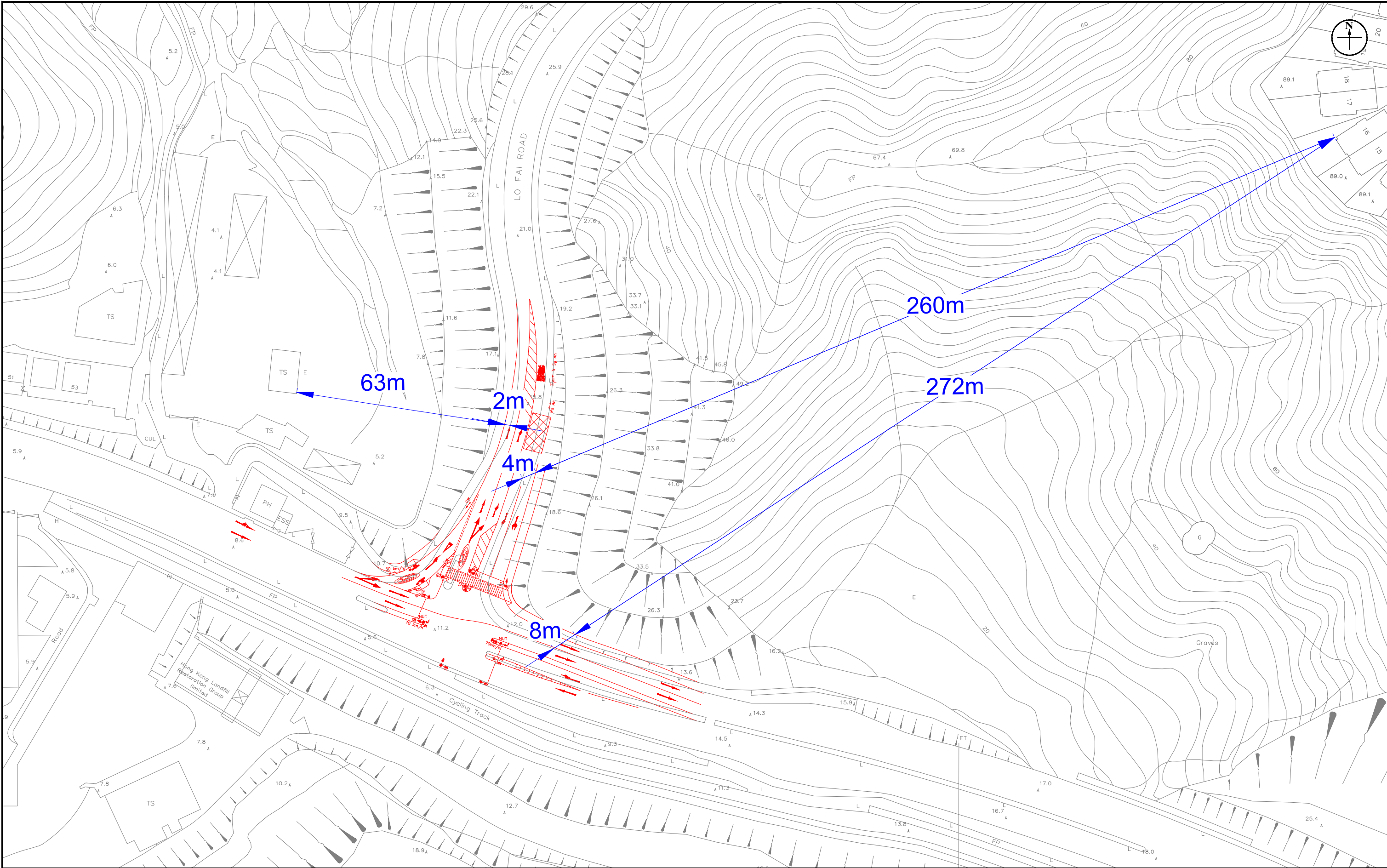


<b>Figure:</b> 14e		RAMBOLL	
<b>Title:</b> Nearby Noise Sensitive Receivers for Road Junction Work (J5)		Drawn by: CM	
<b>Project:</b> Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po		Checked by: CC	
		Rev.: 1.6	
		Date: Feb 2025	





<b>Figure:</b> 14f	<div> </div> <div>           Drawn by: CM         </div> <div>           Checked by: CC         </div>
<b>Title:</b> Nearby Noise Sensitive Receivers for Road Junction Work (J6)	
<b>Project:</b> Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po	Rev.: 1.6
	Date: Feb 2025



**Figure:** 14g

**Title:** Nearby Noise Sensitive Receivers for Road Junction Work (J7)

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

**RAMBOLL**

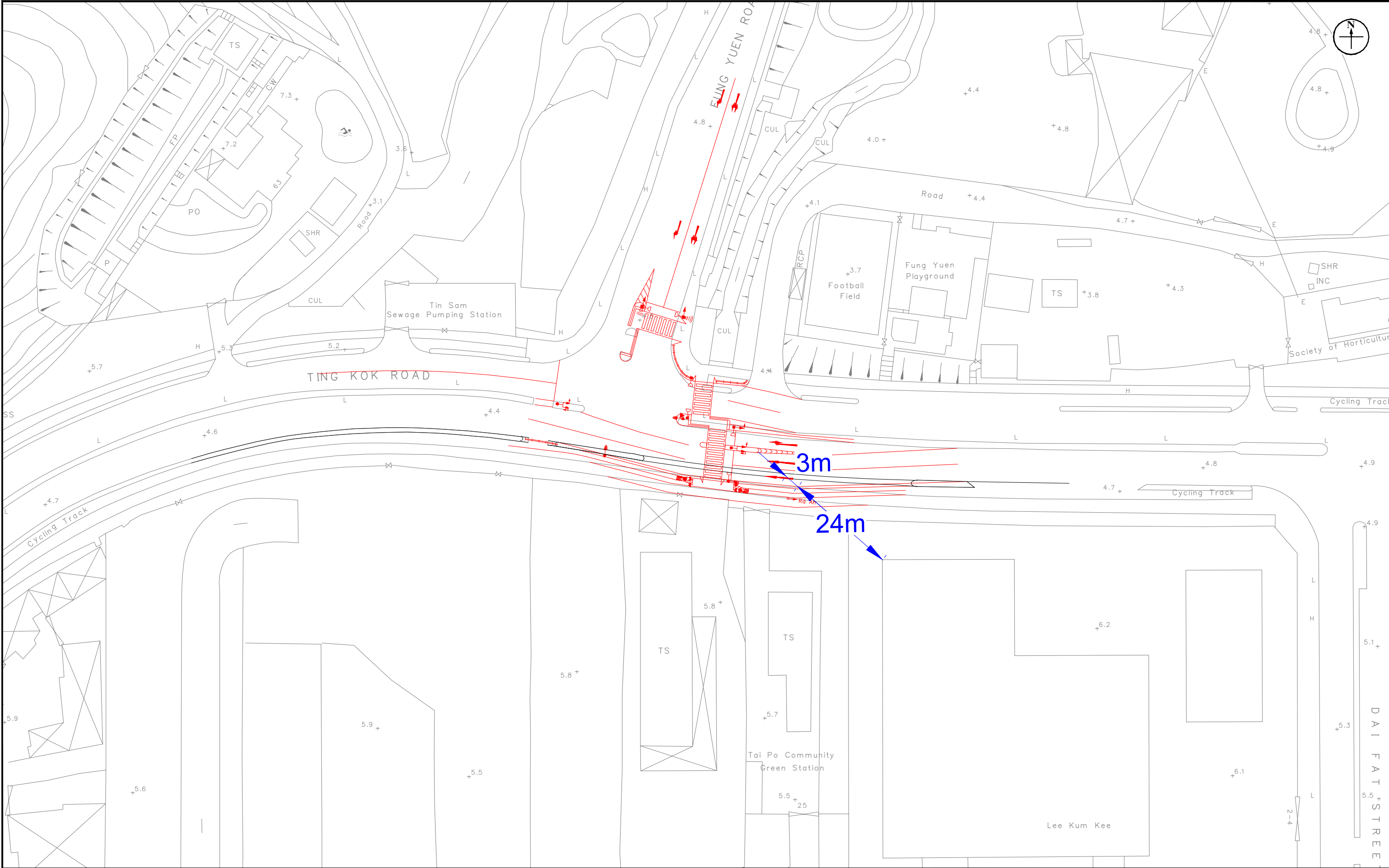
Drawn by: CM

Checked by: CC

Rev.: 1.6

Date: Feb 2025





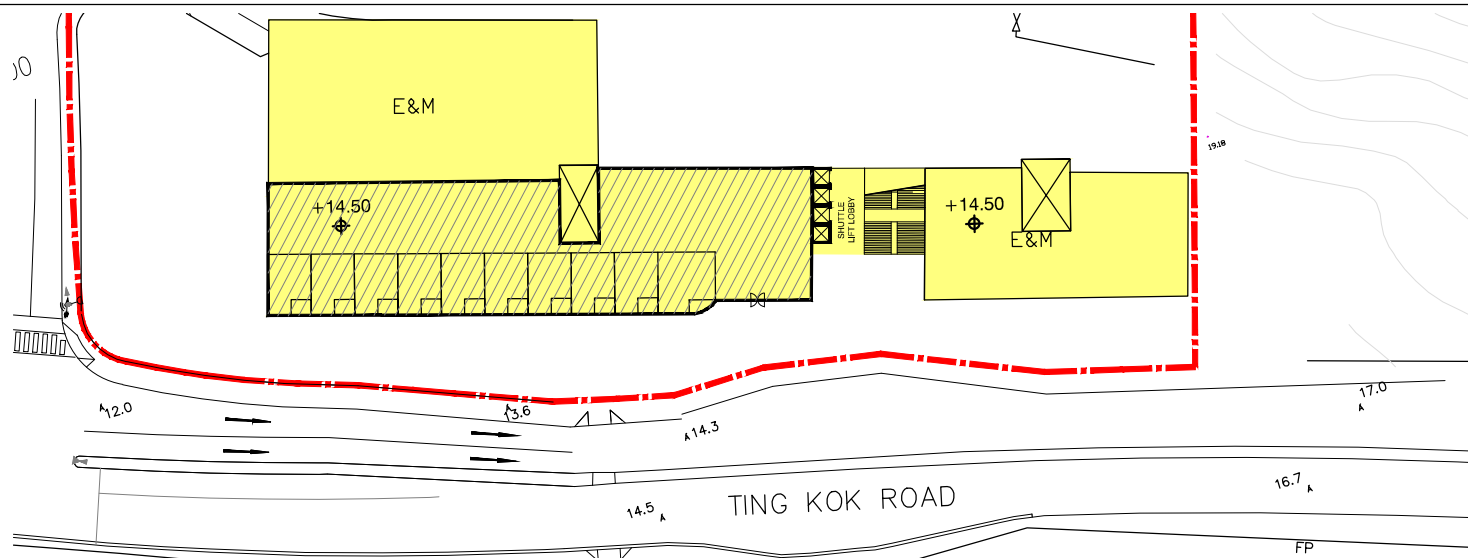
<b>Figure:</b> 14h		RAMBOLL	
<b>Title:</b> Nearby Noise Sensitive Receivers for Road Junction Work (J8)		Drawn by: CM	
<b>Project:</b> Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po		Checked by: CC	
		Rev.: 1.2	
		Date: Jan 2025	

**Appendix 1      Proposed Master Layout Plan**

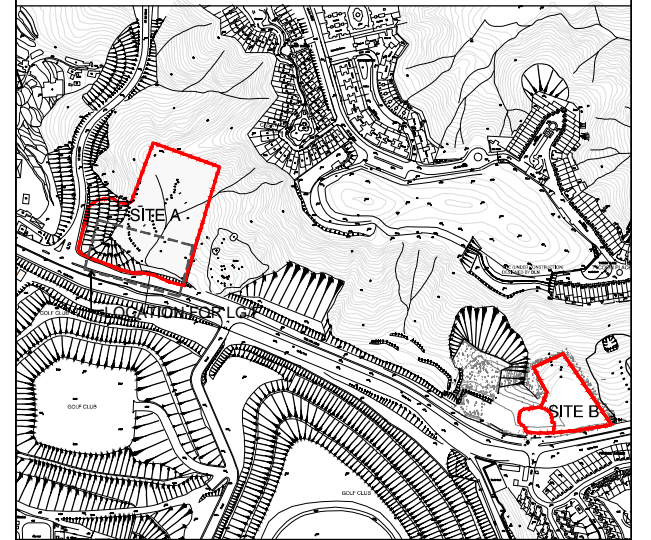




G/F









LG/F



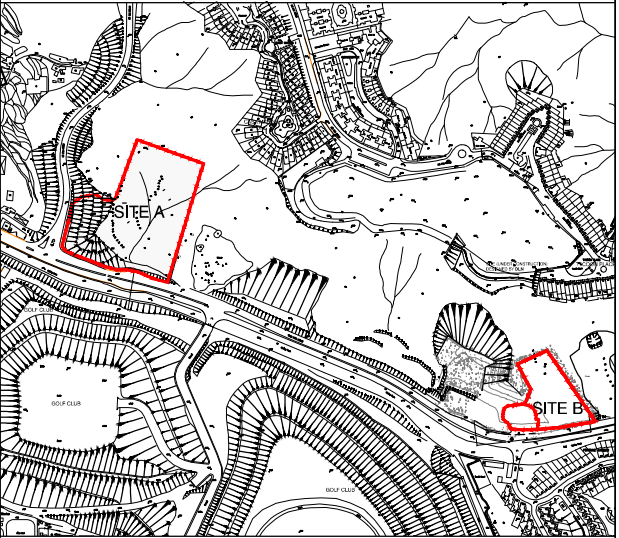
SITE KEY PLAN

DATE:20250210

### LEGEND

-  PROPOSED SITE BOUNDARY
-  PROPOSED INGRESS AND EGRESS
-  GIC (RCHE)
-  RETAIL
-  UPPER PODIUM
-  LOWER PODIUM




Site A - LG/F & G/F Part Plan  
Scale 1:1000 (A3)



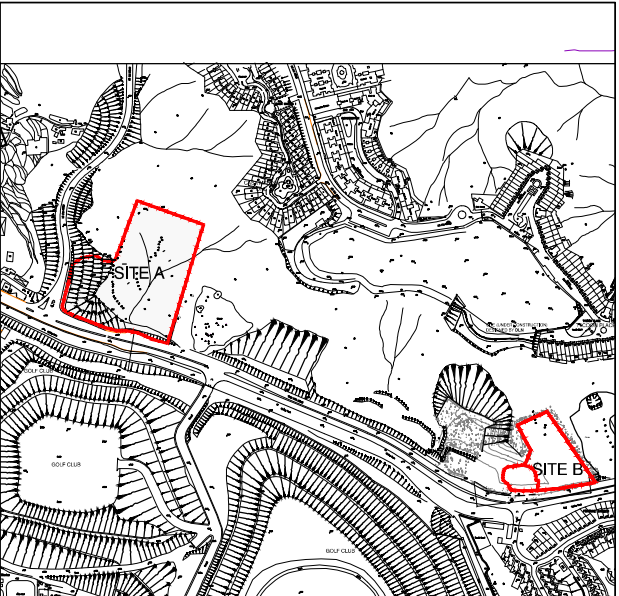
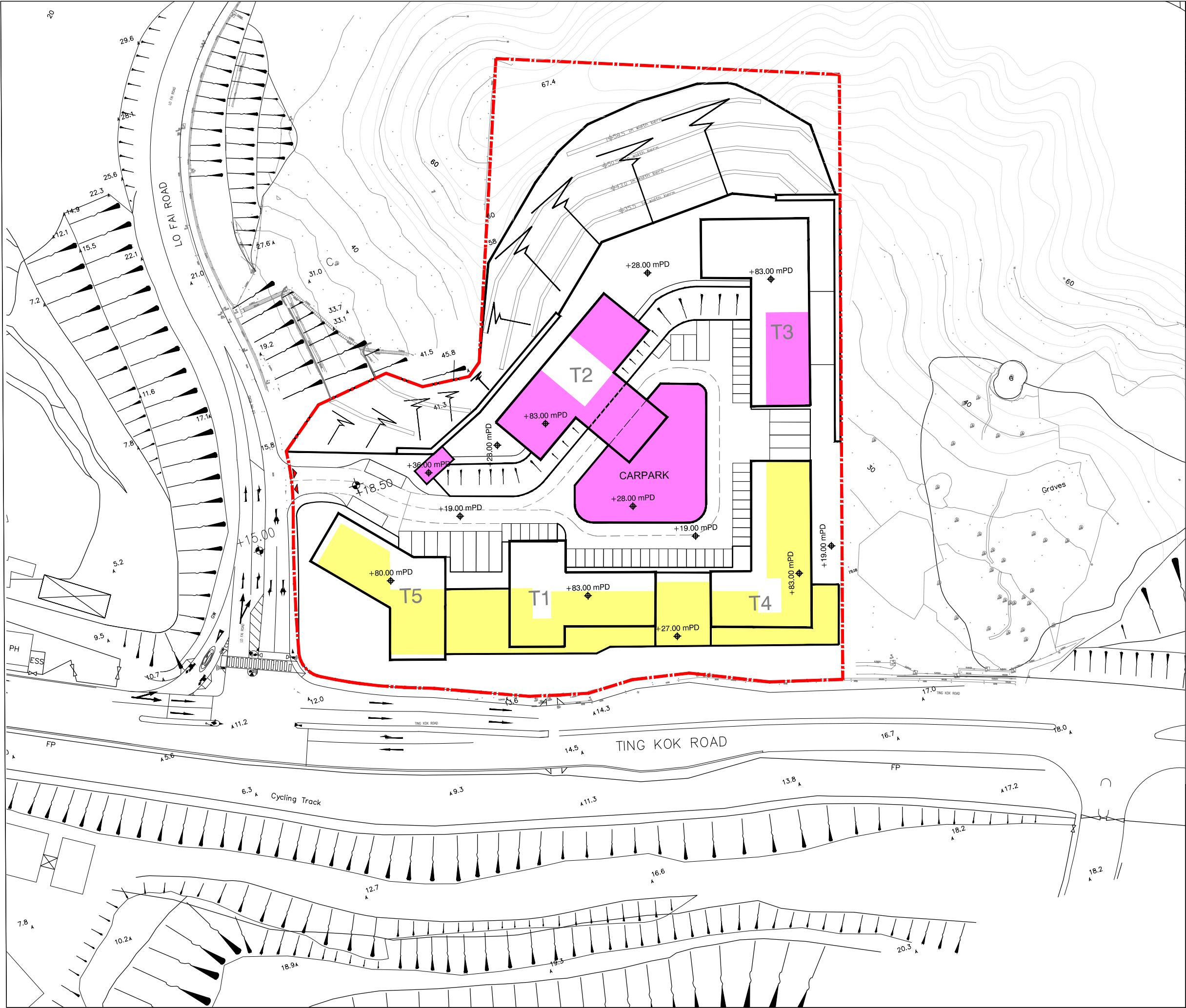
SITE KEY PLAN

DATE:20250212

LEGEND

-  PROPOSED SITE BOUNDARY
-  PROPOSED INGRESS AND EGRESS
-  PROPOSED WHIP TREE PLANTING AREA



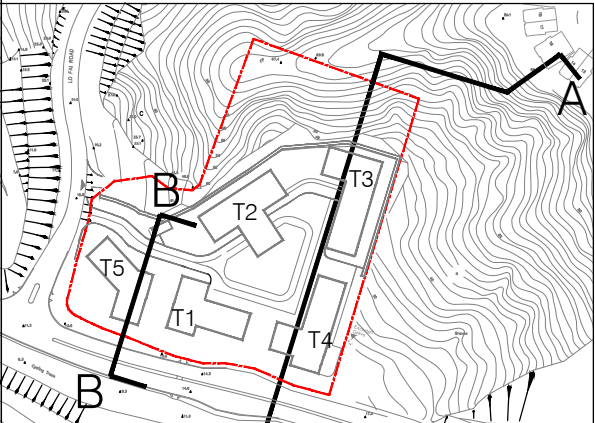


SITE KEY PLAN

DATE:20250210

LEGEND

- PROPOSED SITE BOUNDARY
- PROPOSED INGRESS AND EGRESS
- UPPER PODIUM
- LOWER PODIUM

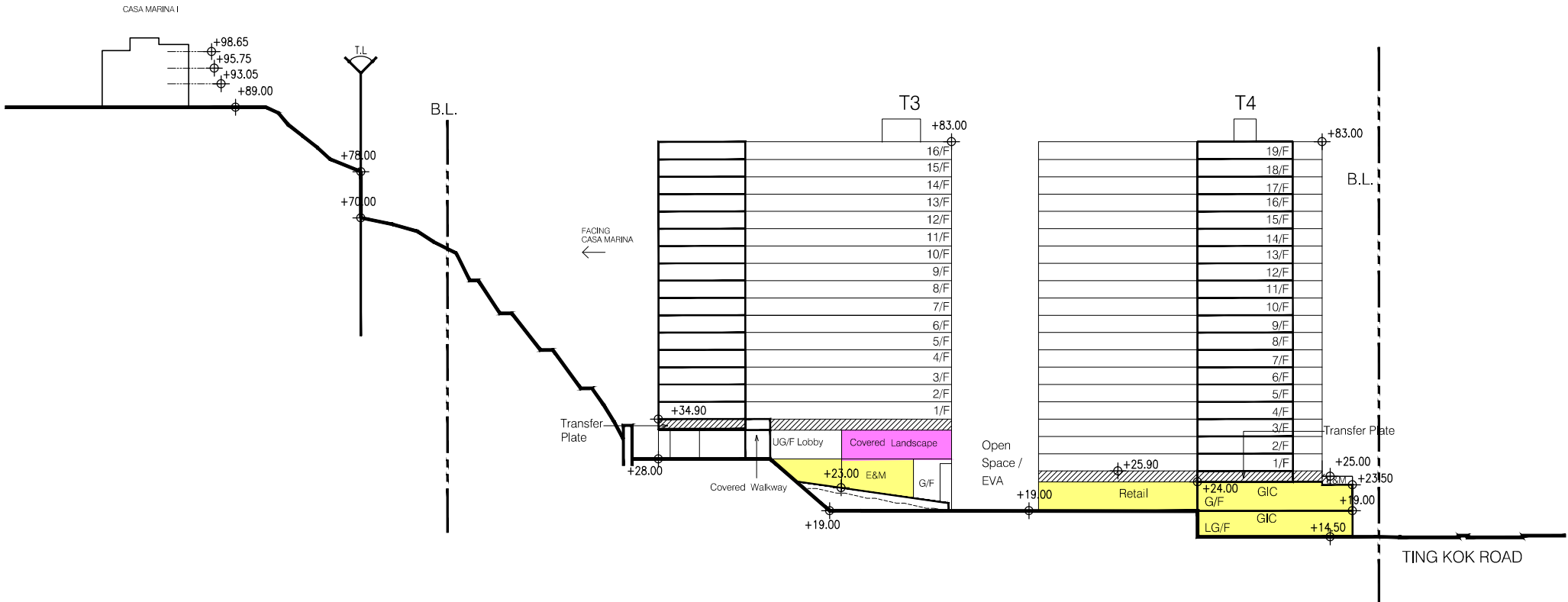


KEY PLAN

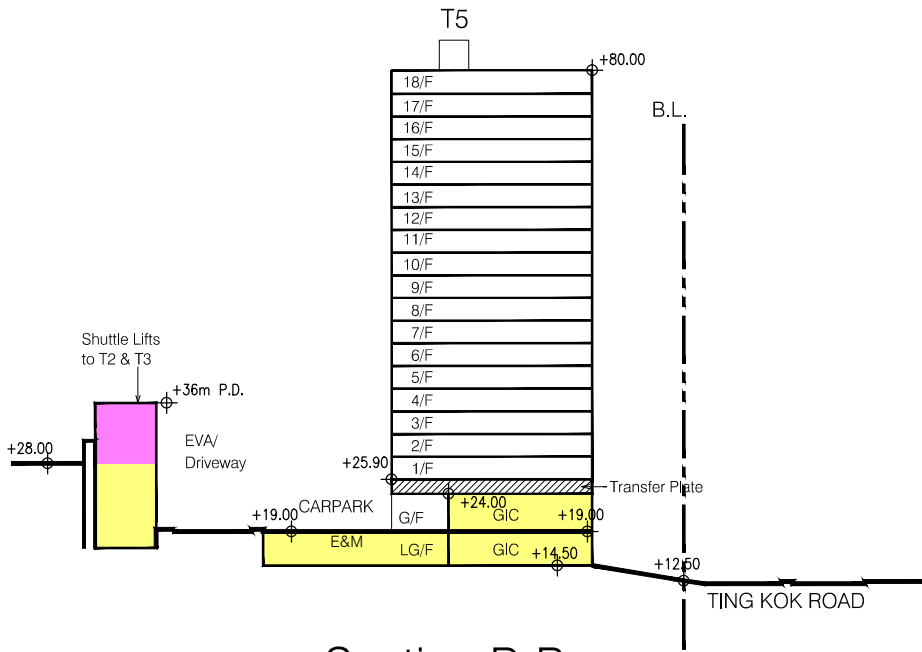
DATE:20240212

LEGEND

- UPPER PODIUM
- LOWER PODIUM



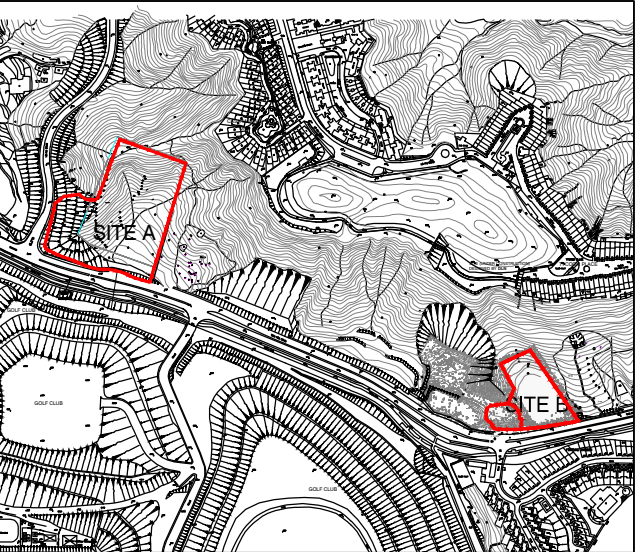
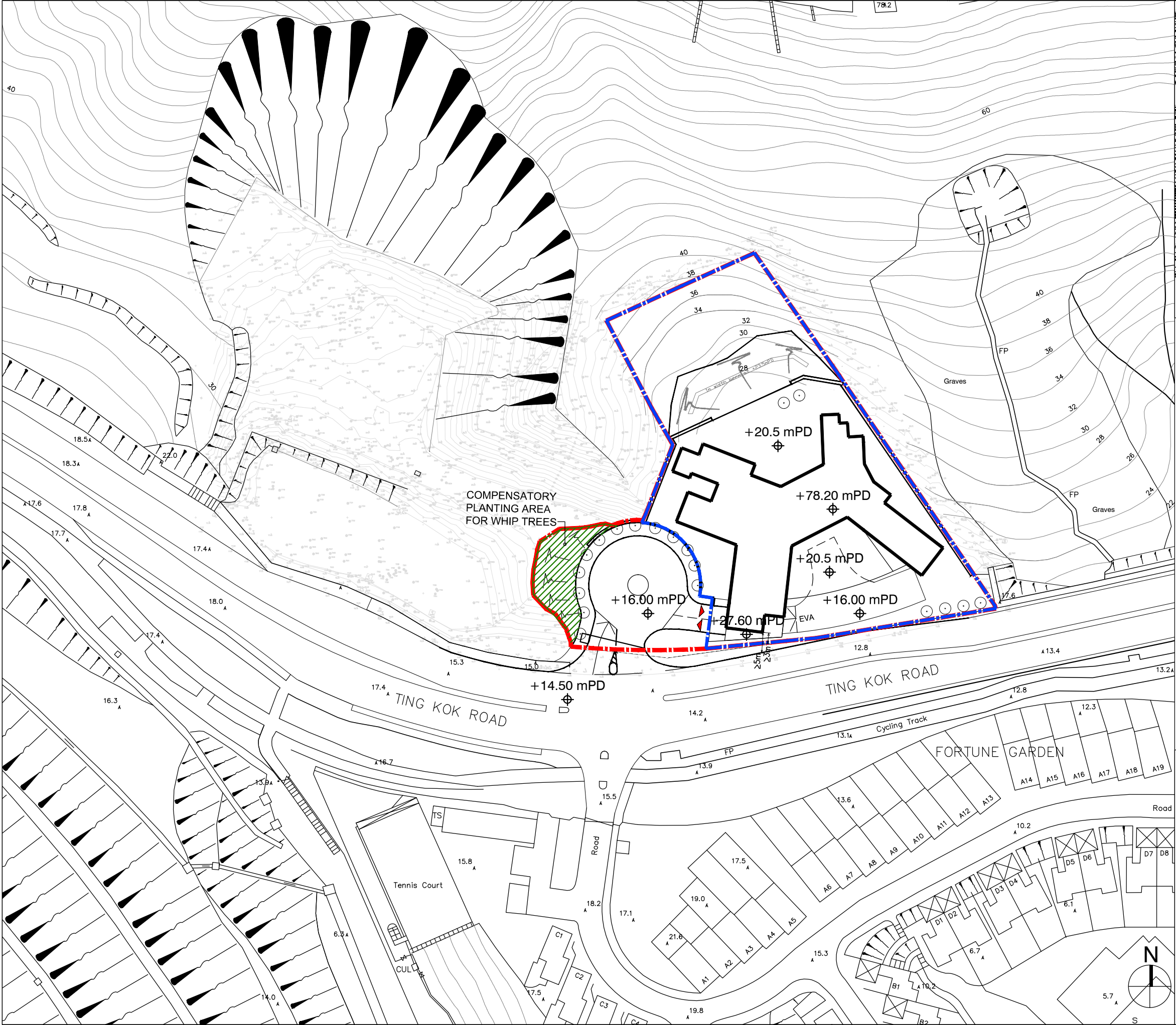
Section A-A



Section B-B

Site A - Section A-A & B-B  
Scale 1:1000 (A3)



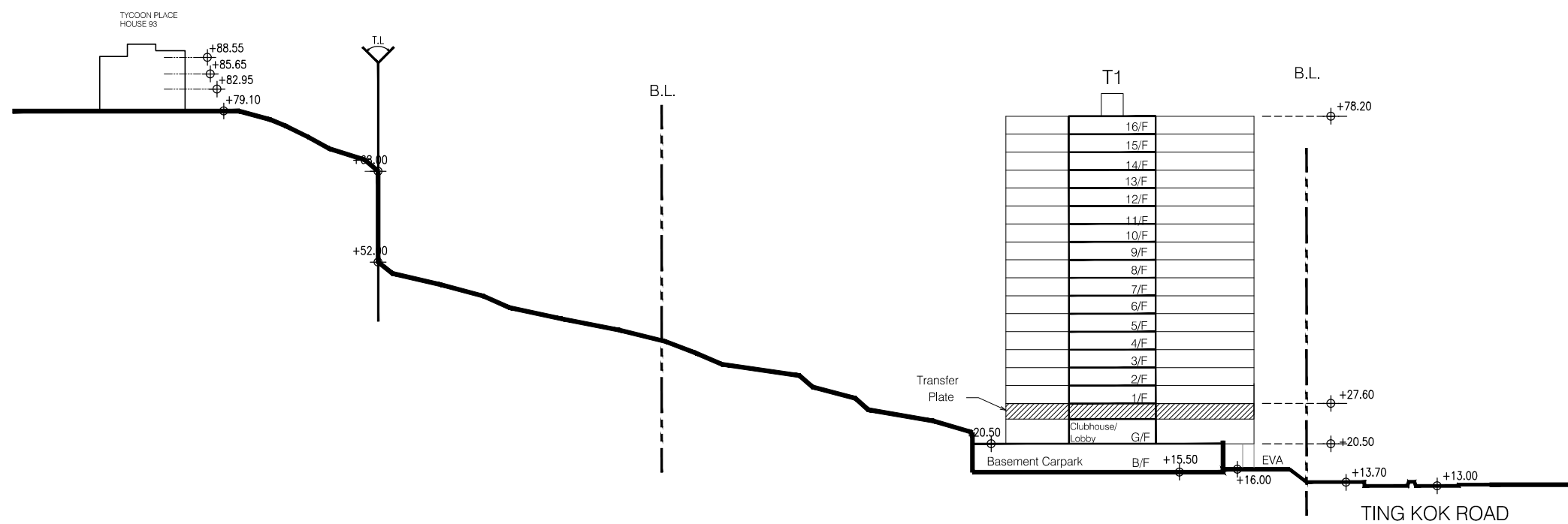


SITE KEY PLAN

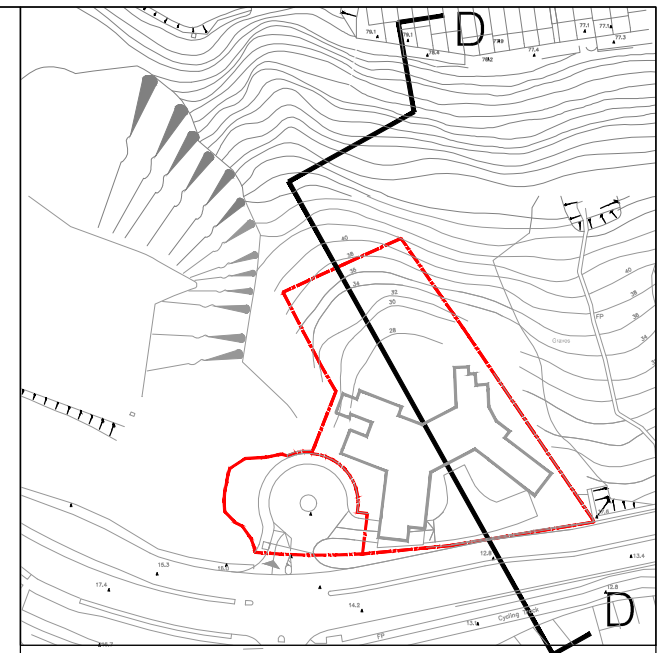
LEGEND:

- PROPOSED REZONING SITE BOUNDARY
- PROPOSED DEVELOPMENT SITE BOUNDARY
- PROPOSED INGRESS AND EGRESS
- PROPOSED WHIP TREE PLANTING AREA

Site B - Master Layout Plan  
Scale 1:1000 (A3)



Section D-D

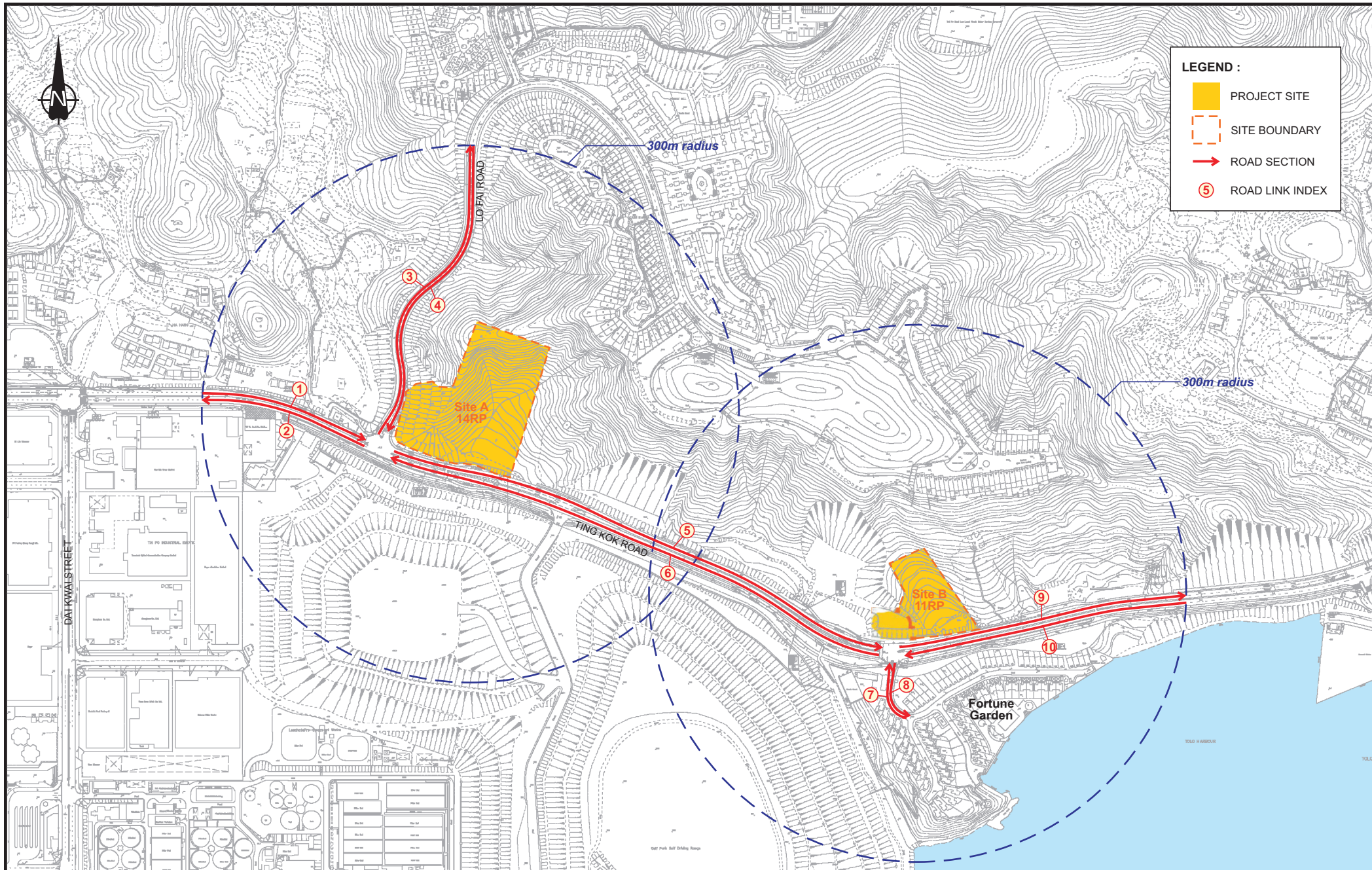


KEY PLAN

DATE:20250210

**Appendix 2      Traffic Forecast for Year 2048 Provided by Project Traffic  
Consultant**





Rev.	Description	Checked	Date
-	-	-	-
-	-	-	-
-	-	-	-

Project Title
TCS FOR THE PROPOSED APPLICATION AT WONG YUE TAN LOT NOS. 11 & 14, TAI PO

Drawing Title											
ENVIRONMENTAL ASSESSMENT STUDY AREA AND ROAD LINKS											
Designed	TSO	Checked	HWL	Scale	NTS	Date	DEC 2024	Drawing No.	1	Rev.	-





Calvin Chiu

**From:** TSUI Gary <gtsui@systra.com>  
**Sent:** Tuesday, December 12, 2023 2:04 PM  
**To:** Cheng, Carmen; Dominic, Chi Leung TSE; Michelle, Un Lam CHEONG; Carmen, Ka Man LEUNG; Karen, Wing Yi YIU; Tracy, Yung WONG; Vincent, Wai Yip WONG; DLN - Wong Yue Tan, Tai Po; Fu Kai Ming; Kitty Yuen; KTA - David Fok; KTA - Kenneth To; 'Faith Lai'; Calvin Chiu; SOOTOO Francis; 'Thomas Chui'; Philip Leung; 'Ben Leung'; David Yeung; Casey Chan; Ringo Lee  
**Cc:** Phoebe, Ka Yan TSE; Vicky, Wai Chi PANG; Lau, CK; Ng, Amy; Kwong, Jason; Leung, Ocean  
**Subject:** RE: Wong Yue Tan - 152nd Project Meeting (face to face)

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Dear Calvin,

Pls see below updated traffic forecast at 2048 for your information.

Estimated Traffic Flows in Design Year 2048

LINK INDEX.	ROAD	AM PEAK TRAFFIC FLOW (VEH/HR)	AM HEAVY VEHICLE (%)	PM PEAK TRAFFIC FLOW (VEH/HR)	PM HEAVY VEHICLE (%)
1	Ting Kok Road	1495	22%	1605	17%
2	Ting Kok Road	1765	21%	1445	19%
3	Lo Fai Road	720	19%	555	17%
4	Lo Fai Road	625	19%	565	17%
5	Ting Kok Road	865	24%	1115	17%
6	Ting Kok Road	1230	22%	945	19%
7	Fortune Garden	20	7%	20	0%
8	Fortune Garden	20	0%	35	14%
9	Ting Kok Road	820	25%	1070	17%
10	Ting Kok Road	1175	23%	915	20%

Note: Traffic flow round to the nearest 5.

Thanks.

Best Regards,

**Gary Tsui**  
Associate Director  
Tel: +852 2864 6452 (Direct Line) • Gen: +852 2529 7037 • Fax: +852 2527 8490



22nd Floor • Genesis • 33-35 Wong Chuk Hang Road • Hong Kong  
[www.mvaasia.com](http://www.mvaasia.com)  
MVA email disclaimer: [www.mvaasia.com/disclaimer](http://www.mvaasia.com/disclaimer)  
Please consider the environment before printing.

**From:** Cheng, Carmen <Carmen.Cheng@colliers.com>  
**Sent:** Monday, December 11, 2023 10:26 AM  
**To:** Dominic, Chi Leung TSE <dominic.tse@nanfung.com>; Michelle, Un Lam CHEONG <michelle.cheong@nanfung.com>; Carmen, Ka Man LEUNG <carmen.leung@nanfung.com>; Karen, Wing Yi YIU <karen.yiu@nanfung.com>; Tracy, Yung WONG <tracy.wong@nanfung.com>; Vincent, Wai Yip WONG <vincent.wong@nanfung.com>; DLN - Wong Yue Tan, Tai Po <n3001-h@dln.com.hk>; Fu Kai Ming <kmf@dln.com.hk>; TSUI Gary <gtsui@systra.com>; Kitty Yuen <kitty.yuen@earthasia.com.hk>; KTA - David Fok <davidfok@ktaplanning.com>; KTA - Kenneth To <kennethto@ktaplanning.com>; 'Faith Lai' <faithlai@ktaplanning.com>; 'Calvin Chiu' <cchiu@ramboll.com>; SOOTOO Francis <fsootoo@systra.com>; 'Thomas Chui' <thomaschui@cmwal.com>; Philip Leung <philip.leung@earthasia.com.hk>; 'Ben Leung' <benl@cmwal.com>; 'David Yeung' <dyeung@ramboll.com>; 'Casey Chan' <caschan@ramboll.com>; Ringo Lee <ringo.lee@earthasia.com.hk>  
**Cc:** Phoebe, Ka Yan TSE <phoebe.tse@nanfung.com>; Vicky, Wai Chi PANG <vicky.pang@nanfung.com>; Lau, CK <Ck.Lau@colliers.com>; Ng, Amy <Amy.Ng@colliers.com>; Kwong, Jason <Jason.Kwong@colliers.com>; Leung, Ocean <Ocean.Leung@colliers.com>  
**Subject:** RE: Wong Yue Tan - 152nd Project Meeting (face to face)

Dear All,

The meeting today will be held face-to-face at NF office. The agenda for discussion is as follows:

**Appendix 3      Predicted Traffic Road Noise Level (L10(1-hr)) at Selected  
NSRs**

Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - GIC (Base Case Scenario (AM Peak))

Site A GIC																	
Floor	*mPD	GIC-01	GIC-02	GIC-03	GIC-04	GIC-05	GIC-06	GIC-07	GIC-08	GIC-09	GIC-10	GIC-11	GIC-12	GIC-13	GIC-14	GIC-15	GIC-16
LG	15.7	79	79	79	79	79	79	79	79	79	79	-	-	-	-	-	-
GF	20.2	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79
Maximum Noise Level, dB(A)		79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79

Noted:  

Noise level exceed stardand of 70 dB(A)

\* The assessment point is located at 1m in front of the most exposed part of an openable window for ventilation at a habitable room (NSRs) and 1.2m above the floor level of individual floors of the residential towers of the proposed development.  
Remark: The predicted noise levels are not the actual noise levels at the external façade after the application of innovative noise mitigation measures (acoustic window (baffle type)/enhanced acoustic balcony (baffle type)). These predicted noise levels are the equivalent noise levels at 1m from the external façade after accounting the reduction in noise levels inside the room offered by the proposed noise mitigation measures.

Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - GIC (Base Case Scenario (PM Peak))

Site A GIC																	
Floor	*mPD	GIC-01	GIC-02	GIC-03	GIC-04	GIC-05	GIC-06	GIC-07	GIC-08	GIC-09	GIC-10	GIC-11	GIC-12	GIC-13	GIC-14	GIC-15	GIC-16
LG	15.7	79	79	79	79	79	79	79	79	79	79	-	-	-	-	-	-
GF	20.2	79	78	78	78	78	78	78	78	79	79	79	79	79	79	79	79
Maximum Noise Level, dB(A)		79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79

Noted: 

Noise level exceed stardand of 70 dB(A)

\* The assessment point is located at 1m in front of the most exposed part of an openable window for ventilation at a habitable room (NSRs) and 1.2m above the floor level of individual floors of the residential towers of the proposed development.  
Remark: The predicted noise levels are not the actual noise levels at the external façade after the application of innovative noise mitigation measures (acoustic window (baffle type)/enhanced acoustic balcony (baffle type)). These predicted noise levels are the equivalent noise levels at 1m from the external façade after accounting the reduction in noise levels inside the room offered by the proposed noise mitigation measures.



Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - GIC (Mitigated Case Scenario)

Site A GIC

Floor	*mPD	GIC-01	GIC-02	GIC-03	GIC-04	GIC-05	GIC-06	GIC-07	GIC-08	GIC-09	GIC-10	GIC-11	GIC-12	GIC-13	GIC-14	GIC-15	GIC-16
LG	15.7	70	70	70	70	70	70	70	70	70	70	-	-	-	-	-	-
GF	20.2	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70
Maximum Noise Level, dB(A)		70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70

Noted: 

Acoustic Window (Baffle Type)/ Enhanced Acoustic Balcony (Baffle Type)

\* The assessment point is located at 1m in front of the most exposed part of an openable window for ventilation at a habitable room (NSRs) and 1.2m above the floor level of individual floors of the residential towers of the proposed development.  
Remark: The predicted noise levels are not the actual noise levels at the external façade after the application of innovative noise mitigation measures (acoustic window (baffle type)/enhanced acoustic balcony (baffle type)). These predicted noise levels are the equivalent noise levels at 1m from the external façade after accounting the reduction in noise levels inside the room offered by the proposed noise mitigation measures.

Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Base Case Scenario (AM Peak))

Site A Tower 1

Floor	*mPD	N1-01	N1-02	N1-03	N1-04	N1-05	N1-06	N1-07	N1-08	N1-09	N1-10	N1-11	N1-12	N1-13	N1-14	N1-15
1/F	27.1	76	76	75	74	73	72	66	66	66	51	45	51	59	61	61
2/F	30.1	77	77	77	76	75	74	70	66	66	51	45	51	59	61	61
3/F	33.1	77	77	76	76	75	74	72	68	67	51	45	51	59	61	61
4/F	36.1	77	76	76	76	75	74	72	69	68	51	45	51	59	61	61
5/F	39.1	76	76	76	75	74	74	72	70	68	51	45	51	59	61	61
6/F	42.1	76	76	76	75	74	74	72	70	69	51	45	51	59	61	61
7/F	45.1	76	76	75	75	74	73	72	70	69	51	45	51	59	61	61
8/F	48.1	76	75	75	75	74	73	71	70	69	51	45	51	59	61	61
9/F	51.1	75	75	75	74	73	73	71	70	69	51	45	51	59	61	61
10/F	54.1	75	75	75	74	73	73	71	70	69	51	44	51	59	61	61
11/F	57.1	75	75	75	74	73	73	71	70	69	51	44	51	59	61	61
12/F	60.1	75	75	74	74	73	72	71	70	69	51	44	51	59	61	61
13/F	63.1	74	74	74	74	72	72	71	69	69	51	44	51	59	61	61
14/F	66.1	74	74	74	73	72	72	71	69	69	51	44	51	59	61	61
15/F	69.1	74	74	74	73	72	72	70	69	69	51	44	51	59	61	61
16/F	72.1	74	74	73	73	72	72	70	69	69	52	44	52	59	61	61
17/F	75.1	74	74	73	73	72	71	70	69	69	52	45	52	59	61	61
18/F	78.1	73	73	73	73	72	71	70	69	68	52	47	53	59	61	61
19/F	81.1	73	73	73	72	71	71	70	69	68	53	50	54	59	61	61
Exceedance		19	19	19	19	19	19	12	0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		77	77	77	76	75	74	72	70	69	53	50	54	59	61	61

Site A Tower 2

Floor	*mPD	N2-01	N2-02	N2-03	N2-04	N2-05	N2-06	N2-07	N2-08	N2-09	N2-10	N2-11	N2-12	N2-13	N2-14	N2-15	N2-16	N2-17	N2-18
1/F	36.1	61	51	51	50	50	69	68	68	68	68	67	67	67	59	61	59	59	58
2/F	39.1	62	53	52	52	52	69	68	68	68	67	67	67	67	59	60	59	59	58
3/F	42.1	62	55	54	53	54	69	68	68	68	67	67	67	67	59	60	59	59	58
4/F	45.1	63	57	56	55	55	69	68	68	68	67	67	67	67	59	60	59	59	57
5/F	48.1	63	58	57	56	56	69	68	68	68	67	67	67	67	59	60	59	59	57
6/F	51.1	63	58	58	57	57	69	69	68	68	67	67	67	67	59	60	59	59	57
7/F	54.1	63	59	58	58	58	69	69	69	68	68	67	67	67	59	60	59	59	57
8/F	57.1	64	59	59	58	58	69	69	69	68	68	67	67	67	59	60	59	59	57
9/F	60.1	64	60	59	59	59	69	69	69	68	68	68	67	67	59	60	59	59	57
10/F	63.1	64	60	59	59	59	69	69	69	68	68	68	68	67	59	60	59	58	57
11/F	66.1	64	60	59	59	59	69	69	69	68	68	68	68	67	59	60	59	58	57
12/F	69.1	64	60	59	59	59	69	69	69	68	68	68	68	68	59	60	59	58	57
13/F	72.1	63	60	59	59	59	69	69	69	68	68	68	68	68	59	60	59	58	57
14/F	75.1	63	60	59	59	59	69	69	69	68	68	68	68	68	59	60	59	58	57
15/F	78.1	63	60	59	59	59	69	69	69	68	68	68	68	68	59	60	59	58	57
16/F	81.1	63	60	59	59	59	69	69	69	68	68	68	68	68	59	60	59	58	57
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		64	60	59	59	59	69	69	69	68	68	68	68	68	59	61	59	59	58

Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Base Case Scenario (AM Peak))

Site A Tower 3

Floor	*mPD	N3-01	N3-02	N3-03	N3-04	N3-05	N3-06	N3-07	N3-08	N3-09	N3-10	N3-11	N3-12	N3-13	N3-14	N3-15	N3-16	N3-17	N3-18	N3-19	N3-20	N3-21
1/F	36.1	50	50	53	54	52	50	47	49	62	43	42	42	63	64	65	66	66	67	65	67	68
2/F	39.1	51	51	53	54	52	50	47	49	62	43	43	43	64	64	65	66	66	67	65	67	68
3/F	42.1	53	52	54	54	53	51	48	50	62	44	43	43	64	64	65	66	66	67	65	68	68
4/F	45.1	54	54	54	55	53	52	49	51	62	44	44	43	65	65	66	66	67	67	65	68	68
5/F	48.1	56	56	55	55	54	52	50	51	62	45	44	44	65	65	66	66	67	67	65	68	68
6/F	51.1	57	57	56	56	54	53	51	52	62	46	45	45	65	65	66	66	67	67	65	68	68
7/F	54.1	58	58	57	57	55	54	52	53	63	47	46	46	65	66	66	66	67	67	65	68	68
8/F	57.1	59	58	58	58	56	55	53	54	63	48	47	47	66	66	66	67	67	67	65	68	68
9/F	60.1	59	59	58	58	57	56	54	55	63	50	49	49	66	66	66	67	67	67	65	68	68
10/F	63.1	60	59	58	58	57	56	55	56	63	53	52	51	66	66	66	67	67	67	65	68	68
11/F	66.1	60	60	59	59	58	57	56	57	64	56	55	55	66	66	67	67	67	67	65	68	68
12/F	69.1	61	60	59	59	58	57	56	57	64	58	57	57	66	66	67	67	67	67	65	68	68
13/F	72.1	61	61	59	59	58	58	57	58	64	59	58	58	66	66	67	67	67	67	65	68	68
14/F	75.1	61	61	60	60	59	58	57	58	65	60	59	59	66	66	67	67	67	67	65	68	68
15/F	78.1	61	61	60	60	59	59	58	59	65	61	60	60	66	66	67	67	67	67	65	68	68
16/F	81.1	62	61	60	60	59	59	59	60	65	62	61	61	66	66	67	67	67	67	65	68	68
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0		0		0
Maximum Noise Level, dB(A)		62	61	60	60	59	59	59	60	65	62	61	61	66	66	67	67	67	67	65	68	68

Site A Tower 4

Floor	*mPD	N4-01	N4-02	N4-03	N4-04	N4-05	N4-06	N4-07	N4-08	N4-09	N4-10	N4-11	N4-12	N4-13	N4-14	N4-15	N4-16
1/F	27.1	77	77	60	59	59	59	59	58	57	69	69	70	70	70	71	73
2/F	30.1	77	77	60	60	59	59	59	58	58	69	70	70	71	71	72	75
3/F	33.1	77	77	60	60	59	60	60	59	58	69	70	71	71	72	73	75
4/F	36.1	77	77	60	60	59	61	61	60	59	70	70	71	71	72	73	75
5/F	39.1	77	77	60	60	59	62	62	61	61	70	70	71	71	72	73	74
6/F	42.1	76	76	60	60	59	62	63	62	62	70	70	71	71	72	73	74
7/F	45.1	76	76	60	60	59	62	63	63	62	70	70	71	71	72	72	74
8/F	48.1	76	76	60	59	59	62	63	63	63	70	70	71	71	72	72	74
9/F	51.1	76	76	60	59	59	62	63	63	63	70	70	71	71	72	72	73
10/F	54.1	75	75	60	59	59	62	63	63	63	70	70	71	71	71	72	73
11/F	57.1	75	75	60	59	59	62	63	63	63	70	70	71	71	71	72	73
12/F	60.1	75	75	60	59	59	62	63	63	63	70	70	70	71	71	71	73
13/F	63.1	75	75	60	59	59	62	63	63	63	69	70	70	70	71	71	72
14/F	66.1	74	74	59	59	59	62	63	63	63	69	70	70	70	71	71	72
15/F	69.1	74	74	59	59	59	62	63	63	63	69	70	70	70	71	71	72
16/F	72.1	74	74	59	59	60	62	63	63	63	69	70	70	70	70	71	72
17/F	75.1	74	74	59	59	60	62	63	63	63	69	69	70	70	70	71	72
18/F	78.1	74	74	59	59	60	62	63	63	63	69	69	70	70	70	70	71
19/F	81.1	74	74	60	60	60	62	63	63	63	69	69	70	70	70	70	71
Exceedance		19	19	0	0	0	0	0	0	0	0	0	11		14	17	19
Maximum Noise Level, dB(A)		77	77	60	60	60	62	63	63	63	70	70	71	71	72	73	75

Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Base Case Scenario (AM Peak))

Site A Tower 5

Floor	*mPD	N5-01	N5-02	N5-03	N5-04	N5-05	N5-06	N5-07	N5-08	N5-09	N5-10	N5-11	N5-12	N5-13
1/F	27.1	77	76	76	77	77	71	69	68	67	58	60	66	75
2/F	30.1	77	76	76	77	77	71	69	68	67	61	64	71	75
3/F	33.1	76	76	76	76	77	71	69	68	67	65	68	72	75
4/F	36.1	76	75	76	76	77	70	69	67	67	67	70	72	75
5/F	39.1	76	75	76	76	77	70	69	67	67	68	70	72	74
6/F	42.1	76	75	75	76	76	70	68	67	67	69	70	72	74
7/F	45.1	75	75	75	76	76	70	68	67	67	69	70	72	74
8/F	48.1	75	75	75	75	76	70	68	67	67	69	70	72	74
9/F	51.1	75	74	75	75	76	69	68	67	67	69	70	71	73
10/F	54.1	75	74	75	75	75	69	68	67	66	69	70	71	73
11/F	57.1	74	74	74	75	75	69	68	67	66	69	70	71	73
12/F	60.1	74	74	74	75	75	69	67	67	66	68	69	71	73
13/F	63.1	74	74	74	75	75	69	67	66	66	68	69	71	72
14/F	66.1	74	73	74	74	75	69	67	66	66	68	69	70	72
15/F	69.1	74	73	74	74	75	69	67	66	66	68	69	70	72
16/F	72.1	74	73	74	74	74	68	67	66	66	68	69	70	72
17/F	75.1	73	73	73	74	74	68	67	66	66	68	69	70	72
18/F	78.1	73	73	73	74	74	68	67	66	66	68	69	70	72
Exceedance		18	18	18	18	18	3	0	0	0	0	0	12	18
Maximum Noise Level, dB(A)		77	76	76	77	77	71	69	68	67	69	70	72	75



Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Base Case Scenario (AM Peak))

Site B Tower 1

Floor	*mPD	N6-01	N6-02	N6-03	N6-04	N6-05	N6-06	N6-07	N6-08	N6-09	N6-10	N6-11	N6-12	N6-13	N6-14	N6-15
1/F	28.8	71	76	76	75	74	73	73	73	73	73	74	75	76	75	74
2/F	32.0	71	76	76	75	74	73	73	73	73	73	73	74	75	75	74
3/F	35.1	71	76	76	75	74	73	73	73	73	73	73	74	75	75	74
4/F	38.3	71	76	75	74	73	72	72	73	73	73	73	74	75	74	74
5/F	41.4	71	75	75	74	73	72	72	73	73	73	73	74	74	74	74
6/F	44.6	70	75	75	74	73	72	72	72	72	72	73	73	74	74	73
7/F	47.7	70	75	75	74	73	72	72	72	72	72	72	73	74	74	73
8/F	50.9	70	74	74	73	73	72	72	72	72	72	72	73	74	74	73
9/F	54.0	70	74	74	73	73	72	72	72	72	72	72	73	73	73	73
10/F	57.2	69	74	74	73	72	71	71	72	72	72	72	72	73	73	73
11/F	60.3	69	74	74	73	72	71	71	71	72	71	72	72	73	73	73
12/F	63.5	69	74	73	73	72	71	71	71	71	71	71	72	73	73	72
13/F	66.6	69	73	73	72	72	71	71	71	71	71	71	72	72	72	72
14/F	69.8	69	73	73	72	72	71	71	71	71	71	71	72	72	72	72
15/F	72.9	69	73	73	72	71	71	71	71	71	71	71	71	72	72	72
16/F	76.1	68	73	73	72	71	70	70	71	71	71	71	71	72	72	72
Exceedance		16			16	16	15	15	16	16	16	16	16	16	16	16
Maximum Noise Level, dB(A)		71	76	76	75	74	73	73	73	73	73	74	75	76	75	74

Floor	*mPD	N6-16	N6-17	N6-18	N6-19	N6-20	N6-21	N6-22	N6-23	N6-24	N6-25	N6-26	N6-27	N6-28	N6-29
1/F	28.8	73	73	73	73	73	71	70	53	43	44	44	44	52	58
2/F	32.0	73	73	72	73	73	71	70	53	43	43	44	43	52	58
3/F	35.1	73	73	72	73	73	71	70	53	43	43	44	43	52	58
4/F	38.3	73	72	72	73	73	71	70	54	43	43	43	43	52	58
5/F	41.4	73	72	72	73	73	71	70	54	43	43	43	44	52	58
6/F	44.6	73	72	72	73	73	71	70	58	43	43	43	45	54	59
7/F	47.7	73	72	72	72	73	71	70	59	43	43	43	46	57	61
8/F	50.9	72	72	72	72	72	71	70	59	43	43	43	46	58	61
9/F	54.0	72	72	72	72	72	71	70	59	43	43	43	46	58	62
10/F	57.2	72	72	72	72	72	71	70	59	43	43	43	46	58	62
11/F	60.3	72	72	71	72	72	71	69	58	42	43	43	46	58	62
12/F	63.5	72	71	71	72	72	70	69	58	42	43	43	46	58	62
13/F	66.6	72	71	71	72	72	70	69	58	42	42	43	46	58	61
14/F	69.8	71	71	71	72	72	70	69	58	43	43	43	46	58	61
15/F	72.9	71	71	71	71	72	70	69	58	45	45	45	47	58	61
16/F	76.1	71	71	71	71	72	70	69	58	48	48	47	49	58	61
Exceedance		16	16	16	16	16		0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		73	73	73	73	73	71	70	59	48	48	47	49	58	62

Total no. of Flats:	1750
Total no. of Exceedance:	634
Compliance Level:	64%
Max. Noise Level:	77

Noted:

Noise level exceed stardand of 70 dB(A)

\* The assessment point is located at 1m in front of the most exposed part of an openable window for ventilation at a habitable room (NSRs) and 1.2m above the floor level of individual floors of the residential towers of the proposed development.  
Remark: The predicted noise levels are not the actual noise levels at the external façade after the application of innovative noise mitigation measures (acoustic window (baffle type)/enhanced acoustic balcony (baffle type)). These predicted noise levels are the equivalent noise levels at 1m from the external façade after accounting the reduction in noise levels inside the room offered by the proposed noise mitigation measures.

Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Base Case Scenario (PM Peak))

Site A Tower 1

Floor	*mPD	N1-01	N1-02	N1-03	N1-04	N1-05	N1-06	N1-07	N1-08	N1-09	N1-10	N1-11	N1-12	N1-13	N1-14	N1-15
1/F	27.1	76	75	74	73	73	71	65	64	65	50	45	50	57	60	60
2/F	30.1	76	76	76	75	74	74	70	65	65	50	45	50	57	60	60
3/F	33.1	76	76	76	75	74	74	71	67	65	50	45	50	57	60	60
4/F	36.1	76	76	76	75	74	73	72	68	66	50	44	50	57	59	60
5/F	39.1	76	76	75	75	74	73	71	69	67	50	44	50	57	59	60
6/F	42.1	75	75	75	75	74	73	71	69	68	50	44	50	57	59	60
7/F	45.1	75	75	75	74	73	73	71	69	68	50	44	50	57	59	60
8/F	48.1	75	75	75	74	73	73	71	69	68	50	44	50	57	59	60
9/F	51.1	75	75	74	74	73	72	71	69	68	50	44	50	57	59	60
10/F	54.1	75	74	74	74	73	72	71	69	68	50	44	50	57	59	60
11/F	57.1	74	74	74	73	72	72	70	69	68	50	44	50	57	59	60
12/F	60.1	74	74	74	73	72	72	70	69	68	50	44	50	57	59	60
13/F	63.1	74	74	74	73	72	72	70	69	68	50	43	50	57	59	60
14/F	66.1	74	74	73	73	72	71	70	69	68	50	43	50	57	59	60
15/F	69.1	73	73	73	73	71	71	70	69	68	50	43	50	57	59	60
16/F	72.1	73	73	73	72	71	71	70	68	68	50	44	51	57	59	60
17/F	75.1	73	73	73	72	71	71	69	68	68	51	44	51	57	59	60
18/F	78.1	73	73	73	72	71	71	69	68	68	51	46	51	58	59	60
19/F	81.1	73	73	72	72	71	71	69	68	68	52	49	52	58	60	60
Exceedance		19	19	19	19	19	19	8	0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		76	76	76	75	74	74	72	69	68	52	49	52	58	60	60

Site A Tower 2

Floor	*mPD	N2-01	N2-02	N2-03	N2-04	N2-05	N2-06	N2-07	N2-08	N2-09	N2-10	N2-11	N2-12	N2-13	N2-14	N2-15	N2-16	N2-17	N2-18
1/F	36.1	60	51	50	49	49	68	67	67	67	67	66	66	66	59	60	59	58	57
2/F	39.1	61	52	51	51	51	68	67	67	67	67	66	66	66	58	60	59	58	57
3/F	42.1	61	54	53	52	53	68	67	67	67	67	66	66	66	58	60	59	58	57
4/F	45.1	62	56	55	54	54	68	67	67	67	67	66	66	66	58	60	59	58	57
5/F	48.1	62	57	56	55	55	68	67	67	67	67	66	66	66	58	60	59	58	57
6/F	51.1	62	57	57	56	56	68	68	67	67	67	66	66	66	58	60	58	58	57
7/F	54.1	63	58	57	57	57	68	68	68	67	67	66	66	66	58	60	58	58	57
8/F	57.1	63	59	58	57	57	68	68	68	67	67	66	66	66	58	60	58	58	57
9/F	60.1	63	59	58	58	58	68	68	68	67	67	67	66	66	58	60	58	58	57
10/F	63.1	63	59	58	58	58	68	68	68	67	67	67	67	66	58	59	58	58	57
11/F	66.1	63	59	59	58	58	68	68	68	67	67	67	67	66	58	59	58	58	56
12/F	69.1	63	59	59	58	58	68	68	68	67	67	67	67	67	58	59	58	58	56
13/F	72.1	63	59	59	58	58	68	68	68	67	67	67	67	67	58	59	58	58	56
14/F	75.1	63	59	59	58	58	68	68	68	67	67	67	67	67	58	59	58	58	56
15/F	78.1	63	59	59	58	58	68	68	68	67	67	67	67	67	58	59	58	58	56
16/F	81.1	63	59	59	59	58	68	68	68	67	67	67	67	67	58	59	58	58	57
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		63	59	59	59	58	68	68	68	67	67	67	67	67	59	60	59	58	57

Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Base Case Scenario (PM Peak))

Site A Tower 3

Floor	*mPD	N3-01	N3-02	N3-03	N3-04	N3-05	N3-06	N3-07	N3-08	N3-09	N3-10	N3-11	N3-12	N3-13	N3-14	N3-15	N3-16	N3-17	N3-18	N3-19	N3-20	N3-21
1/F	36.1	49	49	51	52	51	49	46	48	61	42	41	41	63	63	65	65	66	66	64	67	67
2/F	39.1	50	50	52	53	51	49	46	48	61	42	42	42	63	64	65	65	66	66	64	67	67
3/F	42.1	52	51	52	53	51	50	47	49	61	43	42	42	63	64	65	65	66	66	64	67	68
4/F	45.1	53	53	53	54	52	50	48	50	61	43	43	42	64	64	65	65	66	66	64	67	68
5/F	48.1	55	54	54	54	53	51	49	50	61	44	43	43	64	65	65	66	66	66	65	67	68
6/F	51.1	56	56	55	55	53	52	50	51	61	45	44	44	65	65	65	66	66	66	65	67	68
7/F	54.1	57	56	56	56	54	53	51	52	62	46	45	45	65	65	66	66	66	67	65	67	68
8/F	57.1	58	57	57	57	55	54	52	53	62	47	46	46	65	65	66	66	66	67	65	67	68
9/F	60.1	58	58	57	57	56	55	53	54	62	49	48	48	65	65	66	66	66	67	65	67	68
10/F	63.1	59	58	57	57	56	55	54	55	62	51	50	50	65	65	66	66	67	67	65	67	68
11/F	66.1	59	59	58	58	56	56	55	55	63	55	54	53	65	66	66	66	67	67	65	67	68
12/F	69.1	60	60	58	58	57	56	55	56	63	56	56	55	65	66	66	66	67	67	65	67	68
13/F	72.1	60	60	59	59	57	57	56	57	63	58	57	57	66	66	66	66	67	67	65	67	68
14/F	75.1	60	60	59	59	58	57	56	57	64	59	58	58	66	66	66	66	67	67	65	67	68
15/F	78.1	61	60	59	59	58	58	57	58	64	60	59	59	66	66	66	66	67	67	65	67	68
16/F	81.1	61	61	60	59	59	58	58	59	64	60	60	60	66	66	66	66	67	67	65	67	67
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0		0		0
Maximum Noise Level, dB(A)		61	61	60	59	59	58	58	59	64	60	60	60	66	66	66	66	67	67	65	67	68

Site A Tower 4

Floor	*mPD	N4-01	N4-02	N4-03	N4-04	N4-05	N4-06	N4-07	N4-08	N4-09	N4-10	N4-11	N4-12	N4-13	N4-14	N4-15	N4-16
1/F	27.1	76	76	58	58	58	58	57	57	56	69	69	69	69	70	70	72
2/F	30.1	77	77	59	58	58	58	58	57	57	69	69	70	70	71	72	74
3/F	33.1	77	77	59	58	58	59	59	58	57	69	69	70	70	71	72	74
4/F	36.1	76	76	59	58	58	60	60	59	58	69	70	70	71	72	72	74
5/F	39.1	76	76	59	58	58	61	61	60	59	69	70	70	71	72	72	74
6/F	42.1	76	76	59	58	58	61	62	61	60	69	70	70	71	72	72	74
7/F	45.1	76	76	59	58	58	62	63	62	61	69	70	70	71	71	72	73
8/F	48.1	75	75	58	58	58	62	63	62	62	69	70	70	71	71	72	73
9/F	51.1	75	75	58	58	58	62	63	63	62	69	70	70	71	71	72	73
10/F	54.1	75	75	58	58	58	61	63	63	62	69	70	70	70	71	71	73
11/F	57.1	75	75	58	58	58	61	63	63	63	69	69	70	70	71	71	72
12/F	60.1	74	74	58	58	58	61	62	63	62	69	69	70	70	71	71	72
13/F	63.1	74	74	58	58	58	61	62	63	62	69	69	70	70	70	71	72
14/F	66.1	74	74	58	58	58	61	62	63	62	69	69	70	70	70	71	72
15/F	69.1	74	74	58	58	58	61	62	63	63	69	69	69	70	70	70	71
16/F	72.1	73	73	58	58	58	61	62	63	63	69	69	69	70	70	70	71
17/F	75.1	73	73	58	58	58	61	62	63	63	69	69	69	69	70	70	71
18/F	78.1	73	73	58	58	58	61	62	63	63	68	69	69	69	70	70	71
19/F	81.1	73	73	58	58	59	61	62	63	63	68	69	69	69	69	70	71
Exceedance		19	19	0	0	0	0	0	0	0	0	0	6		11	13	19
Maximum Noise Level, dB(A)		77	77	59	58	59	62	63	63	63	69	70	70	71	72	72	74

Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Base Case Scenario (PM Peak))

Site A Tower 5

Floor	*mPD	N5-01	N5-02	N5-03	N5-04	N5-05	N5-06	N5-07	N5-08	N5-09	N5-10	N5-11	N5-12	N5-13
1/F	27.1	76	75	76	76	77	70	68	67	66	57	59	65	75
2/F	30.1	76	75	75	76	76	70	68	66	66	60	63	70	75
3/F	33.1	76	75	75	76	76	69	68	66	66	64	67	72	74
4/F	36.1	75	75	75	75	76	69	67	66	66	66	69	72	74
5/F	39.1	75	74	75	75	76	69	67	66	66	68	70	72	74
6/F	42.1	75	74	75	75	76	69	67	66	66	68	70	71	74
7/F	45.1	75	74	74	75	75	69	67	66	66	68	70	71	73
8/F	48.1	74	74	74	75	75	68	67	66	65	68	69	71	73
9/F	51.1	74	74	74	74	75	68	67	66	65	68	69	71	73
10/F	54.1	74	73	74	74	75	68	66	66	65	68	69	71	73
11/F	57.1	74	73	74	74	75	68	66	65	65	68	69	70	72
12/F	60.1	74	73	74	74	74	68	66	65	65	68	69	70	72
13/F	63.1	73	73	73	74	74	68	66	65	65	68	69	70	72
14/F	66.1	73	73	73	74	74	67	66	65	65	68	68	70	72
15/F	69.1	73	73	73	73	74	67	66	65	65	67	68	70	72
16/F	72.1	73	72	73	73	74	67	66	65	65	67	68	69	71
17/F	75.1	73	72	73	73	74	67	66	65	65	67	68	69	71
18/F	78.1	73	72	73	73	73	67	66	65	64	67	68	69	71
Exceedance		18	18	18	18	18	0	0	0	0	0	0	8	18
Maximum Noise Level, dB(A)		76	75	76	76	77	70	68	67	66	68	70	72	75



Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Base Case Scenario (PM Peak))

Site B Tower 1

Floor	*mPD	N6-01	N6-02	N6-03	N6-04	N6-05	N6-06	N6-07	N6-08	N6-09	N6-10	N6-11	N6-12	N6-13	N6-14	N6-15
1/F	28.8	71	76	76	75	73	72	72	73	73	73	73	74	75	75	74
2/F	32.0	71	76	75	74	73	72	72	72	73	73	73	74	75	74	74
3/F	35.1	70	75	75	74	73	72	72	72	72	72	73	74	74	74	73
4/F	38.3	70	75	75	74	73	72	72	72	72	72	72	73	74	74	73
5/F	41.4	70	75	75	74	73	72	72	72	72	72	72	73	74	74	73
6/F	44.6	70	74	74	73	73	71	71	72	72	72	72	73	74	73	73
7/F	47.7	70	74	74	73	72	71	71	72	72	72	72	73	73	73	73
8/F	50.9	69	74	74	73	72	71	71	71	72	71	72	72	73	73	72
9/F	54.0	69	74	73	73	72	71	71	71	71	71	71	72	73	73	72
10/F	57.2	69	73	73	72	72	71	71	71	71	71	71	72	72	72	72
11/F	60.3	69	73	73	72	71	71	71	71	71	71	71	72	72	72	72
12/F	63.5	68	73	73	72	71	70	70	71	71	71	71	71	72	72	72
13/F	66.6	68	73	73	72	71	70	70	70	71	70	71	71	72	72	71
14/F	69.8	68	72	72	72	71	70	70	70	70	70	70	71	72	72	71
15/F	72.9	68	72	72	71	71	70	70	70	70	70	70	71	71	71	71
16/F	76.1	68	72	72	71	71	70	70	70	70	70	70	71	71	71	71
Exceedance		16			16	16	11	11	12	13	12	13	16	16	16	16
Maximum Noise Level, dB(A)		71	76	76	75	73	72	72	73	73	73	73	74	75	75	74

Floor	*mPD	N6-16	N6-17	N6-18	N6-19	N6-20	N6-21	N6-22	N6-23	N6-24	N6-25	N6-26	N6-27	N6-28	N6-29
1/F	28.8	73	72	72	72	72	71	69	53	43	43	43	43	51	57
2/F	32.0	73	72	72	72	72	71	69	53	43	43	43	43	51	57
3/F	35.1	73	72	72	72	72	71	69	53	42	43	43	43	51	57
4/F	38.3	72	72	72	72	72	70	69	53	42	43	43	43	51	57
5/F	41.4	72	72	72	72	72	70	69	54	42	43	43	43	52	57
6/F	44.6	72	72	71	72	72	70	69	57	42	43	43	44	54	58
7/F	47.7	72	71	71	72	72	70	69	58	42	42	43	46	57	60
8/F	50.9	72	71	71	72	72	70	69	58	42	42	42	46	58	61
9/F	54.0	72	71	71	72	72	70	69	58	42	42	42	46	58	61
10/F	57.2	71	71	71	71	72	70	69	58	42	42	42	46	58	61
11/F	60.3	71	71	71	71	71	70	69	58	42	42	42	46	57	61
12/F	63.5	71	71	71	71	71	70	69	58	42	42	42	46	57	61
13/F	66.6	71	71	70	71	71	70	69	58	42	42	42	45	57	61
14/F	69.8	71	70	70	71	71	70	69	58	42	42	43	46	57	61
15/F	72.9	71	70	70	71	71	69	68	58	44	44	44	47	57	61
16/F	76.1	70	70	70	71	71	69	68	58	47	47	47	48	57	61
Exceedance		15	13	12	16	16		0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		73	72	72	72	72	71	69	58	47	47	47	48	58	61

Total no. of Flats:	1750
Total no. of Exceedance:	581
Compliance Level:	67%
Max. Noise Level:	77

Noted:

Noise level exceed stardand of 70 dB(A)

\* The assessment point is located at 1m in front of the most exposed part of an openable window for ventilation at a habitable room (NSRs) and 1.2m above the floor level of individual floors of the residential towers of the proposed development.  
Remark: The predicted noise levels are not the actual noise levels at the external façade after the application of innovative noise mitigation measures (acoustic window (baffle type)/enhanced acoustic balcony (baffle type)). These predicted noise levels are the equivalent noise levels at 1m from the external façade after accounting the reduction in noise levels inside the room offered by the proposed noise mitigation measures.

Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Mitigated Case Scenario)

Site A Tower 1

Acoustic Window Type		B	B	B	A	B	B	B								
Floor	*mPD	N1-01	N1-02	N1-03	N1-04	N1-05	N1-06	N1-07	N1-08	N1-09	N1-10	N1-11	N1-12	N1-13	N1-14	N1-15
1/F	27.1	69	70	70	70	70	70	66	66	66	51	45	51	59	61	61
2/F	30.1	70	70	70	70	70	70	70	66	66	51	45	51	59	61	61
3/F	33.1	70	70	70	70	70	70	70	68	67	51	45	51	59	61	61
4/F	36.1	69	70	70	70	70	70	70	69	68	51	45	51	59	61	61
5/F	39.1	69	70	70	70	70	70	70	70	68	51	45	51	59	61	61
6/F	42.1	69	70	70	70	70	70	70	70	69	51	45	51	59	61	61
7/F	45.1	69	70	70	70	70	70	70	70	69	51	45	51	59	61	61
8/F	48.1	68	70	70	70	70	70	70	70	69	51	45	51	59	61	61
9/F	51.1	68	70	70	70	70	70	70	70	69	51	45	51	59	61	61
10/F	54.1	68	70	70	70	70	70	70	70	69	51	44	51	59	61	61
11/F	57.1	68	70	70	70	70	70	70	70	69	51	44	51	59	61	61
12/F	60.1	68	70	70	70	70	70	70	70	69	51	44	51	59	61	61
13/F	63.1	67	70	70	70	70	70	70	69	69	51	44	51	59	61	61
14/F	66.1	67	70	70	70	70	70	70	69	69	51	44	51	59	61	61
15/F	69.1	67	70	70	70	70	70	70	69	69	51	44	51	59	61	61
16/F	72.1	67	70	70	70	70	70	70	69	69	52	44	52	59	61	61
17/F	75.1	67	70	70	70	70	70	70	69	69	52	45	52	59	61	61
18/F	78.1	66	70	70	70	70	70	70	69	68	52	47	53	59	61	61
19/F	81.1	66	70	70	70	70	70	70	69	68	53	50	54	59	61	61
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		70	70	70	70	70	70	70	70	69	53	50	54	59	61	61

Site A Tower 2

Acoustic Window Type																			
Floor	*mPD	N2-01	N2-02	N2-03	N2-04	N2-05	N2-06	N2-07	N2-08	N2-09	N2-10	N2-11	N2-12	N2-13	N2-14	N2-15	N2-16	N2-17	N2-18
1/F	36.1	61	51	51	50	50	69	68	68	68	68	67	67	67	59	61	59	59	58
2/F	39.1	62	53	52	52	52	69	68	68	68	67	67	67	67	59	60	59	59	58
3/F	42.1	62	55	54	53	54	69	68	68	68	67	67	67	67	59	60	59	59	58
4/F	45.1	63	57	56	55	55	69	68	68	68	67	67	67	67	59	60	59	59	57
5/F	48.1	63	58	57	56	56	69	68	68	68	67	67	67	67	59	60	59	59	57
6/F	51.1	63	58	58	57	57	69	69	68	68	67	67	67	67	59	60	59	59	57
7/F	54.1	63	59	58	58	58	69	69	69	68	68	67	67	67	59	60	59	59	57
8/F	57.1	64	59	59	58	58	69	69	69	68	68	67	67	67	59	60	59	59	57
9/F	60.1	64	60	59	59	59	69	69	69	68	68	68	67	67	59	60	59	59	57
10/F	63.1	64	60	59	59	59	69	69	69	68	68	68	68	67	59	60	59	58	57
11/F	66.1	64	60	59	59	59	69	69	69	68	68	68	68	67	59	60	59	58	57
12/F	69.1	64	60	59	59	59	69	69	69	68	68	68	68	68	59	60	59	58	57
13/F	72.1	63	60	59	59	59	69	69	69	68	68	68	68	68	59	60	59	58	57
14/F	75.1	63	60	59	59	59	69	69	69	68	68	68	68	68	59	60	59	58	57
15/F	78.1	63	60	59	59	59	69	69	69	68	68	68	68	68	59	60	59	58	57
16/F	81.1	63	60	59	59	59	69	69	69	68	68	68	68	68	59	60	59	58	57
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		64	60	59	59	59	69	69	69	68	68	68	68	68	59	61	59	59	58

Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Mitigated Case Scenario)

Site A Tower 3

Acoustic Window Type																						
Floor	*mPD	N3-01	N3-02	N3-03	N3-04	N3-05	N3-06	N3-07	N3-08	N3-09	N3-10	N3-11	N3-12	N3-13	N3-14	N3-15	N3-16	N3-17	N3-18	N3-19	N3-20	N3-21
1/F	36.1	50	50	53	54	52	50	47	49	62	43	42	42	63	64	65	66	66	67	65	67	68
2/F	39.1	51	51	53	54	52	50	47	49	62	43	43	43	64	64	65	66	66	67	65	67	68
3/F	42.1	53	52	54	54	53	51	48	50	62	44	43	43	64	64	65	66	66	67	65	68	68
4/F	45.1	54	54	54	55	53	52	49	51	62	44	44	43	65	65	66	66	67	67	65	68	68
5/F	48.1	56	56	55	55	54	52	50	51	62	45	44	44	65	65	66	66	67	67	65	68	68
6/F	51.1	57	57	56	56	54	53	51	52	62	46	45	45	65	65	66	66	67	67	65	68	68
7/F	54.1	58	58	57	57	55	54	52	53	63	47	46	46	65	66	66	66	67	67	65	68	68
8/F	57.1	59	58	58	58	56	55	53	54	63	48	47	47	66	66	66	67	67	67	65	68	68
9/F	60.1	59	59	58	58	57	56	54	55	63	50	49	49	66	66	66	67	67	67	65	68	68
10/F	63.1	60	59	58	58	57	56	55	56	63	53	52	51	66	66	66	67	67	67	65	68	68
11/F	66.1	60	60	59	59	58	57	56	57	64	56	55	55	66	66	67	67	67	67	65	68	68
12/F	69.1	61	60	59	59	58	57	56	57	64	58	57	57	66	66	67	67	67	67	65	68	68
13/F	72.1	61	61	59	59	58	58	57	58	64	59	58	58	66	66	67	67	67	67	65	68	68
14/F	75.1	61	61	60	60	59	58	57	58	65	60	59	59	66	66	67	67	67	67	65	68	68
15/F	78.1	61	61	60	60	59	59	58	59	65	61	60	60	66	66	67	67	67	67	65	68	68
16/F	81.1	62	61	60	60	59	59	59	60	65	62	61	61	66	66	67	67	67	67	65	68	68
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0		0		0
Maximum Noise Level, dB(A)		62	61	60	60	59	59	59	60	65	62	61	61	66	66	67	67	67	67	65	68	68

Site A Tower 4

Acoustic Window Type		B												C	B	B	B	B
Floor	*mPD	N4-01	N4-02	N4-03	N4-04	N4-05	N4-06	N4-07	N4-08	N4-09	N4-10	N4-11	N4-12	N4-13	N4-14	N4-15	N4-16	
1/F	27.1	70	70	60	59	59	59	59	58	57	69	69	70	70	70	63	66	
2/F	30.1	70	70	60	60	59	59	59	58	58	69	70	70	63	64	65	68	
3/F	33.1	70	70	60	60	59	60	60	59	58	69	70	66	64	65	66	68	
4/F	36.1	70	70	60	60	59	61	61	60	59	70	70	67	64	65	66	67	
5/F	39.1	69	69	60	60	59	62	62	61	61	70	70	67	64	65	66	67	
6/F	42.1	69	69	60	60	59	62	63	62	62	70	70	67	64	65	66	67	
7/F	45.1	69	69	60	60	59	62	63	63	62	70	70	67	64	65	65	67	
8/F	48.1	69	69	60	59	59	62	63	63	63	70	70	67	64	65	65	66	
9/F	51.1	68	68	60	59	59	62	63	63	63	70	70	67	64	65	65	66	
10/F	54.1	68	68	60	59	59	62	63	63	63	70	70	66	64	64	65	66	
11/F	57.1	68	68	60	59	59	62	63	63	63	70	70	66	64	64	65	66	
12/F	60.1	68	68	60	59	59	62	63	63	63	70	70	70	64	64	64	66	
13/F	63.1	68	68	60	59	59	62	63	63	63	69	70	70	70	64	64	65	
14/F	66.1	67	67	59	59	59	62	63	63	63	69	70	70	70	64	64	65	
15/F	69.1	67	67	59	59	59	62	63	63	63	69	70	70	70	64	64	65	
16/F	72.1	67	67	59	59	60	62	63	63	63	69	70	70	70	70	64	65	
17/F	75.1	67	67	59	59	60	62	63	63	63	69	69	70	70	70	64	65	
18/F	78.1	67	67	59	59	60	62	63	63	63	69	69	70	70	70	70	64	
19/F	81.1	66	66	60	60	60	62	63	63	63	69	69	70	70	70	70	64	
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	
Maximum Noise Level, dB(A)		70	70	60	60	60	62	63	63	63	70	70	70	70	70	70	68	

Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Mitigated Case Scenario)

Site A Tower 5

Acoustic Window Type		B	B	B	B	A	A						B	B
Floor	*mPD	N5-01	N5-02	N5-03	N5-04	N5-05	N5-06	N5-07	N5-08	N5-09	N5-10	N5-11	N5-12	N5-13
1/F	27.1	70	69	69	70	70	64	69	68	67	58	60	66	68
2/F	30.1	69	69	69	69	70	64	69	68	67	61	64	64	68
3/F	33.1	69	68	69	69	70	64	69	68	67	65	68	65	68
4/F	36.1	69	68	69	69	70	70	69	67	67	67	70	65	68
5/F	39.1	69	68	68	69	70	70	69	67	67	68	70	65	67
6/F	42.1	68	68	68	69	69	70	68	67	67	69	70	65	67
7/F	45.1	68	68	68	68	69	70	68	67	67	69	70	65	67
8/F	48.1	68	67	68	68	69	70	68	67	67	69	70	64	67
9/F	51.1	68	67	68	68	69	69	68	67	67	69	70	64	66
10/F	54.1	68	67	68	68	69	69	68	67	66	69	70	64	66
11/F	57.1	67	67	67	68	68	69	68	67	66	69	70	64	66
12/F	60.1	67	67	67	68	68	69	67	67	66	68	69	64	66
13/F	63.1	67	66	67	67	68	69	67	66	66	68	69	63	65
14/F	66.1	67	66	67	67	68	69	67	66	66	68	69	70	65
15/F	69.1	67	66	67	67	68	69	67	66	66	68	69	70	65
16/F	72.1	66	66	67	67	68	68	67	66	66	68	69	70	65
17/F	75.1	66	66	66	67	67	68	67	66	66	68	69	70	65
18/F	78.1	66	66	66	67	67	68	67	66	66	68	69	70	64
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		70	69	69	70	70	70	69	68	67	69	70	70	68



Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Mitigated Case Scenario)

Site B Tower 1

Floor	*mPD	N6-01	N6-02	N6-03	N6-04	N6-05	N6-06	N6-07	N6-08	N6-09	N6-10	N6-11	N6-12	N6-13	N6-14	N6-15
1/F	28.8	65	FG	70	69	68	67	67	67	67	67	68	69	70	69	68
2/F	32.0	65	FG	70	69	68	67	67	67	67	67	67	68	69	69	68
3/F	35.1	65	FG	70	69	68	67	67	67	67	67	67	68	69	69	68
4/F	38.3	65	FG	69	68	67	66	66	67	67	67	67	68	69	68	68
5/F	41.4	65	FG	69	68	67	66	66	67	67	67	67	68	68	68	68
6/F	44.6	70	FG	69	68	67	66	66	66	66	66	67	67	68	68	67
7/F	47.7	70	FG	69	68	67	66	66	66	66	66	66	67	68	68	67
8/F	50.9	70	FG	68	67	67	66	66	66	66	66	66	67	68	68	67
9/F	54.0	70	FG	68	67	67	66	66	66	66	66	66	67	67	67	67
10/F	57.2	69	FG	68	67	66	65	65	66	66	66	66	66	67	67	67
11/F	60.3	69	FG	68	67	66	65	65	65	66	65	66	66	67	67	67
12/F	63.5	69	FG	67	67	66	65	65	65	65	65	65	66	67	67	66
13/F	66.6	69	FG	67	66	66	65	65	65	65	65	65	66	66	66	66
14/F	69.8	69	FG	67	66	66	65	65	65	65	65	65	66	66	66	66
15/F	72.9	69	FG	67	66	65	65	65	65	65	65	65	65	66	66	66
16/F	76.1	68	FG	67	66	65	70	70	65	65	65	65	65	66	66	66
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		70	0	70	69	68	70	70	67	67	67	68	69	70	69	68

Floor	*mPD	N6-16	N6-17	N6-18	N6-19	N6-20	N6-21	N6-22	N6-23	N6-24	N6-25	N6-26	N6-27	N6-28	N6-29
1/F	28.8	67	67	67	67	67	65	70	53	43	44	44	44	52	58
2/F	32.0	67	67	66	67	67	65	70	53	43	43	44	43	52	58
3/F	35.1	67	67	66	67	67	65	70	53	43	43	44	43	52	58
4/F	38.3	67	66	66	67	67	65	70	54	43	43	43	43	52	58
5/F	41.4	67	66	66	67	67	65	70	54	43	43	43	44	52	58
6/F	44.6	67	66	66	67	67	65	70	58	43	43	43	45	54	59
7/F	47.7	67	66	66	66	67	65	70	59	43	43	43	46	57	61
8/F	50.9	66	66	66	66	66	65	70	59	43	43	43	46	58	61
9/F	54.0	66	66	66	66	66	65	70	59	43	43	43	46	58	62
10/F	57.2	66	66	66	66	66	65	70	59	43	43	43	46	58	62
11/F	60.3	66	66	65	66	66	65	69	58	42	43	43	46	58	62
12/F	63.5	66	65	65	66	66	70	69	58	42	43	43	46	58	62
13/F	66.6	66	65	65	66	66	70	69	58	42	42	43	46	58	61
14/F	69.8	65	65	65	66	66	70	69	58	43	43	43	46	58	61
15/F	72.9	65	65	65	65	66	70	69	58	45	45	45	47	58	61
16/F	76.1	65	65	65	65	66	70	69	58	48	48	47	49	58	61
		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		67	67	67	67	67	70	70	59	48	48	47	49	58	62

Total no. of Flats:	1750
Total no. of Exceedance:	0
Compliance Level:	100%
Max. Noise Level:	70

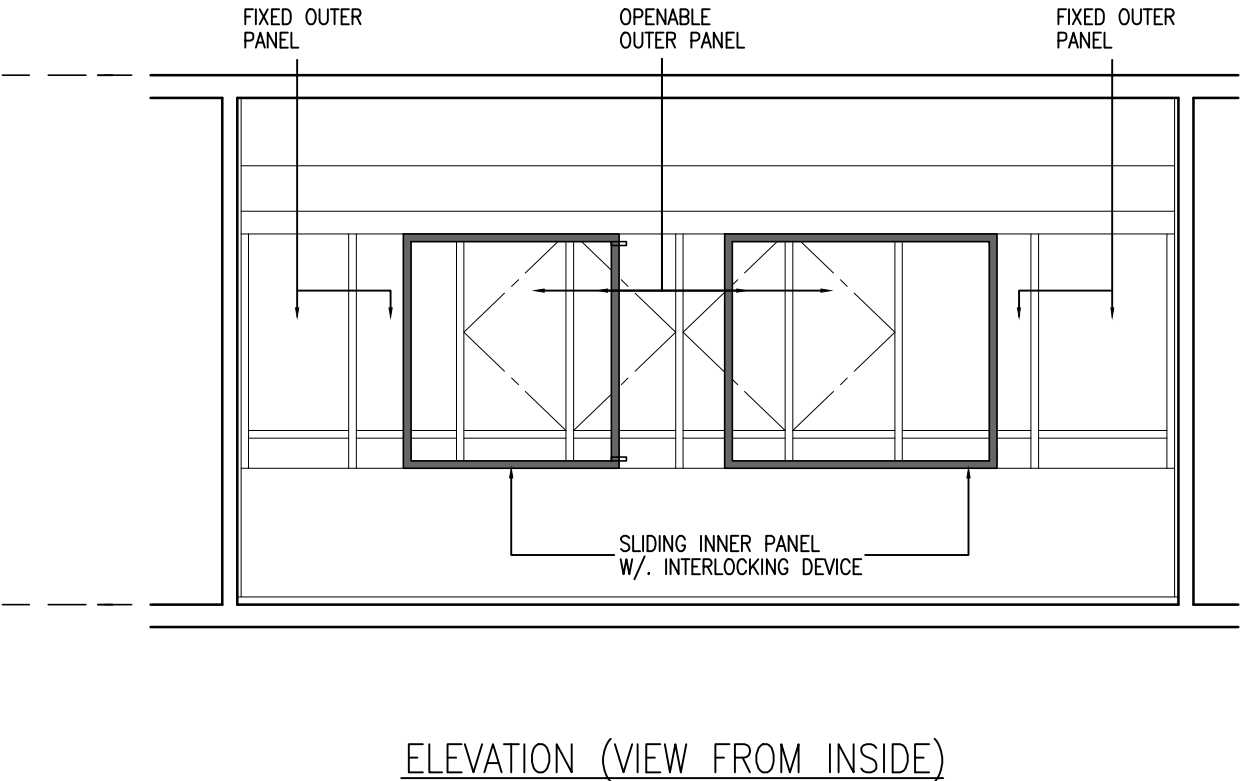
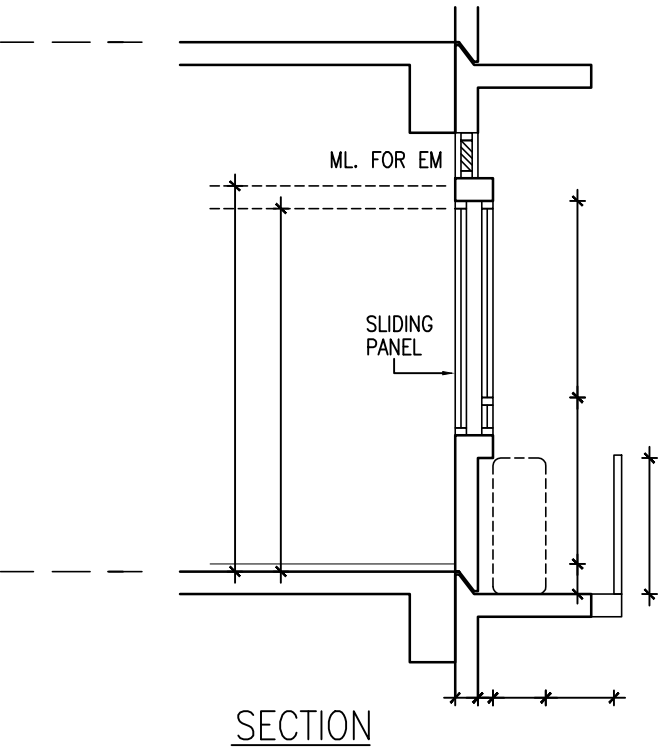
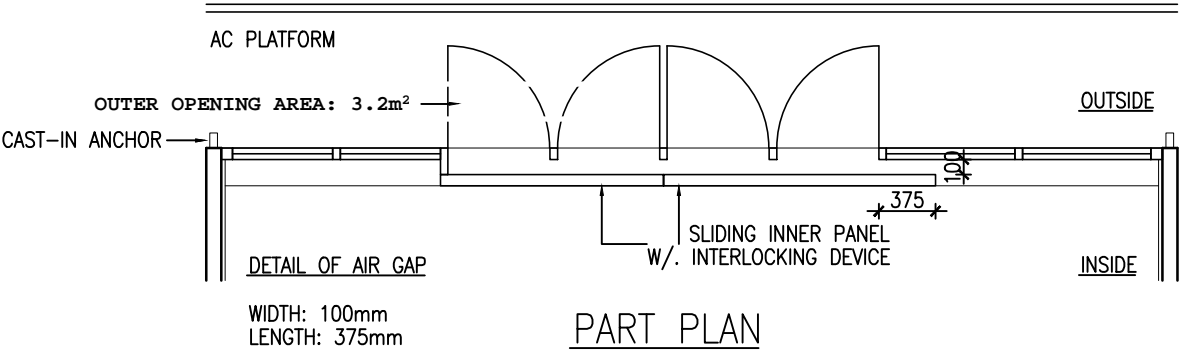
Noted:

	Acoustic Window (Baffle Type)/ Enhanced Acoustic Balcony (Baffle Type)
FG	Fixed Glazing (with or without maintenance window)

\* The assessment point is located at 1m in front of the most exposed part of an openable window for ventilation at a habitable room (NSRs) and 1.2m above the floor level of individual floors of the residential towers of the proposed development.  
Remark: The predicted noise levels are not the actual noise levels at the external façade after the application of innovative noise mitigation measures (acoustic window (baffle type)/enhanced acoustic balcony (baffle type)). These predicted noise levels are the equivalent noise levels at 1m from the external façade after accounting the reduction in noise levels inside the room offered by the proposed noise mitigation measures.

**Appendix 4      Example of configuration of acoustic window (baffle type) and  
enhanced acoustic balcony (baffle type) referenced**

Acoustic Window (Baffle Type) for Dormitory of RCHE on Site A



DETAILS OF ACOUSTIC WINDOW WITH CALCULATIONS

# Acoustic Window (Baffle Type) for Residential Tower on Site A

Annex D

The noise attenuation of the MFD-MiC with acoustic window for the public housing development, with suitable correction applied are summarized below.

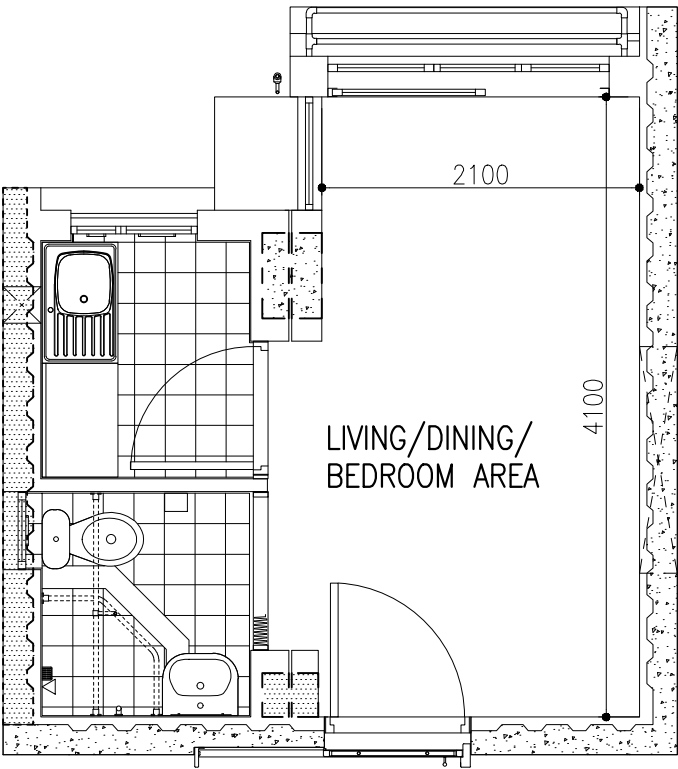
## Summary of Noise Attenuation Performance for MFD-MiC with Acoustic Window

		Acoustic Window Configurations				Noise Attenuation dB(A)	
Flat Type	Floor Size (m²)	Inner Window Opening	Outer Window Opening	Window Overlapping Length	Gap Width between Window Panel	With Sound Absorptive Lining	Without Sound Absorptive Lining
Type A-M2	9.357	1352mm (H) x 820mm (W)	1352mm (H) x 700mm (W)	340mm	175 mm	7.1	5.9
Type B-M2	15.592	1352mm (H) x 895mm (W)	1352mm (H) x 945mm (W)	200mm	175 mm	6.9	A 5.8
Type C-M2							
Living Room	16.414	1352mm (H) x 915mm (W)	1352mm (H) x 985mm (W)	100mm	175 mm	7.1	B 5.6
Bedroom 1	6.117	1352mm (H) x 660mm (W)	1352mm (H) x 633mm (W)	607mm	175 mm		
Type C-M3							
Living Room	16.736	1352mm (H) x 985mm (W)	1352mm (H) x 1125mm (W)	330mm	175 mm	7.1	5.6
Bedroom 1	6.094	1352mm (H) x 660mm (W)	1352mm (H) x 633mm (W)	607mm	175 mm		
Type D-M2							
Living Room	16.414	1352mm (H) x 915mm (W)	1352mm (H) x 985mm (W)	100mm	175 mm	7.1	5.6
Bedroom 1	6.117	1352mm (H) x 660mm (W)	1352mm (H) x 633mm (W)	607mm	175 mm		
Bedroom 2	4.692	1352mm (H) x 545mm (W)	1352mm (H) x 545mm (W)	680mm	175 mm	4.2	C 3.0

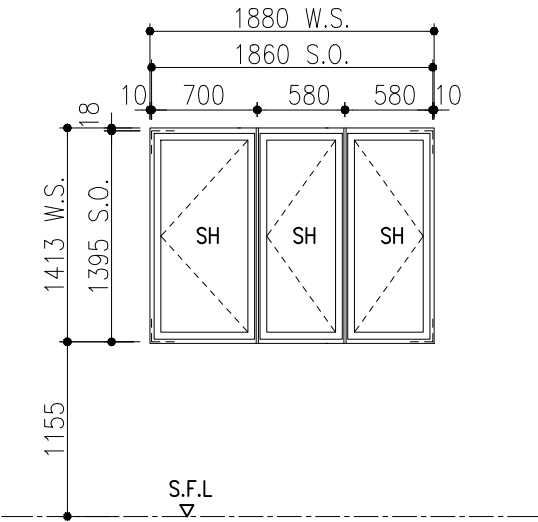
The above values are estimated noise attenuation for use. For the acoustic window configuration deviated from those considered in this technical note/ more refined estimation of the noise attenuation value is required, further discussion with EPD is required on project basis.



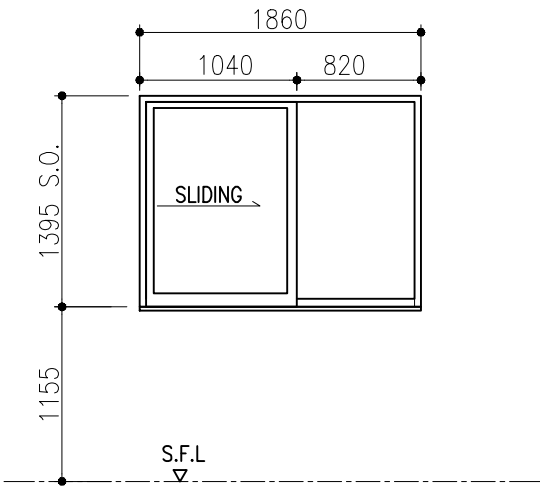
Acoustic Window (Baffle Type) for Residential Tower on Site A



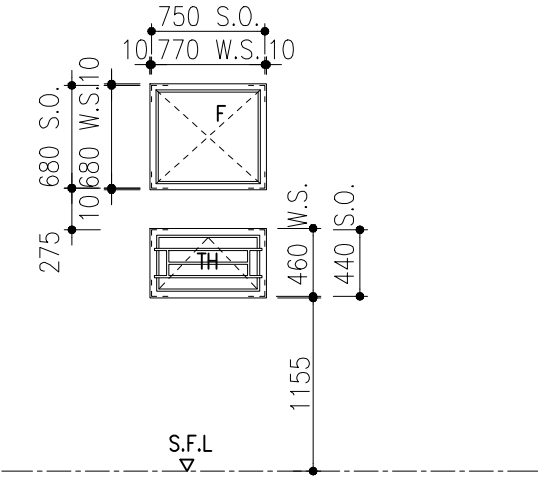
TYPE A – M2 FLAT (WITH ACOUSTIC WINDOW)  
SCALE 1:50(A3)



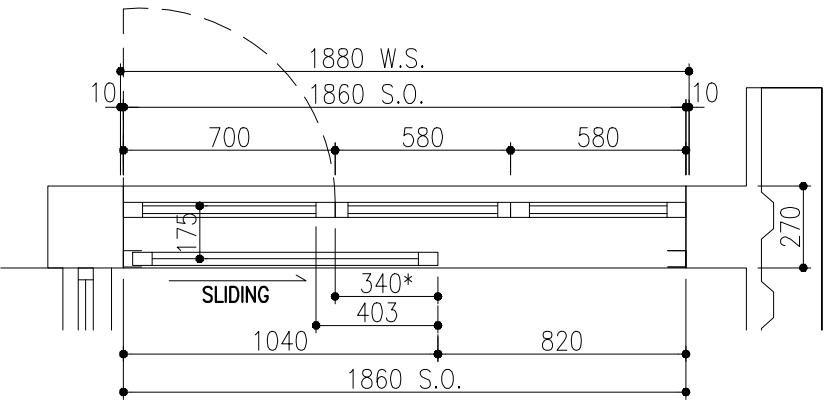
ELEVATION (OUTER LAYER)  
SCALE 1:50(A3)



ELEVATION (INNER LAYER)  
SCALE 1:50(A3)



SIDE ELEVATION-LIVING ROOM  
SCALE 1:50(A3)



PART PLAN OF ACOUSTIC WINDOW  
SCALE 1:25(A3)

IFA

LIVING ROOM: 9.357m<sup>2</sup>

NOTE: ELEVATIONS VIEWED FROM INSIDE

F –FIXED WINDOW

TH –TOP HUNG WINDOW

SH –SIDE HUNG WINDOW

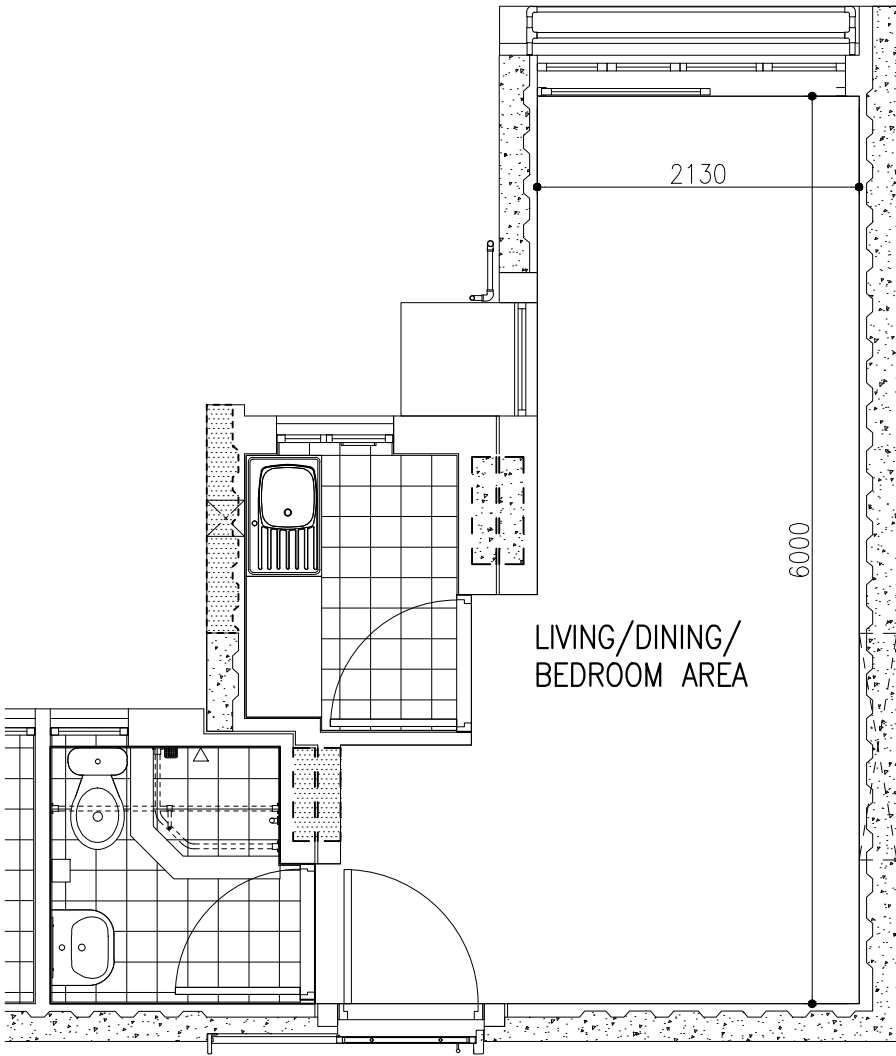
S.O. –STRUCTURAL OPENING

W.S. –WINDOW DIMENSION

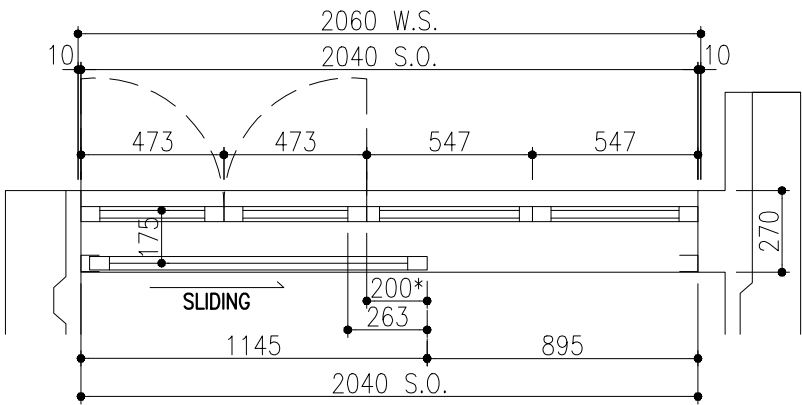
**MODULAR FLAT (MIC) WITH  
ACOUSTIC WINDOW  
TYPE A-M2 FLAT**

MARCH 2022 (FOR EPD)

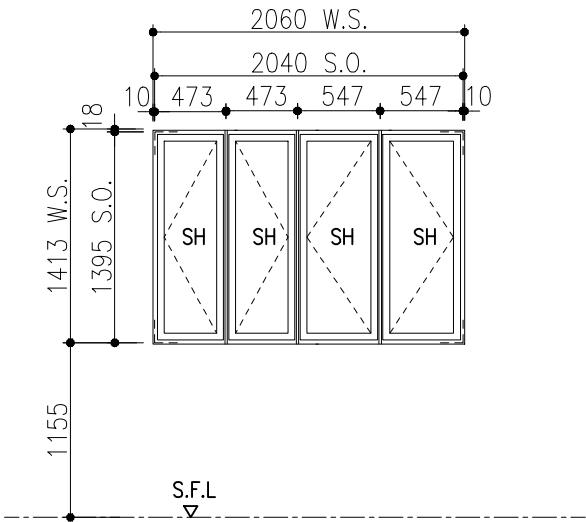
Acoustic Window (Baffle Type) for Residential Tower on Site A



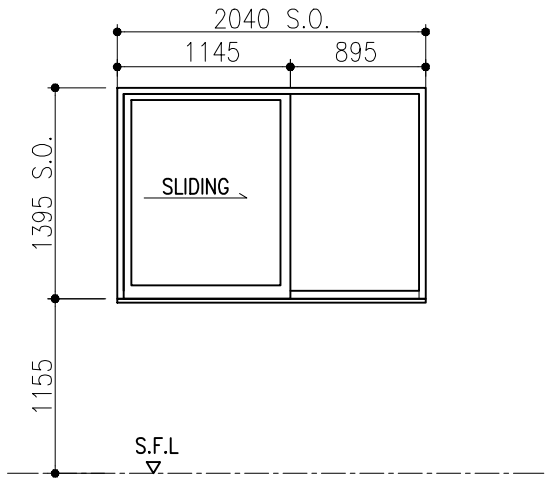
TYPE B – M2 FLAT (WITH ACOUSTIC WINDOW) SCALE 1:50(A3)



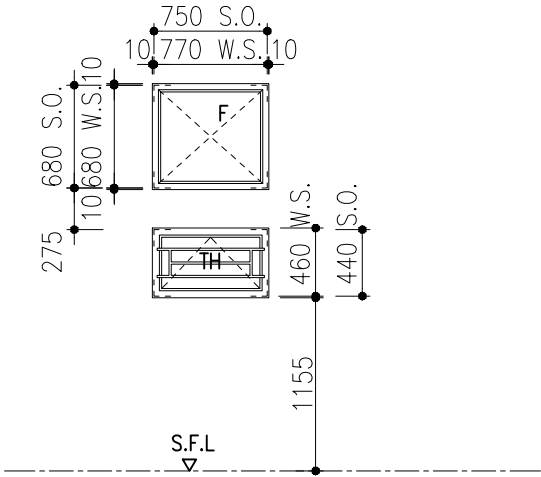
PART PLAN OF ACOUSTIC WINDOW  
SCALE 1:25(A3)



ELEVATION (OUTER LAYER)  
SCALE 1:50(A3)



ELEVATION (INNER LAYER)  
SCALE 1:50(A3)



SIDE ELEVATION–LIVING ROOM  
SCALE 1:50(A3)

IFA

LIVING ROOM: 15.592m<sup>2</sup>

NOTE: ELEVATIONS VIEWED FROM INSIDE

F –FIXED WINDOW

TH –TOP HUNG WINDOW

SH –SIDE HUNG WINDOW

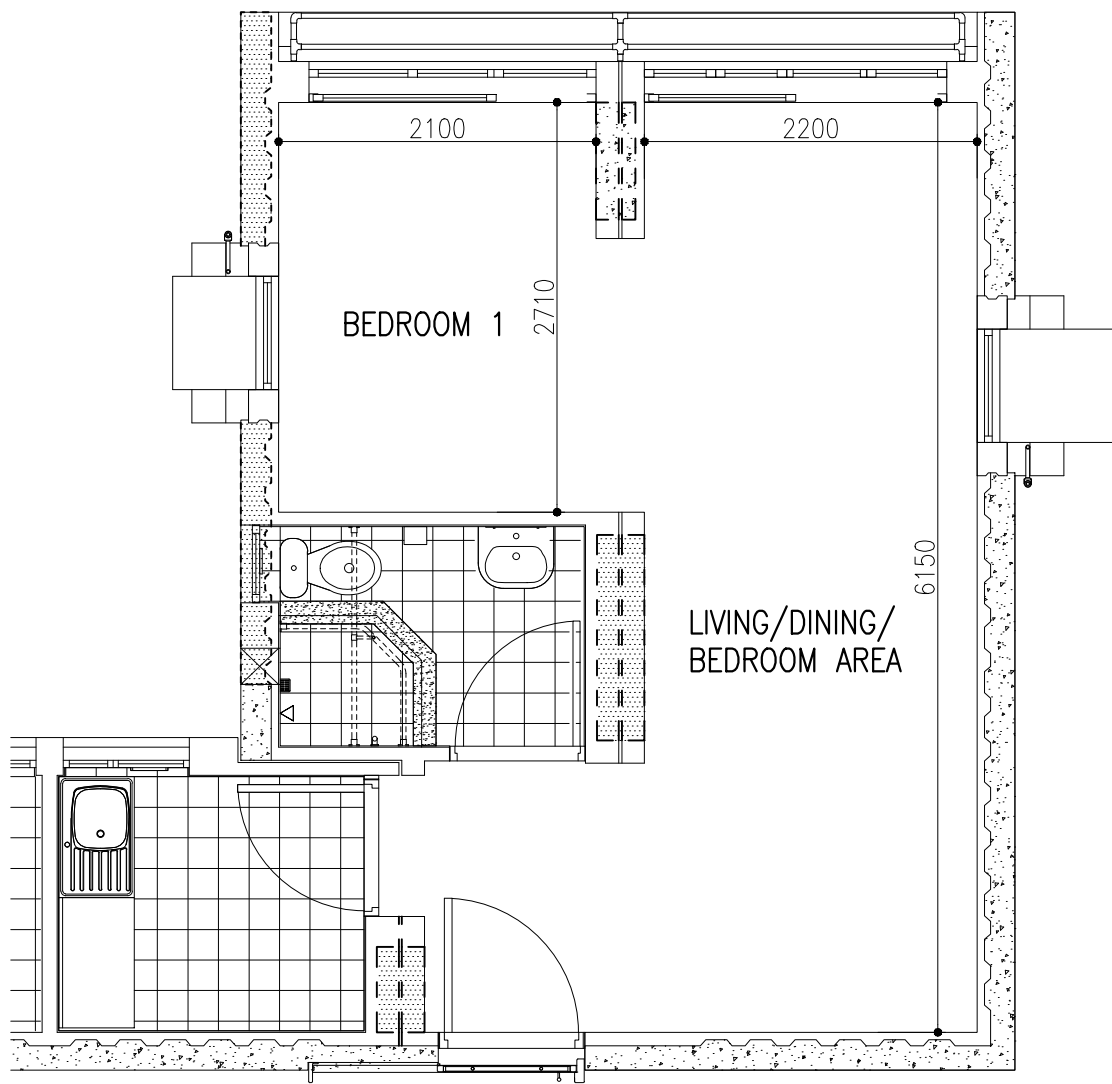
S.O. –STRUCTURAL OPENING

W.S. –WINDOW DIMENSION

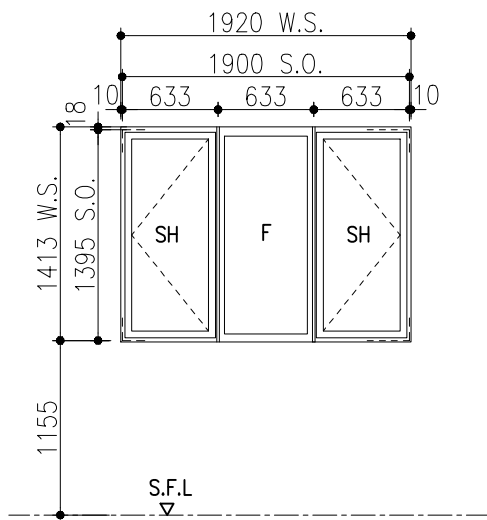
**MODULAR FLAT (MIC) WITH  
ACOUSTIC WINDOW  
TYPE B-M2 FLAT**

NOVEMBER 2022 (FOR EPD)

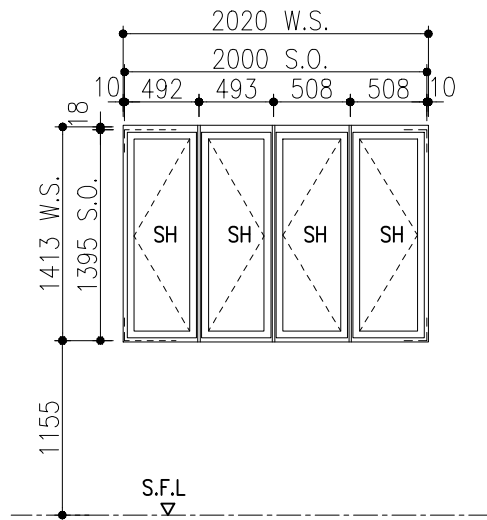
Acoustic Window (Baffle Type) for Residential Tower on Site A



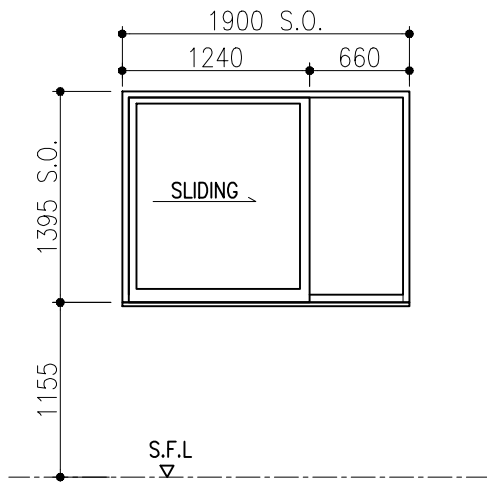
TYPE C – M2 FLAT (WITH ACOUSTIC WINDOW) SCALE 1:50(A3)



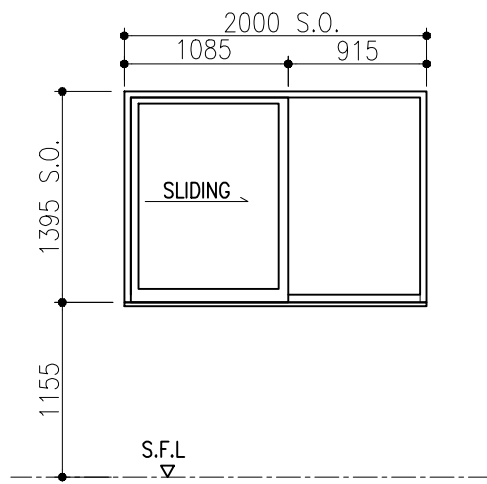
ELEVATION-BEDROOM1  
(OUTER LAYER) SCALE 1:50(A3)



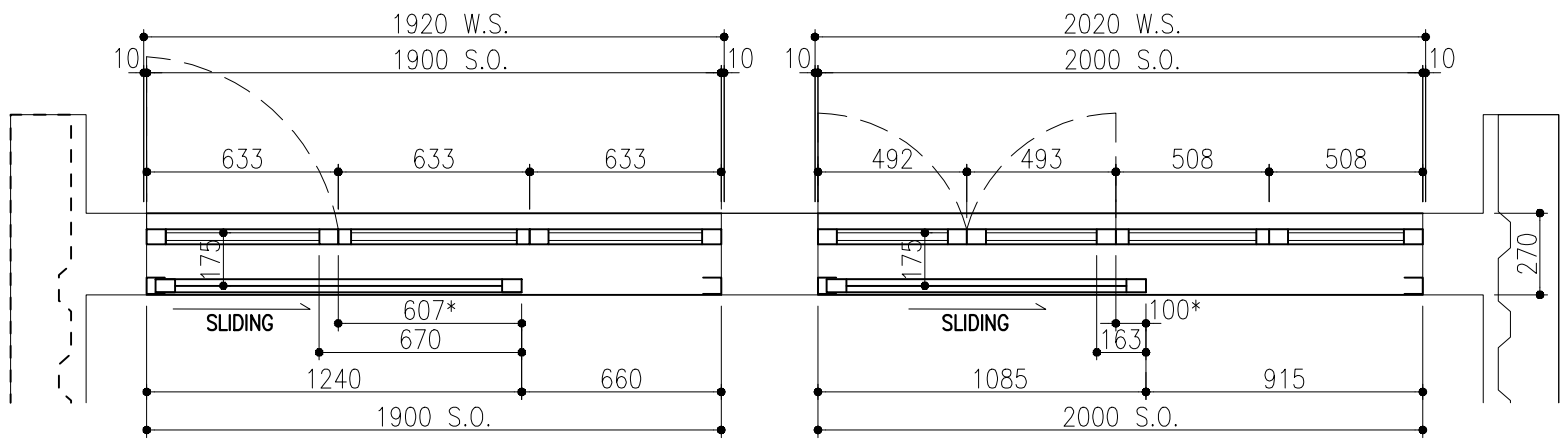
ELEVATION-LIVING ROOM  
(OUTER LAYER) SCALE 1:50(A3)



ELEVATION-BEDROOM1  
(INNER LAYER) SCALE 1:50(A3)



ELEVATION-LIVING ROOM  
(INNER LAYER) SCALE 1:50(A3)



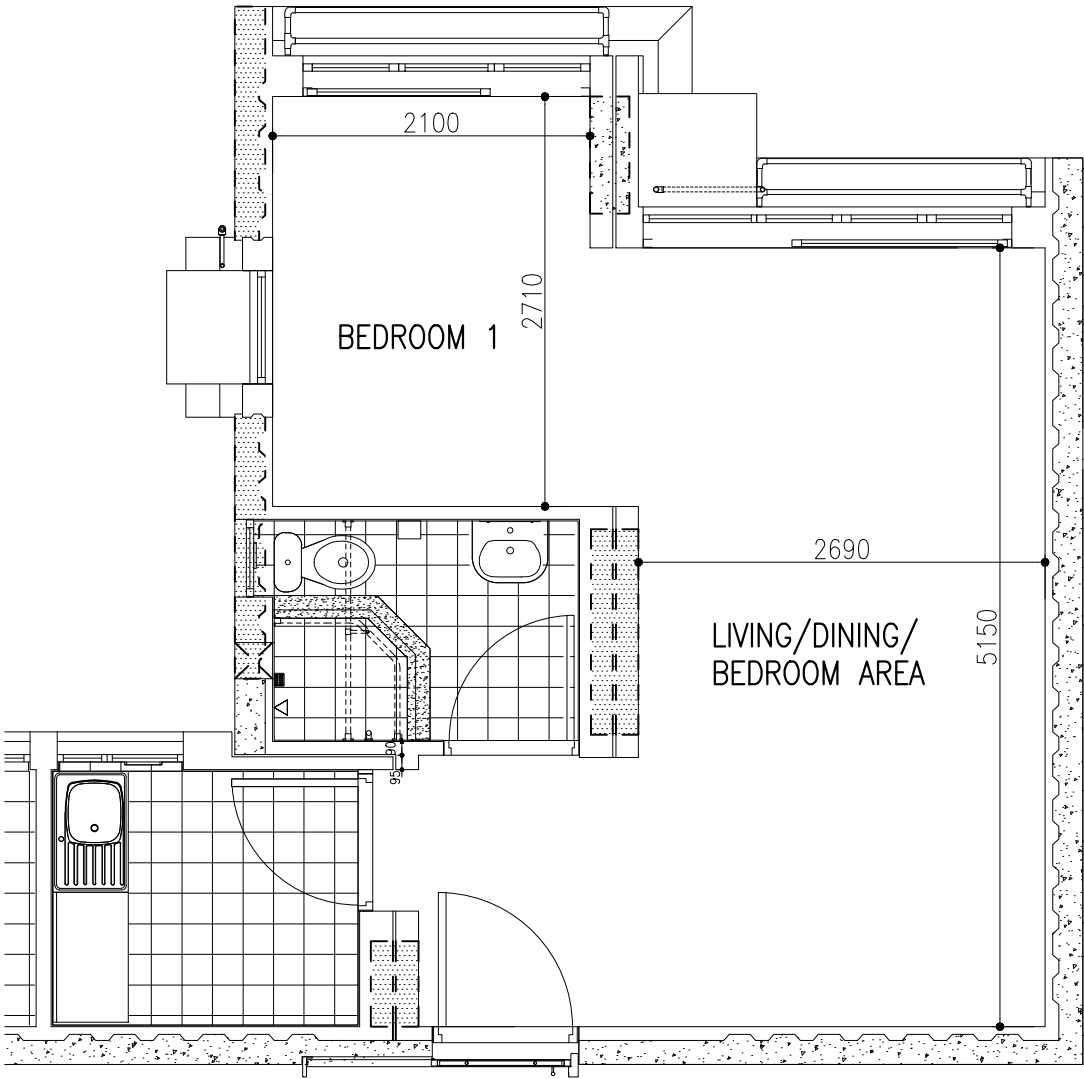
PART PLAN OF ACOUSTIC WINDOW  
SCALE 1:25(A3)

IFA  
LIVING ROOM: 16.414m<sup>2</sup>  
BR1: 6.117m<sup>2</sup>

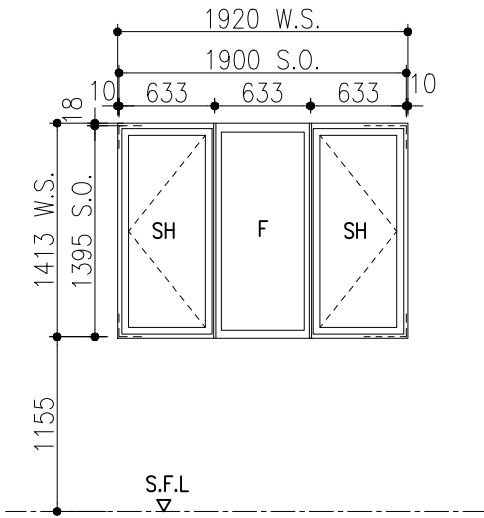
NOTE: ELEVATIONS VIEWED FROM INSIDE  
F –FIXED WINDOW  
SH –SIDE HUNG WINDOW  
S.O. –STRUCTURAL OPENING  
W.S. –WINDOW DIMENSION

**MODULAR FLAT (MIC) WITH  
ACOUSTIC WINDOW  
TYPE C-M2 FLAT**  
MARCH 2022 (FOR EPD)

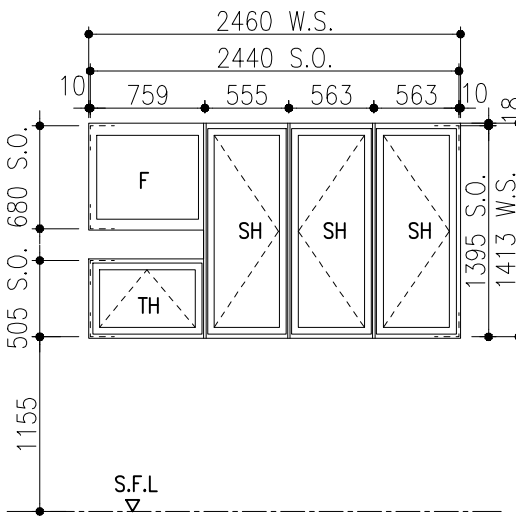
Acoustic Window (Baffle Type) for Residential Tower on Site A



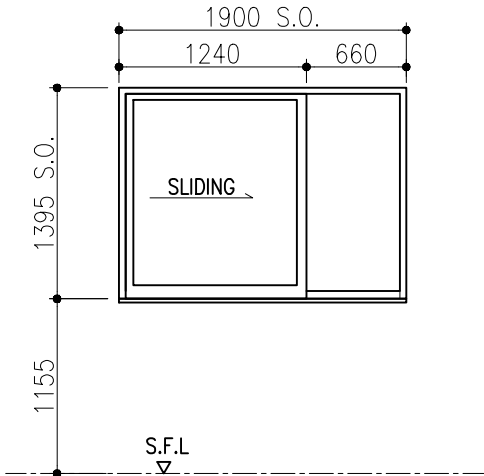
TYPE C – M3 FLAT (WITH ACOUSTIC WINDOW) SCALE 1:50(A3)



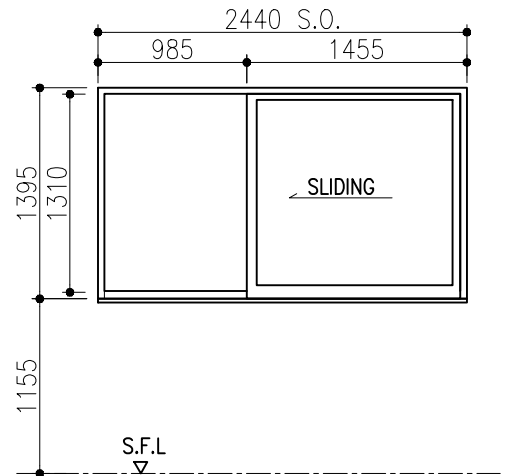
ELEVATION-BEDROOM1  
(OUTER LAYER) SCALE 1:50(A3)



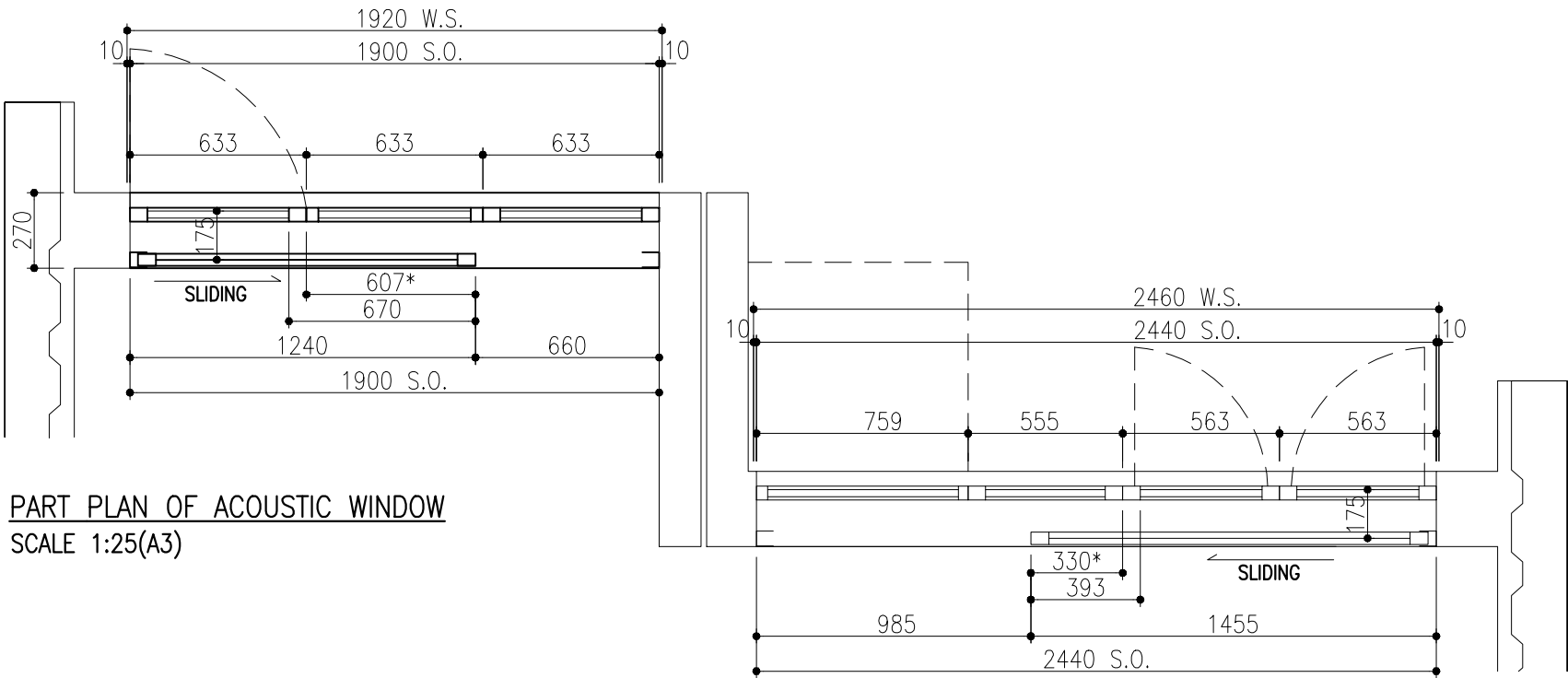
ELEVATION-LIVING ROOM  
(OUTER LAYER) SCALE 1:50(A3)



ELEVATION-BEDROOM1  
(INNER LAYER) SCALE 1:50(A3)



ELEVATION-LIVING ROOM  
(INNER LAYER) SCALE 1:50(A3)



PART PLAN OF ACOUSTIC WINDOW  
SCALE 1:25(A3)

IFA

LIVING ROOM: 16.736m<sup>2</sup>

BR1: 6.094m<sup>2</sup>

NOTE: ELEVATIONS VIEWED FROM INSIDE

F –FIXED WINDOW

TH –TOP HUNG WINDOW

SH –SIDE HUNG WINDOW

S.O. –STRUCTURAL OPENING

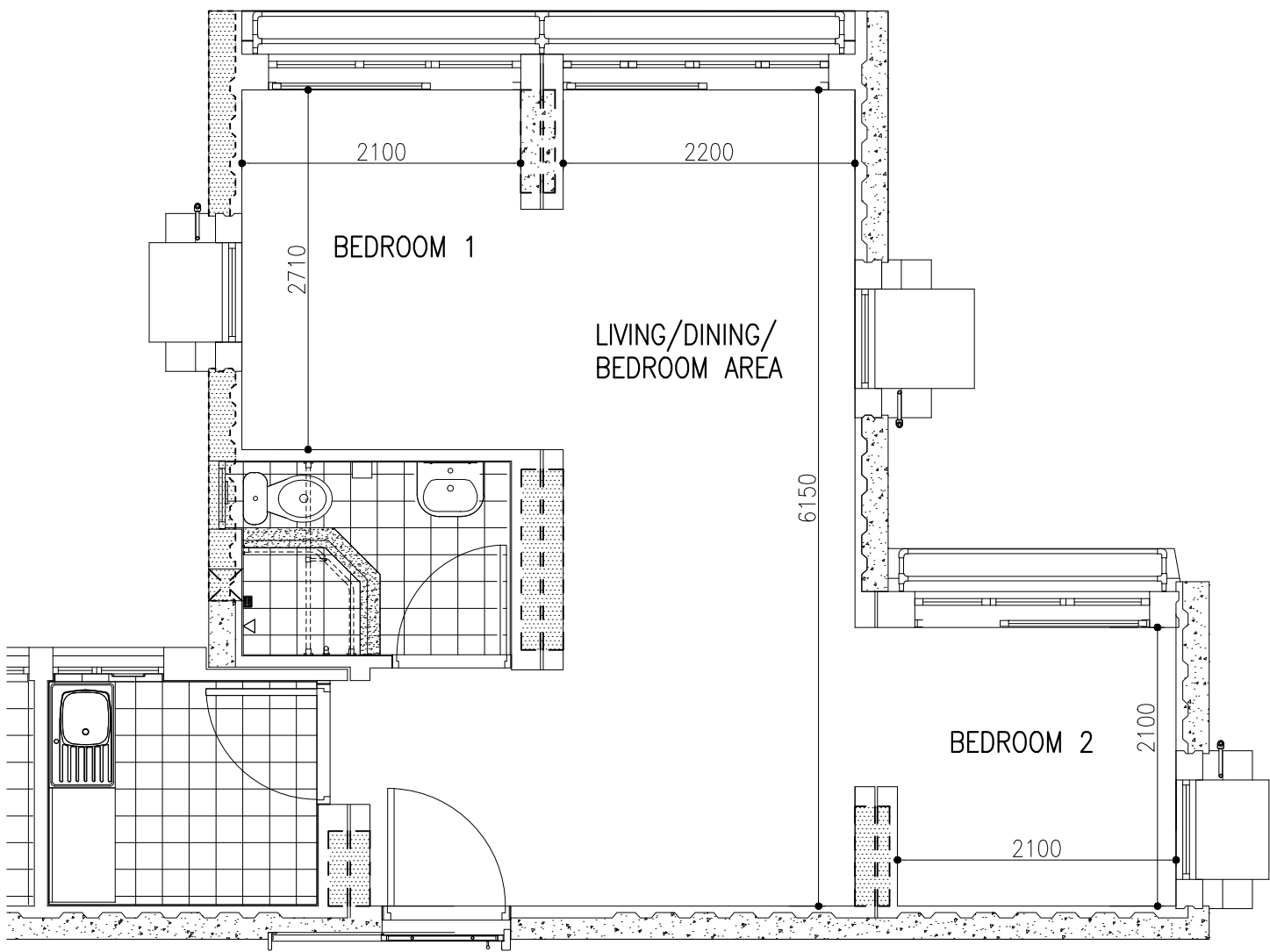
W.S. –WINDOW DIMENSION

**MODULAR FLAT (MIC) WITH  
ACOUSTIC WINDOW  
TYPE C-M3 FLAT**

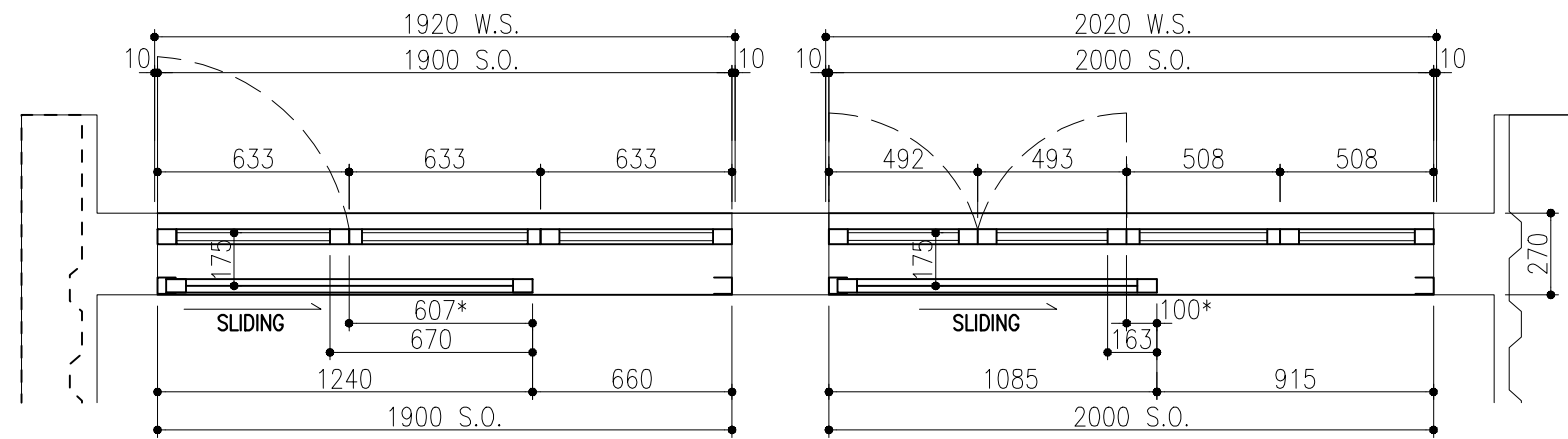
MARCH 2022 (FOR EPD)



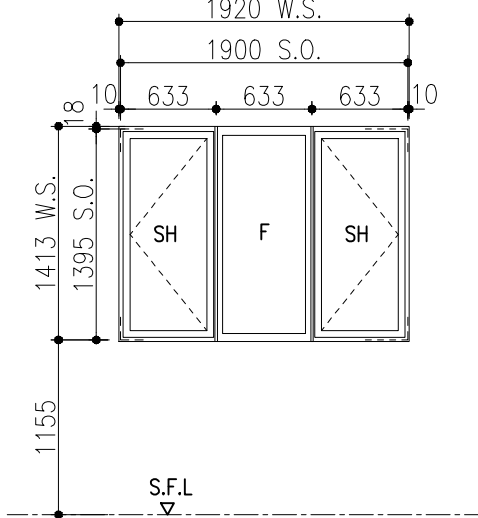
Acoustic Window (Baffle Type) for Residential Tower on Site A



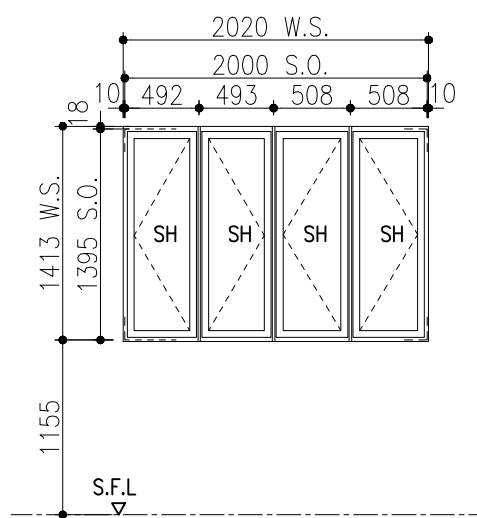
TYPE D – M2 FLAT (WITH ACOUSTIC WINDOW) SCALE 1:50(A3)



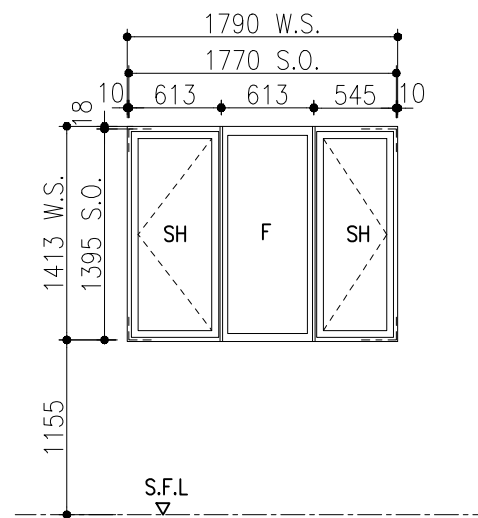
PART PLAN OF ACOUSTIC WINDOW  
SCALE 1:25(A3)



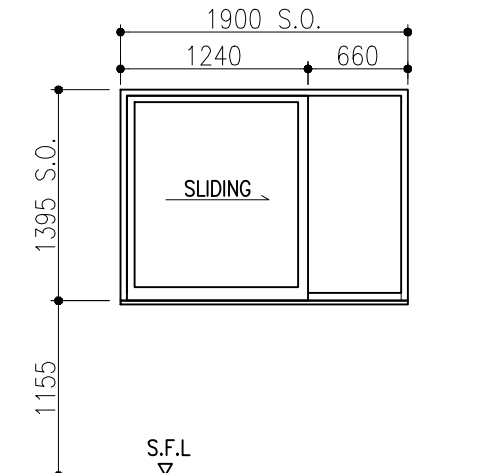
ELEVATION-BEDROOM1  
(OUTER LAYER) SCALE 1:50(A3)



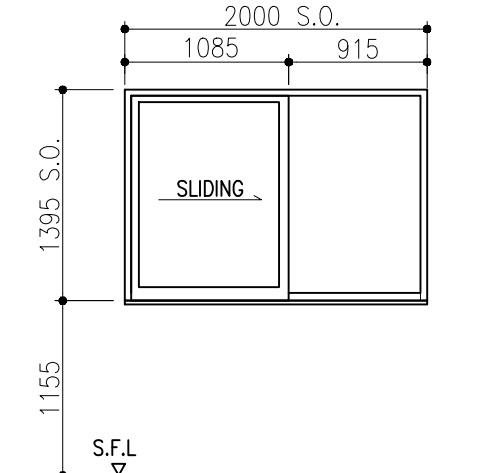
ELEVATION-LIVING ROOM  
(OUTER LAYER) SCALE 1:50(A3)



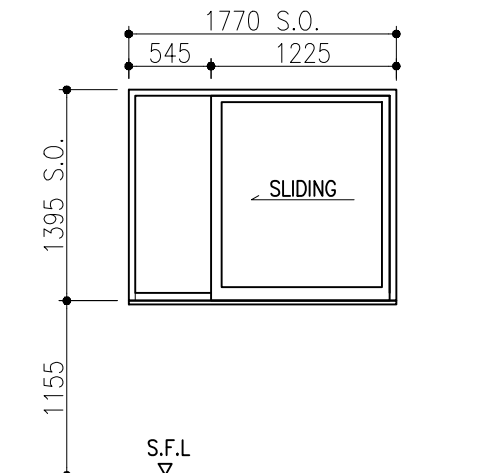
ELEVATION-BEDROOM2  
(OUTER LAYER) SCALE 1:50(A3)



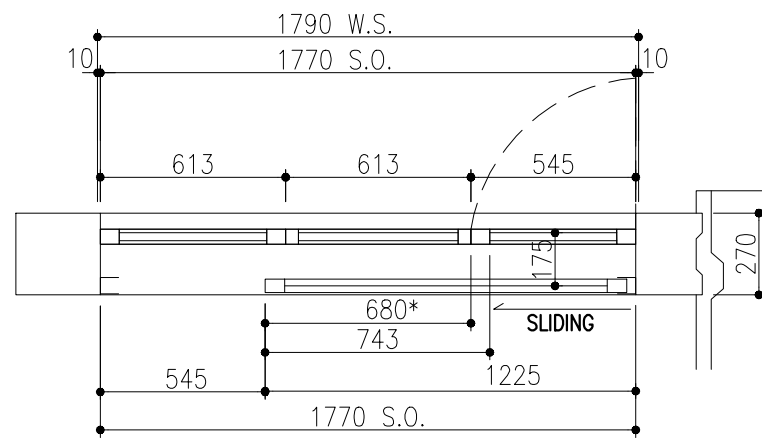
ELEVATION-BEDROOM1  
(INNER LAYER) SCALE 1:50(A3)



ELEVATION-LIVING ROOM  
(INNER LAYER) SCALE 1:50(A3)



ELEVATION-BEDROOM2  
(INNER LAYER) SCALE 1:50(A3)



PART PLAN OF ACOUSTIC WINDOW – BEDROOM 2  
SCALE 1:25(A3)

IFA

LIVING ROOM: 16.414m<sup>2</sup>

BR1: 6.117m<sup>2</sup>

BR2: 4.692m<sup>2</sup>

NOTE: ELEVATIONS VIEWED FROM INSIDE

F –FIXED WINDOW

SH –SIDE HUNG WINDOW

S.O. –STRUCTURAL OPENING

W.S. –WINDOW DIMENSION

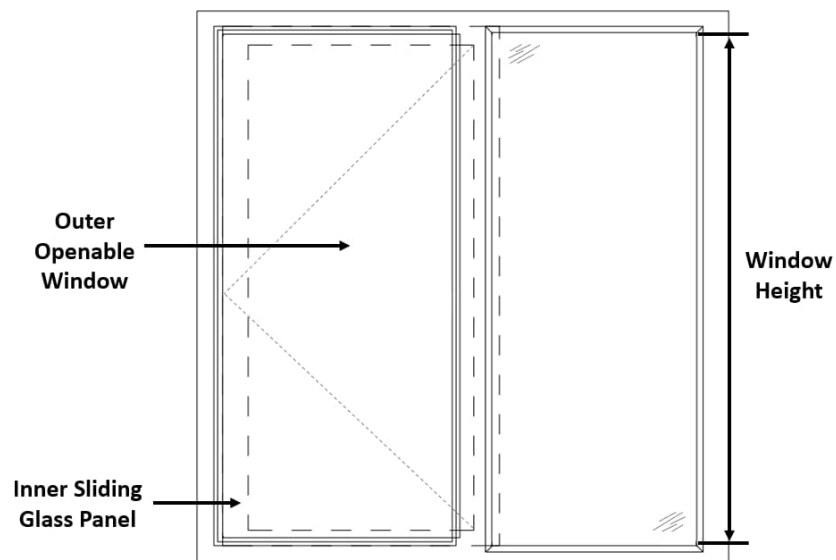
MODULAR FLAT (MIC) WITH  
ACOUSTIC WINDOW  
TYPE D-M2 FLAT

MARCH 2022 (FOR EPD)

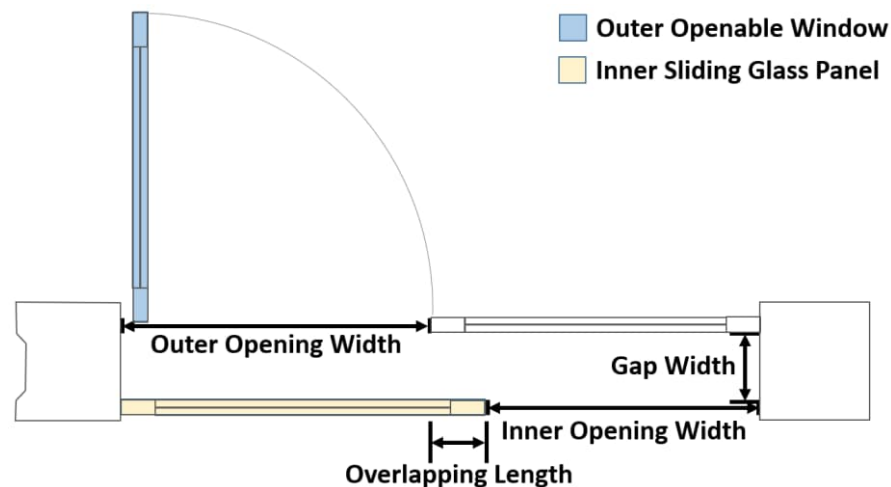
# Acoustic Window (Baffle Type)/ Enhanced Acoustic Balcony for Residential Tower on Site B

Annex A

(I) Possible design of “Acoustic Window (Baffle Type)” for 8m<sup>2</sup> and 18m<sup>2</sup> habitable rooms (i.e. dining room, living room or bedroom)



INTERNAL VIEW (NOT TO SCALE)



PLAN (NOT TO SCALE)

Possible Designs of “Acoustic Window (Baffle Type)” for 8m<sup>2</sup> and 18m<sup>2</sup> rooms

Room Size (m <sup>2</sup> )	Room Dimensions (mm <sup>3</sup> )	Inner Window Opening (mm <sup>2</sup> )	Outer Window Opening (mm <sup>2</sup> )	Overlapping Length (mm)	Gap Width (mm)
8	3200 (W) x 2500 (D) x 3400 (H)	580 (W) x 870 (H)	600 (W) x 870 (H)	≥ 100	100 to 175
18	5300 (W) x 3390 (D) x 3400 (H)	750 (W) x 1500 (H)	750 (W) x 1500 (H)	≥ 100	100 to 175

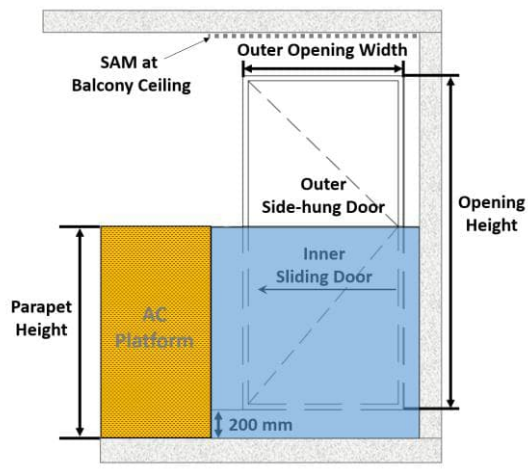
Notes:

a. These are feasible designs of AW(BT) for 8m<sup>2</sup> and 18m<sup>2</sup> rooms.

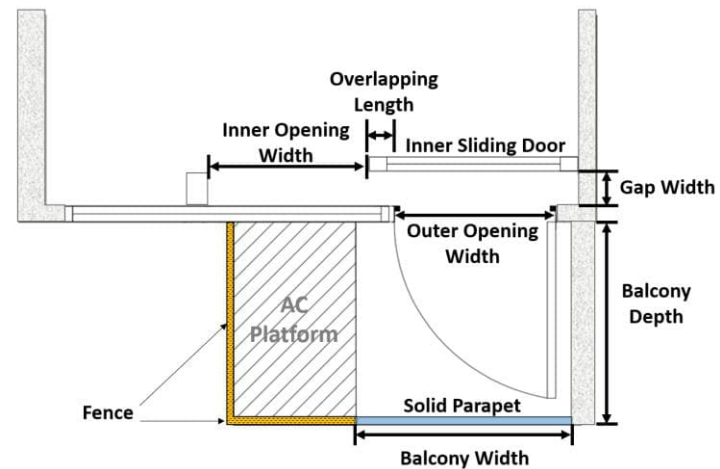
b. For optimum performance of noise reduction, the air gap should have a pane-to-pane overlapping length of ≥ 100mm and a gap width between 100mm and 175mm, with the inner sliding glass panel in a closed position. The window pane shall be ≥ 6mm in thickness.

Acoustic Window (Baffle Type)/ Enhanced Acoustic Balcony for Residential Tower on Site B

(II) Possible designs of “Enhanced Acoustic Balcony (Baffle Type)” in 14m<sup>2</sup> and 18m<sup>2</sup> habitable rooms (i.e. dining room, living room or bedroom)



EXTERNAL VIEW (NOT TO SCALE)



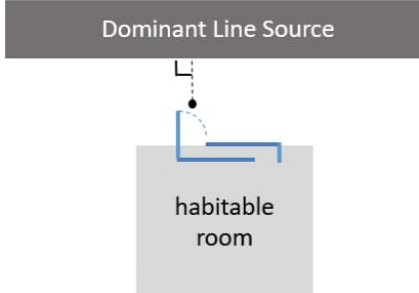
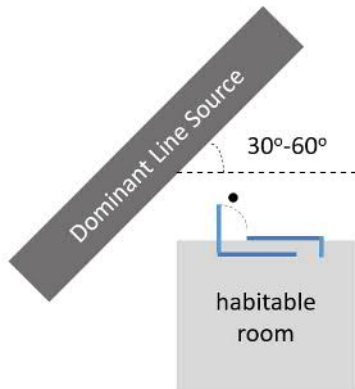
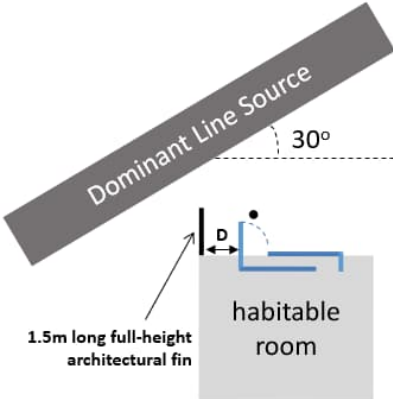
PLAN (NOT TO SCALE)

 Fence (≥ 70% Permeability)  Solid Parapet

Possible Designs of “Enhanced Acoustic Balcony (Baffle Type)” for 14m <sup>2</sup> and 18m <sup>2</sup> rooms								
Room size (m <sup>2</sup> )	Room Dimensions (mm <sup>3</sup> )	Balcony Width (mm)	Balcony Depth (mm)	Parapet Height (mm)	Inner Opening (mm <sup>2</sup> )	Outer Opening (mm <sup>2</sup> )	Overlapping Length (mm)	Gap Width (mm)
14	3400 (W) x 4100 (D) x 3100 (H)	≥ 1440	≥ 1300	≥ 1450	1025 (W) x 2210 (H)	1150 (W) x 2210 (H)	≥ 100	100
18	5300 (W) x 3390 (D) x 3400 (H)	≥ 2055	≥ 1300	≥ 1450	1150 (W) x 2210 (H)	1150 (W) x 2210 (H)	≥ 100	100

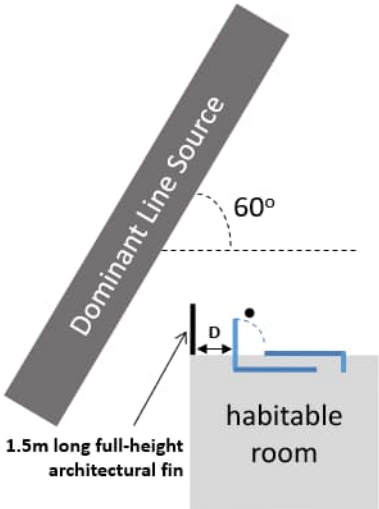
- Notes:
1. These are feasible designs of EAB for 14m<sup>2</sup> and 18m<sup>2</sup> rooms. The room with EAB should meet the natural lighting and ventilation requirements in regulations 30 & 31 of the Building (Planning) Regulations (B(P)R). The AC platform should comply with the requirements under Appendix B of Code of Practice on Access for External Maintenance 2021 (AfEM Code), and balconies for residential buildings should comply with the criteria and conditions set out in Joint Practice Note (JPN) 1 for application of exemption from gross floor area and/or site coverage under the B(P)R.
  2. SAM at balcony ceiling refers to sound absorptive material of noise reduction coefficient ≥ 0.7. It is an essential feature to attain the basic noise reduction performance in Annex B.
  3. Comparable noise performance is anticipated should the AC platform be replaced by balcony with solid parapet.

# Acoustic Window (Baffle Type)/ Enhanced Acoustic Balcony for Residential Tower on Site B

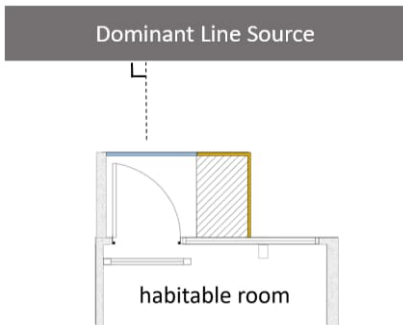
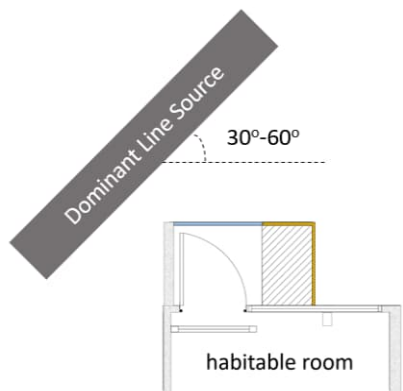
Table 1: Summary on RNR of Acoustic Window (Baffle Type) (for use in NIA) *Plan not to scale		Correction dB(A) L10(1hr)	
		8m <sup>2</sup>	18m <sup>2</sup>
	(a) Provision of AW(BT) parallel to dominant line source (whichever side the outer side-hung window is)	- 6.0	- 7.0
		- 7.5 (added SAM <sup>1</sup> )	- 8.5 (added SAM <sup>1</sup> )
	(b) Tilting the AW(BT) in (a) above to 30° - 60° horizontal incident angle to dominant line source (whichever side the outer side-hung window is)	- 7.0	- 8.0
		- 8.5 (added SAM <sup>1</sup> )	- 9.5 (added SAM <sup>1</sup> )
  D = Distance from architectural fin to nearest window frame should be at most 900mm.	(b1) If tilted AW(BT) is at 30° horizontal incident angle to dominant line source  + 1.5m long full-height architectural fin <sup>2</sup>  * AW(BT) + architectural fin should be considered as ONE package of noise mitigation measures. Outer side-hung window of AW(BT) and architectural fin should be installed at the side nearer to dominant line source.	- 8.0  - 9.5 (added SAM <sup>1</sup> )	- 9.0  - 10.5 (added SAM <sup>1</sup> )



Acoustic Window (Baffle Type)/ Enhanced Acoustic Balcony  
for Residential Tower on Site B

Table 1: Summary on RNR of Acoustic Window (Baffle Type) (for use in NIA) *Plan not to scale		Correction dB(A) L10(1hr)	
		8m <sup>2</sup>	18m <sup>2</sup>
 <p>(b2) If tilted AW(BT) is at 60° horizontal incident angle to dominant line source</p> <p>+ 1.5m long full-height architectural fin<sup>2</sup></p> <p>* AW(BT) + architectural fin should be considered as ONE package of noise mitigation measures. Outer side-hung window of AW(BT) and architectural fin should be installed at the side nearer to dominant line source.</p> <p>D = Distance from architectural fin to nearest window frame should be at most 900mm.</p>	- 9.0	- 10.0	
	- 10.5 (added SAM <sup>1</sup> )	- 11.5 (added SAM <sup>1</sup> )	
	Note 1: The additional Sound Absorptive Material (SAM) shall be of Noise Reduction Coefficient ≥ 0.7 and applied at top and outer opening side of mullion. The material of SAM is subject to the requirements of section 3 of Building (Construction) Regulation.		
	Note 2: The 1.5m long full-height architectural fin may be subject to the requirements for natural lighting and ventilation, gross floor area and site coverage under the B(P)R.		

# Acoustic Window (Baffle Type)/ Enhanced Acoustic Balcony for Residential Tower on Site B


Table 2: Summary on RNR of Enhanced Acoustic Balcony (Baffle Type) (for use in NIA) *Plan not to scale		Correction dB(A) L10(1hr)	
		14m <sup>2</sup>	18m <sup>2</sup>
	(a) Provision of EAB(BT) parallel to dominant line source	- 8.0	- 9.0
		- 9.5 (added SAM <sup>1</sup> )	- 10.5 (added SAM <sup>1</sup> )
	(b) Tilting the EAB(BT) in (a) above to 30° - 60° horizontal incident angle to dominant line source	- 11.0	- 11.0
		- 12.5 (added SAM <sup>1</sup> )	- 12.5 (added SAM <sup>1</sup> )
Note 1: The additional Sound Absorptive Material (SAM) shall be of Noise Reduction Coefficient ≥ 0.7 and applied at top and outer opening side of the mullion. The material of SAM is subject to the requirements of section 3 of Building (Construction) Regulation.			

<sup>i</sup> Should there be any variation on the proposed INMD, or practitioners and professionals consider that a higher RNR value should be adopted, justifications together with technical documents, e.g. corrections based on acoustic principles, laboratory testing reports, in-situ measurement reports, etc. should be submitted to the EPD for consideration. For requirements of laboratory measurement or in-situ measurement requirements, practitioners and professionals may contact the EPD for further details. As RNR varies with room size, practitioners and professionals may like to propose the preferred RNR to the EPD for consideration if different room size is encountered in the NIA study. Having said that, information indicates that for **Tables 1 and 2**:

- Variations of room size within +/- 10% would not affect the RNR;
- Variations of floor-to-ceiling height within +/- 5% would not affect the RNR; and
- Variations of window / door opening size within +/- 5% would not affect the RNR.

## **Appendix 5      Site Visit Noise Measurement for the Noise Source**

**Appendix 5: Noise Measurement and Calculation of the Sound Power Level (SWL) generated from Noise Source (RC-1) for Fixed Noise Impact Assessment**

<p>Measurement Date: 12 April 2022 (Wed) 1045 – 1115</p> <p>Noise Source ID: RC-1</p>	<p>Observation: Refrigerated container (as circled in red below) with noticeable noise was identified.</p> <p>Noise measurement was conducted to measure the noise generated during the operation of the refrigerated container at the position of about 10 m away from the louvre.</p> 
---	---

Sound Level meter: Norsonic 139	Sound Calibrator: Norsonic 1256
---------------------------------	---------------------------------

**Deduced Sound Power Level for the Refrigerated Containers**

Activity	SPL, dB(A)	Measurement distance (D), m	Derived SWL, dB(A)*	Duration (min) / 30mins
Refrigerated Containers	72.7	10	100.7	30

Note:

- Only noise measurement was conducted during daytime as no operation was observed during site survey at nighttime.

Remark:

\* –  $SWL = SPL + 20 \times \log(D) + 8$



## Certificate of Calibration

Certificate No.: A220029

<b>Description:</b>	<b>Sound level meter</b>	<b>Microphone</b>	<b>Preamplifier</b>
<b>Make:</b>	Norsonic	Norsonic	Norsonic
<b>Model:</b>	139	1228	1207
<b>Serial No.:</b>	1392834	03476	20873
<b>Type:</b>	1	-	-
<b>Customer:</b>	Ramboll Hong Kong Limited		
<b>Department:</b>	-		
<b>Address:</b>	21/F, BEA Harbour View Centre, 56 Gloucester Road, Wanchai, Hong Kong		
<b>Date of receipt the calibration item:</b>	2022-07-11		
<b>Environmental conditions:</b>			
<b>Pressure:</b>	(99.61 $\pm$ 0.50) kPa		
<b>Temperature:</b>	(24.2 $\pm$ 1.0) °C		
<b>Humidity:</b>	(51.6 $\pm$ 2.0)%RH		
<b>Date of calibration:</b>	2022-07-27		
<b>Date of issue:</b>	2022-07-27		

Prepared by:



Wong Hau Chun

Checked by:



Choi Pui Sum

Approved Signatory:



Choi Pui Sum

Hong Kong Accreditation Service (HKAS) has accredited this laboratory (Reg. No. HOKLAS 302) under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this certificate are traceable to the International System of Unit (SI) or recognised measurement standards. This certificate shall not be reproduced except in full.

*Certificate No.: A220029*

**Preconditioning:**

The equipment was preconditioned for more than 12 hours at the measurement conditions of pressure, temperature and humidity.

**Measurement method:**

A description of the in-house test procedure (ESG-NOISE-001) is available separately from the calibration laboratory.

**Test Specification:**

The Sound Level Meter has been calibrated in accordance with the requirements as specified the electrical tests in IEC 61672-3:2013 (Clause 11.2, 13, 14, 15, 16, 17(If necessary) \*, 18, 19, 20 and 21).

\*The application of Clause 17 is based on the more than one level range of Sound Level Meter.

**Reference equipment used in the calibration:**

Description:	Model:	Serial No.	Calibration Date:	Traceable to:
Signal generator	DS 360	123901	29-Jul-2021	The Government of HKSAR Standards and Calibration Laboratory Huber Instrumente Calibration Laboratory
Meteo Station HM30	HM30	J120806	20-Aug-2021	

**Uncertainty:**

The measurement uncertainty evaluation has been carried out in accordance with principles in the Evaluation of Measurement Data – Guide to the Expression of Uncertainty in Measurement, JCGM 100:2008. The expanded measurement uncertainty  $U$ , with its coverage factor  $k$ , corresponds to an approximate 95% probability that the value of measurand  $Y$  lies within the interval  $y-U$  to  $y+U$ . The combined standard measurement uncertainty  $u_c$  can be calculated as  $u_c = U/k$  and its degree of freedom  $V_{\text{eff}}$  is given by the t-distribution with the respective  $k$  value.

*Certificate No.: A220029*

**Summary of Measurement Results**

Self-generated noise - IEC 61672-3 Ed.2.0 Clause 11  
Frequency weightings: A Network - IEC 61672-3 Ed.2.0 Clause 13.3  
Frequency weightings: C Network - IEC 61672-3 Ed.2.0 Clause 13.3  
Frequency weightings: Z Network - IEC 61672-3 Ed.2.0 Clause 13.3  
Frequency and time weightings at 1 kHz IEC 61672-3 Ed.2.0 Clause 14  
Long term stability test - IEC 61672-3 Ed.2.0 Clause 15  
Level linearity on the reference level range - IEC 61672-3 Ed.2.0 Clause 16  
Toneburst response - IEC 61672-3 Ed.2.0 Clause 18  
Peak C sound level - IEC 61672-3 Ed.2.0 Clause 19  
Overload indication - IEC 61672-3 Ed.2.0 Clause 20  
High level stability test - IEC 61672-3 Ed.2.0 Clause 21

**Verification:**

The verification measurements have been performed using the calibration system Nor1504A with software SImCal62Y8.exe.

Detailed measurement results are printed on the following pages.

**Comment:**

The values given in this Certificate of Calibration only relate to values measured at the time of the test and any measurement uncertainties quoted will not include allowances for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, or the capability of any other laboratory to repeat the measurement. The results apply to the item as received.

---

Hong Kong Accreditation Service (HKAS) has accredited this laboratory (Reg. No. HOKLAS 302) under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this certificate are traceable to the International System of Unit (SI) or recognised measurement standards. This certificate shall not be reproduced except in full.

ESG Matters Limited – Acoustic Calibration Centre  
Unit 1818-19, 18/F, Tower A, Regent Centre, 63 Wo Yi Hop Road, Kwai Chung, Hong Kong  
Tel : 2525 8033 Website : [www.esgmatters.asia](http://www.esgmatters.asia) Email : [email@esgmatters.asia](mailto:email@esgmatters.asia)



Certificate No.: A220029

#### Measurement results

Self-generated noise test - IEC 61672-3:2013 Clause 11			
Description: Relevant tests were carried out in accordance with Section 11 of IEC 61672-3:2013. The noise test is performed in the most sensitive of the SLM with the microphone replaced by an equivalent impedance.			
Noise level in A weighting network		15.7	dB
Noise level in C weighting network		19.9	dB
Noise level in Z (Lin) weighting network		23.3	dB

Frequency weighting test - IEC 61672-3:2013 Clause 13.3							
Description: Relevant tests were carried out in accordance with Section 13.3 of IEC 61672-3:2013. The frequency response of the weighting networks are tested at octave intervals over the frequency ranges 63.1Hz to 15848.9 Hz.							
On the reference level range and for each frequency weighting to be tested, the level of a 1 kHz input signal shall be adjusted to yield an indication that is 45 dB less than the upper boundary stated in the Instruction Manual for the linear operating range at 1 kHz on the reference level range.							

Frequency weighting A:								
Frequency	Reference level	Measured level	Expanded Measurement Uncertainty U	Coverage Factor k	Deviation	Acceptance limit (dB)		Maximum permitted uncertainty
Hz	dB	dB	dB		dB	+	-	dB
63.1	92.0	92.0	0.1	2.0	0.0	1.0	1.0	0.6
125.9	92.0	91.9	0.1		-0.1	1.0	1.0	
251.2	92.0	91.9	0.1		-0.1	1.0	1.0	
501.2	92.0	91.9	0.1		-0.1	1.0	1.0	
1000.0	92.0	92.0	0.1		0.0	0.7	0.7	
1995.3	92.0	91.9	0.1		-0.1	1.0	1.0	
3981.1	92.0	91.9	0.1		-0.1	1.0	1.0	0.7
7943.3	92.0	91.9	0.1		-0.1	1.5	2.5	
15848.9	92.0	91.9	0.1		-0.1	2.5	16	

Frequency weighting C:								
Frequency	Reference level	Measured level	Expanded Measurement Uncertainty U	Coverage Factor k	Deviation	Acceptance limit (dB)		Maximum permitted uncertainty
Hz	dB	dB	dB		dB	+	-	dB
63.1	92.0	91.9	0.1	2.0	-0.1	1.0	1.0	0.6
125.9	92.0	92.0	0.1		0.0	1.0	1.0	
251.2	92.0	91.9	0.1		-0.1	1.0	1.0	
501.2	92.0	92.0	0.1		0.0	1.0	1.0	
1000.0	92.0	92.0	0.1		0.0	0.7	0.7	
1995.3	92.0	91.9	0.1		-0.1	1.0	1.0	
3981.1	92.0	91.9	0.1		-0.1	1.0	1.0	
7943.3	92.0	91.9	0.1		-0.1	1.5	2.5	0.7
15848.9	92.0	91.9	0.1		-0.1	2.5	16	1.0

Hong Kong Accreditation Service (HKAS) has accredited this laboratory (Reg. No. HOKLAS 302) under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this certificate are traceable to the International System of Unit (SI) or recognised measurement standards. This certificate shall not be reproduced except in full.



Certificate No.: A220029

Frequency weighting Z:								
Frequency	Reference level	Measured level	Expanded Measurement Uncertainty U	Coverage Factor k	Deviation	Acceptance limit (dB)		Maximum permitted uncertainty
Hz	dB	dB	dB	2.0	dB	+	-	dB
63.1	92.0	92.0	0.1		0.0	1.0	1.0	0.6
125.9	92.0	91.9	0.1		-0.1	1.0	1.0	
251.2	92.0	91.9	0.1		-0.1	1.0	1.0	
501.2	92.0	92.0	0.1		0.0	1.0	1.0	
1000.0	92.0	92.0	0.1		0.0	0.7	0.7	
1995.3	92.0	91.9	0.1		-0.1	1.0	1.0	
3981.1	92.0	91.9	0.1		-0.1	1.0	1.0	
7943.3	92.0	91.9	0.1		-0.1	1.5	2.5	0.7
15848.9	92.0	91.9	0.1		-0.1	2.5	16	1.0

#### Frequency and time weighting test at 1kHz- IEC 61672-3:2013 Clause 14

Description:

Relevant tests were carried out in accordance with Section 14 of IEC 61672-3:2013. For a steady sinusoidal electrical input signal at 1 kHz on the reference level range and with an input signal that yields an indication of the reference sound pressure level with frequency weighting A, C and Z, with the sound level meter set to display F-time-weighted sound level, or time averaged sound level, as available. In addition, the indications with frequency weighting A shall be recorded with the sound level meter set to display F-time-weighted sound level, S-time-weighted sound level, and time-averaged sound level.

Parameter setting	Reference level	Measured Level	Expanded Measurement Uncertainty U	Coverage Factor k	Deviation	Acceptance Limits (dB)		Maximum permitted uncertainty
	dB	dB	dB		dB	+	-	dB
L <sub>AF</sub> SPL	114.0	114.0	0.1	2.0	0.0	0.2	0.2	0.2
L <sub>C</sub> F SPL	114.0	114.0	0.1		0.0			
L <sub>Z</sub> F SPL	114.0	114.0	0.1		0.0			
L <sub>As</sub> SPL	114.0	113.9	0.1		-0.1	0.1	0.1	
L <sub>A</sub> eq	114.0	114.0	0.1		0.0			
L <sub>A</sub> E	124.0	124.0	0.1		0.0			

#### Long term stability test - IEC 61672-3:2013 Clause 15

Description:

Relevant tests were carried out in accordance with Section 15 of IEC 61672-3:2013. The long-term stability of a sound level meter is evaluated from the difference between the A-weighted sound levels indicated in response to steady 1 kHz signals applied at the beginning and end of a period of operation. The period of continuous operation shall be between 25 min and 35 min are performed.

Test signal: Sine wave at 1 kHz

Time interval	Reading at beginning	Reading at Ending	Expanded Measurement Uncertainty U	Coverage Factor k	Deviation	Acceptance Limits (dB)		Maximum permitted uncertainty
mm:ss	dB	dB	dB		dB	+	-	dB
25:12	114.0	114.0	0.1	2.0	0.0	0.1	0.1	0.1

Hong Kong Accreditation Service (HKAS) has accredited this laboratory (Reg. No. HOKLAS 302) under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this certificate are traceable to the International System of Unit (SI) or recognised measurement standards. This certificate shall not be reproduced except in full.

ESG Matters Limited – Acoustic Calibration Centre

Unit 1818-19, 18/F, Tower A, Regent Centre, 63 Wo Yi Hop Road, Kwai Chung, Hong Kong

Tel : 2525 8033 Website : [www.esgmatters.asia](http://www.esgmatters.asia) Email : [email@esgmatters.asia](mailto:email@esgmatters.asia)

Certificate No.: A220029

**Level linearity on the reference level range test - IEC 61672-3:2013 Clause 16**

**Description:**

Relevant tests were carried out in accordance with Section 16 of IEC 61672-3:2013. Level linearity shall be tested with steady sinusoidal electrical signals at a frequency of 8 kHz with the sound level meter set for frequency-weighting A. Level linearity shall be measured in 5 dB steps of increasing input signal level from the starting point up to within 5 dB of the upper boundary stated in the Instruction Manual for the linear operating range at 8 kHz, then at 1 dB steps of increasing input signal level up to, but not including, the first indication of overload. The test of level linearity shall then be continued at 5 dB steps of decreasing input signal level from the starting point down to within 5 dB of the specified lower boundary, then at 1 dB steps of decreasing input signal level down to, but not including, the first indication of an under-range condition.

Reference level	Measured level	Expanded Measurement Uncertainty U	Coverage Factor k	Deviation	Acceptance limit (dB)		Maximum permitted uncertainty
dB	dB	dB		dB	+	-	dB
114.0	113.9	0.1	2.0	-0.1	0.8	0.8	0.3
119.0	118.9	0.1		-0.1			
124.0	123.9	0.1		-0.1			
129.0	128.9	0.1		-0.1			
132.0	131.9	0.1		-0.1			
133.0	132.9	0.1		-0.1			
134.0	133.9	0.1		-0.1			
135.0	134.9	0.1		-0.1			
136.0	136.0	0.1		0.0			
114.0	113.9	0.1		-0.1			
109.0	108.9	0.1		-0.1			
104.0	103.9	0.1		-0.1			
99.0	98.9	0.1		-0.1			0.3
94.0	93.9	0.1		-0.1			
89.0	88.9	0.1		-0.1			
84.0	83.9	0.1		-0.1			
79.0	78.9	0.1		-0.1			
74.0	73.9	0.1		-0.1			
69.0	68.9	0.1		-0.1			
64.0	63.9	0.1		-0.1			
59.0	58.9	0.1		-0.1			
54.0	53.9	0.1		-0.1			
49.0	48.9	0.1		-0.1			
44.0	43.9	0.1		-0.1			
39.0	38.9	0.1		-0.1			
34.0	34.0	0.1		0.0			
29.0	29.1	0.1		0.1			
28.0	28.1	0.1		0.1			
27.0	27.2	0.1		0.2			
26.0	26.3	0.1		0.3			
25.0	25.5	0.1		0.5			
24.0	24.5	0.1		0.5			

Hong Kong Accreditation Service (HKAS) has accredited this laboratory (Reg. No. HOKLAS 302) under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this certificate are traceable to the International System of Unit (SI) or recognised measurement standards. This certificate shall not be reproduced except in full.



Certificate No.: A220029

**Toneburst response test - IEC 61672-3:2013 Clause 18**

Description:

Relevant tests were carried out in accordance with Section 18 of IEC 61672-3:2013. For the toneburst signals, indications of the sound level meter to be recorded are maximum F-time-weighted sound level, maximum S-time-weighted sound level, and sound exposure level. The level of the steady input signal shall be adjusted to display an F-time-weighted, S time-weighted, or time-averaged sound level, as appropriate, that is 3 dB less than the upper boundary stated in the Instruction Manual for the linear operating range at 4 kHz on the reference level range.

For tests with the F time weighting, the indication shall be recorded of the maximum F time-weighted sound level in response to tonebursts having durations of 200 ms, 2 ms, and 0.25 ms.

For tests with the S time weighting, the indication shall be recorded of the maximum S time-weighted sound level in response to tonebursts having durations of 200 ms and 2 ms.

For measurements of sound exposure level (or time-averaged sound level for an averaging time that includes the toneburst), the indications in response to tonebursts having durations of 200 ms, 2 ms, and 0.25 ms.

Parameter setting	Burst duration	Reference level	Measured level	Expanded Measurement Uncertainty U	Coverage Factor k	Deviation	Acceptance limit (dB)		Maximum permitted uncertainty
	ms	dB	dB	dB		dB	+	-	dB
L <sub>AF</sub> MAX	200	134.0	133.9	0.1	2.0	-0.1	0.5	0.5	0.3
	2	117.0	116.7	0.1		-0.3	1.0	1.5	
	0.25	108.0	107.5	0.1		-0.5	1.0	3.0	
L <sub>AS</sub> MAX	200	127.6	127.5	0.1		-0.1	0.5	0.5	
	2	108.0	107.8	0.1		-0.2	1.0	3.0	
LAE	200	128.0	128.0	0.1		0.0	0.5	0.5	
	2	108.0	107.9	0.1		-0.1	1.0	1.5	
	0.25	99.0	98.6	0.1		-0.4	1.0	3.0	

Hong Kong Accreditation Service (HKAS) has accredited this laboratory (Reg. No. HOKLAS 302) under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this certificate are traceable to the International System of Unit (SI) or recognised measurement standards. This certificate shall not be reproduced except in full.

Certificate No.: A220029

**Peak C sound level test - IEC 61672-3:2013 Clause 19**

**Description:**

Relevant tests were carried out in accordance with Section 19 of IEC 61672-3:2013. Indications of C-weighted peak sound level shall be tested on the least-sensitive level range. The test signals consist of (a) a single complete cycle of an 8 kHz sinusoid starting and stopping at zero crossings and (b) positive and negative half cycles of a 500 Hz sinusoid that also start and stop at zero crossings.

The level of the steady sinusoidal 8 kHz electrical input signal, from which a single complete cycle is extracted, shall be adjusted to yield an indication of C-weighted, F-time-weighted sound level, or C-weighted, time-averaged sound level, that is 8 dB less than the upper boundary stated in the Instruction Manual for the peak level range at 8 kHz on the least sensitive level range.

The level of the steady sinusoidal 500 Hz electrical input signal, from which positive and negative half cycles are extracted, shall be adjusted to yield an indication of C-weighted, F time-weighted sound level, or C-weighted, time-averaged sound level, that is 8 dB less than the upper boundary stated in the Instruction Manual for the peak level range on the least-sensitive level range.

Pulse type	Pulse frequency	Reference Peak level	Measured level	Expanded Measurement Uncertainty U	Coverage Factor k	Deviation	Acceptance limit (dB)		Maximum permitted uncertainty
	Hz	dB	dB	dB		dB	+	-	dB
1 cycle	8000	129.40	129.20	0.10	2.00	-0.20	2.00	2.00	0.35
Positive cycle	500	131.40	131.30	0.10		-0.10	1.00	1.00	
Negative cycle	500	131.40	131.30	0.10		-0.10			

**Overload indication test - IEC 61672-3:2013 Clause 20**

**Description:**

Relevant tests were carried out in accordance with Section 20 of IEC 61672-3:2013. The sound level meter set to display A-weighted, time-averaged sound level. Positive and negative one-half cycle sinusoidal electrical signals at a frequency of 4 kHz.

The test shall begin at an indicated time-averaged level for the steady input signal that corresponds to 1 dB less than the upper boundary specified for the linear operating range at 4 kHz. The level of the single positive one-half-cycle input signal shall be increased to the first indication of overload, to a resolution of 0,1 dB. The process shall be repeated for the single negative one-half-cycle signal.

Overload indication at 4 kHz		Expanded Measurement Uncertainty U	Coverage Factor k	Deviation	Acceptance limit (dB)		Maximum permitted uncertainty
Positive one-half-cycle	Negative one-half-cycle				+	-	
dB	dB	dB		dB			dB
141.40	141.60	0.10	2.00	0.20	1.50	1.50	0.25

Hong Kong Accreditation Service (HKAS) has accredited this laboratory (Reg. No. HOKLAS 302) under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this certificate are traceable to the International System of Unit (SI) or recognised measurement standards. This certificate shall not be reproduced except in full.



Certificate No.: A220029

High level stability test - IEC 61672-3:2013 Clause 21							
Description: Relevant tests were carried out in accordance with Section 21 of IEC 61672-3:2013. The ability of a sound level meter to operate continuously in response to high signal levels without significant change in sensitivity is evaluated from the difference between the A weighted sound levels indicated in response to a steady 1 kHz electrical signal at the beginning and end of a 5 min period of continuous exposure to the signal.							
The level of the steady electrical input signal shall be that which is required to display the sound level that is 1 dB less than the upper boundary of the 1 kHz linear operating range on the least-sensitive level range.							
Reading at beginning	Reading at Ending	Expanded Measurement Uncertainty U	Coverage Factor k	Deviation	Acceptance Limits (dB)		Maximum permitted uncertainty
dB	dB	dB		dB	+	-	dB
136.0	136.0	0.1	2.0	0.0	0.1	0.1	0.1

**Remark:**

Acoustical levels are stated relative to 20μPa. Other dB levels are relative values.

- END -

Hong Kong Accreditation Service (HKAS) has accredited this laboratory (Reg. No. HOKLAS 302) under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this certificate are traceable to the International System of Unit (SI) or recognised measurement standards. This certificate shall not be reproduced except in full.

## Certificate of Calibration

Certificate No.: B220010

<b>Description:</b>	<b>Sound calibrator</b>
<b>Make:</b>	Norsonic
<b>Model:</b>	1256
<b>Serial No.:</b>	125626667
<b>Class:</b>	1
<b>Customer:</b>	Ramboll Hong Kong Limited
<b>Department:</b>	-
<b>Address:</b>	21/F, BEA Harbour View Centre, 56 Gloucester Road, Wanchai, Hong Kong
<b>Date of receipt the calibration item:</b>	2022-07-11
<b>Environmental conditions:</b>	
<b>Pressure:</b>	(99.43 $\pm$ 0.50) kPa
<b>Temperature:</b>	(25.4 $\pm$ 1.0) °C
<b>Humidity:</b>	(47.3 $\pm$ 2.0)%RH
<b>Date of calibration:</b>	2022-07-27
<b>Date of issue:</b>	2022-07-27

**Prepared by:**



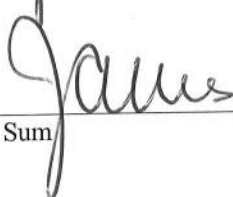
Wong Hau Chun

**Checked by:**



Choi Pui Sum

**Approved Signatory:**



Choi Pui Sum

Hong Kong Accreditation Service (HKAS) has accredited this laboratory (Reg. No. HOKLAS 302) under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this certificate are traceable to the International System of Unit (SI) or recognised measurement standards. This certificate shall not be reproduced except in full.

**Certificate No.:** B220010

**Preconditioning:**

The equipment was preconditioned for more than 12 hours at the measurement conditions of pressure, temperature and humidity.

**Measurement method:**

A description of the in-house test procedure (ESG-NOISE-003) is available separately from the calibration laboratory.

**Test Specification:**

The Sound Calibrator has been calibrated in accordance with the requirements as specified the in-house test procedure ESG-NOISE-003.

The verification measurements were performed using the calibration system Nor1504A with software CalCal62NCL.exe. As acoustical reference was used WSM - Nor1225-215371 with sensitivity: 54.76 mV/Pa.

**Reference equipment used in the calibration:**

Description:	Model:	Serial No.	Calibration Date:	Traceable to:
Signal generator	DS 360	123901	2021-07-30	The Government of HKSAR Standards and Calibration Laboratory
Multimeter	Agilent 34401A	MY41030277	2021-08-03	The Government of HKSAR Standards and Calibration Laboratory
Meteo Station HM30	HM30	J120806	2021-08-20	Huber Instrumente Calibration Laboratory
Reference microphone	Nor 1225	215371	2021-06-28	The Government of HKSAR Standards and Calibration Laboratory
Reference Calibrator	B&K 4231	3014997	2021-08-03	The Government of HKSAR Standards and Calibration Laboratory
Audio Analyzer	8903B	3011A11797	2021-08-13	China Ceprei Laboratory Calibration & Testing Centre

**Uncertainty:**

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor  $k$ , which with the reported effective degree of freedom corresponds to coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with EA publication EA-4/02.

The measurement uncertainty evaluation has been carried out in accordance with principles in the Evaluation of Measurement Data – Guide to the Expression of Uncertainty in Measurement, JCGM 100:2008. The expanded measurement uncertainty  $U$ , with its coverage factor  $k$ , corresponds to an approximate 95% probability that the value of measurand  $Y$  lies within the interval  $y-U$  to  $y+U$ . The combined standard measurement uncertainty  $u_c$  can be calculated as  $u_c = U/k$  and its degree of freedom  $\nu_{eff}$  is given by the t-distribution with the respective  $k$  value.

**Comment:**

The values given in this Certificate of Calibration only relate to values measured at the time of the test and any measurement uncertainties quoted will not include allowances for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, or the capability of any other laboratory to repeat the measurement. The results apply to the item as received.

All tests are performed according to in-house test procedure ESG-Noise-003.

Hong Kong Accreditation Service (HKAS) has accredited this laboratory (Reg. No. HOKLAS 302) under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this certificate are traceable to the International System of Unit (SI) or recognised measurement standards. This certificate shall not be reproduced except in full.

ESG Matters Limited – Acoustic Calibration Centre  
Unit 1818-19, 18/F, Tower A, Regent Centre, 63 Wo Yi Hop Road, Kwai Chung, Hong Kong  
Tel: 2525 8033 Website: [www.esgmatters.asia](http://www.esgmatters.asia) Email: [email@esgmatters.asia](mailto:email@esgmatters.asia)



Certificate No.: B220010

**Table 1**

**Sound Pressure Level Test Results**

Description:

Performance tests were carried out in accordance with Annex B.3.4.3.2 of IEC 60942:2003. The sound pressure level generated by the equipment was compare to the reference sound pressure level by the reference equipment B&K 4231 (Equipment No.:3014997).

Norsonic 1256			Measured Deviation (b) – (a)			Acceptance Limits	Maximum Permitted Uncertainty
Frequency Setting	Sound Pressure Level		Value y	Measurement Uncertainty			
	Expected Reading (a)	Measured Reading (b)		Expanded Measurement Uncertainty U (dB)	Coverage Factor k		
(Hz)	(dB)	(dB)	(dB)	(dB)		(dB)	(dB)
1000.00	94.00	93.91	-0.09	0.13	2.00	±0.40	0.15
	114.00	113.92	-0.08	0.13	2.00	±0.40	0.15

The calibrator was placed on top of the reference microphone, only held in place by gravity. At least three repetitions have been performed. No adapter ring was needed to obtain half inch configuration.

The calibrator level was not adjusted.

Hong Kong Accreditation Service (HKAS) has accredited this laboratory (Reg. No. HOKLAS 302) under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this certificate are traceable to the International System of Unit (SI) or recognised measurement standards. This certificate shall not be reproduced except in full.

ESG Matters Limited – Acoustic Calibration Centre  
Unit 1818-19, 18/F, Tower A, Regent Centre, 63 Wo Yi Hop Road, Kwai Chung, Hong Kong  
Tel: 2525 8033 Website: [www.esgmatters.asia](http://www.esgmatters.asia) Email: [email@esgmatters.asia](mailto:email@esgmatters.asia)



Certificate No.: B220010

**Table 2**  
**Frequency Test Results**

Description:

Relevant tests were carried out in accordance with Annex B.3.5 of IEC 60942:2003. The frequency of sound pressure level generated by the equipment was measured by the multimeter (Equipment No.: MY41030277).

Norsonic 1256			Measured Deviation [ =([b] – [a])/[a] x 100% ]			Acceptance Limits	Maximum Permitted Uncertainty
Sound Pressure Level Setting	Frequency		Value y	Measurement Uncertainty			
	Expected Reading (a)	Measured Reading (b)		Expanded Measurement Uncertainty U	Coverage Factor k		
(dB)	(Hz)	(Hz)	(%)	(%)		(%)	(%)
94.00	1000.00	1000.00	0.00	0.02	2.00	±1.00	0.30
114.00	1000.00	1000.01	0.00	0.02	2.00	±1.00	0.30

The calibrator was placed on top of the reference microphone, only held in place by gravity. At least three repetitions have been performed. No adapter ring was needed to obtain half inch configuration.

The calibrator level was not adjusted.

Hong Kong Accreditation Service (HKAS) has accredited this laboratory (Reg. No. HOKLAS 302) under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this certificate are traceable to the International System of Unit (SI) or recognised measurement standards. This certificate shall not be reproduced except in full.

ESG Matters Limited – Acoustic Calibration Centre  
Unit 1818-19, 18/F, Tower A, Regent Centre, 63 Wo Yi Hop Road, Kwai Chung, Hong Kong  
Tel: 2525 8033 Website: [www.esgmatters.asia](http://www.esgmatters.asia) Email: [email@esgmatters.asia](mailto:email@esgmatters.asia)

Certificate No.: B220010

**Table 3**

**Total Distortion Test Results**

Description:						
Relevant tests were carried out in accordance with Annex B.3.6 of IEC 60942:2003. The total distortion of the acoustic signal generated by the equipment was measured by the Laboratory's audio analyzer (Equipment No.: 3011A11797).						
Norsonic 1256		Measured Total Distortion			Acceptance Limits	Maximum Permitted Uncertainty
Frequency Setting	Sound Pressure Level Setting	Value y	Measurement Uncertainty			
			Expanded Measurement Uncertainty U	Coverage Factor k		
(Hz)	(dB)	(%)	(%)		(%)	(%)
1000.00	94.00	1.24	0.50	2.00	±3.00	0.50
	114.00	0.16	0.50	2.00	±3.00	0.50

The calibrator was placed on top of the reference microphone, only held in place by gravity. At least three repetitions have been performed. No adapter ring was needed to obtain half inch configuration.

The calibrator level was not adjusted.

The stated levels are relative to 20μPa. The distortion value (in %) is the signal to total noise ratio.

- END -

Hong Kong Accreditation Service (HKAS) has accredited this laboratory (Reg. No. HOKLAS 302) under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this certificate are traceable to the International System of Unit (SI) or recognised measurement standards. This certificate shall not be reproduced except in full.

**Appendix 6      Detailed Calculation of Fixed Source Noise Impact Assessment**

**Summary Result Table of Fixed Noise Assessment for the Proposed Development (dB(A), Leq-30mins)**  
*Day time and Evening and Night-time Base-Case Scenario*

Tower	Noise Sensitive Receiver (NSR)	dB(A)	Corresponding ANI	Excedence
T5	N5-01	47	65/55	N
GIC	GIC-01	47	65/55	N



Predicted Noise Level for Fixed Noise Impact Assessment - Base Case Scenario  
Day/Evening Time and Night-time  
N5-01

		NSR Coordinate:		x =		837868.8		y =		835806.6			
Source ID	Description	Industrial Noise Source Coordinate:		SPL	Ref dist.	SWL <sup>1</sup>	Qty	Horizontal distance from source to NSR (m)	Qty Corr.	Distance Corr.	Façade Corr.	Tonality Corr.	ANL
		x	y										
RC-1	Refrigerated Containers	837551.1	835836.4	72.7	10.0	100.7	1.0	319.1	0.0	-58.1	3.0	0.0	45.6
KW-1	VRV (Ref - Mitsubishi: PUHY-P450YJM-A(-BS)) <sup>2</sup>	837573.8	835766.7	--	--	82.0	2.0	297.7	3.0	-57.5	3.0	3.0	33.5
MY-1	VRV (Ref - Mitsubishi: PUHY-P450YJM-A(-BS)) <sup>2</sup>	837623.0	835652.1	--	--	82.0	8.0	290.4	9.0	-57.3	3.0	3.0	39.8
										Noise standard:	65/55	Overall	47

Note:  
1. Corrected SWL are estimated according to ISO 3746.  
2. Similar model of VRV has been referenced based on the desktop study

Predicted Noise Level for Fixed Noise Impact Assessment - Base Case Scenario

Day/Evening Time and Night-time

GIC-01 NSR Coordinate: x = 837871.0 y = 835799.6

Source ID	Description	Industrial Noise Source Coordinate:		SPL	Ref dist.	SWL <sup>1</sup>	Qty	Horizontal distance from source to NSR (m)	Qty Corr.	Distance Corr.	Façade Corr.	Tonality Corr.	ANL
		x	y										
RC-1	Refrigerated Containers	837551.1	835836.4	72.7	10.0	100.7	1.0	322.0	0.0	-58.2	3.0	0.0	45.5
KW-1	VRV (Ref - Mitsubishi: PUHY-P450YJM-A(-BS)) <sup>2</sup>	837573.8	835766.7	--	--	82.0	2.0	299.0	3.0	-57.5	3.0	3.0	33.5
MY-1	VRV (Ref - Mitsubishi: PUHY-P450YJM-A(-BS)) <sup>2</sup>	837623.0	835652.1	--	--	82.0	8.0	288.6	9.0	-57.2	3.0	3.0	39.8
										Noise standard:	65/55	Overall	47

Note:

- 1. Corrected SWL are estimated according to ISO 3746.
- 2. Similar model of VRV has been referenced based on the desktop study

Ref.: NFDUDWYTEI00\_0\_0030L.23

By Fax (2664 6342) and Post

1 November 2023

Meyer Aluminium Limited  
5 Dai Li Street,  
Tai Po Industrial Estate,  
New Territories, Hong Kong

Dear Sir/Madam,

**Proposed Public Residential Housing / Starter Homes Development at Lot 14 RP in Unsurveyed District at Wong Yue Tan and Adjoining Government Land and Proposed Private Residential Development at Lot 11 RP in Unsurveyed District at Wong Yue Tan and Adjoining Government Land, Tai Po, New Territories – Request for Information of the Chillers, Cooling Towers and VRVs**

We are the appointed environmental consultant to conduct environmental studies for the captioned project. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

According to desktop review, eight numbers of equipment (e.g. chillers, cooling towers and VRVs) are identified at the rooftop of the building which falls within the noise impact assessment area. In order to assess the potential noise impact to the Proposed Development, it would be grateful if you could provide the following information as available for the study:

- Inventory of equipment (e.g. Chillers, Cooling Tower, VRVs);
- The operation parameters of the equipment from the enclosed Location Plan:
  - Quantity (e.g. 2 nos Cooling Tower, 6 nos VRVs)
  - Operating Hour or Schedule (e.g. 9am to 6pm, Monday to Friday)
  - Particulars (e.g. catalogue, brand and model, power rating, sound emission data as available)
  - Acoustic / sound insulation measures adopted (e.g. acoustic silencers / noise enclosures)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 10 November 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2811 (email: [cchiu@ramboll.com](mailto:cchiu@ramboll.com)) or our Mr. Mike Kwan at 3465 2871 (email: [mikekwan@ramboll.com](mailto:mikekwan@ramboll.com)).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited

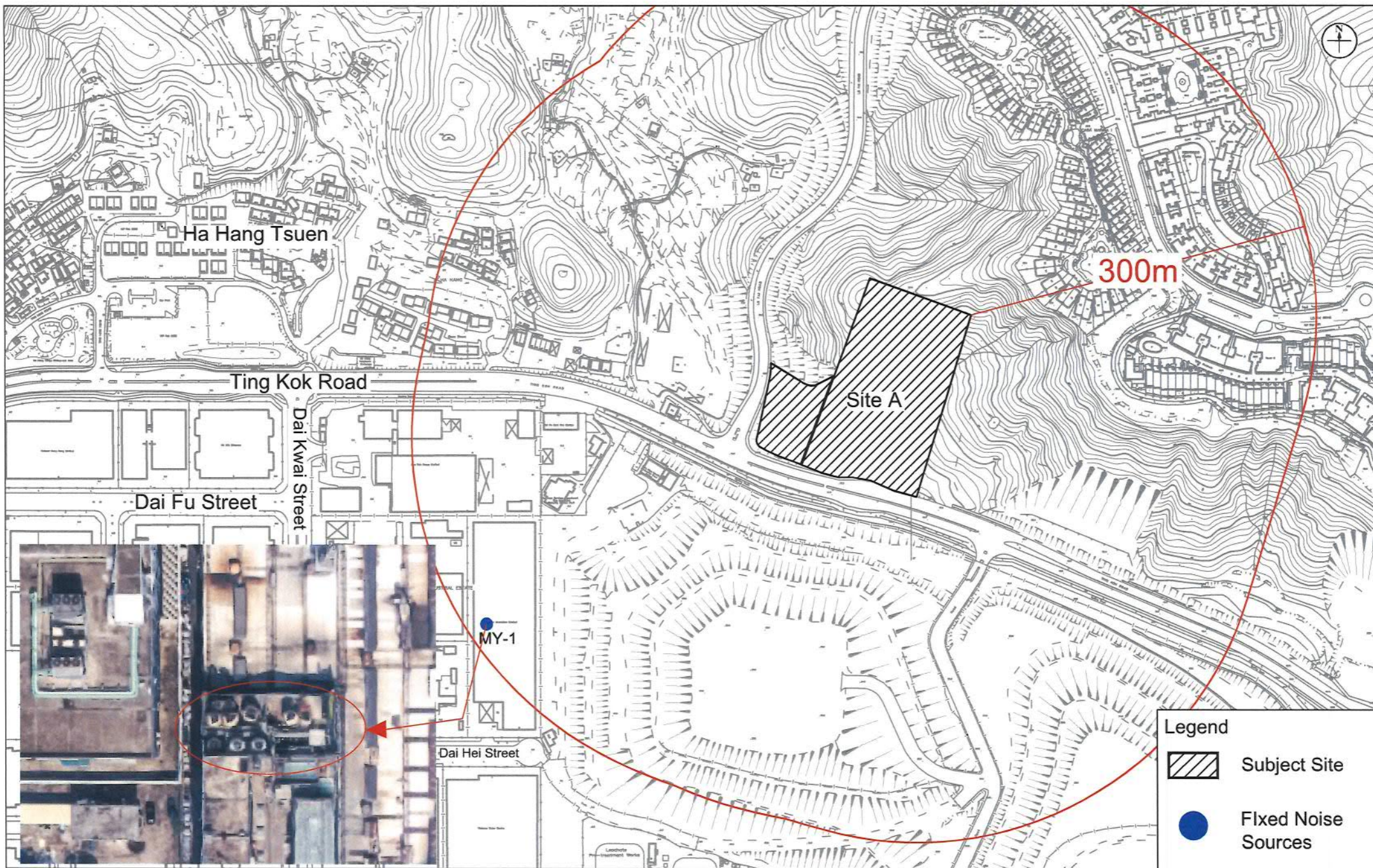


Calvin Chiu  
Senior Managing Consultant

Enclosure:      Location Plan of the Proposed Development

Q:\Projects\NFDUDWYTEI00\02 Project Management\02 Corr\NFDUDWYTEI00\_0\_0030L.23.docx







Ref.: NFDUDWYTEI00\_0\_0031L.23

By Fax (2786 0119) and Post

31 October 2023

Kee Wah Bakery Limited  
Kee Wah Industrial Building  
3/F, 666 Castle Peak Road,  
Cheung Sha Wan,  
Kowloon, Hong Kong

Dear Sir/Madam,

**Proposed Public Residential Housing / Starter Homes Development at Lot 14 RP in Unsurveyed District at Wong Yue Tan and Adjoining Government Land and Proposed Private Residential Development at Lot 11 RP in Unsurveyed District at Wong Yue Tan and Adjoining Government Land, Tai Po, New Territories – Request for Information of the VRVs at Kee Wah Group Limited, Tai Po Industrial Estate**

We are the appointed environmental consultant to conduct environmental studies for the captioned project. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

According to desktop review, two VRVs are identified at the rooftop of Kee Wah Group Limited at Tai Po Industrial Estate which falls within the noise impact assessment area. In order to assess the potential noise impact to the Proposed Development, it would be grateful if you could provide the following information of the identified equipment as available for the study:

- The operation parameters of equipment:
  - Quantity (e.g. 4 nos + 2 nos standby)
  - Operating Hour or Schedule (e.g. 9am to 6pm, Monday to Friday)
  - Location (layout / room layout plan)
  - Particulars (e.g. catalogue, brand and model, power rating, sound emission data as available)
  - Acoustic / sound insulation measures adopted (e.g. acoustic silencers / noise enclosures)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 10 November 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2811 (email: [cchiu@ramboll.com](mailto:cchiu@ramboll.com)) or our Mr. Mike Kwan at 3465 2871 (email: [mikekwan@ramboll.com](mailto:mikekwan@ramboll.com)).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Calvin Chiu  
Senior Managing Consultant

Enclosure:      Location Plan of the Proposed Development

Q:\Projects\NFDUDWYTEI00\02 Project Management\02 Corr\NFDUDWYTEI00\_0\_0031L.23.docx







**Appendix 7      Catalogue of Fixed Source Variable Refrigerant Volume (VRV)**

OUTDOOR UNIT  
Y Series  
PUHY-P YJM-A(-BS)



► Specifications

Model			PUHY-P350YJM-A(-BS)	PUHY-P400YJM-A(-BS)	PUHY-P450YJM-A(-BS)
Power source			3-phase 4-wire 380-400-415V 50/60Hz	3-phase 4-wire 380-400-415V 50/60Hz	3-phase 4-wire 380-400-415V 50/60Hz
Cooling capacity (Nominal)	*1	kW	40.0	45.0	50.0
		BTU / h	136,500	153,500	170,600
	Power input	kW	11.01	13.11	15.47
		A	18.5-17.6-17.0	22.1-21.0-20.2	26.1-24.8-23.9
		COP	3.63	3.43	3.23
Temp. range of cooling	Indoor	W.B.	15.0~24.0°C(59~75°F)	15.0~24.0°C(59~75°F)	15.0~24.0°C(59~75°F)
	Outdoor	D.B.	-5.0~46.0°C(23~115°F)	-5.0~46.0°C(23~115°F)	-5.0~46.0°C(23~115°F)
Heating capacity (Nominal)	*2	kW	45.0	50.0	56.0
		BTU / h	153,500	170,600	191,100
	Power input	kW	11.19	12.82	14.62
		A	18.8-17.9-17.2	21.6-20.5-19.8	24.6-23.4-22.5
		COP	4.02	3.90	3.83
Temp. range of heating	Indoor	W.B.	15.0~27.0°C(59~81°F)	15.0~27.0°C(59~81°F)	15.0~27.0°C(59~81°F)
	Outdoor	W.B.	-20.0~15.5°C(-4~60°F)	-20.0~15.5°C(-4~60°F)	-20.0~15.5°C(-4~60°F)
Indoor unit connectable	Total capacity		50~130 % of outdoor unit capacity	50~130 % of outdoor unit capacity	50~130 % of outdoor unit capacity
	Model / Quantity		P15~P250 / 1~30	P15~P250 / 1~34	P15~P250 / 1~39
Sound pressure level (measured in anechoic room)		dB <A>	60	61	62
Power pressure level (measured in anechoic room)		dB <A>	80	81	82
Refrigerant piping diameter	Liquid pipe	mm (in.)	12.7(1/2) Braze	12.7(1/2) Braze	15.88(5/8) Braze
	Gas pipe	mm (in.)	28.58(1-1/8) Braze	28.58(1-1/8) Braze	28.58(1-1/8) Braze
FAN	Type x Quantity		Propeller fan x 1	Propeller fan x 1	Propeller fan x 2
	Air flow rate	m³/min	210	210	370
		L/s	3,500	3,500	6,167
		cfm	7,415	7,415	13,065
	Driving mechanism		Inverter-control, Direct-driven by motor	Inverter-control, Direct-driven by motor	Inverter-control, Direct-driven by motor
Compressor	*3	Motor output	0.46 x 1	0.46 x 1	0.46 x 2
		External static press.	0 Pa (0 mmH₂O)	0 Pa (0 mmH₂O)	0 Pa (0 mmH₂O)
	Type x Quantity		Inverter scroll hermetic compressor	Inverter scroll hermetic compressor	Inverter scroll hermetic compressor
	Starting method		Inverter	Inverter	Inverter
	Motor output	kW	9.9	10.1	11.6
Case heater		kW	0.045	0.045	0.045
External finish			Pre-coated galvanized steel sheets (+powder coating for -BS type) <MUNSELL 5Y 8/1 or similar>	Pre-coated galvanized steel sheets (+powder coating for -BS type) <MUNSELL 5Y 8/1 or similar>	Pre-coated galvanized steel sheets (+powder coating for -BS type) <MUNSELL 5Y 8/1 or similar>
External dimension HxWxD		mm	1,710(1,650 without legs) x 1,220 x 760	1,710(1,650 without legs) x 1,220 x 760	1,710(1,650 without legs) x 1,750 x 760
		in.	67-3/8(65 without legs) x 48-1/16 x 29-15/16	67-3/8(65 without legs) x 48-1/16 x 29-15/16	67-3/8(65 without legs) x 68-15/16 x 29-15/16
Protection devices	High pressure protection		High pressure sensor, High pressure switch at 4.15MPa (601 psi)	High pressure sensor, High pressure switch at 4.15MPa (601 psi)	High pressure sensor, High pressure switch at 4.15MPa (601 psi)
	Inverter circuit (COMP./FAN)		Over-heat protection, Over-current protection	Over-heat protection, Over-current protection	Over-heat protection, Over-current protection
	Compressor		Over-heat protection	Over-heat protection	Over-heat protection
	Fan motor		Thermal switch	Thermal switch	Thermal switch
Refrigerant		Type x original charge	R410A x 11.5kg (26lbs)	R410A x 11.5kg (26lbs)	R410A x 11.8kg (27lbs)
Net weight		kg (lbs)	250(552)	250(552)	290(640)
Heat exchanger			Salt-resistant cross fin & copper tube	Salt-resistant cross fin & copper tube	Salt-resistant cross fin & copper tube
Optional parts			Joint: CMY-Y102SS/LS-G2, CMY-Y202S-G2 Header: CMY-Y104/108/1010-G	Joint: CMY-Y102SS/LS-G2, CMY-Y202S-G2 Header: CMY-Y104/108/1010-G	Joint: CMY-Y102SS/LS-G2, CMY-Y202S-G2 Header: CMY-Y104/108/1010-G



OUTDOOR UNIT  
Y Series  
PUHY-P YSJM-A(1)(-BS)



► Specifications

Model			PUHY-P500YSJM-A(-BS)		PUHY-P500YSJM-A1(-BS)		PUHY-P550YSJM-A(-BS)		PUHY-P600YSJM-A1(-BS)		
Power source			3-phase 4-wire 380-400-415V 50/60Hz		3-phase 4-wire 380-400-415V 50/60Hz		3-phase 4-wire 380-400-415V 50/60Hz		3-phase 4-wire 380-400-415V 50/60Hz		
Cooling capacity (Nominal)	*1	kW	56.0		56.0		63.0		69.0		
		BTU / h	191,100		191,100		215,000		235,400		
	Power input	kW	15.38		15.05		17.16		19.00		
		Current input	A	25.9-24.6-23.7		25.4-24.1-23.2		28.9-27.5-26.5		32.0-30.4-29.3	
		COP	kW / kW	3.64		3.72		3.67		3.63	
Temp. range of cooling	Indoor	W.B.	15.0~24.0°C(59~75°F)		15.0~24.0°C(59~75°F)		15.0~24.0°C(59~75°F)		15.0~24.0°C(59~75°F)		
	Outdoor	D.B.	-5.0~46.0°C(23~115°F)		-5.0~46.0°C(23~115°F)		-5.0~46.0°C(23~115°F)		-5.0~46.0°C(23~115°F)		
Heating capacity (Nominal)	*2	kW	63.0		63.0		69.0		76.5		
		BTU / h	215,000		215,000		235,400		261,000		
	Power input	kW	15.03		15.51		16.87		19.26		
		Current input	A	25.3-24.1-23.2		26.1-24.8-23.9		28.4-27.0-26.0		32.5-30.8-29.7	
		COP	kW / kW	4.19		4.06		4.09		3.97	
Temp. range of heating	Indoor	D.B.	15.0~27.0°C(59~81°F)		15.0~27.0°C(59~81°F)		15.0~27.0°C(59~81°F)		15.0~27.0°C(59~81°F)		
	Outdoor	W.B.	-20.0~15.5°C(-4~60°F)		-20.0~15.5°C(-4~60°F)		-20.0~15.5°C(-4~60°F)		-20.0~15.5°C(-4~60°F)		
Indoor unit connectable	Total capacity		50~130 % of outdoor unit capacity		50~130 % of outdoor unit capacity		50~130 % of outdoor unit capacity		50~130 % of outdoor unit capacity		
	Model / Quantity		P15-P250 / 1~43		P15-P250 / 1~43		P15-P250 / 1~47		P15-P250 / 1~50		
Sound pressure level (measured in anechoic room)		dB <A>	61		61		61.5		62		
Power pressure level (measured in anechoic room)		dB <A>	81		81		81.5		82		
Refrigerant piping diameter	Liquid pipe	mm (in.)	15.88(5/8) Brazed		15.88(5/8) Brazed		15.88(5/8) Brazed		15.88(5/8) Brazed		
	Gas pipe	mm (in.)	28.58(1-1/8) Brazed		28.58(1-1/8) Brazed		28.58(1-1/8) Brazed		28.58(1-1/8) Brazed		
Set Model											
Model			PUHY-P250YJM-A(-BS)	PUHY-P250YJM-A(-BS)	PUHY-P200YJM-A(-BS)	PUHY-P300YJM-A(-BS)	PUHY-P250YJM-A(-BS)	PUHY-P300YJM-A(-BS)	PUHY-P300YJM-A(-BS)	PUHY-P300YJM-A(-BS)	
FAN	Type x Quantity		Propeller fan x 1	Propeller fan x 1	Propeller fan x 1	Propeller fan x 1	Propeller fan x 1	Propeller fan x 1	Propeller fan x 1	Propeller fan x 1	
	Air flow rate	m³/min	170	170	170	170	170	170	170	170	
		L/s	2,833	2,833	2,833	2,833	2,833	2,833	2,833	2,833	
		cfm	6,003	6,003	6,003	6,003	6,003	6,003	6,003	6,003	
	Driving mechanism		Inverter-control, Direct-driven by motor		Inverter-control, Direct-driven by motor		Inverter-control, Direct-driven by motor		Inverter-control, Direct-driven by motor		
	Motor output	kW	0.46 x 1	0.46 x 1	0.46 x 1	0.46 x 1	0.46 x 1	0.46 x 1	0.46 x 1	0.46 x 1	
Compressor	*3 External static press.		0 Pa (0 mmH <sub>2</sub> O) 0 Pa (0 mmH <sub>2</sub> O)		0 Pa (0 mmH <sub>2</sub> O) 0 Pa (0 mmH <sub>2</sub> O)		0 Pa (0 mmH <sub>2</sub> O) 0 Pa (0 mmH <sub>2</sub> O)		0 Pa (0 mmH <sub>2</sub> O) 0 Pa (0 mmH <sub>2</sub> O)		
	Type x Quantity		Inverter scroll hermetic compressor		Inverter scroll hermetic compressor		Inverter scroll hermetic compressor		Inverter scroll hermetic compressor		
	Starting method		Inverter		Inverter		Inverter		Inverter		
	Motor output	kW	6.8	6.8	5.4	7.7	6.8	7.7	7.7	7.7	
	Case heater	kW	0.035	0.035	0.035	0.045	0.035	0.045	0.045	0.045	
External finish			Pre-coated galvanized steel sheets (+powder coating for -BS type) <MUNSELL 5Y 8/1 or similar>		Pre-coated galvanized steel sheets (+powder coating for -BS type) <MUNSELL 5Y 8/1 or similar>		Pre-coated galvanized steel sheets (+powder coating for -BS type) <MUNSELL 5Y 8/1 or similar>		Pre-coated galvanized steel sheets (+powder coating for -BS type) <MUNSELL 5Y 8/1 or similar>		
External dimension HxWxD		mm	1,710(1,650 without legs) x 920 x 760		1,710(1,650 without legs) x 920 x 760		1,710(1,650 without legs) x 920 x 760		1,710(1,650 without legs) x 920 x 760		
		in.	67-3/8(65 without legs) x 36-1/4 x 29-15/16		67-3/8(65 without legs) x 36-1/4 x 29-15/16		67-3/8(65 without legs) x 36-1/4 x 29-15/16		67-3/8(65 without legs) x 36-1/4 x 29-15/16		
Protection devices	High pressure protection		High pressure sensor, High pressure switch at 4.15MPa (601 psi)		High pressure sensor, High pressure switch at 4.15MPa (601 psi)		High pressure sensor, High pressure switch at 4.15MPa (601 psi)		High pressure sensor, High pressure switch at 4.15MPa (601 psi)		
	Inverter circuit (COMP./FAN)		Over-heat protection, Over-current protection		Over-heat protection, Over-current protection		Over-heat protection, Over-current protection		Over-heat protection, Over-current protection		
	Compressor		Over-heat protection		Over-heat protection		Over-heat protection		Over-heat protection		
	Fan motor		Thermal switch	Thermal switch	Thermal switch	Thermal switch	Thermal switch	Thermal switch	Thermal switch	Thermal switch	
Refrigerant		Type x original charge	R410A x 8.0kg (18lbs) R410A x 8.0kg (18lbs)		R410A x 6.5kg (15lbs) R410A x 8.0kg (18lbs)		R410A x 8.0kg (18lbs) R410A x 8.0kg (18lbs)		R410A x 8.0kg (18lbs) R410A x 8.0kg (18lbs)		
Net weight		kg (lbs)	200(441) 200(441)		190(419) 215(474)		200(441) 215(474)		215(474) 215(474)		
Heat exchanger			Salt-resistant cross fin & copper tube		Salt-resistant cross fin & copper tube		Salt-resistant cross fin & copper tube		Salt-resistant cross fin & copper tube		
Pipe between unit and distributor	Liquid pipe	mm (in.)	9.52(3/8) Braze 9.52(3/8) Braze		9.52(3/8) Braze 12.7(1/2) Braze		9.52(3/8) Braze 12.7(1/2) Braze		12.7(1/2) Braze 12.7(1/2) Braze		
	Gas pipe	mm (in.)	22.2(7/8) Braze 22.2(7/8) Braze		19.05(3/4) Braze 22.2(7/8) Braze		22.2(7/8) Braze 22.2(7/8) Braze		22.2(7/8) Braze 22.2(7/8) Braze		
Optional parts			Outdoor Twinning kit: CMY-Y100VBK2 Joint: CMY-Y102SS/LS-G2, CMY-Y202S-G2 Header: CMY-Y104/108/1010-G		Outdoor Twinning kit: CMY-Y100VBK2 Joint: CMY-Y102SS/LS-G2, CMY-Y202S-G2 Header: CMY-Y104/108/1010-G		Outdoor Twinning kit: CMY-Y100VBK2 Joint: CMY-Y102SS/LS-G2, CMY-Y202S/302S-G2 Header: CMY-Y104/108/1010-G		Outdoor Twinning kit: CMY-Y100VBK2 Joint: CMY-Y102SS/LS-G2, CMY-Y202S/302S-G2 Header: CMY-Y104/108/1010-G		

Notes:

\*1,\*2 Nominal conditions

	Indoor	Outdoor	Pipe length	Level difference
Cooling	27°C DB/19°C WB (81°F DB/66°F WB)	35°C DB(95°F DB)	7.5m (24-9/16ft.)	0m (0ft.)
Heating	20°C DB(68°F DB)	7°C DB/6°C WB(45°F DB/43°F WB)	7.5m (24-9/16ft.)	0m (0ft.)

\*3 External static pressure option is available (30Pa, 60Pa / 3.1mmH₂O, 6.1mmH₂O).  
\*Nominal condition \*1,\*2 are subject to JIS B8615-1.  
\*Due to continuing improvement, above specification may be subject to change without notice.

Notes:

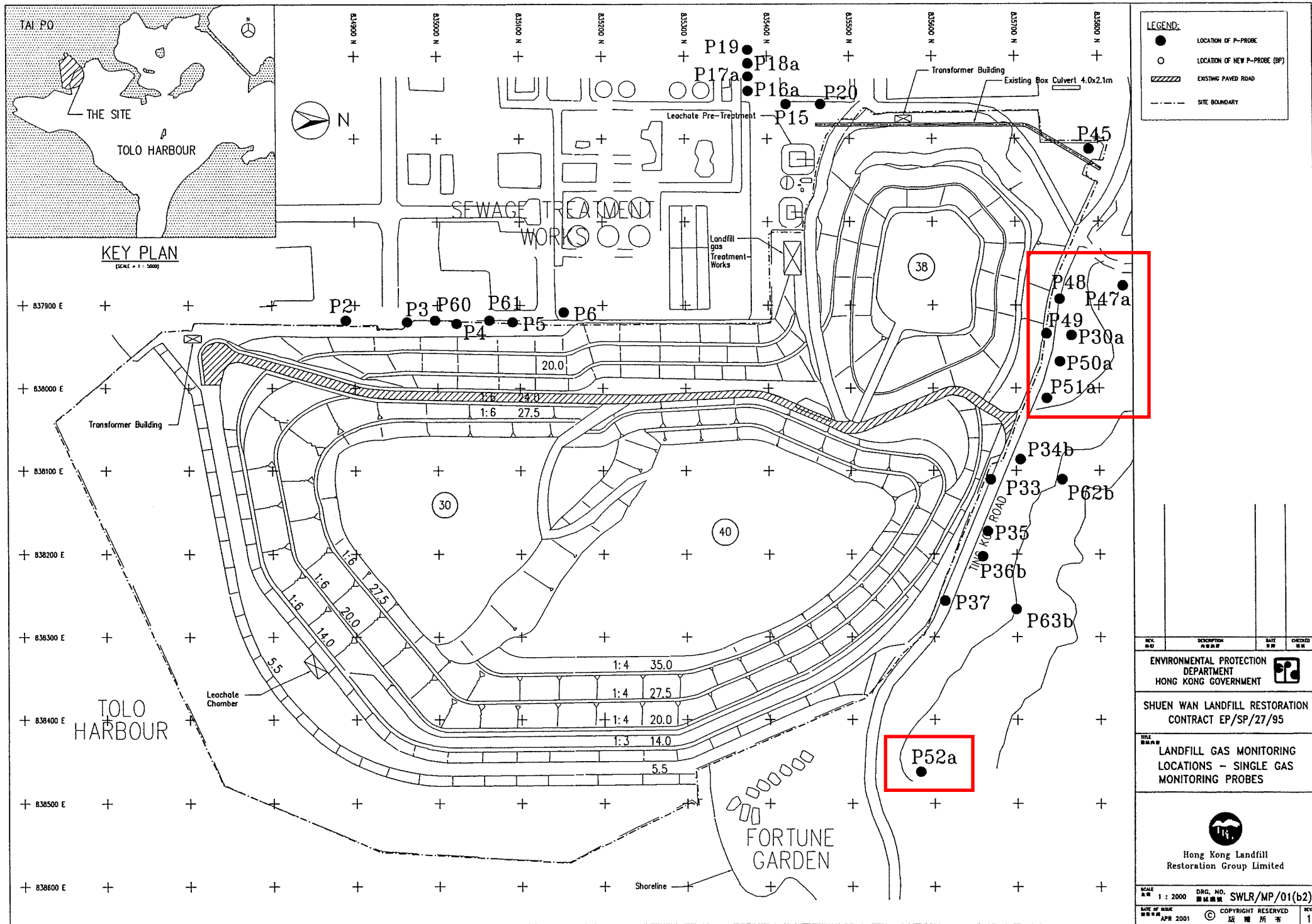
\*1,\*2 Nominal conditions

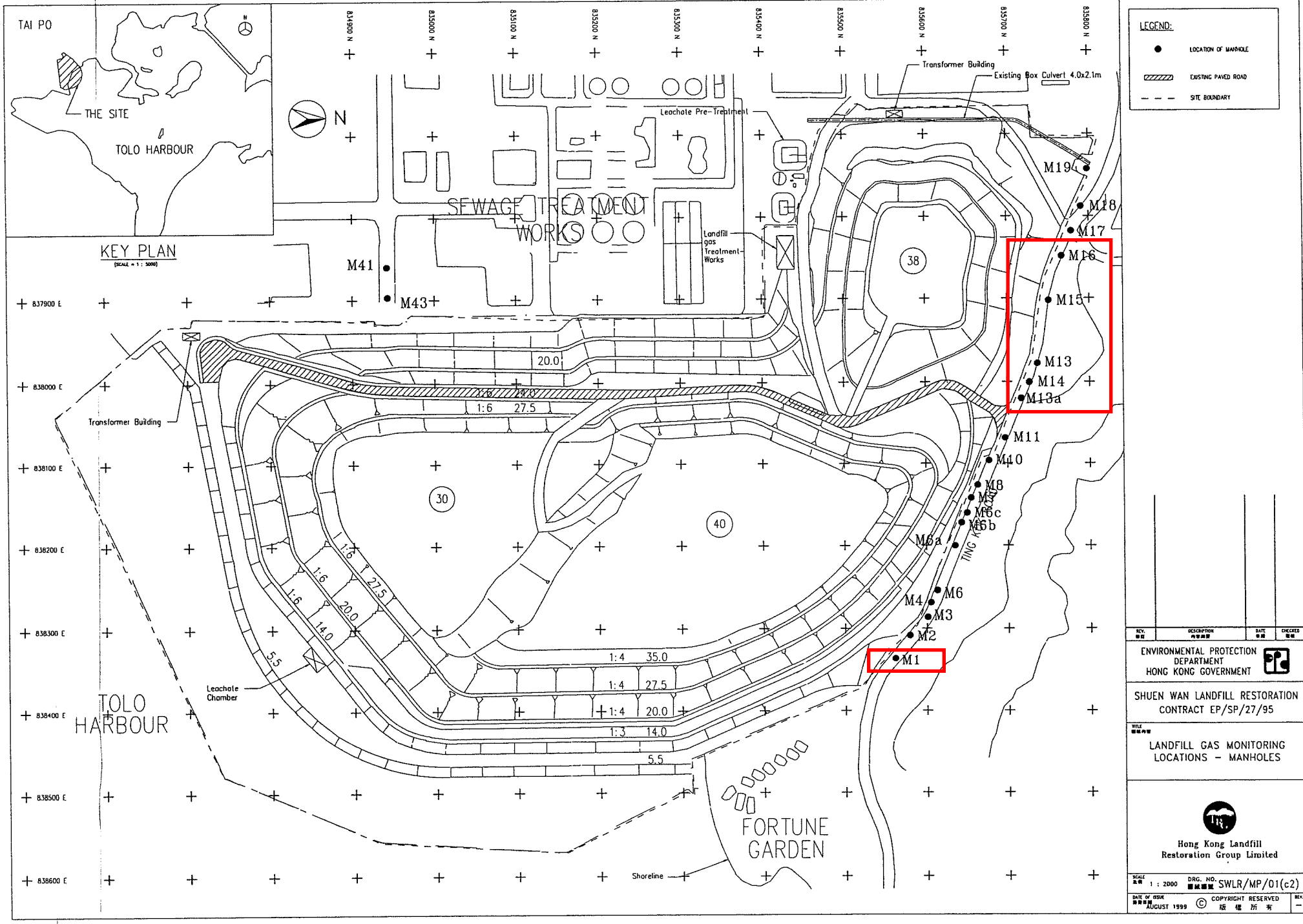
	Indoor	Outdoor	Pipe length	Level difference
Cooling	27°C DB/19°C WB (81°F DB/66°F WB)	35°C DB(95°F DB)	7.5m (24-9/16ft.)	0m (0ft.)
Heating	20°C DB(68°F DB)	7°C DB/6°C WB(45°F DB/43°F WB)	7.5m (24-9/16ft.)	0m (0ft.)

\*3 External static pressure option is available (30Pa, 60Pa / 3.1mmH₂O, 6.1mmH₂O).  
\*Nominal condition \*1,\*2 are subject to JIS B8615-1.  
\*Due to continuing improvement, above specification may be subject to change without notice.



**Appendix 8      Landfill Gas Monitoring Data at Nearest Monitoring Locations  
for 24-Month Period (5/2019-4/2021)**





**LEGEND:**

- LOCATION OF MANHOLE
- ▨ EXISTING PAVED ROAD
- - - SITE BOUNDARY

REV	DESCRIPTION	DATE	DRAWN

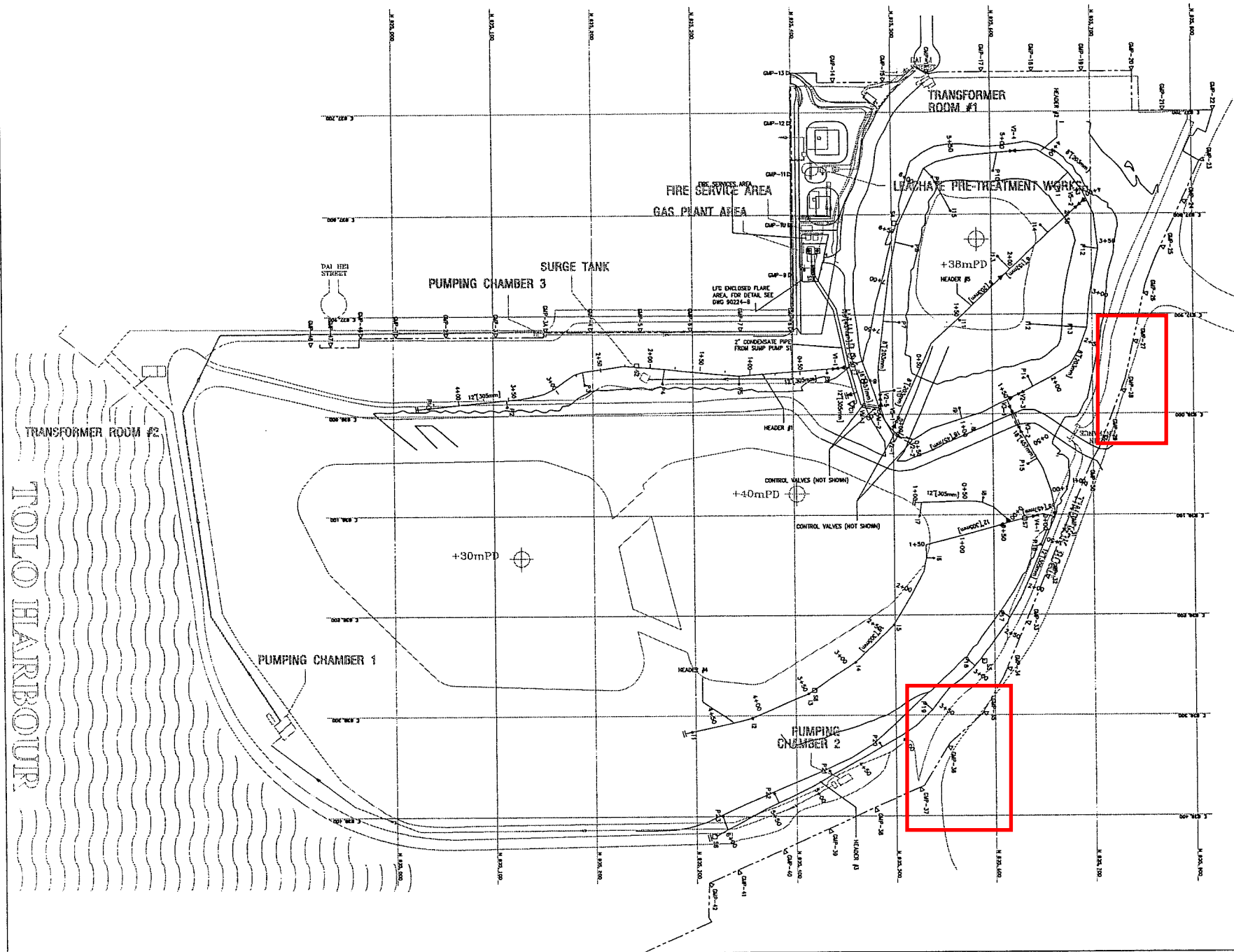
ENVIRONMENTAL PROTECTION DEPARTMENT  
HONG KONG GOVERNMENT

SHUEN WAN LANDFILL RESTORATION CONTRACT EP/SP/27/95

LANDFILL GAS MONITORING LOCATIONS - MANHOLES

Hong Kong Landfill Restoration Group Limited

SCALE 1 : 2000  
DATE OF ISSUE AUGUST 1999  
DRG. NO. SWLR/MP/01(c2)  
COPYRIGHT RESERVED



# LEGEND:

40

GENERAL FINISHED GRADE OF LANDFILL  
UPON COMPLETION OF LANDFILLING  
IN SEPTEMBER 1995

EXISTING PAVED ROAD

EXISTING PAVED ROAD

SITE BOUNDARY

SITE BOUNDARY

## NOTE:

1. THE SITE BOUNDARY SHOWN IS NOT AS PRESENTLY EXIST, BUT AS PROPOSED FOR THIS CONTRACT EP/SP/29/95.

## LEGEND

- OPW PERIMETER WELL
- OW INTERIOR WELL
- CV CONTROL VALVE
- CS CONDENSATE SUMP
- EC END CAP
- RC ROAD CROSSING
- HP HIGH POINT
- R REDUCER
- PL PROPERTY LINE
- MP MONITORING WELL
- TW TEST WELLS
- CI CONDENSATE INJECTION WELL

REV. DESCRIPTION DATE CHECKED

ENVIRONMENTAL PROTECTION  
DEPARTMENT  
HONG KONG GOVERNMENT



SHUEN WAN LANDFILL RESTORATION  
CONTRACT EP/SP/27/95

LANDFILL GAS  
MONITORING LOCATIONS  
EXISTING GAS EXTRACTION WELL



Hong Kong Landfill  
Restoration Group Limited

SCALE N.T.S. ORG. NO. SWLR/MP/01(d2)

DATE OF ISSUE AUGUST 1996 COPYRIGHT RESERVED 版權所有



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Apr-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP22S	04-Apr-19	12:15	Cloudy	79.7	0.0	0.0	20.3	24.0	
GMP35D	04-Apr-19	14:02	Cloudy	80.0	0.0	0.4	19.6	24.0	
GMP35M	04-Apr-19	14:01	Cloudy	80.0	0.0	0.2	19.8	24.0	
GMP35S	04-Apr-19	14:00	Cloudy	79.7	0.0	0.0	20.3	25.0	
GMP36D	04-Apr-19	14:10	Cloudy	80.0	0.0	0.2	19.8	25.0	
GMP36M	04-Apr-19	14:09	Cloudy	79.9	0.0	0.0	20.1	26.0	
GMP36S	04-Apr-19	14:08	Cloudy	80.0	0.0	0.1	19.9	25.0	
GMP37D	04-Apr-19	14:14	Cloudy	79.9	0.0	0.0	20.1	25.0	
GMP37M	04-Apr-19	14:13	Cloudy	79.8	0.0	0.0	20.2	25.0	
GMP37S	04-Apr-19	14:12	Cloudy	79.7	0.0	0.0	20.3	25.0	
GMP38M	04-Apr-19	14:17	Cloudy	80.0	0.0	0.2	19.8	26.0	
GMP38S	04-Apr-19	14:16	Cloudy	80.0	0.0	0.3	19.7	25.0	
GMP39M	04-Apr-19	14:21	Cloudy	79.8	0.0	0.0	20.2	24.0	

Prepared by:

Sammi Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Apr-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M1	11-Apr-19	14:00	Cloudy	79.8	0.0	0.0	20.2	30.0	
M2	11-Apr-19	14:01	Cloudy	79.9	0.0	0.0	20.1	29.0	
M3	11-Apr-19	14:02	Cloudy	79.7	0.0	0.1	20.2	30.0	
M4	11-Apr-19	14:03	Cloudy	79.9	0.0	0.0	20.1	30.0	
M6	11-Apr-19	14:04	Cloudy	79.8	0.0	0.0	20.2	29.0	
M6a	11-Apr-19	14:05	Cloudy	79.9	0.0	0.0	20.1	30.0	
M6b	11-Apr-19	14:06	Cloudy	79.8	0.0	0.0	20.2	29.0	
M6c	11-Apr-19	14:07	Cloudy	79.9	0.0	0.0	20.1	30.0	
M7	11-Apr-19	14:08	Cloudy	79.8	0.0	0.0	20.2	30.0	
M8	11-Apr-19	14:09	Cloudy	79.9	0.0	0.0	20.1	30.0	
M10	11-Apr-19	14:10	Cloudy	79.8	0.0	0.0	20.2	29.0	
M11	11-Apr-19	14:11	Cloudy	79.9	0.0	0.0	20.1	29.0	
M13	11-Apr-19	14:23	Cloudy	79.8	0.0	0.0	20.2	29.0	

Prepared by:

Sammi Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill

Date of measurement: Apr-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M13a	11-Apr-19	14:24	Cloudy	79.9	0.0	0.0	20.1	30.0	
M14	11-Apr-19	14:25	Cloudy	79.7	0.0	0.0	20.3	30.0	
M15	11-Apr-19	14:26	Cloudy	79.8	0.0	0.0	20.2	29.0	
M16	11-Apr-19	14:29	Cloudy	79.9	0.0	0.0	20.1	29.0	
M17	11-Apr-19	14:30	Cloudy	79.8	0.0	0.0	20.2	30.0	
M18	11-Apr-19	14:31	Cloudy	79.9	0.0	0.0	20.1	29.0	
M19	11-Apr-19	14:32	Cloudy	79.8	0.0	0.0	20.2	29.0	
M41	11-Apr-19	11:15	Cloudy	79.7	0.0	0.0	20.3	31.0	
M43	11-Apr-19	11:16	Cloudy	79.7	0.0	0.0	20.3	32.0	

Prepared by:

Sammi Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill

Date of measurement: Apr-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P2	26-Apr-19	11:35	Cloudy	79.6	0.0	0.0	20.4	31.0	
P3	26-Apr-19	11:40	Cloudy	79.8	0.0	0.0	20.2	31.0	
P4	26-Apr-19	11:48	Cloudy	80.0	0.0	0.2	19.8	34.0	
P5	26-Apr-19	11:50	Cloudy	80.1	0.0	0.0	19.9	34.0	
P6	26-Apr-19	11:56	Cloudy	80.0	0.0	0.0	20.0	34.0	
P15	11-Apr-19	15:14	Cloudy	79.9	0.0	0.0	20.1	30.0	
P16a	11-Apr-19	15:15	Cloudy	79.8	0.0	0.0	20.2	29.0	
P17a	11-Apr-19	15:16	Cloudy	80.0	0.0	0.2	19.8	29.0	
P18a	11-Apr-19	15:17	Cloudy	79.9	0.0	0.0	20.1	29.0	
P19	11-Apr-19	15:18	Cloudy	80.0	0.0	0.1	19.9	29.0	
P20	11-Apr-19	15:19	Cloudy	79.9	0.0	0.0	20.1	30.0	
P30aD	11-Apr-19	14:19	Cloudy	80.0	0.0	0.1	19.9	29.0	
P30aM	11-Apr-19	14:18	Cloudy	80.0	0.0	0.2	19.8	30.0	

Prepared by:

Sammi Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG




## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Apr-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P30aS	11-Apr-19	14:17	Cloudy	80.0	0.0	0.4	19.6	29.0	
P33	11-Apr-19	14:20	Cloudy	80.0	0.0	0.2	19.8	29.0	
P34bD	11-Apr-19	14:15	Cloudy	79.9	0.0	0.0	20.1	29.0	
P34bM	11-Apr-19	14:14	Cloudy	80.0	0.0	0.3	19.7	29.0	
P34bS	11-Apr-19	14:13	Cloudy	79.9	0.0	0.0	20.1	29.0	
P35	11-Apr-19	14:22	Cloudy	79.9	0.0	0.0	20.1	30.0	
P36bD	11-Apr-19	14:54	Cloudy	80.0	0.0	0.1	19.9	30.0	
P36bM	11-Apr-19	14:53	Cloudy	80.0	0.0	0.4	19.0	30.0	
P36bS	11-Apr-19	14:52	Cloudy	80.0	0.0	0.2	19.8	30.0	
P37	11-Apr-19	14:12	Cloudy	79.9	0.0	0.0	20.1	30.0	
P45	11-Apr-19	14:33	Cloudy	80.0	0.0	0.0	20.0	29.0	
P47aD	11-Apr-19	14:42	Cloudy	80.0	0.0	0.1	19.9	29.0	
P47aM	11-Apr-19	14:41	Cloudy	80.0	0.0	0.2	19.8	29.0	

Prepared by:

  
Sammi Lam

Checked by:

  
Mike Shek

HKLRG

EN/DS/001


## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Apr-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P47aS	11-Apr-19	14:40	Cloudy	79.9	0.0	0.0	20.1	30.0	
P48	11-Apr-19	14:28	Cloudy	79.9	0.0	0.0	20.1	29.0	
P49	11-Apr-19	14:27	Cloudy	79.8	0.0	0.0	20.2	30.0	
P50aD	11-Apr-19	14:46	Cloudy	79.9	0.0	0.0	20.1	29.0	
P50aM	11-Apr-19	14:45	Cloudy	80.0	0.0	0.2	19.8	29.0	
P50aS	11-Apr-19	14:44	Cloudy	80.0	0.0	0.4	19.6	30.0	
P51aD	11-Apr-19	14:49	Cloudy	79.9	0.0	0.0	20.1	29.0	
P51aM	11-Apr-19	14:48	Cloudy	80.0	0.0	0.1	19.9	30.0	
P51aS	11-Apr-19	14:47	Cloudy	80.0	0.0	0.2	19.8	29.0	
P52a	11-Apr-19	15:03	Cloudy	79.8	0.0	0.0	20.2	29.0	
P60M	26-Apr-19	11:45	Cloudy	80.0	0.0	0.1	19.9	34.0	
P60S	26-Apr-19	11:43	Cloudy	79.9	0.0	0.0	20.1	34.0	
P61M	26-Apr-19	11:54	Cloudy	80.0	0.0	0.3	19.7	30.0	

Prepared by:

  
Sammi Lam

Checked by:

  
Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: May-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP22S	10-May-19	11:21	Cloudy	80.0	0.0	0.0	20.0	27.0	
GMP35D	24-May-19	14:52	Cloudy	80.0	0.0	0.1	19.9	28.0	
GMP35M	24-May-19	14:51	Cloudy	80.0	0.0	0.2	19.8	28.0	
GMP35S	24-May-19	14:50	Cloudy	79.9	0.0	0.0	20.1	28.0	
GMP36D	24-May-19	15:32	Cloudy	80.0	0.0	0.3	19.7	28.0	
GMP36M	24-May-19	15:31	Cloudy	80.0	0.0	0.1	19.9	28.0	
GMP36S	24-May-19	15:30	Cloudy	79.9	0.0	0.0	20.1	27.0	
GMP37D	24-May-19	14:57	Cloudy	80.0	0.0	0.4	19.6	28.0	
GMP37M	24-May-19	14:56	Cloudy	80.0	0.0	0.2	19.8	27.0	
GMP37S	24-May-19	14:55	Cloudy	79.9	0.0	0.0	20.1	28.0	
GMP38M	24-May-19	15:00	Cloudy	80.0	0.0	0.1	19.9	28.0	
GMP38S	24-May-19	14:59	Cloudy	79.9	0.0	0.0	20.1	27.0	
GMP39M	24-May-19	15:04	Cloudy	80.0	0.0	0.3	19.7	28.0	

Prepared by:

Sammi Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: May-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M1	10-May-19	14:35	Cloudy	79.9	0.0	0.0	20.1	29.0	
M2	10-May-19	14:36	Cloudy	79.8	0.0	0.0	20.2	28.0	
M3	10-May-19	14:37	Cloudy	80.0	0.0	0.1	19.9	28.0	
M4	10-May-19	14:38	Cloudy	79.9	0.0	0.0	20.1	29.0	
M6	10-May-19	14:39	Cloudy	80.0	0.0	0.1	19.9	29.0	
M6a	10-May-19	14:40	Cloudy	79.9	0.0	0.0	20.1	28.0	
M6b	10-May-19	14:41	Cloudy	79.8	0.0	0.0	20.2	28.0	
M6c	10-May-19	14:42	Cloudy	80.0	0.0	0.0	20.0	28.0	
M7	10-May-19	14:45	Cloudy	79.9	0.0	0.0	20.1	28.0	
M8	10-May-19	14:46	Cloudy	79.8	0.0	0.0	20.2	27.0	
M10	10-May-19	14:47	Cloudy	79.9	0.0	0.0	20.1	28.0	
M11	10-May-19	14:48	Cloudy	79.7	0.0	0.0	20.3	29.0	
M13	10-May-19	14:49	Cloudy	79.9	0.0	0.0	20.1	28.0	

Prepared by:

Sammi Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: May-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M13a	10-May-19	14:50	Cloudy	79.8	0.0	0.0	20.2	28.0	
M14	10-May-19	14:51	Cloudy	79.9	0.0	0.0	20.1	29.0	
M15	10-May-19	14:52	Cloudy	79.8	0.0	0.0	20.2	28.0	
M16	10-May-19	14:53	Cloudy	79.8	0.0	0.0	20.2	28.0	
M17	10-May-19	14:54	Cloudy	79.7	0.0	0.0	20.3	29.0	
M18	10-May-19	14:55	Cloudy	79.9	0.0	0.0	20.1	29.0	
M19	10-May-19	14:56	Cloudy	79.8	0.0	0.0	20.2	28.0	
M41	10-May-19	15:35	Cloudy	79.7	0.0	0.0	20.3	28.0	
M43	10-May-19	15:36	Cloudy	79.8	0.0	0.0	20.2	28.0	

Prepared by:

Sammi Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: May-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P2	10-May-19	15:38	Cloudy	80.0	0.0	0.2	19.8	29.0	
P3	10-May-19	15:39	Cloudy	79.9	0.0	0.0	20.1	28.0	
P4	10-May-19	15:40	Cloudy	80.0	0.0	0.1	19.9	28.0	
P5	10-May-19	15:46	Cloudy	79.9	0.0	0.0	20.1	29.0	
P6	10-May-19	15:47	Cloudy	79.7	0.0	0.0	20.3	28.0	
P15	10-May-19	16:03	Cloudy	79.9	0.0	0.0	20.1	28.0	
P16a	10-May-19	16:02	Cloudy	79.9	0.0	0.0	20.1	29.0	
P17a	10-May-19	16:01	Cloudy	80.0	0.0	0.1	19.9	29.0	
P18a	10-May-19	16:00	Cloudy	79.9	0.0	0.0	20.1	29.0	
P19	10-May-19	15:59	Cloudy	80.0	0.0	0.2	19.8	29.0	
P20	10-May-19	15:58	Cloudy	79.9	0.0	0.0	20.1	29.0	
P30aD	10-May-19	15:30	Cloudy	79.9	0.0	0.0	20.1	29.0	
P30aM	10-May-19	15:29	Cloudy	80.0	0.0	0.2	19.8	29.0	

Prepared by:

Sammi Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: May-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P30aS	10-May-19	15:28	Cloudy	80.0	0.0	0.4	19.6	29.0	
P33	10-May-19	14:44	Cloudy	80.0	0.0	0.1	19.9	29.0	
P34bD	10-May-19	14:27	Cloudy	79.8	0.0	0.0	20.2	29.0	
P34bM	10-May-19	14:26	Cloudy	80.0	0.0	0.1	19.9	29.0	
P34bS	10-May-19	14:25	Cloudy	79.6	0.0	0.0	20.4	29.0	
P35	10-May-19	14:43	Cloudy	80.0	0.0	0.2	19.8	29.0	
P36bD	10-May-19	14:16	Cloudy	80.0	0.0	1.0	19.0	29.0	
P36bM	10-May-19	14:16	Cloudy	79.7	0.0	0.0	20.3	29.0	
P36bS	10-May-19	14:15	Cloudy	79.7	0.0	0.0	20.3	29.0	
P37	10-May-19	15:24	Cloudy	80.0	0.0	0.2	19.8	29.0	
P45	10-May-19	11:22	Cloudy	79.9	0.0	0.0	20.1	27.0	
P47aD	10-May-19	15:07	Cloudy	80.0	0.0	0.3	19.7	28.0	
P47aM	10-May-19	15:06	Cloudy	80.0	0.0	0.4	19.6	28.0	

Prepared by:

Sammi Lam

Checked by:

Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: May-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P47aS	10-May-19	15:05	Cloudy	80.0	0.0	0.1	19.9	29.0	
P48	10-May-19	15:00	Cloudy	80.0	0.0	0.4	19.6	28.0	
P49	10-May-19	14:58	Cloudy	79.9	0.0	0.0	20.1	28.0	
P50aD	10-May-19	15:12	Cloudy	79.9	0.0	0.0	20.1	28.0	
P50aM	10-May-19	15:11	Cloudy	80.0	0.0	0.1	19.9	28.0	
P50aS	10-May-19	15:10	Cloudy	79.8	0.0	0.0	20.2	29.0	
P51aD	10-May-19	15:15	Cloudy	79.9	0.0	0.0	20.1	28.0	
P51aM	10-May-19	15:14	Cloudy	80.0	0.0	0.2	19.8	29.0	
P51aS	10-May-19	15:13	Cloudy	80.0	0.0	0.4	19.6	28.0	
P52a	31-May-19	13:20	Cloudy	79.9	0.0	0.0	20.1	28.0	
P60M	10-May-19	15:42	Cloudy	79.6	0.0	0.2	20.2	28.0	
P60S	10-May-19	15:41	Cloudy	79.6	0.0	0.0	20.4	29.0	
P61M	10-May-19	15:44	Cloudy	79.7	0.0	0.1	20.2	28.0	

Prepared by:

Sammi Lam

Checked by:

Mike Shek

HKLRG

EN/DS/001




## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jun-19


Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP23S	06-Jun-19	14:24	Sunny	80.0	0.0	0.3	19.7	29.0	No compliance
GMP24D	06-Jun-19	14:27	Sunny	80.0	0.0	0.2	19.8	29.0	No compliance
GMP24M	06-Jun-19	14:28	Sunny	79.9	0.0	0.0	20.1	30.0	No compliance
GMP24S	06-Jun-19	14:29	Sunny	79.7	0.0	0.0	20.3	30.0	No compliance
GMP25D	06-Jun-19	14:31	Sunny	80.0	0.0	0.3	19.7	30.0	No compliance
GMP25M	06-Jun-19	14:32	Sunny	80.0	0.0	0.2	19.8	29.0	No compliance
GMP25S	06-Jun-19	14:33	Sunny	79.9	0.0	0.0	20.1	30.0	No compliance
GMP26D	06-Jun-19	14:36	Sunny	79.8	0.0	0.0	20.2	30.0	No compliance
GMP26M	06-Jun-19	14:37	Sunny	80.0	0.0	0.1	19.9	30.0	No compliance
GMP26S	06-Jun-19	14:38	Sunny	79.8	0.0	0.0	20.2	29.0	No compliance
GMP27D	06-Jun-19	14:41	Sunny	79.9	0.0	0.0	20.1	29.0	No compliance
GMP27M	06-Jun-19	14:42	Sunny	79.8	0.0	0.0	20.2	29.0	No compliance
GMP27S	06-Jun-19	14:43	Sunny	80.0	0.0	0.2	19.8	29.0	No compliance

Prepared by:

  
Sammi Lam

Checked by:

  
Mike Shek

HKLRG

EN/DS/001


## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jun-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP28D	06-Jun-19	14:46	Sunny	79.9	0.0	0.0	20.1	30.0	No compliance
GMP28M	06-Jun-19	14:47	Sunny	80.0	0.0	0.0	20.0	30.0	No compliance
GMP28S	06-Jun-19	14:48	Sunny	79.9	0.0	0.0	20.1	30.0	No compliance
GMP29D	06-Jun-19	14:52	Sunny	79.8	0.0	0.0	20.2	30.0	No compliance
GMP29M	06-Jun-19	14:53	Sunny	79.7	0.0	0.0	20.3	30.0	No compliance
GMP29S	06-Jun-19	14:54	Sunny	79.9	0.0	0.0	20.1	30.0	No compliance
GMP30D	06-Jun-19	14:57	Sunny	79.9	0.0	0.0	20.1	31.0	No compliance
GMP30M	06-Jun-19	14:58	Sunny	80.0	0.0	0.1	19.9	32.0	No compliance
GMP30S	06-Jun-19	14:59	Sunny	79.9	0.0	0.0	20.1	32.0	No compliance
GMP31D	06-Jun-19	15:01	Sunny	80.0	0.0	0.2	19.8	33.0	No compliance
GMP31M	06-Jun-19	15:02	Sunny	79.9	0.0	0.0	20.1	32.0	No compliance
GMP31S	06-Jun-19	15:03	Sunny	80.0	0.0	0.3	19.7	33.0	No compliance
GMP32D	06-Jun-19	15:06	Sunny	79.9	0.0	0.0	20.1	33.0	No compliance

Prepared by:

  
Sammi Lam

Checked by:

  
Mike Shek

HKLRG

EN/DS/001


## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jun-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP32M	06-Jun-19	15:07	Sunny	80.0	0.0	0.2	19.8	32.0	No compliance
GMP32S	06-Jun-19	15:08	Sunny	80.0	0.0	0.4	19.6	32.0	No compliance
GMP33D	06-Jun-19	15:12	Sunny	79.9	0.0	0.0	20.1	32.0	No compliance
GMP33M	06-Jun-19	15:13	Sunny	79.7	0.0	0.0	20.3	32.0	No compliance
GMP33S	06-Jun-19	15:14	Sunny	80.0	0.0	0.2	19.8	33.0	No compliance
GMP34D	06-Jun-19	15:18	Sunny	79.9	0.0	0.0	20.1	33.0	No compliance
GMP34M	06-Jun-19	15:19	Sunny	80.0	0.0	0.3	19.7	32.0	No compliance
GMP34S	06-Jun-19	15:20	Sunny	79.9	0.0	0.0	20.1	32.0	No compliance
GMP35D	06-Jun-19	15:23	Sunny	80.0	0.0	0.1	19.9	32.0	
GMP35M	06-Jun-19	15:24	Sunny	79.9	0.0	0.0	20.1	32.0	
GMP35S	06-Jun-19	15:25	Sunny	79.8	0.0	0.0	20.2	33.0	
GMP36D	06-Jun-19	15:28	Sunny	80.0	0.0	0.3	19.7	31.0	
GMP36M	06-Jun-19	15:29	Sunny	79.9	0.0	0.0	20.1	32.0	

Prepared by:

  
Sammi Lam

Checked by:

  
Mike Shek

EN/DS-001

HKLRG


## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jun-19


Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP36S	06-Jun-19	15:30	Sunny	80.0	0.0	0.2	19.8	32.0	
GMP37D	06-Jun-19	15:32	Sunny	79.9	0.0	0.0	20.1	31.0	
GMP37M	06-Jun-19	15:33	Sunny	79.8	0.0	0.0	20.2	31.0	
GMP37S	06-Jun-19	15:34	Sunny	80.0	0.0	0.2	19.8	31.0	
GMP38M	06-Jun-19	15:37	Sunny	79.9	0.0	0.0	20.1	31.0	
GMP38S	06-Jun-19	15:38	Sunny	80.0	0.0	0.3	19.7	31.0	
GMP39M	06-Jun-19	15:39	Sunny	79.6	0.0	0.0	20.4	31.0	
GMP39S	06-Jun-19	15:40	Sunny	79.8	0.0	0.0	20.2	31.0	
GMP40M	06-Jun-19	15:42	Sunny	79.6	0.0	0.0	20.4	31.0	
GMP40S	06-Jun-19	15:43	Sunny	79.7	0.0	0.0	20.3	31.0	
GMP41M	06-Jun-19	15:48	Sunny	80.1	0.0	0.1	19.8	31.0	
GMP41S	06-Jun-19	15:49	Sunny	80.0	0.0	0.2	19.8	32.0	
GMP42D	06-Jun-19	15:51	Sunny	79.6	0.0	0.0	20.4	32.0	

Prepared by:

  
Sammi Lam

Checked by:

  
Mike Shek

EN/DS-001

HKLRG




## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jun-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M1	21-Jun-19	14:58	Sunny	79.9	0.0	0.0	20.1	34.0	
M2	21-Jun-19	14:59	Sunny	79.8	0.0	0.0	20.2	33.0	
M3	21-Jun-19	15:00	Sunny	79.7	0.0	0.0	20.3	33.0	
M4	21-Jun-19	15:01	Sunny	79.8	0.0	0.0	20.2	33.0	
M6	21-Jun-19	15:05	Sunny	79.9	0.0	0.0	20.1	34.0	
M6a	21-Jun-19	15:06	Sunny	79.8	0.0	0.0	20.2	33.0	
M6b	21-Jun-19	15:07	Sunny	79.7	0.0	0.0	20.3	33.0	
M6c	21-Jun-19	15:08	Sunny	79.6	0.0	0.0	20.4	34.0	
M7	21-Jun-19	15:09	Sunny	97.99	0.0	0.0	2.01	33.0	
M8	21-Jun-19	15:10	Sunny	79.8	0.0	0.0	20.2	32.0	
M10	21-Jun-19	15:11	Sunny	79.9	0.0	0.0	20.1	33.0	
M11	21-Jun-19	15:12	Sunny	79.7	0.0	0.0	20.3	34.0	
M13	21-Jun-19	14:01	Sunny	79.8	0.0	0.0	20.2	33.0	

Prepared by:

  
Sammi Lam

Checked by:

  
Mike Shek

HKLRG

EN/DS/001


## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jun-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M13a	21-Jun-19	14:00	Sunny	79.9	0.0	0.0	20.1	33.0	
M14	21-Jun-19	14:02	Sunny	79.8	0.0	0.0	20.2	34.0	
M15	21-Jun-19	14:03	Sunny	79.9	0.0	0.0	20.1	33.0	
M16	21-Jun-19	14:04	Sunny	79.8	0.0	0.0	20.2	34.0	
M17	21-Jun-19	14:11	Sunny	79.9	0.0	0.0	20.1	34.0	
M18	21-Jun-19	14:12	Sunny	79.8	0.0	0.0	20.2	33.0	
M19	21-Jun-19	14:13	Sunny	79.9	0.0	0.0	20.1	33.0	
M41	21-Jun-19	12:10	Sunny	79.8	0.0	0.0	20.2	34.0	
M43	21-Jun-19	12:11	Sunny	79.7	0.0	0.0	20.3	34.0	

Prepared by:

  
Sammi Lam

Checked by:

  
Mike Shek

HKLRG

EN/DS/001


## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jun-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P2	21-Jun-19	11:55	Sunny	79.9	0.0	0.0	20.1	34.0	
P3	21-Jun-19	11:56	Sunny	80.0	0.0	0.1	19.9	33.0	
P4	21-Jun-19	11:57	Sunny	79.9	0.0	0.0	20.1	34.0	
P5	21-Jun-19	11:58	Sunny	80.0	0.0	0.2	19.8	33.0	
P6	21-Jun-19	11:59	Sunny	79.9	0.0	0.0	20.1	34.0	
P15	21-Jun-19	11:43	Sunny	79.9	0.0	0.0	20.1	34.0	
P16a	21-Jun-19	11:45	Sunny	79.8	0.0	0.0	20.2	34.0	
P17a	21-Jun-19	11:42	Sunny	79.8	0.0	0.0	20.2	34.0	
P18a	21-Jun-19	11:41	Sunny	79.8	0.0	0.0	20.2	34.0	
P19	21-Jun-19	11:37	Sunny	79.9	0.0	0.0	20.1	34.0	
P20	21-Jun-19	11:39	Sunny	79.8	0.0	0.0	20.2	34.0	
P30aD	21-Jun-19	14:35	Sunny	80.0	0.0	0.1	19.9	34.0	
P30aM	21-Jun-19	14:34	Sunny	80.0	0.0	1.0	19.0	34.0	

Prepared by:

  
Sammi Lam

Checked by:

  
Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jun-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P30aS	21-Jun-19	14:33	Sunny	80.0	0.0	0.3	19.7	34.0	
P33	21-Jun-19	15:16	Sunny	79.9	0.0	0.0	20.1	33.0	
P34bD	21-Jun-19	14:39	Sunny	79.9	0.0	0.0	20.1	34.0	
P34bM	21-Jun-19	14:38	Sunny	80.0	0.0	0.4	19.6	33.0	
P34bS	21-Jun-19	14:37	Sunny	80.0	0.0	0.2	19.8	34.0	
P35	21-Jun-19	15:15	Sunny	80.0	0.0	0.2	19.8	33.0	
P36bD	21-Jun-19	14:44	Sunny	80.0	0.0	0.3	19.7	34.0	
P36bM	21-Jun-19	14:43	Sunny	80.0	0.0	0.2	19.8	34.0	
P36bS	21-Jun-19	14:42	Sunny	80.0	0.0	0.2	19.8	34.0	
P37	21-Jun-19	15:04	Sunny	80.0	0.0	0.1	19.9	33.0	
P45	21-Jun-19	14:10	Sunny	79.9	0.0	0.0	20.1	34.0	
P47aD	21-Jun-19	14:19	Sunny	80.0	0.0	0.4	19.6	33.0	
P47aM	21-Jun-19	14:18	Sunny	80.0	0.0	0.2	19.8	34.0	

Prepared by:

  
Sammi Lam

Checked by:

  
Mike Shek

EN/DS/001

HKLRG


## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jun-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P47aS	21-Jun-19	14:17	Sunny	79.8	0.0	0.0	20.2	33.0	
P48	21-Jun-19	14:07	Sunny	79.9	0.0	0.0	20.1	33.0	
P49	21-Jun-19	14:05	Sunny	79.8	0.0	0.0	20.2	34.0	
P50aD	21-Jun-19	14:25	Sunny	80.0	0.0	0.4	19.6	32.0	
P50aM	21-Jun-19	14:23	Sunny	79.8	0.0	0.0	20.2	33.0	
P50aS	21-Jun-19	14:22	Sunny	79.7	0.0	0.0	20.3	33.0	
P51aD	21-Jun-19	14:28	Sunny	80.0	0.0	0.3	19.7	32.0	
P51aM	21-Jun-19	14:27	Sunny	79.9	0.0	0.0	20.1	33.0	
P51aS	21-Jun-19	14:26	Sunny	80.0	0.0	0.2	19.8	34.0	
P52a	21-Jun-19	14:47	Sunny	80.0	0.0	0.4	19.6	33.0	
P60M	21-Jun-19	14:49	Sunny	79.9	0.0	0.0	20.1	33.0	
P60S	21-Jun-19	14:48	Sunny	80.0	0.0	0.2	19.8	32.0	
P61M	21-Jun-19	14:46	Sunny	79.9	0.0	0.0	20.1	33.0	

Prepared by:

  
Sammi Lam

Checked by:

  
Mike Shek

EN/DS/001

HKLRG


## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jun-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P61S	21-Jun-19	14:45	Sunny	79.8	0.0	0.0	20.2	32.0	
P62bD	21-Jun-19	12:04	Sunny	80.0	0.0	0.2	19.8	33.0	
P62bM	21-Jun-19	12:03	Sunny	80.0	0.0	0.4	19.6	33.0	
P62bS	21-Jun-19	12:02	Sunny	79.7	0.0	0.0	20.3	32.0	
P63bD	21-Jun-19	12:08	Sunny	79.9	0.0	0.0	20.1	33.0	
P63bM	21-Jun-19	12:07	Sunny	80.0	0.0	0.3	19.7	33.0	
P63bS	21-Jun-19	12:06	Sunny	79.9	0.0	0.0	20.1	32.0	

Prepared by:

  
Sammi Lam

Checked by:

  
Mike Shek

EN/DS/001

HKLRG



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jul-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP22S	05-Jul-19	11:30	Sunny	81.1	0.0	0.0	18.9	28.0	
GMP35D	05-Jul-19	10:37	Sunny	80.0	0.0	0.1	19.9	28.0	
GMP35M	05-Jul-19	10:38	Sunny	80.0	0.0	0.2	19.8	28.0	
GMP35S	05-Jul-19	10:39	Sunny	79.9	0.0	0.0	20.1	28.0	
GMP36D	05-Jul-19	14:02	Sunny	80.0	0.0	0.3	19.7	28.0	
GMP36M	05-Jul-19	14:03	Sunny	80.0	0.0	0.1	19.9	28.0	
GMP36S	05-Jul-19	14:04	Sunny	79.9	0.0	0.0	20.1	29.0	
GMP37D	05-Jul-19	14:08	Sunny	80.0	0.0	0.4	19.6	29.0	
GMP37M	05-Jul-19	14:09	Sunny	80.0	0.0	0.2	19.8	28.0	
GMP37S	05-Jul-19	14:10	Sunny	79.9	0.0	0.0	20.1	28.0	
GMP38M	05-Jul-19	14:13	Sunny	80.0	0.0	0.1	19.9	28.0	
GMP38S	05-Jul-19	14:14	Sunny	79.9	0.0	0.0	20.1	28.0	
GMP39M	05-Jul-19	14:17	Sunny	80.0	0.0	0.3	19.7	28.0	

Prepared by:

Sammi Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jul-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M1	12-Jul-19	11:26	Sunny	80.9	0.0	0.0	19.1	35.0	
M2	12-Jul-19	11:24	Sunny	81.7	0.0	0.0	18.3	36.0	
M3	12-Jul-19	11:22	Sunny	81.6	0.0	0.0	18.4	38.0	
M4	12-Jul-19	11:21	Sunny	81.5	0.0	0.0	18.5	37.0	
M6	12-Jul-19	11:20	Sunny	81.5	0.0	0.0	18.5	37.0	
M6a	12-Jul-19	11:19	Sunny	81.4	0.0	0.0	18.6	36.0	
M6b	12-Jul-19	11:18	Sunny	81.3	0.0	0.0	18.7	37.0	
M6c	12-Jul-19	11:17	Sunny	81.2	0.0	0.0	18.8	36.0	
M7	12-Jul-19	11:16	Sunny	80.8	0.0	0.0	19.2	33.0	
M8	12-Jul-19	11:14	Sunny	81.1	0.0	0.0	18.9	37.0	
M10	12-Jul-19	11:12	Sunny	81.0	0.0	0.0	19.0	37.0	
M11	12-Jul-19	11:10	Sunny	80.9	0.0	0.0	19.1	37.0	
M13	12-Jul-19	11:08	Sunny	80.0	0.0	0.0	20.0	37.0	

Prepared by:

Sammi Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jul-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M13a	12-Jul-19	11:07	Sunny	80.3	0.0	0.0	19.7	37.0	
M14	12-Jul-19	11:05	Sunny	80.6	0.0	0.0	19.4	36.0	
M15	12-Jul-19	11:03	Sunny	80.5	0.0	0.0	19.5	36.0	
M16	12-Jul-19	11:00	Sunny	80.9	0.0	0.0	19.1	37.0	
M17	12-Jul-19	10:58	Sunny	81.4	0.0	0.0	18.6	36.0	
M18	12-Jul-19	10:56	Sunny	81.1	0.0	0.0	18.9	35.0	
M19	12-Jul-19	10:54	Sunny	80.8	0.0	0.0	19.2	35.0	
M41	12-Jul-19	10:52	Sunny	80.6	0.0	0.0	19.4	37.0	
M43	12-Jul-19	10:50	Sunny	81.0	0.0	0.0	19.0	37.0	

Prepared by:



Sammi Lam

Checked by:



Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jul-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P2	12-Jul-19	11:42	Sunny	82.2	0.0	0.0	17.8	35.0	
P3	12-Jul-19	11:45	Sunny	82.5	0.0	0.0	17.5	35.0	
P4	12-Jul-19	11:47	Sunny	81.8	0.0	0.1	18.1	35.0	
P5	12-Jul-19	11:50	Sunny	81.8	0.0	0.0	18.2	35.0	
P6	12-Jul-19	11:52	Sunny	82.6	0.0	0.0	17.4	35.0	
P15	12-Jul-19	11:54	Sunny	82.1	0.0	0.1	17.8	36.0	
P16a	12-Jul-19	11:55	Sunny	82.1	0.0	0.0	17.9	36.0	
P17a	12-Jul-19	11:57	Sunny	81.9	0.0	0.0	18.1	35.0	
P18a	12-Jul-19	11:59	Sunny	81.9	0.0	0.0	18.1	35.0	
P19	12-Jul-19	12:02	Sunny	82.6	0.0	0.2	17.2	36.0	
P20	12-Jul-19	12:04	Sunny	82.5	0.0	0.0	17.5	36.0	
P30aD	12-Jul-19	12:09	Sunny	81.8	0.0	0.0	18.2	36.0	
P30aM	12-Jul-19	12:08	Sunny	82.0	0.0	0.1	17.9	35.0	

Prepared by:



Sammi Lam

Checked by:



Mike Shek

EN/DS/001

HKLRG

# LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jul-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P30aS	12-Jul-19	12:07	Sunny	82.8	0.0	0.1	17.1	35.0	
P33	12-Jul-19	11:34	Sunny	82.9	0.0	0.0	17.1	34.0	
P34bD	12-Jul-19	11:39	Sunny	82.9	0.0	0.0	17.1	34.0	
P34bM	12-Jul-19	11:38	Sunny	82.2	0.0	0.0	17.8	35.0	
P34bS	12-Jul-19	11:37	Sunny	82.4	0.0	0.2	17.4	36.0	
P35	12-Jul-19	11:32	Sunny	82.6	0.0	0.2	17.2	36.0	
P36bD	12-Jul-19	12:13	Sunny	80.7	0.0	0.2	19.1	36.0	
P36bM	12-Jul-19	12:12	Sunny	80.4	0.0	0.1	19.5	36.0	
P36bS	12-Jul-19	12:11	Sunny	80.5	0.0	0.1	19.4	36.0	
P37	12-Jul-19	11:30	Sunny	80.9	0.0	0.0	19.1	36.0	
P45	05-Jul-19	11:33	Sunny	81.0	0.0	0.0	19.0	28.0	
P47aD	12-Jul-19	14:20	Sunny	80.7	0.0	0.2	19.1	37.0	
P47aM	12-Jul-19	14:19	Sunny	80.1	0.0	0.0	19.9	36.0	

Prepared by:

Sammi Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG

# LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jul-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P47aS	12-Jul-19	14:18	Sunny	80.5	0.0	0.0	19.5	36.0	
P48	12-Jul-19	14:22	Sunny	80.5	0.0	0.0	19.5	37.0	
P49	12-Jul-19	14:24	Sunny	81.1	0.0	0.0	18.9	37.0	
P50aD	12-Jul-19	14:30	Sunny	81.2	0.0	0.1	18.7	37.0	
P50aM	12-Jul-19	14:29	Sunny	81.1	0.0	0.0	18.9	36.0	
P50aS	12-Jul-19	14:28	Sunny	80.6	0.0	0.0	19.4	36.0	
P51aD	12-Jul-19	14:37	Sunny	80.1	0.0	0.2	19.7	36.0	
P51aM	12-Jul-19	14:36	Sunny	80.6	0.0	0.0	19.4	36.0	
P51aS	12-Jul-19	14:35	Sunny	80.1	0.0	0.0	19.9	36.0	
P52a	12-Jul-19	14:41	Sunny	81.0	0.0	0.0	19.0	36.0	
P60M	12-Jul-19	14:45	Sunny	81.3	0.0	0.0	18.7	36.0	
P60S	12-Jul-19	14:44	Sunny	80.5	0.0	0.0	19.5	36.0	
P61M	12-Jul-19	14:53	Sunny	80.5	0.0	0.0	19.5	37.0	

Prepared by:

Sammi Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill

Date of measurement: Aug-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP21S	09-Aug-19	11:16	Sunny	79.8	0.0	0.0	20.2	36.4	
GMP22M	09-Aug-19	11:12	Sunny	79.8	0.0	0.0	20.2	34.8	
GMP22S	09-Aug-19	11:00	Sunny	80.0	0.0	0.4	19.6	34.8	
GMP35D	09-Aug-19	14:26	Sunny	81.2	0.0	0.1	18.7	36.0	
GMP35M	09-Aug-19	14:27	Sunny	81.2	0.0	0.1	18.7	36.0	
GMP35S	09-Aug-19	14:28	Sunny	81.3	0.0	0.0	18.7	36.0	
GMP36D	09-Aug-19	11:39	Sunny	80.5	0.0	0.0	19.5	34.0	
GMP36M	09-Aug-19	11:37	Sunny	79.9	0.0	0.0	20.1	34.0	
GMP36M	23-Aug-19	12:45	Sunny	79.8	0.0	0.0	20.2	N/A	Bulk Gas Sampled
GMP36S	09-Aug-19	11:35	Sunny	80.1	0.0	0.0	19.9	34.0	
GMP37D	09-Aug-19	11:44	Sunny	80.0	0.0	0.0	20.0	35.3	
GMP37M	09-Aug-19	11:42	Sunny	80.0	0.0	0.0	20.0	35.2	
GMP37S	09-Aug-19	11:40	Sunny	80.6	0.0	0.0	19.4	35.2	

Prepared by:

Sammi Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill

Date of measurement: Aug-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M1	20-Aug-19	11:02	Cloudy	79.9	0.0	0.0	20.1	33.0	
M2	20-Aug-19	11:01	Cloudy	79.8	0.0	0.0	20.2	33.0	
M3	20-Aug-19	11:00	Cloudy	79.7	0.0	0.0	20.3	33.0	
M4	20-Aug-19	10:59	Cloudy	79.9	0.0	0.0	20.1	33.0	
M6	20-Aug-19	10:58	Cloudy	80.0	0.0	0.0	20.0	34.0	
M6a	20-Aug-19	10:57	Cloudy	80.0	0.0	0.1	19.9	33.0	
M6b	20-Aug-19	10:56	Cloudy	79.9	0.0	0.0	20.1	33.0	
M6c	20-Aug-19	10:55	Cloudy	80.0	0.0	0.1	19.9	34.0	
M7	20-Aug-19	10:54	Cloudy	79.9	0.0	0.0	20.1	33.0	
M8	20-Aug-19	10:53	Cloudy	79.8	0.0	0.0	20.2	34.0	
M10	20-Aug-19	10:52	Cloudy	79.9	0.0	0.0	20.1	34.0	
M11	20-Aug-19	10:51	Cloudy	80.0	0.0	0.0	20.0	34.0	
M13	20-Aug-19	10:50	Cloudy	79.8	0.0	0.0	20.2	33.2	

Prepared by:

Sammi Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Aug-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M13a	20-Aug-19	10:52	Cloudy	80.3	0.0	0.2	19.5	33.7	
M14	20-Aug-19	10:51	Cloudy	79.9	0.0	0.0	20.1	33.3	
M15	20-Aug-19	10:44	Cloudy	79.7	0.0	0.0	20.3	31.7	
M16	20-Aug-19	10:41	Cloudy	79.8	0.0	0.0	20.2	31.7	
M17	20-Aug-19	10:39	Cloudy	79.7	0.0	0.0	20.3	31.7	
M18	20-Aug-19	10:38	Cloudy	79.8	0.0	0.0	20.2	31.8	
M19	20-Aug-19	10:36	Cloudy	80.0	0.0	0.0	20.0	31.6	
M41	20-Aug-19	11:50	Cloudy	79.7	0.0	0.0	20.3	33.0	
M43	20-Aug-19	11:51	Cloudy	79.8	0.0	0.0	20.2	33.0	

Prepared by:

Sammi Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Aug-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P2	20-Aug-19	11:53	Cloudy	79.9	0.0	0.0	20.1	33.0	
P3	20-Aug-19	11:54	Cloudy	80.0	0.0	0.1	19.9	33.0	
P4	20-Aug-19	11:55	Cloudy	80.0	0.0	0.2	19.8	34.0	
P5	20-Aug-19	11:56	Cloudy	79.9	0.0	0.0	20.1	33.0	
P6	20-Aug-19	11:57	Cloudy	80.0	0.0	0.3	19.7	34.0	
P15	20-Aug-19	12:15	Cloudy	79.9	0.0	0.0	20.1	33.0	
P16a	20-Aug-19	12:16	Cloudy	79.9	0.0	0.0	20.1	33.0	
P17a	20-Aug-19	12:17	Cloudy	79.8	0.0	0.0	20.2	34.0	
P18a	20-Aug-19	12:18	Cloudy	80.0	0.0	0.1	19.9	33.0	
P19	20-Aug-19	12:19	Cloudy	79.9	0.0	0.0	20.1	33.0	
P20	20-Aug-19	12:20	Cloudy	79.8	0.0	0.0	20.2	33.0	
P30aD	20-Aug-19	11:26	Cloudy	80.0	0.0	0.4	19.6	33.0	
P30aM	20-Aug-19	11:25	Cloudy	79.9	0.0	0.0	20.1	33.0	

Prepared by:

Sammi Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Aug-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P30aS	20-Aug-19	11:24	Cloudy	79.7	0.0	0.0	20.3	34.0	
P33	20-Aug-19	11:03	Cloudy	80.0	0.0	0.2	19.8	34.0	
P34bD	20-Aug-19	11:22	Cloudy	80.0	0.0	0.2	19.8	33.0	
P34bM	20-Aug-19	11:21	Cloudy	80.0	0.0	0.4	19.6	33.0	
P34bS	20-Aug-19	11:20	Cloudy	80.0	0.0	0.3	19.7	33.0	
P35	20-Aug-19	11:04	Cloudy	80.0	0.0	0.3	19.7	33.0	
P35	23-Aug-19	12:30	Sunny	79.9	0.0	0.0	20.1	N/A	Bulk Gas Sampled
P36bD	20-Aug-19	11:09	Cloudy	80.0	0.0	0.1	19.9	33.0	
P36bM	20-Aug-19	11:08	Cloudy	80.0	0.0	0.3	19.7	33.0	
P36bS	20-Aug-19	11:07	Cloudy	79.8	0.0	0.2	20.0	33.0	
P37	20-Aug-19	11:05	Cloudy	80.0	0.0	0.3	19.7	33.0	
P45	09-Aug-19	11:14	Cloudy	79.7	0.0	0.0	20.3	35.2	
P45	23-Aug-19	12:20	Sunny	80.0	0.0	0.0	20.0	N/A	Bulk Gas Sampled

Prepared by:

Sammi Lam

Checked by:

Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Aug-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P47aD	20-Aug-19	11:42	Cloudy	80.0	0.0	1.0	19.0	33.0	
P47aM	20-Aug-19	11:41	Cloudy	80.0	0.0	0.4	19.6	34.0	
P47aS	20-Aug-19	11:40	Cloudy	79.9	0.0	0.0	20.1	33.0	
P48	20-Aug-19	10:40	Cloudy	79.7	0.0	0.0	20.3	31.7	
P49	20-Aug-19	10:43	Cloudy	79.7	0.0	0.0	20.3	31.7	
P50aD	20-Aug-19	11:32	Cloudy	80.0	0.0	0.2	19.8	33.0	
P50aM	20-Aug-19	11:31	Cloudy	79.9	0.0	0.0	20.1	32.0	
P50aS	20-Aug-19	11:30	Cloudy	80.0	0.0	0.1	19.9	31.8	
P51aD	20-Aug-19	11:35	Cloudy	80.0	0.0	0.4	19.6	32.0	
P51aM	20-Aug-19	11:34	Cloudy	79.9	0.0	0.0	20.1	33.0	
P51aS	20-Aug-19	11:33	Cloudy	80.0	0.0	0.3	19.7	33.0	
P52a	20-Aug-19	11:13	Cloudy	79.9	0.0	0.0	20.1	33.0	
P60M	20-Aug-19	11:16	Cloudy	79.7	0.0	0.0	20.3	32.0	

Prepared by:

Sammi Lam

Checked by:

Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
 Date of measurement: Sep-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP23S	20-Sep-19	14:30	Sunny	80.0	0.0	0.7	19.3	31.0	No compliance
GMP24D	20-Sep-19	14:29	Sunny	79.9	0.0	0.0	20.1	32.0	No compliance
GMP24M	20-Sep-19	14:27	Sunny	80.0	0.0	0.2	19.8	31.0	No compliance
GMP24S	20-Sep-19	14:26	Sunny	80.0	0.0	0.1	19.9	32.0	No compliance
GMP25D	20-Sep-19	14:24	Sunny	80.0	0.0	0.2	19.8	32.0	No compliance
GMP25M	20-Sep-19	14:23	Sunny	79.9	0.0	0.0	20.1	31.0	No compliance
GMP25S	20-Sep-19	14:22	Sunny	80.0	0.0	0.4	19.6	32.0	No compliance
GMP26D	20-Sep-19	14:20	Sunny	79.9	0.0	0.0	20.1	32.0	No compliance
GMP26M	20-Sep-19	14:19	Sunny	80.0	0.0	0.2	19.8	31.0	No compliance
GMP26S	20-Sep-19	14:18	Sunny	79.9	0.0	0.0	20.1	32.0	No compliance
GMP27D	20-Sep-19	14:17	Sunny	80.0	0.0	0.1	19.9	31.0	No compliance
GMP27M	20-Sep-19	14:16	Sunny	79.9	0.0	0.0	20.1	31.0	No compliance
GMP27S	20-Sep-19	14:13	Sunny	80.0	0.0	0.2	19.8	31.0	No compliance

Prepared by: lv  
 Lemon Lam

Checked by: f  
 Mike Shek

EN/DS/001

**HKLRG**

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
 Date of measurement: Sep-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP28D	20-Sep-19	14:12	Sunny	80.0	0.0	0.1	19.9	32.0	No compliance
GMP28M	20-Sep-19	14:11	Sunny	79.9	0.0	0.0	20.1	31.0	No compliance
GMP28S	20-Sep-19	14:10	Sunny	80.0	0.0	0.3	19.7	31.0	No compliance
GMP29D	20-Sep-19	14:07	Sunny	79.9	0.0	0.0	20.1	32.0	No compliance
GMP29M	20-Sep-19	14:06	Sunny	80.0	0.0	0.2	19.8	32.0	No compliance
GMP29S	20-Sep-19	14:05	Sunny	79.9	0.0	0.0	20.1	32.0	No compliance
GMP30D	20-Sep-19	14:01	Sunny	80.0	0.0	0.4	19.6	32.0	No compliance
GMP30M	20-Sep-19	14:00	Sunny	80.0	0.0	0.2	19.8	32.0	No compliance
GMP30S	20-Sep-19	13:59	Sunny	79.9	0.0	0.0	20.1	31.0	No compliance
GMP31D	20-Sep-19	13:58	Sunny	79.8	0.0	0.0	20.2	31.0	No compliance
GMP31M	20-Sep-19	13:57	Sunny	80.0	0.0	0.3	19.7	31.0	No compliance
GMP31S	20-Sep-19	13:56	Sunny	79.9	0.0	0.0	20.1	32.0	No compliance
GMP32D	20-Sep-19	13:54	Sunny	80.0	0.0	0.2	19.8	32.0	No compliance

Prepared by: lv  
 Lemon Lam

Checked by: f  
 Mike Shek

EN/DS/001

**HKLRG**



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Sep-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP32M	20-Sep-19	13:53	Sunny	79.9	0.0	0.0	20.1	32.0	No compliance
GMP32S	20-Sep-19	13:52	Sunny	79.8	0.0	0.0	20.2	32.0	No compliance
GMP33D	20-Sep-19	13:49	Sunny	80.0	0.0	0.2	19.8	31.0	No compliance
GMP33M	20-Sep-19	13:48	Sunny	80.0	0.0	0.3	19.7	31.0	No compliance
GMP33S	20-Sep-19	13:46	Sunny	79.9	0.0	0.0	20.1	32.0	No compliance
GMP34D	20-Sep-19	13:05	Sunny	80.2	0.0	0.1	19.7	32.0	No compliance
GMP34M	20-Sep-19	13:04	Sunny	79.9	0.0	0.0	20.1	32.0	No compliance
GMP34S	20-Sep-19	13:43	Sunny	80.0	0.0	0.2	19.8	32.0	No compliance
GMP35D	20-Sep-19	13:42	Sunny	79.9	0.0	0.0	20.1	32.0	
GMP35M	20-Sep-19	13:41	Sunny	79.9	0.0	0.0	20.1	32.0	
GMP35S	20-Sep-19	13:40	Sunny	79.9	0.0	0.0	20.1	32.0	
GMP36D	20-Sep-19	13:37	Sunny	79.9	0.0	0.0	20.1	33.0	
GMP36M	20-Sep-19	13:36	Sunny	80.0	0.0	0.2	19.8	32.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

**HKLRG**

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Sep-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP36S	20-Sep-19	13:35	Sunny	80.0	0.0	0.3	19.7	33.0	
GMP37D	20-Sep-19	13:34	Sunny	79.9	0.0	0.0	20.1	32.0	
GMP37M	20-Sep-19	13:33	Sunny	80.0	0.0	0.1	19.9	33.0	
GMP37S	20-Sep-19	13:32	Sunny	79.9	0.0	0.0	20.1	33.0	
GMP38M	20-Sep-19	13:31	Sunny	80.0	0.0	0.3	19.7	33.0	
GMP38S	20-Sep-19	13:30	Sunny	79.8	0.0	0.0	20.2	33.0	
GMP39M	20-Sep-19	11:33	Sunny	79.6	0.0	0.0	20.4	33.0	
GMP39S	20-Sep-19	11:30	Sunny	79.6	0.0	0.0	20.4	34.0	
GMP40M	20-Sep-19	11:39	Sunny	79.6	0.0	0.0	20.4	33.0	
GMP40S	20-Sep-19	11:36	Sunny	79.7	0.0	0.0	20.3	32.0	
GMP41M	20-Sep-19	11:45	Sunny	79.6	0.0	1.1	19.3	34.0	
GMP41S	20-Sep-19	11:42	Sunny	79.7	0.0	0.0	20.3	34.0	
GMP42D	20-Sep-19	11:51	Sunny	79.9	0.0	0.0	20.1	34.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

**HKLRG**

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
 Date of measurement: Sep-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M1	30-Sep-19	15:11	Sunny	79.9	0.0	0.1	20.0	34.0	
M2	30-Sep-19	15:12	Sunny	79.9	0.0	0.0	20.1	34.0	
M3	30-Sep-19	15:13	Sunny	79.8	0.0	0.0	20.2	35.0	
M4	30-Sep-19	15:14	Sunny	79.9	0.0	0.0	20.1	35.0	
M6	30-Sep-19	15:15	Sunny	80.0	0.0	0.0	20.0	35.0	
M6a	30-Sep-19	15:17	Sunny	79.9	0.0	0.0	20.1	34.0	
M6b	30-Sep-19	15:18	Sunny	79.8	0.0	0.0	20.2	35.0	
M6c	30-Sep-19	15:19	Sunny	80.0	0.0	0.1	19.9	35.0	
M7	30-Sep-19	15:20	Sunny	79.9	0.0	0.0	20.1	34.0	
M8	30-Sep-19	15:21	Sunny	79.8	0.0	0.0	20.2	35.0	
M10	30-Sep-19	15:22	Sunny	79.9	0.0	0.0	20.1	34.0	
M11	30-Sep-19	15:23	Sunny	79.8	0.0	0.0	20.2	35.0	
M13	30-Sep-19	15:24	Sunny	79.9	0.0	0.0	20.1	35.0	

Prepared by: W  
 Lemon Lam

Checked by: f  
 Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
 Date of measurement: Sep-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M13a	30-Sep-19	15:25	Sunny	79.8	0.0	0.0	20.2	34.0	
M14	30-Sep-19	15:28	Sunny	79.7	0.0	0.0	20.3	35.0	
M15	30-Sep-19	15:29	Sunny	79.9	0.0	0.0	20.1	34.0	
M16	30-Sep-19	15:30	Sunny	79.9	0.0	0.0	20.1	34.0	
M17	30-Sep-19	15:33	Sunny	79.8	0.0	0.0	20.2	35.0	
M18	30-Sep-19	15:34	Sunny	79.9	0.0	0.0	20.1	35.0	
M19	30-Sep-19	15:35	Sunny	79.8	0.0	0.0	20.2	34.0	
M41	13-Sep-19	11:30	Sunny	79.6	0.0	0.0	20.4	35.0	
M43	13-Sep-19	11:33	Sunny	79.7	0.0	0.0	20.3	36.0	

Prepared by: W  
 Lemon Lam

Checked by: f  
 Mike Shek

EN/DS/001

HKLRG



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Sep-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P2	30-Sep-19	13:55	Sunny	79.6	0.0	0.0	20.4	35.0	
P3	13-Sep-19	11:36	Sunny	79.9	0.0	0.0	20.1	36.0	
P4	30-Sep-19	14:07	Sunny	79.6	0.0	0.0	20.4	36.0	
P5	30-Sep-19	14:11	Sunny	80.4	0.0	0.5	19.1	36.0	
P6	30-Sep-19	14:19	Sunny	80.0	0.0	0.2	19.8	37.0	
P15	30-Sep-19	15:37	Sunny	79.9	0.0	0.0	20.1	37.0	
P16a	30-Sep-19	15:38	Sunny	80.0	0.0	0.2	19.8	35.0	
P17a	30-Sep-19	15:39	Sunny	79.9	0.0	0.0	20.1	35.0	
P18a	30-Sep-19	15:40	Sunny	80.0	0.0	0.1	19.9	36.0	
P19	30-Sep-19	15:41	Sunny	79.9	0.0	0.0	20.1	34.0	
P20	30-Sep-19	15:42	Sunny	80.0	0.0	0.2	19.8	34.0	
P30aD	30-Sep-19	15:04	Sunny	80.0	0.0	0.4	19.6	33.0	
P30aM	30-Sep-19	15:03	Sunny	80.0	0.0	0.3	19.7	34.0	

Prepared by: lv  
Lemon Lam

Checked by: Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Sep-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P30aS	30-Sep-19	15:02	Sunny	79.9	0.0	0.0	20.1	35.0	
P33	30-Sep-19	15:27	Sunny	80.0	0.0	0.4	19.6	35.0	
P34bD	30-Sep-19	15:08	Sunny	80.0	0.0	0.2	19.8	35.0	
P34bM	30-Sep-19	15:07	Sunny	80.0	0.0	0.6	19.4	35.0	
P34bS	30-Sep-19	15:06	Sunny	79.9	0.0	0.0	20.1	34.0	
P35	30-Sep-19	15:26	Sunny	79.9	0.0	0.0	20.1	35.0	
P36bD	30-Sep-19	14:42	Sunny	80.0	0.0	0.2	19.8	34.0	
P36bM	30-Sep-19	14:41	Sunny	80.0	0.0	0.4	19.6	35.0	
P36bS	30-Sep-19	14:40	Sunny	80.0	0.0	0.3	19.7	35.0	
P37	30-Sep-19	15:16	Sunny	80.0	0.0	0.2	19.8	35.0	
P45	30-Sep-19	14:32	Sunny	81.0	0.0	0.0	19.0	35.0	
P47aD	30-Sep-19	14:37	Sunny	79.9	0.0	0.0	20.1	35.0	
P47aM	30-Sep-19	14:36	Sunny	80.0	0.0	0.3	19.7	34.0	

Prepared by: lv  
Lemon Lam

Checked by: Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Sep-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P47aS	30-Sep-19	14:35	Sunny	80.0	0.0	0.2	19.8	35.0	
P48	30-Sep-19	15:31	Sunny	79.8	0.0	0.0	20.2	34.0	
P49	30-Sep-19	15:32	Sunny	79.9	0.0	0.0	20.1	35.0	
P50aD	30-Sep-19	14:47	Sunny	79.9	0.0	0.0	20.1	34.0	
P50aM	30-Sep-19	14:46	Sunny	80.0	0.0	0.4	19.6	35.0	
P50aS	30-Sep-19	14:45	Sunny	79.9	0.0	0.0	20.1	34.0	
P51aD	30-Sep-19	14:50	Sunny	80.0	0.0	0.2	19.8	35.0	
P51aM	30-Sep-19	14:40	Sunny	79.9	0.0	0.0	20.1	35.0	
P51aS	30-Sep-19	14:48	Sunny	80.0	0.0	0.3	19.7	34.0	
P52a	30-Sep-19	15:10	Sunny	79.9	0.0	0.0	20.1	34.0	
P60M	30-Sep-19	14:03	Sunny	79.7	0.0	0.0	20.3	36.0	
P60S	30-Sep-19	14:00	Sunny	79.7	0.0	0.0	20.3	36.0	
P61M	30-Sep-19	14:16	Sunny	79.9	0.0	0.0	20.1	36.0	

Prepared by:

ll  
Lemon Lam

Checked by:

f  
Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Oct-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP21S	11-Oct-19	12:00	Sunny	80.2	0.0	0.0	19.8	35.0	
GMP22M	11-Oct-19	11:56	Sunny	80.0	0.0	0.0	20.0	35.0	
GMP22S	11-Oct-19	11:55	Sunny	80.0	0.0	0.0	20.0	35.0	
GMP35D	04-Oct-19	14:02	Sunny	80.0	0.0	0.5	19.5	33.0	
GMP35M	04-Oct-19	14:01	Sunny	80.0	0.0	0.3	19.7	33.0	
GMP35S	04-Oct-19	14:00	Sunny	79.9	0.0	0.0	20.1	33.0	
GMP36D	04-Oct-19	14:08	Sunny	80.0	0.0	0.4	19.6	34.0	
GMP36M	04-Oct-19	14:07	Sunny	80.0	0.0	0.2	19.8	33.0	
GMP36M	23-Oct-19	14:35	Sunny	79.8	0.0	0.0	20.2	N/A	Bulk Gas Sampled
GMP36S	04-Oct-19	14:06	Sunny	79.9	0.0	0.0	20.1	33.0	
GMP37D	04-Oct-19	14:13	Sunny	80.0	0.0	0.1	19.9	33.0	
GMP37M	04-Oct-19	14:12	Sunny	79.9	0.0	0.0	20.1	34.0	
GMP37S	04-Oct-19	14:11	Sunny	79.8	0.0	0.0	20.2	33.0	

Prepared by:

ll  
Lemon Lam

Checked by:

f  
Mike Shek

EN/DS/001

HKLRG



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Oct-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M1	11-Oct-19	14:31	Sunny	80.1	0.0	0.0	19.9	35.0	
M2	11-Oct-19	14:32	Sunny	80.0	0.0	0.0	20.0	35.0	
M3	11-Oct-19	14:33	Sunny	80.0	0.0	0.0	20.0	34.0	
M4	11-Oct-19	14:06	Sunny	79.9	0.0	0.0	20.1	33.0	
M6	11-Oct-19	14:37	Sunny	79.9	0.0	0.0	20.1	32.0	
M6a	11-Oct-19	14:38	Sunny	79.8	0.0	0.0	20.2	33.0	
M6b	11-Oct-19	14:39	Sunny	80.2	0.0	0.0	19.8	33.0	
M6c	11-Oct-19	14:40	Sunny	79.9	0.0	0.0	20.1	36.0	
M7	11-Oct-19	14:42	Sunny	80.0	0.0	0.0	20.0	35.0	
M8	11-Oct-19	14:43	Sunny	79.9	0.0	0.0	20.1	35.0	
M10	11-Oct-19	14:44	Sunny	80.0	0.0	0.0	20.0	33.0	
M11	11-Oct-19	14:45	Sunny	79.9	0.0	0.0	20.1	35.0	
M13	11-Oct-19	11:22	Sunny	80.6	0.0	0.0	19.4	35.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Oct-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M13a	11-Oct-19	11:20	Sunny	80.6	0.0	0.0	19.4	35.0	
M14	11-Oct-19	11:23	Sunny	80.8	0.0	0.0	19.2	35.0	
M15	11-Oct-19	11:27	Sunny	80.9	0.0	0.0	19.1	35.0	
M16	11-Oct-19	11:40	Sunny	81.0	0.0	0.0	19.0	34.0	
M17	11-Oct-19	11:47	Sunny	81.1	0.0	0.0	18.9	35.0	
M18	11-Oct-19	11:49	Sunny	80.8	0.0	0.0	19.2	35.0	
M19	11-Oct-19	11:51	Sunny	81.0	0.0	0.0	19.0	35.0	
M41	11-Oct-19	13:31	Sunny	79.8	0.0	0.0	20.2	35.0	
M43	11-Oct-19	13:30	Sunny	79.8	0.0	0.0	20.2	35.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Oct-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P2	11-Oct-19	13:34	Sunny	79.9	0.0	0.0	20.1	35.0	
P3	11-Oct-19	13:36	Sunny	79.8	0.0	0.0	20.2	34.0	
P4	11-Oct-19	13:37	Sunny	79.7	0.0	0.0	20.3	34.0	
P5	11-Oct-19	13:38	Sunny	79.8	0.0	0.0	20.2	35.0	
P6	11-Oct-19	13:40	Sunny	80.0	0.0	0.1	19.9	34.0	
P15	11-Oct-19	14:50	Sunny	79.9	0.0	0.0	20.1	35.0	
P16a	11-Oct-19	14:51	Sunny	80.0	0.0	0.2	19.8	33.0	
P17a	11-Oct-19	14:52	Sunny	80.0	0.0	0.1	19.9	35.0	
P18a	11-Oct-19	14:53	Sunny	79.9	0.0	0.0	20.1	34.0	
P19	11-Oct-19	14:54	Sunny	80.0	0.0	0.1	19.9	34.0	
P20	11-Oct-19	14:55	Sunny	79.9	0.0	0.0	20.1	34.0	
P30aD	11-Oct-19	14:09	Sunny	80.0	0.0	0.7	19.3	34.0	
P30aM	11-Oct-19	14:08	Sunny	80.0	0.0	0.4	19.6	35.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Oct-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P30aS	11-Oct-19	14:07	Sunny	79.8	0.0	0.0	20.2	35.0	
P33	11-Oct-19	14:46	Sunny	80.0	0.0	0.6	19.4	35.0	
P34bD	11-Oct-19	14:14	Sunny	79.9	0.0	0.0	20.1	35.0	
P34bM	11-Oct-19	14:13	Sunny	80.0	0.0	0.1	19.9	34.0	
P34bS	11-Oct-19	14:12	Sunny	80.0	0.0	0.2	19.8	35.0	
P35	11-Oct-19	14:41	Sunny	80.0	0.0	0.3	19.7	34.0	
P36bD	11-Oct-19	14:18	Sunny	80.0	0.0	0.3	19.7	34.0	
P36bM	11-Oct-19	14:17	Sunny	80.0	0.0	0.2	19.8	34.0	
P36bS	11-Oct-19	14:16	Sunny	79.9	0.0	0.0	20.1	34.0	
P36bS	23-Oct-19	15:00	Sunny	79.8	0.0	0.0	20.2	N/A	Bulk Gas Sampled
P37	11-Oct-19	14:35	Sunny	80.0	0.0	0.2	19.8	35.0	
P45	11-Oct-19	11:58	Sunny	81.1	0.0	0.0	18.9	35.0	
P47aD	11-Oct-19	13:57	Sunny	80.0	0.0	0.3	19.7	34.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Oct-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P47aM	11-Oct-19	13:56	Sunny	80.0	0.0	0.1	19.9	35.0	
P47aS	11-Oct-19	13:55	Sunny	79.9	0.0	0.0	20.1	34.0	
P48	11-Oct-19	11:45	Sunny	80.8	0.0	0.0	19.2	35.0	
P48	23-Oct-19	11:55	Sunny	80.0	0.0	0.0	20.0	N/A	Bulk Gas Sampled
P49	11-Oct-19	11:42	Sunny	81.0	0.0	0.0	19.0	35.0	
P50aD	11-Oct-19	14:02	Sunny	80.0	0.0	0.2	19.8	34.0	
P50aM	11-Oct-19	14:01	Sunny	80.0	0.0	0.6	19.4	35.0	
P50aS	11-Oct-19	14:00	Sunny	79.9	0.0	0.0	20.1	34.0	
P51aD	11-Oct-19	14:05	Sunny	80.0	0.0	0.2	19.8	35.0	
P51aM	11-Oct-19	14:04	Sunny	80.0	0.0	0.4	19.6	34.0	
P51aS	11-Oct-19	14:03	Sunny	79.9	0.0	0.0	20.1	35.0	
P52a	11-Oct-19	14:29	Sunny	79.9	0.0	0.0	20.1	34.0	
P60M	11-Oct-19	13:42	Sunny	80.0	0.0	0.1	19.9	34.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Nov-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP22S	14-Nov-19	14:09	Sunny	79.9	0.0	0.0	20.1	28.0	
GMP35D	14-Nov-19	14:19	Sunny	79.9	0.0	0.0	20.1	28.0	
GMP35M	14-Nov-19	14:18	Sunny	80.0	0.0	0.1	19.9	28.0	
GMP35S	14-Nov-19	14:17	Sunny	80.0	0.0	0.3	19.7	28.0	
GMP36D	14-Nov-19	14:24	Sunny	80.0	0.0	0.8	19.2	27.0	
GMP36M	14-Nov-19	14:23	Sunny	79.7	0.0	0.0	20.3	28.0	
GMP36S	14-Nov-19	14:22	Sunny	80.1	0.0	0.7	19.2	27.0	
GMP37D	14-Nov-19	14:28	Sunny	79.9	0.0	0.0	20.1	28.0	
GMP37M	14-Nov-19	14:27	Sunny	79.6	0.0	0.0	20.4	28.0	
GMP37S	14-Nov-19	14:26	Sunny	79.8	0.0	0.6	19.6	28.0	
GMP38M	14-Nov-19	14:32	Sunny	79.8	0.0	0.0	20.2	28.0	
GMP38S	14-Nov-19	14:31	Sunny	80.0	0.0	0.2	19.8	29.0	
GMP39M	14-Nov-19	14:35	Sunny	79.9	0.0	0.0	20.1	29.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Nov-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M1	15-Nov-19	15:10	Sunny	79.9	0.0	0.0	20.1	27.0	
M2	15-Nov-19	15:09	Sunny	79.8	0.0	0.0	20.2	27.0	
M3	15-Nov-19	15:08	Sunny	79.9	0.0	0.0	20.1	28.0	
M4	15-Nov-19	15:07	Sunny	79.7	0.0	0.0	20.3	28.0	
M6	15-Nov-19	15:06	Sunny	79.9	0.0	0.0	20.1	27.0	
M6a	15-Nov-19	15:05	Sunny	79.8	0.0	0.0	20.2	28.0	
M6b	15-Nov-19	15:04	Sunny	79.9	0.0	0.0	20.1	27.0	
M6c	15-Nov-19	15:03	Sunny	79.8	0.0	0.0	20.2	28.0	
M7	15-Nov-19	15:02	Sunny	79.7	0.0	0.0	20.3	27.0	
M8	15-Nov-19	15:01	Sunny	79.9	0.0	0.0	20.1	28.0	
M10	15-Nov-19	15:00	Sunny	79.8	0.0	0.0	20.2	27.0	
M11	15-Nov-19	14:56	Sunny	79.7	0.0	0.0	20.3	28.0	
M13	15-Nov-19	14:55	Sunny	79.9	0.0	0.0	20.1	28.0	

Prepared by:

LV  
Lemon Lam

Checked by:

Mike Shek  
Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Nov-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M13a	15-Nov-19	14:54	Sunny	79.8	0.0	0.0	20.2	27.0	
M14	15-Nov-19	14:53	Sunny	79.7	0.0	0.0	20.3	27.0	
M15	15-Nov-19	14:49	Sunny	79.8	0.0	0.0	20.2	28.0	
M16	15-Nov-19	14:48	Sunny	79.7	0.0	0.0	20.3	27.0	
M17	15-Nov-19	14:47	Sunny	79.8	0.0	0.0	20.2	28.0	
M18	15-Nov-19	14:46	Sunny	79.9	0.0	0.0	20.1	28.0	
M19	15-Nov-19	14:45	Sunny	79.8	0.0	0.0	20.2	27.0	
M41	15-Nov-19	14:19	Sunny	79.7	0.0	0.0	20.3	27.0	
M43	15-Nov-19	14:18	Sunny	79.7	0.0	0.0	20.3	27.0	

Prepared by:

LV  
Lemon Lam

Checked by:

Mike Shek  
Mike Shek

EN/DS/001

HKLRG



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Nov-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P2	15-Nov-19	14:00	Sunny	79.9	0.0	0.0	20.1	27.0	
P3	15-Nov-19	14:01	Sunny	79.8	0.0	0.0	20.2	28.0	
P4	15-Nov-19	14:02	Sunny	79.7	0.0	0.0	20.3	27.0	
P5	15-Nov-19	14:03	Sunny	80.0	0.0	0.2	19.8	28.0	
P6	15-Nov-19	14:06	Sunny	79.9	0.0	0.0	20.1	28.0	
P15	15-Nov-19	15:35	Sunny	79.7	0.0	0.0	20.3	27.0	
P16a	15-Nov-19	15:36	Sunny	79.8	0.0	0.0	20.2	27.0	
P17a	15-Nov-19	15:37	Sunny	80.0	0.0	0.2	19.8	28.0	
P18a	15-Nov-19	15:38	Sunny	80.0	0.0	0.1	19.9	27.0	
P19	15-Nov-19	15:39	Sunny	79.9	0.0	0.0	20.1	28.0	
P20	15-Nov-19	15:40	Sunny	79.9	0.0	0.0	20.1	27.0	
P30aD	15-Nov-19	11:44	Sunny	79.6	0.0	1.9	18.5	28.0	
P30aM	15-Nov-19	11:43	Sunny	80.0	0.0	1.0	19.0	28.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Nov-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P30aS	15-Nov-19	11:42	Sunny	80.1	0.0	0.0	19.9	28.0	
P33	15-Nov-19	14:40	Sunny	80.0	0.0	0.3	19.7	28.0	
P34bD	15-Nov-19	14:37	Sunny	80.0	0.0	0.3	19.7	28.0	
P34bM	15-Nov-19	14:36	Sunny	80.0	0.0	0.4	19.6	27.0	
P34bS	15-Nov-19	14:35	Sunny	79.9	0.0	0.0	20.1	27.0	
P35	15-Nov-19	14:58	Sunny	80.0	0.0	0.2	19.8	27.0	
P36bD	15-Nov-19	15:25	Sunny	80.0	0.0	0.2	19.8	27.0	
P36bM	15-Nov-19	15:24	Sunny	80.0	0.0	0.7	19.3	27.0	
P36bS	15-Nov-19	15:23	Sunny	80.0	0.0	0.1	19.9	27.0	
P37	15-Nov-19	15:20	Sunny	80.0	0.0	0.4	19.6	27.0	
P45	14-Nov-19	14:10	Sunny	80.0	0.0	0.0	20.0	28.0	
P47aD	15-Nov-19	12:00	Sunny	80.7	0.0	0.2	19.1	27.0	
P47aM	15-Nov-19	11:59	Sunny	80.7	0.0	0.6	18.7	27.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Nov-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P47aS	15-Nov-19	11:58	Sunny	80.7	0.0	0.0	19.3	27.0	
P48	15-Nov-19	14:51	Sunny	80.0	0.0	0.1	19.9	27.0	
P49	15-Nov-19	14:52	Sunny	79.7	0.0	0.0	20.3	28.0	
P50aD	15-Nov-19	11:49	Sunny	80.1	0.0	0.0	19.9	27.0	
P50aM	15-Nov-19	11:48	Sunny	80.3	0.0	1.4	18.3	27.0	
P50aS	15-Nov-19	11:47	Sunny	80.5	0.0	0.1	19.4	27.0	
P51aD	15-Nov-19	11:55	Sunny	81.0	0.0	1.0	18.0	28.0	
P51aM	15-Nov-19	11:54	Sunny	80.3	0.0	1.2	18.5	28.0	
P51aS	15-Nov-19	11:53	Sunny	80.6	0.0	0.0	19.4	28.0	
P52a	15-Nov-19	14:25	Sunny	79.7	0.0	0.0	20.3	28.0	
P60M	15-Nov-19	14:11	Sunny	79.9	0.0	0.0	20.1	28.0	
P60S	15-Nov-19	14:10	Sunny	79.7	0.0	0.0	20.3	27.0	
P61M	15-Nov-19	14:13	Sunny	79.7	0.0	0.0	20.3	28.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Dec-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP23S	20-Dec-19	15:06	Sunny	80.0	0.0	0.3	19.7	25.0	No compliance
GMP24D	20-Dec-19	15:12	Sunny	79.8	0.0	0.0	20.2	24.0	No compliance
GMP24M	20-Dec-19	15:11	Sunny	80.0	0.0	0.7	19.3	25.0	No compliance
GMP24S	20-Dec-19	15:10	Sunny	79.9	0.0	0.0	20.1	25.0	No compliance
GMP25D	20-Dec-19	15:17	Sunny	80.0	0.0	0.2	19.8	24.0	No compliance
GMP25M	20-Dec-19	15:16	Sunny	79.8	0.0	0.0	20.2	25.0	No compliance
GMP25S	20-Dec-19	15:14	Sunny	80.0	0.0	0.4	19.6	25.0	No compliance
GMP26D	20-Dec-19	15:21	Sunny	80.0	0.0	0.8	19.2	25.0	No compliance
GMP26M	20-Dec-19	15:20	Sunny	80.0	0.0	0.2	19.8	24.0	No compliance
GMP26S	20-Dec-19	15:19	Sunny	79.8	0.0	0.0	20.2	24.0	No compliance
GMP27D	20-Dec-19	15:25	Sunny	80.0	0.0	0.5	19.5	25.0	No compliance
GMP27M	20-Dec-19	15:24	Sunny	79.7	0.0	0.0	20.3	24.0	No compliance
GMP27S	20-Dec-19	15:23	Sunny	80.0	0.0	0.3	19.7	25.0	No compliance

Prepared by:

Lemon Lam

Checked by:

Mike Shek

HKLRG

EN/DS/001



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Dec-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP28D	20-Dec-19	15:29	Sunny	80.0	0.0	0.2	19.8	24.0	No compliance
GMP28M	20-Dec-19	15:28	Sunny	79.8	0.0	0.0	20.2	25.0	No compliance
GMP28S	20-Dec-19	15:27	Sunny	80.0	0.0	0.1	19.9	25.0	No compliance
GMP29D	20-Dec-19	15:33	Sunny	79.8	0.0	0.0	20.2	24.0	No compliance
GMP29M	20-Dec-19	15:32	Sunny	79.7	0.0	0.0	20.3	25.0	No compliance
GMP29S	20-Dec-19	15:31	Sunny	79.6	0.0	0.0	20.4	25.0	No compliance
GMP30D	20-Dec-19	15:36	Sunny	80.0	0.0	0.6	19.4	24.0	No compliance
GMP30M	20-Dec-19	15:35	Sunny	80.0	0.0	1.0	19.0	25.0	No compliance
GMP30S	20-Dec-19	15:34	Sunny	80.0	0.0	0.2	19.8	25.0	No compliance
GMP31D	20-Dec-19	15:40	Sunny	80.0	0.0	0.7	19.3	24.0	No compliance
GMP31M	20-Dec-19	15:39	Sunny	79.9	0.0	0.0	20.1	25.0	No compliance
GMP31S	20-Dec-19	15:38	Sunny	80.0	0.0	0.4	19.6	24.0	No compliance
GMP32D	20-Dec-19	15:43	Sunny	79.9	0.0	0.0	20.1	25.0	No compliance

Prepared by:

Lemon Lam

Checked by:

Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Dec-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP32M	20-Dec-19	15:42	Sunny	80.0	0.0	0.3	19.7	25.0	No compliance
GMP32S	20-Dec-19	15:41	Sunny	80.0	0.0	0.7	19.3	24.0	No compliance
GMP33D	20-Dec-19	15:46	Sunny	79.9	0.0	0.0	20.1	25.0	No compliance
GMP33M	20-Dec-19	15:45	Sunny	81.0	0.0	1.2	17.8	24.0	No compliance
GMP33S	20-Dec-19	15:44	Sunny	80.0	0.0	0.8	19.2	25.0	No compliance
GMP34D	20-Dec-19	15:49	Sunny	80.0	0.0	0.2	19.8	25.0	No compliance
GMP34M	20-Dec-19	15:48	Sunny	80.0	0.0	0.3	19.7	24.0	No compliance
GMP34S	20-Dec-19	15:47	Sunny	79.9	0.0	0.0	20.1	25.0	No compliance
GMP35D	20-Dec-19	15:52	Sunny	80.0	0.0	0.1	19.9	24.0	No compliance
GMP35M	20-Dec-19	15:51	Sunny	80.0	0.0	0.2	19.8	25.0	No compliance
GMP35S	20-Dec-19	15:50	Sunny	79.8	0.0	0.0	20.2	24.0	No compliance
GMP36D	20-Dec-19	15:55	Sunny	80.0	0.0	0.7	19.3	25.0	No compliance
GMP36M	20-Dec-19	15:54	Sunny	79.9	0.0	0.0	20.1	24.0	No compliance

Prepared by:

Lemon Lam

Checked by:

Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Dec-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP36S	20-Dec-19	15:53	Sunny	80.0	0.0	0.2	19.8	23.0	
GMP37D	20-Dec-19	15:58	Sunny	79.9	0.0	0.0	20.1	24.0	
GMP37M	20-Dec-19	15:57	Sunny	80.0	0.0	0.3	19.7	24.0	
GMP37S	20-Dec-19	15:56	Sunny	79.9	0.0	0.0	20.1	24.0	
GMP38M	20-Dec-19	16:01	Sunny	80.0	0.0	0.1	19.9	24.0	
GMP38S	20-Dec-19	16:00	Sunny	79.8	0.0	0.0	20.2	24.0	
GMP39M	20-Dec-19	11:51	Sunny	80.0	0.0	0.2	19.8	24.0	
GMP39G	20-Dec-19	11:40	Sunny	80.0	0.0	0.7	19.3	24.0	
GMP40M	20-Dec-19	11:57	Sunny	80.0	0.0	0.1	19.9	25.0	
GMP40S	20-Dec-19	11:54	Sunny	79.8	0.0	0.1	20.1	25.0	
GMP41M	20-Dec-19	12:02	Sunny	80.1	0.0	0.1	19.8	23.0	
GMP41S	20-Dec-19	12:00	Sunny	80.0	0.0	0.1	19.9	23.0	
GMP42D	20-Dec-19	12:09	Sunny	80.0	0.0	0.1	19.9	23.0	

Prepared by: LL  
Lemon Lam

Checked by: MS  
Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Dec-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M1	13-Dec-19	14:41	Sunny	79.9	0.0	0.0	20.1	24.0	
M2	13-Dec-19	14:40	Sunny	79.8	0.0	0.0	20.2	25.0	
M3	13-Dec-19	14:39	Sunny	79.9	0.0	0.0	20.1	24.0	
M4	13-Dec-19	14:38	Sunny	80.0	0.0	0.0	20.0	25.0	
M6	13-Dec-19	14:37	Sunny	79.9	0.0	0.0	20.1	24.0	
M6a	13-Dec-19	14:36	Sunny	79.8	0.0	0.0	20.2	25.0	
M6b	13-Dec-19	14:35	Sunny	79.9	0.0	0.0	20.1	24.0	
M6c	13-Dec-19	14:34	Sunny	79.8	0.0	0.0	20.2	25.0	
M7	13-Dec-19	14:33	Sunny	79.9	0.0	0.0	20.1	24.0	
M8	13-Dec-19	14:32	Sunny	79.8	0.0	0.0	20.2	24.0	
M10	13-Dec-19	14:31	Sunny	79.9	0.0	0.0	20.1	25.0	
M11	13-Dec-19	14:30	Sunny	79.8	0.0	0.0	20.2	25.0	
M13	13-Dec-19	14:29	Sunny	79.7	0.0	0.0	20.3	26.0	

Prepared by: LL  
Lemon Lam

Checked by: MS  
Mike Shek

HKLRG

EN/DS/001



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Dec-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M13a	13-Dec-19	14:27	Sunny	79.8	0.0	0.1	20.1	26.0	
M14	13-Dec-19	14:28	Sunny	79.9	0.0	0.0	20.1	26.0	
M15	13-Dec-19	14:25	Sunny	79.7	0.0	0.0	20.3	24.0	
M16	13-Dec-19	14:22	Sunny	79.7	0.0	0.0	20.3	25.0	
M17	13-Dec-19	14:18	Sunny	79.8	0.0	0.0	20.2	25.0	
M18	13-Dec-19	14:17	Sunny	79.9	0.0	0.0	20.1	25.0	
M19	13-Dec-19	14:15	Sunny	79.9	0.0	0.0	20.1	25.0	
M41	13-Dec-19	15:18	Sunny	79.9	0.0	0.0	20.1	25.0	
M43	13-Dec-19	15:19	Sunny	79.8	0.0	0.0	20.2	25.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Dec-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P2	13-Dec-19	15:20	Sunny	80.1	0.0	0.0	19.9	24.0	
P3	13-Dec-19	15:21	Sunny	79.9	0.0	0.0	20.1	25.0	
P4	13-Dec-19	15:22	Sunny	80.0	0.0	0.2	19.8	25.0	
P5	13-Dec-19	15:23	Sunny	80.0	0.0	0.1	19.9	24.0	
P6	13-Dec-19	15:24	Sunny	79.7	0.0	0.0	20.3	25.0	
P15	13-Dec-19	15:38	Sunny	79.8	0.0	0.0	20.2	24.0	
P16a	13-Dec-19	15:39	Sunny	79.8	0.0	0.0	20.2	25.0	
P17a	13-Dec-19	15:40	Sunny	79.7	0.0	0.0	20.3	25.0	
P18a	13-Dec-19	15:41	Sunny	79.7	0.0	0.0	20.3	24.0	
P19	13-Dec-19	15:42	Sunny	79.6	0.0	0.0	20.4	24.0	
P20	13-Dec-19	15:43	Sunny	79.8	0.0	0.0	20.2	24.0	
P30aD	13-Dec-19	15:12	Sunny	79.9	0.0	0.0	20.1	24.0	
P30aM	13-Dec-19	15:11	Sunny	80.1	0.0	0.0	19.9	25.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Dec-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P30aS	13-Dec-19	15:10	Sunny	80.2	0.0	0.0	19.8	25.0	
P33	13-Dec-19	14:42	Sunny	80.4	0.0	0.0	19.6	25.0	
P34bD	13-Dec-19	15:08	Sunny	79.9	0.0	0.0	20.1	24.0	
P34bM	13-Dec-19	15:07	Sunny	80.3	0.0	0.0	19.7	25.0	
P34bS	13-Dec-19	15:06	Sunny	79.9	0.0	0.0	20.1	24.0	
P35	13-Dec-19	14:43	Sunny	80.2	0.0	0.0	19.8	25.0	
P36bD	13-Dec-19	14:54	Sunny	80.3	0.0	0.0	19.7	24.0	
P36bM	13-Dec-19	14:53	Sunny	80.1	0.0	0.0	19.9	24.0	
P36bS	13-Dec-19	14:52	Sunny	80.0	0.0	0.2	19.8	24.0	
P37	13-Dec-19	14:44	Sunny	80.1	0.0	0.2	19.7	24.0	
P45	13-Dec-19	14:09	Sunny	79.5	0.0	1.9	18.6	26.0	
P47aD	13-Dec-19	15:04	Sunny	79.8	0.0	0.0	20.2	25.0	
P47aM	13-Dec-19	15:03	Sunny	80.0	0.0	0.3	19.7	24.0	

Prepared by: W  
Lemon Lam

Checked by: Mike Shek  
Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Dec-19

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P47aS	13-Dec-19	15:02	Sunny	80.0	0.0	0.1	19.9	25.0	
P48	13-Dec-19	14:20	Sunny	79.7	0.0	0.7	19.6	24.0	
P49	13-Dec-19	14:24	Sunny	80.1	0.0	0.7	19.2	25.0	
P50aD	13-Dec-19	15:00	Sunny	80.0	0.0	0.1	19.9	24.0	
P50aM	13-Dec-19	14:59	Sunny	80.0	0.0	0.2	19.8	25.0	
P50aS	13-Dec-19	14:58	Sunny	80.0	0.0	0.4	19.6	24.0	
P51aD	13-Dec-19	14:57	Sunny	80.0	0.0	0.3	19.7	24.0	
P51aM	13-Dec-19	14:56	Sunny	80.0	0.0	0.2	19.8	24.0	
P51aS	13-Dec-19	14:55	Sunny	79.9	0.0	0.0	20.1	25.0	
P52a	13-Dec-19	14:45	Sunny	79.9	0.0	0.0	20.1	25.0	
P60M	13-Dec-19	15:26	Sunny	80.0	0.0	0.2	19.8	25.0	
P60S	13-Dec-19	15:25	Sunny	79.8	0.0	0.0	20.2	24.0	
P61M	13-Dec-19	15:28	Sunny	79.9	0.0	0.0	20.1	24.0	

Prepared by: W  
Lemon Lam

Checked by: Mike Shek  
Mike Shek

EN/DS/001

HKLRG



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jan-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP22S	03-Jan-20	15:30	Sunny	79.9	0.0	0.0	20.1	25.0	
GMP35D	03-Jan-20	15:37	Sunny	80.0	0.0	0.3	19.7	25.0	
GMP35M	03-Jan-20	15:36	Sunny	80.0	0.0	0.1	19.9	25.0	
GMP35S	03-Jan-20	15:35	Sunny	79.9	0.0	0.0	20.1	24.0	
GMP36D	03-Jan-20	14:40	Sunny	80.0	0.0	0.3	19.7	25.0	
GMP36M	03-Jan-20	14:39	Sunny	79.9	0.0	0.0	20.1	25.0	
GMP36S	03-Jan-20	14:38	Sunny	80.0	0.0	0.2	19.8	26.0	
GMP37D	03-Jan-20	14:30	Sunny	80.0	0.0	0.7	19.3	26.0	
GMP37M	03-Jan-20	14:34	Sunny	79.9	0.0	0.0	20.1	26.0	
GMP37S	03-Jan-20	14:33	Sunny	80.0	0.0	0.8	19.2	25.0	
GMP38M	03-Jan-20	14:31	Sunny	80.0	0.0	1.0	19.0	26.0	
GMP38S	03-Jan-20	14:30	Sunny	80.0	0.0	0.2	19.8	25.0	
GMP39M	03-Jan-20	14:16	Sunny	80.0	0.0	0.1	19.9	26.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jan-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M1	10-Jan-20	14:15	Sunny	80.0	0.0	0.1	19.9	25.0	
M2	10-Jan-20	14:16	Sunny	79.9	0.0	0.0	20.1	24.0	
M3	10-Jan-20	14:17	Sunny	80.0	0.0	0.0	20.0	25.0	
M4	10-Jan-20	14:18	Sunny	80.0	0.0	0.1	19.9	25.0	
M6	10-Jan-20	14:19	Sunny	79.9	0.0	0.0	20.1	24.0	
M6a	10-Jan-20	14:21	Sunny	79.8	0.0	0.0	20.2	25.0	
M6b	10-Jan-20	14:22	Sunny	79.9	0.0	0.0	20.1	25.0	
M6c	10-Jan-20	14:23	Sunny	79.8	0.0	0.0	20.2	24.0	
M7	10-Jan-20	14:24	Sunny	79.7	0.0	0.0	20.3	25.0	
M8	10-Jan-20	14:25	Sunny	79.8	0.0	0.0	20.2	25.0	
M10	10-Jan-20	14:26	Sunny	79.9	0.0	0.0	20.1	25.0	
M11	10-Jan-20	14:27	Sunny	79.8	0.0	0.0	20.2	24.0	
M13	10-Jan-20	14:28	Sunny	79.8	0.0	0.0	20.2	25.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jan-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M13a	10-Jan-20	14:29	Sunny	79.8	0.0	0.1	20.1	25.0	
M14	10-Jan-20	14:30	Sunny	79.9	0.0	0.0	20.1	25.0	
M15	10-Jan-20	14:37	Sunny	79.8	0.0	0.0	20.2	25.0	
M16	10-Jan-20	14:38	Sunny	79.9	0.0	0.0	20.1	24.0	
M17	10-Jan-20	14:39	Sunny	79.9	0.0	0.0	20.1	25.0	
M18	10-Jan-20	14:40	Sunny	79.9	0.0	0.0	20.1	25.0	
M19	10-Jan-20	14:41	Sunny	79.8	0.0	0.0	20.2	24.0	
M41	10-Jan-20	14:48	Sunny	79.0	0.0	0.0	20.1	25.0	
M43	10-Jan-20	14:49	Sunny	79.8	0.0	0.0	20.2	25.0	

Prepared by:

LV  
Lemon Lam

Checked by:

Mike Shek  
Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jan-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P2	10-Jan-20	14:56	Sunny	79.9	0.0	0.0	20.1	25.0	
P3	10-Jan-20	14:57	Sunny	79.8	0.0	0.0	20.2	24.0	
P4	10-Jan-20	14:58	Sunny	80.0	0.0	0.2	19.8	25.0	
P5	10-Jan-20	14:59	Sunny	79.9	0.0	0.0	20.1	24.0	
P6	10-Jan-20	15:00	Sunny	80.0	0.0	0.3	19.7	24.0	
P15	10-Jan-20	15:10	Sunny	79.9	0.0	0.0	20.1	25.0	
P16a	10-Jan-20	15:11	Sunny	80.0	0.0	0.1	19.9	24.0	
P17a	10-Jan-20	15:12	Sunny	79.8	0.0	0.0	20.2	25.0	
P18a	10-Jan-20	15:13	Sunny	79.7	0.0	0.0	20.3	24.0	
P19	10-Jan-20	15:14	Sunny	79.9	0.0	0.0	20.1	25.0	
P20	10-Jan-20	15:15	Sunny	79.8	0.0	0.0	20.2	25.0	
P30aD	10-Jan-20	11:55	Sunny	79.1	0.0	1.4	19.5	24.0	
P30aM	10-Jan-20	11:54	Sunny	78.8	0.0	3.0	18.2	24.0	

Prepared by:

LV  
Lemon Lam

Checked by:

Mike Shek  
Mike Shek

EN/DS/001

HKLRG



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jan-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P30aS	10-Jan-20	11:53	Sunny	80.5	0.0	2.2	17.3	24.0	
P33	10-Jan-20	14:32	Sunny	80.0	0.0	0.2	19.8	25.0	
P34bD	10-Jan-20	14:36	Sunny	80.0	0.0	1.0	19.0	24.0	
P34bM	10-Jan-20	14:35	Sunny	80.0	0.0	0.4	19.6	25.0	
P34bS	10-Jan-20	14:34	Sunny	80.0	0.0	0.3	19.7	24.0	
P35	10-Jan-20	14:33	Sunny	80.0	0.0	0.2	19.8	25.0	
P36bD	10-Jan-20	14:12	Sunny	80.0	0.0	0.2	19.8	24.0	
P36bM	10-Jan-20	14:11	Sunny	80.0	0.0	0.7	19.3	24.0	
P36bS	10-Jan-20	14:10	Sunny	79.9	0.0	0.0	20.1	25.0	
P37	10-Jan-20	14:14	Sunny	80.0	0.0	0.2	19.8	24.0	
P45	10-Jan-20	14:46	Sunny	79.9	0.0	0.0	20.1	25.0	
P47aD	10-Jan-20	11:45	Sunny	79.5	0.0	0.8	19.7	24.0	
P47aM	10-Jan-20	11:43	Sunny	79.6	0.0	0.5	19.9	24.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jan-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P47aS	10-Jan-20	11:42	Sunny	79.5	0.0	0.9	19.6	24.0	
P48	10-Jan-20	14:42	Sunny	80.0	0.0	0.2	19.8	25.0	
P49	10-Jan-20	14:43	Sunny	80.0	0.0	0.1	19.9	24.0	
P50aD	10-Jan-20	12:00	Sunny	79.4	0.0	1.4	19.2	25.0	
P50aM	10-Jan-20	11:59	Sunny	79.2	0.0	1.8	19.0	25.0	
P50aS	10-Jan-20	11:58	Sunny	79.7	0.0	0.1	20.2	25.0	
P51aD	10-Jan-20	12:04	Sunny	79.7	0.0	0.4	19.9	24.0	
P51aM	10-Jan-20	12:05	Sunny	79.7	0.0	0.6	19.7	24.0	
P51aS	10-Jan-20	12:03	Sunny	79.7	0.0	0.0	20.3	24.0	
P52a	10-Jan-20	14:00	Sunny	79.9	0.0	0.0	20.1	25.0	
P60M	10-Jan-20	14:51	Sunny	80.0	0.0	0.2	19.8	24.0	
P60S	10-Jan-20	14:50	Sunny	79.9	0.0	0.0	20.1	24.0	
P61M	10-Jan-20	14:53	Sunny	80.0	0.0	0.7	19.3	25.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Feb-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP21S	28-Feb-20	11:35	Fine	79.8	0.0	0.0	20.2	23.0	
GMP22M	28-Feb-20	11:33	Fine	79.9	0.0	0.0	20.1	23.0	
GMP22S	28-Feb-20	11:32	Fine	80.0	0.0	0.0	20.0	23.0	
GMP35D	07-Feb-20	15:36	Fine	79.8	0.0	0.2	20.0	22.0	
GMP35M	07-Feb-20	15:35	Fine	80.0	0.0	0.2	19.8	22.0	
GMP35S	07-Feb-20	15:34	Fine	80.1	0.0	0.0	19.9	22.0	
GMP36D	07-Feb-20	14:34	Fine	79.9	0.0	0.1	20.0	22.0	
GMP36M	07-Feb-20	14:33	Fine	79.8	0.0	0.0	20.2	22.0	
GMP36M	27-Feb-20	13:20	Sunny	79.8	0.0	0.0	20.2	N/A	Bulk Gas Sampled
GMP36S	07-Feb-20	14:32	Fine	79.8	0.0	0.3	19.9	22.0	
GMP37D	07-Feb-20	14:27	Fine	80.2	0.0	0.6	19.2	21.0	
GMP37M	07-Feb-20	14:26	Fine	79.9	0.0	0.0	20.1	22.0	
GMP37S	07-Feb-20	14:25	Fine	80.2	0.0	1.0	18.8	22.0	

Prepared by: Lemon Lam

Checked by: Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Feb-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M1	28-Feb-20	12:06	Sunny	79.6	0.0	0.0	20.4	23.0	
M2	28-Feb-20	12:04	Sunny	79.6	0.0	0.0	20.4	22.0	
M3	28-Feb-20	12:02	Sunny	79.6	0.0	0.0	20.4	24.0	
M4	28-Feb-20	12:00	Sunny	79.6	0.0	0.0	20.4	22.0	
M6	28-Feb-20	11:59	Sunny	79.7	0.0	0.0	20.3	23.0	
M6a	28-Feb-20	11:54	Sunny	79.6	0.0	0.0	20.4	22.0	
M6b	28-Feb-20	11:53	Sunny	79.7	0.0	0.0	20.3	22.0	
M6c	28-Feb-20	11:51	Sunny	79.9	0.0	0.0	20.1	22.0	
M7	28-Feb-20	11:50	Sunny	79.8	0.0	0.0	20.2	22.0	
M8	28-Feb-20	11:45	Sunny	79.7	0.0	0.0	20.3	22.0	
M10	28-Feb-20	11:43	Sunny	79.8	0.0	0.0	20.2	22.0	
M11	28-Feb-20	11:41	Sunny	79.8	0.0	0.0	20.2	24.0	
M13	28-Feb-20	14:10	Sunny	79.9	0.0	0.0	20.1	22.0	

Prepared by: Lemon Lam

Checked by: Mike Shek

EN/DS/001

HKLRG



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Feb-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M13a	28-Feb-20	14:11	Sunny	79.8	0.0	0.0	20.2	23.0	
M14	28-Feb-20	14:12	Sunny	79.7	0.0	0.0	20.3	23.0	
M15	28-Feb-20	14:13	Sunny	79.8	0.0	0.0	20.2	23.0	
M16	28-Feb-20	14:14	Sunny	79.6	0.0	0.0	20.4	22.0	
M17	28-Feb-20	14:15	Sunny	79.8	0.0	0.0	20.2	22.0	
M18	28-Feb-20	14:16	Sunny	79.7	0.0	0.0	20.3	23.0	
M19	28-Feb-20	14:19	Sunny	79.8	0.0	0.0	20.2	23.0	
M41	28-Feb-20	14:46	Sunny	79.8	0.0	0.0	20.2	23.0	
M43	28-Feb-20	14:45	Sunny	79.7	0.0	0.0	20.3	23.0	

Prepared by: LL  
Lemon Lam

Checked by: Mike Shek  
Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Feb-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P2	28-Feb-20	14:45	Sunny	79.9	0.0	0.0	20.1	23.0	
P3	28-Feb-20	14:50	Sunny	80.0	0.0	0.2	19.8	22.0	
P4	28-Feb-20	14:51	Sunny	79.9	0.0	0.0	20.1	23.0	
P5	28-Feb-20	14:56	Sunny	80.0	0.0	0.3	19.7	23.0	
P6	28-Feb-20	14:57	Sunny	80.0	0.0	0.1	19.9	22.0	
P15	28-Feb-20	14:58	Sunny	79.9	0.0	0.0	20.1	23.0	
P16a	28-Feb-20	14:59	Sunny	79.9	0.0	0.0	20.1	22.0	
P17a	28-Feb-20	15:00	Sunny	79.8	0.0	0.0	20.2	23.0	
P18a	28-Feb-20	15:02	Sunny	79.8	0.0	0.0	20.2	22.0	
P19	28-Feb-20	15:03	Sunny	79.7	0.0	0.0	20.3	23.0	
P20	28-Feb-20	15:04	Sunny	79.6	0.0	0.0	20.4	22.0	
P30aD	28-Feb-20	15:20	Sunny	80.0	0.0	0.6	19.4	22.0	
P30aM	28-Feb-20	15:19	Sunny	80.1	0.0	0.4	19.5	23.0	

Prepared by: LL  
Lemon Lam

Checked by: Mike Shek  
Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Feb-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P30aS	28-Feb-20	15:18	Sunny	79.6	0.0	0.0	20.4	23.0	
P33	28-Feb-20	11:40	Sunny	79.9	0.0	0.0	20.1	23.0	
P34bD	28-Feb-20	14:27	Sunny	80.0	0.0	0.3	19.7	23.0	
P34bM	28-Feb-20	14:26	Sunny	80.0	0.0	0.2	19.8	22.0	
P34bS	28-Feb-20	14:25	Sunny	79.9	0.0	0.0	20.1	23.0	
P35	28-Feb-20	14:48	Sunny	79.6	0.0	0.0	20.4	22.0	
P36bD	28-Feb-20	13:55	Sunny	80.0	0.0	0.2	19.8	23.0	
P36bM	28-Feb-20	13:54	Sunny	80.0	0.0	0.1	19.9	23.0	
P36bS	27-Feb-20	13:08	Sunny	79.6	0.0	0.0	20.4	N/A	Bulk Gas Sampled
P36bS	28-Feb-20	13:53	Sunny	80.0	0.0	0.4	19.6	23.0	
P37	28-Feb-20	11:57	Sunny	79.6	0.0	0.0	20.4	23.0	
P45	28-Feb-20	11:30	Sunny	79.8	0.0	0.0	20.2	24.0	
P47aD	28-Feb-20	13:42	Sunny	79.9	0.0	0.0	20.1	23.0	

Prepared by: WV  
Lemon Lam

Checked by: Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Feb-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P47aM	28-Feb-20	13:41	Sunny	80.0	0.0	0.2	19.8	23.0	
P47aS	28-Feb-20	13:40	Sunny	80.0	0.0	0.1	19.9	23.0	
P48	27-Feb-20	12:05	Sunny	80.0	0.0	0.4	19.6	N/A	Bulk Gas Sampled
P48	28-Feb-20	14:17	Sunny	79.8	0.0	0.0	20.2	22.0	
P49	28-Feb-20	14:18	Sunny	79.9	0.0	0.0	20.1	23.0	
P50aD	28-Feb-20	13:48	Sunny	79.9	0.0	0.0	20.1	23.0	
P50aM	28-Feb-20	13:47	Sunny	80.0	0.0	0.2	19.8	22.0	
P50aS	28-Feb-20	13:46	Sunny	80.0	0.0	0.3	19.7	22.0	
P51aD	28-Feb-20	13:51	Sunny	80.0	0.0	0.6	19.4	23.0	
P51aM	28-Feb-20	13:50	Sunny	80.0	0.0	0.4	19.6	23.0	
P51aS	28-Feb-20	13:49	Sunny	79.8	0.0	0.0	20.2	22.0	
P52a	28-Feb-20	14:05	Sunny	79.9	0.0	0.0	20.1	22.0	
P60M	28-Feb-20	14:53	Sunny	79.9	0.0	0.0	20.1	22.0	

Prepared by: LV  
Lemon Lam

Checked by: Mike Shek

EN/DS/001

HKLRG



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Mar-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP23S	02-Mar-20	14:00	Sunny	80.0	0.0	0.3	19.7	24.0	No compliance
GMP24D	02-Mar-20	14:05	Sunny	79.9	0.0	0.0	20.1	23.0	No compliance
GMP24M	02-Mar-20	14:03	Sunny	80.0	0.0	0.1	19.9	24.0	No compliance
GMP24S	02-Mar-20	14:03	Sunny	80.0	0.0	0.4	19.6	23.0	No compliance
GMP25D	02-Mar-20	14:08	Sunny	79.9	0.0	0.0	20.1	24.0	No compliance
GMP25M	02-Mar-20	14:07	Sunny	80.0	0.0	0.1	19.9	23.0	No compliance
GMP25S	02-Mar-20	14:06	Sunny	79.9	0.0	0.0	20.1	24.0	No compliance
GMP26D	02-Mar-20	14:12	Sunny	80.0	0.0	0.6	10.4	23.0	No compliance
GMP26M	02-Mar-20	14:11	Sunny	80.0	0.0	0.2	19.8	24.0	No compliance
GMP26S	02-Mar-20	12:10	Sunny	80.0	0.0	0.4	19.6	23.0	No compliance
GMP27D	02-Mar-20	14:16	Sunny	79.8	0.0	0.0	20.2	24.0	No compliance
GMP27M	02-Mar-20	14:15	Sunny	80.0	0.0	0.1	19.9	23.0	No compliance
GMP27S	02-Mar-20	14:14	Sunny	80.1	0.0	0.0	19.9	23.0	No compliance

Prepared by:

Lemon Lam

Checked by:

Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Mar-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP28D	02-Mar-20	14:20	Sunny	80.0	0.0	0.3	19.7	24.0	No compliance
GMP28M	02-Mar-20	14:19	Sunny	79.9	0.0	0.0	20.1	23.0	No compliance
GMP28S	02-Mar-20	14:18	Sunny	80.0	0.0	0.4	19.6	24.0	No compliance
GMP29D	02-Mar-20	14:24	Sunny	79.9	0.0	0.0	20.1	23.0	No compliance
GMP29M	02-Mar-20	14:23	Sunny	79.8	0.0	0.0	20.2	24.0	No compliance
GMP29S	02-Mar-20	14:22	Sunny	79.7	0.0	0.0	20.3	23.0	No compliance
GMP30D	02-Mar-20	14:28	Sunny	80.0	0.0	0.1	19.9	24.0	No compliance
GMP30M	02-Mar-20	14:27	Sunny	79.9	0.0	0.0	20.1	23.0	No compliance
GMP30S	02-Mar-20	14:26	Sunny	80.0	0.0	0.2	19.8	24.0	No compliance
GMP31D	02-Mar-20	14:31	Sunny	80.0	0.0	0.3	19.7	23.0	No compliance
GMP31M	02-Mar-20	14:40	Sunny	79.9	0.0	0.0	20.1	24.0	No compliance
GMP31S	02-Mar-20	14:29	Sunny	80.0	0.0	0.4	19.6	23.0	No compliance
GMP32D	02-Mar-20	14:35	Sunny	79.9	0.0	0.0	20.1	24.0	No compliance

Prepared by:

Lemon Lam

Checked by:

Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Mar-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP32M	02-Mar-20	14:34	Sunny	80.0	0.0	0.2	19.8	23.0	No compliance
GMP32S	02-Mar-20	14:33	Sunny	80.0	0.0	0.6	19.4	24.0	No compliance
GMP33D	02-Mar-20	14:39	Sunny	80.0	0.0	0.7	19.3	23.0	No compliance
GMP33M	02-Mar-20	14:38	Sunny	80.0	0.0	1.0	19.0	24.0	No compliance
GMP33S	02-Mar-20	14:37	Sunny	80.0	0.0	0.2	19.8	23.0	No compliance
GMP34D	02-Mar-20	14:43	Sunny	79.9	0.0	0.0	20.1	23.0	No compliance
GMP34M	02-Mar-20	14:42	Sunny	80.0	0.0	0.3	19.7	23.0	No compliance
GMP34S	02-Mar-20	14:41	Sunny	80.0	0.0	0.6	19.4	23.0	No compliance
GMP35D	02-Mar-20	14:47	Sunny	79.9	0.0	0.0	20.1	23.0	
GMP35M	02-Mar-20	14:46	Sunny	80.0	0.0	0.8	19.2	23.0	
GMP35S	02-Mar-20	14:45	Sunny	80.0	0.0	0.2	19.8	23.0	
GMP36D	02-Mar-20	14:50	Sunny	80.0	0.0	0.4	19.6	23.0	
GMP36M	02-Mar-20	14:49	Sunny	79.9	0.0	0.0	20.1	22.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

ENDS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Mar-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP36S	02-Mar-20	14:48	Sunny	80.0	0.0	0.3	19.7	23.0	
GMP37D	02-Mar-20	14:53	Sunny	79.9	0.0	0.0	20.1	24.0	
GMP37M	02-Mar-20	14:52	Sunny	80.0	0.0	0.1	19.9	23.0	
GMP37S	02-Mar-20	14:51	Sunny	79.9	0.0	0.0	20.1	22.0	
GMP38M	02-Mar-20	14:56	Sunny	80.0	0.0	0.6	19.4	23.0	
GMP38S	02-Mar-20	14:55	Sunny	80.0	0.0	0.2	19.8	23.0	
GMP39M	02-Mar-20	14:58	Sunny	79.9	0.0	0.0	20.1	22.0	
GMP39S	02-Mar-20	14:57	Sunny	80.0	0.0	0.7	19.3	23.0	
GMP40M	02-Mar-20	15:01	Sunny	79.9	0.0	0.0	20.1	23.0	
GMP40S	02-Mar-20	15:00	Sunny	80.0	0.0	0.2	19.8	22.0	
GMP41M	02-Mar-20	15:03	Sunny	79.9	0.0	0.0	20.1	23.0	
GMP41S	02-Mar-20	15:02	Sunny	80.0	0.0	0.2	19.8	22.0	
GMP42D	02-Mar-20	15:08	Sunny	80.0	0.0	0.3	19.7	23.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

ENDS/001

HKLRG



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Mar-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M1	13-Mar-20	11:14	Sunny	79.8	0.0	0.0	20.2	24.0	
M2	13-Mar-20	11:21	Sunny	79.9	0.0	0.0	20.1	23.0	
M3	13-Mar-20	11:25	Sunny	79.6	0.0	0.0	20.4	24.0	
M4	13-Mar-20	11:30	Sunny	79.6	0.0	0.0	20.4	24.0	
M6	13-Mar-20	11:34	Sunny	79.7	0.0	0.0	20.3	24.0	
M6a	13-Mar-20	11:41	Sunny	79.6	0.0	0.0	20.4	24.0	
M6b	13-Mar-20	11:45	Sunny	79.7	0.0	0.0	20.3	23.0	
M6c	13-Mar-20	11:47	Sunny	79.9	0.0	0.0	20.1	23.0	
M7	13-Mar-20	11:51	Sunny	79.8	0.0	0.0	20.2	24.0	
M8	13-Mar-20	11:55	Sunny	79.7	0.0	0.0	20.3	24.0	
M10	13-Mar-20	11:57	Sunny	79.8	0.0	0.0	20.2	24.0	
M11	13-Mar-20	12:00	Sunny	79.8	0.0	0.0	20.2	23.0	
M13	13-Mar-20	12:05	Sunny	79.9	0.0	0.0	20.1	24.0	

Prepared by: LL  
Lemon Lam

Checked by: MS  
Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Mar-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M13a	13-Mar-20	12:07	Sunny	79.8	0.0	0.0	20.2	24.0	
M14	13-Mar-20	12:11	Sunny	79.7	0.0	0.0	20.3	24.0	
M15	13-Mar-20	12:13	Sunny	79.8	0.0	0.0	20.2	23.0	
M16	13-Mar-20	12:15	Sunny	79.6	0.0	0.0	20.4	24.0	
M17	13-Mar-20	12:18	Sunny	79.8	0.0	0.0	20.2	23.0	
M18	13-Mar-20	12:20	Sunny	79.7	0.0	0.0	20.3	23.0	
M19	13-Mar-20	12:23	Sunny	79.8	0.0	0.0	20.2	24.0	
M41	13-Mar-20	12:25	Sunny	79.8	0.0	0.0	20.2	24.0	
M43	13-Mar-20	12:28	Sunny	79.7	0.0	0.0	20.3	24.0	

Prepared by: LL  
Lemon Lam

Checked by: MS  
Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Mar-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P2	13-Mar-20	14:14	Sunny	80.1	0.0	0.0	19.9	24.0	
P3	13-Mar-20	14:17	Sunny	80.1	0.0	0.2	19.7	24.0	
P4	13-Mar-20	14:20	Sunny	80.2	0.0	0.1	19.7	24.0	
P5	13-Mar-20	14:22	Sunny	79.9	0.0	0.0	20.1	23.0	
P6	13-Mar-20	14:25	Sunny	79.7	0.0	0.0	20.3	24.0	
P15	13-Mar-20	14:30	Sunny	79.7	0.0	0.1	20.2	24.0	
P16a	13-Mar-20	14:28	Sunny	79.6	0.0	0.2	20.0	24.0	
P17a	13-Mar-20	14:31	Sunny	79.8	0.0	0.0	20.2	24.0	
P18a	13-Mar-20	14:34	Sunny	79.8	0.0	0.0	20.2	23.0	
P19	13-Mar-20	14:38	Sunny	80.0	0.0	0.3	19.7	24.0	
P20	13-Mar-20	14:36	Sunny	79.8	0.0	0.0	20.2	24.0	
P30aD	13-Mar-20	14:03	Sunny	80.3	0.0	0.2	19.5	24.0	
P30aM	13-Mar-20	14:02	Sunny	79.7	0.0	0.0	20.3	23.0	

Prepared by: Lemon Lam

Checked by: Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Mar-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P30aS	13-Mar-20	14:01	Sunny	79.8	0.0	0.0	20.2	23.0	
P33	13-Mar-20	14:05	Sunny	80.2	0.0	0.3	19.5	24.0	
P34bD	13-Mar-20	14:10	Sunny	80.1	0.0	0.3	19.6	23.0	
P34bM	13-Mar-20	14:09	Sunny	80.1	0.0	0.1	19.8	24.0	
P34bS	13-Mar-20	14:08	Sunny	79.9	0.0	0.0	20.1	24.0	
P35	13-Mar-20	14:12	Sunny	80.1	0.0	0.0	19.9	24.0	
P36bD	13-Mar-20	14:44	Sunny	80.0	0.0	0.1	19.9	24.0	
P36bM	13-Mar-20	14:42	Sunny	79.9	0.0	0.0	20.1	24.0	
P36bS	13-Mar-20	14:43	Sunny	80.2	0.0	0.3	19.5	24.0	
P37	13-Mar-20	14:48	Sunny	79.9	0.0	0.0	20.1	23.0	
P45	13-Mar-20	14:45	Sunny	79.8	0.0	0.0	20.2	24.0	
P47aD	13-Mar-20	14:52	Sunny	79.9	0.0	0.0	20.1	24.0	
P47aM	13-Mar-20	14:51	Sunny	79.9	0.0	0.1	20.0	24.0	

Prepared by: Lemon Lam

Checked by: Mike Shek

EN/DS/001

HKLRG



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Mar-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P47aS	13-Mar-20	14:50	Sunny	79.7	0.0	0.0	20.3	24.0	
P48	13-Mar-20	14:55	Sunny	80.1	0.0	0.0	19.9	23.0	
P49	13-Mar-20	14:58	Sunny	79.6	0.0	0.0	20.4	23.0	
P50aD	13-Mar-20	15:04	Sunny	79.9	0.0	0.1	20.0	24.0	
P50aM	13-Mar-20	15:03	Sunny	79.5	0.0	0.4	20.1	24.0	
P50aS	13-Mar-20	15:02	Sunny	79.7	0.0	0.0	20.3	24.0	
P51aD	13-Mar-20	15:08	Sunny	80.2	0.0	0.3	19.5	24.0	
P51aM	13-Mar-20	15:07	Sunny	80.1	0.0	0.0	19.9	24.0	
P51aS	13-Mar-20	15:06	Sunny	79.9	0.0	0.0	20.1	24.0	
P52a	13-Mar-20	15:11	Sunny	80.1	0.0	0.3	19.6	23.0	
P60M	13-Mar-20	15:14	Sunny	79.8	0.0	0.0	20.2	23.0	
P60S	13-Mar-20	15:13	Sunny	80.1	0.0	0.0	19.9	24.0	
P61M	13-Mar-20	15:08	Sunny	79.6	0.0	0.2	20.2	24.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

**HKLRG**

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Apr-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP22S	17-Apr-20	15:18	Cloudy	79.9	0.0	0.0	20.1	30.0	
GMP35D	17-Apr-20	11:07	Cloudy	80.4	0.0	0.3	19.3	29.0	
GMP35M	17-Apr-20	11:06	Cloudy	80.4	0.0	0.2	19.4	29.0	
GMP35S	17-Apr-20	11:05	Cloudy	80.4	0.0	0.2	19.4	29.0	
GMP36D	17-Apr-20	11:11	Cloudy	80.0	0.0	0.0	20.0	31.0	
GMP36M	17-Apr-20	11:10	Cloudy	80.1	0.0	0.0	19.9	31.0	
GMP36S	17-Apr-20	11:09	Cloudy	80.5	0.0	0.1	19.4	31.0	
GMP37D	17-Apr-20	11:14	Cloudy	80.1	0.0	0.0	19.9	31.0	
GMP37M	17-Apr-20	11:13	Cloudy	80.9	0.0	0.1	19.0	31.0	
GMP37S	17-Apr-20	11:12	Cloudy	80.1	0.0	0.0	19.9	31.0	
GMP38M	17-Apr-20	11:16	Cloudy	80.0	0.0	0.0	20.0	31.0	
GMP38S	17-Apr-20	11:15	Cloudy	80.0	0.0	0.0	20.0	31.0	
GMP39M	17-Apr-20	14:00	Cloudy	79.9	0.0	0.0	20.1	31.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

**HKLRG**

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Apr-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M1	24-Apr-20	10:56	Cloudy	79.9	0.0	0.0	20.1	31.0	
M2	24-Apr-20	10:55	Cloudy	80.0	0.0	0.1	19.9	31.0	
M3	24-Apr-20	10:54	Cloudy	79.9	0.0	0.0	20.1	30.0	
M4	24-Apr-20	10:52	Cloudy	79.8	0.0	0.0	20.2	31.0	
M6	24-Apr-20	10:51	Cloudy	79.9	0.0	0.0	20.1	30.0	
M6a	24-Apr-20	10:50	Cloudy	79.7	0.0	0.0	20.3	31.0	
M6b	24-Apr-20	10:49	Cloudy	79.8	0.0	0.0	20.2	31.0	
M6c	24-Apr-20	10:48	Cloudy	79.9	0.0	0.0	20.1	31.0	
M7	24-Apr-20	10:47	Cloudy	79.8	0.0	0.0	20.2	30.0	
M8	24-Apr-20	10:44	Cloudy	79.9	0.0	0.0	20.1	30.0	
M10	24-Apr-20	10:43	Cloudy	79.9	0.0	0.0	20.1	30.0	
M11	24-Apr-20	10:42	Cloudy	79.7	0.0	0.0	20.3	31.0	
M13	24-Apr-20	10:41	Cloudy	79.8	0.0	0.0	20.2	30.0	

Prepared by: LV  
Lemon Lam

Checked by: Mike Shek  
Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Apr-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M13a	24-Apr-20	10:40	Cloudy	79.8	0.0	0.0	20.2	30.0	
M14	24-Apr-20	10:35	Cloudy	79.9	0.0	0.0	20.1	31.0	
M15	24-Apr-20	10:34	Cloudy	79.8	0.0	0.0	20.2	31.0	
M16	24-Apr-20	10:33	Cloudy	79.9	0.0	0.0	20.1	30.0	
M17	24-Apr-20	10:32	Cloudy	79.8	0.0	0.0	20.2	30.0	
M18	24-Apr-20	10:31	Cloudy	79.7	0.0	0.0	20.3	30.0	
M19	24-Apr-20	10:30	Cloudy	79.8	0.0	0.0	20.2	30.0	
M41	24-Apr-20	11:20	Cloudy	79.9	0.0	0.0	20.1	30.0	
M43	24-Apr-20	11:21	Cloudy	79.8	0.0	0.0	20.2	30.0	

Prepared by: LV  
Lemon Lam

Checked by: Mike Shek  
Mike Shek

HKLRG

EN/DS/001



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill

Date of measurement: Apr-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P2	24-Apr-20	11:24	Cloudy	80.0	0.0	0.2	19.8	30.0	
P3	24-Apr-20	11:25	Cloudy	79.9	0.0	0.0	20.1	29.0	
P4	24-Apr-20	11:26	Cloudy	79.8	0.0	0.0	20.2	30.0	
P5	24-Apr-20	11:27	Cloudy	80.0	0.0	0.1	19.9	31.0	
P6	24-Apr-20	11:28	Cloudy	79.9	0.0	0.0	20.1	30.0	
P15	24-Apr-20	11:45	Cloudy	80.0	0.0	0.4	19.6	30.0	
P16a	24-Apr-20	11:46	Cloudy	79.9	0.0	0.0	20.1	30.0	
P17a	24-Apr-20	11:47	Cloudy	80.0	0.0	0.2	19.8	29.0	
P18a	24-Apr-20	11:48	Cloudy	79.9	0.0	0.0	20.1	30.0	
P19	24-Apr-20	11:49	Cloudy	80.0	0.0	0.1	19.9	30.0	
P20	24-Apr-20	11:50	Cloudy	79.9	0.0	0.0	20.1	30.0	
P30aD	24-Apr-20	11:16	Cloudy	80.0	0.0	0.3	19.7	30.0	
P30aM	24-Apr-20	11:15	Cloudy	79.9	0.0	0.0	20.1	31.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill

Date of measurement: Apr-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P30aS	24-Apr-20	11:14	Cloudy	80.0	0.0	0.2	19.8	29.0	
P33	24-Apr-20	10:46	Cloudy	79.9	0.0	0.0	20.1	31.0	
P34bD	24-Apr-20	11:46	Cloudy	80.0	0.0	0.7	19.3	30.0	
P34bM	24-Apr-20	11:45	Cloudy	80.5	0.0	0.5	19.0	30.0	
P34bS	24-Apr-20	11:44	Cloudy	80.0	0.0	0.6	19.4	30.0	
P35	24-Apr-20	10:45	Cloudy	80.0	0.0	0.2	19.8	30.0	
P36bD	17-Apr-20	11:36	Cloudy	80.0	0.0	3.0	17.0	31.0	
P36bM	17-Apr-20	11:35	Cloudy	80.0	0.0	2.2	17.8	31.0	
P36bS	17-Apr-20	11:34	Cloudy	80.0	0.0	2.4	17.6	31.0	
P37	24-Apr-20	10:53	Cloudy	79.9	0.0	0.0	20.1	30.0	
P45	24-Apr-20	10:36	Cloudy	79.7	0.0	0.0	20.3	29.0	
P47aD	24-Apr-20	11:02	Cloudy	80.0	0.0	0.2	19.8	30.0	
P47aM	24-Apr-20	11:01	Cloudy	80.0	0.0	0.1	19.9	31.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Apr-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P47aS	24-Apr-20	11:00	Cloudy	79.9	0.0	0.0	20.1	31.0	
P48	24-Apr-20	10:37	Cloudy	79.9	0.0	0.0	20.1	30.0	
P49	24-Apr-20	10:38	Cloudy	79.9	0.0	0.0	20.1	30.0	
P50aD	24-Apr-20	11:07	Cloudy	80.0	0.0	0.3	19.7	30.0	
P50aM	24-Apr-20	11:06	Cloudy	79.9	0.0	0.0	20.1	30.0	
P50aS	24-Apr-20	11:05	Cloudy	80.0	0.0	0.2	19.8	31.0	
P51aD	24-Apr-20	11:11	Cloudy	80.0	0.0	0.2	19.8	30.0	
P51aM	24-Apr-20	11:10	Cloudy	79.9	0.0	0.0	20.1	30.0	
P51aS	24-Apr-20	11:09	Cloudy	80.0	0.0	0.2	19.8	31.0	
P52a	17-Apr-20	11:28	Cloudy	80.0	0.0	0.8	19.2	31.0	
P60M	24-Apr-20	11:31	Cloudy	80.0	0.0	0.2	19.8	30.0	
P60S	24-Apr-20	11:30	Cloudy	79.9	0.0	0.0	20.1	31.0	
P61M	24-Apr-20	11:33	Cloudy	80.0	0.0	0.1	19.9	31.0	

Prepared by: W  
Lemon Lam

Checked by: Mike Shek  
Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: May-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP22S	15-May-20	11:23	Sunny	79.7	0.0	0.3	20.0	32.0	
GMP35D	15-May-20	14:42	Sunny	80.0	0.0	0.2	19.8	33.0	
GMP35M	15-May-20	14:41	Sunny	79.9	0.0	0.0	20.1	32.0	
GMP35S	15-May-20	14:40	Sunny	80.0	0.0	0.1	19.9	33.0	
GMP36D	15-May-20	14:48	Sunny	80.0	0.0	0.4	19.6	32.0	
GMP36M	15-May-20	14:47	Sunny	80.0	0.0	0.1	19.9	32.0	
GMP36S	15-May-20	14:46	Sunny	79.9	0.0	0.0	20.1	33.0	
GMP37D	15-May-20	14:52	Sunny	80.0	0.0	0.3	19.7	32.0	
GMP37M	15-May-20	14:51	Sunny	79.9	0.0	0.0	20.1	33.0	
GMP37S	15-May-20	14:50	Sunny	80.0	0.0	0.2	19.8	31.0	
GMP38M	15-May-20	14:55	Sunny	80.0	0.0	0.4	19.6	32.0	
GMP38S	15-May-20	14:54	Sunny	79.9	0.0	0.0	20.1	32.0	
GMP39M	15-May-20	14:58	Sunny	80.0	0.0	0.6	19.4	33.0	

Prepared by: W  
Lemon Lam

Checked by: Mike Shek  
Mike Shek

HKLRG

EN/DS/001



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: May-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M1	08-May-20	14:18	Sunny	79.9	0.0	0.0	20.1	33.0	
M2	08-May-20	14:17	Sunny	79.8	0.0	0.0	20.2	32.0	
M3	08-May-20	14:16	Sunny	79.9	0.0	0.0	20.1	33.0	
M4	08-May-20	14:14	Sunny	79.8	0.0	0.0	20.2	32.0	
M6	08-May-20	14:13	Sunny	79.7	0.0	0.0	20.3	33.0	
M6a	08-May-20	14:10	Sunny	79.9	0.0	0.0	20.1	32.0	
M6b	08-May-20	14:11	Sunny	79.8	0.0	0.0	20.2	33.0	
M6c	08-May-20	14:12	Sunny	79.8	0.0	0.0	20.2	32.0	
M7	08-May-20	14:05	Sunny	79.9	0.0	0.0	20.1	33.0	
M8	08-May-20	14:04	Sunny	79.7	0.0	0.0	20.3	33.0	
M10	08-May-20	14:03	Sunny	79.8	0.0	0.0	20.2	33.0	
M11	08-May-20	14:02	Sunny	79.9	0.0	0.0	20.1	33.0	
M13	08-May-20	14:01	Sunny	79.8	0.0	0.0	20.2	32.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: May-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M13a	08-May-20	14:00	Sunny	79.9	0.0	0.0	20.1	33.0	
M14	08-May-20	15:31	Sunny	79.8	0.0	0.0	20.2	32.0	
M15	08-May-20	15:31	Sunny	79.7	0.0	0.0	20.3	33.0	
M16	08-May-20	15:32	Sunny	79.8	0.0	0.0	20.2	33.0	
M17	08-May-20	15:33	Sunny	79.9	0.0	0.0	20.1	33.0	
M18	08-May-20	15:34	Sunny	79.8	0.0	0.0	20.2	32.0	
M19	08-May-20	15:35	Sunny	79.8	0.0	0.0	20.2	33.0	
M41	08-May-20	11:32	Sunny	79.6	0.0	0.0	20.4	33.0	
M43	08-May-20	11:33	Sunny	79.7	0.0	0.0	20.3	33.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

HKLRG

EN/DS/001



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: May-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P2	08-May-20	11:38	Sunny	79.7	0.0	0.0	20.3	32.0	
P3	08-May-20	11:35	Sunny	79.6	0.0	0.0	20.4	33.0	
P4	08-May-20	11:44	Sunny	80.0	0.0	0.2	19.8	32.0	
P5	08-May-20	11:50	Sunny	80.0	0.0	0.1	19.9	32.0	
P6	08-May-20	11:57	Sunny	80.0	0.0	0.1	19.9	32.0	
P15	08-May-20	15:15	Sunny	79.9	0.0	0.0	20.1	31.0	
P16a	08-May-20	15:16	Sunny	80.0	0.0	0.2	19.8	32.0	
P17a	08-May-20	15:17	Sunny	79.9	0.0	0.0	20.1	31.0	
P18a	08-May-20	15:18	Sunny	80.1	0.0	0.0	19.9	32.0	
P19	08-May-20	15:19	Sunny	79.9	0.0	0.0	20.1	31.0	
P20	08-May-20	15:20	Sunny	79.8	0.0	0.0	20.2	32.0	
P30aD	08-May-20	14:32	Sunny	80.0	0.0	0.1	19.9	31.0	
P30aM	08-May-20	14:31	Sunny	80.0	0.0	0.4	19.6	32.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: May-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P30aS	08-May-20	14:30	Sunny	80.0	0.0	0.2	19.8	31.0	
P33	08-May-20	14:06	Sunny	80.0	0.0	0.6	19.4	32.0	
P34bD	08-May-20	14:23	Sunny	80.0	0.0	0.4	19.6	31.0	
P34bM	08-May-20	14:22	Sunny	80.0	0.0	0.2	19.8	32.0	
P34bS	08-May-20	14:21	Sunny	79.9	0.0	0.0	20.1	31.0	
P35	08-May-20	14:08	Sunny	80.0	0.0	0.3	19.7	32.0	
P36bD	08-May-20	14:27	Sunny	79.9	0.0	0.0	20.1	31.0	
P36bM	08-May-20	14:26	Sunny	80.0	0.0	0.1	19.9	31.0	
P36bS	08-May-20	14:25	Sunny	80.0	0.0	0.2	19.8	31.0	
P37	08-May-20	14:15	Sunny	80.0	0.0	0.4	19.6	31.0	
P45	15-May-20	11:25	Sunny	79.6	0.0	0.0	20.4	31.0	
P47aD	08-May-20	14:45	Sunny	80.0	0.0	0.4	19.6	31.0	
P47aM	08-May-20	14:44	Sunny	80.0	0.0	0.6	19.4	31.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: May-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P47aS	08-May-20	14:43	Sunny	79.9	0.0	0.0	20.1	32.0	
P48	08-May-20	15:05	Sunny	79.9	0.0	0.0	20.1	31.0	
P49	08-May-20	15:08	Sunny	79.7	0.0	0.0	20.3	31.0	
P50aD	08-May-20	14:36	Sunny	80.0	0.0	0.7	19.3	31.0	
P50aM	08-May-20	14:35	Sunny	80.0	0.0	0.3	19.7	31.0	
P50aS	08-May-20	14:34	Sunny	79.9	0.0	0.0	20.1	32.0	
P51aD	08-May-20	14:39	Sunny	80.0	0.0	0.2	19.8	31.0	
P51aM	08-May-20	14:38	Sunny	79.9	0.0	0.0	20.1	31.0	
P51aS	08-May-20	14:37	Sunny	80.0	0.0	0.4	19.6	32.0	
P52a	08-May-20	14:20	Sunny	79.6	0.0	0.0	20.4	32.0	
P60M	08-May-20	12:01	Sunny	79.9	0.0	0.0	20.1	32.0	
P60S	08-May-20	12:00	Sunny	80.1	0.0	0.0	19.9	32.0	
P61M	08-May-20	11:48	Sunny	79.8	0.0	0.0	20.2	32.0	

Prepared by:

L  
Lemon Lam

Checked by:

f  
Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jun-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP23S	05-Jun-20	16:20	Cloudy	79.9	0.0	0.0	20.1	31.0	No compliance
GMP24D	05-Jun-20	16:26	Cloudy	80.0	0.0	0.8	19.2	31.0	No compliance
GMP24M	05-Jun-20	16:25	Cloudy	80.0	0.0	0.2	19.8	30.0	No compliance
GMP24S	05-Jun-20	16:24	Cloudy	79.8	0.0	0.0	20.2	30.0	No compliance
GMP25D	05-Jun-20	16:30	Cloudy	80.0	0.0	0.3	19.7	31.0	No compliance
GMP25M	05-Jun-20	16:29	Cloudy	79.9	0.0	0.0	20.1	31.0	No compliance
GMP25S	05-Jun-20	16:28	Cloudy	79.8	0.0	0.0	20.2	30.0	No compliance
GMP26D	05-Jun-20	16:34	Cloudy	80.0	0.0	0.1	19.9	31.0	No compliance
GMP26M	05-Jun-20	16:33	Cloudy	79.9	0.0	0.0	20.1	30.0	No compliance
GMP26S	05-Jun-20	16:32	Cloudy	80.0	0.0	0.2	19.8	30.0	No compliance
GMP27D	05-Jun-20	16:37	Cloudy	80.1	0.0	0.2	19.7	31.0	No compliance
GMP27M	05-Jun-20	16:36	Cloudy	80.0	0.0	0.3	19.7	30.0	No compliance
GMP27S	05-Jun-20	16:35	Cloudy	79.7	0.0	0.0	20.3	31.0	No compliance

Prepared by:

L  
Lemon Lam

Checked by:

f  
Mike Shek

EN/DS/001

HKLRG



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jun-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP28D	05-Jun-20	16:42	Cloudy	80.0	0.0	0.4	19.6	30.0	No compliance
GMP28M	05-Jun-20	16:41	Cloudy	79.9	0.0	0.0	20.1	31.0	No compliance
GMP28S	05-Jun-20	16:40	Cloudy	80.0	0.0	0.1	19.9	30.0	No compliance
GMP29D	05-Jun-20	16:47	Cloudy	79.9	0.0	0.0	20.1	31.0	No compliance
GMP29M	05-Jun-20	16:46	Cloudy	79.8	0.0	0.0	20.2	30.0	No compliance
GMP29S	05-Jun-20	16:45	Cloudy	79.9	0.0	0.0	20.1	31.0	No compliance
GMP30D	05-Jun-20	15:27	Cloudy	80.0	0.0	0.4	19.6	31.0	No compliance
GMP30M	06-Jun-20	15:26	Cloudy	79.9	0.0	0.0	20.1	30.0	No compliance
GMP30S	05-Jun-20	15:25	Cloudy	80.0	0.0	0.3	19.7	30.0	No compliance
GMP31D	05-Jun-20	15:30	Cloudy	79.9	0.0	0.0	20.1	31.0	No compliance
GMP31M	05-Jun-20	15:29	Cloudy	80.0	0.0	1.0	19.0	31.0	No compliance
GMP31S	05-Jun-20	15:28	Cloudy	80.0	0.0	0.2	19.8	30.0	No compliance
GMP32D	05-Jun-20	15:35	Cloudy	79.8	0.0	0.0	20.2	31.0	No compliance

Prepared by: Lemon Lam

Checked by: Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jun-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP32M	05-Jun-20	15:34	Cloudy	80.0	0.0	0.4	19.6	31.0	No compliance
GMP32S	05-Jun-20	15:33	Cloudy	79.9	0.0	0.0	20.1	30.0	No compliance
GMP33D	05-Jun-20	15:39	Cloudy	80.0	0.0	0.3	19.7	30.0	No compliance
GMP33M	05-Jun-20	15:38	Cloudy	80.0	0.0	0.7	19.3	31.0	No compliance
GMP33S	05-Jun-20	15:37	Cloudy	79.9	0.0	0.0	20.1	30.0	No compliance
GMP34D	05-Jun-20	15:43	Cloudy	80.0	0.0	0.8	19.2	31.0	No compliance
GMP34M	05-Jun-20	15:42	Cloudy	80.0	0.0	0.2	19.8	31.0	No compliance
GMP34S	05-Jun-20	15:41	Cloudy	79.9	0.0	0.0	20.1	31.0	No compliance
GMP35D	05-Jun-20	15:48	Cloudy	80.0	0.0	0.2	19.8	30.0	
GMP35M	05-Jun-20	15:47	Cloudy	79.9	0.0	0.0	20.1	31.0	
GMP35S	05-Jun-20	15:46	Cloudy	79.9	0.0	0.0	20.1	30.0	
GMP36D	05-Jun-20	15:52	Cloudy	80.0	0.0	0.2	19.8	31.0	
GMP36M	05-Jun-20	15:51	Cloudy	80.0	0.0	0.3	19.7	30.0	

Prepared by: Lemon Lam

Checked by: Mike Shek

HKLRG

EN/DS/001



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jun-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP36S	05-Jun-20	15:50	Cloudy	80.0	0.0	0.4	19.6	31.0	
GMP37D	05-Jun-20	15:55	Cloudy	79.9	0.0	0.0	20.1	31.0	
GMP37M	05-Jun-20	15:54	Cloudy	80.0	0.0	0.2	19.8	30.0	
GMP37S	05-Jun-20	15:53	Cloudy	79.9	0.0	0.0	20.1	32.0	
GMP38M	05-Jun-20	15:57	Cloudy	80.0	0.0	0.5	19.5	31.0	
GMP38S	05-Jun-20	15:56	Cloudy	80.0	0.0	0.2	19.8	30.0	
GMP39M	05-Jun-20	16:01	Cloudy	79.9	0.0	0.0	20.1	30.0	
GMP39S	05-Jun-20	16:00	Cloudy	80.0	0.0	0.3	19.7	31.0	
GMP40M	05-Jun-20	16:04	Cloudy	79.9	0.0	0.0	20.1	31.0	
GMP40S	05-Jun-20	16:03	Cloudy	80.0	0.0	0.4	19.6	30.0	
GMP41M	05-Jun-20	16:06	Cloudy	79.9	0.0	0.0	20.1	30.0	
GMP41S	05-Jun-20	16:05	Cloudy	80.0	0.0	0.3	19.7	30.0	
GMP42D	05-Jun-20	16:10	Cloudy	79.9	0.0	0.0	20.1	30.0	

Prepared by: Lemon Lam

Checked by: Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jun-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M1	12-Jun-20	15:08	Sunny	79.7	0.0	0.0	20.3	35.0	
M2	12-Jun-20	15:09	Sunny	79.8	0.0	0.0	20.2	35.0	
M3	12-Jun-20	15:12	Sunny	79.9	0.0	0.1	20.0	36.0	
M4	12-Jun-20	15:13	Sunny	79.8	0.0	0.0	20.2	35.0	
M6	12-Jun-20	15:14	Sunny	79.8	0.0	0.0	20.2	35.0	
M6a	12-Jun-20	15:15	Sunny	79.9	0.0	0.0	20.1	36.0	
M6b	12-Jun-20	15:16	Sunny	79.7	0.0	0.0	20.3	35.0	
M6c	12-Jun-20	15:17	Sunny	79.8	0.0	0.0	20.2	35.0	
M7	12-Jun-20	15:19	Sunny	79.7	0.0	0.0	20.3	34.0	
M8	12-Jun-20	15:20	Sunny	79.8	0.0	0.0	20.2	35.0	
M10	12-Jun-20	15:21	Sunny	79.7	0.0	0.0	20.3	35.0	
M11	12-Jun-20	15:22	Sunny	79.8	0.0	0.0	20.2	35.0	
M13	12-Jun-20	11:56	Sunny	79.7	0.0	0.0	20.3	35.0	

Prepared by: Lemon Lam

Checked by: Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill

Date of measurement: Jun-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M13a	12-Jun-20	11:58	Sunny	79.9	0.0	0.0	20.1	35.0	
M14	12-Jun-20	11:55	Sunny	79.9	0.0	0.0	20.1	34.0	
M15	12-Jun-20	12:00	Sunny	79.8	0.0	0.0	20.2	36.0	
M16	12-Jun-20	12:03	Sunny	79.7	0.0	0.0	20.3	36.0	
M17	12-Jun-20	12:07	Sunny	79.8	0.0	0.0	20.2	36.0	
M18	12-Jun-20	12:08	Sunny	79.7	0.0	0.0	20.3	36.0	
M19	12-Jun-20	12:10	Sunny	79.7	0.0	0.0	20.3	35.0	
M41	12-Jun-20	14:00	Sunny	79.9	0.0	0.0	20.1	36.0	
M43	12-Jun-20	14:01	Sunny	79.7	0.0	0.0	20.3	36.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill

Date of measurement: Jun-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P2	12-Jun-20	14:05	Sunny	80.0	0.0	0.1	19.9	35.0	
P3	12-Jun-20	14:06	Sunny	79.9	0.0	0.0	20.1	35.0	
P4	12-Jun-20	14:07	Sunny	79.8	0.0	0.0	20.2	34.0	
P5	12-Jun-20	14:12	Sunny	80.0	0.0	0.2	19.8	34.0	
P6	12-Jun-20	14:13	Sunny	79.9	0.0	0.0	20.1	35.0	
P15	12-Jun-20	14:20	Sunny	79.8	0.0	0.0	20.2	34.0	
P16a	12-Jun-20	14:21	Sunny	79.7	0.0	0.0	20.3	34.0	
P17a	12-Jun-20	14:22	Sunny	79.8	0.0	0.0	20.2	35.0	
P18a	12-Jun-20	14:23	Sunny	79.9	0.0	0.0	20.1	35.0	
P19	12-Jun-20	14:24	Sunny	80.0	0.0	0.1	19.9	34.0	
P20	12-Jun-20	14:25	Sunny	79.9	0.0	0.0	20.1	35.0	
P30aD	12-Jun-20	14:48	Sunny	80.0	0.0	0.1	19.9	35.0	
P30aM	12-Jun-20	14:47	Sunny	80.0	0.0	0.2	19.8	35.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

HKLRG

EN/DS/001



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
 Date of measurement: Jun-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P30aS	12-Jun-20	14:46	Sunny	80.0	0.0	0.4	19.6	34.0	
P33	12-Jun-20	15:23	Sunny	80.0	0.0	0.4	19.6	34.0	
P34bD	12-Jun-20	14:44	Sunny	80.0	0.0	0.7	19.3	35.0	
P34bM	12-Jun-20	14:43	Sunny	79.9	0.0	0.0	20.1	35.0	
P34bS	12-Jun-20	14:42	Sunny	80.0	0.0	0.3	19.7	35.0	
P35	12-Jun-20	15:18	Sunny	80.0	0.0	0.3	19.7	34.0	
P36bD	12-Jun-20	15:00	Sunny	80.0	0.0	0.1	19.9	36.0	
P36bM	12-Jun-20	14:59	Sunny	80.0	0.0	0.3	19.7	36.0	
P36bS	12-Jun-20	14:58	Sunny	80.0	0.0	0.2	19.8	36.0	
P37	12-Jun-20	15:10	Sunny	80.1	0.0	0.2	19.7	36.0	
P45	05-Jun-20	14:02	Sunny	80.0	0.0	0.1	19.9	30.0	
P47aD	12-Jun-20	14:32	Sunny	80.0	0.0	0.1	19.9	34.0	
P47aM	12-Jun-20	14:31	Sunny	80.0	0.0	0.2	19.8	35.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
 Date of measurement: Jun-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P47aS	12-Jun-20	14:30	Sunny	80.0	0.0	0.0	20.0	35.0	
P48	12-Jun-20	12:05	Sunny	79.8	0.0	0.0	20.2	36.0	
P49	12-Jun-20	12:02	Sunny	79.8	0.0	0.0	20.2	36.0	
P50aD	12-Jun-20	14:37	Sunny	79.9	0.0	0.0	20.1	34.0	
P50aM	12-Jun-20	14:36	Sunny	80.0	0.0	0.1	19.9	35.0	
P50aS	12-Jun-20	14:35	Sunny	80.0	0.0	0.3	19.7	35.0	
P51aD	12-Jun-20	14:40	Sunny	80.0	0.0	0.3	19.7	35.0	
P51aM	12-Jun-20	14:39	Sunny	79.9	0.0	0.0	20.1	34.0	
P51aS	12-Jun-20	14:38	Sunny	80.0	0.0	0.2	19.8	34.0	
P52a	12-Jun-20	15:05	Sunny	80.0	0.0	0.2	19.8	35.0	
P60M	12-Jun-20	14:09	Sunny	80.0	0.0	0.3	19.7	35.0	
P60S	12-Jun-20	14:08	Sunny	79.9	0.0	0.0	20.1	34.0	
P61M	12-Jun-20	14:11	Sunny	79.9	0.0	0.0	20.1	36.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

HKLRG

EN/DS/001



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jul-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP22S	03-Jul-20	14:06	Sunny	80.1	0.0	1.5	18.4	33.0	
GMP35D	03-Jul-20	15:12	Sunny	80.0	0.0	0.1	19.9	33.0	
GMP35M	03-Jul-20	15:11	Sunny	79.9	0.0	0.0	20.1	33.0	
GMP35S	03-Jul-20	15:10	Sunny	80.0	0.0	0.2	19.8	32.0	
GMP36D	03-Jul-20	14:54	Sunny	79.9	0.0	0.1	20.0	32.0	
GMP36M	03-Jul-20	14:53	Sunny	79.8	0.0	0.0	20.2	31.0	
GMP36S	03-Jul-20	14:52	Sunny	79.7	0.0	0.0	20.3	32.0	
GMP37D	03-Jul-20	14:50	Sunny	80.0	0.0	0.3	19.7	33.0	
GMP37M	03-Jul-20	14:49	Sunny	79.9	0.0	0.0	20.1	33.0	
GMP37S	03-Jul-20	14:48	Sunny	80.0	0.0	0.2	19.8	32.0	
GMP38M	03-Jul-20	14:46	Sunny	80.0	0.0	0.1	19.9	31.0	
GMP38S	03-Jul-20	14:45	Sunny	79.8	0.0	0.0	20.2	32.0	
GMP39M	03-Jul-20	14:27	Sunny	80.0	0.0	0.0	20.0	28.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jul-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M1	24-Jul-20	14:15	Sunny	79.9	0.0	0.0	20.1	34.0	
M2	24-Jul-20	14:14	Sunny	79.8	0.0	0.0	20.2	33.0	
M3	24-Jul-20	14:13	Sunny	80.0	0.0	0.1	19.9	34.0	
M4	24-Jul-20	14:12	Sunny	79.9	0.0	0.0	20.1	32.0	
M6	24-Jul-20	14:11	Sunny	79.8	0.0	0.0	20.2	33.0	
M6a	24-Jul-20	14:10	Sunny	80.0	0.0	0.1	19.9	33.0	
M6b	24-Jul-20	14:09	Sunny	79.9	0.0	0.0	20.1	32.0	
M6c	24-Jul-20	14:08	Sunny	79.8	0.0	0.0	20.2	34.0	
M7	24-Jul-20	14:07	Sunny	79.9	0.0	0.0	20.1	34.0	
M8	24-Jul-20	14:06	Sunny	79.7	0.0	0.0	20.3	33.0	
M10	24-Jul-20	14:03	Sunny	79.8	0.0	0.0	20.2	33.0	
M11	24-Jul-20	14:02	Sunny	79.9	0.0	0.0	20.1	32.0	
M13	24-Jul-20	14:01	Sunny	79.8	0.0	0.0	20.2	33.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jul-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M13a	24-Jul-20	14:00	Sunny	79.9	0.0	0.0	20.1	33.0	
M14	24-Jul-20	14:30	Sunny	79.7	0.0	0.0	20.3	33.0	
M15	24-Jul-20	14:31	Sunny	80.0	0.0	0.0	20.0	32.0	
M16	24-Jul-20	14:32	Sunny	79.9	0.0	0.0	20.1	33.0	
M17	24-Jul-20	14:33	Sunny	79.9	0.0	0.0	20.1	33.0	
M18	24-Jul-20	14:37	Sunny	79.8	0.0	0.0	20.2	33.0	
M19	24-Jul-20	14:38	Sunny	79.7	0.0	0.0	20.3	32.0	
M41	24-Jul-20	15:00	Sunny	79.8	0.0	0.0	20.2	33.0	
M43	24-Jul-20	15:01	Sunny	79.9	0.0	0.0	20.1	33.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jul-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P2	24-Jul-20	15:04	Sunny	80.0	0.0	0.1	19.9	34.0	
P3	24-Jul-20	15:07	Sunny	79.9	0.0	0.0	20.1	34.0	
P4	24-Jul-20	15:08	Sunny	79.8	0.0	0.0	20.2	34.0	
P5	24-Jul-20	15:09	Sunny	79.7	0.0	0.0	20.3	33.0	
P6	24-Jul-20	15:14	Sunny	79.8	0.0	0.0	20.2	33.0	
P15	24-Jul-20	15:20	Sunny	79.9	0.0	0.0	20.1	34.0	
P16a	24-Jul-20	15:21	Sunny	79.8	0.0	0.0	20.2	32.0	
P17a	24-Jul-20	15:22	Sunny	79.7	0.0	0.0	20.3	33.0	
P18a	24-Jul-20	15:23	Sunny	79.8	0.0	0.0	20.2	33.0	
P19	24-Jul-20	15:24	Sunny	80.0	0.0	0.1	19.9	34.0	
P20	24-Jul-20	15:25	Sunny	79.9	0.0	0.0	20.1	33.0	
P30aD	24-Jul-20	11:19	Sunny	79.8	0.0	1.1	19.1	33.0	
P30aM	24-Jul-20	11:18	Sunny	79.8	0.0	1.2	19.0	33.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

HKLRG

EN/DS/001



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jul-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P30aS	24-Jul-20	11:17	Sunny	80.0	0.0	1.0	19.0	34.0	
P33	24-Jul-20	14:04	Sunny	79.9	0.0	0.0	20.1	34.0	
P34bD	24-Jul-20	14:27	Sunny	80.0	0.0	0.2	19.8	33.0	
P34bM	24-Jul-20	14:26	Sunny	80.0	0.0	0.4	19.6	34.0	
P34bS	24-Jul-20	14:25	Sunny	79.9	0.0	0.0	20.1	34.0	
P35	24-Jul-20	14:05	Sunny	79.9	0.0	0.0	20.1	33.0	
P36bD	24-Jul-20	14:42	Sunny	80.0	0.0	0.7	19.3	33.0	
P36bM	24-Jul-20	14:41	Sunny	80.0	0.0	0.2	19.0	33.0	
P36bS	24-Jul-20	14:40	Sunny	80.0	0.0	0.1	19.9	33.0	
P37	24-Jul-20	14:16	Sunny	80.0	0.0	0.1	19.9	33.0	
P45	03-Jul-20	14:10	Sunny	79.9	0.0	0.0	20.1	33.0	
P47aD	24-Jul-20	11:14	Sunny	80.0	0.0	0.6	19.4	34.0	
P47aM	24-Jul-20	11:13	Sunny	79.1	0.0	0.6	20.3	34.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jul-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P47aS	24-Jul-20	11:12	Sunny	80.0	0.0	0.8	19.2	34.0	
P48	24-Jul-20	14:36	Sunny	80.0	0.0	0.2	19.8	34.0	
P49	24-Jul-20	14:35	Sunny	79.9	0.0	0.0	20.1	34.0	
P50aD	24-Jul-20	11:32	Sunny	80.0	0.0	0.8	19.2	32.0	
P50aM	24-Jul-20	11:31	Sunny	79.5	0.0	0.7	19.8	32.0	
P50aS	24-Jul-20	11:30	Sunny	79.6	0.0	0.0	20.4	32.0	
P51aD	24-Jul-20	11:26	Sunny	80.0	0.0	1.0	19.0	32.0	
P51aM	24-Jul-20	11:25	Sunny	80.0	0.0	2.0	18.0	32.0	
P51aS	24-Jul-20	11:24	Sunny	79.6	0.0	0.0	20.4	33.0	
P52a	24-Jul-20	14:18	Sunny	79.9	0.0	0.0	20.1	34.0	
P60M	24-Jul-20	15:11	Sunny	79.8	0.0	0.0	20.2	34.0	
P60S	24-Jul-20	15:10	Sunny	79.9	0.0	0.0	20.1	34.0	
P61M	24-Jul-20	15:13	Sunny	79.8	0.0	0.0	20.2	33.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Aug-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP22S	07-Aug-20	14:20	Sunny	79.9	0.0	0.1	20.0	35.0	
GMP35D	07-Aug-20	14:49	Sunny	80.0	0.0	0.1	19.9	34.0	
GMP35M	07-Aug-20	14:48	Sunny	80.0	0.0	0.4	19.6	34.0	
GMP35S	07-Aug-20	14:47	Sunny	80.0	0.0	0.3	19.7	34.0	
GMP36D	07-Aug-20	14:48	Sunny	80.0	0.0	0.2	19.8	34.0	
GMP36M	07-Aug-20	14:49	Sunny	79.9	0.0	0.0	20.1	34.0	
GMP36S	07-Aug-20	14:50	Sunny	80.0	0.0	0.1	19.9	33.0	
GMP37D	07-Aug-20	14:54	Sunny	80.0	0.0	0.3	19.7	34.0	
GMP37M	07-Aug-20	14:53	Sunny	79.9	0.0	0.0	20.1	33.0	
GMP37S	07-Aug-20	14:52	Sunny	80.0	0.0	0.4	19.6	34.0	
GMP38M	07-Aug-20	14:57	Sunny	79.9	0.0	0.0	20.1	33.0	
GMP38S	07-Aug-20	14:56	Sunny	80.9	0.0	0.1	19.0	34.0	
GMP39M	07-Aug-20	14:59	Sunny	80.0	0.0	0.3	19.7	33.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Aug-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M1	17-Aug-20	11:27	Sunny	79.6	0.0	0.0	20.4	31.0	
M2	17-Aug-20	11:28	Sunny	79.6	0.0	0.0	20.4	29.0	
M3	17-Aug-20	11:30	Sunny	79.6	0.0	0.0	20.4	30.0	
M4	17-Aug-20	11:31	Sunny	79.7	0.0	0.0	20.3	30.0	
M6	17-Aug-20	11:41	Sunny	79.7	0.0	0.0	20.3	30.0	
M6a	17-Aug-20	11:35	Sunny	79.7	0.0	0.0	20.3	30.0	
M6b	17-Aug-20	11:39	Sunny	79.6	0.0	0.0	20.4	30.0	
M6c	17-Aug-20	11:43	Sunny	79.7	0.0	0.0	20.3	30.0	
M7	17-Aug-20	11:45	Sunny	79.7	0.0	0.0	20.3	30.0	
M8	17-Aug-20	11:47	Sunny	79.7	0.0	0.0	20.3	30.0	
M10	17-Aug-20	11:49	Sunny	79.6	0.0	0.0	20.4	29.0	
M11	17-Aug-20	11:51	Sunny	79.7	0.0	0.0	20.3	29.0	
M13	17-Aug-20	11:53	Sunny	79.9	0.0	0.0	20.1	30.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Aug-20

Sampling equipment used : -	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M13a	17-Aug-20	11:52	Sunny	79.8	0.0	0.0	20.2	30.0	
M14	17-Aug-20	11:54	Sunny	79.9	0.0	0.0	20.1	30.0	
M15	17-Aug-20	11:55	Sunny	79.7	0.0	0.0	20.3	30.0	
M16	17-Aug-20	11:58	Sunny	79.6	0.0	0.0	20.4	29.0	
M17	17-Aug-20	11:59	Sunny	79.8	0.0	0.0	20.2	30.0	
M18	17-Aug-20	12:00	Sunny	79.7	0.0	0.0	20.3	30.0	
M19	17-Aug-20	12:01	Sunny	79.6	0.0	0.0	20.4	30.0	
M41	17-Aug-20	14:01	Sunny	79.7	0.0	0.0	20.3	30.0	
M43	17-Aug-20	14:00	Sunny	79.7	0.0	0.0	20.3	30.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Aug-20

Sampling equipment used : -	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P2	17-Aug-20	14:05	Sunny	79.9	0.0	0.0	20.1	30.0	
P3	17-Aug-20	14:08	Sunny	80.0	0.0	0.1	19.9	30.0	
P4	17-Aug-20	14:09	Sunny	79.7	0.0	0.0	20.3	30.0	
P5	17-Aug-20	14:15	Sunny	79.8	0.0	0.0	20.2	30.0	
P6	17-Aug-20	14:16	Sunny	80.0	0.0	0.2	19.8	30.0	
P15	17-Aug-20	14:28	Sunny	79.9	0.0	0.0	20.1	30.0	
P16a	17-Aug-20	14:27	Sunny	79.7	0.0	0.0	20.3	30.0	
P17a	17-Aug-20	14:26	Sunny	79.6	0.0	0.0	20.4	30.0	
P18a	17-Aug-20	14:25	Sunny	79.8	0.0	0.0	20.2	30.0	
P19	17-Aug-20	14:24	Sunny	79.7	0.0	0.0	20.3	30.0	
P20	17-Aug-20	14:23	Sunny	80.0	0.0	0.1	19.9	30.0	
P30aD	17-Aug-20	14:52	Sunny	79.7	0.0	0.0	20.3	30.0	
P30aM	17-Aug-20	14:51	Sunny	79.8	0.0	0.0	20.2	30.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Aug-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P30aS	17-Aug-20	14:50	Sunny	79.9	0.0	0.0	20.1	30.0	
P33	17-Aug-20	11:53	Sunny	79.6	0.0	0.0	20.4	30.0	
P34bD	17-Aug-20	14:57	Sunny	80.0	0.0	0.3	19.7	31.0	
P34bM	17-Aug-20	14:56	Sunny	80.0	0.0	0.2	19.8	31.0	
P34bS	17-Aug-20	14:55	Sunny	79.9	0.0	0.0	20.1	31.0	
P35	17-Aug-20	11:37	Sunny	80.0	0.0	1.0	19.0	30.0	
P36bD	17-Aug-20	14:41	Sunny	80.0	0.0	0.2	19.8	30.0	
P36bM	17-Aug-20	14:40	Sunny	80.0	0.0	0.1	19.9	30.0	
P36bS	17-Aug-20	14:39	Sunny	79.7	0.0	0.0	20.3	30.0	
P37	17-Aug-20	11:33	Sunny	79.6	0.0	0.0	20.4	29.0	
P45	07-Aug-20	14:24	Sunny	79.6	0.0	0.0	20.4	35.0	
P47aD	17-Aug-20	14:37	Sunny	80.0	0.0	0.2	19.8	30.0	
P47aM	17-Aug-20	14:36	Sunny	80.0	0.0	0.4	19.6	30.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Aug-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P47aS	17-Aug-20	14:35	Sunny	79.9	0.0	0.0	20.1	30.0	
P48	17-Aug-20	11:57	Sunny	79.7	0.0	0.0	20.3	30.0	
P49	17-Aug-20	11:56	Sunny	80.0	0.0	0.1	19.9	30.0	
P50aD	17-Aug-20	14:45	Sunny	80.0	0.0	1.0	19.0	30.0	
P50aM	17-Aug-20	14:44	Sunny	80.0	0.0	0.4	19.6	30.0	
P50aS	17-Aug-20	14:43	Sunny	79.9	0.0	0.0	20.1	30.0	
P51aD	17-Aug-20	14:48	Sunny	80.0	0.0	0.1	19.9	30.0	
P51aM	17-Aug-20	14:47	Sunny	80.0	0.0	0.2	19.8	30.0	
P51aS	17-Aug-20	14:46	Sunny	79.9	0.0	0.0	20.1	30.0	
P52a	17-Aug-20	15:10	Sunny	79.9	0.0	0.0	20.1	31.0	
P60M	17-Aug-20	14:11	Sunny	79.8	0.0	0.0	20.2	30.0	
P60S	17-Aug-20	14:10	Sunny	79.7	0.0	0.0	20.3	30.0	
P61M	17-Aug-20	14:13	Sunny	79.8	0.0	0.0	20.2	30.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Sep-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP23D	04-Sep-20	15:44	Cloudy	80.0	0.0	0.4	19.6	31.0	No compliance
GMP23M	04-Sep-20	15:43	Cloudy	80.0	0.0	0.1	19.9	31.0	No compliance
GMP23S	04-Sep-20	15:42	Cloudy	80.0	0.0	0.2	19.8	30.0	No compliance
GMP24D	04-Sep-20	15:47	Cloudy	80.0	0.0	0.3	19.7	29.0	No compliance
GMP24M	04-Sep-20	15:46	Cloudy	79.9	0.0	0.0	20.1	30.0	No compliance
GMP24S	04-Sep-20	15:45	Cloudy	80.0	0.0	0.1	19.9	31.0	No compliance
GMP25D	04-Sep-20	15:50	Cloudy	79.9	0.0	0.0	20.1	29.0	No compliance
GMP25M	04-Sep-20	15:49	Cloudy	80.0	0.0	0.2	19.6	29.0	No compliance
GMP25S	04-Sep-20	15:48	Cloudy	79.9	0.0	0.0	20.1	30.0	No compliance
GMP26D	04-Sep-20	15:53	Cloudy	80.0	0.0	0.3	19.7	30.0	No compliance
GMP26M	04-Sep-20	15:52	Cloudy	79.6	0.0	0.0	20.4	29.0	No compliance
GMP26S	04-Sep-20	15:51	Cloudy	80.0	0.0	0.4	19.6	30.0	No compliance
GMP27D	04-Sep-20	15:55	Cloudy	79.9	0.0	0.0	20.1	30.0	No compliance

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Sep-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP27M	04-Sep-20	15:54	Cloudy	80.0	0.0	0.2	19.8	29.0	No compliance
GMP27S	04-Sep-20	15:56	Cloudy	79.9	0.0	0.0	20.1	30.0	No compliance
GMP28D	04-Sep-20	15:59	Cloudy	80.0	0.0	0.3	19.7	29.0	No compliance
GMP28M	04-Sep-20	15:58	Cloudy	79.9	0.0	0.0	20.1	30.0	No compliance
GMP28S	04-Sep-20	15:57	Cloudy	80.0	0.0	0.1	19.9	30.0	No compliance
GMP29D	04-Sep-20	16:03	Cloudy	79.7	0.0	0.0	20.3	29.0	No compliance
GMP29M	04-Sep-20	16:02	Cloudy	79.8	0.0	0.2	20.0	30.0	No compliance
GMP29S	04-Sep-20	16:01	Cloudy	79.4	0.0	0.0	20.6	30.0	No compliance
GMP30D	04-Sep-20	16:06	Cloudy	80.0	0.0	0.3	19.7	30.0	No compliance
GMP30M	04-Sep-20	16:05	Cloudy	80.0	0.0	0.1	19.9	31.0	No compliance
GMP30S	04-Sep-20	16:04	Cloudy	79.7	0.0	0.0	20.3	30.0	No compliance
GMP31D	04-Sep-20	16:09	Cloudy	80.0	0.0	0.2	19.8	30.0	No compliance
GMP31M	04-Sep-20	16:08	Cloudy	80.0	0.0	0.6	19.4	30.0	No compliance

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Sep-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP31S	04-Sep-20	16:07	Cloudy	80.0	0.0	0.4	19.6	31.0	No compliance
GMP32D	04-Sep-20	16:13	Cloudy	79.7	0.0	0.0	20.3	31.0	No compliance
GMP32M	04-Sep-20	16:12	Cloudy	80.0	0.0	0.3	19.7	30.0	No compliance
GMP32S	04-Sep-20	16:11	Cloudy	80.0	0.0	0.2	19.8	30.0	No compliance
GMP33D	04-Sep-20	16:16	Cloudy	79.9	0.0	0.0	20.1	31.0	No compliance
GMP33M	04-Sep-20	16:15	Cloudy	80.0	0.0	0.1	19.9	30.0	No compliance
GMP33S	04-Sep-20	16:14	Cloudy	79.9	0.0	0.0	20.1	30.0	No compliance
GMP34D	04-Sep-20	16:19	Cloudy	79.9	0.0	0.0	20.3	30.0	No compliance
GMP34M	04-Sep-20	16:18	Cloudy	80.2	0.0	0.0	19.8	31.0	No compliance
GMP34S	04-Sep-20	16:17	Cloudy	79.7	0.0	0.2	20.1	30.0	No compliance
GMP35D	04-Sep-20	16:22	Cloudy	79.8	0.0	0.0	20.2	30.0	
GMP35M	04-Sep-20	16:21	Cloudy	79.7	0.0	0.0	20.3	31.0	
GMP35S	04-Sep-20	16:20	Cloudy	79.6	0.0	0.0	20.4	30.0	

Prepared by: W  
Lemon Lam

Checked by: f  
Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Sep-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP36D	11-Sep-20	11:00	Cloudy	79.7	0.0	0.1	20.2	30.0	
GMP36M	11-Sep-20	16:15	Cloudy	79.8	0.0	0.0	20.2	N/A	Bulk Gas Sampled
GMP36M	11-Sep-20	11:01	Cloudy	79.4	0.0	0.0	20.6	31.0	
GMP36S	11-Sep-20	11:02	Cloudy	80.0	0.0	0.2	19.8	30.0	
GMP37D	11-Sep-20	11:06	Cloudy	79.9	0.0	0.0	20.1	30.0	
GMP37M	11-Sep-20	11:05	Cloudy	80.0	0.0	0.3	19.7	30.0	
GMP37S	11-Sep-20	11:04	Cloudy	79.6	0.0	0.0	20.4	31.0	
GMP38M	11-Sep-20	11:08	Cloudy	80.0	0.0	0.1	19.9	30.0	
GMP38S	11-Sep-20	11:07	Cloudy	80.0	0.0	0.4	19.6	30.0	
GMP39M	11-Sep-20	11:10	Cloudy	79.9	0.0	0.0	20.1	31.0	
GMP39S	11-Sep-20	11:09	Cloudy	80.0	0.0	0.2	19.8	30.0	
GMP39S	11-Sep-20	16:20	Cloudy	79.7	0.0	0.0	20.3	N/A	Bulk Gas Sampled
GMP40M	11-Sep-20	11:12	Cloudy	79.6	0.0	0.0	20.4	30.0	

Prepared by: W  
Lemon Lam

Checked by: f  
Mike Shek

EN/DS/001

HKLRG



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Sep-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M1	11-Sep-20	16:32	Cloudy	80.0	0.0	0.1	19.9	30.0	
M2	11-Sep-20	16:33	Cloudy	79.9	0.0	0.0	20.1	30.0	
M3	11-Sep-20	16:34	Cloudy	79.4	0.0	0.0	20.6	29.0	
M4	11-Sep-20	16:35	Cloudy	79.5	0.0	0.1	20.4	30.0	
M6	11-Sep-20	16:36	Cloudy	79.5	0.0	0.0	20.5	29.0	
M6a	11-Sep-20	16:38	Cloudy	79.4	0.0	0.0	20.6	29.0	
M6b	11-Sep-20	16:39	Cloudy	79.6	0.0	0.0	20.4	29.0	
M6c	11-Sep-20	16:40	Cloudy	79.5	0.0	0.0	20.5	30.0	
M7	11-Sep-20	16:41	Cloudy	79.4	0.0	0.0	20.6	29.0	
M8	11-Sep-20	16:42	Cloudy	79.6	0.0	0.0	20.4	30.0	
M10	11-Sep-20	16:44	Cloudy	79.5	0.0	0.0	20.5	30.0	
M11	11-Sep-20	16:45	Cloudy	79.6	0.0	0.0	20.4	30.0	
M13	11-Sep-20	16:46	Cloudy	79.6	0.0	0.0	20.4	30.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Sep-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M13a	11-Sep-20	16:48	Cloudy	79.7	0.0	0.0	20.3	29.0	
M14	11-Sep-20	16:49	Cloudy	79.6	0.0	0.0	20.4	29.0	
M15	11-Sep-20	16:50	Cloudy	79.5	0.0	0.0	20.5	30.0	
M16	11-Sep-20	16:51	Cloudy	79.6	0.0	0.0	20.4	30.0	
M17	11-Sep-20	16:52	Cloudy	79.5	0.0	0.0	20.5	30.0	
M18	11-Sep-20	16:53	Cloudy	79.6	0.0	0.0	20.4	30.0	
M19	11-Sep-20	15:54	Cloudy	79.5	0.0	0.0	20.5	30.0	
M41	11-Sep-20	17:05	Cloudy	79.4	0.0	0.0	20.6	30.0	
M43	11-Sep-20	17:06	Cloudy	79.3	0.0	0.0	20.7	30.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Sep-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P2	11-Sep-20	15:50	Cloudy	79.4	0.0	0.0	20.6	28.0	
P3	11-Sep-20	15:51	Cloudy	79.4	0.0	0.0	20.6	29.0	
P4	11-Sep-20	15:52	Cloudy	79.5	0.0	0.0	20.5	29.0	
P5	11-Sep-20	15:53	Cloudy	79.9	0.0	0.2	19.9	29.0	
P6	11-Sep-20	15:54	Cloudy	79.6	0.0	0.0	20.4	30.0	
P15	11-Sep-20	15:42	Cloudy	79.9	0.0	0.0	20.1	28.0	
P16	11-Sep-20	15:40	Cloudy	79.6	0.0	0.0	20.4	30.0	Bulk Gas Sampled
P16a	11-Sep-20	15:40	Cloudy	79.6	0.0	0.0	20.4	30.0	
P17a	11-Sep-20	15:44	Cloudy	80.0	0.0	0.2	19.8	28.0	
P18a	11-Sep-20	15:46	Cloudy	79.9	0.0	0.0	20.1	28.0	
P19	11-Sep-20	15:50	Cloudy	80.0	0.0	0.2	19.8	29.0	
P20	11-Sep-20	15:48	Cloudy	79.9	0.0	0.0	20.1	29.0	
P30aD	11-Sep-20	16:16	Cloudy	80.0	0.0	0.4	19.6	29.0	

Prepared by: Lemon Lam

Checked by: Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Sep-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P30aM	11-Sep-20	16:15	Cloudy	80.0	0.0	0.2	19.8	30.0	
P30aS	11-Sep-20	16:14	Cloudy	79.7	0.0	0.0	20.3	29.0	
P33	11-Sep-20	16:47	Cloudy	80.0	0.0	0.3	19.7	30.0	
P34bD	11-Sep-20	16:19	Cloudy	80.0	0.0	0.4	19.6	30.0	
P34bM	11-Sep-20	16:18	Cloudy	79.9	0.0	0.0	20.1	30.0	
P34bS	11-Sep-20	16:17	Cloudy	80.0	0.0	0.2	19.8	29.0	
P35	11-Sep-20	16:43	Cloudy	80.0	0.0	0.3	19.7	30.0	
P36bD	11-Sep-20	16:22	Cloudy	80.0	0.0	0.1	19.9	30.0	
P36bM	11-Sep-20	16:21	Cloudy	80.0	0.0	0.7	19.3	30.0	
P36bS	11-Sep-20	16:20	Cloudy	80.0	0.0	0.2	19.8	30.0	
P37	11-Sep-20	16:37	Cloudy	80.0	0.0	0.4	19.6	30.0	
P45	11-Sep-20	17:00	Cloudy	79.4	0.0	0.0	20.6	30.0	
P45	11-Sep-20	15:35	Cloudy	79.6	0.0	0.0	20.4	N/A	Bulk Gas Sampled

Prepared by: Lemon Lam

Checked by: Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Sep-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P47aD	11-Sep-20	16:07	Cloudy	80.0	0.0	0.2	19.8	31.0	
P47aM	11-Sep-20	16:06	Cloudy	80.0	0.0	0.4	19.6	30.0	
P47aS	11-Sep-20	16:05	Cloudy	79.9	0.0	0.0	20.1	30.0	
P48	11-Sep-20	16:56	Cloudy	79.4	0.0	0.0	20.6	30.0	
P49	11-Sep-20	16:55	Cloudy	79.6	0.0	0.0	20.4	30.0	
P50aD	11-Sep-20	16:10	Cloudy	79.6	0.0	0.1	20.3	30.0	
P50aM	11-Sep-20	16:09	Cloudy	80.0	0.0	0.2	19.8	30.0	
P50aS	11-Sep-20	16:08	Cloudy	79.6	0.0	0.0	20.4	30.0	
P51aD	11-Sep-20	16:13	Cloudy	79.6	0.0	0.0	20.4	30.0	
P51aM	11-Sep-20	16:12	Cloudy	80.0	0.0	0.4	19.6	30.0	
P51aS	11-Sep-20	16:11	Cloudy	79.7	0.0	0.0	20.3	30.0	
P52a	11-Sep-20	16:30	Cloudy	79.6	0.0	0.0	20.4	30.0	
P60M	11-Sep-20	15:57	Cloudy	80.0	0.0	0.1	19.9	31.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Oct-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP22S	12-Oct-20	11:32	Sunny	79.7	0.0	0.8	19.5	28.0	
GMP35D	12-Oct-20	12:18	Sunny	80.2	0.0	0.2	19.6	27.0	
GMP35M	12-Oct-20	12:19	Sunny	80.2	0.0	0.2	19.6	28.0	
GMP35S	12-Oct-20	12:20	Sunny	80.3	0.0	0.2	19.5	28.0	
GMP36D	12-Oct-20	12:25	Sunny	80.6	0.0	0.6	18.8	28.0	
GMP36M	12-Oct-20	12:24	Sunny	80.4	0.0	0.1	19.5	28.0	
GMP36S	12-Oct-20	12:23	Sunny	80.4	0.0	0.1	19.5	28.0	
GMP37D	12-Oct-20	12:32	Sunny	80.6	0.0	0.0	19.4	29.0	
GMP37M	12-Oct-20	12:31	Sunny	80.1	0.0	0.8	19.1	29.0	
GMP37S	12-Oct-20	12:30	Sunny	80.5	0.0	0.7	18.8	28.0	
GMP38M	12-Oct-20	12:35	Sunny	79.7	0.0	0.0	20.3	27.0	
GMP38S	12-Oct-20	12:34	Sunny	80.0	0.0	0.2	19.8	26.0	
GMP39M	12-Oct-20	12:38	Sunny	79.6	0.0	0.0	20.4	26.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
 Date of measurement: Oct-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M1	09-Oct-20	14:00	Sunny	79.7	0.0	0.0	20.3	36.0	
M2	09-Oct-20	14:01	Sunny	79.4	0.0	0.0	20.6	35.0	
M3	09-Oct-20	14:02	Sunny	79.5	0.0	0.0	20.5	36.0	
M4	09-Oct-20	14:03	Sunny	79.4	0.0	0.0	20.6	35.0	
M6	09-Oct-20	14:04	Sunny	79.5	0.0	0.0	20.5	36.0	
M6a	09-Oct-20	14:05	Sunny	79.4	0.0	0.0	20.6	35.0	
M6b	09-Oct-20	14:06	Sunny	79.5	0.0	0.0	20.5	36.0	
M6c	09-Oct-20	14:07	Sunny	79.4	0.0	0.0	20.6	36.0	
M7	09-Oct-20	14:08	Sunny	79.5	0.0	0.0	20.5	36.0	
M8	09-Oct-20	14:13	Sunny	79.4	0.0	0.0	20.6	36.0	
M10	09-Oct-20	14:14	Sunny	79.6	0.0	0.0	20.4	35.0	
M11	09-Oct-20	14:15	Sunny	79.5	0.0	0.0	20.5	36.0	
M13	09-Oct-20	14:16	Sunny	79.4	0.0	0.0	20.6	35.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
 Date of measurement: Oct-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M13a	09-Oct-20	14:17	Sunny	79.6	0.0	0.0	20.4	36.0	
M14	09-Oct-20	14:18	Sunny	79.5	0.0	0.0	20.5	36.0	
M15	09-Oct-20	14:19	Sunny	79.4	0.0	0.0	20.6	35.0	
M16	09-Oct-20	14:22	Sunny	79.3	0.0	0.0	20.7	36.0	
M17	09-Oct-20	14:23	Sunny	79.3	0.0	0.0	20.7	36.0	
M18	09-Oct-20	14:24	Sunny	79.5	0.0	0.0	20.5	35.0	
M19	09-Oct-20	14:25	Sunny	79.4	0.0	0.0	20.6	36.0	
M41	09-Oct-20	11:30	Sunny	79.4	0.0	0.0	20.4	34.0	
M43	09-Oct-20	11:32	Sunny	79.3	0.0	0.0	20.7	34.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

HKLRG

EN/DS/001



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Oct-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P2	09-Oct-20	11:36	Sunny	79.2	0.0	0.0	20.8	34.0	
P3	09-Oct-20	14:12	Sunny	79.6	0.0	0.0	20.4	30.0	
P4	09-Oct-20	11:42	Sunny	79.2	0.0	0.0	20.8	30.0	
P5	09-Oct-20	11:54	Sunny	79.2	0.0	0.0	20.8	32.0	
P6	09-Oct-20	11:56	Sunny	79.3	0.0	0.0	20.7	32.0	
P15	09-Oct-20	12:00	Sunny	80.0	0.0	0.2	19.8	30.0	
P16a	09-Oct-20	12:01	Sunny	79.9	0.0	0.0	20.1	32.0	
P17a	09-Oct-20	12:02	Sunny	80.0	0.0	0.1	19.9	30.0	
P18a	09-Oct-20	12:03	Sunny	79.6	0.0	0.0	20.4	29.0	
P19	09-Oct-20	12:04	Sunny	80.0	0.0	0.2	19.8	28.0	
P20	09-Oct-20	12:05	Sunny	79.7	0.0	0.0	20.3	28.0	
P30aD	09-Oct-20	13:47	Sunny	79.6	0.0	0.0	20.4	30.0	
P30aM	09-Oct-20	13:46	Sunny	80.0	0.0	0.3	19.7	28.0	

Prepared by: Lemon Lam

Checked by: Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Oct-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P30aS	09-Oct-20	13:45	Sunny	80.0	0.0	0.1	19.9	27.0	
P33	09-Oct-20	14:11	Sunny	80.0	0.0	0.4	19.6	30.0	
P34bD	09-Oct-20	13:50	Sunny	79.7	0.0	0.0	20.3	30.0	
P34bM	09-Oct-20	13:49	Sunny	79.8	0.0	0.0	20.2	30.0	
P34bS	09-Oct-20	13:48	Sunny	79.9	0.0	0.0	20.1	28.0	
P35	09-Oct-20	14:10	Sunny	79.6	0.0	0.0	20.4	30.0	
P36bD	09-Oct-20	14:36	Sunny	80.0	0.0	0.1	19.9	30.0	
P36bM	09-Oct-20	14:35	Sunny	80.0	0.0	0.2	19.8	30.0	
P36bS	09-Oct-20	14:34	Sunny	80.0	0.0	0.1	19.9	30.0	
P37	09-Oct-20	14:09	Sunny	79.9	0.0	0.0	20.1	30.0	
P45	12-Oct-20	11:36	Sunny	79.5	0.0	5.1	15.4	29.0	
P47aD	09-Oct-20	13:32	Sunny	79.9	0.0	0.0	20.1	30.0	
P47aM	09-Oct-20	13:31	Sunny	80.0	0.0	0.1	19.9	30.0	

Prepared by: Lemon Lam

Checked by: Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Oct-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P47aS	09-Oct-20	13:30	Sunny	80.0	0.0	0.2	19.8	31.0	
P48	09-Oct-20	14:21	Sunny	79.8	0.0	0.0	20.2	30.0	
P49	09-Oct-20	14:20	Sunny	80.0	0.0	0.3	19.7	29.0	
P50aD	09-Oct-20	13:39	Sunny	80.0	0.0	0.4	19.6	30.0	
P50aM	09-Oct-20	13:38	Sunny	79.8	0.0	0.0	20.2	29.0	
P50aS	09-Oct-20	13:37	Sunny	79.7	0.0	0.0	20.3	28.0	
P51aD	09-Oct-20	13:42	Sunny	80.0	0.0	0.3	19.7	30.0	
P51aM	09-Oct-20	13:41	Sunny	79.4	0.0	0.0	20.6	29.0	
P51aS	09-Oct-20	13:40	Sunny	79.9	0.0	0.2	19.9	30.0	
P52a	09-Oct-20	13:57	Sunny	79.5	0.0	0.0	20.5	30.0	
P60M	09-Oct-20	11:39	Sunny	80.0	0.0	0.2	19.8	34.0	
P60S	09-Oct-20	11:38	Sunny	79.2	0.0	0.0	20.8	34.0	
P61M	09-Oct-20	11:52	Sunny	79.1	0.0	0.3	20.6	32.0	

Prepared by: Lemon Lam

Checked by: Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Nov-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP22S	23-Nov-20	11:30	Sunny	79.0	0.0	0.1	20.9	25.6	
GMP35D	23-Nov-20	14:32	Sunny	80.0	0.0	0.3	19.7	25.0	
GMP35M	23-Nov-20	14:31	Sunny	79.9	0.0	0.1	20.0	25.0	
GMP35S	23-Nov-20	14:30	Sunny	79.2	0.0	0.2	20.6	25.0	
GMP36D	23-Nov-20	14:35	Sunny	79.4	0.0	0.0	20.6	25.0	
GMP36M	23-Nov-20	14:34	Sunny	79.8	0.0	0.3	19.9	25.0	
GMP36S	23-Nov-20	14:33	Sunny	79.5	0.0	0.0	20.5	25.0	
GMP37D	23-Nov-20	14:39	Sunny	79.4	0.0	0.0	20.6	24.0	
GMP37M	23-Nov-20	14:38	Sunny	80.0	0.0	0.2	19.8	25.0	
GMP37S	23-Nov-20	14:37	Sunny	79.6	0.0	0.0	20.4	25.0	
GMP38M	23-Nov-20	14:42	Sunny	79.5	0.0	0.0	20.5	25.0	
GMP38S	23-Nov-20	14:41	Sunny	80.0	0.0	0.3	19.7	24.0	
GMP39M	23-Nov-20	14:44	Sunny	80.0	0.0	0.4	19.6	24.0	

Prepared by: Lemon Lam

Checked by: Mike Shek

EN/DS/001

HKLRG



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Nov-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M1	24-Nov-20	13:26	Sunny	79.4	0.0	0.0	20.6	25.0	
M2	24-Nov-20	13:27	Sunny	79.5	0.0	0.0	20.5	25.0	
M3	24-Nov-20	13:28	Sunny	79.4	0.0	0.1	20.5	25.0	
M4	24-Nov-20	13:29	Sunny	79.4	0.0	0.0	20.6	24.0	
M6	24-Nov-20	13:30	Sunny	79.3	0.0	0.0	20.7	25.0	
M6a	24-Nov-20	13:31	Sunny	79.4	0.0	0.0	20.6	25.0	
M6b	24-Nov-20	13:32	Sunny	79.5	0.0	0.0	20.5	25.0	
M6c	24-Nov-20	13:33	Sunny	79.5	0.0	0.0	20.5	26.0	
M7	24-Nov-20	13:35	Sunny	79.4	0.0	0.0	20.6	25.0	
M8	24-Nov-20	13:36	Sunny	79.6	0.0	0.0	20.4	26.0	
M10	24-Nov-20	13:37	Sunny	79.5	0.0	0.0	20.5	26.0	
M11	24-Nov-20	13:38	Sunny	79.4	0.0	0.0	20.6	25.0	
M13	24-Nov-20	13:01	Sunny	79.5	0.0	0.0	20.5	26.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Nov-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M13a	24-Nov-20	13:00	Sunny	79.4	0.0	0.0	20.6	26.0	
M14	24-Nov-20	13:02	Sunny	79.4	0.0	0.0	20.6	27.0	
M15	24-Nov-20	13:03	Sunny	79.3	0.0	0.0	20.7	26.0	
M16	24-Nov-20	13:04	Sunny	79.3	0.0	0.0	20.7	26.0	
M17	24-Nov-20	13:07	Sunny	79.2	0.0	0.0	20.8	26.0	
M18	24-Nov-20	13:08	Sunny	79.1	0.0	0.0	20.9	26.0	
M19	24-Nov-20	13:09	Sunny	79.3	0.0	0.0	20.7	25.0	
M41	24-Nov-20	13:40	Sunny	79.2	0.0	0.0	20.8	26.0	
M43	24-Nov-20	13:41	Sunny	79.3	0.0	0.0	20.7	26.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

HKLRG

EN/DS/001



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Nov-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P2	24-Nov-20	13:42	Sunny	79.4	0.0	0.0	20.6	24.0	
P3	24-Nov-20	13:43	Sunny	79.5	0.0	0.0	20.5	24.0	
P4	24-Nov-20	13:44	Sunny	79.6	0.0	0.0	20.4	24.0	
P5	24-Nov-20	13:45	Sunny	79.4	0.0	0.0	20.6	24.0	
P6	24-Nov-20	13:50	Sunny	79.3	0.0	0.0	20.7	25.0	
P15	24-Nov-20	14:00	Sunny	79.2	0.0	0.0	20.8	25.0	
P16a	24-Nov-20	14:01	Sunny	79.6	0.0	0.0	20.4	25.0	
P17a	24-Nov-20	14:02	Sunny	79.4	0.0	0.0	20.6	25.0	
P18a	24-Nov-20	14:03	Sunny	79.9	0.0	0.1	20.0	25.0	
P19	24-Nov-20	14:04	Sunny	79.6	0.0	0.0	20.4	25.0	
P20	24-Nov-20	14:05	Sunny	79.6	0.0	0.0	20.4	25.0	
P30aD	23-Nov-20	14:09	Sunny	78.8	0.0	2.5	18.7	24.2	
P30aM	23-Nov-20	14:08	Sunny	80.0	0.0	0.7	19.3	24.2	

Prepared by: lv

Lemon Lam

Checked by: Mike Shek

Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Nov-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P30aS	23-Nov-20	14:07	Sunny	79.1	0.0	0.6	20.3	24.2	
P33	24-Nov-20	13:39	Sunny	79.6	0.0	0.4	20.0	24.0	
P34bD	24-Nov-20	13:43	Sunny	79.6	0.0	0.7	19.7	24.0	
P34bM	24-Nov-20	13:42	Sunny	79.9	0.0	0.2	19.9	24.0	
P34bS	24-Nov-20	13:41	Sunny	79.4	0.0	0.0	20.6	24.0	
P35	24-Nov-20	13:34	Sunny	80.5	0.0	0.3	19.2	24.0	
P36bD	24-Nov-20	13:22	Sunny	79.7	0.0	0.1	20.2	25.0	
P36bM	24-Nov-20	13:21	Sunny	79.8	0.0	0.2	20.0	25.0	
P36bS	24-Nov-20	13:20	Sunny	79.6	0.0	0.0	20.4	25.0	
P37	24-Nov-20	13:05	Sunny	80.0	0.0	0.2	19.8	24.0	
P45	23-Nov-20	11:34	Sunny	79.6	0.0	0.0	20.4	25.2	
P47aD	23-Nov-20	14:04	Sunny	79.6	0.0	1.0	19.4	24.4	
P47aM	23-Nov-20	14:03	Sunny	79.8	0.0	0.1	20.1	24.4	

Prepared by: lv

Lemon Lam

Checked by: Mike Shek

Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Nov-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P47aS	23-Nov-20	14:02	Sunny	80.0	0.0	0.8	19.2	24.4	
P48	24-Nov-20	13:05	Sunny	79.4	0.0	0.0	20.6	24.0	
P49	24-Nov-20	13:06	Sunny	79.4	0.0	0.0	20.6	24.0	
P50aD	23-Nov-20	14:15	Sunny	79.1	0.0	1.6	19.3	23.9	
P50eM	23-Nov-20	14:14	Sunny	79.2	0.0	1.7	19.1	24.0	
P50aS	23-Nov-20	14:13	Sunny	79.2	0.0	1.7	19.1	24.0	
P51eD	23-Nov-20	14:22	Sunny	79.2	0.0	1.3	19.5	24.0	
P51eM	23-Nov-20	14:21	Sunny	78.5	0.0	2.2	19.3	24.0	
P51aS	23-Nov-20	14:20	Sunny	78.8	0.0	2.1	19.1	24.0	
P52a	24-Nov-20	13:17	Sunny	79.5	0.0	0.0	20.5	24.0	
P60M	24-Nov-20	13:07	Sunny	80.0	0.0	0.3	19.7	25.0	
P60S	24-Nov-20	13:06	Sunny	79.4	0.0	0.0	20.6	25.0	
P61M	24-Nov-20	13:09	Sunny	79.8	0.0	0.8	19.4	25.0	

Prepared by: Lemon Lam

Checked by: Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Dec-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP23S	18-Dec-20	15:55	Cloudy	79.7	0.0	0.0	20.3	22.0	No compliance
GMP24D	18-Dec-20	15:54	Cloudy	80.0	0.0	0.4	19.6	22.0	No compliance
GMP24M	18-Dec-20	15:53	Cloudy	80.0	0.0	0.6	19.4	23.0	No compliance
GMP24S	18-Dec-20	15:52	Cloudy	79.9	0.0	0.0	20.1	22.2	No compliance
GMP25D	18-Dec-20	15:50	Cloudy	80.0	0.0	0.2	19.8	23.0	No compliance
GMP25M	18-Dec-20	15:49	Cloudy	79.8	0.0	0.3	19.9	23.1	No compliance
GMP25S	18-Dec-20	15:48	Cloudy	79.4	0.0	0.1	20.5	22.3	No compliance
GMP26D	18-Dec-20	15:46	Cloudy	79.4	0.0	0.0	20.6	22.2	No compliance
GMP26M	18-Dec-20	15:45	Cloudy	79.5	0.0	0.2	20.3	22.3	No compliance
GMP26S	18-Dec-20	15:44	Cloudy	79.6	0.0	0.4	20.0	22.2	No compliance
GMP27D	18-Dec-20	15:43	Cloudy	79.4	0.0	0.6	20.0	22.3	No compliance
GMP27M	18-Dec-20	15:42	Cloudy	79.4	0.0	0.0	20.6	22.2	No compliance
GMP27S	18-Dec-20	15:41	Cloudy	79.6	0.0	0.3	20.1	22.2	No compliance

Prepared by: Lemon Lam

Checked by: Mike Shek

HKLRG

EN/DS/001



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Dec-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP28D	18-Dec-20	15:40	Cloudy	79.8	0.0	0.2	20.0	22.0	No compliance
GMP28M	18-Dec-20	15:39	Cloudy	79.5	0.0	0.1	20.4	22.3	No compliance
GMP28S	18-Dec-20	15:38	Cloudy	79.3	0.0	0.0	20.7	22.1	No compliance
GMP29D	18-Dec-20	15:37	Cloudy	79.7	0.0	0.3	20.0	22.3	No compliance
GMP29M	18-Dec-20	15:36	Cloudy	79.4	0.0	0.0	20.6	22.2	No compliance
GMP29S	18-Dec-20	15:35	Cloudy	79.9	0.0	0.2	19.9	22.3	No compliance
GMP30D	30-Dec-20	10:17	Sunny	79.5	0.0	0.2	20.3	18.0	No compliance
GMP30M	30-Dec-20	10:16	Sunny	79.4	0.0	0.1	20.5	18.0	No compliance
GMP30S	30-Dec-20	10:15	Sunny	79.4	0.0	0.0	20.6	17.0	No compliance
GMP31D	30-Dec-20	10:21	Sunny	79.6	0.0	0.3	20.1	17.0	No compliance
GMP31M	30-Dec-20	10:20	Sunny	79.3	0.0	0.0	20.7	17.0	No compliance
GMP31S	30-Dec-20	10:19	Sunny	79.3	0.0	0.0	20.7	17.0	No compliance
GMP32D	30-Dec-20	10:25	Sunny	79.2	0.0	0.0	20.8	16.0	No compliance

Prepared by:

Lemon Lam

Checked by:

Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Dec-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP32M	30-Dec-20	10:24	Sunny	79.4	0.0	0.0	20.6	15.0	No compliance
GMP32S	30-Dec-20	10:23	Sunny	79.3	0.0	0.0	20.7	15.0	No compliance
GMP33D	30-Dec-20	10:28	Sunny	79.3	0.0	0.0	20.7	16.0	No compliance
GMP33M	30-Dec-20	10:27	Sunny	79.7	0.0	0.3	20.0	16.0	No compliance
GMP33S	30-Dec-20	10:26	Sunny	79.5	0.0	0.7	19.8	16.0	No compliance
GMP34D	30-Dec-20	10:31	Sunny	79.7	0.0	0.2	20.1	17.0	No compliance
GMP34M	30-Dec-20	10:30	Sunny	79.4	0.0	0.0	20.6	16.0	No compliance
GMP34S	30-Dec-20	10:29	Sunny	79.6	0.0	0.4	20.0	17.0	No compliance
GMP35D	30-Dec-20	10:35	Sunny	79.3	0.0	0.0	20.7	16.0	No compliance
GMP35M	30-Dec-20	10:34	Sunny	79.4	0.0	0.0	20.6	17.0	No compliance
GMP35S	30-Dec-20	10:33	Sunny	79.4	0.0	0.0	20.6	16.0	No compliance
GMP36D	30-Dec-20	10:39	Sunny	80.0	0.0	0.3	19.7	17.0	No compliance
GMP36M	30-Dec-20	10:38	Sunny	79.4	0.0	0.0	20.6	16.0	No compliance

Prepared by:

Lemon Lam

Checked by:

Mike Shek

HKLRG

EN/DS/001



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Dec-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP36S	30-Dec-20	10:37	Sunny	79.8	0.0	0.2	20.0	17.0	
GMP37D	30-Dec-20	10:44	Sunny	79.6	0.0	0.4	20.0	16.0	
GMP37M	30-Dec-20	10:43	Sunny	80.0	0.0	0.2	19.8	16.0	
GMP37S	30-Dec-20	10:42	Sunny	79.3	0.0	0.0	20.7	16.0	
GMP38M	30-Dec-20	10:47	Sunny	79.6	0.0	0.3	20.1	16.0	
GMP38S	30-Dec-20	10:46	Sunny	79.8	0.0	0.2	20.0	17.0	
GMP39M	30-Dec-20	10:50	Sunny	79.4	0.0	0.0	20.6	16.0	
GMP39S	30-Dec-20	10:49	Sunny	79.7	0.0	0.3	20.0	16.0	
GMP40M	30-Dec-20	10:53	Sunny	79.8	0.0	0.2	20.0	16.0	
GMP40S	30-Dec-20	10:52	Sunny	79.4	0.0	0.0	20.6	17.0	
GMP41M	30-Dec-20	10:56	Sunny	79.4	0.0	0.0	20.6	16.0	
GMP41S	30-Dec-20	10:55	Sunny	79.4	0.0	0.1	20.5	16.0	
GMP42D	30-Dec-20	11:02	Sunny	79.5	0.0	0.2	20.3	16.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

HKLRG

ENDS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Dec-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M1	11-Dec-20	15:06	Sunny	79.3	0.0	0.0	20.7	26.0	
M2	11-Dec-20	15:07	Sunny	79.4	0.0	0.0	20.6	25.0	
M3	11-Dec-20	15:08	Sunny	79.3	0.0	0.0	20.7	25.0	
M4	11-Dec-20	15:10	Sunny	79.3	0.0	0.0	20.7	26.0	
M6	11-Dec-20	15:11	Sunny	79.4	0.0	0.0	20.6	26.0	
M6a	11-Dec-20	15:12	Sunny	79.3	0.0	0.1	20.6	25.0	
M6b	11-Dec-20	15:13	Sunny	79.3	0.0	0.0	20.7	26.0	
M6c	11-Dec-20	15:14	Sunny	79.4	0.0	0.0	20.6	26.0	
M7	11-Dec-20	15:17	Sunny	79.2	0.0	0.1	20.7	25.0	
M8	11-Dec-20	15:18	Sunny	79.2	0.0	0.0	20.8	26.0	
M10	11-Dec-20	15:19	Sunny	79.2	0.0	0.0	20.8	25.0	
M11	11-Dec-20	15:20	Sunny	79.2	0.0	0.0	20.8	26.0	
M13	11-Dec-20	13:54	Sunny	79.2	0.0	0.0	20.8	26.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

HKLRG

ENDS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
 Date of measurement: Dec-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M13a	11-Dec-20	13:50	Sunny	79.1	0.0	0.0	20.9	25.0	
M14	11-Dec-20	13:52	Sunny	79.2	0.0	0.0	20.8	26.0	
M15	11-Dec-20	13:57	Sunny	79.1	0.0	0.0	20.9	26.0	
M16	11-Dec-20	14:02	Sunny	79.2	0.0	0.0	20.8	26.0	
M17	11-Dec-20	14:04	Sunny	79.2	0.0	0.0	20.8	26.0	
M18	11-Dec-20	14:06	Sunny	79.2	0.0	0.0	20.8	25.0	
M19	11-Dec-20	14:07	Sunny	79.2	0.0	0.0	20.8	26.0	
M41	11-Dec-20	14:15	Sunny	79.3	0.0	0.0	20.7	26.0	
M43	11-Dec-20	14:16	Sunny	79.3	0.0	0.0	20.7	26.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

**HKLRG**

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
 Date of measurement: Dec-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P2	11-Dec-20	14:18	Sunny	79.4	0.0	0.0	20.6	25.0	
P3	11-Dec-20	14:19	Sunny	79.5	0.0	0.0	20.5	25.0	
P4	11-Dec-20	14:20	Sunny	79.7	0.0	0.2	20.1	25.0	
P5	11-Dec-20	14:21	Sunny	79.4	0.0	0.0	20.6	25.0	
P6	11-Dec-20	14:22	Sunny	79.4	0.0	0.1	20.5	26.0	
P15	11-Dec-20	15:27	Sunny	79.4	0.0	0.0	20.6	25.0	
P16a	11-Dec-20	15:28	Sunny	79.3	0.0	0.0	20.7	25.0	
P17a	11-Dec-20	15:29	Sunny	79.3	0.0	0.0	20.7	26.0	
P18a	11-Dec-20	15:30	Sunny	79.4	0.0	0.0	20.6	25.0	
P19	11-Dec-20	15:31	Sunny	79.3	0.0	0.0	20.7	26.0	
P20	11-Dec-20	15:32	Sunny	79.4	0.0	0.0	20.6	25.0	
P30aD	11-Dec-20	14:47	Sunny	79.4	0.0	0.1	20.5	25.0	
P30aM	11-Dec-20	14:46	Sunny	79.9	0.0	0.2	19.9	26.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

**HKLRG**



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Dec-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P30aS	11-Dec-20	14:45	Sunny	79.4	0.0	0.0	20.6	26.0	
P33	11-Dec-20	15:16	Sunny	79.8	0.0	0.2	20.0	25.0	
P34bD	11-Dec-20	14:50	Sunny	79.5	0.0	0.0	20.5	25.0	
P34bM	11-Dec-20	14:49	Sunny	79.4	0.0	0.1	20.5	26.0	
P34bS	11-Dec-20	14:48	Sunny	79.7	0.0	0.3	20.0	25.0	
P35	11-Dec-20	15:15	Sunny	79.7	0.0	0.1	20.2	25.0	
P36bD	11-Dec-20	14:43	Sunny	79.9	0.0	0.2	19.9	26.0	
P36bM	11-Dec-20	14:42	Sunny	79.7	0.0	0.3	20.0	26.0	
P36bS	11-Dec-20	14:41	Sunny	79.5	0.0	0.2	20.3	26.0	
P37	11-Dec-20	15:09	Sunny	79.4	0.0	0.0	20.6	25.0	
P45	18-Dec-20	14:19	Cloudy	79.2	0.0	0.1	20.7	21.3	
P47aD	11-Dec-20	14:32	Sunny	79.6	0.0	1.0	19.4	26.0	
P47aM	11-Dec-20	14:31	Sunny	79.4	0.0	0.2	20.4	26.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Dec-20

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P47aS	11-Dec-20	14:30	Sunny	79.4	0.0	0.0	20.6	26.0	
P48	11-Dec-20	14:03	Sunny	79.1	0.0	0.1	20.8	26.0	
P49	11-Dec-20	14:00	Sunny	79.5	0.0	0.5	20.0	26.0	
P50aD	11-Dec-20	14:37	Sunny	79.4	0.0	0.0	20.6	25.0	
P50aM	11-Dec-20	14:36	Sunny	79.5	0.0	0.2	20.3	25.0	
P50aS	11-Dec-20	14:35	Sunny	79.4	0.0	0.0	20.6	26.0	
P51aD	11-Dec-20	14:40	Sunny	79.8	0.0	0.4	19.8	26.0	
P51aM	11-Dec-20	14:39	Sunny	79.5	0.0	0.5	20.0	26.0	
P51aS	11-Dec-20	14:38	Sunny	79.4	0.0	0.0	20.6	26.0	
P52a	11-Dec-20	15:05	Sunny	79.3	0.0	0.0	20.7	26.0	
P60M	11-Dec-20	14:24	Sunny	79.5	0.0	0.0	20.5	25.0	
P60S	11-Dec-20	14:23	Sunny	79.6	0.0	0.0	20.4	26.0	
P61M	11-Dec-20	14:36	Sunny	79.5	0.0	0.0	20.5	26.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

EN/DS/001

HKLRG



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jan-21

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP22S	15-Jan-21	14:40	Sunny	79.9	0.0	0.0	20.1	25.5	
GMP35D	15-Jan-21	14:50	Sunny	79.7	0.0	0.1	20.2	25.2	
GMP35M	15-Jan-21	14:49	Sunny	79.3	0.0	0.1	20.6	25.1	
GMP35S	15-Jan-21	14:48	Sunny	79.4	0.0	0.7	19.9	24.9	
GMP36D	15-Jan-21	14:53	Sunny	79.3	0.0	0.0	20.7	25.0	
GMP36M	15-Jan-21	14:52	Sunny	79.3	0.0	0.7	20.0	25.1	
GMP36S	15-Jan-21	14:51	Sunny	79.4	0.0	0.2	20.4	25.1	
GMP37D	16 Jan 21	14:57	Sunny	79.3	0.0	0.1	20.6	25.2	
GMP37M	15-Jan-21	14:56	Sunny	79.3	0.0	0.0	20.7	25.3	
GMP37S	15-Jan-21	14:55	Sunny	79.5	0.0	0.4	20.1	25.4	
GMP38M	15-Jan-21	15:01	Sunny	79.2	0.0	0.2	20.6	25.1	
GMP38S	15-Jan-21	15:00	Sunny	79.3	0.0	0.3	20.4	25.0	
GMP39M	15-Jan-21	15:04	Sunny	79.3	0.0	0.0	20.7	25.2	

Prepared by: Lemon Lam

Checked by: Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jan-21

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M1	08-Jan-21	14:25	Cloudy	79.1	0.0	0.0	20.9	11.4	
M2	08-Jan-21	14:26	Cloudy	79.2	0.0	0.0	20.8	11.6	
M3	08-Jan-21	14:27	Cloudy	79.2	0.0	0.0	20.8	11.8	
M4	08-Jan-21	14:29	Cloudy	79.1	0.0	0.1	20.8	11.3	
M6	08-Jan-21	14:30	Cloudy	79.1	0.0	0.0	20.9	11.7	
M6a	08-Jan-21	14:31	Cloudy	79.3	0.0	0.0	20.7	11.2	
M6b	08-Jan-21	14:32	Cloudy	79.2	0.0	0.0	20.8	11.4	
M6c	08-Jan-21	14:33	Cloudy	79.3	0.0	0.0	20.7	11.2	
M7	08-Jan-21	14:35	Cloudy	79.2	0.0	0.0	20.8	11.7	
M8	08-Jan-21	14:36	Cloudy	79.3	0.0	0.0	20.7	12.0	
M10	08-Jan-21	14:37	Cloudy	79.2	0.0	0.0	20.8	12.1	
M11	08-Jan-21	14:38	Cloudy	79.3	0.0	0.0	20.7	12.0	
M13	08-Jan-21	11:18	Cloudy	78.2	0.0	0.0	21.8	11.2	

Prepared by: Lemon Lam

Checked by: Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill

Date of measurement: Jan-21

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M13a	08-Jan-21	11:21	Cloudy	78.2	0.0	0.2	21.6	10.8	
M14	08-Jan-21	11:19	Cloudy	78.8	0.0	0.0	21.2	11.8	
M15	08-Jan-21	11:16	Cloudy	78.3	0.0	0.0	21.7	10.9	
M16	08-Jan-21	11:12	Cloudy	78.4	0.0	0.1	21.5	11.6	
M17	08-Jan-21	11:08	Cloudy	78.5	0.0	0.0	21.5	12.6	
M18	08-Jan-21	11:05	Cloudy	78.6	0.0	0.0	21.4	12.9	
M19	08-Jan-21	11:00	Cloudy	78.7	0.0	0.0	21.3	14.3	
M41	08-Jan-21	11:30	Cloudy	79.3	0.0	0.0	20.7	12.1	
M43	08-Jan-21	11:31	Cloudy	79.3	0.0	0.0	20.7	12.1	

Prepared by: LV  
Lemon Lam

Checked by: MC  
Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill

Date of measurement: Jan-21

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P2	08-Jan-21	11:33	Cloudy	79.2	0.0	0.0	20.8	12.2	
P3	08-Jan-21	11:34	Cloudy	79.3	0.0	0.0	20.7	12.1	
P4	08-Jan-21	11:35	Cloudy	79.2	0.0	0.0	20.8	12.3	
P5	08-Jan-21	11:36	Cloudy	79.3	0.0	0.0	20.7	12.4	
P6	08-Jan-21	11:37	Cloudy	79.2	0.0	0.2	20.6	12.6	
P15	08-Jan-21	11:38	Cloudy	79.3	0.0	0.0	20.7	12.0	
P16a	08-Jan-21	11:39	Cloudy	79.2	0.0	0.0	20.8	12.0	
P17a	08-Jan-21	11:40	Cloudy	79.2	0.0	0.0	20.8	12.1	
P18a	08-Jan-21	11:41	Cloudy	79.1	0.0	0.0	20.9	12.3	
P19	08-Jan-21	11:42	Cloudy	79.2	0.0	0.0	20.8	12.2	
P20	08-Jan-21	11:43	Cloudy	79.3	0.0	0.0	20.7	12.1	
P30aD	08-Jan-21	14:00	Cloudy	79.3	0.0	0.4	20.3	12.0	
P30aM	08-Jan-21	13:59	Cloudy	79.4	0.0	0.3	20.3	12.0	

Prepared by: LV  
Lemon Lam

Checked by: MC  
Mike Shek

EN/DS/001

HKLRG



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jan-21

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P30aS	08-Jan-21	13:58	Cloudy	79.4	0.0	0.0	20.6	12.0	
P33	08-Jan-21	14:39	Cloudy	79.2	0.0	0.4	20.4	12.1	
P34bD	08-Jan-21	14:03	Cloudy	79.2	0.0	0.2	20.6	12.1	
P34bM	08-Jan-21	14:02	Cloudy	79.2	0.0	0.5	20.3	12.1	
P34bS	08-Jan-21	14:01	Cloudy	79.0	0.0	0.7	20.3	12.0	
P35	08-Jan-21	14:34	Cloudy	79.3	0.0	0.2	20.5	12.1	
P36bD	08-Jan-21	14:10	Cloudy	79.2	0.0	0.3	20.5	12.0	
P36bM	08-Jan-21	14:09	Cloudy	79.2	0.0	0.1	20.7	12.0	
P36bS	08-Jan-21	14:08	Cloudy	79.4	0.0	0.2	20.4	12.0	
P37	08-Jan-21	14:28	Cloudy	79.4	0.0	0.3	20.3	12.0	
P45	15-Jan-21	14:45	Cloudy	80.0	0.0	3.5	16.5	23.8	
P47aD	08-Jan-21	13:47	Cloudy	79.3	0.0	0.3	20.4	12.1	
P47aM	08-Jan-21	13:46	Cloudy	79.2	0.0	0.4	20.4	12.0	

Prepared by: Lemon Lam

Checked by: Mike Shek

ENIDS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Jan-21

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P47aS	08-Jan-21	13:45	Cloudy	79.3	0.0	0.0	20.7	12.3	
P48	08-Jan-21	11:10	Cloudy	78.4	0.0	1.7	19.9	12.2	
P49	08-Jan-21	11:14	Cloudy	78.7	0.0	0.7	20.6	11.3	
P50aD	08-Jan-21	13:52	Cloudy	79.2	0.0	1.0	19.8	12.0	
P50aM	08-Jan-21	13:51	Cloudy	79.3	0.0	0.7	20.0	11.7	
P50aS	08-Jan-21	13:50	Cloudy	79.3	0.0	0.0	20.7	11.8	
P51aD	08-Jan-21	13:55	Cloudy	79.2	0.0	0.7	20.1	11.9	
P51aM	08-Jan-21	13:54	Cloudy	79.3	0.0	0.2	20.5	11.8	
P51aS	08-Jan-21	13:53	Cloudy	79.2	0.0	0.4	20.4	11.7	
P52a	08-Jan-21	14:22	Cloudy	79.3	0.0	0.0	20.7	12.0	
P60M	08-Jan-21	11:50	Cloudy	79.2	0.0	0.2	20.6	12.2	
P60S	08-Jan-21	11:49	Cloudy	79.2	0.0	0.0	20.8	12.1	
P61M	08-Jan-21	11:52	Cloudy	79.3	0.0	0.0	20.7	11.9	

Prepared by: Lemon Lam

Checked by: Mike Shek

ENIDS/001

HKLRG



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Feb-21

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP20S	11-Feb-21	10:49	Sunny	79.5	0.0	2.6	17.9	17.0	Compensatory monitoring
GMP20S	17-Feb-21	8:44	Sunny	80.3	0.0	1.9	17.8	16.0	Compensatory monitoring
GMP20S	25-Feb-21	8:50	Sunny	81.9	0.0	1.1	17.0	20.0	Compensatory monitoring
GMP21M	01-Feb-21	11:46	Sunny	79.4	0.0	0.0	20.6	25.7	
GMP21S	01-Feb-21	11:44	Sunny	79.4	0.0	0.0	20.6	25.7	
GMP22M	01-Feb-21	11:39	Sunny	79.3	0.0	0.0	20.7	26.9	
GMP22S	01-Feb-21	11:38	Sunny	79.4	0.0	0.0	20.6	26.9	
GMP35D	01-Feb-21	14:32	Sunny	79.4	0.0	0.3	20.3	25.7	
GMP35M	01-Feb-21	14:31	Sunny	79.3	0.0	0.1	20.6	25.5	
GMP35S	01-Feb-21	14:30	Sunny	79.3	0.0	0.7	20.0	25.5	
GMP36D	01-Feb-21	14:37	Sunny	79.4	0.0	0.2	20.4	25.4	
GMP36M	01-Feb-21	14:36	Sunny	79.3	0.0	0.7	20.0	25.5	
GMP36S	01-Feb-21	14:35	Sunny	79.4	0.0	0.0	20.6	25.5	

Prepared by: Lemon Lam

Checked by: Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Feb-21

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M1	05-Feb-21	14:40	Sunny	79.3	0.0	0.0	20.7	25.4	
M2	05-Feb-21	14:41	Sunny	79.4	0.0	0.0	20.6	25.3	
M3	05-Feb-21	14:42	Sunny	79.3	0.0	0.0	20.7	25.7	
M4	05-Feb-21	14:43	Sunny	79.3	0.0	0.0	20.7	25.6	
M6	05-Feb-21	14:47	Sunny	79.6	0.0	0.0	20.4	25.4	
M6a	05-Feb-21	14:48	Sunny	79.4	0.0	0.0	20.6	25.6	
M6b	05-Feb-21	14:49	Sunny	79.3	0.0	0.0	20.7	25.4	
M6c	05-Feb-21	14:50	Sunny	79.2	0.0	0.0	20.8	25.2	
M7	05-Feb-21	14:51	Sunny	79.3	0.0	0.0	20.7	25.3	
M8	05-Feb-21	14:52	Sunny	79.4	0.0	0.0	20.6	25.4	
M10	05-Feb-21	14:53	Sunny	79.1	0.0	0.0	20.9	25.7	
M11	05-Feb-21	14:54	Sunny	79.3	0.0	0.0	20.7	25.6	
M13	05-Feb-21	14:01	Sunny	79.6	0.0	0.0	20.4	25.7	

Prepared by: Lemon Lam

Checked by: Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Feb-21

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M13a	05-Feb-21	14:00	Sunny	79.4	0.0	0.0	20.6	25.6	
M14	05-Feb-21	14:02	Sunny	79.3	0.0	0.0	20.7	25.7	
M15	05-Feb-21	14:03	Sunny	79.4	0.0	0.0	20.6	25.8	
M16	05-Feb-21	14:04	Sunny	79.3	0.0	0.0	20.7	25.7	
M17	05-Feb-21	14:05	Sunny	79.4	0.0	0.0	20.6	25.6	
M18	05-Feb-21	14:06	Sunny	79.3	0.0	0.0	20.7	25.4	
M19	05-Feb-21	14:07	Sunny	79.4	0.0	0.0	20.6	25.7	
M41	05-Feb-21	15:06	Sunny	79.3	0.0	0.0	20.7	25.7	
M43	05-Feb-21	15:05	Sunny	79.4	0.0	0.0	20.6	25.7	

Prepared by:

LV  
Lemon Lam

Checked by:

Mike Shek  
Mike Shek

EN/DS/001

HKLRG

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Feb-21

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P2	05-Feb-21	15:07	Sunny	79.3	0.0	0.0	20.7	26.0	
P3	05-Feb-21	15:08	Sunny	79.5	0.0	0.2	20.3	25.8	
P4	05-Feb-21	15:09	Sunny	79.4	0.0	0.0	20.6	25.7	
P5	05-Feb-21	15:10	Sunny	79.2	0.0	0.0	20.8	25.4	
P6	05-Feb-21	15:11	Sunny	79.3	0.0	0.0	20.7	25.6	
P15	05-Feb-21	15:18	Sunny	79.2	0.0	0.0	20.8	25.0	
P16a	05-Feb-21	15:19	Sunny	79.6	0.0	0.0	20.4	25.3	
P17a	05-Feb-21	15:20	Sunny	79.3	0.0	0.1	20.6	25.1	
P18a	05-Feb-21	15:21	Sunny	79.6	0.0	0.0	20.4	25.6	
P19	05-Feb-21	15:22	Sunny	79.4	0.0	0.0	20.6	25.2	
P20	05-Feb-21	15:23	Sunny	79.3	0.0	0.0	20.7	25.3	
P30aD	05-Feb-21	14:25	Sunny	79.2	0.0	0.0	20.8	25.2	
P30aM	05-Feb-21	14:24	Sunny	79.2	0.0	0.7	20.1	25.3	

Prepared by:

LV  
Lemon Lam

Checked by:

Mike Shek  
Mike Shek

EN/DS/001

HKLRG



# LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Feb-21

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P30aS	05-Feb-21	14:23	Sunny	79.4	0.0	0.3	20.3	25.4	
P33	05-Feb-21	14:55	Sunny	79.4	0.0	0.2	20.4	25.3	
P34bD	05-Feb-21	11:43	Sunny	79.8	0.0	0.3	19.9	25.4	
P34bM	05-Feb-21	11:42	Sunny	79.8	0.0	0.2	20.0	25.4	
P34bS	05-Feb-21	11:40	Sunny	79.7	0.0	0.2	20.1	25.3	
P35	05-Feb-21	14:46	Sunny	79.4	0.0	0.0	20.6	25.3	
P36bD	05-Feb-21	11:52	Sunny	79.9	0.0	5.2	14.9	26.3	
P36bM	05-Feb-21	11:51	Sunny	79.8	0.0	4.6	15.6	26.3	
P36bS	05-Feb-21	11:55	Sunny	79.6	0.0	5.4	15.0	26.3	
P37	05-Feb-21	14:45	Sunny	79.9	0.0	0.2	19.9	26.2	
P45	01-Feb-21	11:40	Sunny	78.3	0.0	3.9	17.8	26.3	
P47aD	05-Feb-21	14:13	Sunny	79.3	0.0	0.0	20.7	26.2	
P47aM	05-Feb-21	14:12	Sunny	79.4	0.0	0.4	20.2	26.4	

Prepared by:

VV

Lemon Lam

Checked by:

X

Mike Shek

HKLRG

END/5/001

# LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Feb-21

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P47aD	05-Feb-21	14:13	Sunny	79.3	0.0	0.0	20.7	26.2	
P47aM	05-Feb-21	14:12	Sunny	79.4	0.0	0.4	20.2	26.4	
P47aS	05-Feb-21	14:11	Sunny	79.4	0.0	0.0	20.6	26.3	
P48	05-Feb-21	14:09	Sunny	79.2	0.0	0.0	20.8	26.3	
P49	05-Feb-21	14:08	Sunny	79.3	0.0	0.0	20.7	26.6	
P50aD	05-Feb-21	14:18	Sunny	79.4	0.0	0.2	20.4	26.0	
P50aM	05-Feb-21	14:17	Sunny	79.4	0.0	0.3	20.3	26.3	
P50aS	05-Feb-21	14:16	Sunny	79.4	0.0	0.0	20.6	26.4	
P51aD	05-Feb-21	14:21	Sunny	79.5	0.0	0.0	20.5	26.4	
P51aM	05-Feb-21	14:20	Sunny	79.4	0.0	0.4	20.2	26.3	
P51aS	05-Feb-21	14:19	Sunny	79.3	0.0	0.0	20.7	26.2	
P52a	05-Feb-21	14:38	Sunny	79.2	0.0	0.3	20.5	26.5	
P60M	05-Feb-21	14:32	Sunny	79.3	0.0	0.1	20.6	26.4	

Prepared by:

VV

Lemon Lam

Checked by:

X

Mike Shek

HKLRG



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Mar-21

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP23S	04-Mar-21	13:07	Cloudy	79.2	0.0	0.0	20.8	20.7	No compliance
GMP24D	04-Mar-21	13:12	Cloudy	79.2	0.0	0.3	20.5	20.6	No compliance
GMP24M	04-Mar-21	13:11	Cloudy	79.2	0.0	0.0	20.8	20.8	No compliance
GMP24S	04-Mar-21	13:10	Cloudy	79.4	0.0	0.2	20.4	20.4	No compliance
GMP25D	04-Mar-21	13:15	Cloudy	79.2	0.0	0.3	20.5	20.6	No compliance
GMP25M	04-Mar-21	13:14	Cloudy	79.3	0.0	0.0	20.7	20.7	No compliance
GMP25S	04-Mar-21	13:13	Cloudy	79.1	0.0	0.1	20.8	20.6	No compliance
GMP26D	04-Mar-21	13:18	Cloudy	79.4	0.0	0.0	20.6	20.7	No compliance
GMP26M	04-Mar-21	13:17	Cloudy	79.3	0.0	0.4	20.3	20.4	No compliance
GMP26S	04-Mar-21	13:16	Cloudy	79.5	0.0	0.0	20.5	20.6	No compliance
GMP27D	04-Mar-21	13:21	Cloudy	79.1	0.0	0.3	20.6	20.7	No compliance
GMP27M	04-Mar-21	13:20	Cloudy	79.3	0.0	0.0	20.7	20.6	No compliance
GMP27S	04-Mar-21	13:19	Cloudy	79.2	0.0	0.2	20.6	20.7	No compliance

Prepared by: Lemon Lam

Checked by: Mike Shek

HKLRG

END/S/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Mar-21

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP28D	04-Mar-21	13:24	Cloudy	79.3	0.0	0.0	20.7	20.8	No compliance
GMP28M	04-Mar-21	13:23	Cloudy	79.2	0.0	0.4	20.4	20.6	No compliance
GMP28S	04-Mar-21	13:22	Cloudy	79.2	0.0	0.2	20.6	20.6	No compliance
GMP29D	04-Mar-21	13:27	Cloudy	79.3	0.0	0.0	20.7	20.7	No compliance
GMP29M	04-Mar-21	13:26	Cloudy	79.1	0.0	0.3	20.6	20.6	No compliance
GMP29S	04-Mar-21	13:25	Cloudy	79.2	0.0	0.0	20.8	20.6	No compliance
GMP30D	04-Mar-21	13:30	Sunny	79.2	0.0	0.0	20.8	20.7	No compliance
GMP30M	04-Mar-21	13:29	Sunny	79.2	0.0	0.2	20.6	20.6	No compliance
GMP30S	04-Mar-21	13:28	Sunny	79.1	0.0	0.3	20.6	20.7	No compliance
GMP31D	04-Mar-21	13:33	Sunny	79.2	0.0	0.0	20.8	20.4	No compliance
GMP31M	04-Mar-21	13:32	Sunny	79.2	0.0	0.1	20.7	20.6	No compliance
GMP31S	04-Mar-21	13:31	Sunny	79.2	0.0	0.0	20.8	20.7	No compliance
GMP32D	04-Mar-21	13:36	Sunny	79.2	0.0	0.4	20.4	20.8	No compliance

Prepared by: Lemon Lam

Checked by: Mike Shek

HKLRG

END/S/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Mar-21

Sampling equipment used:	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP32M	04-Mar-21	13:35	Sunny	79.2	0.0	0.0	20.8	20.9	No compliance
GMP32S	04-Mar-21	13:34	Sunny	79.1	0.0	0.3	20.6	20.8	No compliance
GMP33D	04-Mar-21	13:39	Sunny	79.2	0.0	0.0	20.8	20.7	No compliance
GMP33M	04-Mar-21	13:38	Sunny	79.1	0.0	0.0	20.9	20.4	No compliance
GMP33S	04-Mar-21	13:37	Sunny	79.1	0.0	0.2	20.7	20.6	No compliance
GMP34D	04-Mar-21	13:42	Sunny	79.1	0.0	0.3	20.6	20.7	No compliance
GMP34M	04-Mar-21	13:41	Sunny	79.2	0.0	0.2	20.6	20.4	No compliance
GMP34S	04-Mar-21	13:40	Sunny	79.1	0.0	0.1	20.8	20.6	No compliance
GMP35D	04-Mar-21	11:50	Sunny	79.1	0.0	0.8	20.1	20.8	
GMP35M	04-Mar-21	11:48	Sunny	79.1	0.0	0.9	20.0	20.8	
GMP35S	04-Mar-21	11:46	Sunny	79.1	0.0	0.0	20.9	20.9	
GMP36D	04-Mar-21	11:57	Sunny	78.9	0.0	3.0	18.1	20.2	
GMP36M	04-Mar-21	11:55	Sunny	78.4	0.0	1.9	19.7	20.2	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Mar-21

Sampling equipment used:	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
GMP36S	04-Mar-21	11:53	Sunny	78.5	0.0	1.9	19.6	20.2	
GMP37D	04-Mar-21	12:04	Sunny	79.3	0.0	0.0	20.7	20.0	
GMP37M	04-Mar-21	12:02	Sunny	79.2	0.0	0.0	20.8	20.0	
GMP37S	04-Mar-21	12:00	Sunny	78.5	0.0	0.5	21.0	20.0	
GMP38M	04-Mar-21	12:02	Sunny	79.1	0.0	0.0	20.9	20.7	
GMP38S	04-Mar-21	12:01	Sunny	79.2	0.0	0.2	20.6	20.6	
GMP39M	04-Mar-21	12:04	Sunny	79.3	0.0	0.0	20.7	20.7	
GMP39S	04-Mar-21	12:03	Sunny	79.3	0.0	0.3	20.4	20.8	
GMP40M	04-Mar-21	12:06	Sunny	79.2	0.0	0.0	20.8	20.7	
GMP40S	04-Mar-21	12:05	Sunny	79.2	0.0	0.4	20.4	20.6	
GMP41M	04-Mar-21	12:08	Sunny	79.2	0.0	0.2	20.6	20.7	
GMP41S	04-Mar-21	12:07	Sunny	79.1	0.0	0.0	20.9	20.8	
GMP42D	04-Mar-21	12:11	Sunny	79.2	0.0	0.1	20.7	20.7	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

HKLRG

EN/DS/001



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Mar-21

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M1	12-Mar-21	12:48	Sunny	79.2	0.0	0.0	20.8	27.4	
M2	12-Mar-21	12:49	Sunny	79.3	0.0	0.0	20.7	27.2	
M3	12-Mar-21	12:50	Sunny	79.3	0.0	0.1	20.6	27.7	
M4	12-Mar-21	12:51	Sunny	79.2	0.0	0.0	20.8	27.2	
M6	12-Mar-21	12:52	Sunny	79.3	0.0	0.0	20.7	27.0	
M6a	12-Mar-21	12:53	Sunny	79.2	0.0	0.0	20.8	27.3	
M6b	12-Mar-21	12:54	Sunny	79.2	0.0	0.1	20.7	27.4	
M6c	12-Mar-21	12:55	Sunny	79.1	0.0	0.0	20.9	27.2	
M7	12-Mar-21	12:57	Sunny	79.3	0.0	0.0	20.7	27.1	
M8	12-Mar-21	12:58	Sunny	79.2	0.0	0.0	20.8	27.3	
M10	12-Mar-21	13:00	Sunny	79.3	0.0	0.0	20.7	27.4	
M11	12-Mar-21	13:01	Sunny	79.2	0.0	0.0	20.8	27.2	
M13	12-Mar-21	13:03	Sunny	79.3	0.0	0.0	20.7	27.3	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Mar-21

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
M13a	12-Mar-21	13:04	Sunny	79.2	0.0	0.0	20.8	27.2	
M14	12-Mar-21	13:05	Sunny	79.3	0.0	0.0	20.7	27.3	
M15	12-Mar-21	13:06	Sunny	79.2	0.0	0.0	20.8	27.4	
M16	12-Mar-21	13:07	Sunny	79.3	0.0	0.0	20.7	27.2	
M17	12-Mar-21	13:08	Sunny	79.2	0.0	0.0	20.8	27.1	
M18	12-Mar-21	13:09	Sunny	79.3	0.0	0.0	20.7	27.3	
M19	12-Mar-21	13:10	Sunny	79.2	0.0	0.0	20.8	27.3	
M41	12-Mar-21	11:56	Sunny	78.6	0.0	0.1	20.4	28.1	
M43	12-Mar-21	11:58	Sunny	79.7	0.0	0.0	20.3	27.9	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

HKLRG

EN/DS/001



## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Mar-21

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P2	12-Mar-21	12:16	Sunny	79.8	0.0	0.1	20.1	27.0	
P3	12-Mar-21	12:00	Sunny	79.6	0.0	0.1	20.3	28.2	
P4	12-Mar-21	12:05	Sunny	79.8	0.0	0.2	20.0	27.1	
P5	12-Mar-21	12:11	Sunny	80.0	0.0	0.0	20.0	26.8	
P6	12-Mar-21	12:13	Sunny	80.0	0.0	0.1	19.9	27.2	
P15	12-Mar-21	13:20	Sunny	79.4	0.0	0.2	20.4	27.0	
P16a	12-Mar-21	13:21	Sunny	79.2	0.0	0.3	20.5	27.2	
P17a	12-Mar-21	13:22	Sunny	79.4	0.0	0.0	20.6	27.1	
P18a	12-Mar-21	13:23	Sunny	79.2	0.0	0.1	20.7	27.3	
P19	12-Mar-21	13:24	Sunny	79.3	0.0	0.0	20.7	27.4	
P20	12-Mar-21	13:25	Sunny	79.2	0.0	0.2	20.6	27.2	
P30aD	12-Mar-21	12:35	Sunny	79.2	0.0	0.0	20.8	27.3	
P30aM	12-Mar-21	12:34	Sunny	79.2	0.0	0.1	20.7	27.2	

Prepared by: LV  
Lemon Lam

Checked by: [Signature]  
Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
Date of measurement: Mar-21

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						Remark
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	
P30aS	12-Mar-21	12:33	Sunny	79.2	0.0	0.0	20.8	27.3	
P33	12-Mar-21	13:02	Sunny	79.2	0.0	0.2	20.6	27.4	
P34bD	12-Mar-21	12:38	Sunny	79.3	0.0	0.0	20.7	27.2	
P34bM	12-Mar-21	12:37	Sunny	79.4	0.0	0.0	20.6	27.1	
P34bS	12-Mar-21	12:36	Sunny	79.2	0.0	0.1	20.7	27.2	
P35	12-Mar-21	12:59	Sunny	79.4	0.0	0.0	20.6	27.2	
P36bD	12-Mar-21	12:31	Sunny	79.3	0.0	0.0	20.7	27.2	
P36bM	12-Mar-21	12:30	Sunny	79.4	0.0	0.2	20.4	27.2	
P36bS	12-Mar-21	12:29	Sunny	79.3	0.0	0.0	20.7	27.2	
P37	12-Mar-21	12:56	Sunny	79.3	0.0	0.0	20.7	27.2	
P45	04-Mar-21	11:34	Cloudy	79.1	0.0	0.0	20.9	20.5	
P47aD	12-Mar-21	12:22	Sunny	79.1	0.0	0.3	20.6	27.4	
P47aM	12-Mar-21	12:21	Sunny	79.2	0.0	0.1	20.7	27.4	

Prepared by: W  
Lemon Lam

Checked by: [Signature]  
Mike Shek

HKLRG

EN/DS/001

## LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of site: Shuen Wan Landfill  
 Date of measurement: Mar-21

Sampling equipment used :	Dates calibrated
Landtec's GEM-5000 gas analyzer	Prior to sampling
A-023-06	

Sample location	Date of measurement	Sampling time	Perimeter on-site and/or off-site monitoring holes						
			Weather condition	Balance gas (%)	Flammable gas (methane %)	Carbon dioxide (%)	Oxygen (%)	Temp (°C)	Remark
P47aS	12-Mar-21	12:20	Sunny	79.2	0.0	0.2	20.6	27.3	
P48	12-Mar-21	13:30	Sunny	79.2	0.0	0.2	20.6	27.5	
P49	12-Mar-21	13:31	Sunny	79.3	0.0	0.0	20.7	27.7	
P50aD	12-Mar-21	12:25	Sunny	79.3	0.0	0.1	20.6	27.2	
P50aM	12-Mar-21	12:24	Sunny	79.2	0.0	0.2	20.6	27.4	
P50aS	12-Mar-21	12:23	Sunny	79.2	0.0	0.4	20.4	27.7	
P51aD	12-Mar-21	12:28	Sunny	79.2	0.0	0.4	20.4	27.2	
P51aM	12-Mar-21	12:27	Sunny	79.2	0.0	0.0	20.8	27.4	
P51aS	12-Mar-21	12:26	Sunny	79.2	0.0	0.2	20.6	27.3	
P52a	12-Mar-21	12:47	Sunny	79.1	0.0	0.3	20.6	27.1	
P60M	12-Mar-21	12:03	Sunny	79.6	0.0	0.0	20.4	27.7	
P60S	12-Mar-21	12:02	Sunny	79.6	0.0	0.0	20.4	27.7	
P61M	12-Mar-21	12:09	Sunny	79.9	0.0	0.1	20.0	27.0	

Prepared by:

Lemon Lam

Checked by:

Mike Shek

**HKLRG**

EN/DS/001

## **Appendix 9      Historic Aerial Photos**





Site A

Site B

Legend (Year 1949)



Subject Site





Site A

Site B

Legend (Year 1979)



Subject Site





Site A

Site B

Legend (Year 1990)



Subject Site





Site A

Site B

Legend (Year 1995)



Subject Site





Site A

Site B

Legend (Year 2000)



Subject Site





Site A

Site B

Legend (Year 2009)

 Subject Site





Site A

Site B

Legend (Year 2022)

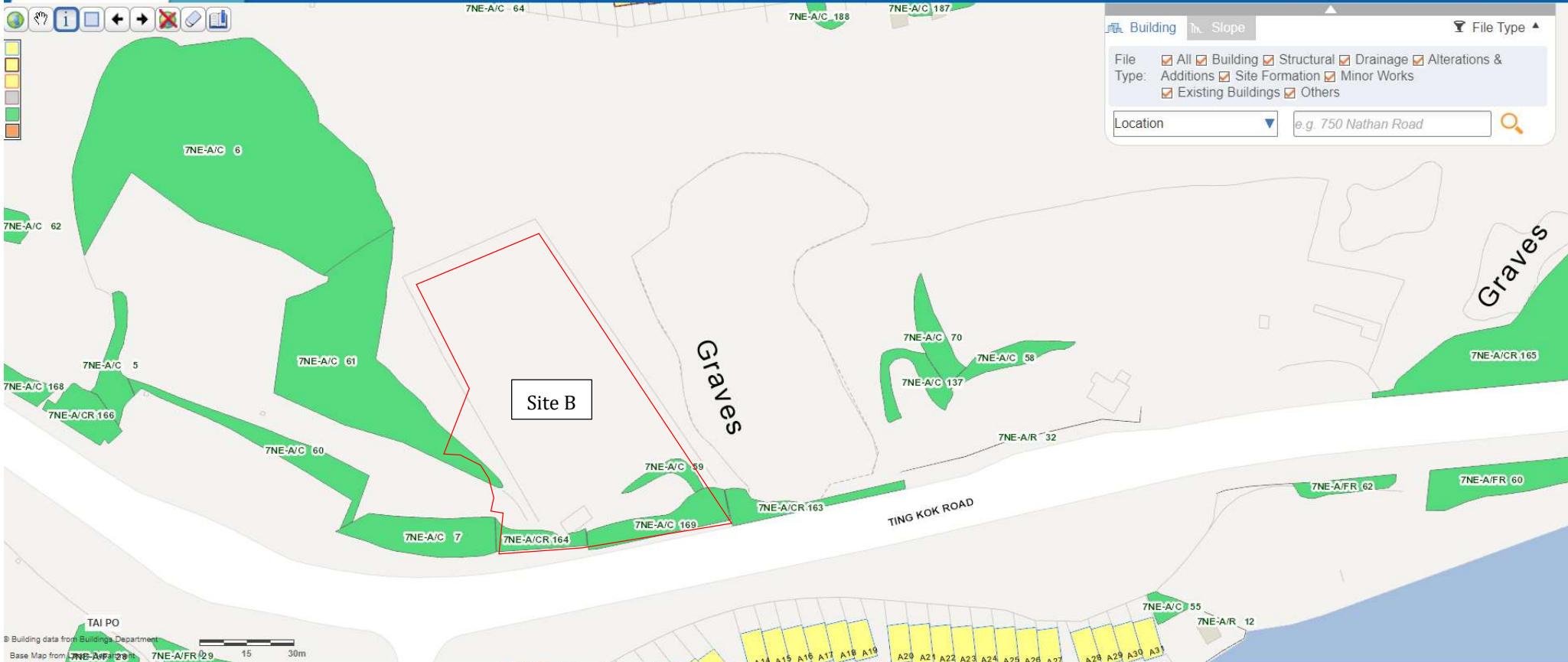
Subject Site



**Appendix 10 BRAVO Record for Site A and Site B**







## **Appendix 11      Walkover Checklist and Photo Records**

# Site Walkover Checklist

## GENERAL SITE DETAILS

SITE OWNER/CLIENT Kam Luk Investment Company Limited

PROPERTY ADDRESS UDWYT Lot 14RP, Ting Kok Road, Tai Po, New Territories

## PERSON CONDUCTING THE QUESTIONNAIRE

NAME Mike Kwan

POSITION Assistant Environmental Consultant (Ramboll Hong Kong Limited)

## AUTHORIZED OWNER/CLIENT REPRESENTATIVE (IF APPLICABLE)

NAME \_\_\_\_\_

POSITION \_\_\_\_\_

TELEPHONE \_\_\_\_\_

## SITE ACTIVITIES

Briefly describe activities carried out on site, including types of products/chemicals/materials handled. Obtain a flow schematic if possible.

Number of employees:	Full-time:	-
	Part-time:	-
	Temporary/Seasonal:	-
Maximum no. of people on site at any time:		-
Typical hours of operation:		-
Number of shifts:		-
Days per week:		-
Weeks per year:		-
Scheduled plant shut-down:		-



Detail the main sources of energy at the site:

Gas	Yes/No
Electricity	Yes/No
Coal	Yes/No
Oil	Yes/No
Other	Yes/No

## SITE DESCRIPTION

This section is intended to gather information on site setting and environmental receptors on, adjacent or close to the site.

What is the total site area: Approximately 19,834m<sup>2</sup>

What area of the site is covered by buildings (%): No building on site

Please list all current and previous owners/occupiers if possible.

Previous Occupiers: N/A

Current Occupiers: Private and Government

Is a site plan available? If yes, please attach. Yes/No (Please refer to the attached site plan)

Are there any other parties on site as tenants or sub-tenants? Yes/No

If yes, identify those parties: \_\_\_\_\_

Describe surrounding land use (residential, industrial, rural, etc.) and identify neighbouring facilities and types of industry.

North: Residential: Casa Marina  
Residential: Forest Hill

South: Traffic Road: Ting Kok Road  
Recreational: Nine Eagles Gold Club

East: Residential: Fortune Garden  
Traffic Road: Ting Kok Road

West: Government: Tai Po East Fire Station  
Traffic Road: Lo Fai Road

## Site Walkover Checklist

Describe the topography of the area (flat terrain, rolling hills, mountains, by a large body of water, vegetation, etc.).

Vegetated hill slope

State the size and location of the nearest residential communities.

Casa Marina, Forest Hill, Casa Brave, Tycoon Place, Villa Lucca, Fortune Garden

Are there any sensitive habitats nearby, such as nature reserves, parks, wetlands or sites of special scientific interest?

No

### Questionnaire with Existing/Previous Site Owner or Occupier

Ref.		Yes/No	Notes
1.	What are the main activities/operations at the above address?	No	-
2.	How long have you been occupying the site?	-	-
3.	Were you the first occupant on site? (If yes, what was the usage of the site prior to occupancy?)	Yes	Private and Government
4.	Prior to your occupancy, who occupied the site?	-	-
5.	What were the main activities/operations during their occupancy?	-	-
6.	Have there been any major changes in operations carried out at the site in the last 10 years?	No	-
7.	Have any polluting activities been carried out in the vicinity of the site in the past?	No	-
8.	To the best of your knowledge, has the site ever been used as a petrol filling station/car service garage?	No	-
9.	Are there any boreholes/wells or natural springs either on the site or in the surrounding area?	No	-
10.	Do you have any registered hazardous installations as defined under relevant ordinances? (If yes, please provide details.)	No	-
11.	Are any chemicals used in your daily operations? (If yes, please provide details.)	No	-
	• Where do you store these chemicals?	-	-
12.	Material inventory lists, including quantities and locations available? (If yes, how often are these inventories updated?)	No	-
13.	Has the facility produced a separate hazardous substance inventory?	No	-
14.	Have there ever been any incidents or accidents (e.g. spills, fires, injuries, etc.) involving any of these materials? (If yes, please provide details.)	No	-

Ref.		Yes/No	Notes
15.	How are materials received (e.g. rail, truck, etc.) and stored on site (e.g. drums, tanks, carboys, bags, silos, cisterns, vaults and cylinders)?	No	-
16.	Do you have any underground storage tanks? (If yes, please provide details.)	No	-
	▪ How many underground storage tanks do you have on site?	-	-
	▪ What are the tanks constructed of?	-	-
	▪ What are the contents of these tanks?	-	-
	▪ Are the pipelines above or below ground?	-	-
	▪ If the pipelines are below ground, has any leak and integrity testing been performed?	-	-
	▪ Have there been any spills associated with these tanks?	-	-
17.	Are there any disused underground storage tanks?	No	-
18.	Do you have regular check for any spillage and monitoring of chemicals handled? (If yes, please provide details.)	-	-
19.	How are the wastes disposed of?	-	-
20.	Have you ever received any notices of violation of environmental regulations or received public complaints? (If yes, please provide details.)	No	-
21.	Have any spills occurred on site? (If yes, please provide details.)	No	-
	• When did the spill occur?	-	-
	• What were the substances spilled?	-	-
	• What was the quantity of material spilled?	-	-
	• Did you notify the relevant departments of the spill?	-	-
	• What were the actions taken to clean up the spill?	-	-
	• What were the areas affected?	-	-
22.	Do you have any records of major renovation of your site or rearrangement of underground utilities, pipe work/underground tanks (If yes, please provide details.)	No	-
23.	Have disused underground tanks been removed or otherwise secured (e.g. concrete, sand, etc.)?	-	-
24.	Are there any known contaminations on site? (If yes, please provide details.)	No	-
25.	Has the site ever been remediated? (If yes, please provide details.)	No	-



### Observations

1.	Are chemical storage areas provided with secondary containment (i.e. bund walls and floors)?	No	-
2.	What are the conditions of the bund walls and floors?	-	The Subject Site is mainly vegetation and natural hillslope
3.	Are any surface water drains located near to drum storage and unloading areas?	-	No storage and unloading area in the Site
4.	Are any solid or liquid waste (other than wastewater) generated at the site? (If yes, please provide details.)	No	-
5.	Is there a storage site for the wastes?	No	-
6.	Is there an on-site landfill?	No	-
7.	Were any stressed vegetation noted on site during the site reconnaissance? (If yes, please indicate location and approximate size.)	No	-
8.	Were any stained surfaces noted on-site during the site reconnaissance? (If yes, please provide details.)	No	-
9.	Are there any potential off-site sources of contamination?	No	-
10.	Does the site have any equipment which might contain polychlorinated biphenyls (PCBs)?	No	-
11.	Are there any sumps, effluent pits, interceptors or lagoons on site?	No	-
12.	Any noticeable odours during site walkover?	No	-
13.	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?	No	-

# Site Walkover Checklist

## GENERAL SITE DETAILS

SITE OWNER/CLIENT Kam Luk Investment Company Limited

PROPERTY ADDRESS UDWYT Lot 11 RP, Ting Kok Road, Tai Po, New Territories

## PERSON CONDUCTING THE QUESTIONNAIRE

NAME Mike Kwan

POSITION Assistant Environmental Consultant (Ramboll Hong Kong Limited)

## AUTHORIZED OWNER/CLIENT REPRESENTATIVE (IF APPLICABLE)

NAME \_\_\_\_\_

POSITION \_\_\_\_\_

TELEPHONE \_\_\_\_\_

## SITE ACTIVITIES

Briefly describe activities carried out on site, including types of products/chemicals/materials handled. Obtain a flow schematic if possible.

Number of employees:	Full-time:	-
	Part-time:	-
	Temporary/Seasonal:	-
Maximum no. of people on site at any time:		-
Typical hours of operation:		-
Number of shifts:		-
Days per week:		-
Weeks per year:		-
Scheduled plant shut-down:		-

Detail the main sources of energy at the site:

Gas	Yes/No
Electricity	Yes/No
Coal	Yes/No
Oil	Yes/No
Other	Yes/No

## SITE DESCRIPTION

This section is intended to gather information on site setting and environmental receptors on, adjacent or close to the site.

What is the total site area: Approximately 5,696m<sup>2</sup>

What area of the site is covered by buildings (%): No building on site

Please list all current and previous owners/occupiers if possible.

Previous Occupiers: N/A

Current Occupiers: Private and Government

Is a site plan available? If yes, please attach. Yes/No (Please refer to the attached site plan)

Are there any other parties on site as tenants or sub-tenants? Yes/No

If yes, identify those parties: \_\_\_\_\_

Describe surrounding land use (residential, industrial, rural, etc.) and identify neighbouring facilities and types of industry.

North: Residential: Tycoon Place  
Residential: Villa Lucca

South: Traffic Road: Ting Kok Road  
Residential: Fortune Garden

East: Residential: The Beverly Hills  
Traffic Road: Ting Kok Road

West: Government: Tai Po East Fire Station  
Traffic Road: Ting Kok Road



## Site Walkover Checklist

Describe the topography of the area (flat terrain, rolling hills, mountains, by a large body of water, vegetation, etc.).

Vegetated hill slope

State the size and location of the nearest residential communities.

Casa Marina, Casa Brave, Tycoon Place, Villa Lucca, Fortune Garden

Are there any sensitive habitats nearby, such as nature reserves, parks, wetlands or sites of special scientific interest?

No

### Questionnaire with Existing/Previous Site Owner or Occupier

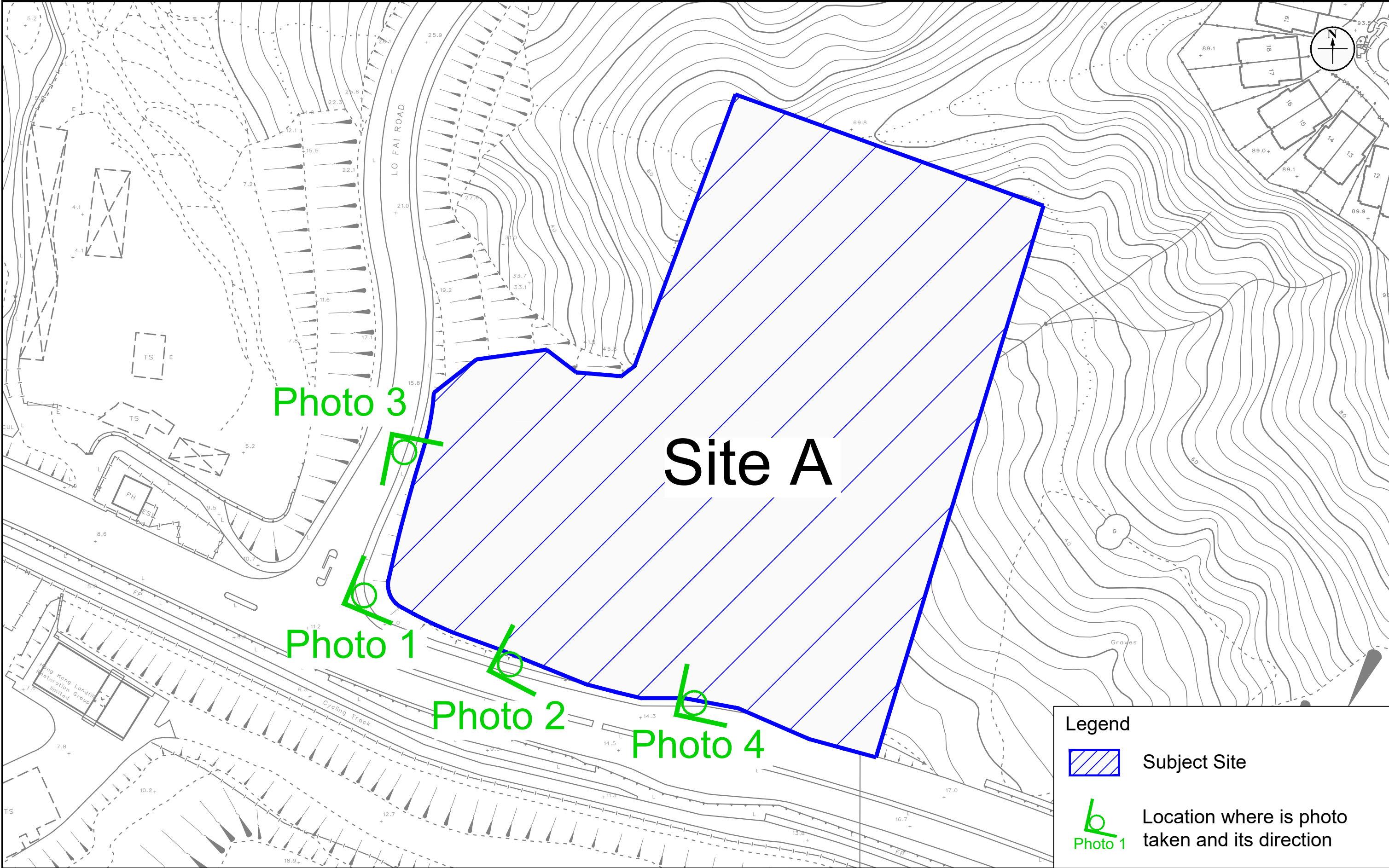
Ref.		Yes/No	Notes
1.	What are the main activities/operations at the above address?	No	-
2.	How long have you been occupying the site?	-	-
3.	Were you the first occupant on site? (If yes, what was the usage of the site prior to occupancy?)	Yes	Private and Government
4.	Prior to your occupancy, who occupied the site?	-	-
5.	What were the main activities/operations during their occupancy?	-	-
6.	Have there been any major changes in operations carried out at the site in the last 10 years?	No	-
7.	Have any polluting activities been carried out in the vicinity of the site in the past?	No	-
8.	To the best of your knowledge, has the site ever been used as a petrol filling station/car service garage?	No	-
9.	Are there any boreholes/wells or natural springs either on the site or in the surrounding area?	No	-
10.	Do you have any registered hazardous installations as defined under relevant ordinances? (If yes, please provide details.)	No	-
11.	Are any chemicals used in your daily operations? (If yes, please provide details.)	No	-
	• Where do you store these chemicals?	-	-
12.	Material inventory lists, including quantities and locations available? (If yes, how often are these inventories updated?)	No	-
13.	Has the facility produced a separate hazardous substance inventory?	No	-
14.	Have there ever been any incidents or accidents (e.g. spills, fires, injuries, etc.) involving any of these materials? (If yes, please provide details.)	No	-

Ref.		Yes/No	Notes
15.	How are materials received (e.g. rail, truck, etc.) and stored on site (e.g. drums, tanks, carboys, bags, silos, cisterns, vaults and cylinders)?	No	-
16.	Do you have any underground storage tanks? (If yes, please provide details.)	No	-
	▪ How many underground storage tanks do you have on site?	-	-
	▪ What are the tanks constructed of?	-	-
	▪ What are the contents of these tanks?	-	-
	▪ Are the pipelines above or below ground?	-	-
	▪ If the pipelines are below ground, has any leak and integrity testing been performed?	-	-
	▪ Have there been any spills associated with these tanks?	-	-
17.	Are there any disused underground storage tanks?	No	-
18.	Do you have regular check for any spillage and monitoring of chemicals handled? (If yes, please provide details.)	-	-
19.	How are the wastes disposed of?	-	-
20.	Have you ever received any notices of violation of environmental regulations or received public complaints? (If yes, please provide details.)	No	-
21.	Have any spills occurred on site? (If yes, please provide details.)	No	-
	• When did the spill occur?	-	-
	• What were the substances spilled?	-	-
	• What was the quantity of material spilled?	-	-
	• Did you notify the relevant departments of the spill?	-	-
	• What were the actions taken to clean up the spill?	-	-
	• What were the areas affected?	-	-
22.	Do you have any records of major renovation of your site or rearrangement of underground utilities, pipe work/underground tanks (If yes, please provide details.)	No	-
23.	Have disused underground tanks been removed or otherwise secured (e.g. concrete, sand, etc.)?	-	-
24.	Are there any known contaminations on site? (If yes, please provide details.)	No	-
25.	Has the site ever been remediated? (If yes, please provide details.)	No	-

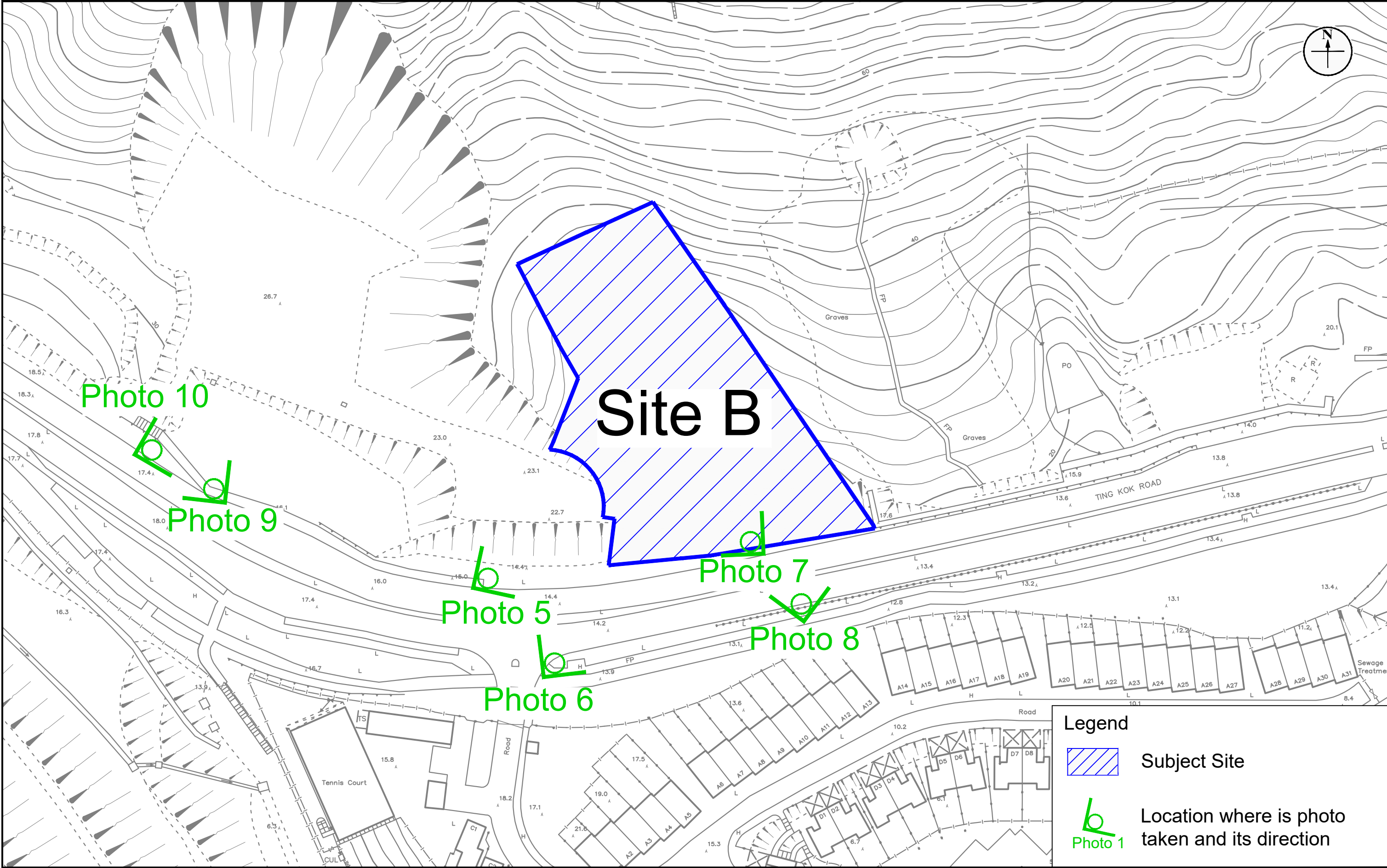
### Observations

1.	Are chemical storage areas provided with secondary containment (i.e. bund walls and floors)?	No	-
2.	What are the conditions of the bund walls and floors?	-	The Subject Site is mainly vegetation and natural hillslope
3.	Are any surface water drains located near to drum storage and unloading areas?	-	No storage and unloading area in the Site
4.	Are any solid or liquid waste (other than wastewater) generated at the site? (If yes, please provide details.)	No	-
5.	Is there a storage site for the wastes?	No	-
6.	Is there an on-site landfill?	No	-
7.	Were any stressed vegetation noted on site during the site reconnaissance? (If yes, please indicate location and approximate size.)	No	-
8.	Were any stained surfaces noted on-site during the site reconnaissance? (If yes, please provide details.)	No	-
9.	Are there any potential off-site sources of contamination?	No	-
10.	Does the site have any equipment which might contain polychlorinated biphenyls (PCBs)?	No	-
11.	Are there any sumps, effluent pits, interceptors or lagoons on site?	No	-
12.	Any noticeable odours during site walkover?	No	-
13.	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?	No	-





<b>Appendix: 11</b>		<b>RAMBOLL</b>	
<b>Title:</b> Site Survey Record Plan (Site A)		Drawn by: MK	
<b>Project:</b> Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po		Checked by: CC	
		Rev.: 1.1	
		Date: Oct 2024	



Legend

Subject Site

Location where is photo taken and its direction

Appendix: 11		RAMBOLL	
Title: Site Survey Record Plan (Site B)		Drawn by: MK	
Project: Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po		Checked by: CC	
		Rev.: 1.0	
		Date: Jul 2023	



### Photo Records

	
Photo 1: Natural vegetated slope at Site A	Photo 2: Site A to the north of Ting Kok Road
	
Photo 3: Natural vegetated slope near Lo Fai Road	Photo 4: Site A to the north of Ting Kok Road
	
Photo 5: Site B to the north of Ting Kok Road	Photo 6: Site B bounded by Ting Kok Road





Photo 7: Natural vegetated slope at Site B



Photo 8: Site B with natural vegetation



Photo 9: Ongoing waterwork at the west of Site B



Photo 10: Ongoing waterwork at the west of Site B

## **Appendix 12      Correspondence with Various Departments**

Ref.: NFDUDWYTEI00\_0\_0016L.23.docx

18 July 2023

Planning Department,  
District Planning Branch,  
Metro District Planning Division,  
Tsuen Wan and West Kowloon District Planning Office,  
27/F, Tsuen Wan Government Offices,  
38 Sai Lau Kok Road,  
Tsuen Wan, New Territories

By Fax (2412 5435) &amp; Post

Dear Sir / Madam,

**Re: Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP (Site A) & UDWYT Lot 11 RP (Site B), Wong Yue Tan, Tai Po**  
**Enquiry for Land Contamination Information**

We are conducting a Land Contamination Assessment Study for a site at Wong Yue Tan. As required by the "Practice Guide for Investigation and Remediation of Contaminated Land" published by the Environmental Protection Department of the Government of HKSAR (EPD), information pertaining to the change of land uses/past activities/incidents/accidents at the subject site are required as part of the vetting process.

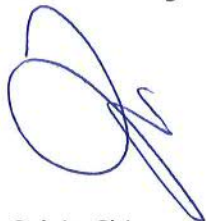
To prepare the assessment, we need information on the previous and current potential land contaminating land uses and events that happened at the works areas. As such, we would like to request the following information on the works areas, if any and available, to facilitate our assessment:

1. Any change on the land use; and
2. Future land use.

A location plan for the project is enclosed for your reference. Due to the tight timeline of the project, we would be much appreciated if you could provide the requested information by **01 August 2023**.

Should you have any query, please do not hesitate to contact the undersigned at 3465 2811 (email: cchiu@ramboll.com). We sincerely seek your feedback on this matter.

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Calvin Chiu  
Senior Manager

Enclosure: Location Plan of the Application Site

Q:\Projects\NFDUDWYTEI00\02 Project Management\02 Corr\NFDUDWYTEI00\_0\_0016L.23.docx



Ref.: NFDUDWYTEI00\_0\_0023L.23.docx

19 July 2023

Planning Department,  
District Planning Branch,  
New Territories District Planning Division,  
Sha Tin, Tai Po and North District Planning Office,  
13/F, Sha Tin Government Offices,  
1 Sheung Wo Che Road,  
Sha Tin, N.T.

By Fax (2691 2806) &amp; Post

Dear Sir / Madam,

**Re: Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP (Site A) & UDWYT Lot 11 RP (Site B), Wong Yue Tan, Tai Po**  
**Enquiry for Land Contamination Information**

We are conducting a Land Contamination Assessment Study for a site at Wong Yue Tan. As required by the "Practice Guide for Investigation and Remediation of Contaminated Land" published by the Environmental Protection Department of the Government of HKSAR (EPD), information pertaining to the change of land uses/past activities/incidents/accidents at the subject site are required as part of the vetting process.

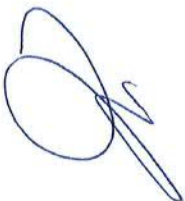
To prepare the assessment, we need information on the previous and current potential land contaminating land uses and events that happened at the works areas. As such, we would like to request the following information on the works areas, if any and available, to facilitate our assessment:

1. Any change on the land use; and
2. Future land use.

A location plan for the project is enclosed for your reference. Due to the tight timeline of the project, we would be much appreciated if you could provide the requested information by **01 August 2023**.

Should you have any query, please do not hesitate to contact the undersigned at 3465 2811 (email: cchiu@ramboll.com). We sincerely seek your feedback on this matter.

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Calvin Chiu  
Senior Manager

Enclosure: Location Plan of the Application Site

Q:\Projects\NFDUDWYTEI00\02 Project Management\02 Corr\NFDUDWYTEI00\_0\_0023L.23.docx

## 規 劃 署

沙田、大埔及北區規劃處  
香港新界沙田上禾輦路一號  
沙田政府合署  
十三樓 1301-1314 室



## Planning Department

Sha Tin, Tai Po & North District Planning Office  
Rooms 1301-1314, 13/F,  
Shatin Government Offices,  
1 Sheung Wo Che Road, Sha Tin,  
N.T., Hong Kong

來函檔號 Your Reference NFDUDWYTEI00\_0\_0016L.23.docx &  
NFDUDWYTEI00\_0\_0023L.23.docx  
本署信號 Our Reference ( ) in PD/TP 1/30/1 (L)  
電話號碼 Tel. No. : 2158 6225  
傳真機號碼 Fax No. : 2691 2806/2696 2377

Ramboll Hong Kong Limited  
21/F, BEA Harbour View Centre,  
56 Gloucester Road,  
Wan Chai, Hong Kong  
(Attn.: Mr. Calvin CHIU)

**By Post & Fax (3465 2899)**  
(1 page)

31 July 2023

Dear Sir,

**Proposed Public Residential Housing/ Starter Homes Development  
at UDWYT Lot 14 RP (Site A) & UDWYT Lot 11 RP (Site B), Wong Yue Tan, Tai Po  
Enquiry for Land Contamination Information**

I refer to your letters dated 18.7.2023 and 19.7.2023 regarding the captioned.

The subject sites fall within an area zoned "Green Belt" since the first Tai Po Outline Zoning Plan No. LTP/47 gazetted in 1980. Please note that this office does not have any readily available information regarding the current and past land uses of the subject sites. You may consider consulting Lands Department for past activities (e.g. incidents or accidents) happened at the subject sites, or making reference to aerial photos over the years. For future land use, please note that the subject sites form part of the Land Sharing Pilot Scheme application No. LSPS/001 currently under vetting by the Government.

For any reported land contamination issue, you may approach Environmental Protection Department for the information required.

Yours faithfully,

( Benson LAU )  
for District Planning Officer/  
Sha Tin, Tai Po & North  
Planning Department

Internal  
Site Record

KL/BI/bi

Ref.: NFDUDWYTEI00\_0\_0024L.23.docx

19 July 2023

Environmental Protection Department  
Environmental Compliance Division  
Regional Office (North)  
10th floor, Shatin Government Offices,  
No.1 Sheung Wo Che Road,  
Sha Tin, New Territories

By Fax (2685 1155) &amp; Post

Dear Sir / Madam,

**Re: Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP (Site A) & UDWYT Lot 11 RP (Site B), Wong Yue Tan, Tai Po**  
**Enquiry for Land Contamination Information**

We are conducting a Land Contamination Assessment Study for a site at Wong Yue Tan. As required by the "Practice Guide for Investigation and Remediation of Contaminated Land" published by the Environmental Protection Department of the Government of HKSAR (EPD), information pertaining to the change of land uses/past activities/incidents/accidents at the subject site are required as part of the vetting process.

To prepare the assessment, we need information on the previous and current potential land contaminating land uses and events that happened at the works areas. A location plan for the project is enclosed for your reference. As such, we would like to request the following information on the works areas, if any and available, to facilitate our assessment:

1. Current and past registration of registered chemical waste producers;
2. Historical records of chemical spillage/ leakage;
3. Waste disposal records; and
4. Any submission relating to land contamination assessment.

A location plan for the project is enclosed for your reference. Due to the tight timeline of the project, we would be much appreciated if you could provide the requested information by **01 August 2023**.

Should you have any queries, please do not hesitate to contact the undersigned at 3465 2811 (email: cchiu@ramboll.com). We sincerely seek your feedback on this matter.

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Calvin Chiu  
Senior Manager

Enclosure: Location Plan of the Application Site.

Q:\Projects\NFDUDWYTEI00\02 Project Management\02 Corr\NFDUDWYTEI00\_0\_0024L.23.docx



本署檔案  
OUR REF: ( ) in EP550/W2/4  
來函檔案  
YOUR REF: NFDUDWYTEI00\_0\_0024L.23.docx  
電話  
TEL. NO.: 2158 5801  
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., Shatin Governmental Offices,  
1 Sheung Wo Che Road,  
Sha Tin, 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 10 樓

**By Email: [cchiu@ramboll.com](mailto:cchiu@ramboll.com)**

31 July 2023

Ramboll Hong Kong Limited  
21/F., BEA Harbour View Centre  
56 Gloucester Road, Wan Chai, Hong Kong  
(Attn.: Mr. Calvin CHIU)

Dear Mr. CHIU,

**Re: Proposed Public Residential Housing / Starter Homes Development at  
UDWYT Lot 14 RP (Site A) & UDWYT Lot 11 RP (Site B), Wong Yue Tan, Tai Po  
Enquiry for Land Contamination Information**

I refer to your letter dated 19 July 2023 on the captioned subject.

According to the records in this office, there are no record of chemical spillage accident and submission relating to land contamination assessment at the subject site in the past 3 years.

As regards registered Chemical Waste Producer(s) at the location concerned, a registry of chemical waste producers is available in the Territorial Control Office of this department. Please contact our Chief Environmental Protection Inspector (Territorial Control)5, Mr. TSANG Ching Kau at 2835 1017 for making an appointment to view the records.

While we have made a reasonable effort to ensure the completeness and accuracy of the information provided, you should comprehend that the information is provided as is and EPD is not responsible or liable for any claim, loss or damage resulting from the use of this information.

Yours sincerely,

(Maverick AU)

Regional Office (North)  
for Director of Environmental Protection

c.c. TCO/EPD (Attn.: Mr. TSANG Ching Kau)

Fax: 2305 0453

**Appendix 13      Confirmation on Road Types of Ting Kok Road and Lo Fai Road  
from Transport Department**

Calvin Chiu

---

From: Ka Fai CHAN <kafaichan@td.gov.hk>  
Sent: Tuesday, December 17, 2024 9:40 AM  
To: TSUI Gary  
Cc: Calvin Chiu; Yanny OY LI  
Subject: Re: Fw: Road Type Clarification - Land Sharing Pilot Scheme: Proposed Development at Lo Fai Road / Ting Kok Road, Tai Po Lot 11 RP and 14 RP in Unsurveyed District at Wong Yue Tan, Ting Kok Road, Tai Po, NT

You don't often get email from kafaichan@td.gov.hk. [Learn why this is important](#)

Dear Gary,

I have no objection to that Lo Fai Road is a Local Distributor.

Regards,  
Issac K F Chan  
E/TP2, TE/NTE, TD  
Tel: 2399 2406

From: TSUI Gary <gtsui@systra.com>  
To: Ka Fai CHAN <kafaichan@td.gov.hk>  
Cc: Yanny OY LI <oiyinli@td.gov.hk>, "cchiu@ramboll.com" <cchiu@ramboll.com>  
Date: 10/12/2024 12:00 AM  
Subject: Re: Fw: Road Type Clarification - Land Sharing Pilot Scheme: Proposed Development at Lo Fai Road / Ting Kok Road, Tai Po Lot 11 RP and 14 RP in Unsurveyed District at Wong Yue Tan, Ting Kok Road, Tai Po, NT

---

Dear Issac,

Our study team has further received EPD's comments on that the project Environmental Consultant to provide evidence on the road types of Lo Fai Road for the EIA study.

By comparing the traffic flows along Yuen Shin Road (classified as Primary Distributor from the below email), we would like to assume Lo Fai Road should be classified as Local Distributor for your review and comment.

Please kindly advise if you have any comment on our assumption for our Client further liaison with EPD.

Your early reply on the above will be appreciated. Should you have any queries on the above or need any further information, please feel free to contact me at 9048 2260.

Thank you very much for your kind assistance.

Best Regards,



☐Urgent ☐Return receipt ☒Expand Group ☐Restricted ☐Prevent Copy ☐Confidential

**Raymond YB LEONG/DEVB**

---

寄件者: Ka Fai CHAN <kafaichan@td.gov.hk>  
寄件日期: 2023年7月14日星期五 17:05  
收件者: Raymond YB LEONG/DEVB  
副本: Yanny OY LI/TD; Walter TW POON/DEVB  
主旨: Re: LSPS/001 - updated submission  
附件: 20230704 EPD.pdf

Dear Raymond,

The section of Ting Kok Road near the application sites is the section from Dai Kwai Street to Tai Mei Tuk, which is a Rural Road.

Lo Fai Road connecting to that section of Ting Kok Road is also considered as a Rural Road.

Regards,  
Issac K F Chan  
E/TP2, TE/NTE, TD  
Tel: 2399 2406

From: "Raymond YB LEONG/DEVB" <raymondleong@devb.gov.hk>  
To: "Yanny OY LI/TD" <oiyinli@td.gov.hk>  
Cc: "Walter TW POON/DEVB" <walterpoon@devb.gov.hk>, "Ka Fai CHAN/TD" <kafaichan@td.gov.hk>  
Date: 07/07/2023 02:55 PM  
Subject: Re: LSPS/001 - updated submission

---

Dear Yanny,

I refer to item 4 of EPD's comments on the latest submission for proposed LSPS development at Ting Kok Road (Application No. LSPS/001) as attached.

*[See attachment "20230704 EPD.pdf"]*

Much grateful for your advice of the road type for Ting Kok Road and Lo Fai Road.

Thank you.

Raymond LEONG  
3841 7163

## Coco Ma

---

**From:** TSUI Gary <gtsui@systra.com>  
**Sent:** 28 February 2024 09:23  
**To:** Calvin Chiu  
**Cc:** Coco Ma; David Yeung; TANG Carla  
**Subject:** RE: Wong Yue Tan - justification for different classification of Ting Kok Road and Lo Fai Road

Some people who received this message don't often get email from gtsui@systra.com. [Learn why this is important](#)

Dear Calvin,

Pls note below paragraph for your further consolidation.

*According to the reply by Transport Department, Lo Fai Road is also classified as rural road, which is same as Ting Kok Road. However, in view the number of traffic flow in year 2033 along Lo Fai Road and Ting Kok Road from the TIA report, Lo Fai Road has only approximately 1100 vehicles (two-way) per hour during AM peak hour and Ting Kok Road will have approximately 3000 vehicles (two-way) per hour during AM peak hour, which is almost three times of Lo Fai Road. In view of Annual Traffic Census from Transport Department, roads with around 1100 vehicles per hour are mainly classified as Local and District Distributor. Lo Fai Road could also classified as Local or District Distributor from traffic engineering point view.*

Thanks.

Best Regards,

**Gary Tsui**

Associate Director

Tel: +852 2864 6452 (Direct Line) • Gen: +852 2529 7037 • Fax: +852 2527 8490



22nd Floor • Genesis • 33-35 Wong Chuk Hang Road • Hong Kong

[www.mvaasia.com](http://www.mvaasia.com)

MVA email disclaimer: [www.mvaasia.com/disclaimer](http://www.mvaasia.com/disclaimer)

Please consider the environment before printing.

Classification: Confidential

---

**From:** Calvin Chiu <cchiu@ramboll.com>  
**Sent:** Tuesday, February 27, 2024 8:47 AM  
**To:** TSUI Gary <gtsui@systra.com>  
**Cc:** Coco Ma <COCOMA@ramboll.com>; David Yeung <dyeung@ramboll.com>; TANG Carla <ctang@systra.com>  
**Subject:** RE: Wong Yue Tan - justification for different classification of Ting Kok Road and Lo Fai Road  
**Importance:** High

Dear Gary,

Pls be reminded to provide us input for captioned issue.

**Appendix 14      Correspondence from Environmental Protection Department**



本署檔案  
OUR REF:( ) in  
來函檔案  
YOUR REF: NFDUDWYTEI00\_0\_0035L.24  
電話  
TEL. NO.: 2158 5801  
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., Shatin Governmental Offices,  
1 Sheung Wo Che Road,  
Sha Tin, 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  
上禾輋路一號  
沙田政府合署 10 樓

**By Email: [cchiu@ramboll.com](mailto:cchiu@ramboll.com)**

21 February 2024

Ramboll Hong Kong Limited  
21/F., BEA Harbour View Centre, 56 Gloucester Road,  
Wan Chai, Hong Kong  
(Attn.: Mr Calvin CHIU)

Dear Mr. CHIU,

**Re: Request for Information of Odour Issues of the Drainage Services Department**  
**Ting Kok Road Pumping Station No. 5**

I refer to your letter dated 8 February 2024 on the captioned subject.

According to the records in this office, there are no record of odour issue at the subject site in the past 5 years.

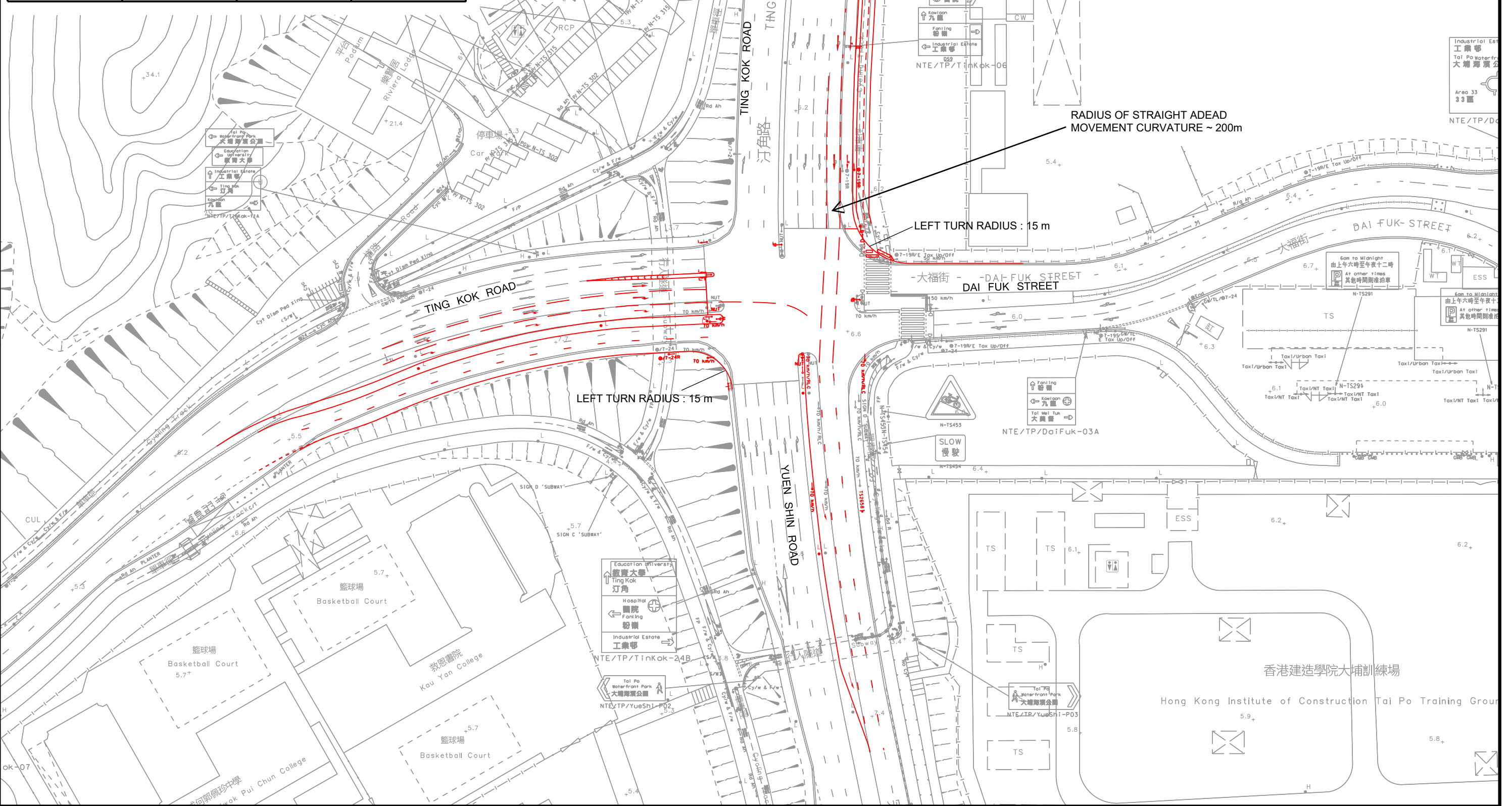
While we have made a reasonable effort to ensure the completeness and accuracy of the information provided, you should comprehend that the information is provided as is and EPD is not responsible or liable for any claim, loss or damage resulting from the use of this information.

Yours sincerely,

(Maverick AU) / Regional Office (North)  
for Director of Environmental Protection

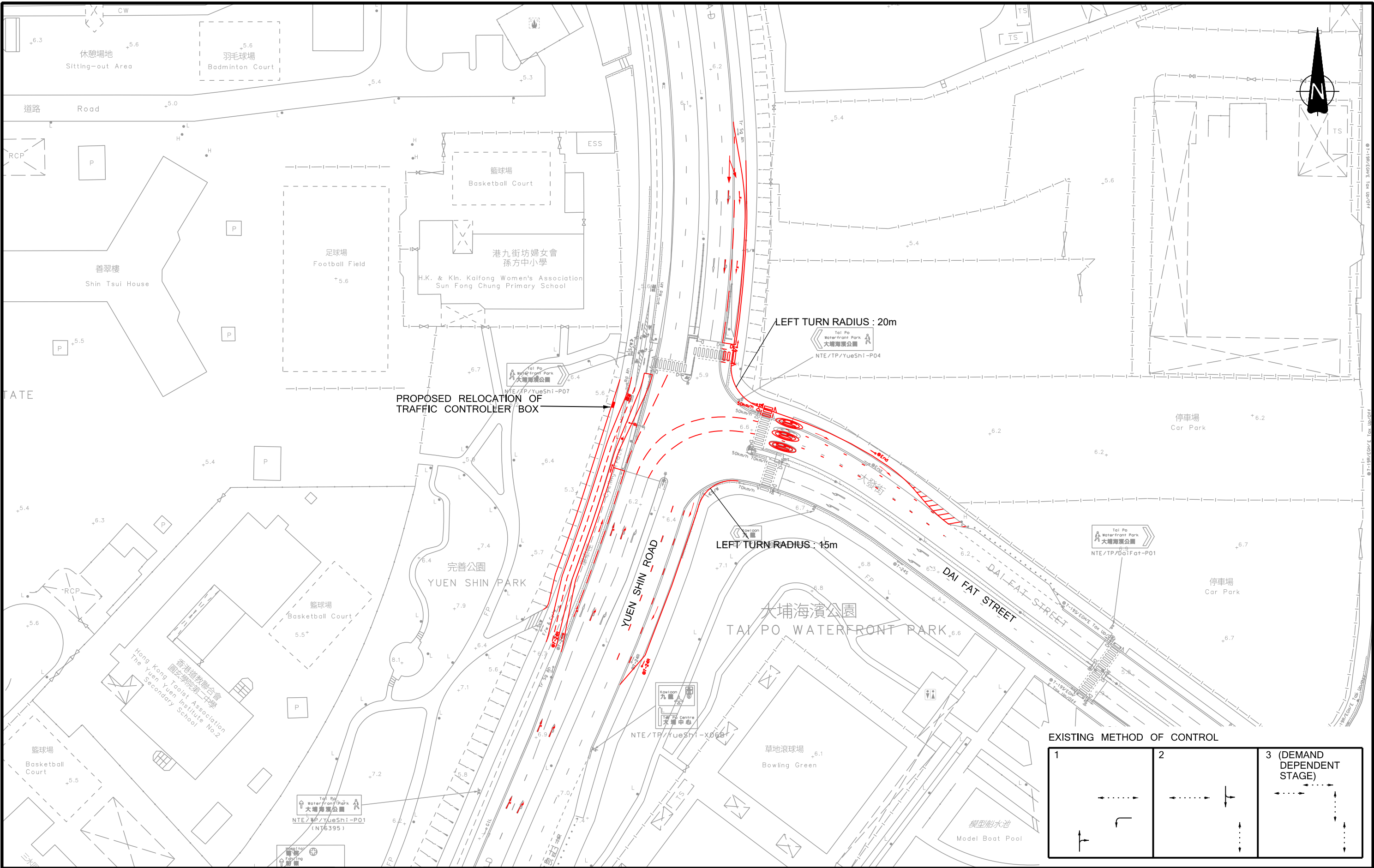
## **Appendix 15      Locations of Road Junction Work**

1	2	3	4



D	MODIFIED IMPROVEMENT SCHEME	TKM	10JAN25	<div>Project Title</div> <div>TCS FOR THE PROPOSED APPLICATION IN UNSURVEYED DISTRICT AT WONG YUE TAN LOT NOS. 11 RP &amp; 14 RP, TAI PO</div>	<div>Drawing Title</div> <div>PROPOSED IMPROVEMENT SCHEME OF TING KOK ROAD / YUEN SHIN ROAD / DAI FUK STREET (J1)</div>						<div>SYSTRA MVA</div>
C	MODIFIED IMPROVEMENT SCHEME	TKM	04DEC24		<div>Designed</div> <div>TYL</div>	<div>Checked</div> <div>TKM</div>	<div>Scale</div> <div>1:1000(A3)</div>	<div>Date</div> <div>MAR 2023</div>	<div>Drawing No.</div> <div>5.1</div>	<div>Rev.</div> <div>D</div>	
B	RESPONSE TO COMMENTS	TKM	02SEP24								
A	RESPONSE TO COMMENTS	TKM	03AUG23								
Rev.	Description	Checked	Date								





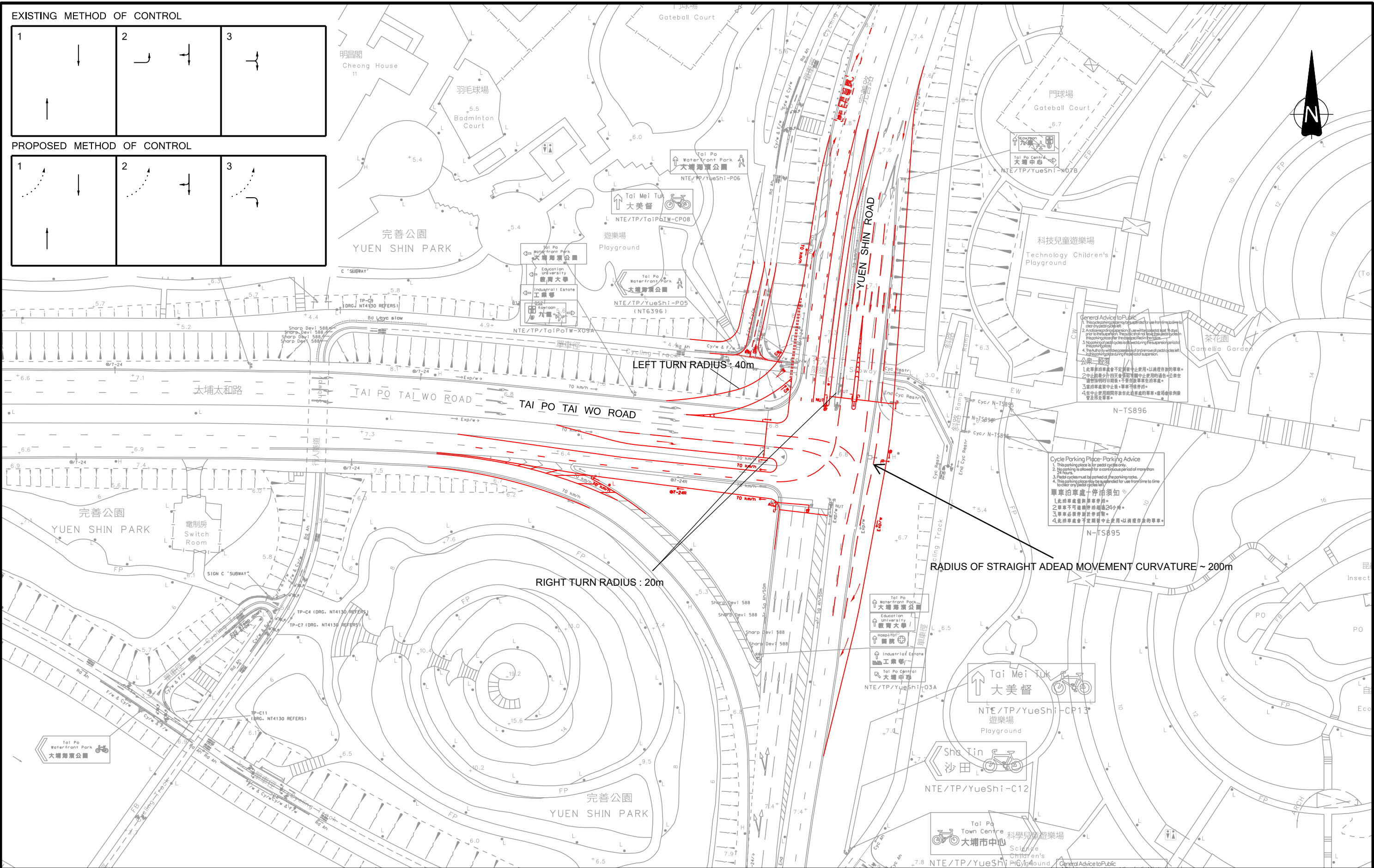
-	-	-	-
-	-	-	-
B	RESPONSE TO COMMENTS	TKM	02SEP24
A	RESPONSE TO COMMENTS	TKM	03AUG23
Rev.	Description	Checked	Date

Project Title

TCS FOR THE PROPOSED APPLICATION IN  
UNSURVEYED DISTRICT AT WONG YUE TAN  
LOT NOS. 11 RP & 14 RP, TAI PO

Drawing Title				
PROPOSED IMPROVEMENT SCHEME OF YUEN SHIN ROAD / DAI FAT STREET (J2)				
Designed	TLY	Checked	TKM	Scale
1:1000(A3)		Date	MAR 2023	Drawing No.
5.2		Rev.	B	





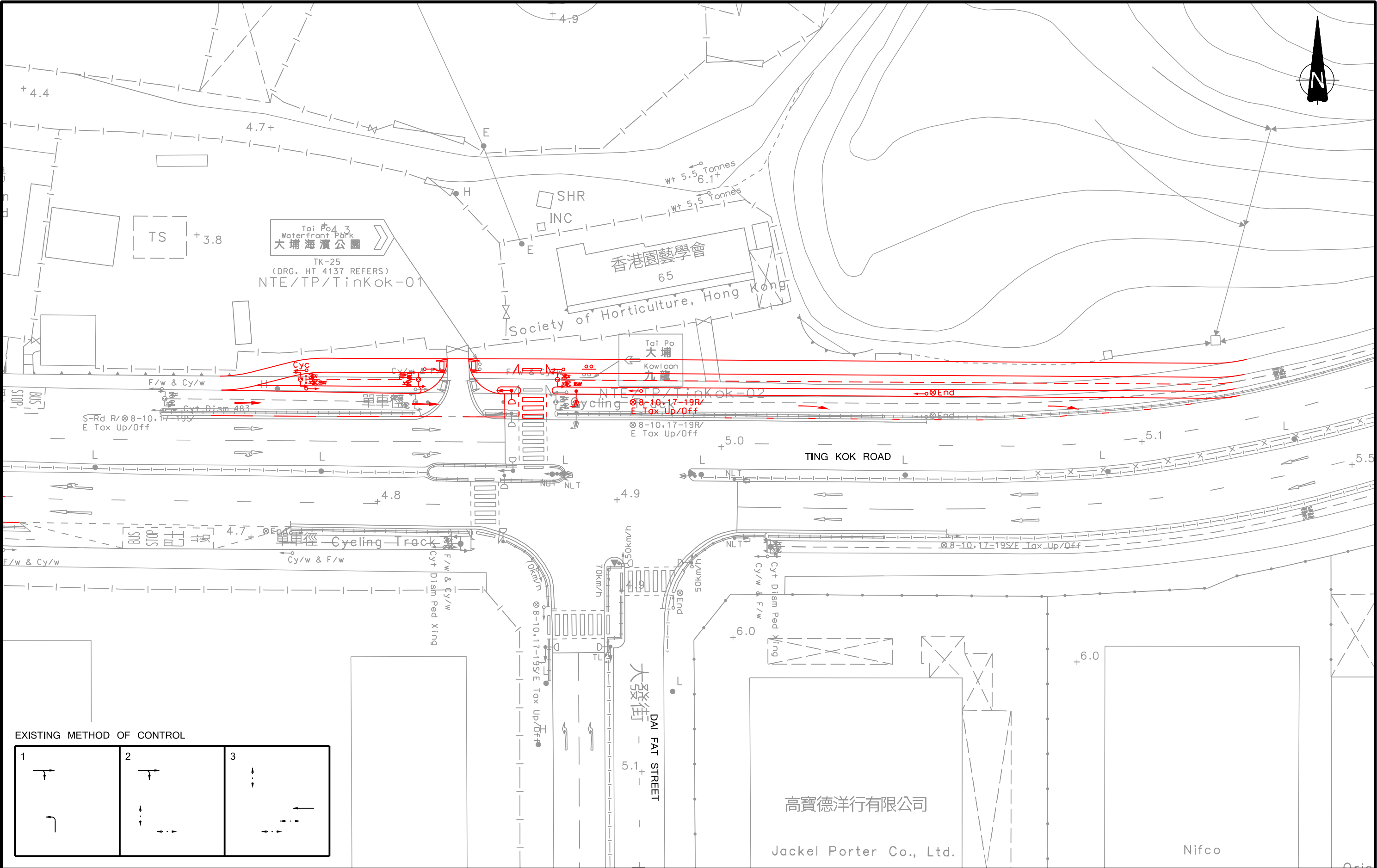
D	MODIFIED IMPROVEMENT SCHEME	TKM	11FEB25
C	MODIFIED IMPROVEMENT SCHEME	TKM	04DEC24
B	RESPONSE TO COMMENTS	TKM	29AUG24
A	RESPONSE TO COMMENTS	TKM	03AUG23
Rev.	Description	Checked	Date

Project Title
TCS FOR THE PROPOSED APPLICATION IN UNSURVEYED DISTRICT AT WONG YUE TAN LOT NOS. 11 RP & 14 RP, TAI PO

Drawing Title											
PROPOSED IMPROVEMENT SCHEME OF TAI PO TAI WO ROAD / YUEN SHIN ROAD (J3)											
Designed	TLY	Checked	TKM	Scale	1:1000(A3)	Date	MAR 2023	Drawing No.	5.3	Rev.	D







EXISTING METHOD OF CONTROL		
1	2	3

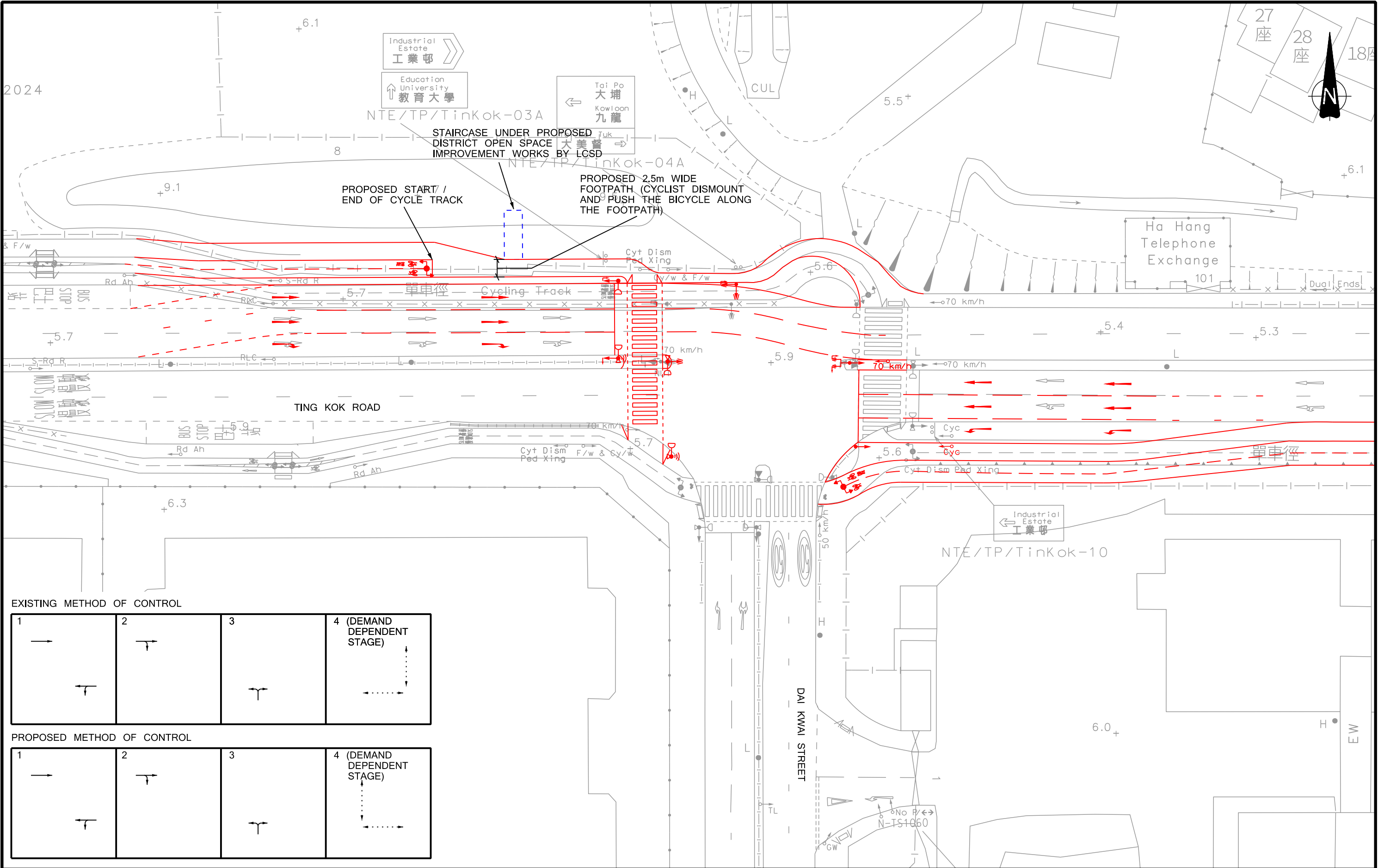
-	-	-	-
C	RESPONSE TO COMMENTS	TKM	10JAN25
B	RESPONSE TO COMMENTS	TKM	06JUN24
A	RESPONSE TO COMMENTS	TKM	03AUG23
Rev.	Description	Checked	Date

Project Title			
TCS FOR THE PROPOSED APPLICATION IN UNSURVEYED DISTRICT AT WONG YUE TAN LOT NOS. 11 RP & 14 RP, TAI PO			

Drawing Title					
PROPOSED IMPROVEMENT SCHEME OF TING KOK ROAD / DAI FAT STREET (J4)					
Designed	TLY	Checked	TKM	Scale	1:500(A3)
Date	MAR 2023	Drawing No.	5.4	Rev.	C

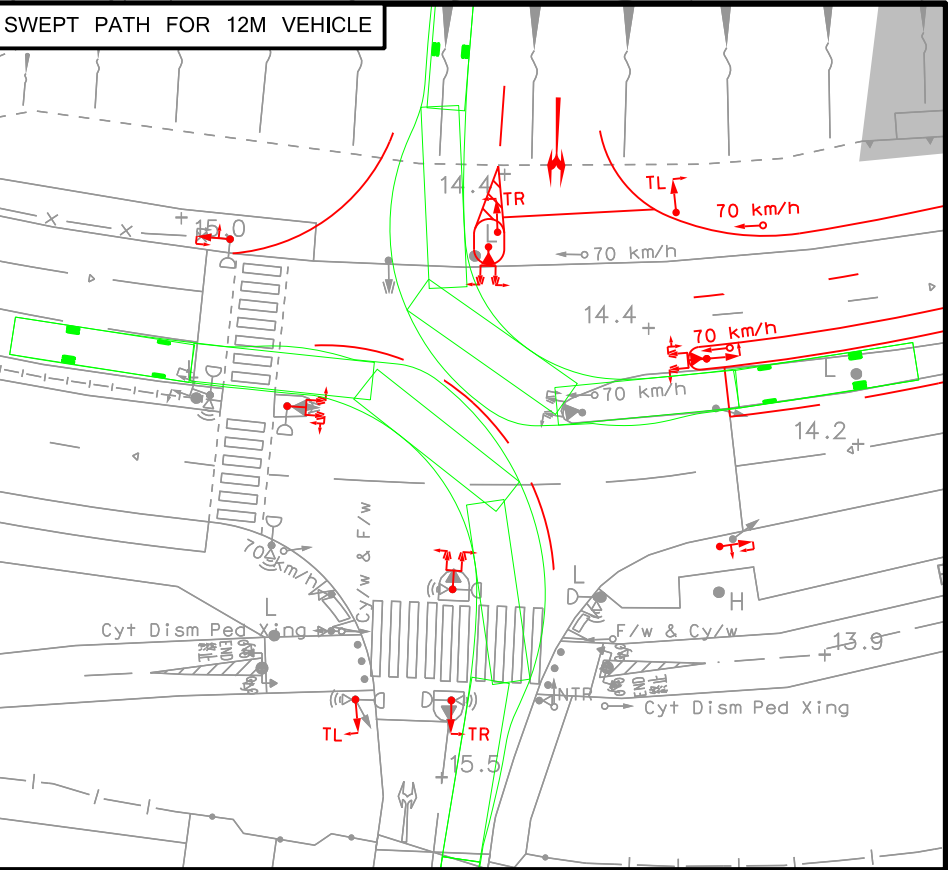
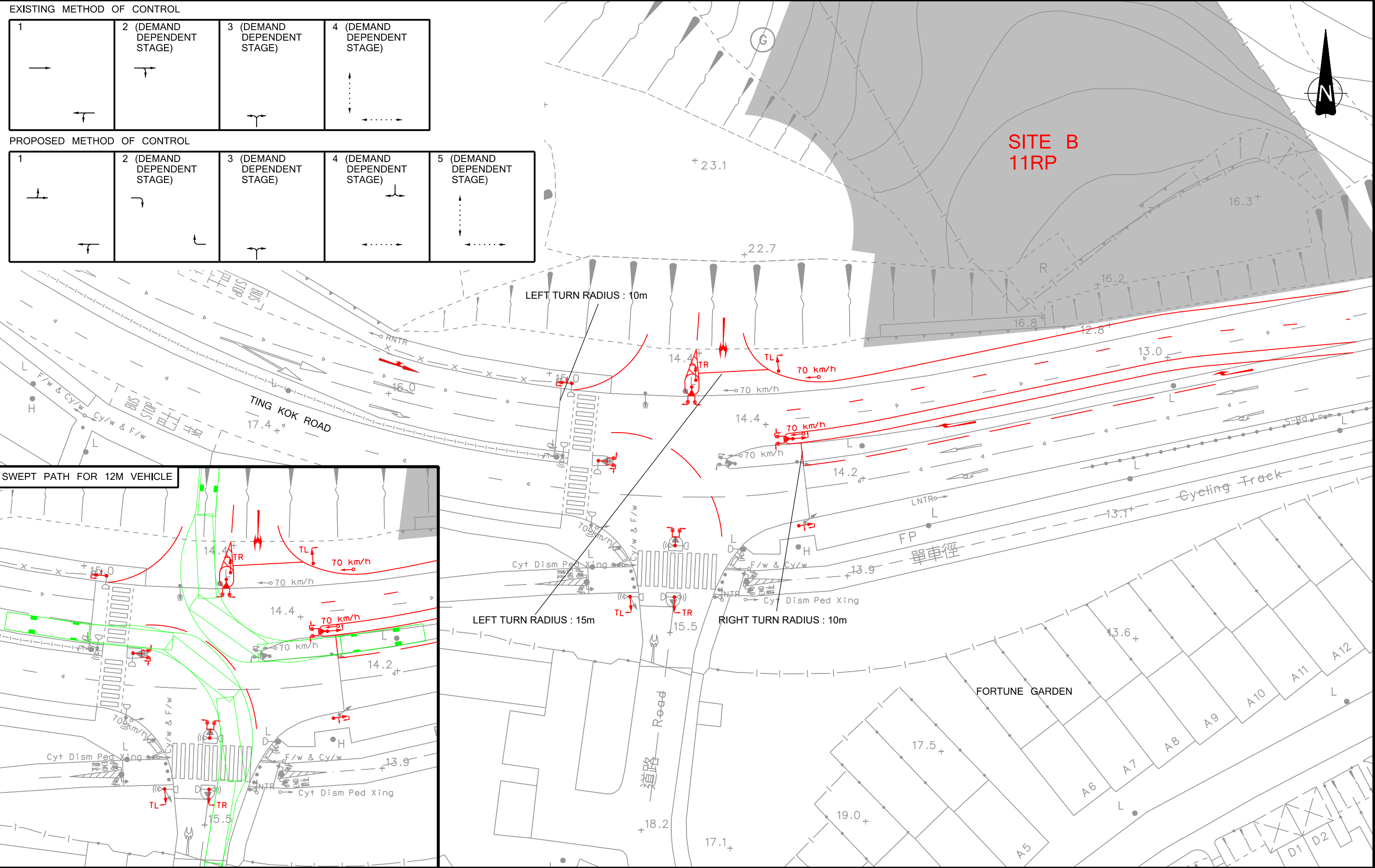




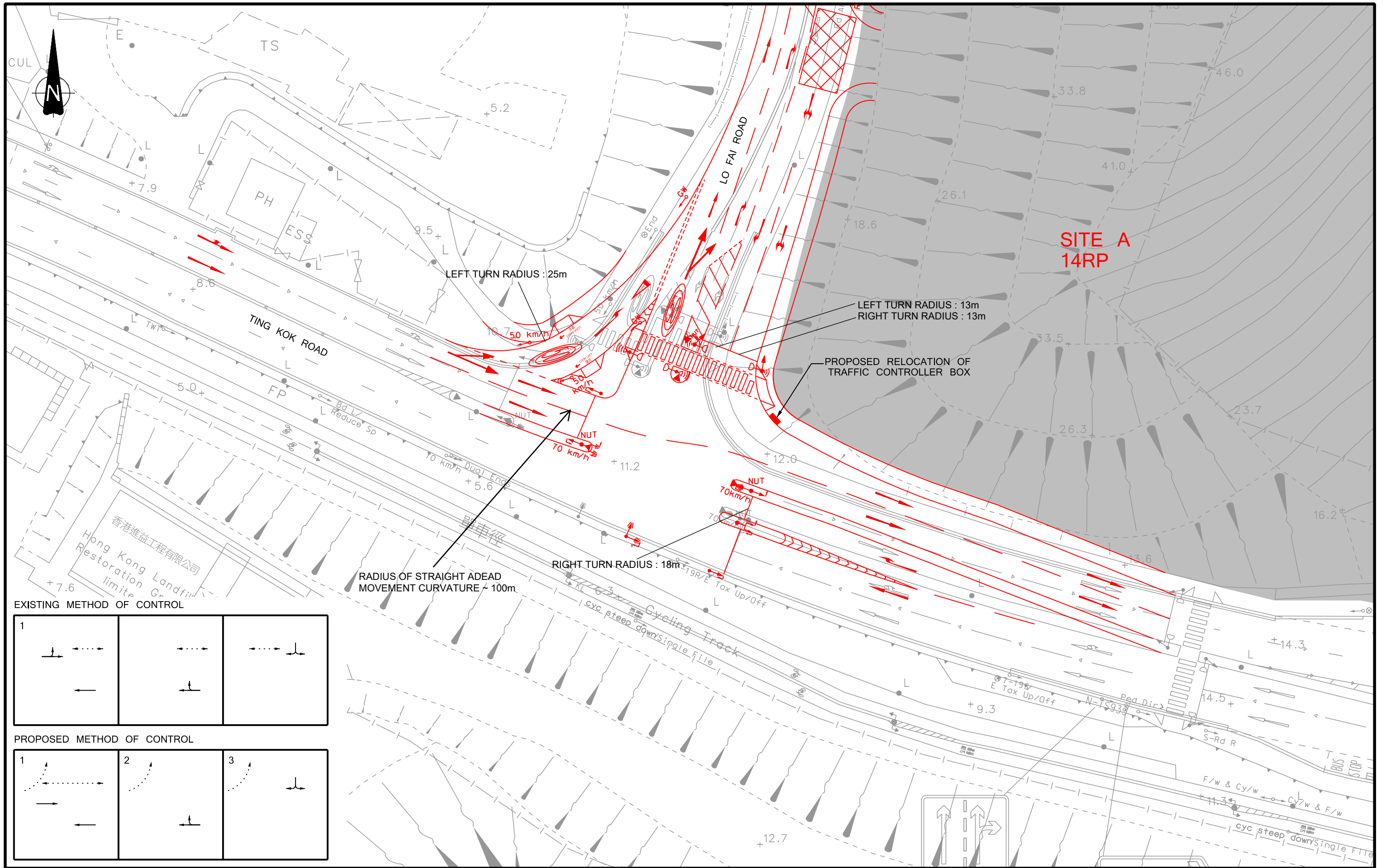


EXISTING METHOD OF CONTROL			
1	2	3	4 (DEMAND DEPENDENT STAGE)
PROPOSED METHOD OF CONTROL			
1	2	3	4 (DEMAND DEPENDENT STAGE)

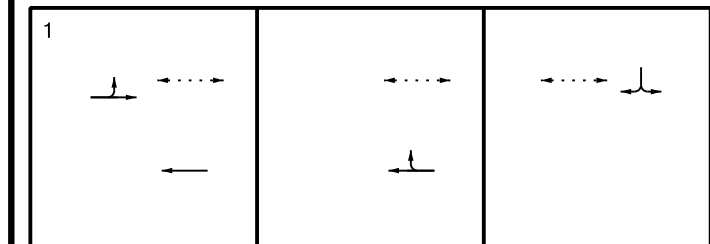
-	-	-	-	Project Title  TCS FOR THE PROPOSED APPLICATION IN UNSURVEYED DISTRICT AT WONG YUE TAN LOT NOS. 11 RP & 14 RP, TAI PO	Drawing Title  <b>PROPOSED ALTERNATIVE IMPROVEMENT SCHEME OF TING KOK ROAD / DAI KWAI STREET (J5)</b>						
-	-	-	-								
-	-	-	-								
A	RESPONSE TO COMMENTS	TKM	02SEP24								
Rev.	Description	Checked	Date								
					Designed TLY	Checked TKM	Scale 1:500(A3)	Date JUN 2024	Drawing No. <b>5.5A</b>	Rev. A	



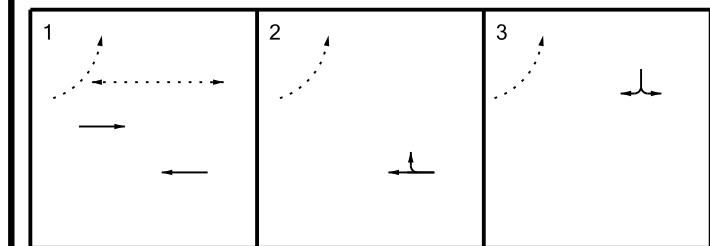
-	-	-	-	Project Title  TCS FOR THE PROPOSED APPLICATION AT WONG YUE TAN LOT NOS. 11 & 14, TAI PO	Drawing Title  <b>PROPOSED IMPROVEMENT SCHEME OF TING KOK ROAD OUTSIDE FORTUNE GARDEN (J6)</b>				
B	RESPONSE TO COMMENTS	TKM	05SEP24		Designed	TLY	Checked	TKM	
A	RESPONSE TO COMMENTS	TKM	03AUG23		Scale	1:500(A3)	Date	APR 2023	
Rev.	Description	Checked	Date		Drawing No.	5.6	Rev.	B	



EXISTING METHOD OF CONTROL



PROPOSED METHOD OF CONTROL



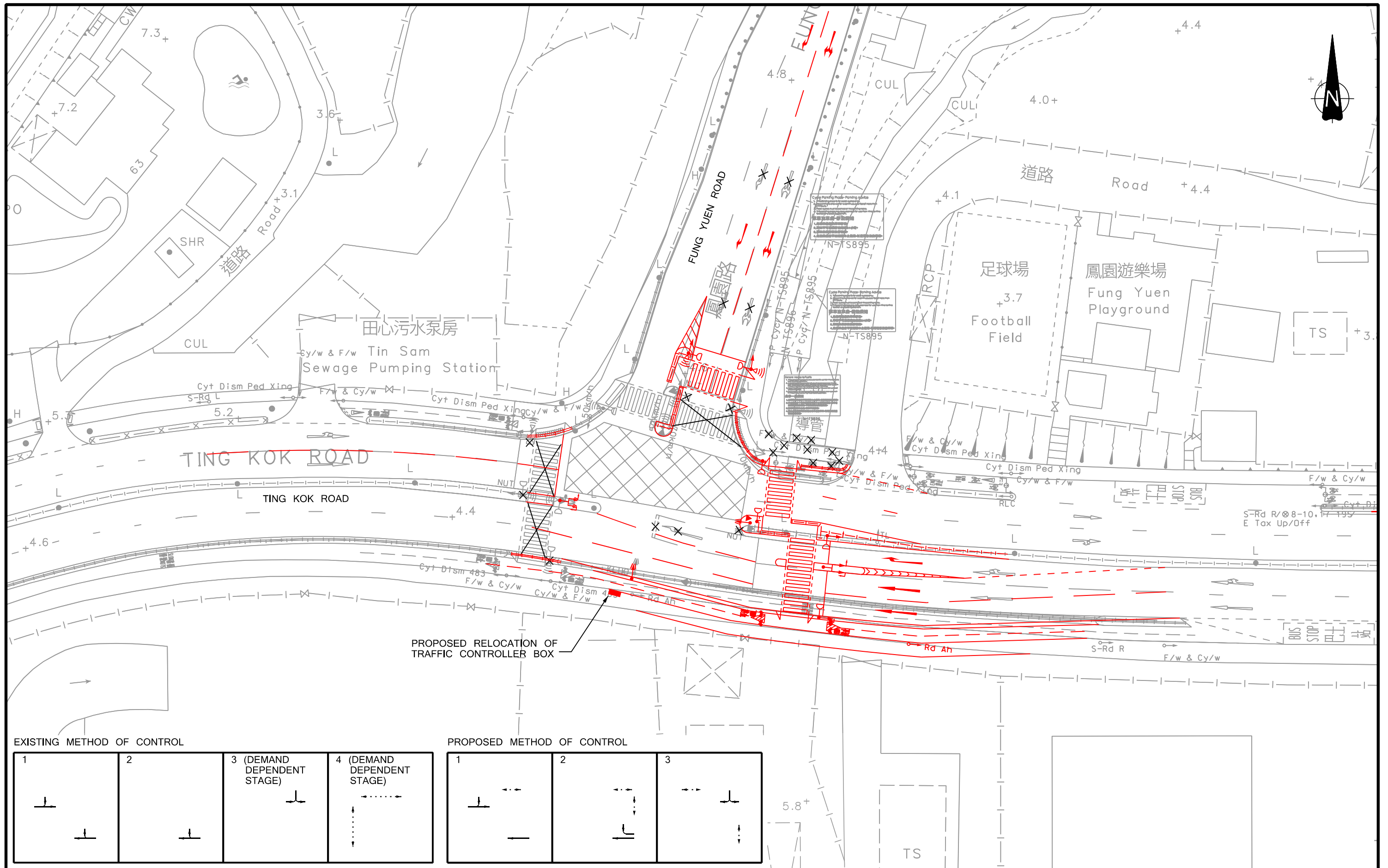
D		TKM	11FEB25	Project Title
C	RESPONSE TO COMMENTS	TKM	10JAN25	
B	RESPONSE TO COMMENTS	TKM	31OCT23	
A	RESPONSE TO COMMENTS	TKM	03AUG23	
Rev.	Description	Checked	Date	


TCS FOR THE PROPOSED APPLICATION IN  
UNSURVEYED DISTRICT AT WONG YUE TAN  
LOT NOS. 11 RP & 14 RP, TAI PO

Drawing Title				
PROPOSED IMPROVEMENT SCHEME TING KOK ROAD / LO FAI ROAD (J7)				
Designed	TLY	Checked	TKM	Scale 1:500(A3)
Date	APR 2023	Drawing No.	5.7	Rev. D







D	MODIFIED IMPROVEMENT SCHEME	TKM	06JAN25	Project Title  TCS FOR THE PROPOSED APPLICATION IN UNSURVEYED DISTRICT AT WONG YUE TAN LOT NOS. 11RP & 14RP, TAI PO	Drawing Title  <b>PROPOSED IMPROVEMENT SCHEME OF TING KOK ROAD / FUNG YUEN ROAD (J8)</b>											
C	MODIFIED IMPROVEMENT SCHEME	TKM	04DEC24													
B	RESPONSE TO COMMENTS	TKM	02SEP24													
A	RESPONSE TO COMMENTS	TKM	03AUG23													
Rev.	Description	Checked	Date													
					Designed	TLY	Checked	TKM	Scale	1:500(A3)	Date	MAR 2023	Drawing No.	5.8	Rev.	D

## **Appendix 16      Historic Aerial Photos in 1997**











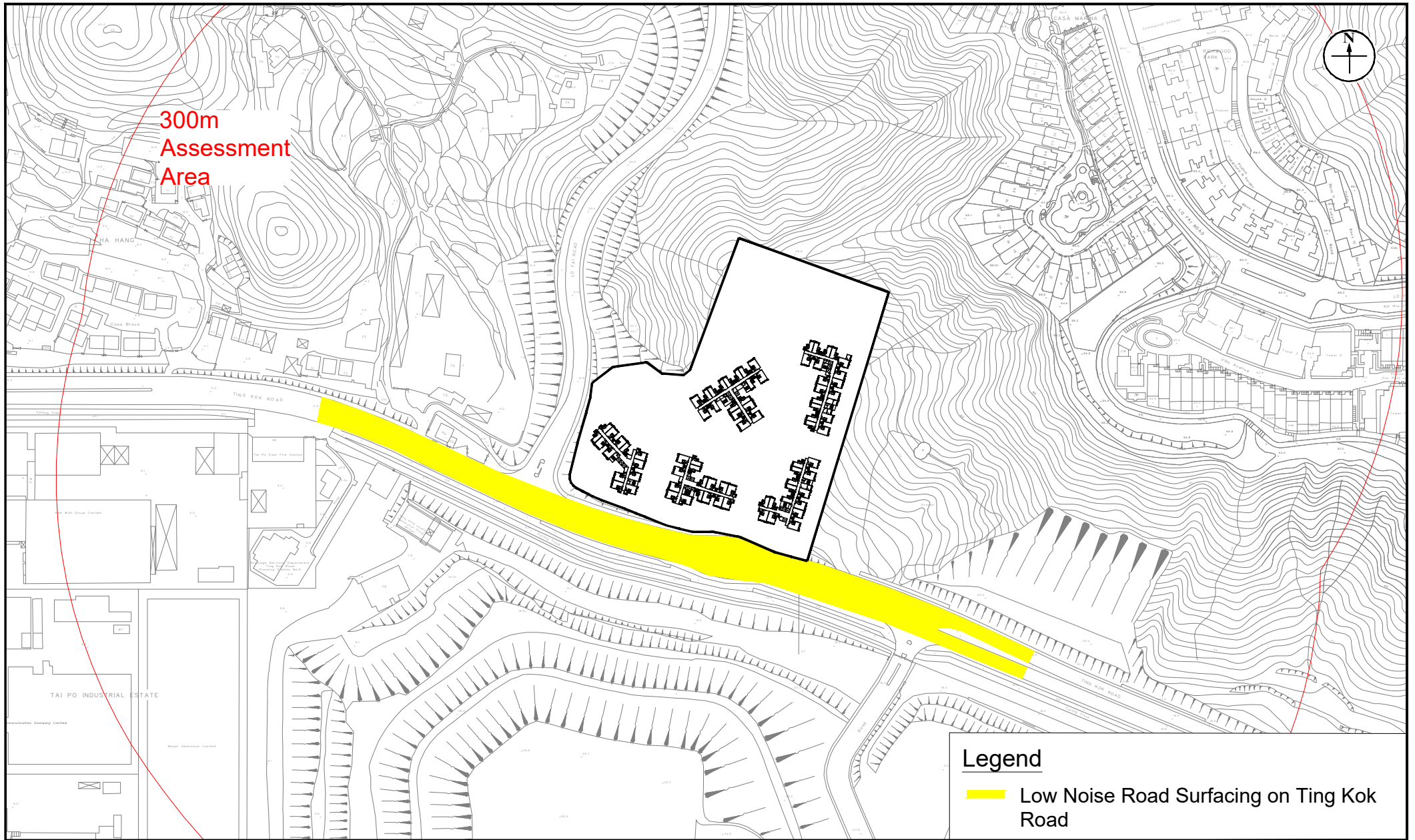
**Appendix 17      Sensitivity Test for Road Traffic Noise**

Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs

Exceedance Summary

	Base Case	Low Noise Road Surfacing on Ting Kok Road Case	Low Noise Road Surfacing on Ting Kok Road and 5m high Cantilever Barrier with 3m Cantilever at 45° Case	Low Noise Road Surfacing on Ting Kok Road and 10m high Cantilever Barrier with 3m Cantilever at 45° Case	Low Noise Road Surfacing on Ting Kok Road, 10m high Cantilever Barrier with 3m Cantilever at 45°, Road Side Barrier and Noise Barrier at Central Divider Case Scenario
Total no. of Flats:	1750	1750	1750	1750	1750
Total no. of Exceedance:	634	531	501	434	392
Compliance Level:	64%	70%	71%	75%	78%
Max. Noise Level (Site A):	77	76	76	76	73
Max. Noise Level (Site A and B):	77	76	76	76	76





## Appendix: 17a Low Noise Road Surfacing on Ting Kok Road Scenario

**Title:** Location of Low Noise Road Surfacing on Ting Kok Road

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

RAMBOLL

Drawn by: CM

Checked by: CC

Rev.: 1.1

Date: Oct 2024

**Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Low Noise Road Surfacing on Ting Kok Road Case Scenario (AM Peak))**

**Site A Tower 1**

Floor	*mPD	N1-01	N1-02	N1-03	N1-04	N1-05	N1-06	N1-07	N1-08	N1-09	N1-10	N1-11	N1-12	N1-13	N1-14	N1-15
1/F	27.1	74	74	72	72	71	70	65	65	66	51	43	50	59	61	61
2/F	30.1	74	74	74	73	72	72	68	66	66	51	43	50	59	61	61
3/F	33.1	74	74	74	73	72	72	70	67	66	51	43	50	59	61	61
4/F	36.1	74	74	74	73	72	72	70	68	67	51	43	50	59	61	61
5/F	39.1	74	74	73	73	72	71	70	68	67	51	43	50	59	61	61
6/F	42.1	74	73	73	73	72	71	70	69	68	51	43	50	58	61	61
7/F	45.1	73	73	73	72	71	71	70	68	68	51	43	50	58	61	61
8/F	48.1	73	73	73	72	71	71	69	68	68	51	43	50	58	61	61
9/F	51.1	73	73	72	72	71	71	69	68	68	51	43	50	58	61	61
10/F	54.1	73	73	72	72	71	70	69	68	68	51	43	50	59	61	61
11/F	57.1	72	72	72	72	70	70	69	68	68	51	43	50	59	61	61
12/F	60.1	72	72	72	71	70	70	69	68	68	51	43	51	59	61	61
13/F	63.1	72	72	72	71	70	70	69	68	68	51	43	51	59	61	61
14/F	66.1	72	72	71	71	70	70	69	68	67	51	43	51	59	61	61
15/F	69.1	72	71	71	71	70	70	68	68	67	51	43	51	59	61	61
16/F	72.1	71	71	71	71	69	69	68	68	67	51	43	51	59	61	61
17/F	75.1	71	71	71	70	69	69	68	68	67	51	44	52	59	61	61
18/F	78.1	71	71	71	70	69	69	68	68	67	52	46	52	59	61	61
19/F	81.1	71	71	71	70	69	69	68	68	67	53	49	53	59	61	61
Exceedance		19	19	19	16	10	8	0	0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		74	74	74	73	72	72	70	69	68	53	49	53	59	61	61

**Site A Tower 2**

Floor	*mPD	N2-01	N2-02	N2-03	N2-04	N2-05	N2-06	N2-07	N2-08	N2-09	N2-10	N2-11	N2-12	N2-13	N2-14	N2-15	N2-16	N2-17	N2-18
1/F	36.1	61	49	48	48	48	68	68	68	67	67	66	66	66	57	60	59	59	58
2/F	39.1	61	51	50	50	50	68	68	67	67	67	66	66	66	57	60	59	59	58
3/F	42.1	61	53	51	51	52	68	68	67	67	67	66	66	66	57	60	59	59	58
4/F	45.1	62	54	53	53	53	68	68	67	67	67	66	66	66	57	60	59	59	57
5/F	48.1	62	55	54	54	54	69	68	67	67	67	66	66	66	57	60	59	59	57
6/F	51.1	62	56	55	55	55	69	68	68	67	67	66	66	66	57	60	59	59	57
7/F	54.1	62	57	56	55	55	69	68	68	67	67	66	66	66	57	60	59	59	57
8/F	57.1	62	57	56	56	56	69	68	68	68	67	66	66	66	57	60	59	59	57
9/F	60.1	62	57	56	56	56	68	68	68	68	68	67	66	66	57	60	59	59	57
10/F	63.1	62	57	57	56	56	68	68	68	68	68	67	67	66	57	60	59	58	57
11/F	66.1	62	57	57	56	56	69	68	68	68	68	67	67	67	57	60	59	58	57
12/F	69.1	62	57	57	57	56	69	68	68	68	68	68	67	67	56	60	59	58	57
13/F	72.1	62	57	57	57	56	68	68	68	68	68	68	67	67	56	60	59	58	57
14/F	75.1	62	57	57	57	56	68	68	68	68	68	68	68	67	56	59	59	58	57
15/F	78.1	62	57	57	57	56	68	68	68	68	68	68	68	67	57	59	59	58	57
16/F	81.1	62	58	57	57	57	68	68	68	68	68	68	68	67	57	60	59	58	57
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		62	58	57	57	57	69	68	68	68	68	68	68	67	57	60	59	59	58

**Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Low Noise Road Surfacing on Ting Kok Road Case Scenario (AM Peak))**

**Site A Tower 3**

Floor	*mPD	N3-01	N3-02	N3-03	N3-04	N3-05	N3-06	N3-07	N3-08	N3-09	N3-10	N3-11	N3-12	N3-13	N3-14	N3-15	N3-16	N3-17	N3-18	N3-19	N3-20	N3-21
1/F	36.1	48	47	52	53	51	49	45	48	60	42	42	41	61	61	63	64	64	65	63	65	66
2/F	39.1	49	49	52	53	51	50	45	48	60	43	42	42	61	62	63	64	64	65	63	65	66
3/F	42.1	51	50	53	53	52	50	46	49	60	43	42	42	62	62	63	64	64	65	63	66	66
4/F	45.1	52	51	53	54	52	50	47	49	60	44	43	43	63	63	64	64	64	65	63	66	66
5/F	48.1	54	53	54	54	53	51	48	50	60	45	44	44	63	63	64	64	65	65	63	66	66
6/F	51.1	55	54	55	55	53	52	49	51	61	46	45	44	63	63	64	64	65	65	64	66	66
7/F	54.1	56	55	55	56	54	52	50	52	62	47	46	46	63	64	64	65	65	65	64	66	66
8/F	57.1	56	56	56	56	55	53	51	53	62	48	47	47	64	64	64	65	65	65	64	66	66
9/F	60.1	57	56	56	56	55	54	52	54	62	50	49	49	64	64	65	65	65	65	64	66	66
10/F	63.1	57	57	56	57	55	54	53	54	62	53	52	51	64	64	65	65	65	66	64	66	66
11/F	66.1	58	58	57	57	56	55	53	55	63	56	55	55	64	64	65	65	65	66	64	66	66
12/F	69.1	59	58	57	57	56	55	54	56	63	58	57	57	64	64	65	65	65	66	64	66	66
13/F	72.1	59	59	58	58	57	56	55	56	64	59	58	58	65	65	65	65	65	66	64	66	66
14/F	75.1	60	59	58	58	57	56	55	57	64	60	59	59	65	65	65	65	65	66	64	66	66
15/F	78.1	60	60	58	58	57	57	56	58	64	61	60	60	65	65	65	65	65	66	64	66	66
16/F	81.1	60	60	59	58	58	58	57	59	65	61	61	61	65	65	65	65	65	66	64	66	66
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0		0		0
Maximum Noise Level, dB(A)		60	60	59	58	58	58	57	59	65	61	61	61	65	65	65	65	65	66	64	66	66

**Site A Tower 4**

Floor	*mPD	N4-01	N4-02	N4-03	N4-04	N4-05	N4-06	N4-07	N4-08	N4-09	N4-10	N4-11	N4-12	N4-13	N4-14	N4-15	N4-16
1/F	27.1	74	74	60	59	59	58	58	57	57	67	68	68	68	68	69	71
2/F	30.1	75	75	60	59	59	59	59	58	57	67	68	68	68	69	70	72
3/F	33.1	75	75	60	60	59	59	59	58	58	67	68	68	69	70	71	72
4/F	36.1	74	74	60	60	59	60	60	59	58	68	68	69	69	70	71	72
5/F	39.1	74	74	60	60	59	61	61	60	59	68	68	69	69	70	71	72
6/F	42.1	74	74	60	59	59	61	62	61	60	68	68	69	69	70	70	72
7/F	45.1	74	74	60	59	59	61	62	61	61	68	68	69	69	70	70	71
8/F	48.1	73	73	60	59	59	61	62	61	61	68	68	69	69	70	70	71
9/F	51.1	73	73	60	59	59	61	62	62	61	68	68	69	69	69	70	71
10/F	54.1	73	73	60	59	59	61	62	62	61	68	68	68	69	69	70	71
11/F	57.1	73	73	60	59	59	61	62	62	61	68	68	68	69	69	69	70
12/F	60.1	72	72	60	59	59	61	62	62	61	67	68	68	68	69	69	70
13/F	63.1	72	72	59	59	59	61	62	62	61	67	68	68	68	69	69	70
14/F	66.1	72	72	59	59	59	61	62	62	61	67	68	68	68	69	69	70
15/F	69.1	72	72	59	59	59	61	62	62	62	67	68	68	68	68	69	70
16/F	72.1	72	72	59	59	59	61	62	62	62	67	67	68	68	68	69	69
17/F	75.1	71	71	59	59	60	61	62	62	62	67	67	68	68	68	68	69
18/F	78.1	71	71	59	59	60	61	62	62	62	67	67	68	68	68	68	69
19/F	81.1	71	71	59	59	60	61	62	62	62	67	67	67	68	68	68	69
Exceedance		19	19	0	0	0	0	0	0	0	0	0	0		0	3	10
Maximum Noise Level, dB(A)		75	75	60	60	60	61	62	62	62	68	68	69	69	70	71	72



**Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Low Noise Road Surfacing on Ting Kok Road Case Scenario (AM Peak))**

**Site A Tower 5**

Floor	*mPD	N5-01	N5-02	N5-03	N5-04	N5-05	N5-06	N5-07	N5-08	N5-09	N5-10	N5-11	N5-12	N5-13
1/F	27.1	75	74	75	75	76	71	69	68	67	56	58	63	73
2/F	30.1	75	74	74	75	76	71	69	68	67	59	62	68	73
3/F	33.1	74	74	74	75	76	71	69	68	67	63	66	70	72
4/F	36.1	74	74	74	75	75	70	69	67	67	65	67	70	72
5/F	39.1	74	73	74	74	75	70	69	67	67	66	68	70	72
6/F	42.1	74	73	74	74	75	70	68	67	67	67	68	69	72
7/F	45.1	74	73	74	74	75	70	68	67	67	67	68	69	71
8/F	48.1	73	73	73	74	75	70	68	67	67	67	68	69	71
9/F	51.1	73	73	73	74	74	69	68	67	66	67	68	69	71
10/F	54.1	73	72	73	73	74	69	68	67	66	66	67	69	71
11/F	57.1	73	72	73	73	74	69	68	67	66	66	67	68	70
12/F	60.1	72	72	73	73	74	69	67	67	66	66	67	68	70
13/F	63.1	72	72	72	73	74	69	67	66	66	66	67	68	70
14/F	66.1	72	72	72	73	73	69	67	66	66	66	67	68	70
15/F	69.1	72	71	72	73	73	68	67	66	66	66	67	68	70
16/F	72.1	72	71	72	72	73	68	67	66	66	66	67	68	69
17/F	75.1	72	71	72	72	73	68	67	66	66	66	66	67	69
18/F	78.1	71	71	72	72	73	68	67	66	66	66	66	67	69
Exceedance		18	18	18	18	18	3	0	0	0	0	0	0	10
Maximum Noise Level, dB(A)		75	74	75	75	76	71	69	68	67	67	68	70	73

Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Low Noise Road Surfacing on Ting Kok Road Case Scenario (AM Peak))

Site B Tower 1

Floor	*mPD	N6-01	N6-02	N6-03	N6-04	N6-05	N6-06	N6-07	N6-08	N6-09	N6-10	N6-11	N6-12	N6-13	N6-14	N6-15
1/F	28.8	71	76	76	75	74	73	73	73	73	73	74	75	76	75	74
2/F	32.0	71	76	76	75	74	73	73	73	73	73	73	74	75	75	74
3/F	35.1	71	76	76	75	74	73	73	73	73	73	73	74	75	75	74
4/F	38.3	71	76	75	74	73	72	72	73	73	73	73	74	75	74	74
5/F	41.4	71	75	75	74	73	72	72	73	73	73	73	74	74	74	74
6/F	44.6	70	75	75	74	73	72	72	72	72	72	73	73	74	74	73
7/F	47.7	70	75	75	74	73	72	72	72	72	72	72	73	74	74	73
8/F	50.9	70	74	74	73	73	72	72	72	72	72	72	73	74	74	73
9/F	54.0	70	74	74	73	73	72	72	72	72	72	72	73	73	73	73
10/F	57.2	69	74	74	73	72	71	71	72	72	72	72	72	73	73	73
11/F	60.3	69	74	74	73	72	71	71	71	72	71	72	72	73	73	73
12/F	63.5	69	74	73	73	72	71	71	71	71	71	71	72	73	73	72
13/F	66.6	69	73	73	72	72	71	71	71	71	71	71	72	72	72	72
14/F	69.8	69	73	73	72	72	71	71	71	71	71	71	72	72	72	72
15/F	72.9	69	73	73	72	71	71	71	71	71	71	71	71	72	72	72
16/F	76.1	68	73	73	72	71	70	70	71	71	71	71	71	72	72	72
Exceedance		16			16	16	15	15	16	16	16	16	16	16	16	16
Maximum Noise Level, dB(A)		71	76	76	75	74	73	73	73	73	73	74	75	76	75	74

Floor	*mPD	N6-16	N6-17	N6-18	N6-19	N6-20	N6-21	N6-22	N6-23	N6-24	N6-25	N6-26	N6-27	N6-28	N6-29
1/F	28.8	73	73	73	73	73	71	70	53	43	44	44	44	52	58
2/F	32.0	73	73	72	73	73	71	70	53	43	43	44	43	52	58
3/F	35.1	73	73	72	73	73	71	70	53	43	43	44	43	52	58
4/F	38.3	73	72	72	73	73	71	70	54	43	43	43	43	52	58
5/F	41.4	73	72	72	73	73	71	70	54	43	43	43	44	52	58
6/F	44.6	73	72	72	73	73	71	70	58	43	43	43	45	54	59
7/F	47.7	73	72	72	72	73	71	70	59	43	43	43	46	57	61
8/F	50.9	72	72	72	72	72	71	70	59	43	43	43	46	58	61
9/F	54.0	72	72	72	72	72	71	70	59	43	43	43	46	58	62
10/F	57.2	72	72	72	72	72	71	70	59	43	43	43	46	58	62
11/F	60.3	72	72	71	72	72	71	69	58	42	43	43	46	58	62
12/F	63.5	72	71	71	72	72	70	69	58	42	43	43	46	58	62
13/F	66.6	72	71	71	72	72	70	69	58	42	42	43	46	58	61
14/F	69.8	71	71	71	72	72	70	69	58	43	43	43	46	58	61
15/F	72.9	71	71	71	71	72	70	69	58	45	45	45	47	58	61
16/F	76.1	71	71	71	71	72	70	69	58	48	48	47	49	58	61
Exceedance		16	16	16	16	16		0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		73	73	73	73	73	71	70	59	48	48	47	49	58	62

Total no. of Flats:	1750
Total no. of Exceedance:	531
Compliance Level:	70%
Max. Noise Level:	76

Noted:

Noise level exceed stardand of 70 dB(A)

\* The assessment point is located at 1m in front of the most exposed part of an openable window for ventilation at a habitable room (NSRs) and 1.2m above the floor level of individual floors of the residential towers of the proposed development.  
Remark: The predicted noise levels are not the actual noise levels at the external façade after the application of innovative noise mitigation measures (acoustic window (baffle type)/enhanced acoustic balcony (baffle type)). These predicted noise levels are the equivalent noise levels at 1m from the external façade after accounting the reduction in noise levels inside the room offered by the proposed noise mitigation measures.

**Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Low Noise Road Surfacing on Ting Kok Road Case Scenario (PM Peak))**

**Site A Tower 1**

Floor	*mPD	N1-01	N1-02	N1-03	N1-04	N1-05	N1-06	N1-07	N1-08	N1-09	N1-10	N1-11	N1-12	N1-13	N1-14	N1-15
1/F	27.1	73	73	72	71	70	69	64	64	64	49	43	49	57	60	60
2/F	30.1	74	74	74	73	72	71	67	65	65	49	43	49	57	60	60
3/F	33.1	74	74	73	73	72	71	69	66	65	49	43	49	57	59	60
4/F	36.1	74	73	73	73	72	71	69	67	66	49	43	49	57	59	60
5/F	39.1	73	73	73	72	71	71	69	68	66	49	42	49	57	59	60
6/F	42.1	73	73	73	72	71	71	69	68	67	49	42	49	57	59	60
7/F	45.1	73	73	72	72	71	70	69	68	67	49	42	49	57	59	60
8/F	48.1	73	72	72	72	71	70	69	68	67	49	42	49	57	59	60
9/F	51.1	72	72	72	71	70	70	69	67	67	49	42	49	57	59	60
10/F	54.1	72	72	72	71	70	70	68	67	67	49	42	49	57	59	60
11/F	57.1	72	72	71	71	70	70	68	67	67	50	42	49	57	59	60
12/F	60.1	72	72	71	71	70	69	68	67	67	50	42	49	57	59	60
13/F	63.1	71	71	71	71	69	69	68	67	67	50	42	50	57	59	60
14/F	66.1	71	71	71	70	69	69	68	67	67	50	42	50	57	59	60
15/F	69.1	71	71	71	70	69	69	68	67	67	50	42	50	57	59	60
16/F	72.1	71	71	70	70	69	69	68	67	66	50	42	50	57	59	60
17/F	75.1	71	71	70	70	69	69	67	67	66	50	43	50	57	59	60
18/F	78.1	70	70	70	70	68	68	67	67	66	51	45	51	57	59	60
19/F	81.1	70	70	70	69	68	68	67	67	66	52	48	52	58	59	60
Exceedance		17	17	15	13	7	5	0	0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		74	74	74	73	72	71	69	68	67	52	48	52	58	60	60

**Site A Tower 2**

Floor	*mPD	N2-01	N2-02	N2-03	N2-04	N2-05	N2-06	N2-07	N2-08	N2-09	N2-10	N2-11	N2-12	N2-13	N2-14	N2-15	N2-16	N2-17	N2-18
1/F	36.1	60	48	47	47	47	67	67	67	66	66	65	65	65	56	59	59	58	57
2/F	39.1	60	50	49	49	49	67	67	66	66	66	65	65	65	56	59	59	58	57
3/F	42.1	60	52	50	50	50	67	67	66	66	66	65	65	65	56	59	59	58	57
4/F	45.1	61	53	52	52	52	67	67	66	66	66	65	65	65	56	59	59	58	57
5/F	48.1	61	54	53	53	53	67	67	66	66	66	65	65	65	56	59	59	58	57
6/F	51.1	61	55	54	54	54	68	67	67	66	66	65	65	65	56	59	58	58	57
7/F	54.1	61	56	55	54	55	67	67	67	66	66	65	65	65	56	59	58	58	57
8/F	57.1	61	56	55	55	55	67	67	67	66	66	65	65	65	56	59	58	58	57
9/F	60.1	61	57	56	55	55	67	67	67	67	67	66	65	65	56	59	58	58	57
10/F	63.1	61	57	56	56	56	67	67	67	67	67	66	66	65	56	59	58	58	57
11/F	66.1	61	57	56	56	56	67	67	67	67	67	66	66	66	56	59	58	58	56
12/F	69.1	61	57	56	56	56	67	67	67	67	67	66	66	66	56	59	58	58	56
13/F	72.1	61	57	56	56	56	67	67	67	67	67	66	66	66	56	59	58	58	56
14/F	75.1	61	57	56	56	56	67	67	67	67	67	66	66	66	56	59	58	58	56
15/F	78.1	61	57	56	56	56	67	67	67	67	67	67	66	66	56	59	58	58	56
16/F	81.1	61	57	56	56	56	67	67	67	67	67	67	66	66	56	59	58	58	57
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		61	57	56	56	56	68	67	67	67	67	67	66	66	56	59	59	58	57



**Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Low Noise Road Surfacing on Ting Kok Road Case Scenario (PM Peak))**

**Site A Tower 3**

Floor	*mPD	N3-01	N3-02	N3-03	N3-04	N3-05	N3-06	N3-07	N3-08	N3-09	N3-10	N3-11	N3-12	N3-13	N3-14	N3-15	N3-16	N3-17	N3-18	N3-19	N3-20	N3-21
1/F	36.1	47	46	51	52	50	48	44	47	59	41	41	40	60	61	62	63	64	64	63	65	65
2/F	39.1	48	48	51	52	50	48	45	47	59	42	41	41	60	61	62	63	64	64	63	65	66
3/F	42.1	50	49	51	52	51	49	45	48	59	42	41	41	61	62	63	63	64	64	63	65	66
4/F	45.1	51	50	52	53	51	49	46	48	59	43	42	42	62	62	63	63	64	64	63	65	66
5/F	48.1	53	52	52	53	51	50	47	49	60	44	43	42	62	63	63	63	64	64	63	65	66
6/F	51.1	54	53	53	54	52	51	48	50	60	44	43	43	63	63	63	64	64	64	63	65	66
7/F	54.1	55	54	54	54	53	51	49	50	61	45	44	44	63	63	64	64	64	65	63	65	66
8/F	57.1	55	55	55	55	53	52	50	51	61	47	46	46	63	63	64	64	64	65	63	65	66
9/F	60.1	56	55	55	55	54	53	51	52	61	49	48	48	63	64	64	64	65	65	63	65	66
10/F	63.1	57	56	55	56	54	53	52	53	61	51	50	50	64	64	64	64	65	65	63	65	66
11/F	66.1	57	57	56	56	55	54	52	54	62	54	54	53	64	64	64	64	65	65	63	65	66
12/F	69.1	58	58	56	56	55	54	53	54	62	56	56	55	64	64	64	64	65	65	63	65	66
13/F	72.1	58	58	57	57	56	55	54	55	63	58	57	57	64	64	64	64	65	65	63	65	66
14/F	75.1	59	59	57	57	56	55	54	56	63	59	58	58	64	64	64	65	65	65	63	65	66
15/F	78.1	59	59	58	57	56	56	55	57	63	60	59	59	64	64	64	65	65	65	63	65	66
16/F	81.1	59	59	58	57	57	57	56	58	64	60	60	59	64	64	64	65	65	65	63	65	66
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0		0		0
Maximum Noise Level, dB(A)		59	59	58	57	57	57	56	58	64	60	60	59	64	64	64	65	65	65	63	65	66

**Site A Tower 4**

Floor	*mPD	N4-01	N4-02	N4-03	N4-04	N4-05	N4-06	N4-07	N4-08	N4-09	N4-10	N4-11	N4-12	N4-13	N4-14	N4-15	N4-16
1/F	27.1	74	74	58	58	58	57	57	56	56	67	67	67	67	68	68	70
2/F	30.1	74	74	59	58	58	58	58	57	56	67	67	68	68	69	69	72
3/F	33.1	74	74	59	58	58	58	58	57	56	67	67	68	68	69	70	72
4/F	36.1	74	74	59	58	58	59	59	58	57	67	67	68	69	69	70	72
5/F	39.1	74	74	59	58	58	59	60	59	58	67	68	68	69	69	70	71
6/F	42.1	73	73	59	58	58	60	61	60	59	67	68	68	69	69	70	71
7/F	45.1	73	73	58	58	58	60	61	60	60	67	68	68	69	69	70	71
8/F	48.1	73	73	58	58	58	60	61	61	60	67	68	68	68	69	69	71
9/F	51.1	73	73	58	58	58	60	61	61	60	67	68	68	68	69	69	70
10/F	54.1	72	72	58	58	58	60	61	61	61	67	68	68	68	69	69	70
11/F	57.1	72	72	58	58	58	60	61	61	61	67	67	68	68	69	69	70
12/F	60.1	72	72	58	58	58	60	61	61	61	67	67	68	68	68	69	70
13/F	63.1	72	72	58	58	58	60	61	61	61	67	67	68	68	68	68	70
14/F	66.1	71	71	58	58	58	60	61	61	61	67	67	67	68	68	68	69
15/F	69.1	71	71	58	58	58	60	61	61	61	67	67	67	67	68	68	69
16/F	72.1	71	71	58	58	58	60	61	61	61	67	67	67	67	68	68	69
17/F	75.1	71	71	58	58	58	60	61	61	61	66	67	67	67	68	68	69
18/F	78.1	71	71	58	58	58	60	61	61	61	66	67	67	67	67	68	69
19/F	81.1	71	71	58	58	58	60	61	61	61	66	67	67	67	67	68	68
Exceedance		19	19	0	0	0	0	0	0	0	0	0	0		0	0	7
Maximum Noise Level, dB(A)		74	74	59	58	58	60	61	61	61	67	68	68	69	69	70	72

**Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Low Noise Road Surfacing on Ting Kok Road Case Scenario (PM Peak))**

**Site A Tower 5**

Floor	*mPD	N5-01	N5-02	N5-03	N5-04	N5-05	N5-06	N5-07	N5-08	N5-09	N5-10	N5-11	N5-12	N5-13
1/F	27.1	74	73	74	74	75	70	68	67	66	55	57	62	72
2/F	30.1	74	73	74	74	75	70	68	66	66	58	61	68	72
3/F	33.1	74	73	73	74	75	69	68	66	66	62	65	69	72
4/F	36.1	74	73	73	74	75	69	67	66	66	64	67	69	72
5/F	39.1	73	73	73	74	74	69	67	66	66	65	67	69	71
6/F	42.1	73	72	73	73	74	69	67	66	66	66	67	69	71
7/F	45.1	73	72	73	73	74	69	67	66	66	66	67	69	71
8/F	48.1	73	72	73	73	74	68	67	66	65	66	67	68	71
9/F	51.1	72	72	72	73	73	68	67	66	65	66	67	68	70
10/F	54.1	72	72	72	73	73	68	66	65	65	66	67	68	70
11/F	57.1	72	71	72	72	73	68	66	65	65	66	67	68	70
12/F	60.1	72	71	72	72	73	68	66	65	65	66	66	68	70
13/F	63.1	72	71	72	72	73	68	66	65	65	65	66	68	69
14/F	66.1	71	71	71	72	72	67	66	65	65	65	66	67	69
15/F	69.1	71	71	71	72	72	67	66	65	65	65	66	67	69
16/F	72.1	71	71	71	72	72	67	66	65	65	65	66	67	69
17/F	75.1	71	70	71	71	72	67	66	65	65	65	66	67	69
18/F	78.1	71	70	71	71	72	67	66	65	64	65	66	67	69
Exceedance		18	16	18	18	18	0	0	0	0	0	0	0	8
Maximum Noise Level, dB(A)		74	73	74	74	75	70	68	67	66	66	67	69	72

**Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Low Noise Road Surfacing on Ting Kok Road Case Scenario (PM Peak))**

**Site B Tower 1**

Floor	*mPD	N6-01	N6-02	N6-03	N6-04	N6-05	N6-06	N6-07	N6-08	N6-09	N6-10	N6-11	N6-12	N6-13	N6-14	N6-15
1/F	28.8	71	76	76	75	73	72	72	73	73	73	73	74	75	75	74
2/F	32.0	71	76	75	74	73	72	72	72	73	73	73	74	75	74	74
3/F	35.1	70	75	75	74	73	72	72	72	72	72	73	74	74	74	73
4/F	38.3	70	75	75	74	73	72	72	72	72	72	72	73	74	74	73
5/F	41.4	70	75	75	74	73	72	72	72	72	72	72	73	74	74	73
6/F	44.6	70	74	74	73	73	71	71	72	72	72	72	73	74	73	73
7/F	47.7	70	74	74	73	72	71	71	72	72	72	72	73	73	73	73
8/F	50.9	69	74	74	73	72	71	71	71	72	71	72	72	73	73	72
9/F	54.0	69	74	73	73	72	71	71	71	71	71	71	72	73	73	72
10/F	57.2	69	73	73	72	72	71	71	71	71	71	71	72	72	72	72
11/F	60.3	69	73	73	72	71	71	71	71	71	71	71	72	72	72	72
12/F	63.5	68	73	73	72	71	70	70	71	71	71	71	71	72	72	72
13/F	66.6	68	73	73	72	71	70	70	70	71	70	71	71	72	72	71
14/F	69.8	68	72	72	72	71	70	70	70	70	70	70	71	72	72	71
15/F	72.9	68	72	72	71	71	70	70	70	70	70	70	71	71	71	71
16/F	76.1	68	72	72	71	71	70	70	70	70	70	70	71	71	71	71
Exceedance		16			16	16	11	11	12	13	12	13	16	16	16	16
Maximum Noise Level, dB(A)		71	76	76	75	73	72	72	73	73	73	73	74	75	75	74

Floor	*mPD	N6-16	N6-17	N6-18	N6-19	N6-20	N6-21	N6-22	N6-23	N6-24	N6-25	N6-26	N6-27	N6-28	N6-29
1/F	28.8	73	72	72	72	72	71	69	53	43	43	43	43	51	57
2/F	32.0	73	72	72	72	72	71	69	53	43	43	43	43	51	57
3/F	35.1	73	72	72	72	72	71	69	53	42	43	43	43	51	57
4/F	38.3	72	72	72	72	72	70	69	53	42	43	43	43	51	57
5/F	41.4	72	72	72	72	72	70	69	54	42	43	43	43	52	57
6/F	44.6	72	72	71	72	72	70	69	57	42	43	43	44	54	58
7/F	47.7	72	71	71	72	72	70	69	58	42	42	43	46	57	60
8/F	50.9	72	71	71	72	72	70	69	58	42	42	42	46	58	61
9/F	54.0	72	71	71	72	72	70	69	58	42	42	42	46	58	61
10/F	57.2	71	71	71	71	72	70	69	58	42	42	42	46	58	61
11/F	60.3	71	71	71	71	71	70	69	58	42	42	42	46	57	61
12/F	63.5	71	71	71	71	71	70	69	58	42	42	42	46	57	61
13/F	66.6	71	71	70	71	71	70	69	58	42	42	42	45	57	61
14/F	69.8	71	70	70	71	71	70	69	58	42	42	43	46	57	61
15/F	72.9	71	70	70	71	71	69	68	58	44	44	44	47	57	61
16/F	76.1	70	70	70	71	71	69	68	58	47	47	47	48	57	61
Exceedance		15	13	12	16	16		0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		73	72	72	72	72	71	69	58	47	47	47	48	58	61

Total no. of Flats:	1750
Total no. of Exceedance:	471
Compliance Level:	73%
Max. Noise Level:	76

Noted:  
Noise level exceed stardand of 70 dB(A)

\* The assessment point is located at 1m in front of the most exposed part of an openable window for ventilation at a habitable room (NSRs) and 1.2m above the floor level of individual floors of the residential towers of the proposed development.  
Remark: The predicted noise levels are not the actual noise levels at the external façade after the application of innovative noise mitigation measures (acoustic window (baffle type)/enhanced acoustic balcony (baffle type)). These predicted noise levels are the equivalent noise levels at 1m from the external façade after accounting the reduction in noise levels inside the room offered by the proposed noise mitigation measures.





# Appendix: 17b 5m high Cantilever Barrier with 3m Cantilever at 45° Scenario

**Title:** Location of 5m high Cantilever Barrier with 3m Cantilever at 45°

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

RAMBOLL

Drawn by: CM

Checked by: CC

Rev.: 1.1

Date: Oct 2024

**Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Low Noise Road Surfacing on Ting Kok Road and 5m high Cantilever Barrier with 3m Cantilever at 45° Case Scenario (AM Peak))**

**Site A Tower 1**

Floor	*mPD	N1-01	N1-02	N1-03	N1-04	N1-05	N1-06	N1-07	N1-08	N1-09	N1-10	N1-11	N1-12	N1-13	N1-14	N1-15
1/F	27.1	71	70	70	69	68	65	64	65	66	51	43	50	59	61	61
2/F	30.1	72	72	71	71	70	68	66	65	66	51	43	50	59	61	61
3/F	33.1	73	72	72	71	70	69	67	66	66	51	43	50	59	61	61
4/F	36.1	73	73	72	71	70	69	68	67	66	51	43	50	59	61	61
5/F	39.1	73	73	72	71	70	69	68	67	66	51	43	50	59	61	61
6/F	42.1	73	73	72	71	71	70	68	67	67	51	43	50	58	61	61
7/F	45.1	73	73	72	71	71	70	68	67	67	51	43	50	58	61	61
8/F	48.1	73	72	72	71	70	70	68	67	67	51	43	50	58	61	61
9/F	51.1	73	72	72	71	70	70	68	67	67	51	43	50	58	61	61
10/F	54.1	72	72	72	71	70	70	68	67	67	51	43	50	59	61	61
11/F	57.1	72	72	72	71	70	70	68	67	67	51	43	50	59	61	61
12/F	60.1	72	72	72	71	70	70	68	67	67	51	43	51	59	61	61
13/F	63.1	72	72	71	71	70	70	68	67	67	51	43	51	59	61	61
14/F	66.1	72	72	71	71	70	70	68	67	67	51	43	51	59	61	61
15/F	69.1	71	71	71	71	69	69	68	67	67	51	43	51	59	61	61
16/F	72.1	71	71	71	70	69	69	68	67	67	51	43	51	59	61	61
17/F	75.1	71	71	71	70	69	69	68	67	67	51	44	52	59	61	61
18/F	78.1	71	71	71	70	69	69	68	67	67	52	46	52	59	61	61
19/F	81.1	71	71	70	70	69	69	68	67	67	53	49	53	59	61	61
Exceedance		19	18	17	14	2	0	0	0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		73	73	72	71	71	70	68	67	67	53	49	53	59	61	61

**Site A Tower 2**

Floor	*mPD	N2-01	N2-02	N2-03	N2-04	N2-05	N2-06	N2-07	N2-08	N2-09	N2-10	N2-11	N2-12	N2-13	N2-14	N2-15	N2-16	N2-17	N2-18
1/F	36.1	61	49	48	47	47	68	68	68	67	67	66	66	66	57	60	59	59	58
2/F	39.1	61	50	49	49	49	68	68	67	67	67	66	66	66	57	60	59	59	58
3/F	42.1	61	52	51	50	50	68	68	67	67	67	66	66	66	57	60	59	59	58
4/F	45.1	61	54	53	52	52	68	68	67	67	67	66	66	66	57	60	59	59	57
5/F	48.1	61	55	54	53	52	69	68	67	67	67	66	66	66	57	60	59	59	57
6/F	51.1	61	55	54	54	53	69	68	68	67	67	66	66	66	57	60	59	59	57
7/F	54.1	62	55	55	54	54	69	68	68	67	67	66	66	66	57	60	59	59	57
8/F	57.1	62	56	55	54	54	69	68	68	68	67	66	66	66	57	60	59	59	57
9/F	60.1	62	56	55	55	54	68	68	68	68	68	67	66	66	57	60	59	59	57
10/F	63.1	62	56	55	55	54	68	68	68	68	68	67	67	66	57	60	59	58	57
11/F	66.1	62	56	55	55	54	69	68	68	68	68	67	67	67	57	60	59	58	57
12/F	69.1	62	56	55	55	54	69	68	68	68	68	68	67	67	56	60	59	58	57
13/F	72.1	62	56	55	55	54	68	68	68	68	68	68	67	67	56	60	59	58	57
14/F	75.1	62	56	56	55	54	68	68	68	68	68	68	68	67	56	59	59	58	57
15/F	78.1	62	57	56	55	55	68	68	68	68	68	68	68	67	57	59	59	58	57
16/F	81.1	62	57	56	56	55	68	68	68	68	68	68	68	67	57	60	59	58	57
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		62	57	56	56	55	69	68	68	68	68	68	68	67	57	60	59	59	58

**Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Low Noise Road Surfacing on Ting Kok Road and 5m high Cantilever Barrier with 3m Cantilever at 45° Case Scenario (AM Peak))**

**Site A Tower 3**

Floor	*mPD	N3-01	N3-02	N3-03	N3-04	N3-05	N3-06	N3-07	N3-08	N3-09	N3-10	N3-11	N3-12	N3-13	N3-14	N3-15	N3-16	N3-17	N3-18	N3-19	N3-20	N3-21
1/F	36.1	47	47	52	53	51	49	45	48	60	42	42	41	61	61	63	64	64	65	63	65	66
2/F	39.1	48	48	52	53	51	49	45	48	60	43	42	42	61	62	63	64	64	65	63	65	66
3/F	42.1	50	49	52	53	52	50	46	49	60	43	42	42	62	62	63	64	64	65	63	66	66
4/F	45.1	51	51	53	54	52	50	47	49	60	44	43	43	63	63	64	64	64	65	63	66	66
5/F	48.1	53	52	53	54	52	51	47	50	60	45	44	44	63	63	64	64	65	65	63	66	66
6/F	51.1	54	54	54	55	53	51	49	51	61	46	45	44	63	63	64	64	65	65	64	66	66
7/F	54.1	55	54	55	55	54	52	49	51	62	47	46	46	63	64	64	64	65	65	64	66	66
8/F	57.1	55	55	55	56	54	53	51	52	62	48	47	47	64	64	64	65	65	65	64	66	66
9/F	60.1	56	55	56	56	55	54	52	53	62	50	49	49	64	64	65	65	65	65	64	66	66
10/F	63.1	56	56	56	56	55	54	52	54	62	53	52	51	64	64	65	65	65	65	64	66	66
11/F	66.1	57	57	56	56	55	54	53	54	63	56	55	55	64	64	65	65	65	65	64	66	66
12/F	69.1	58	57	56	57	55	55	53	55	63	58	57	57	64	64	65	65	65	65	64	66	66
13/F	72.1	58	58	57	57	56	55	54	56	64	59	58	58	65	65	65	65	65	65	64	66	66
14/F	75.1	59	59	57	57	56	56	55	57	64	60	59	59	65	65	65	65	65	65	64	66	66
15/F	78.1	59	59	58	57	57	56	55	58	64	61	60	60	65	65	65	65	65	66	64	66	66
16/F	81.1	60	60	58	58	57	57	57	59	65	61	61	61	65	65	65	65	65	66	64	66	66
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0		0		0
Maximum Noise Level, dB(A)		60	60	58	58	57	57	57	59	65	61	61	61	65	65	65	65	65	66	64	66	66

**Site A Tower 4**

Floor	*mPD	N4-01	N4-02	N4-03	N4-04	N4-05	N4-06	N4-07	N4-08	N4-09	N4-10	N4-11	N4-12	N4-13	N4-14	N4-15	N4-16
1/F	27.1	72	72	60	59	59	58	58	57	57	67	68	68	68	68	68	70
2/F	30.1	73	73	60	59	59	59	59	58	57	67	68	68	68	69	70	72
3/F	33.1	73	73	60	60	59	59	59	58	57	67	68	68	69	70	70	72
4/F	36.1	73	73	60	60	59	59	60	59	58	68	68	69	69	70	70	71
5/F	39.1	74	74	60	60	59	60	60	59	59	68	68	69	69	70	70	71
6/F	42.1	73	73	60	59	59	60	60	60	59	68	68	69	69	70	70	71
7/F	45.1	73	73	60	59	59	60	61	60	60	68	68	69	69	69	70	71
8/F	48.1	73	73	60	59	59	60	61	60	60	68	68	68	69	69	70	71
9/F	51.1	73	73	60	59	59	60	61	61	60	68	68	68	69	69	70	71
10/F	54.1	73	73	60	59	59	60	61	61	60	67	68	68	68	69	69	71
11/F	57.1	73	73	60	59	59	60	61	61	60	67	68	68	68	69	69	70
12/F	60.1	72	72	60	59	59	60	61	61	61	67	68	68	68	69	69	70
13/F	63.1	72	72	59	59	59	60	61	61	61	67	68	68	68	69	69	70
14/F	66.1	72	72	59	59	59	60	61	61	61	67	67	68	68	69	69	70
15/F	69.1	72	72	59	59	59	60	61	61	61	67	67	68	68	68	69	70
16/F	72.1	72	72	59	59	59	61	61	62	61	67	67	68	68	68	69	69
17/F	75.1	71	71	59	59	60	61	61	62	62	67	67	68	68	68	68	69
18/F	78.1	71	71	59	59	60	61	62	62	62	67	67	68	68	68	68	69
19/F	81.1	71	71	59	59	60	61	62	62	62	67	67	67	68	68	68	69
Exceedance		19	19	0	0	0	0	0	0	0	0	0	0		0	0	9
Maximum Noise Level, dB(A)		74	74	60	60	60	61	62	62	62	68	68	69	69	70	70	72



***Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Low Noise Road Surfacing on Ting Kok Road and 5m high Cantilever Barrier with 3m Cantilever at 45° Case Scenario (AM Peak))***

**Site A Tower 5**

Floor	*mPD	N5-01	N5-02	N5-03	N5-04	N5-05	N5-06	N5-07	N5-08	N5-09	N5-10	N5-11	N5-12	N5-13
1/F	27.1	73	72	73	74	76	71	69	68	67	54	56	61	69
2/F	30.1	73	73	73	74	75	71	69	68	67	57	59	65	70
3/F	33.1	74	73	73	74	75	71	69	68	67	60	63	66	70
4/F	36.1	74	73	73	74	75	70	69	67	67	62	64	67	70
5/F	39.1	74	73	73	74	75	70	69	67	67	64	65	67	71
6/F	42.1	74	73	73	74	75	70	68	67	67	64	65	67	71
7/F	45.1	73	73	73	74	74	70	68	67	67	64	65	67	71
8/F	48.1	73	73	73	74	74	70	68	67	67	64	65	67	71
9/F	51.1	73	73	73	73	74	69	68	67	66	64	66	67	71
10/F	54.1	73	72	73	73	74	69	68	67	66	64	66	68	70
11/F	57.1	73	72	73	73	74	69	68	67	66	65	66	68	70
12/F	60.1	72	72	73	73	74	69	67	67	66	65	66	68	70
13/F	63.1	72	72	72	73	73	69	67	66	66	65	66	68	70
14/F	66.1	72	72	72	73	73	69	67	66	66	65	66	67	70
15/F	69.1	72	71	72	73	73	68	67	66	66	65	66	67	70
16/F	72.1	72	71	72	72	73	68	67	66	66	65	66	67	69
17/F	75.1	72	71	72	72	73	68	67	66	66	65	66	67	69
18/F	78.1	71	71	72	72	73	68	67	66	66	65	66	67	69
Exceedance		18	18	18	18	18	3	0	0	0	0	0	0	5
Maximum Noise Level, dB(A)		74	73	73	74	76	71	69	68	67	65	66	68	71

**Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Low Noise Road Surfacing on Ting Kok Road and 5m high Cantilever Barrier with 3m Cantilever at 45° Case Scenario (AM Peak))**

**Site B Tower 1**

Floor	*mPD	N6-01	N6-02	N6-03	N6-04	N6-05	N6-06	N6-07	N6-08	N6-09	N6-10	N6-11	N6-12	N6-13	N6-14	N6-15
1/F	28.8	71	76	76	75	74	73	73	73	73	73	74	75	76	75	74
2/F	32.0	71	76	76	75	74	73	73	73	73	73	73	74	75	75	74
3/F	35.1	71	76	76	75	74	73	73	73	73	73	73	74	75	75	74
4/F	38.3	71	76	75	74	73	72	72	73	73	73	73	74	75	74	74
5/F	41.4	71	75	75	74	73	72	72	73	73	73	73	74	74	74	74
6/F	44.6	70	75	75	74	73	72	72	72	72	72	73	73	74	74	73
7/F	47.7	70	75	75	74	73	72	72	72	72	72	72	73	74	74	73
8/F	50.9	70	74	74	73	73	72	72	72	72	72	72	73	74	74	73
9/F	54.0	70	74	74	73	73	72	72	72	72	72	72	73	73	73	73
10/F	57.2	69	74	74	73	72	71	71	72	72	72	72	72	73	73	73
11/F	60.3	69	74	74	73	72	71	71	71	72	71	72	72	73	73	73
12/F	63.5	69	74	73	73	72	71	71	71	71	71	71	72	73	73	72
13/F	66.6	69	73	73	72	72	71	71	71	71	71	71	72	72	72	72
14/F	69.8	69	73	73	72	72	71	71	71	71	71	71	72	72	72	72
15/F	72.9	69	73	73	72	71	71	71	71	71	71	71	71	72	72	72
16/F	76.1	68	73	73	72	71	70	70	71	71	71	71	71	72	72	72
Exceedance		16			16	16	15	15	16	16	16	16	16	16	16	16
Maximum Noise Level, dB(A)		71	76	76	75	74	73	73	73	73	73	74	75	76	75	74

Floor	*mPD	N6-16	N6-17	N6-18	N6-19	N6-20	N6-21	N6-22	N6-23	N6-24	N6-25	N6-26	N6-27	N6-28	N6-29
1/F	28.8	73	73	73	73	73	71	70	53	43	44	44	44	52	58
2/F	32.0	73	73	72	73	73	71	70	53	43	43	44	43	52	58
3/F	35.1	73	73	72	73	73	71	70	53	43	43	44	43	52	58
4/F	38.3	73	72	72	73	73	71	70	54	43	43	43	43	52	58
5/F	41.4	73	72	72	73	73	71	70	54	43	43	43	44	52	58
6/F	44.6	73	72	72	73	73	71	70	58	43	43	43	45	54	59
7/F	47.7	73	72	72	72	73	71	70	59	43	43	43	46	57	61
8/F	50.9	72	72	72	72	72	71	70	59	43	43	43	46	58	61
9/F	54.0	72	72	72	72	72	71	70	59	43	43	43	46	58	62
10/F	57.2	72	72	72	72	72	71	70	59	43	43	43	46	58	62
11/F	60.3	72	72	71	72	72	71	69	58	42	43	43	46	58	62
12/F	63.5	72	71	71	72	72	70	69	58	42	43	43	46	58	62
13/F	66.6	72	71	71	72	72	70	69	58	42	42	43	46	58	61
14/F	69.8	71	71	71	72	72	70	69	58	43	43	43	46	58	61
15/F	72.9	71	71	71	71	72	70	69	58	45	45	45	47	58	61
16/F	76.1	71	71	71	71	72	70	69	58	48	48	47	49	58	61
Exceedance		16	16	16	16	16		0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		73	73	73	73	73	71	70	59	48	48	47	49	58	62

Total no. of Flats:	1750
Total no. of Exceedance:	501
Compliance Level:	71%
Max. Noise Level:	76

Noted:  
Noise level exceed stardand of 70 dB(A)

\* The assessment point is located at 1m in front of the most exposed part of an openable window for ventilation at a habitable room (NSRs) and 1.2m above the floor level of individual floors of the residential towers of the proposed development.  
Remark: The predicted noise levels are not the actual noise levels at the external façade after the application of innovative noise mitigation measures (acoustic window (baffle type)/enhanced acoustic balcony (baffle type)). These predicted noise levels are the equivalent noise levels at 1m from the external façade after accounting the reduction in noise levels inside the room offered by the proposed noise mitigation measures.

**Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Low Noise Road Surfacing on Ting Kok Road and 5m high Cantilever Barrier with 3m Cantilever at 45° Case Scenario (PM Peak))**

**Site A Tower 1**

Floor	*mPD	N1-01	N1-02	N1-03	N1-04	N1-05	N1-06	N1-07	N1-08	N1-09	N1-10	N1-11	N1-12	N1-13	N1-14	N1-15
1/F	27.1	70	69	69	68	67	64	63	64	64	49	43	49	57	60	60
2/F	30.1	71	71	70	70	69	67	64	64	64	49	43	49	57	60	60
3/F	33.1	72	71	71	70	69	68	66	65	65	49	43	49	57	59	60
4/F	36.1	72	72	71	70	70	68	66	65	65	49	43	49	57	59	60
5/F	39.1	72	72	71	71	70	68	67	66	65	49	42	49	57	59	60
6/F	42.1	72	72	71	71	70	69	67	66	65	49	42	49	57	59	60
7/F	45.1	72	72	71	71	70	69	67	66	65	49	42	49	57	59	60
8/F	48.1	72	72	71	71	70	69	67	66	65	49	42	49	57	59	60
9/F	51.1	72	72	71	71	70	69	67	66	65	49	42	49	57	59	60
10/F	54.1	72	72	71	71	70	69	68	66	66	49	42	49	57	59	60
11/F	57.1	72	71	71	71	69	69	68	66	65	50	42	49	57	59	60
12/F	60.1	71	71	71	70	69	69	68	66	66	50	42	49	57	59	60
13/F	63.1	71	71	71	70	69	69	68	66	66	50	42	50	57	59	60
14/F	66.1	71	71	71	70	69	69	68	66	66	50	42	50	57	59	60
15/F	69.1	71	71	71	70	69	69	67	66	66	50	42	50	57	59	60
16/F	72.1	71	71	70	70	69	69	67	66	66	50	42	50	57	59	60
17/F	75.1	71	70	70	70	69	69	67	67	66	50	43	50	57	59	60
18/F	78.1	70	70	70	69	68	68	67	66	66	51	45	51	57	59	60
19/F	81.1	70	70	70	69	68	68	67	66	66	52	48	52	58	59	60
Exceedance		16	15	13	7	0	0	0	0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		72	72	71	71	70	69	68	67	66	52	48	52	58	60	60

**Site A Tower 2**

Floor	*mPD	N2-01	N2-02	N2-03	N2-04	N2-05	N2-06	N2-07	N2-08	N2-09	N2-10	N2-11	N2-12	N2-13	N2-14	N2-15	N2-16	N2-17	N2-18
1/F	36.1	60	48	47	46	46	67	67	67	66	66	65	65	65	56	59	59	58	57
2/F	39.1	60	49	48	48	48	67	67	66	66	66	65	65	65	56	59	59	58	57
3/F	42.1	60	51	50	49	49	67	67	66	66	66	65	65	65	56	59	59	58	57
4/F	45.1	60	52	51	51	50	67	67	66	66	66	65	65	65	56	59	59	58	57
5/F	48.1	61	53	52	52	51	67	67	66	66	66	65	65	65	56	59	59	58	57
6/F	51.1	61	54	53	52	52	68	67	67	66	66	65	65	65	56	59	58	58	57
7/F	54.1	61	54	53	53	52	67	67	67	66	66	65	65	65	56	59	58	58	57
8/F	57.1	61	54	54	53	53	67	67	67	66	66	65	65	65	56	59	58	58	57
9/F	60.1	61	55	54	53	53	67	67	67	67	67	66	65	65	56	59	58	58	57
10/F	63.1	61	55	54	54	53	67	67	67	67	67	66	66	65	56	59	58	58	57
11/F	66.1	61	55	54	54	53	67	67	67	67	67	66	66	66	56	59	58	58	56
12/F	69.1	61	55	54	54	53	67	67	67	67	67	66	66	66	56	59	58	58	56
13/F	72.1	61	55	54	54	53	67	67	67	67	67	66	66	66	56	59	58	58	56
14/F	75.1	61	55	55	54	53	67	67	67	67	67	66	66	66	56	59	58	58	56
15/F	78.1	61	56	55	54	53	67	67	67	67	67	67	66	66	56	59	58	58	56
16/F	81.1	61	56	55	55	54	67	67	67	67	67	67	66	66	56	59	58	58	57
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		61	56	55	55	54	68	67	67	67	67	67	66	66	56	59	59	58	57



**Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Low Noise Road Surfacing on Ting Kok Road and 5m high Cantilever Barrier with 3m Cantilever at 45° Case Scenario (PM Peak))**

**Site A Tower 3**

Floor	*mPD	N3-01	N3-02	N3-03	N3-04	N3-05	N3-06	N3-07	N3-08	N3-09	N3-10	N3-11	N3-12	N3-13	N3-14	N3-15	N3-16	N3-17	N3-18	N3-19	N3-20	N3-21
1/F	36.1	46	46	51	52	50	48	44	47	59	41	41	40	60	61	62	63	64	64	63	65	65
2/F	39.1	47	47	51	52	50	48	44	47	59	42	41	41	60	61	62	63	64	64	63	65	66
3/F	42.1	49	48	51	52	50	49	45	48	59	42	41	41	61	62	63	63	64	64	63	65	66
4/F	45.1	50	50	52	53	51	49	46	48	59	43	42	42	62	62	63	63	64	64	63	65	66
5/F	48.1	52	51	52	53	51	50	46	49	60	44	43	42	62	63	63	63	64	64	63	65	66
6/F	51.1	53	52	53	53	52	50	48	49	60	44	43	43	63	63	63	64	64	64	63	65	66
7/F	54.1	54	53	54	54	52	51	48	50	61	45	44	44	63	63	64	64	64	65	63	65	66
8/F	57.1	54	54	54	54	53	52	50	51	61	47	46	46	63	63	64	64	64	65	63	65	66
9/F	60.1	54	54	54	55	53	52	50	52	61	49	48	48	63	64	64	64	65	65	63	65	66
10/F	63.1	55	55	55	55	54	53	51	53	61	51	50	50	64	64	64	64	65	65	63	65	66
11/F	66.1	56	55	55	55	54	53	52	53	62	54	54	53	64	64	64	64	65	65	63	65	66
12/F	69.1	57	56	55	55	54	54	52	54	62	56	56	55	64	64	64	64	65	65	63	65	66
13/F	72.1	57	57	55	55	55	54	53	54	63	58	57	57	64	64	64	64	65	65	63	65	66
14/F	75.1	58	58	56	56	55	55	53	55	63	59	58	58	64	64	64	64	65	65	63	65	65
15/F	78.1	58	58	57	56	55	55	54	56	63	60	59	59	64	64	64	64	65	65	63	65	65
16/F	81.1	59	58	57	56	56	56	55	57	64	60	60	59	64	64	64	64	65	65	63	65	65
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0		0		0
Maximum Noise Level, dB(A)		59	58	57	56	56	56	55	57	64	60	60	59	64	64	64	64	65	65	63	65	66

**Site A Tower 4**

Floor	*mPD	N4-01	N4-02	N4-03	N4-04	N4-05	N4-06	N4-07	N4-08	N4-09	N4-10	N4-11	N4-12	N4-13	N4-14	N4-15	N4-16
1/F	27.1	71	71	58	58	58	57	57	56	56	67	67	67	67	67	68	70
2/F	30.1	72	72	59	58	58	57	57	56	56	67	67	68	68	69	69	71
3/F	33.1	72	73	59	58	58	58	58	57	56	67	67	68	68	69	70	71
4/F	36.1	73	73	59	58	58	58	58	57	57	67	67	68	68	69	70	71
5/F	39.1	73	73	59	58	58	58	59	58	58	67	68	68	68	69	69	71
6/F	42.1	73	73	59	58	58	59	59	59	58	67	67	68	68	69	69	71
7/F	45.1	73	73	58	58	58	59	59	59	59	67	67	68	68	69	69	71
8/F	48.1	73	73	58	58	58	59	59	59	59	67	67	68	68	69	69	70
9/F	51.1	72	72	58	58	58	59	60	59	59	67	67	68	68	69	69	70
10/F	54.1	72	72	58	58	58	59	60	59	59	67	67	68	68	68	69	70
11/F	57.1	72	72	58	58	58	59	60	60	59	67	67	68	68	68	69	70
12/F	60.1	72	72	58	58	58	59	60	60	59	67	67	67	68	68	69	70
13/F	63.1	72	72	58	58	58	59	60	60	60	67	67	67	68	68	68	69
14/F	66.1	71	71	58	58	58	59	60	60	60	66	67	67	67	68	68	69
15/F	69.1	71	71	58	58	58	59	60	60	60	66	67	67	67	68	68	69
16/F	72.1	71	71	58	58	58	59	60	61	60	66	67	67	67	68	68	69
17/F	75.1	71	71	58	58	58	60	60	61	61	66	67	67	67	68	68	69
18/F	78.1	71	71	58	58	58	60	61	61	61	66	67	67	67	67	68	69
19/F	81.1	71	71	58	58	58	60	61	61	61	66	67	67	67	67	68	68
Exceedance		19	19	0	0	0	0	0	0	0	0	0	0		0	0	6
Maximum Noise Level, dB(A)		73	73	59	58	58	60	61	61	61	67	68	68	68	69	70	71

***Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Low Noise Road Surfacing on Ting Kok Road and 5m high Cantilever Barrier with 3m Cantilever at 45° Case Scenario (PM Peak))***

**Site A Tower 5**

Floor	*mPD	N5-01	N5-02	N5-03	N5-04	N5-05	N5-06	N5-07	N5-08	N5-09	N5-10	N5-11	N5-12	N5-13
1/F	27.1	72	71	72	73	75	70	68	67	66	53	55	59	68
2/F	30.1	72	72	72	73	74	70	68	66	66	56	58	63	69
3/F	33.1	73	72	72	73	74	69	68	66	66	59	61	65	69
4/F	36.1	73	72	72	73	74	69	67	66	66	61	63	65	70
5/F	39.1	73	72	72	73	74	69	67	66	66	62	64	66	70
6/F	42.1	73	72	72	73	74	69	67	66	66	63	64	66	70
7/F	45.1	73	72	72	73	74	69	67	66	66	63	64	66	70
8/F	48.1	73	72	72	73	73	68	67	66	65	63	64	66	70
9/F	51.1	72	72	72	73	73	68	67	66	65	63	64	67	70
10/F	54.1	72	72	72	72	73	68	66	65	65	63	65	67	70
11/F	57.1	72	71	72	72	73	68	66	65	65	63	65	67	70
12/F	60.1	72	71	72	72	73	68	66	65	65	63	65	67	70
13/F	63.1	72	71	72	72	73	68	66	65	65	64	65	67	69
14/F	66.1	71	71	71	72	72	67	66	65	65	64	65	67	69
15/F	69.1	71	71	71	72	72	67	66	65	65	64	65	67	69
16/F	72.1	71	71	71	72	72	67	66	65	65	64	65	67	69
17/F	75.1	71	70	71	71	72	67	66	65	65	64	65	67	69
18/F	78.1	71	70	71	71	72	67	66	65	64	64	65	66	68
Exceedance		18	16	18	18	18	0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		73	72	72	73	75	70	68	67	66	64	65	67	70

**Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Low Noise Road Surfacing on Ting Kok Road and 5m high Cantilever Barrier with 3m Cantilever at 45° Case Scenario (PM Peak))**

**Site B Tower 1**

Floor	*mPD	N6-01	N6-02	N6-03	N6-04	N6-05	N6-06	N6-07	N6-08	N6-09	N6-10	N6-11	N6-12	N6-13	N6-14	N6-15
1/F	28.8	71	76	76	75	73	72	72	73	73	73	73	74	75	75	74
2/F	32.0	71	76	75	74	73	72	72	72	73	73	73	74	75	74	74
3/F	35.1	70	75	75	74	73	72	72	72	72	72	73	74	74	74	73
4/F	38.3	70	75	75	74	73	72	72	72	72	72	72	73	74	74	73
5/F	41.4	70	75	75	74	73	72	72	72	72	72	72	73	74	74	73
6/F	44.6	70	74	74	73	73	71	71	72	72	72	72	73	74	73	73
7/F	47.7	70	74	74	73	72	71	71	72	72	72	72	73	73	73	73
8/F	50.9	69	74	74	73	72	71	71	71	72	71	72	72	73	73	72
9/F	54.0	69	74	73	73	72	71	71	71	71	71	71	72	73	73	72
10/F	57.2	69	73	73	72	72	71	71	71	71	71	71	72	72	72	72
11/F	60.3	69	73	73	72	71	71	71	71	71	71	71	72	72	72	72
12/F	63.5	68	73	73	72	71	70	70	71	71	71	71	71	72	72	72
13/F	66.6	68	73	73	72	71	70	70	70	71	70	71	71	72	72	71
14/F	69.8	68	72	72	72	71	70	70	70	70	70	70	71	72	72	71
15/F	72.9	68	72	72	71	71	70	70	70	70	70	70	71	71	71	71
16/F	76.1	68	72	72	71	71	70	70	70	70	70	70	71	71	71	71
Exceedance		16			16	16	11	11	12	13	12	13	16	16	16	16
Maximum Noise Level, dB(A)		71	76	76	75	73	72	72	73	73	73	73	74	75	75	74

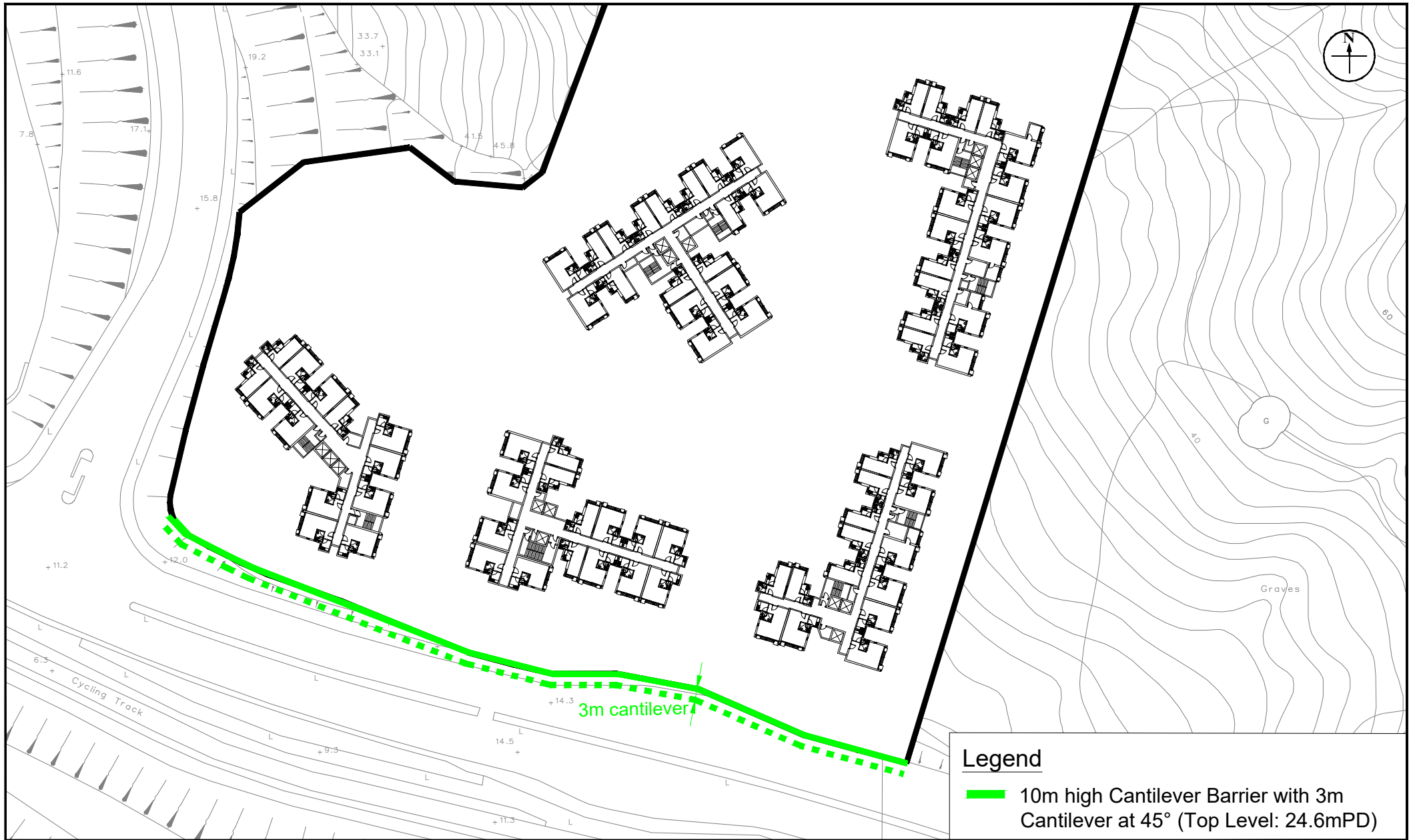
Floor	*mPD	N6-16	N6-17	N6-18	N6-19	N6-20	N6-21	N6-22	N6-23	N6-24	N6-25	N6-26	N6-27	N6-28	N6-29
1/F	28.8	73	72	72	72	72	71	69	53	43	43	43	43	51	57
2/F	32.0	73	72	72	72	72	71	69	53	43	43	43	43	51	57
3/F	35.1	73	72	72	72	72	71	69	53	42	43	43	43	51	57
4/F	38.3	72	72	72	72	72	70	69	53	42	43	43	43	51	57
5/F	41.4	72	72	72	72	72	70	69	54	42	43	43	43	52	57
6/F	44.6	72	72	71	72	72	70	69	57	42	43	43	44	54	58
7/F	47.7	72	71	71	72	72	70	69	58	42	42	43	46	57	60
8/F	50.9	72	71	71	72	72	70	69	58	42	42	42	46	58	61
9/F	54.0	72	71	71	72	72	70	69	58	42	42	42	46	58	61
10/F	57.2	71	71	71	71	72	70	69	58	42	42	42	46	58	61
11/F	60.3	71	71	71	71	71	70	69	58	42	42	42	46	57	61
12/F	63.5	71	71	71	71	71	70	69	58	42	42	42	46	57	61
13/F	66.6	71	71	70	71	71	70	69	58	42	42	42	45	57	61
14/F	69.8	71	70	70	71	71	70	69	58	42	42	43	46	57	61
15/F	72.9	71	70	70	71	71	69	68	58	44	44	44	47	57	61
16/F	76.1	70	70	70	71	71	69	68	58	47	47	47	48	57	61
Exceedance		15	13	12	16	16		0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		73	72	72	72	72	71	69	58	47	47	47	48	58	61

Total no. of Flats:	1750
Total no. of Exceedance:	439
Compliance Level:	75%
Max. Noise Level:	76

Noted:  
Noise level exceed stardand of 70 dB(A)

\* The assessment point is located at 1m in front of the most exposed part of an openable window for ventilation at a habitable room (NSRs) and 1.2m above the floor level of individual floors of the residential towers of the proposed development.  
Remark: The predicted noise levels are not the actual noise levels at the external façade after the application of innovative noise mitigation measures (acoustic window (baffle type)/enhanced acoustic balcony (baffle type)). These predicted noise levels are the equivalent noise levels at 1m from the external façade after accounting the reduction in noise levels inside the room offered by the proposed noise mitigation measures.





# **Appendix: 17c 10m high Cantilever Barrier with 3m Cantilever at 45° Scenario**

**Title:** Location of 5m high Cantilever Barrier with 3m Cantilever at 45°

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

**RAMBOLL**

Drawn by: CM

Checked by: CC

Rev.: 1.0

Date: Oct 2024

***Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Low Noise Road Surfacing on Ting Kok Road and 10m high Cantilever Barrier with 3m Cantilever at 45° Case Scenario (AM Peak))***

**Site A Tower 1**

Floor	*mPD	N1-01	N1-02	N1-03	N1-04	N1-05	N1-06	N1-07	N1-08	N1-09	N1-10	N1-11	N1-12	N1-13	N1-14	N1-15
1/F	27.1	65	64	63	63	62	60	63	65	65	51	43	50	59	61	61
2/F	30.1	65	65	64	64	63	61	63	65	66	51	43	50	59	61	61
3/F	33.1	67	67	66	65	65	62	63	65	66	51	43	50	59	61	61
4/F	36.1	69	69	68	67	67	64	63	65	65	51	43	50	59	61	61
5/F	39.1	70	70	69	68	68	66	64	65	65	51	43	50	59	61	61
6/F	42.1	71	70	70	69	68	67	65	65	65	51	43	50	58	61	61
7/F	45.1	71	71	70	70	69	68	66	65	65	51	43	50	58	61	61
8/F	48.1	71	71	70	70	69	68	67	65	65	51	43	50	58	61	61
9/F	51.1	71	71	70	70	69	68	67	66	66	51	43	50	58	61	61
10/F	54.1	71	71	70	70	69	68	67	66	66	51	43	50	59	61	61
11/F	57.1	71	71	70	70	69	68	67	66	66	51	43	50	59	61	61
12/F	60.1	71	71	70	70	69	68	67	66	66	51	43	51	59	61	61
13/F	63.1	71	71	70	70	69	68	67	67	66	51	43	51	59	61	61
14/F	66.1	71	71	70	70	68	68	67	67	66	51	43	51	59	61	61
15/F	69.1	71	71	70	69	68	68	67	67	66	51	43	51	59	61	61
16/F	72.1	71	71	70	69	68	68	67	67	66	51	43	51	59	61	61
17/F	75.1	71	70	70	69	68	68	67	67	67	51	44	52	59	61	61
18/F	78.1	71	70	70	69	68	68	67	67	66	52	46	52	59	61	61
19/F	81.1	70	70	70	69	68	68	67	67	66	53	49	53	59	61	61
Exceedance		13	10	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		71	71	70	70	69	68	67	67	67	53	49	53	59	61	61

**Site A Tower 2**

Floor	*mPD	N2-01	N2-02	N2-03	N2-04	N2-05	N2-06	N2-07	N2-08	N2-09	N2-10	N2-11	N2-12	N2-13	N2-14	N2-15	N2-16	N2-17	N2-18
1/F	36.1	60	45	44	44	44	68	68	68	67	67	66	66	66	57	60	59	59	58
2/F	39.1	60	45	45	44	44	68	68	67	67	67	66	66	66	57	60	59	59	58
3/F	42.1	60	45	45	45	45	68	68	67	67	67	66	66	66	57	60	59	59	58
4/F	45.1	60	46	45	45	45	68	68	67	67	67	66	66	66	57	60	59	59	57
5/F	48.1	60	47	46	45	45	69	68	67	67	67	66	66	66	57	60	59	59	57
6/F	51.1	60	47	46	46	46	69	68	68	67	67	66	66	66	57	60	59	59	57
7/F	54.1	60	48	47	47	46	69	68	68	67	67	66	66	66	57	60	59	59	57
8/F	57.1	60	49	48	47	47	69	68	68	68	67	66	66	66	57	60	59	59	57
9/F	60.1	60	50	49	48	48	68	68	68	68	68	67	66	66	57	60	59	59	57
10/F	63.1	60	51	50	49	49	68	68	68	68	68	67	67	66	57	60	59	58	57
11/F	66.1	61	52	51	50	50	69	68	68	68	68	67	67	67	57	60	59	58	57
12/F	69.1	61	53	52	51	51	69	68	68	68	68	68	67	67	56	60	59	58	57
13/F	72.1	61	54	52	52	51	68	68	68	68	68	68	67	67	56	60	59	58	57
14/F	75.1	61	54	53	52	52	68	68	68	68	68	68	68	67	56	59	59	58	57
15/F	78.1	61	54	54	53	53	68	68	68	68	68	68	68	67	56	59	59	58	57
16/F	81.1	61	55	54	54	54	68	68	68	68	68	68	68	67	57	60	59	58	57
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		61	55	54	54	54	69	68	68	68	68	68	68	67	57	60	59	59	58

***Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Low Noise Road Surfacing on Ting Kok Road and 10m high Cantilever Barrier with 3m Cantilever at 45° Case Scenario (AM Peak))***

**Site A Tower 3**

Floor	*mPD	N3-01	N3-02	N3-03	N3-04	N3-05	N3-06	N3-07	N3-08	N3-09	N3-10	N3-11	N3-12	N3-13	N3-14	N3-15	N3-16	N3-17	N3-18	N3-19	N3-20	N3-21
1/F	36.1	44	44	51	53	51	49	43	47	60	42	42	41	61	61	63	63	64	65	63	65	66
2/F	39.1	45	44	51	53	51	49	43	47	60	43	42	42	61	62	63	64	64	65	63	65	66
3/F	42.1	45	45	51	53	51	49	44	47	60	43	42	42	62	62	63	64	64	65	63	65	66
4/F	45.1	46	45	51	53	51	49	44	48	60	44	43	43	63	63	64	64	64	65	63	65	66
5/F	48.1	46	46	51	53	51	49	44	48	60	45	44	44	63	63	64	64	64	65	63	65	66
6/F	51.1	47	47	52	53	51	49	45	48	61	46	45	44	63	63	64	64	65	65	64	66	66
7/F	54.1	48	47	52	53	51	50	45	49	62	47	46	46	63	64	64	64	65	65	64	66	66
8/F	57.1	49	48	52	53	51	50	46	49	62	48	47	47	64	64	64	65	65	65	64	66	66
9/F	60.1	50	49	52	53	52	50	47	50	62	50	49	49	64	64	64	65	65	65	64	66	66
10/F	63.1	51	51	52	53	52	50	47	50	62	53	52	51	64	64	65	65	65	65	64	66	66
11/F	66.1	53	53	53	54	52	51	48	51	63	56	55	55	64	64	65	65	65	65	64	66	66
12/F	69.1	55	55	53	54	53	52	49	52	63	58	57	57	64	64	65	65	65	65	64	66	66
13/F	72.1	57	57	54	54	53	52	50	53	64	59	58	58	64	64	65	65	65	65	64	66	66
14/F	75.1	58	57	55	55	54	53	52	55	64	60	59	59	65	64	65	65	65	65	64	66	66
15/F	78.1	58	58	56	55	54	54	53	56	64	61	60	60	65	65	65	65	65	65	64	66	66
16/F	81.1	59	59	57	56	56	56	55	58	65	61	61	61	65	65	65	65	65	65	64	66	66
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0		0		0
Maximum Noise Level, dB(A)		59	59	57	56	56	56	55	58	65	61	61	61	65	65	65	65	65	65	64	66	66

**Site A Tower 4**

Floor	*mPD	N4-01	N4-02	N4-03	N4-04	N4-05	N4-06	N4-07	N4-08	N4-09	N4-10	N4-11	N4-12	N4-13	N4-14	N4-15	N4-16
1/F	27.1	68	67	60	59	59	58	58	57	57	67	67	68	68	68	68	69
2/F	30.1	68	68	60	59	59	59	58	57	57	67	68	68	68	69	69	70
3/F	33.1	69	69	60	60	59	59	58	57	57	67	68	68	69	69	70	70
4/F	36.1	71	71	60	60	59	59	59	58	57	67	68	68	69	69	69	70
5/F	39.1	71	71	60	60	59	59	59	58	57	67	68	68	69	69	69	70
6/F	42.1	71	71	60	59	59	59	59	58	57	67	68	68	68	69	69	70
7/F	45.1	72	71	60	59	59	59	59	58	57	67	68	68	68	69	69	70
8/F	48.1	72	72	60	59	59	59	59	58	58	67	68	68	68	69	69	70
9/F	51.1	72	72	60	59	59	59	59	58	58	67	68	68	68	69	69	70
10/F	54.1	72	72	60	59	59	59	59	59	58	67	68	68	68	69	69	70
11/F	57.1	72	72	60	59	59	59	60	59	59	67	67	68	68	69	69	70
12/F	60.1	71	72	60	59	59	60	60	59	59	67	67	68	68	68	69	69
13/F	63.1	71	71	59	59	59	60	60	60	59	67	67	68	68	68	68	69
14/F	66.1	71	71	59	59	59	60	60	60	60	67	67	68	68	68	68	69
15/F	69.1	71	71	59	59	59	60	61	60	60	67	67	68	68	68	68	69
16/F	72.1	71	71	59	59	59	60	61	61	60	67	67	67	68	68	68	69
17/F	75.1	71	71	59	59	60	61	61	61	61	67	67	67	67	68	68	69
18/F	78.1	71	71	59	59	60	61	61	61	61	67	67	67	67	68	68	69
19/F	81.1	71	71	59	59	60	61	61	61	61	67	67	67	67	68	68	69
Exceedance		16	16	0	0	0	0	0	0	0	0	0	0		0	0	0
Maximum Noise Level, dB(A)		72	72	60	60	60	61	61	61	61	67	68	68	69	69	70	70



***Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Low Noise Road Surfacing on Ting Kok Road and 10m high Cantilever Barrier with 3m Cantilever at 45° Case Scenario (AM Peak))***

**Site A Tower 5**

Floor	*mPD	N5-01	N5-02	N5-03	N5-04	N5-05	N5-06	N5-07	N5-08	N5-09	N5-10	N5-11	N5-12	N5-13
1/F	27.1	71	72	73	74	76	71	69	68	67	51	52	52	59
2/F	30.1	71	72	73	74	75	71	69	68	67	53	53	54	62
3/F	33.1	72	71	73	74	75	71	69	68	67	55	55	56	64
4/F	36.1	72	72	73	74	75	70	69	67	67	57	57	58	67
5/F	39.1	73	72	72	73	75	70	69	67	67	58	59	60	68
6/F	42.1	73	72	72	73	74	70	68	67	67	59	60	63	69
7/F	45.1	73	72	73	73	74	70	68	67	67	60	61	65	69
8/F	48.1	73	72	73	73	74	70	68	67	67	61	62	66	69
9/F	51.1	73	72	72	73	74	69	68	67	66	62	64	66	69
10/F	54.1	73	72	72	73	74	69	68	67	66	63	64	66	69
11/F	57.1	72	72	72	73	74	69	68	67	66	63	64	66	69
12/F	60.1	72	72	72	73	73	69	67	67	66	64	65	66	69
13/F	63.1	72	72	72	73	73	69	67	66	66	64	65	66	69
14/F	66.1	72	72	72	72	73	69	67	66	66	64	65	66	69
15/F	69.1	72	71	72	72	73	68	67	66	66	64	64	66	69
16/F	72.1	72	71	72	72	73	68	67	66	66	64	64	66	69
17/F	75.1	72	71	72	72	73	68	67	66	66	64	64	66	69
18/F	78.1	71	71	71	72	72	68	67	66	66	64	64	66	69
Exceedance		18	18	18	18	18	3	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		73	72	73	74	76	71	69	68	67	64	65	66	69

**Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Low Noise Road Surfacing on Ting Kok Road and 10m high Cantilever Barrier with 3m Cantilever at 45° Case Scenario (AM Peak))**

Site B Tower 1

Floor	*mPD	N6-01	N6-02	N6-03	N6-04	N6-05	N6-06	N6-07	N6-08	N6-09	N6-10	N6-11	N6-12	N6-13	N6-14	N6-15
1/F	28.8	71	76	76	75	74	73	73	73	73	73	74	75	76	75	74
2/F	32.0	71	76	76	75	74	73	73	73	73	73	73	74	75	75	74
3/F	35.1	71	76	76	75	74	73	73	73	73	73	73	74	75	75	74
4/F	38.3	71	76	75	74	73	72	72	73	73	73	73	74	75	74	74
5/F	41.4	71	75	75	74	73	72	72	73	73	73	73	74	74	74	74
6/F	44.6	70	75	75	74	73	72	72	72	72	72	73	73	74	74	73
7/F	47.7	70	75	75	74	73	72	72	72	72	72	72	73	74	74	73
8/F	50.9	70	74	74	73	73	72	72	72	72	72	72	73	74	74	73
9/F	54.0	70	74	74	73	73	72	72	72	72	72	72	73	73	73	73
10/F	57.2	69	74	74	73	72	71	71	72	72	72	72	72	73	73	73
11/F	60.3	69	74	74	73	72	71	71	71	72	71	72	72	73	73	73
12/F	63.5	69	74	73	73	72	71	71	71	71	71	71	72	73	73	72
13/F	66.6	69	73	73	72	72	71	71	71	71	71	71	72	72	72	72
14/F	69.8	69	73	73	72	72	71	71	71	71	71	71	72	72	72	72
15/F	72.9	69	73	73	72	71	71	71	71	71	71	71	71	72	72	72
16/F	76.1	68	73	73	72	71	70	70	71	71	71	71	71	72	72	72
Exceedance		16			16	16	15	15	16	16	16	16	16	16	16	16
Maximum Noise Level, dB(A)		71	76	76	75	74	73	73	73	73	73	74	75	76	75	74

Floor	*mPD	N6-16	N6-17	N6-18	N6-19	N6-20	N6-21	N6-22	N6-23	N6-24	N6-25	N6-26	N6-27	N6-28	N6-29
1/F	28.8	73	73	73	73	73	71	70	53	43	44	44	44	52	58
2/F	32.0	73	73	72	73	73	71	70	53	43	43	44	43	52	58
3/F	35.1	73	73	72	73	73	71	70	53	43	43	44	43	52	58
4/F	38.3	73	72	72	73	73	71	70	54	43	43	43	43	52	58
5/F	41.4	73	72	72	73	73	71	70	54	43	43	43	44	52	58
6/F	44.6	73	72	72	73	73	71	70	58	43	43	43	45	54	59
7/F	47.7	73	72	72	72	73	71	70	59	43	43	43	46	57	61
8/F	50.9	72	72	72	72	72	71	70	59	43	43	43	46	58	61
9/F	54.0	72	72	72	72	72	71	70	59	43	43	43	46	58	62
10/F	57.2	72	72	72	72	72	71	70	59	43	43	43	46	58	62
11/F	60.3	72	72	71	72	72	71	69	58	42	43	43	46	58	62
12/F	63.5	72	71	71	72	72	70	69	58	42	43	43	46	58	62
13/F	66.6	72	71	71	72	72	70	69	58	42	42	43	46	58	61
14/F	69.8	71	71	71	72	72	70	69	58	43	43	43	46	58	61
15/F	72.9	71	71	71	71	72	70	69	58	45	45	45	47	58	61
16/F	76.1	71	71	71	71	72	70	69	58	48	48	47	49	58	61
Exceedance		16	16	16	16	16		0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		73	73	73	73	73	71	70	59	48	48	47	49	58	62

Total no. of Flats:	1750
Total no. of Exceedance:	434
Compliance Level:	75%
Max. Noise Level:	76

Noted:  Noise level exceed stardand of 70 dB(A)

\* The assessment point is located at 1m in front of the most exposed part of an openable window for ventilation at a habitable room (NSRs) and 1.2m above the floor level of individual floors of the residential towers of the proposed development.  
Remark: The predicted noise levels are not the actual noise levels at the external façade after the application of innovative noise mitigation measures (acoustic window (baffle type)/enhanced acoustic balcony (baffle type)). These predicted noise levels are the equivalent noise levels at 1m from the external façade after accounting the reduction in noise levels inside the room offered by the proposed noise mitigation measures.

***Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Low Noise Road Surfacing on Ting Kok Road and 10m high Cantilever Barrier with 3m Cantilever at 45° Case Scenario (PM Peak))***

**Site A Tower 1**

Floor	*mPD	N1-01	N1-02	N1-03	N1-04	N1-05	N1-06	N1-07	N1-08	N1-09	N1-10	N1-11	N1-12	N1-13	N1-14	N1-15
1/F	27.1	64	63	63	62	62	59	61	64	64	49	43	49	57	60	60
2/F	30.1	65	64	63	63	62	60	62	64	64	49	43	49	57	60	60
3/F	33.1	66	66	65	64	64	61	62	64	64	49	43	49	57	59	60
4/F	36.1	68	68	67	66	65	62	62	64	64	49	43	49	57	59	60
5/F	39.1	69	68	68	67	67	64	63	64	64	49	42	49	57	59	60
6/F	42.1	69	69	69	68	67	66	64	64	64	49	42	49	57	59	60
7/F	45.1	70	69	69	68	68	67	65	64	64	49	42	49	57	59	60
8/F	48.1	70	70	69	69	68	67	65	64	64	49	42	49	57	59	60
9/F	51.1	70	70	69	69	68	67	66	65	64	49	42	49	57	59	60
10/F	54.1	70	70	69	69	68	67	66	65	64	49	42	49	57	59	60
11/F	57.1	70	70	69	69	68	67	66	65	65	50	42	49	57	59	60
12/F	60.1	70	70	69	69	68	67	66	65	65	50	42	49	57	59	60
13/F	63.1	70	70	69	69	68	67	66	65	65	50	42	50	57	59	60
14/F	66.1	70	70	69	69	68	68	66	65	65	50	42	50	57	59	60
15/F	69.1	70	70	69	69	68	68	66	65	65	50	42	50	57	59	60
16/F	72.1	70	70	69	69	68	68	66	65	65	50	42	50	57	59	60
17/F	75.1	70	70	69	68	67	68	66	65	65	50	43	50	57	59	60
18/F	78.1	70	70	69	68	67	68	66	65	65	51	45	51	57	59	60
19/F	81.1	70	70	69	68	67	68	66	65	65	52	48	52	58	59	60
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		70	70	69	69	68	68	66	65	65	52	48	52	58	60	60

**Site A Tower 2**

Floor	*mPD	N2-01	N2-02	N2-03	N2-04	N2-05	N2-06	N2-07	N2-08	N2-09	N2-10	N2-11	N2-12	N2-13	N2-14	N2-15	N2-16	N2-17	N2-18
1/F	36.1	60	44	43	43	43	67	67	67	66	66	65	65	65	56	59	59	58	57
2/F	39.1	60	44	44	43	43	67	67	66	66	66	65	65	65	56	59	59	58	57
3/F	42.1	59	44	44	44	44	67	67	66	66	66	65	65	65	56	59	59	58	57
4/F	45.1	59	45	44	44	44	67	67	66	66	66	65	65	65	56	59	59	58	57
5/F	48.1	59	45	45	44	44	67	67	66	66	66	65	65	65	56	59	59	58	57
6/F	51.1	59	46	45	45	45	68	67	67	66	66	65	65	65	56	59	58	58	57
7/F	54.1	59	47	46	45	45	67	67	67	66	66	65	65	65	56	59	58	58	57
8/F	57.1	59	48	47	46	46	67	67	67	66	66	65	65	65	56	59	58	58	57
9/F	60.1	59	49	47	47	47	67	67	67	67	67	66	65	65	56	59	58	58	57
10/F	63.1	59	50	48	48	48	67	67	67	67	67	66	66	65	56	59	58	58	57
11/F	66.1	60	50	49	48	49	67	67	67	67	67	66	66	66	56	59	58	58	56
12/F	69.1	60	51	50	50	49	67	67	67	67	67	66	66	66	56	59	58	58	56
13/F	72.1	60	52	51	50	50	67	67	67	67	67	66	66	66	56	59	58	58	56
14/F	75.1	60	53	52	51	51	67	67	67	67	67	66	66	66	56	59	58	58	56
15/F	78.1	60	53	52	52	51	67	67	67	67	67	67	66	66	56	59	58	58	56
16/F	81.1	60	54	53	53	53	67	67	67	67	67	67	66	66	56	59	58	58	57
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		60	54	53	53	53	68	67	67	67	67	67	66	66	56	59	59	58	57



***Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Low Noise Road Surfacing on Ting Kok Road and 10m high Cantilever Barrier with 3m Cantilever at 45° Case Scenario (PM Peak))***

**Site A Tower 3**

Floor	*mPD	N3-01	N3-02	N3-03	N3-04	N3-05	N3-06	N3-07	N3-08	N3-09	N3-10	N3-11	N3-12	N3-13	N3-14	N3-15	N3-16	N3-17	N3-18	N3-19	N3-20	N3-21
1/F	36.1	43	43	50	51	50	47	42	46	59	41	41	40	60	61	62	63	64	64	63	65	65
2/F	39.1	44	43	50	51	50	48	42	46	59	42	41	41	60	61	62	63	64	64	63	65	65
3/F	42.1	44	44	50	51	50	48	43	46	59	42	41	41	61	62	63	63	64	64	63	65	65
4/F	45.1	45	44	50	52	50	48	43	47	59	43	42	42	62	62	63	63	64	64	63	65	66
5/F	48.1	45	45	50	52	50	48	43	47	60	44	43	42	62	63	63	63	64	64	63	65	65
6/F	51.1	46	45	50	52	50	48	44	47	60	44	43	43	63	63	63	64	64	64	63	65	66
7/F	54.1	47	46	51	52	50	48	44	48	61	45	44	44	63	63	63	64	64	64	63	65	66
8/F	57.1	48	47	51	52	50	49	45	48	61	47	46	46	63	63	64	64	64	65	63	65	66
9/F	60.1	49	48	51	52	50	49	45	49	61	49	48	48	63	63	64	64	64	65	63	65	66
10/F	63.1	50	50	51	52	51	49	46	49	61	51	50	50	63	64	64	64	65	65	63	65	65
11/F	66.1	52	52	52	52	51	50	47	50	62	54	54	53	64	64	64	64	65	65	63	65	65
12/F	69.1	54	54	52	53	51	50	48	51	62	56	56	55	64	64	64	64	65	65	63	65	65
13/F	72.1	56	55	53	53	52	51	49	52	63	58	57	57	64	64	64	64	65	65	63	65	65
14/F	75.1	56	56	54	53	52	52	50	54	63	59	58	58	64	64	64	64	65	65	63	65	65
15/F	78.1	57	57	55	54	53	53	52	55	63	60	59	59	64	64	64	64	65	65	63	65	65
16/F	81.1	57	57	56	55	54	55	54	56	64	60	60	59	64	64	64	64	65	65	63	65	65
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0		0		0
Maximum Noise Level, dB(A)		57	57	56	55	54	55	54	56	64	60	60	59	64	64	64	64	65	65	63	65	66

**Site A Tower 4**

Floor	*mPD	N4-01	N4-02	N4-03	N4-04	N4-05	N4-06	N4-07	N4-08	N4-09	N4-10	N4-11	N4-12	N4-13	N4-14	N4-15	N4-16
1/F	27.1	67	66	58	58	58	57	57	56	56	67	67	67	67	67	68	69
2/F	30.1	68	67	59	58	58	57	57	56	56	67	67	67	68	68	69	70
3/F	33.1	68	68	59	58	58	57	57	56	56	67	67	68	68	69	69	70
4/F	36.1	70	70	59	58	58	58	57	56	56	67	67	68	68	69	69	70
5/F	39.1	70	70	59	58	58	58	57	56	56	67	67	68	68	69	69	70
6/F	42.1	70	70	59	58	58	58	57	56	56	67	67	68	68	68	69	70
7/F	45.1	70	70	58	58	58	58	58	57	56	67	67	68	68	68	69	70
8/F	48.1	71	71	58	58	58	58	58	57	56	67	67	68	68	68	69	69
9/F	51.1	71	71	58	58	58	58	58	57	57	67	67	67	68	68	68	69
10/F	54.1	71	71	58	58	58	58	58	57	57	67	67	67	68	68	68	69
11/F	57.1	71	71	58	58	58	58	58	58	57	67	67	67	67	68	68	69
12/F	60.1	71	71	58	58	58	58	59	58	58	66	67	67	67	68	68	69
13/F	63.1	71	71	58	58	58	58	59	58	58	66	67	67	67	68	68	69
14/F	66.1	71	71	58	58	58	59	59	59	58	66	67	67	67	67	68	68
15/F	69.1	71	71	58	58	58	59	59	59	59	66	67	67	67	67	67	68
16/F	72.1	70	70	58	58	58	59	59	59	59	66	66	67	67	67	67	68
17/F	75.1	70	70	58	58	58	59	60	60	59	66	66	67	67	67	67	68
18/F	78.1	70	70	58	58	58	59	60	60	59	66	66	67	67	67	67	68
19/F	81.1	70	70	58	58	58	59	60	60	60	66	66	66	67	67	67	68
Exceedance		8	8	0	0	0	0	0	0	0	0	0	0		0	0	0
Maximum Noise Level, dB(A)		71	71	59	58	58	59	60	60	60	67	67	68	68	69	69	70

***Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Low Noise Road Surfacing on Ting Kok Road and 10m high Cantilever Barrier with 3m Cantilever at 45° Case Scenario (PM Peak))***

**Site A Tower 5**

Floor	*mPD	N5-01	N5-02	N5-03	N5-04	N5-05	N5-06	N5-07	N5-08	N5-09	N5-10	N5-11	N5-12	N5-13
1/F	27.1	70	71	72	73	75	70	68	67	66	50	51	51	59
2/F	30.1	70	71	72	73	74	70	68	66	66	52	52	53	61
3/F	33.1	71	71	72	73	74	69	68	66	66	54	54	55	63
4/F	36.1	71	71	72	73	74	69	67	66	66	55	56	57	65
5/F	39.1	72	71	72	73	74	69	67	66	66	57	57	59	67
6/F	42.1	72	71	72	72	73	69	67	66	66	58	59	62	67
7/F	45.1	72	71	72	72	73	69	67	66	66	58	60	63	68
8/F	48.1	72	71	72	72	73	68	67	66	65	59	61	64	68
9/F	51.1	72	71	71	72	73	68	67	66	65	60	62	64	68
10/F	54.1	72	71	71	72	73	68	66	65	65	61	63	64	68
11/F	57.1	72	71	71	72	73	68	66	65	65	62	63	64	68
12/F	60.1	72	71	71	72	72	68	66	65	65	62	63	64	68
13/F	63.1	71	71	71	72	72	68	66	65	65	62	63	64	68
14/F	66.1	71	71	71	71	72	67	66	65	65	62	63	64	68
15/F	69.1	71	71	71	71	72	67	66	65	65	62	63	64	68
16/F	72.1	71	70	71	71	72	67	66	65	65	62	63	65	68
17/F	75.1	71	70	71	71	72	67	66	65	65	63	63	65	68
18/F	78.1	71	70	71	71	72	67	66	65	64	63	63	65	68
Exceedance		16	15	18	18	18	0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		72	71	72	73	75	70	68	67	66	63	63	65	68

**Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Low Noise Road Surfacing on Ting Kok Road and 10m high Cantilever Barrier with 3m Cantilever at 45° Case Scenario (PM Peak))**

Site B Tower 1

Floor	*mPD	N6-01	N6-02	N6-03	N6-04	N6-05	N6-06	N6-07	N6-08	N6-09	N6-10	N6-11	N6-12	N6-13	N6-14	N6-15
1/F	28.8	71	76	76	75	73	72	72	73	73	73	73	74	75	75	74
2/F	32.0	71	76	75	74	73	72	72	72	73	73	73	74	75	74	74
3/F	35.1	70	75	75	74	73	72	72	72	72	72	73	74	74	74	73
4/F	38.3	70	75	75	74	73	72	72	72	72	72	72	73	74	74	73
5/F	41.4	70	75	75	74	73	72	72	72	72	72	72	73	74	74	73
6/F	44.6	70	74	74	73	73	71	71	72	72	72	72	73	74	73	73
7/F	47.7	70	74	74	73	72	71	71	72	72	72	72	73	73	73	73
8/F	50.9	69	74	74	73	72	71	71	71	72	71	72	72	73	73	72
9/F	54.0	69	74	73	73	72	71	71	71	71	71	71	72	73	73	72
10/F	57.2	69	73	73	72	72	71	71	71	71	71	71	72	72	72	72
11/F	60.3	69	73	73	72	71	71	71	71	71	71	71	72	72	72	72
12/F	63.5	68	73	73	72	71	70	70	71	71	71	71	71	72	72	72
13/F	66.6	68	73	73	72	71	70	70	70	71	70	71	71	72	72	71
14/F	69.8	68	72	72	72	71	70	70	70	70	70	70	71	72	72	71
15/F	72.9	68	72	72	71	71	70	70	70	70	70	70	71	71	71	71
16/F	76.1	68	72	72	71	71	70	70	70	70	70	70	71	71	71	71
Exceedance		16			16	16	11	11	12	13	12	13	16	16	16	16
Maximum Noise Level, dB(A)		71	76	76	75	73	72	72	73	73	73	73	74	75	75	74

Floor	*mPD	N6-16	N6-17	N6-18	N6-19	N6-20	N6-21	N6-22	N6-23	N6-24	N6-25	N6-26	N6-27	N6-28	N6-29
1/F	28.8	73	72	72	72	72	71	69	53	43	43	43	43	51	57
2/F	32.0	73	72	72	72	72	71	69	53	43	43	43	43	51	57
3/F	35.1	73	72	72	72	72	71	69	53	42	43	43	43	51	57
4/F	38.3	72	72	72	72	72	70	69	53	42	43	43	43	51	57
5/F	41.4	72	72	72	72	72	70	69	54	42	43	43	43	52	57
6/F	44.6	72	72	71	72	72	70	69	57	42	43	43	44	54	58
7/F	47.7	72	71	71	72	72	70	69	58	42	42	43	46	57	60
8/F	50.9	72	71	71	72	72	70	69	58	42	42	42	46	58	61
9/F	54.0	72	71	71	72	72	70	69	58	42	42	42	46	58	61
10/F	57.2	71	71	71	71	72	70	69	58	42	42	42	46	58	61
11/F	60.3	71	71	71	71	71	70	69	58	42	42	42	46	57	61
12/F	63.5	71	71	71	71	71	70	69	58	42	42	42	46	57	61
13/F	66.6	71	71	70	71	71	70	69	58	42	42	42	45	57	61
14/F	69.8	71	70	70	71	71	70	69	58	42	42	43	46	57	61
15/F	72.9	71	70	70	71	71	69	68	58	44	44	44	47	57	61
16/F	76.1	70	70	70	71	71	69	68	58	47	47	47	48	57	61
Exceedance		15	13	12	16	16		0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		73	72	72	72	72	71	69	58	47	47	47	48	58	61

Total no. of Flats:	1750
Total no. of Exceedance:	357
Compliance Level:	80%
Max. Noise Level:	76

Noted:  Noise level exceed stardand of 70 dB(A)

\* The assessment point is located at 1m in front of the most exposed part of an openable window for ventilation at a habitable room (NSRs) and 1.2m above the floor level of individual floors of the residential towers of the proposed development.  
Remark: The predicted noise levels are not the actual noise levels at the external façade after the application of innovative noise mitigation measures (acoustic window (baffle type)/enhanced acoustic balcony (baffle type)). These predicted noise levels are the equivalent noise levels at 1m from the external façade after accounting the reduction in noise levels inside the room offered by the proposed noise mitigation measures.





**Appendix:** 17d 10m high Cantilever Barrier with 3m Cantilever at 45°, Road Side Barrier and Noise Barrier at Central Divider Scenario

**Title:** Location of 10m Noise Barrier, Road Side Barrier and Noise Barrier at Central Divider

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

RAMBOLL

Drawn by: CM

Checked by: CC

Rev.: 1.0

Date: Oct 2024

**Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Low Noise Road Surfacing on Tina Kok Road, 10m high Cantilever Barrier with 3m Cantilever at 45°. Road Side Barrier and Noise Barrier at Central Divider. Case Scenario (AM Peak)).**

**Site A Tower 1**

Floor	*mPD	N1-01	N1-02	N1-03	N1-04	N1-05	N1-06	N1-07	N1-08	N1-09	N1-10	N1-11	N1-12	N1-13	N1-14	N1-15
1/F	27.1	64	64	63	63	62	60	63	65	65	51	44	51	59	61	61
2/F	30.1	65	65	64	63	63	61	63	65	65	51	44	50	59	61	61
3/F	33.1	66	65	65	64	64	62	63	65	65	51	44	50	59	61	61
4/F	36.1	67	66	66	65	65	63	63	65	65	51	44	50	59	61	61
5/F	39.1	68	68	67	66	66	65	64	65	65	51	44	50	59	61	61
6/F	42.1	69	69	68	68	67	66	64	65	65	51	43	50	59	61	61
7/F	45.1	70	70	69	69	68	67	65	65	65	51	43	50	59	61	61
8/F	48.1	71	70	70	69	68	68	66	65	65	51	43	50	58	61	61
9/F	51.1	71	71	70	70	69	68	66	65	65	51	43	50	59	61	61
10/F	54.1	71	71	70	70	69	68	67	66	65	51	43	50	59	61	61
11/F	57.1	71	71	71	70	69	68	67	66	65	51	43	51	59	61	61
12/F	60.1	71	71	71	70	69	68	67	66	66	51	43	51	59	61	61
13/F	63.1	71	71	71	70	69	69	67	66	66	51	43	51	59	61	61
14/F	66.1	71	71	71	70	69	69	67	66	66	51	43	51	59	61	61
15/F	69.1	71	71	71	70	69	69	67	66	66	51	43	51	59	61	61
16/F	72.1	71	71	71	70	69	69	67	66	66	51	43	51	59	61	61
17/F	75.1	71	71	70	70	69	69	67	66	66	51	44	52	59	61	61
18/F	78.1	71	71	70	70	69	69	68	67	66	52	46	52	59	61	61
19/F	81.1	71	71	70	70	69	69	68	67	66	53	50	53	59	61	61
Exceedance		12	11	6	0	0	0	0	0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		71	71	71	70	69	69	68	67	66	53	50	53	59	61	61

**Site A Tower 2**

Floor	*mPD	N2-01	N2-02	N2-03	N2-04	N2-05	N2-06	N2-07	N2-08	N2-09	N2-10	N2-11	N2-12	N2-13	N2-14	N2-15	N2-16	N2-17	N2-18
1/F	36.1	59	45	44	44	44	68	67	66	66	66	65	65	64	57	60	59	59	58
2/F	39.1	60	45	45	44	44	68	67	67	66	66	65	65	64	57	60	59	59	58
3/F	42.1	60	45	45	45	45	68	67	67	66	66	65	65	65	57	60	59	59	58
4/F	45.1	60	46	45	45	45	68	67	67	66	66	65	65	65	57	60	59	59	57
5/F	48.1	59	46	45	45	45	68	67	67	66	66	65	65	65	57	60	59	59	57
6/F	51.1	59	46	46	45	45	68	67	67	66	66	65	65	65	57	60	59	59	57
7/F	54.1	59	46	46	46	46	68	68	68	67	66	66	65	65	57	60	59	59	57
8/F	57.1	59	47	46	46	46	68	68	68	67	67	66	66	65	57	60	59	59	57
9/F	60.1	59	47	46	46	46	68	68	68	67	67	66	66	65	57	60	59	59	57
10/F	63.1	59	48	47	47	47	68	68	68	67	67	67	66	66	57	60	59	58	57
11/F	66.1	59	48	47	47	48	68	68	68	67	67	67	67	66	57	60	59	58	57
12/F	69.1	59	48	48	48	48	68	68	68	68	67	67	67	67	56	60	59	58	57
13/F	72.1	59	49	48	48	49	68	68	68	67	67	67	67	67	56	60	59	58	57
14/F	75.1	59	50	49	49	50	68	68	68	67	67	67	67	67	56	59	59	58	57
15/F	78.1	59	51	50	50	51	68	68	68	67	67	67	67	67	56	59	59	58	57
16/F	81.1	59	52	51	52	52	68	68	68	68	67	67	67	67	57	60	59	58	57
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		60	52	51	52	52	68	68	68	68	67	67	67	67	57	60	59	59	58

**Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Low Noise Road Surfacing on Tina Kok Road, 10m high Cantilever Barrier with 3m Cantilever at 45°. Road Side Barrier and Noise Barrier at Central Divider. Case Scenario (AM Peak))**

**Site A Tower 3**

Floor	*mPD	N3-01	N3-02	N3-03	N3-04	N3-05	N3-06	N3-07	N3-08	N3-09	N3-10	N3-11	N3-12	N3-13	N3-14	N3-15	N3-16	N3-17	N3-18	N3-19	N3-20	N3-21
1/F	36.1	44	44	51	53	51	49	43	47	59	42	42	42	61	61	63	63	64	64	63	65	66
2/F	39.1	45	45	51	53	51	49	44	47	59	43	42	42	61	61	63	63	64	64	63	65	66
3/F	42.1	45	45	51	53	51	49	44	48	59	43	42	42	61	62	63	64	64	64	63	65	66
4/F	45.1	46	45	51	53	51	49	44	48	60	44	43	43	62	63	63	64	64	64	63	65	66
5/F	48.1	46	46	51	53	51	49	45	48	60	45	44	44	63	63	64	64	64	65	63	65	66
6/F	51.1	47	46	52	53	51	49	45	48	61	46	45	44	63	63	64	64	64	65	64	65	66
7/F	54.1	47	47	52	53	51	50	45	49	61	47	46	46	63	63	64	64	65	65	64	65	66
8/F	57.1	48	48	52	53	51	50	46	49	62	48	47	47	64	64	64	64	65	65	64	66	66
9/F	60.1	49	48	52	53	52	50	46	50	62	50	49	49	64	64	64	65	65	65	64	66	66
10/F	63.1	50	50	52	53	52	50	47	50	62	53	52	51	64	64	64	65	65	65	64	66	66
11/F	66.1	52	52	52	53	52	51	48	51	63	56	55	55	64	64	64	65	65	65	64	66	66
12/F	69.1	54	54	53	53	52	51	49	52	63	58	57	57	64	64	64	65	65	65	64	65	66
13/F	72.1	56	56	53	54	53	52	50	53	63	59	58	58	64	64	65	65	65	65	64	65	66
14/F	75.1	57	57	54	54	53	53	51	55	64	60	59	59	64	64	65	65	65	65	64	66	66
15/F	78.1	57	57	55	55	54	54	53	56	64	61	60	60	64	64	65	65	65	65	64	65	66
16/F	81.1	58	58	56	55	55	55	55	57	65	61	61	61	65	64	65	65	65	65	64	66	66
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0		0		0
Maximum Noise Level, dB(A)		58	58	56	55	55	55	55	57	65	61	61	61	65	64	65	65	65	65	64	66	66

**Site A Tower 4**

Floor	*mPD	N4-01	N4-02	N4-03	N4-04	N4-05	N4-06	N4-07	N4-08	N4-09	N4-10	N4-11	N4-12	N4-13	N4-14	N4-15	N4-16
1/F	27.1	67	67	59	59	58	58	58	57	56	67	67	68	68	68	68	69
2/F	30.1	68	67	59	59	59	58	58	57	56	67	67	68	68	69	69	70
3/F	33.1	68	68	59	59	59	58	58	57	56	67	68	68	68	69	69	70
4/F	36.1	68	68	60	59	59	58	58	57	56	67	68	68	68	69	69	70
5/F	39.1	69	69	59	59	59	58	58	57	56	67	68	68	68	69	69	69
6/F	42.1	70	70	59	59	59	59	58	57	56	67	68	68	68	69	69	69
7/F	45.1	71	71	59	59	59	59	58	57	57	67	67	68	68	68	69	69
8/F	48.1	71	71	59	59	59	59	58	57	57	67	67	68	68	68	69	70
9/F	51.1	71	72	59	59	59	59	59	57	57	67	67	68	68	68	69	70
10/F	54.1	72	72	59	59	59	59	59	57	57	67	67	68	68	68	69	70
11/F	57.1	72	72	59	59	59	59	59	58	57	67	67	67	68	68	69	70
12/F	60.1	72	72	59	59	59	59	59	58	57	67	67	67	68	68	69	70
13/F	63.1	72	72	59	59	59	59	59	58	58	67	67	67	68	68	68	69
14/F	66.1	72	72	59	59	59	59	60	59	58	67	67	67	68	68	68	69
15/F	69.1	72	72	59	59	59	60	60	59	59	67	67	67	67	68	68	69
16/F	72.1	72	72	59	59	59	60	60	60	59	67	67	67	67	68	68	69
17/F	75.1	71	72	59	59	59	60	61	60	60	67	67	67	67	68	68	69
18/F	78.1	71	71	59	59	59	60	61	60	60	66	67	67	67	68	68	69
19/F	81.1	71	71	59	59	59	61	61	61	60	66	67	67	67	68	68	69
Exceedance		13	13	0	0	0	0	0	0	0	0	0	0		0	0	0
Maximum Noise Level, dB(A)		72	72	60	59	59	61	61	61	60	67	68	68	68	69	69	70



**Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Low Noise Road Surfacing on Tina Kok Road, 10m high Cantilever Barrier with 3m Cantilever at 45°. Road Side Barrier and Noise Barrier at Central Divider. Case Scenario (AM Peak)).**

**Site A Tower 5**

Floor	*mPD	N5-01	N5-02	N5-03	N5-04	N5-05	N5-06	N5-07	N5-08	N5-09	N5-10	N5-11	N5-12	N5-13
1/F	27.1	64	63	64	66	69	70	69	67	67	51	52	53	59
2/F	30.1	66	66	67	68	70	70	69	67	67	53	53	54	61
3/F	33.1	68	67	68	69	71	70	68	67	67	55	55	56	63
4/F	36.1	69	68	68	70	71	70	68	67	66	57	57	57	65
5/F	39.1	70	69	69	70	72	70	68	67	67	58	58	59	67
6/F	42.1	70	69	69	71	72	70	68	67	67	59	60	61	68
7/F	45.1	71	70	70	71	72	69	68	67	66	59	61	64	68
8/F	48.1	71	70	70	71	73	69	68	67	66	60	62	65	69
9/F	51.1	71	70	71	71	73	69	68	67	66	61	63	65	69
10/F	54.1	71	70	71	72	73	69	67	66	66	62	64	65	69
11/F	57.1	71	70	71	72	73	69	67	66	66	63	64	66	69
12/F	60.1	71	70	71	72	73	69	67	66	66	63	64	66	69
13/F	63.1	71	70	71	72	72	68	67	66	66	63	64	66	69
14/F	66.1	71	70	71	72	72	68	67	66	66	63	64	66	69
15/F	69.1	71	70	71	71	72	68	67	66	66	64	64	66	69
16/F	72.1	71	70	71	71	72	68	67	66	66	64	64	66	69
17/F	75.1	71	70	71	71	72	68	67	66	66	64	64	66	69
18/F	78.1	71	70	71	71	72	68	67	66	65	64	64	66	69
Exceedance		12	0	10	13	16	0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		71	70	71	72	73	70	69	67	67	64	64	66	69

**Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Low Noise Road Surfacing on Tina Kok Road, 10m high Cantilever Barrier with 3m Cantilever at 45°. Road Side Barrier and Noise Barrier at Central Divider. Case Scenario (AM Peak))**

Site B Tower 1

Floor	*mPD	N6-01	N6-02	N6-03	N6-04	N6-05	N6-06	N6-07	N6-08	N6-09	N6-10	N6-11	N6-12	N6-13	N6-14	N6-15
1/F	28.8	71	76	76	75	74	73	73	73	73	73	74	75	76	75	74
2/F	32.0	71	76	76	75	74	73	73	73	73	73	73	74	75	75	74
3/F	35.1	71	76	76	75	74	73	73	73	73	73	73	74	75	75	74
4/F	38.3	71	76	75	74	73	72	72	73	73	73	73	74	75	74	74
5/F	41.4	71	75	75	74	73	72	72	73	73	73	73	74	74	74	74
6/F	44.6	70	75	75	74	73	72	72	72	72	72	73	73	74	74	73
7/F	47.7	70	75	75	74	73	72	72	72	72	72	72	73	74	74	73
8/F	50.9	70	74	74	73	73	72	72	72	72	72	72	73	74	74	73
9/F	54.0	70	74	74	73	73	72	72	72	72	72	72	73	73	73	73
10/F	57.2	69	74	74	73	72	71	71	72	72	72	72	72	73	73	73
11/F	60.3	69	74	74	73	72	71	71	71	72	71	72	72	73	73	73
12/F	63.5	69	74	73	73	72	71	71	71	71	71	71	72	73	73	72
13/F	66.6	69	73	73	72	72	71	71	71	71	71	71	72	72	72	72
14/F	69.8	69	73	73	72	72	71	71	71	71	71	71	72	72	72	72
15/F	72.9	69	73	73	72	71	71	71	71	71	71	71	71	72	72	72
16/F	76.1	68	73	73	72	71	70	70	71	71	71	71	71	72	72	72
Exceedance		16			16	16	15	15	16	16	16	16	16	16	16	16
Maximum Noise Level, dB(A)		71	76	76	75	74	73	73	73	73	73	74	75	76	75	74

Floor	*mPD	N6-16	N6-17	N6-18	N6-19	N6-20	N6-21	N6-22	N6-23	N6-24	N6-25	N6-26	N6-27	N6-28	N6-29
1/F	28.8	73	73	73	73	73	71	70	53	43	44	44	44	52	58
2/F	32.0	73	73	72	73	73	71	70	53	43	43	44	43	52	58
3/F	35.1	73	73	72	73	73	71	70	53	43	43	44	43	52	58
4/F	38.3	73	72	72	73	73	71	70	54	43	43	43	43	52	58
5/F	41.4	73	72	72	73	73	71	70	54	43	43	43	44	52	58
6/F	44.6	73	72	72	73	73	71	70	58	43	43	43	45	54	59
7/F	47.7	73	72	72	72	73	71	70	59	43	43	43	46	57	61
8/F	50.9	72	72	72	72	72	71	70	59	43	43	43	46	58	61
9/F	54.0	72	72	72	72	72	71	70	59	43	43	43	46	58	62
10/F	57.2	72	72	72	72	72	71	70	59	43	43	43	46	58	62
11/F	60.3	72	72	71	72	72	71	69	58	42	43	43	46	58	62
12/F	63.5	72	71	71	72	72	70	69	58	42	43	43	46	58	62
13/F	66.6	72	71	71	72	72	70	69	58	42	42	43	46	58	61
14/F	69.8	71	71	71	72	72	70	69	58	43	43	43	46	58	61
15/F	72.9	71	71	71	71	72	70	69	58	45	45	45	47	58	61
16/F	76.1	71	71	71	71	72	70	69	58	48	48	47	49	58	61
Exceedance		16	16	16	16	16		0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		73	73	73	73	73	71	70	59	48	48	47	49	58	62

Total no. of Flats:	1750
Total no. of Exceedance:	392
Compliance Level:	78%
Max. Noise Level:	76

Noted:  
Noise level exceed stardand of 70 dB(A)

\* The assessment point is located at 1m in front of the most exposed part of an openable window for ventilation at a habitable room (NSRs) and 1.2m above the floor level of individual floors of the residential towers of the proposed development.  
Remark: The predicted noise levels are not the actual noise levels at the external façade after the application of innovative noise mitigation measures (acoustic window (baffle type)/enhanced acoustic balcony (baffle type)). These predicted noise levels are the equivalent noise levels at 1m from the external façade after accounting the reduction in noise levels inside the room offered by the proposed noise mitigation measures.

**Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Low Noise Road Surfacing on Ting Kok Road, 10m high Cantilever Barrier with 3m Cantilever at 45°, Road Side Barrier and Noise Barrier at Central Divider, Case Scenario (PM Peak))**

**Site A Tower 1**

Floor	*mPD	N1-01	N1-02	N1-03	N1-04	N1-05	N1-06	N1-07	N1-08	N1-09	N1-10	N1-11	N1-12	N1-13	N1-14	N1-15
1/F	27.1	64	63	63	62	62	59	61	63	64	50	43	49	57	60	60
2/F	30.1	64	64	63	63	62	60	62	63	64	50	43	49	57	60	60
3/F	33.1	65	65	64	63	63	61	62	63	64	50	43	49	57	59	60
4/F	36.1	66	65	65	64	64	62	62	63	64	49	43	49	57	59	60
5/F	39.1	67	67	66	65	65	63	63	63	64	49	43	49	57	59	60
6/F	42.1	68	68	67	67	66	65	63	63	64	49	43	49	57	59	60
7/F	45.1	69	69	68	68	67	66	64	64	64	49	43	49	57	59	60
8/F	48.1	70	69	69	68	67	66	65	64	64	49	43	49	57	59	60
9/F	51.1	70	70	69	69	68	67	65	64	64	49	42	49	57	59	60
10/F	54.1	71	70	69	69	68	67	65	64	64	50	42	49	57	59	60
11/F	57.1	71	70	70	69	68	67	66	65	64	50	42	49	57	59	60
12/F	60.1	71	70	70	69	68	67	66	65	64	50	42	50	57	59	60
13/F	63.1	71	71	70	69	68	68	66	65	65	50	42	50	57	59	60
14/F	66.1	71	71	70	69	68	68	66	65	65	50	42	50	57	59	60
15/F	69.1	71	70	70	69	68	68	66	65	65	50	42	50	57	59	60
16/F	72.1	71	70	70	69	68	68	66	65	65	50	43	50	57	59	60
17/F	75.1	71	70	70	69	68	68	67	65	65	50	43	51	57	59	60
18/F	78.1	71	70	70	69	68	68	67	65	65	51	45	51	57	59	60
19/F	81.1	70	70	70	69	68	68	67	65	65	52	49	52	58	59	60
Exceedance		9	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		71	71	70	69	68	68	67	65	65	52	49	52	58	60	60

**Site A Tower 2**

Floor	*mPD	N2-01	N2-02	N2-03	N2-04	N2-05	N2-06	N2-07	N2-08	N2-09	N2-10	N2-11	N2-12	N2-13	N2-14	N2-15	N2-16	N2-17	N2-18
1/F	36.1	58	44	44	43	44	66	66	65	65	65	64	64	63	56	59	59	58	57
2/F	39.1	59	44	44	44	44	67	66	66	65	65	64	64	63	56	59	59	58	57
3/F	42.1	59	44	44	44	44	67	66	66	65	65	64	64	64	56	59	59	58	57
4/F	45.1	59	45	44	44	44	67	66	66	65	65	64	64	64	56	59	59	58	57
5/F	48.1	59	45	44	44	44	67	66	66	65	65	64	64	64	56	59	59	58	57
6/F	51.1	59	45	45	44	45	67	66	66	65	65	64	64	64	56	59	58	58	57
7/F	54.1	58	46	45	45	45	67	67	66	66	65	65	64	64	56	59	58	58	57
8/F	57.1	58	46	45	45	45	67	67	67	66	66	65	65	64	56	59	58	58	57
9/F	60.1	58	46	46	45	45	67	67	67	66	66	65	65	64	56	59	58	58	57
10/F	63.1	58	47	46	46	46	67	67	67	66	66	66	65	65	56	59	58	58	57
11/F	66.1	58	47	46	46	46	67	67	67	66	66	66	66	65	56	59	58	58	56
12/F	69.1	58	47	47	47	47	67	67	67	66	66	66	66	66	56	59	58	58	56
13/F	72.1	58	48	47	47	48	67	67	67	66	66	66	66	66	56	59	58	58	56
14/F	75.1	58	49	48	48	49	67	67	67	66	66	66	66	66	56	59	58	58	56
15/F	78.1	58	50	49	49	49	67	67	67	66	66	66	66	66	56	59	58	58	56
16/F	81.1	58	51	50	50	51	67	67	67	66	66	66	66	66	56	59	58	58	57
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		59	51	50	50	51	67	67	67	66	66	66	66	66	56	59	59	58	57



**Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Low Noise Road Surfacing on Ting Kok Road, 10m high Cantilever Barrier with 3m Cantilever at 45°, Road Side Barrier and Noise Barrier at Central Divider- Case Scenario (PM Peak))**

**Site A Tower 3**

Floor	*mPD	N3-01	N3-02	N3-03	N3-04	N3-05	N3-06	N3-07	N3-08	N3-09	N3-10	N3-11	N3-12	N3-13	N3-14	N3-15	N3-16	N3-17	N3-18	N3-19	N3-20	N3-21
1/F	36.1	44	43	50	51	50	48	42	46	58	41	41	41	60	61	62	63	63	64	63	65	65
2/F	39.1	44	44	50	52	50	48	43	46	58	42	41	41	60	61	62	63	64	64	63	65	65
3/F	42.1	44	44	50	51	50	48	43	46	59	42	41	41	61	61	62	63	64	64	63	65	65
4/F	45.1	45	44	50	52	50	48	43	47	59	43	42	42	62	62	63	63	64	64	63	65	65
5/F	48.1	45	45	50	52	50	48	44	47	59	44	43	43	62	62	63	63	64	64	63	65	65
6/F	51.1	46	45	50	52	50	48	44	47	60	44	43	43	62	63	63	63	64	64	63	65	65
7/F	54.1	46	46	50	52	50	48	44	48	60	46	45	44	63	63	63	64	64	64	63	65	65
8/F	57.1	47	47	51	52	50	49	45	48	61	47	46	46	63	63	64	64	64	64	63	65	65
9/F	60.1	48	47	51	52	50	49	45	49	61	49	48	48	63	63	64	64	64	64	65	63	65
10/F	63.1	49	49	51	52	51	49	46	49	61	51	50	50	63	63	64	64	64	64	65	63	65
11/F	66.1	51	51	51	52	51	49	47	50	62	54	54	53	63	64	64	64	64	64	65	63	65
12/F	69.1	53	53	51	52	51	50	47	51	62	56	56	55	64	64	64	64	64	64	65	63	65
13/F	72.1	55	54	52	52	51	51	48	52	63	58	57	57	64	64	64	64	64	64	65	63	65
14/F	75.1	55	55	53	53	52	52	50	53	63	59	58	58	64	64	64	64	64	64	65	63	65
15/F	78.1	56	56	54	53	53	53	51	55	63	60	59	59	64	64	64	64	64	64	65	63	65
16/F	81.1	57	57	55	54	54	54	53	56	64	60	60	59	64	64	64	64	64	65	65	63	65
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0		0		0
Maximum Noise Level, dB(A)		57	57	55	54	54	54	53	56	64	60	60	59	64	64	64	64	65	65	63	65	65

**Site A Tower 4**

Floor	*mPD	N4-01	N4-02	N4-03	N4-04	N4-05	N4-06	N4-07	N4-08	N4-09	N4-10	N4-11	N4-12	N4-13	N4-14	N4-15	N4-16
1/F	27.1	67	66	58	58	57	57	56	55	55	66	67	67	67	67	68	68
2/F	30.1	67	67	58	58	57	57	57	55	55	67	67	67	68	68	69	70
3/F	33.1	67	67	58	58	58	57	57	56	55	67	67	68	68	68	69	69
4/F	36.1	68	68	58	58	58	57	57	56	55	67	67	68	68	68	69	69
5/F	39.1	68	68	58	58	58	57	57	56	55	67	67	68	68	68	69	69
6/F	42.1	69	69	58	58	58	57	57	56	55	67	67	68	68	68	69	69
7/F	45.1	70	70	58	58	57	57	57	56	55	67	67	67	68	68	68	69
8/F	48.1	70	70	58	58	57	57	57	56	55	67	67	67	68	68	68	69
9/F	51.1	71	71	58	58	57	57	57	56	56	67	67	67	67	68	68	69
10/F	54.1	71	71	58	58	57	58	58	56	56	66	67	67	67	68	68	69
11/F	57.1	71	71	58	58	57	58	58	57	56	66	67	67	67	68	68	69
12/F	60.1	71	71	58	58	57	58	58	57	56	66	67	67	67	68	68	69
13/F	63.1	71	71	58	58	57	58	58	57	56	66	67	67	67	68	68	69
14/F	66.1	71	71	58	58	58	58	58	57	57	66	66	67	67	67	68	69
15/F	69.1	71	71	58	58	58	59	59	58	58	66	66	67	67	67	68	69
16/F	72.1	71	71	58	58	58	59	59	59	58	66	66	67	67	67	68	68
17/F	75.1	71	71	58	58	58	59	59	59	59	66	66	67	67	67	67	68
18/F	78.1	71	71	58	58	58	59	60	59	59	66	66	67	67	67	67	68
19/F	81.1	71	71	58	58	58	59	60	59	59	66	66	67	67	67	67	68
Exceedance		11	11	0	0	0	0	0	0	0	0	0	0		0	0	0
Maximum Noise Level, dB(A)		71	71	58	58	58	59	60	59	59	67	67	68	68	68	69	70

~~**Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Low Noise Road Surfacing on Ting Kok Road, 10m high Cantilever Barrier with 3m Cantilever at 45°, Road Side Barrier and Noise Barrier at Central Divider - Case Scenario (PM Peak))**~~

**Site A Tower 5**

Floor	*mPD	N5-01	N5-02	N5-03	N5-04	N5-05	N5-06	N5-07	N5-08	N5-09	N5-10	N5-11	N5-12	N5-13
1/F	27.1	63	63	63	65	68	69	68	66	66	50	51	52	59
2/F	30.1	66	65	66	67	69	69	67	66	66	52	52	53	61
3/F	33.1	67	66	67	68	70	69	67	66	65	54	54	55	62
4/F	36.1	68	67	68	69	70	69	67	66	65	56	56	56	64
5/F	39.1	69	68	68	69	71	68	67	66	65	57	57	58	66
6/F	42.1	69	68	69	70	71	68	67	66	65	58	58	60	67
7/F	45.1	70	69	69	70	71	68	67	66	65	58	59	62	67
8/F	48.1	70	69	69	70	71	68	67	65	65	59	60	63	68
9/F	51.1	70	69	70	70	72	68	66	65	65	60	62	64	68
10/F	54.1	71	69	70	71	72	68	66	65	65	61	62	64	68
11/F	57.1	71	69	70	71	72	67	66	65	65	61	63	64	68
12/F	60.1	71	69	70	71	71	67	66	65	65	62	63	64	69
13/F	63.1	71	70	70	71	71	67	66	65	65	62	63	65	69
14/F	66.1	71	70	70	71	71	67	66	65	64	62	63	65	69
15/F	69.1	70	70	70	70	71	67	66	65	64	62	63	65	69
16/F	72.1	70	70	70	70	71	67	66	65	64	62	63	65	69
17/F	75.1	70	70	70	70	71	67	66	65	64	63	63	65	69
18/F	78.1	70	69	70	70	71	67	65	65	64	63	63	65	69
Exceedance		5	0	0	5	14	0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		71	70	70	71	72	69	68	66	66	63	63	65	69

**Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (Low Noise Road Surfacing on Ting Kok Road, 10m high Cantilever Barrier with 3m Cantilever at 45°, Road Side Barrier and Noise Barrier at Central Divider - Case Scenario (PM Peak))**

**Site B Tower 1**

Floor	*mPD	N6-01	N6-02	N6-03	N6-04	N6-05	N6-06	N6-07	N6-08	N6-09	N6-10	N6-11	N6-12	N6-13	N6-14	N6-15
1/F	28.8	71	76	76	75	73	72	72	73	73	73	73	74	75	75	74
2/F	32.0	71	76	75	74	73	72	72	72	73	73	73	74	75	74	74
3/F	35.1	70	75	75	74	73	72	72	72	72	72	73	74	74	74	73
4/F	38.3	70	75	75	74	73	72	72	72	72	72	72	73	74	74	73
5/F	41.4	70	75	75	74	73	72	72	72	72	72	72	73	74	74	73
6/F	44.6	70	74	74	73	73	71	71	72	72	72	72	73	74	73	73
7/F	47.7	70	74	74	73	72	71	71	72	72	72	72	73	73	73	73
8/F	50.9	69	74	74	73	72	71	71	71	72	71	72	72	73	73	72
9/F	54.0	69	74	73	73	72	71	71	71	71	71	71	72	73	73	72
10/F	57.2	69	73	73	72	72	71	71	71	71	71	71	72	72	72	72
11/F	60.3	69	73	73	72	71	71	71	71	71	71	71	72	72	72	72
12/F	63.5	68	73	73	72	71	70	70	71	71	71	71	71	72	72	72
13/F	66.6	68	73	73	72	71	70	70	70	71	70	71	71	72	72	71
14/F	69.8	68	72	72	72	71	70	70	70	70	70	70	71	72	72	71
15/F	72.9	68	72	72	71	71	70	70	70	70	70	70	71	71	71	71
16/F	76.1	68	72	72	71	71	70	70	70	70	70	70	71	71	71	71
Exceedance		16			16	16	11	11	12	13	12	13	16	16	16	16
Maximum Noise Level, dB(A)		71	76	76	75	73	72	72	73	73	73	73	74	75	75	74

Floor	*mPD	N6-16	N6-17	N6-18	N6-19	N6-20	N6-21	N6-22	N6-23	N6-24	N6-25	N6-26	N6-27	N6-28	N6-29
1/F	28.8	73	72	72	72	72	71	69	53	43	43	43	43	51	57
2/F	32.0	73	72	72	72	72	71	69	53	43	43	43	43	51	57
3/F	35.1	73	72	72	72	72	71	69	53	42	43	43	43	51	57
4/F	38.3	72	72	72	72	72	70	69	53	42	43	43	43	51	57
5/F	41.4	72	72	72	72	72	70	69	54	42	43	43	43	52	57
6/F	44.6	72	72	71	72	72	70	69	57	42	43	43	44	54	58
7/F	47.7	72	71	71	72	72	70	69	58	42	42	43	46	57	60
8/F	50.9	72	71	71	72	72	70	69	58	42	42	42	46	58	61
9/F	54.0	72	71	71	72	72	70	69	58	42	42	42	46	58	61
10/F	57.2	71	71	71	71	72	70	69	58	42	42	42	46	58	61
11/F	60.3	71	71	71	71	71	70	69	58	42	42	42	46	57	61
12/F	63.5	71	71	71	71	71	70	69	58	42	42	42	46	57	61
13/F	66.6	71	71	70	71	71	70	69	58	42	42	42	45	57	61
14/F	69.8	71	70	70	71	71	70	69	58	42	42	43	46	57	61
15/F	72.9	71	70	70	71	71	69	68	58	44	44	44	47	57	61
16/F	76.1	70	70	70	71	71	69	68	58	47	47	47	48	57	61
Exceedance		15	13	12	16	16		0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		73	72	72	72	72	71	69	58	47	47	47	48	58	61

Total no. of Flats:	1750
Total no. of Exceedance:	313
Compliance Level:	82%
Max. Noise Level:	76

Noted:  Noise level exceed stardand of 70 dB(A)

\* The assessment point is located at 1m in front of the most exposed part of an openable window for ventilation at a habitable room (NSRs) and 1.2m above the floor level of individual floors of the residential towers of the proposed development.  
Remark: The predicted noise levels are not the actual noise levels at the external façade after the application of innovative noise mitigation measures (acoustic window (baffle type)/enhanced acoustic balcony (baffle type)). These predicted noise levels are the equivalent noise levels at 1m from the external façade after accounting the reduction in noise levels inside the room offered by the proposed noise mitigation measures.



## **Appendix 18 Site Survey Photo Record of Road Junction Work**

Site Survey Photo Record on 18 July 2024



1. Kau Yan College near Ting Kok Road. (J1)



2. Office in KMB Bus Depot near Dai Fuk Street. (J1)



3. Water treatment plant in KMB Bus Depot near Dai Fuk Street. (J1)



4. Water treatment plant in KMB Bus Depot near Dai Fuk Street. (J1)



5. KMB Bus Depot for Bus Parking. (J1)



6. Unoccupied space with no activity is observed. (J2)





7. Pedestrian walkway and cycling track between Yuen Shin Road and Yuen Shin Park. (J2)



8. Parking space in the junction of Ting Kok Road and Dai Fat Street. (J2)



9. Parking space in the junction of Ting Kok Road and Dai Fat Street. (J2)



10. Tai Po Waterfront Park Bowling Green near Yuen Shin Road. (J2)



11. Bicycle lane near Tai Po Waterfront Park. (J3)



12. Tai Po Waterfront Park Gateball Court. (J3)





13. Gateball Court in Yuen Shin Park near Yuen Shin Road. (J3)



14. Abandon structure in the site of Society of Horticulture, Hong Kong. The site is fenced and there is no sign of activity. (J4)



17. Storage and gardening area of Society of Horticulture Hong Kong. (J4)



18. Storage building of Kee Wah Group Limited. It is clarified by the security guard that the building near Ting Kok Road is used for storage.



19. Storage and gardening area of 麗華花園有限公司. (J7)



20. Structure for resting or administration use of 麗華花園有限公司. (J7)





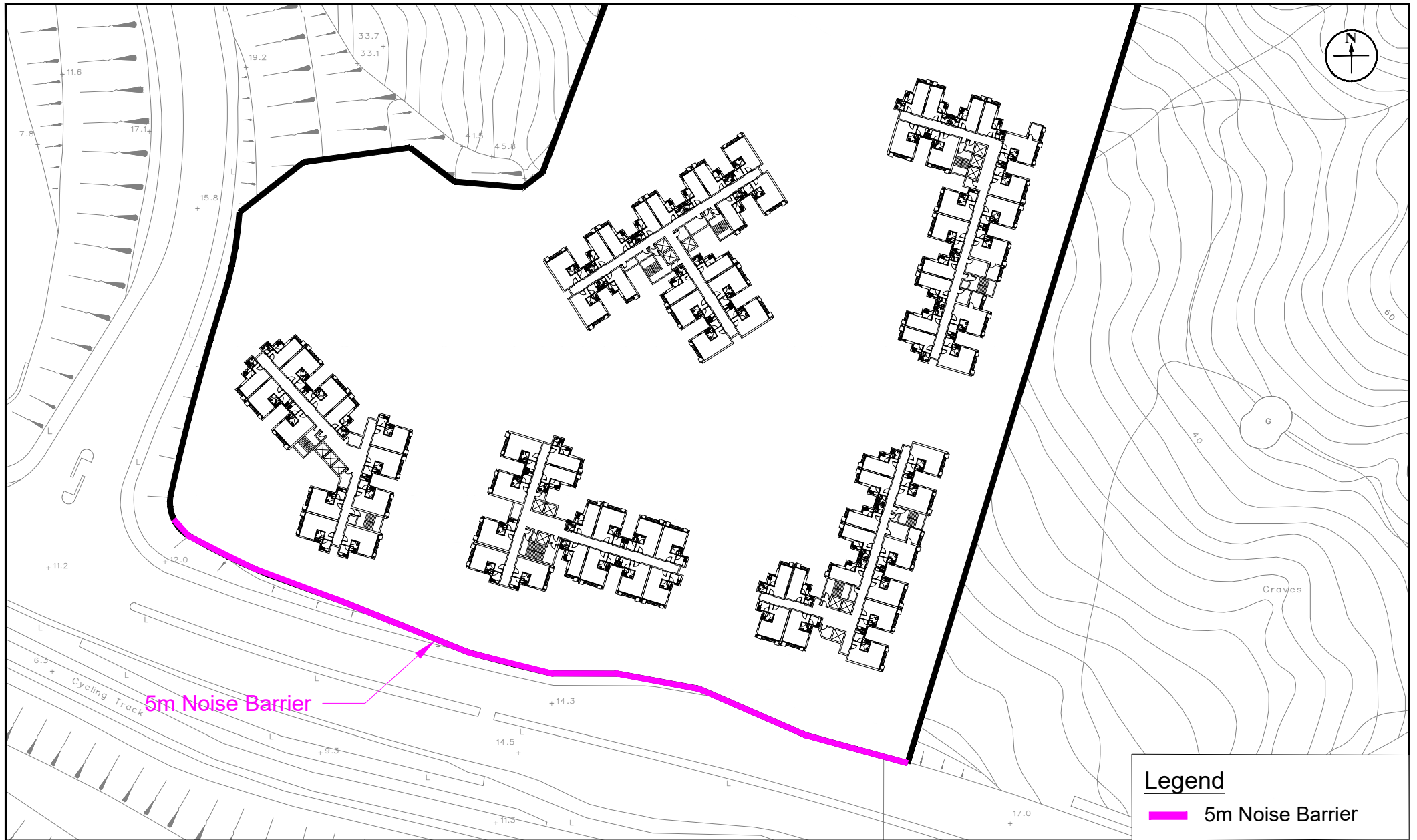
21. Office building of Lee Kum Kee. (J8)



22. Industrial building of Lee Kum Kee.  
(J8)

**Appendix 19      Predicted Traffic Road Noise Level ( $L_{10}(1\text{-hr})$ ) at Selected NSRs  
under 5m high Vertical Barrier Scenario**





## Appendix: 19

**Title:** Location of 5m Noise Barrier

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

**RAMBOLL**

Drawn by: CM

Checked by: CC

Rev.: 1.0

Date: Oct 2024

**Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (5m high Vertical Barrier Scenario (AM Peak))**

**Site A Tower 1**

Floor	*mPD	N1-01	N1-02	N1-03	N1-04	N1-05	N1-06	N1-07	N1-08	N1-09	N1-10	N1-11	N1-12	N1-13	N1-14	N1-15
1/F	27.1	76	76	75	74	73	71	66	66	66	51	45	51	59	61	61
2/F	30.1	77	76	76	75	75	73	70	66	66	51	45	51	59	61	61
3/F	33.1	77	76	76	76	75	74	71	68	67	51	45	51	59	61	61
4/F	36.1	76	76	76	76	74	74	72	69	67	51	45	51	59	61	61
5/F	39.1	76	76	76	75	74	74	72	70	68	51	45	51	59	61	61
6/F	42.1	76	76	76	75	74	74	72	70	69	51	45	51	59	61	61
7/F	45.1	76	76	75	75	74	73	72	70	69	51	45	51	59	61	61
8/F	48.1	76	75	75	75	74	73	71	70	69	51	45	51	59	61	61
9/F	51.1	75	75	75	74	73	73	71	70	69	51	45	51	59	61	61
10/F	54.1	75	75	75	74	73	73	71	70	69	51	44	51	59	61	61
11/F	57.1	75	75	75	74	73	73	71	70	69	51	44	51	59	61	61
12/F	60.1	75	75	74	74	73	72	71	70	69	51	44	51	59	61	61
13/F	63.1	74	74	74	74	72	72	71	69	69	51	44	51	59	61	61
14/F	66.1	74	74	74	73	72	72	71	69	69	51	44	51	59	61	61
15/F	69.1	74	74	74	73	72	72	70	69	69	51	44	51	59	61	61
16/F	72.1	74	74	73	73	72	72	70	69	69	52	44	52	59	61	61
17/F	75.1	74	74	73	73	72	71	70	69	69	52	45	52	59	61	61
18/F	78.1	73	73	73	73	72	71	70	69	68	52	47	53	59	61	61
19/F	81.1	73	73	73	72	71	71	70	69	68	53	50	54	59	61	61
Exceedance		19	19	19	19	19	19	12	0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		77	76	76	76	75	74	72	70	69	53	50	54	59	61	61

**Site A Tower 2**

Floor	*mPD	N2-01	N2-02	N2-03	N2-04	N2-05	N2-06	N2-07	N2-08	N2-09	N2-10	N2-11	N2-12	N2-13	N2-14	N2-15	N2-16	N2-17	N2-18
1/F	36.1	61	51	51	50	50	69	68	68	68	68	67	67	67	59	61	59	59	58
2/F	39.1	62	53	52	52	52	69	68	68	68	67	67	67	67	59	60	59	59	58
3/F	42.1	62	55	54	53	54	69	68	68	68	67	67	67	67	59	60	59	59	58
4/F	45.1	63	57	56	55	55	69	68	68	68	67	67	67	67	59	60	59	59	57
5/F	48.1	63	58	57	56	56	69	68	68	68	67	67	67	67	59	60	59	59	57
6/F	51.1	63	58	58	57	57	69	69	68	68	67	67	67	67	59	60	59	59	57
7/F	54.1	63	59	58	58	58	69	69	69	68	68	67	67	67	59	60	59	59	57
8/F	57.1	64	59	59	58	58	69	69	69	68	68	67	67	67	59	60	59	59	57
9/F	60.1	64	60	59	59	58	69	69	69	68	68	68	67	67	59	60	59	59	57
10/F	63.1	64	60	59	59	59	69	69	69	68	68	68	68	67	59	60	59	58	57
11/F	66.1	64	60	59	59	59	69	69	69	68	68	68	68	67	59	60	59	58	57
12/F	69.1	64	60	59	59	59	69	69	69	68	68	68	68	68	59	60	59	58	57
13/F	72.1	63	60	59	59	59	69	69	69	68	68	68	68	68	59	60	59	58	57
14/F	75.1	63	60	59	59	59	69	69	69	68	68	68	68	68	59	60	59	58	57
15/F	78.1	63	60	59	59	59	69	69	69	68	68	68	68	68	59	60	59	58	57
16/F	81.1	63	60	59	59	59	69	69	69	68	68	68	68	68	59	60	59	58	57
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		64	60	59	59	59	69	69	69	68	68	68	68	68	59	61	59	59	58

**Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (5m high Vertical Barrier Scenario (AM Peak))**

**Site A Tower 3**

Floor	*mPD	N3-01	N3-02	N3-03	N3-04	N3-05	N3-06	N3-07	N3-08	N3-09	N3-10	N3-11	N3-12	N3-13	N3-14	N3-15	N3-16	N3-17	N3-18	N3-19	N3-20	N3-21
1/F	36.1	50	50	53	54	52	50	47	49	62	43	42	42	63	64	65	66	66	67	65	67	68
2/F	39.1	51	51	53	54	52	50	47	49	62	43	43	43	64	64	65	66	66	67	65	67	68
3/F	42.1	53	52	54	54	53	51	48	50	62	44	43	43	64	64	65	66	66	67	65	68	68
4/F	45.1	54	54	54	55	53	52	49	51	62	44	44	43	65	65	66	66	67	67	65	68	68
5/F	48.1	56	56	55	55	54	52	50	51	62	45	44	44	65	65	66	66	67	67	65	68	68
6/F	51.1	57	57	56	56	54	53	51	52	62	46	45	45	65	65	66	66	67	67	65	68	68
7/F	54.1	58	57	57	57	55	54	52	53	63	47	46	46	65	66	66	66	67	67	65	68	68
8/F	57.1	59	58	58	58	56	55	53	54	63	48	47	47	66	66	66	67	67	67	65	68	68
9/F	60.1	59	59	58	58	57	56	54	55	63	50	49	49	66	66	66	67	67	67	65	68	68
10/F	63.1	60	59	58	58	57	56	55	56	63	53	52	51	66	66	66	67	67	67	65	68	68
11/F	66.1	60	60	59	59	58	57	56	57	64	56	55	55	66	66	67	67	67	67	65	68	68
12/F	69.1	61	60	59	59	58	57	56	57	64	58	57	57	66	66	67	67	67	67	65	68	68
13/F	72.1	61	61	59	59	58	58	57	58	64	59	58	58	66	66	67	67	67	67	65	68	68
14/F	75.1	61	61	60	60	59	58	57	58	65	60	59	59	66	66	67	67	67	67	65	68	68
15/F	78.1	61	61	60	60	59	59	58	59	65	61	60	60	66	66	67	67	67	67	65	68	68
16/F	81.1	62	61	60	60	59	59	59	60	65	62	61	61	66	66	67	67	67	67	65	68	68
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0		0		0
Maximum Noise Level, dB(A)		62	61	60	60	59	59	59	60	65	62	61	61	66	66	67	67	67	67	65	68	68

**Site A Tower 4**

Floor	*mPD	N4-01	N4-02	N4-03	N4-04	N4-05	N4-06	N4-07	N4-08	N4-09	N4-10	N4-11	N4-12	N4-13	N4-14	N4-15	N4-16
1/F	27.1	77	77	60	59	59	59	59	58	57	69	69	70	70	70	71	73
2/F	30.1	77	77	60	60	59	59	59	58	58	69	70	70	71	71	72	75
3/F	33.1	77	77	60	60	59	60	60	59	58	69	70	71	71	72	73	75
4/F	36.1	77	77	60	60	59	61	61	60	59	70	70	71	71	72	73	75
5/F	39.1	77	77	60	60	59	61	62	61	60	70	70	71	71	72	73	74
6/F	42.1	76	76	60	60	59	62	63	62	61	70	70	71	71	72	73	74
7/F	45.1	76	76	60	60	59	62	63	63	62	70	70	71	71	72	72	74
8/F	48.1	76	76	60	59	59	62	63	63	63	70	70	71	71	72	72	74
9/F	51.1	76	76	60	59	59	62	63	63	63	70	70	71	71	72	72	73
10/F	54.1	75	75	60	59	59	62	63	63	63	70	70	71	71	71	72	73
11/F	57.1	75	75	60	59	59	62	63	63	63	70	70	71	71	71	72	73
12/F	60.1	75	75	60	59	59	62	63	63	63	70	70	70	71	71	71	73
13/F	63.1	75	75	60	59	59	62	63	63	63	69	70	70	70	71	71	72
14/F	66.1	74	74	59	59	59	62	63	63	63	69	70	70	70	71	71	72
15/F	69.1	74	74	59	59	59	62	63	63	63	69	70	70	70	71	71	72
16/F	72.1	74	74	59	59	60	62	63	63	63	69	70	70	70	70	71	72
17/F	75.1	74	74	59	59	60	62	63	63	63	69	69	70	70	70	71	72
18/F	78.1	74	74	59	59	60	62	63	63	63	69	69	70	70	70	70	71
19/F	81.1	74	74	60	60	60	62	63	63	63	69	69	70	70	70	70	71
Exceedance		19	19	0	0	0	0	0	0	0	0	0	11		14	17	19
Maximum Noise Level, dB(A)		77	77	60	60	60	62	63	63	63	70	70	71	71	72	73	75



**Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (5m high Vertical Barrier Scenario (AM Peak))**

**Site A Tower 5**

Floor	*mPD	N5-01	N5-02	N5-03	N5-04	N5-05	N5-06	N5-07	N5-08	N5-09	N5-10	N5-11	N5-12	N5-13
1/F	27.1	76	75	75	76	77	71	69	68	67	57	60	65	75
2/F	30.1	76	75	75	76	77	71	69	68	67	61	64	70	75
3/F	33.1	76	75	76	76	77	71	69	68	67	65	68	72	75
4/F	36.1	76	75	76	76	77	70	69	67	67	67	69	72	75
5/F	39.1	76	75	75	76	76	70	69	67	67	68	70	72	74
6/F	42.1	76	75	75	76	76	70	68	67	67	68	70	72	74
7/F	45.1	75	75	75	76	76	70	68	67	67	69	70	72	74
8/F	48.1	75	75	75	75	76	70	68	67	67	69	70	71	74
9/F	51.1	75	74	75	75	76	69	68	67	67	69	70	71	73
10/F	54.1	75	74	75	75	75	69	68	67	66	69	70	71	73
11/F	57.1	74	74	74	75	75	69	68	67	66	68	70	71	73
12/F	60.1	74	74	74	75	75	69	67	67	66	68	69	71	73
13/F	63.1	74	74	74	75	75	69	67	66	66	68	69	71	72
14/F	66.1	74	73	74	74	75	69	67	66	66	68	69	70	72
15/F	69.1	74	73	74	74	75	69	67	66	66	68	69	70	72
16/F	72.1	74	73	74	74	74	68	67	66	66	68	69	70	72
17/F	75.1	73	73	73	74	74	68	67	66	66	68	69	70	72
18/F	78.1	73	73	73	74	74	68	67	66	66	68	69	70	72
Exceedance		18	18	18	18	18	3	0	0	0	0	0	11	18
Maximum Noise Level, dB(A)		76	75	76	76	77	71	69	68	67	69	70	72	75

**Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (5m high Vertical Barrier Scenario (AM Peak))**

**Site B Tower 1**

Floor	*mPD	N6-01	N6-02	N6-03	N6-04	N6-05	N6-06	N6-07	N6-08	N6-09	N6-10	N6-11	N6-12	N6-13	N6-14	N6-15
1/F	28.8	71	76	76	75	74	73	73	73	73	73	74	75	76	75	74
2/F	32.0	71	76	76	75	74	73	73	73	73	73	73	74	75	75	74
3/F	35.1	71	76	76	75	74	73	73	73	73	73	73	74	75	75	74
4/F	38.3	71	76	75	74	73	72	72	73	73	73	73	74	75	74	74
5/F	41.4	71	75	75	74	73	72	72	73	73	73	73	74	74	74	74
6/F	44.6	70	75	75	74	73	72	72	72	72	72	73	73	74	74	73
7/F	47.7	70	75	75	74	73	72	72	72	72	72	72	73	74	74	73
8/F	50.9	70	74	74	73	73	72	72	72	72	72	72	73	74	74	73
9/F	54.0	70	74	74	73	73	72	72	72	72	72	72	73	73	73	73
10/F	57.2	69	74	74	73	72	71	71	72	72	72	72	72	73	73	73
11/F	60.3	69	74	74	73	72	71	71	71	72	71	72	72	73	73	73
12/F	63.5	69	74	73	73	72	71	71	71	71	71	71	72	73	73	72
13/F	66.6	69	73	73	72	72	71	71	71	71	71	71	72	72	72	72
14/F	69.8	69	73	73	72	72	71	71	71	71	71	71	72	72	72	72
15/F	72.9	69	73	73	72	71	71	71	71	71	71	71	71	72	72	72
16/F	76.1	68	73	73	72	71	70	70	71	71	71	71	71	72	72	72
Exceedance		16			16	16	15	15	16	16	16	16	16	16	16	16
Maximum Noise Level, dB(A)		71	76	76	75	74	73	73	73	73	73	74	75	76	75	74

Floor	*mPD	N6-16	N6-17	N6-18	N6-19	N6-20	N6-21	N6-22	N6-23	N6-24	N6-25	N6-26	N6-27	N6-28	N6-29
1/F	28.8	73	73	73	73	73	71	70	53	43	44	44	44	52	58
2/F	32.0	73	73	72	73	73	71	70	53	43	43	44	43	52	58
3/F	35.1	73	73	72	73	73	71	70	53	43	43	44	43	52	58
4/F	38.3	73	72	72	73	73	71	70	54	43	43	43	43	52	58
5/F	41.4	73	72	72	73	73	71	70	54	43	43	43	44	52	58
6/F	44.6	73	72	72	73	73	71	70	58	43	43	43	45	54	59
7/F	47.7	73	72	72	72	73	71	70	59	43	43	43	46	57	61
8/F	50.9	72	72	72	72	72	71	70	59	43	43	43	46	58	61
9/F	54.0	72	72	72	72	72	71	70	59	43	43	43	46	58	62
10/F	57.2	72	72	72	72	72	71	70	59	43	43	43	46	58	62
11/F	60.3	72	72	71	72	72	71	69	58	42	43	43	46	58	62
12/F	63.5	72	71	71	72	72	70	69	58	42	43	43	46	58	62
13/F	66.6	72	71	71	72	72	70	69	58	42	42	43	46	58	61
14/F	69.8	71	71	71	72	72	70	69	58	43	43	43	46	58	61
15/F	72.9	71	71	71	71	72	70	69	58	45	45	45	47	58	61
16/F	76.1	71	71	71	71	72	70	69	58	48	48	47	49	58	61
Exceedance		16	16	16	16	16		0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		73	73	73	73	73	71	70	59	48	48	47	49	58	62

Total no. of Flats:	1750
Total no. of Exceedance:	633
Compliance Level:	64%
Max. Noise Level:	77

Noted:  Noise level exceed stardand of 70 dB(A)

\* The assessment point is located at 1m in front of the most exposed part of an openable window for ventilation at a habitable room (NSRs) and 1.2m above the floor level of individual floors of the residential towers of the proposed development.  
Remark: The predicted noise levels are not the actual noise levels at the external façade after the application of innovative noise mitigation measures (acoustic window (baffle type)/enhanced acoustic balcony (baffle type)). These predicted noise levels are the equivalent noise levels at 1m from the external façade after accounting the reduction in noise levels inside the room offered by the proposed noise mitigation measures.

**Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (5m high Vertical Barrier Scenario (PM Peak))**

**Site A Tower 1**

Floor	*mPD	N1-01	N1-02	N1-03	N1-04	N1-05	N1-06	N1-07	N1-08	N1-09	N1-10	N1-11	N1-12	N1-13	N1-14	N1-15
1/F	27.1	75	75	74	73	72	70	65	64	65	50	45	50	57	60	60
2/F	30.1	76	76	76	75	74	73	69	65	65	50	45	50	57	60	60
3/F	33.1	76	76	76	75	74	73	71	67	65	50	45	50	57	60	60
4/F	36.1	76	76	76	75	74	73	71	68	66	50	44	50	57	59	60
5/F	39.1	76	76	75	75	74	73	71	69	67	50	44	50	57	59	60
6/F	42.1	75	75	75	75	74	73	71	69	67	50	44	50	57	59	60
7/F	45.1	75	75	75	74	73	73	71	69	68	50	44	50	57	59	60
8/F	48.1	75	75	75	74	73	73	71	69	68	50	44	50	57	59	60
9/F	51.1	75	75	74	74	73	72	71	69	68	50	44	50	57	59	60
10/F	54.1	75	74	74	74	73	72	71	69	68	50	44	50	57	59	60
11/F	57.1	74	74	74	73	72	72	70	69	68	50	44	50	57	59	60
12/F	60.1	74	74	74	73	72	72	70	69	68	50	44	50	57	59	60
13/F	63.1	74	74	74	73	72	72	70	69	68	50	43	50	57	59	60
14/F	66.1	74	74	73	73	72	71	70	69	68	50	43	50	57	59	60
15/F	69.1	73	73	73	73	71	71	70	69	68	50	43	50	57	59	60
16/F	72.1	73	73	73	72	71	71	70	68	68	50	44	51	57	59	60
17/F	75.1	73	73	73	72	71	71	69	68	68	51	44	51	57	59	60
18/F	78.1	73	73	73	72	71	71	69	68	68	51	46	51	58	59	60
19/F	81.1	73	73	72	72	71	71	69	68	68	52	49	52	58	60	60
Exceedance		19	19	19	19	19	18	8	0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		76	76	76	75	74	73	71	69	68	52	49	52	58	60	60

**Site A Tower 2**

Floor	*mPD	N2-01	N2-02	N2-03	N2-04	N2-05	N2-06	N2-07	N2-08	N2-09	N2-10	N2-11	N2-12	N2-13	N2-14	N2-15	N2-16	N2-17	N2-18
1/F	36.1	60	51	50	49	49	68	67	67	67	67	66	66	66	59	60	59	58	57
2/F	39.1	61	52	51	51	51	68	67	67	67	67	66	66	66	58	60	59	58	57
3/F	42.1	61	54	53	52	53	68	67	67	67	67	66	66	66	58	60	59	58	57
4/F	45.1	62	56	55	54	54	68	67	67	67	67	66	66	66	58	60	59	58	57
5/F	48.1	62	57	56	55	55	68	67	67	67	67	66	66	66	58	60	59	58	57
6/F	51.1	62	57	57	56	56	68	68	67	67	67	66	66	66	58	60	58	58	57
7/F	54.1	63	58	57	57	57	68	68	68	67	67	66	66	66	58	60	58	58	57
8/F	57.1	63	59	58	57	57	68	68	68	67	67	66	66	66	58	60	58	58	57
9/F	60.1	63	59	58	58	58	68	68	68	67	67	67	66	66	58	60	58	58	57
10/F	63.1	63	59	58	58	58	68	68	68	67	67	67	67	66	58	59	58	58	57
11/F	66.1	63	59	59	58	58	68	68	68	67	67	67	67	66	58	59	58	58	56
12/F	69.1	63	59	59	58	58	68	68	68	67	67	67	67	67	58	59	58	58	56
13/F	72.1	63	59	59	58	58	68	68	68	67	67	67	67	67	58	59	58	58	56
14/F	75.1	63	59	59	58	58	68	68	68	67	67	67	67	67	58	59	58	58	56
15/F	78.1	63	59	59	58	58	68	68	68	67	67	67	67	67	58	59	58	58	56
16/F	81.1	63	59	59	59	58	68	68	68	67	67	67	67	67	58	59	58	58	57
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		63	59	59	59	58	68	68	68	67	67	67	67	67	59	60	59	58	57



**Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (5m high Vertical Barrier Scenario (PM Peak))**

**Site A Tower 3**

Floor	*mPD	N3-01	N3-02	N3-03	N3-04	N3-05	N3-06	N3-07	N3-08	N3-09	N3-10	N3-11	N3-12	N3-13	N3-14	N3-15	N3-16	N3-17	N3-18	N3-19	N3-20	N3-21
1/F	36.1	49	49	51	52	51	49	46	48	61	42	41	41	63	63	65	65	66	66	64	67	67
2/F	39.1	50	50	52	53	51	49	46	48	61	42	42	42	63	64	65	65	66	66	64	67	67
3/F	42.1	52	51	52	53	51	50	47	49	61	43	42	42	63	64	65	65	66	66	64	67	68
4/F	45.1	53	53	53	54	52	50	48	50	61	43	43	42	64	64	65	65	66	66	64	67	68
5/F	48.1	55	54	54	54	53	51	49	50	61	44	43	43	64	65	65	66	66	66	65	67	68
6/F	51.1	56	56	55	55	53	52	50	51	61	45	44	44	65	65	65	66	66	66	65	67	68
7/F	54.1	57	56	56	56	54	53	51	52	62	46	45	45	65	65	66	66	66	67	65	67	68
8/F	57.1	58	57	57	56	55	54	52	53	62	47	46	46	65	65	66	66	66	67	65	67	68
9/F	60.1	58	58	57	57	56	55	53	54	62	49	48	48	65	65	66	66	66	67	65	67	68
10/F	63.1	59	58	57	57	56	55	54	55	62	51	50	50	65	65	66	66	67	67	65	67	68
11/F	66.1	59	59	58	58	56	56	54	55	63	55	54	53	65	66	66	66	67	67	65	67	68
12/F	69.1	60	60	58	58	57	56	55	56	63	56	56	55	65	66	66	66	67	67	65	67	68
13/F	72.1	60	60	59	59	57	57	56	57	63	58	57	57	66	66	66	66	67	67	65	67	68
14/F	75.1	60	60	59	59	58	57	56	57	64	59	58	58	66	66	66	66	67	67	65	67	68
15/F	78.1	61	60	59	59	58	58	57	58	64	60	59	59	66	66	66	66	67	67	65	67	68
16/F	81.1	61	61	60	59	59	58	58	59	64	60	60	60	66	66	66	66	67	67	65	67	67
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0		0		0
Maximum Noise Level, dB(A)		61	61	60	59	59	58	58	59	64	60	60	60	66	66	66	66	67	67	65	67	68

**Site A Tower 4**

Floor	*mPD	N4-01	N4-02	N4-03	N4-04	N4-05	N4-06	N4-07	N4-08	N4-09	N4-10	N4-11	N4-12	N4-13	N4-14	N4-15	N4-16
1/F	27.1	76	76	58	58	58	57	57	57	56	69	69	69	69	70	70	72
2/F	30.1	77	77	59	58	58	58	58	57	57	69	69	70	70	71	72	74
3/F	33.1	76	76	59	58	58	59	59	58	57	69	69	70	70	71	72	74
4/F	36.1	76	76	59	58	58	60	60	59	58	69	70	70	71	72	72	74
5/F	39.1	76	76	59	58	58	60	61	60	59	69	70	70	71	72	72	74
6/F	42.1	76	76	59	58	58	61	62	61	60	69	70	70	71	72	72	74
7/F	45.1	76	76	59	58	58	61	62	62	61	69	70	70	71	71	72	73
8/F	48.1	75	75	58	58	58	61	62	62	62	69	70	70	71	71	72	73
9/F	51.1	75	75	58	58	58	61	63	63	62	69	70	70	71	71	72	73
10/F	54.1	75	75	58	58	58	61	63	63	62	69	70	70	70	71	71	73
11/F	57.1	75	75	58	58	58	61	62	63	62	69	69	70	70	71	71	72
12/F	60.1	74	74	58	58	58	61	62	63	62	69	69	70	70	71	71	72
13/F	63.1	74	74	58	58	58	61	62	63	62	69	69	70	70	70	71	72
14/F	66.1	74	74	58	58	58	61	62	63	62	69	69	70	70	70	71	72
15/F	69.1	74	74	58	58	58	61	62	63	63	69	69	69	70	70	70	71
16/F	72.1	73	73	58	58	58	61	62	63	63	69	69	69	70	70	70	71
17/F	75.1	73	73	58	58	58	61	62	63	63	69	69	69	69	70	70	71
18/F	78.1	73	73	58	58	58	61	62	63	63	68	69	69	69	70	70	71
19/F	81.1	73	73	58	58	59	61	62	63	63	68	69	69	69	69	70	71
Exceedance		19	19	0	0	0	0	0	0	0	0	0	6		11	13	19
Maximum Noise Level, dB(A)		77	77	59	58	59	61	63	63	63	69	70	70	71	72	72	74

**Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (5m high Vertical Barrier Scenario (PM Peak))**

**Site A Tower 5**

Floor	*mPD	N5-01	N5-02	N5-03	N5-04	N5-05	N5-06	N5-07	N5-08	N5-09	N5-10	N5-11	N5-12	N5-13
1/F	27.1	76	74	74	75	76	70	68	67	66	57	59	64	74
2/F	30.1	76	75	75	75	76	70	68	66	66	60	63	69	74
3/F	33.1	76	75	75	75	76	69	68	66	66	63	67	71	74
4/F	36.1	75	75	75	75	76	69	67	66	66	66	68	71	74
5/F	39.1	75	74	75	75	76	69	67	66	66	67	69	71	74
6/F	42.1	75	74	75	75	75	69	67	66	66	68	69	71	74
7/F	45.1	75	74	74	75	75	69	67	66	66	68	69	71	73
8/F	48.1	74	74	74	75	75	68	67	66	65	68	69	71	73
9/F	51.1	74	74	74	74	75	68	67	66	65	68	69	71	73
10/F	54.1	74	73	74	74	75	68	66	66	65	68	69	71	73
11/F	57.1	74	73	74	74	75	68	66	65	65	68	69	70	72
12/F	60.1	74	73	74	74	74	68	66	65	65	68	69	70	72
13/F	63.1	73	73	73	74	74	68	66	65	65	68	69	70	72
14/F	66.1	73	73	73	74	74	67	66	65	65	68	68	70	72
15/F	69.1	73	73	73	73	74	67	66	65	65	67	68	70	72
16/F	72.1	73	72	73	73	74	67	66	65	65	67	68	69	71
17/F	75.1	73	72	73	73	74	67	66	65	65	67	68	69	71
18/F	78.1	73	72	73	73	73	67	66	65	64	67	68	69	71
Exceedance		18	18	18	18	18	0	0	0	0	0	0	8	18
Maximum Noise Level, dB(A)		76	75	75	75	76	70	68	67	66	68	69	71	74

**Predicted Traffic Road Noise Level (L10(1-hr)) at Selected NSRs - Residential Tower (5m high Vertical Barrier Scenario (PM Peak))**

**Site B Tower 1**

Floor	*mPD	N6-01	N6-02	N6-03	N6-04	N6-05	N6-06	N6-07	N6-08	N6-09	N6-10	N6-11	N6-12	N6-13	N6-14	N6-15
1/F	28.8	71	76	76	75	73	72	72	73	73	73	73	74	75	75	74
2/F	32.0	71	76	75	74	73	72	72	72	73	73	73	74	75	74	74
3/F	35.1	70	75	75	74	73	72	72	72	72	72	73	74	74	74	73
4/F	38.3	70	75	75	74	73	72	72	72	72	72	72	73	74	74	73
5/F	41.4	70	75	75	74	73	72	72	72	72	72	72	73	74	74	73
6/F	44.6	70	74	74	73	73	71	71	72	72	72	72	73	74	73	73
7/F	47.7	70	74	74	73	72	71	71	72	72	72	72	73	73	73	73
8/F	50.9	69	74	74	73	72	71	71	71	72	71	72	72	73	73	72
9/F	54.0	69	74	73	73	72	71	71	71	71	71	71	72	73	73	72
10/F	57.2	69	73	73	72	72	71	71	71	71	71	71	72	72	72	72
11/F	60.3	69	73	73	72	71	71	71	71	71	71	71	72	72	72	72
12/F	63.5	68	73	73	72	71	70	70	71	71	71	71	71	72	72	72
13/F	66.6	68	73	73	72	71	70	70	70	71	70	71	71	72	72	71
14/F	69.8	68	72	72	72	71	70	70	70	70	70	70	71	72	72	71
15/F	72.9	68	72	72	71	71	70	70	70	70	70	70	71	71	71	71
16/F	76.1	68	72	72	71	71	70	70	70	70	70	70	71	71	71	71
Exceedance		16			16	16	11	11	12	13	12	13	16	16	16	16
Maximum Noise Level, dB(A)		71	76	76	75	73	72	72	73	73	73	73	74	75	75	74

Floor	*mPD	N6-16	N6-17	N6-18	N6-19	N6-20	N6-21	N6-22	N6-23	N6-24	N6-25	N6-26	N6-27	N6-28	N6-29
1/F	28.8	73	72	72	72	72	71	69	53	43	43	43	43	51	57
2/F	32.0	73	72	72	72	72	71	69	53	43	43	43	43	51	57
3/F	35.1	73	72	72	72	72	71	69	53	42	43	43	43	51	57
4/F	38.3	72	72	72	72	72	70	69	53	42	43	43	43	51	57
5/F	41.4	72	72	72	72	72	70	69	54	42	43	43	43	52	57
6/F	44.6	72	72	71	72	72	70	69	57	42	43	43	44	54	58
7/F	47.7	72	71	71	72	72	70	69	58	42	42	43	46	57	60
8/F	50.9	72	71	71	72	72	70	69	58	42	42	42	46	58	61
9/F	54.0	72	71	71	72	72	70	69	58	42	42	42	46	58	61
10/F	57.2	71	71	71	71	72	70	69	58	42	42	42	46	58	61
11/F	60.3	71	71	71	71	71	70	69	58	42	42	42	46	57	61
12/F	63.5	71	71	71	71	71	70	69	58	42	42	42	46	57	61
13/F	66.6	71	71	70	71	71	70	69	58	42	42	42	45	57	61
14/F	69.8	71	70	70	71	71	70	69	58	42	42	43	46	57	61
15/F	72.9	71	70	70	71	71	69	68	58	44	44	44	47	57	61
16/F	76.1	70	70	70	71	71	69	68	58	47	47	47	48	57	61
Exceedance		15	13	12	16	16		0	0	0	0	0	0	0	0
Maximum Noise Level, dB(A)		73	72	72	72	72	71	69	58	47	47	47	48	58	61

Total no. of Flats:	1750
Total no. of Exceedance:	580
Compliance Level:	67%
Max. Noise Level:	77

Noted:  Noise level exceed stardand of 70 dB(A)

\* The assessment point is located at 1m in front of the most exposed part of an openable window for ventilation at a habitable room (NSRs) and 1.2m above the floor level of individual floors of the residential towers of the proposed development.  
Remark: The predicted noise levels are not the actual noise levels at the external façade after the application of innovative noise mitigation measures (acoustic window (baffle type)/enhanced acoustic balcony (baffle type)). These predicted noise levels are the equivalent noise levels at 1m from the external façade after accounting the reduction in noise levels inside the room offered by the proposed noise mitigation measures.



Prepared for

**Kam Luk Investment Company Limited**

Prepared by

**Ramboll Hong Kong Limited**

**PROPOSED PUBLIC RESIDENTIAL HOUSING / STARTER  
HOMES DEVELOPMENT AT UDWYT LOT 14RP AND  
ADJOINING GOVERNMENT LAND (SITE A) & PROPOSED  
PRIVATE RESIDENTIAL DEVELOPMENT AT UDWYT LOT 11  
RP AND ADJOINING GOVERNMENT LAND (SITE B), WONG  
YUE TAN, TAI PO**

**WATER SUPPLY IMPACT ASSESSMENT**

Date **February 2025**

Prepared by **Miko Wan**  
**Environmental Consultant**

Signed



Approved by **Calvin Chiu**  
**Technical Director**



Signed

Project Reference **NFDUDWYTEI00**

Document No. **R8257\_v1.6**

No part of this document may be reproduced or transmitted, in any form or by any means electronic, mechanical, photographic, recording or otherwise, or stored in a retrieval system of any nature without the written permission of Ramboll Hong Kong Ltd, application for which shall be made to Ramboll Hong Kong Ltd, 21/F, BEA Harbour View Centre, 56 Gloucester Road, Wan Chai, Hong Kong.

Disclaimer: This report is made on behalf of Ramboll Hong Kong Ltd. No individual is personally liable in connection with the preparation of this report. By receiving this report and acting on it, the client or any third party relying on it accepts that no individual is personally liable in contract, tort or breach of statutory duty (including negligence).

Ramboll Hong Kong Limited

21/F, BEA Harbour View Centre  
56 Gloucester Road, Wan Chai, Hong Kong

Tel: (852) 3465 2888  
Fax: (852) 3465 2899  
Email: hkinfo@ramboll.com

Q:\Projects\NFDUDWYTEI00\04 Deliverables\05 WSIA Report\R8257\_v1.6\_no highlight.docx

## CHAPTERS

	Page
<b>1. INTRODUCTION .....</b>	<b>1-1</b>
1.1 Project Background.....	1-1
1.2 Subject Site and its Environ .....	1-1
1.3 Proposed Development.....	1-1
<b>2. WATER SUPPLY IMPACT ASSESSMENT .....</b>	<b>2-1</b>
2.1 Scope of Work.....	2-1
2.2 Assessment Criteria and Methodology .....	2-1
2.3 Assessment of Water Demand.....	2-1
2.4 Proposed Water Supply System .....	2-2
<b>3. OVERALL CONCLUSION.....</b>	<b>3-1</b>

## FIGURES

Figure 1	Location of Site A and Site B and its Environ
Figure 2	Existing Water Supply System in the Vicinity
Figure 3	Proposed Freshwater Supply System for Site A
Figure 4	Proposed Freshwater Supply System for Site B
Figure 5	Proposed Saltwater Supply System for Site A
Figure 6	Proposed Saltwater Supply System for Site B

## APPENDICES

Appendix 1	Detailed Water Supply Impact Assessment Calculations
Appendix 2	Records Obtained from Water Supplies Department



## 1. INTRODUCTION

### 1.1 Project Background

- 1.1.1 Referring to the Lands Sharing Pilot Scheme ("LSPS") application at Lo Fai Road/ Ting Kok Road with application no. LSPS/001 on 19 July 2021, the applicant has revised the submission.
- 1.1.2 The application involves two private lots, namely Lot 14 RP and Lot 11 RP in Unserved District at Wong Yue Tan ("UDWYT") and adjoining Government Lands ("GL"). Lot 14 RP and adjoining Government Land (Site A) would be designated for public housing / Starter Homes Housing development, whereas Lot 11 RP and adjoining Government Land (Site B) would be designated for proposed private residential development.
- 1.1.3 As per request from Water Supplies Department (WSD) (dated 1 September 2021), a Water Supply Impact Assessment (WSIA) is submitted herewith for further information.
- 1.1.4 Ramboll Hong Kong Limited has been commissioned by the Applicant to provide environmental consultancy services for the WSIA for the Proposed Development at Site A and Site B.

### 1.2 Site A and Site B and its Environ

- 1.2.1 Site A and Site B are located at Ting Kok Road in Tai Po with residential developments and Tai Po Industrial Estate nearby. The existing use of the sites is vacant.
- 1.2.2 Site A is bounded by Ting Kok Road to the south, and Lo Fai Road to the west. The area to the north to east is vegetated slope area zoned Green Belt.
- 1.2.3 Site B is bounded by Ting Kok Road to the south. The area to the south to east is vegetated slope area zoned Green Belt.
- 1.2.4 The location and its environs are shown in **Figure 1**.

### 1.3 Proposed Development

- 1.3.1 Site A will consist of 1,290 public residential housing / SH housing units with population density of 2.8 while Site B will have 460 private housing units with population density of 2.8 (based on 2021 population census average domestic household size in Tai Po New Town). In addition, GIC uses such as residential care home for elderly (RCHE) and retail facilities will be included in Site A as well. The expected year for completion of the Proposed Development is 2033 tentatively. Yet, it may take extra time to design and complete the development so that the project may be completed as late as by 2033.

## 2. WATER SUPPLY IMPACT ASSESSMENT

### 2.1 Scope of Work

- 2.1.1 The aim of this study is to assess whether the capacity of the existing water supply facilities serving Site A and Site B is sufficient to cope with the water demands from the Proposed Development. Data and record plans from Water Supplies Department (WSD) were obtained to facilitate the WSIA.

### 2.2 Assessment Criteria and Methodology

- 2.2.1 According to the information of fresh water and flushing water supply zones provided by WSD, Site A and Site B will be served by the Tai Po East Low Level Fresh Water Service Reservoir (TPELLFWSR), which has a capacity of 14,600 m<sup>3</sup>. There is existing water main in the vicinity of the sites. The sites are outside the existing saltwater supply zone. The nearest saltwater supply facility is Tai Po Salt Water Pumping Station (Tai Po SWPS), with design daily output of 38,000 m<sup>3</sup>/day. The existing saltwater main nearest to the sites is immediately adjacent to Tai Po East Fresh Water Pumping Station. The existing water supply network is shown in **Figure 2** and **Appendix 2**.
- 2.2.2 Reference has been made to the Water Supplies Department's Departmental Instruction 1309 (WSD DI 1309), as well as Environmental Protection Department's (EPD's) Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning (GESF). In addition, Planning Department's (PlanD) Commercial and Industrial Floor Space Utilization Survey (CIFUS) have also been used.
- 2.2.3 WSD DI 1309 sets out the design criteria for water supplies in Hong Kong and includes unit water demands for various classes of consumer. Apart from the above, EPD's GESF includes unit sewage flow factors for various residential development.
- 2.2.4 For this WSIA, WSD's data from DI 1309 has been referenced to provide unit water demands for the various population categories. with the relevant EPD GESF unit sewage flow factors to determine overall unit water demand factors. PlanD's CIFSUS has been also referenced for calculation of the population density where necessary.
- 2.2.5 The unit water demand has been combined with the relevant development parameters to assess the future water demands, from which the potential impacts have been assessed. Calculations for the water demands of the Indicative Scheme are included in **Appendix 1**.

### 2.3 Assessment of Water Demand

- 2.3.1 As shown in table 1 in **Appendix 1**, the mean daily demand (MDD) of fresh water arising from Site A will amount to about 1,459.1 m<sup>3</sup>/day of fresh water and 439.8 m<sup>3</sup>/day of flushing water, and the MDD arising from Site B will be about 450.8 m<sup>3</sup>/day of fresh water and 134.0 m<sup>3</sup>/day of flushing water.
- 2.3.2 For freshwater, the total MMD of the Proposed Development is 1,909.9 m<sup>3</sup>/day, which is equivalent to about 13.0% of the capacity of the FWSR. Given that the contribution is not significant, the Proposed Development would unlikely pose any adverse impact to existing water service reservoirs.
- 2.3.3 For flushing water supply, as advised by WSD, the Proposed Development should connect to the salt water supply instead of fresh water supply. The total MDD of the Proposed Development is 573.8 m<sup>3</sup>/day, which is equivalent to about 1.5% of the capacity of the existing Tai Po SWPS. In addition, the maximum average daily output is only 32MLD. Therefore, there is ample spare capacity and the Proposed Development would unlikely pose any significant impact to existing saltwater pumping station.

## 2.4 Proposed Water Supply System

### Freshwater Supply System

- 2.4.1 The existing freshwater supply system serving Site A and Site B is shown in **Figure 2**. There is an existing Ø600 mm water main to the west of Site A along Lo Fai Road near the location of main entrance, and an existing Ø450 mm water main to the south of Site B along Ting Kok Road. To supply freshwater to the sites, it is proposed to lay new connections to the existing water mains. A Ø150 mm and a Ø100 mm internal dia. water pipes are proposed for fresh water supply for Site A and Site B respectively. **Figure 3** and **Figure 4** show the proposed freshwater supply schemes.
- 2.4.2 According to Table 2a and 2b in **Appendix 1**, the existing Ø450 mm water main to the south of Site A & B, as well as the proposed Ø150 mm (connecting Site A and the existing Ø450 mm water main) and Ø100 mm water main (connecting Site B and the existing Ø450 mm water main) will have adequate capacity to serve Site A and Site B respectively.
- 2.4.3 A pair of strainers on both distribution main and by-pass watermain is proposed before the connection point to the subject site to enhance the freshwater quality supply.

### Saltwater Supply System

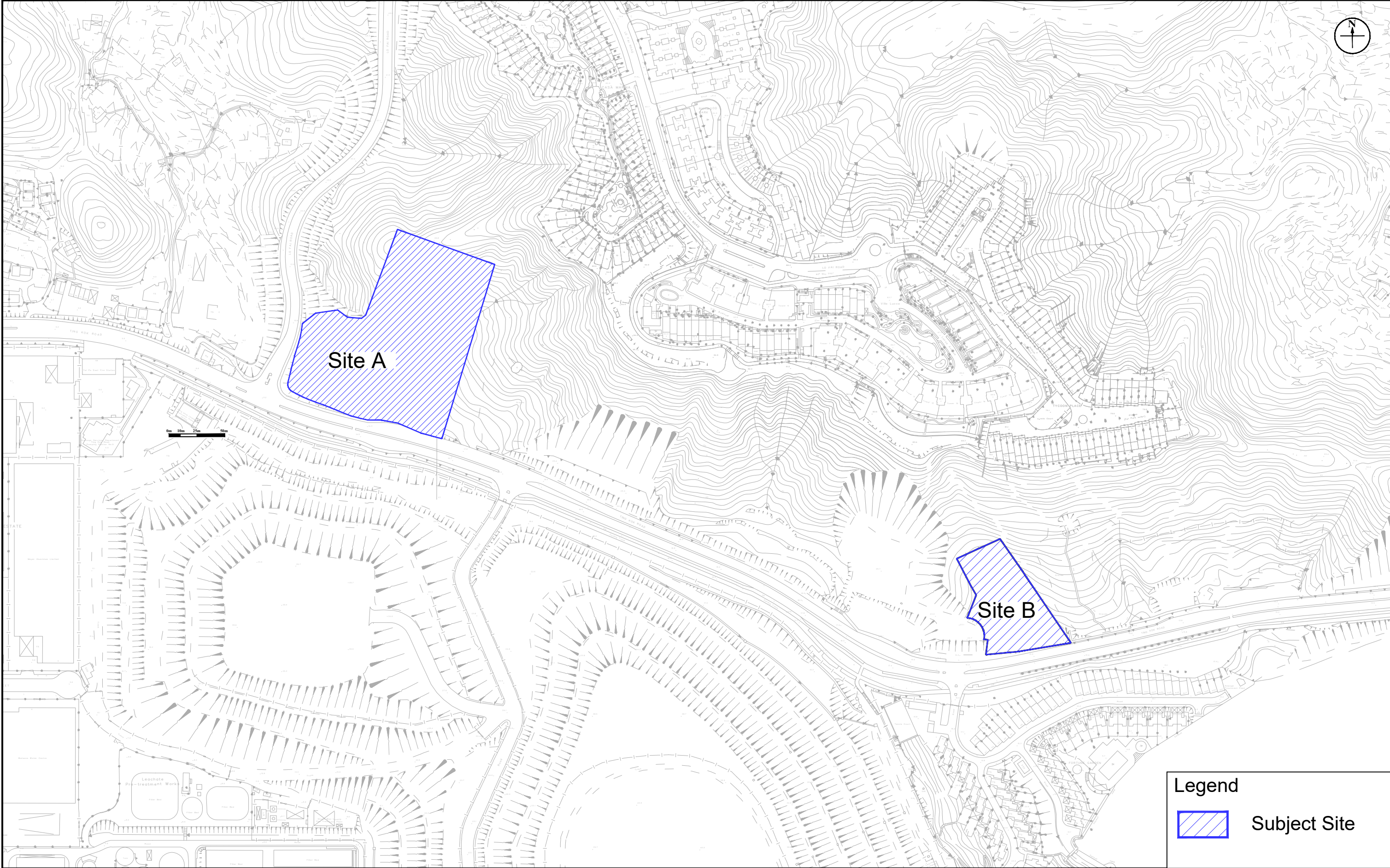
- 2.4.4 The existing saltwater supply system nearby Site A is shown in **Figure 5** (It is noted that there is no salt water supply system nearby Site B). There is an existing Ø200 mm water main to the west of Site A at Ting Lok Road immediately adjacent to Tai Po East Fresh Water Pumping Station. It is proposed to build a new connection from this existing saltwater main to both Site A and Site B. A Ø200 mm water main is proposed to connect from the abovementioned existing Ø200 mm water main to across Lo Fai Road. For Site A, a Ø80 mm water main will be branched (after crossing Lo Fai Road) from the proposed Ø200 water main to the site. For Site B, a Ø200 mm water main (of over 500m) will be branched from the proposed Ø200 water main and constructed along the kerbside of Ting Kok Road. **Figure 5** and **Figure 6** show the proposed saltwater supply schemes.
- 2.4.5 According to Table 2a and 2b in **Appendix 1**, the existing Ø200 mm water main located immediately adjacent to Tai Po East Fresh Water Pumping Station, the proposed Ø200 mm water main (crossing Lo Fai Road), the proposed Ø80 mm water main (connecting Site A) and Ø50 mm (connecting Site B) water main have adequate capacity to serve Site A and Site B respectively.
- 2.4.6 For both freshwater and saltwater system, no upgrading works of the existing pumping stations, service reservoirs and water mains is necessary.
- 2.4.7 The proposed water pipe will be aligned along the internal access road within the sites. For Site B, the pipe will have to cross Ting Kok Road before reaching the site. Alignment of proposed connection for both sites are already the shortest path to existing water supply system to minimise cost and time of construction. Open cut method for pipe laying purpose should be adopted as far as practicable. Other method may be considered in case open cut is not allowed. Total closure of road is not expected for the construction of the water supply system. Details of the internal water supply system for fresh and flushing water supply and the proposed connection to the public water supply system would be finalized in the detailed design stage.



### **3. OVERALL CONCLUSION**

- 3.1.1 The potential water supply impacts have been quantitatively addressed.
- 3.1.2 The existing FWSR have adequate capacity to cater the demand of the Proposed Development. The saltwater demand of the Proposed Development is about 1.38% of the design output of the existing SWPS. No adverse water supply impact is anticipated due to the Proposed Development.
- 3.1.3 Connections will be made to the existing water mains to serve the Proposed Development. Based on the assessment, the existing and proposed water main are adequate to serve both Site A and Site B. No upgrading works of the existing pumping stations, service reservoirs and water mains are recommended.

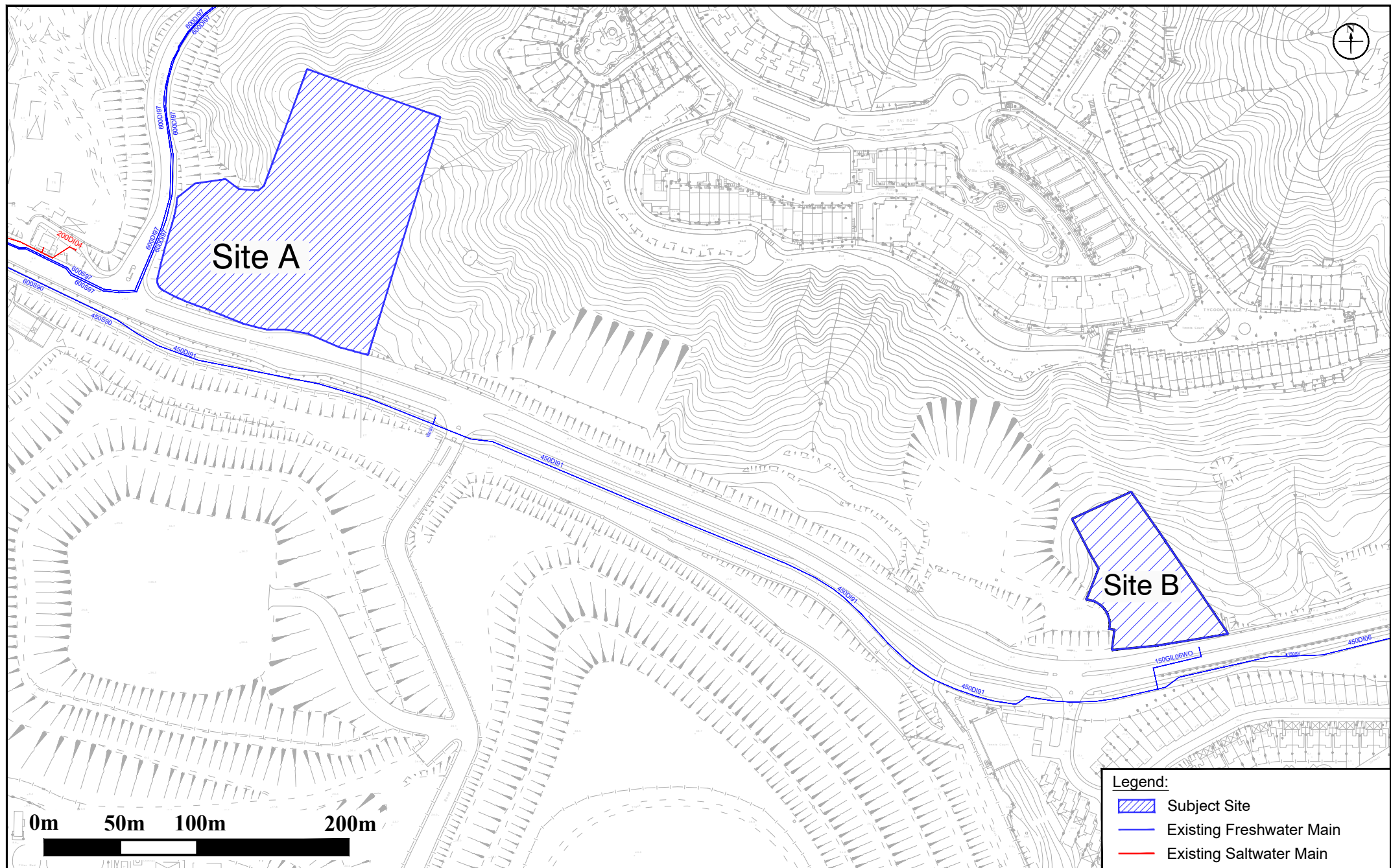
## Figures



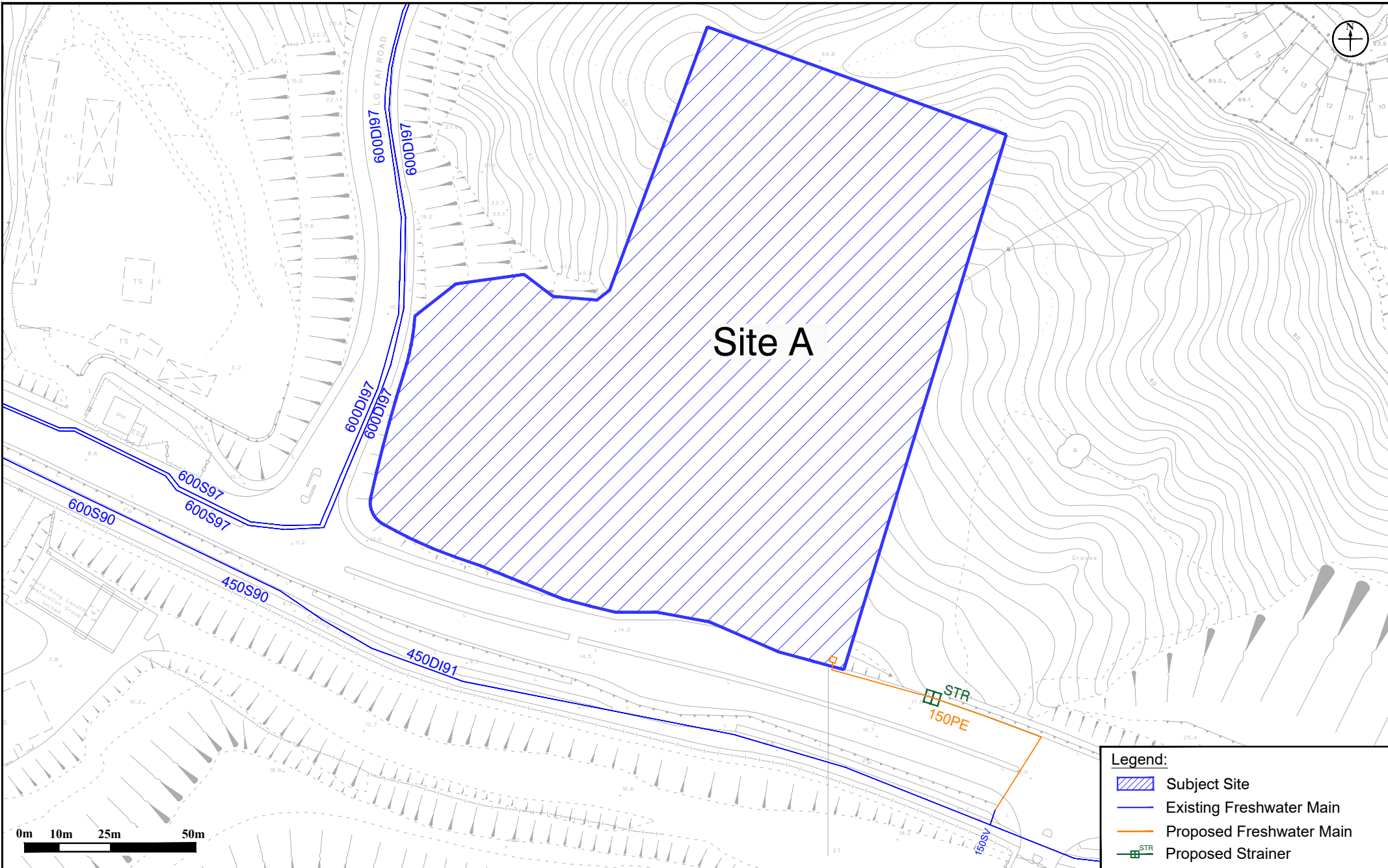
<b>Figure:</b> 1		
	<b>Title:</b>	Location of the Subject Site and its Environ
	<b>Project:</b> Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP (Site A) & UDWYT Lot 11 RP (Site B), Wong Yue Tan, Tai Po	

Drawn by:	MW
Checked by:	CC
Rev.:	1.4
Date:	Oct 2024





<b>Figure:</b> 2	<b>RAMBOLL</b>
<b>Title:</b> Existing Water Supply System in the Vicinity of the Subject Site	Drawn by: MW Checked by: CC
<b>Project:</b> Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po	Rev.: 1.3 Date: Oct 2024

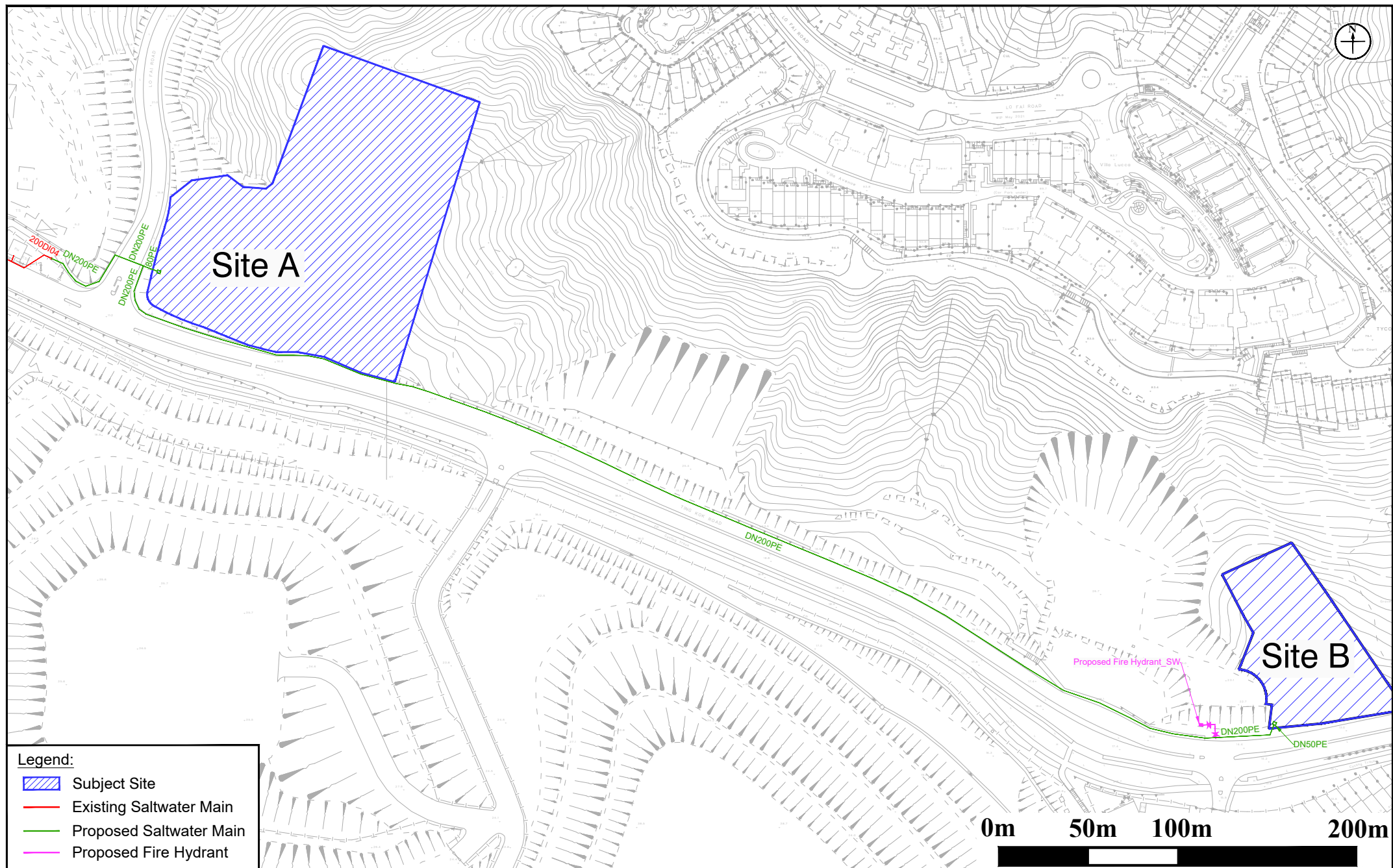


<b>Figure:</b> 3		RAMBOLL	
<b>Title:</b> Proposed Freshwater Supply System for Site A		Drawn by: MW	
<b>Project:</b> Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po		Checked by: CC	
		Rev.: 1.3	
		Date: Oct 2024	









<b>Figure:</b> 6	<b>RAMBOLL</b>
<b>Title:</b> Proposed Saltwater Supply System for Site B	Drawn by: MW
<b>Project:</b> Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po	Checked by: CC
	Rev.: 1.4
	Date: Oct 2024

## **Appendix 1 Detailed Water Supply Impact Assessment Calculations**



**Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po**

**Table 1a Future Water Demands of Site A**

				Freshwater		Flushing Water	
		Type of Use	Population (head)	Daily Unit Demand <sup>(1)</sup> (m³/head/day)	Daily Demand (m³/day)	Daily Unit Demand <sup>(1)</sup> (m³/head/day)	Daily Demand (m³/day)
Future (Site A)	Residential Development	Residential Density Zone R2	3973	0.350	1390.55	0.104	413.19
	GIC	GIC	106	0.250	26.50	0.104	11.02
	GIC Residents	Residential Density Zone R1	150	0.280	42.00	0.104	15.60
					1459.1		439.8

**Table 1b Future Water Demands of Site B**

				Freshwater		Flushing Water	
		Type of Use	Population (head)	Daily Unit Demand <sup>(1)</sup> (m <sup>3</sup> /head/day)	Daily Demand (m <sup>3</sup> /day)	Daily Unit Demand <sup>(1)</sup> (m <sup>3</sup> /head/day)	Daily Demand (m <sup>3</sup> /day)
Future (Site B)	Residential Development	Residential Density Zone R2	1288	0.350	450.80	0.104	133.95
					<b>450.8</b>		<b>134.0</b>

**Remarks:**

(1) Water Supplies Department Departmental Instruction 1309. Service Trade of 0.050 m<sup>3</sup>/head/day (Tai Po) adopted.

**Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po**

**Water Main Assessment of the Proposed Water Supply Systems**

**Table 2a Hydraulic Capacity of the Existing Water Main**

	Segment	Diameter (mm)	Material	Peak factor <sup>(1)</sup>	Demand, Q (cu. m/day)	Factored Q (cu. m/s)	Area (m <sup>2</sup> )	Velocity of Water Main (m/s) (2)	Flow Rate of Water Main (m <sup>3</sup> /s)	% of water main occupied by the Proposed Site
Fresh Water	Water mains along Ting Kok Road (Site A& B)	450	DI	3	1909.9	0.066	0.159	1.50	0.239	28%
Salt Water	Water main near Tai Po East Fresh Water Pumping Station (Site A& B)	200	DI	2	573.8	0.013	0.031	1.50	0.047	28%

**Table 2b Hydraulic Capacity of the Proposed Water Main**

	Segment	Diameter (mm)	Material	Peak factor <sup>(1)</sup>	Demand, Q (cu. m/day)	Factored Q (cu. m/s)	Area (m <sup>2</sup> )	Velocity of Distribution Main (m/s) (2)	Flow Rate of Water Main (m <sup>3</sup> /s)	% of water main occupied by the Proposed Site
Fresh Water	New connection to Water mains along Lo Fai Road (Site A)	150	PE	3	1459.1	0.051	0.018	<b>2.87</b>	0.051	100%
	New connection to Water mains along along Ting Kok Road (Site B)	100	PE	3	450.8	0.016	0.008	<b>1.99</b>	0.016	100%
Salt Water	New Connection to Water main crossing Lo Fai Road along Ting Kok Road (Site A & Site B)	200	PE	2	573.8	0.013	0.031	<b>0.42</b>	0.013	100%
	New Connection to Water main (Site A)	80	PE	2	439.8	0.010	0.005	<b>2.03</b>	0.010	100%
	New Connection to Water main (Site B)	50	PE	2	134.0	0.003	0.002	<b>1.58</b>	0.003	100%

<sup>(1)</sup> Peak factor for distribution mains refers to Departmental Instruction No. 1309 from WSD

<sup>(2)</sup> Mean velocity of water mains assumed as 1.5 m/s; Velocity of distribution mains should be less than 3 m/s

## **Appendix 2      Records Obtained from Water Supplies Department**

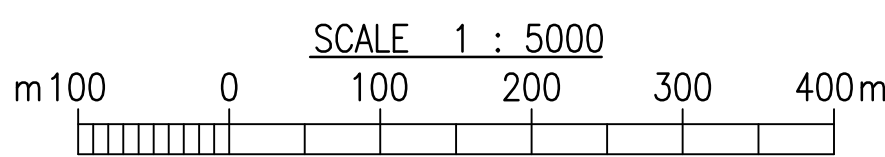




SUPPLY FROM  
3.6 下坑食水配水庫 (SR113)  
Ha Hang FW SR

3.72  
大埔東高地食水配水庫 (SR172)  
Tai Po East HL FW SR

3.82  
大埔東低地食水配水庫 (SR201)  
Tai Po East LL FW SR

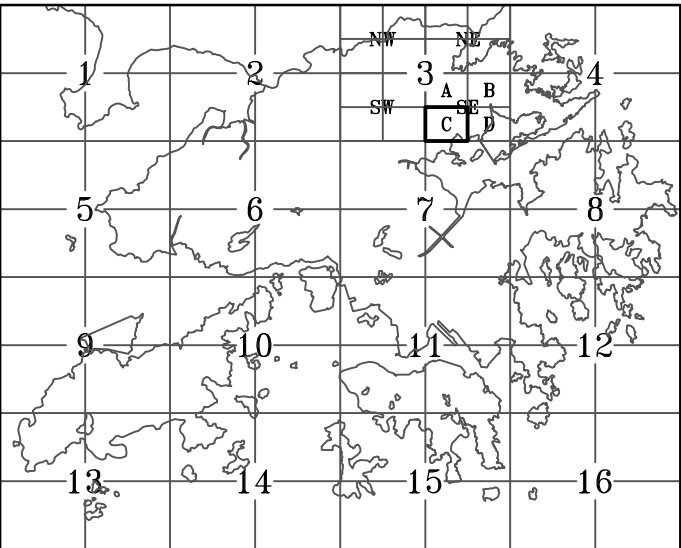


NOTES:

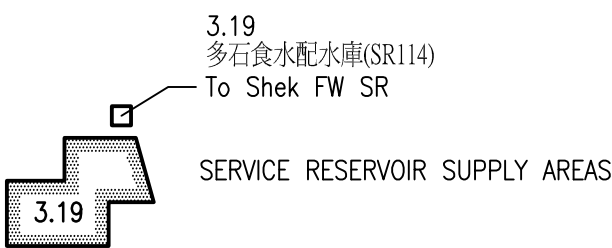
**COPYRIGHT RESERVED**  
This print may not be copied, traced,  
or exhibited without permission of the  
Water Authority.

1. FOR DETAILED CUTLINE BOUNDARIES  
AND SUBSEQUENT CHANGES PLEASE REFER  
TO RECORDS KEPT BY THE RESPECTIVE  
HEADWORKS ENGINEERS.

INDEX TO SHEETS



LEGEND :



編號 no.	日期 date	摘要 description	簽署 initial
-----------	------------	-------------------	---------------

REVISION

測量 surveyed	姓名 name	簽署 initial	日期 date
設計 designed			
繪製 drawn			
摹印 traced			
核對 checked			
加簽 endorsed			

核准  
approved

CE/NTE

合約編號 contract no.	
檔案編號 file no.	WWO 358/2.12.4
工務編號 project no.	
合約 contract	

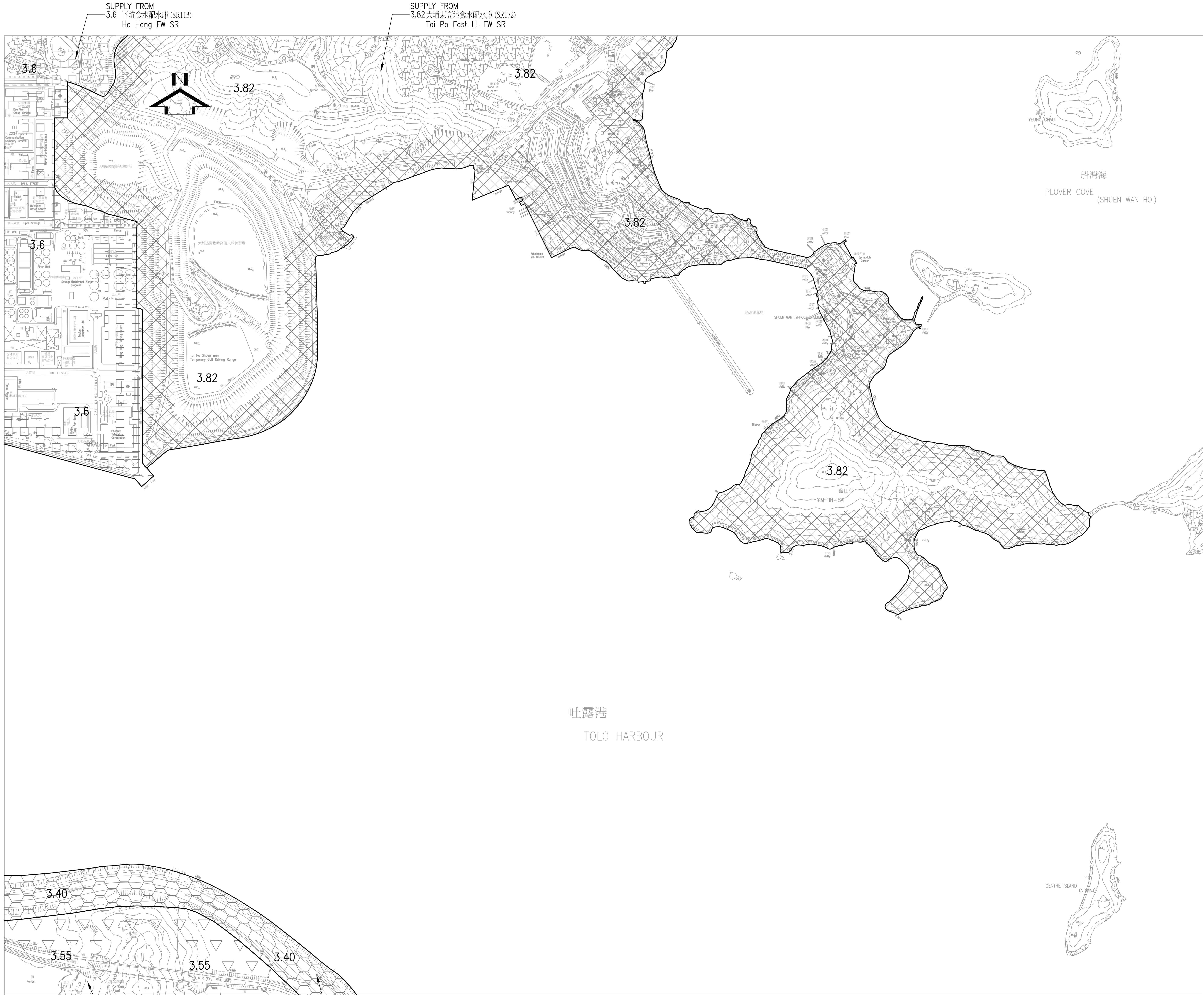
圖則名稱  
drawing title

**FRESH WATER SUPPLY ZONES-  
NEW TERRITORIES EAST  
(SURVEY SHEET NO. 3SE-C)**

(AS AT 12-12-2007)

圖則編號 drawing no.	比例 scale
W 60026/3/3SE-C	1 : 5 000

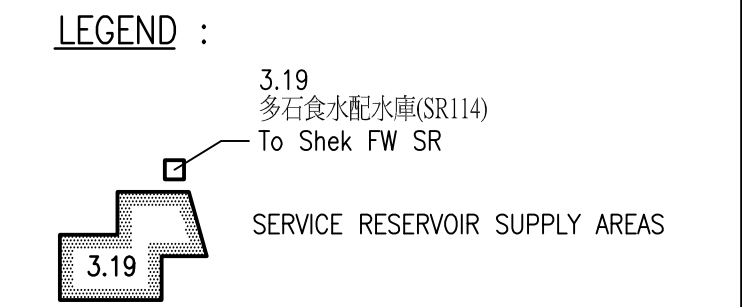
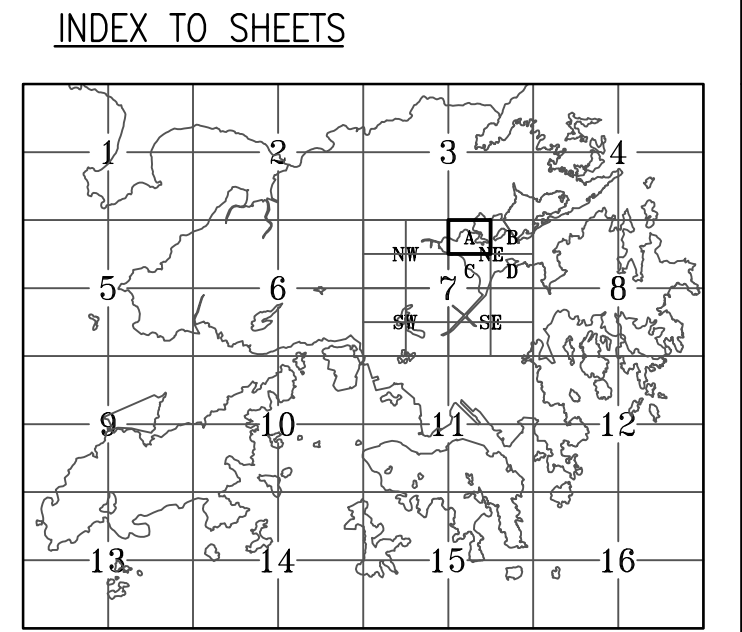




NOTES:

**COPYRIGHT RESERVED**  
This print may not be copied, traced, or exhibited without permission of the Water Authority.

1. FOR DETAILED CUTLINE BOUNDARIES AND SUBSEQUENT CHANGES PLEASE REFER TO RECORDS KEPT BY THE RESPECTIVE HEADWORKS ENGINEERS.



編號 no.	日期 date	摘要 description	簽署 initial
REVISION			
測量 surveyed		姓名 name	簽署 initial 日期 date
設計 designed			
繪製 drawn			
摹印 traced			
核對 checked			
加簽 endorsed			

核准  
approved

CE/NTE

合約編號 contract no.	
檔案編號 file no.	WWO 358/2.12.4
工務編號 project no.	
合約 contract	

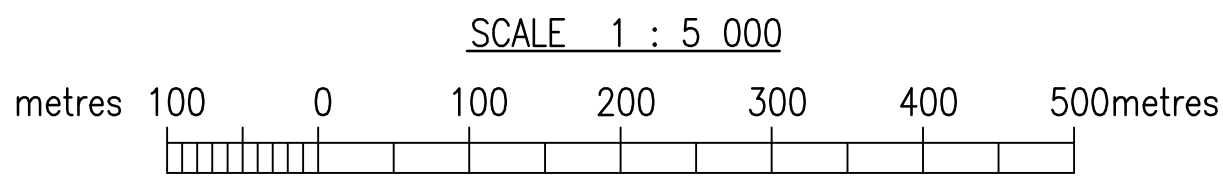
圖則名稱  
drawing title

**FRESH WATER SUPPLY ZONES-  
NEW TERRITORIES EAST  
(SURVEY SHEET NO. 7NE-A)**

(AS AT 12-12-2007)

圖則編號 drawing no.	比例 scale
W 60026/3/7NE-A	1 : 5 000

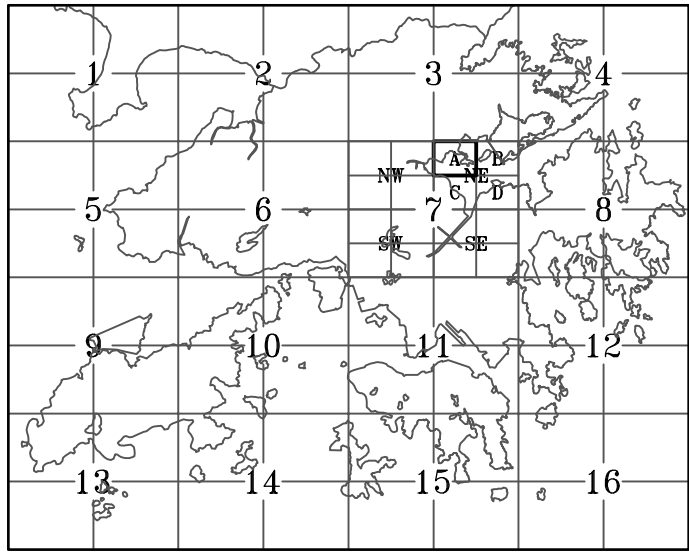




NOTES:

**COPYRIGHT RESERVED**  
This print may not be copied, traced, or exhibited without permission of the Water Authority.

INDEX TO SHEETS



LEGEND :

- 3.21 將軍澳西低地海水配水庫(SR206)  
Tseung Kwan O West LL SW SR
- SERVICE RESERVOIR / PUMPING STATION SUPPLY AREAS
- SUPPLY CODE

編號 no.	日期 date	摘要 description	簽署 initial
REVISION			
編號 no.	姓名 name	簽署 initial	日期 date
測量 surveyed			
設計 designed			
繪製 drawn			
摹印 traced			
核對 checked			
加簽 endorsed			
核准 approved			
CE/NTE			

合約編號 contract no.	
檔案編號 file no.	WWO 358/2.12.5
工務編號 project no.	
合約 contract	

圖則名稱 drawing title  
**FLUSHING WATER  
SUPPLY ZONES -  
NEW TERRITORIES EAST  
(SURVEY SHEET NO. 7NE-A)**  
(AS AT 20-08-2012)

圖則編號 drawing no.	比例 scale
W 60027/3/7NE-A	1 : 5 000











INSET 'A'

INSET 'B'

INSET 'C'

INSET 'D'

INSET 'E'

INSET 'F'



NOTES:  
1. FOR MAINS RECORDS SIGN CONVENTIONS AND DESIGNATIONS SEE SKETCH NO.3988.  
2. DIMENSIONS OF MAINS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.  
3. ALL LEVELS ARE IN METRES ABOVE PRINCIPAL DATUM.

Baseline Date Updated On: 30/06/2019

SCALE 1:1 000

METRES 20 10 0 20 40 60 80 100 METRES

7-NE-1D

FRESH WATER MAINS RECORD PLAN

TING KOK ROAD, SHUEN WAN

THIS IS A COMPUTER PRINTOUT.  
NO SIGNATURE IS REQUIRED.

COPYRIGHT RESERVED

DATE REVISED : 08/03/2023

DRAWING NO.

W67880/ 7-NE-1B

SIGNED C.S. CHIN  
CE/MNE

DATE: 23/04/1999

Water Supplies Department  
HONG KONG

© The Government of the Hong Kong SAR, Map reproduced with permission of the Director of Lands



INSET 'A'

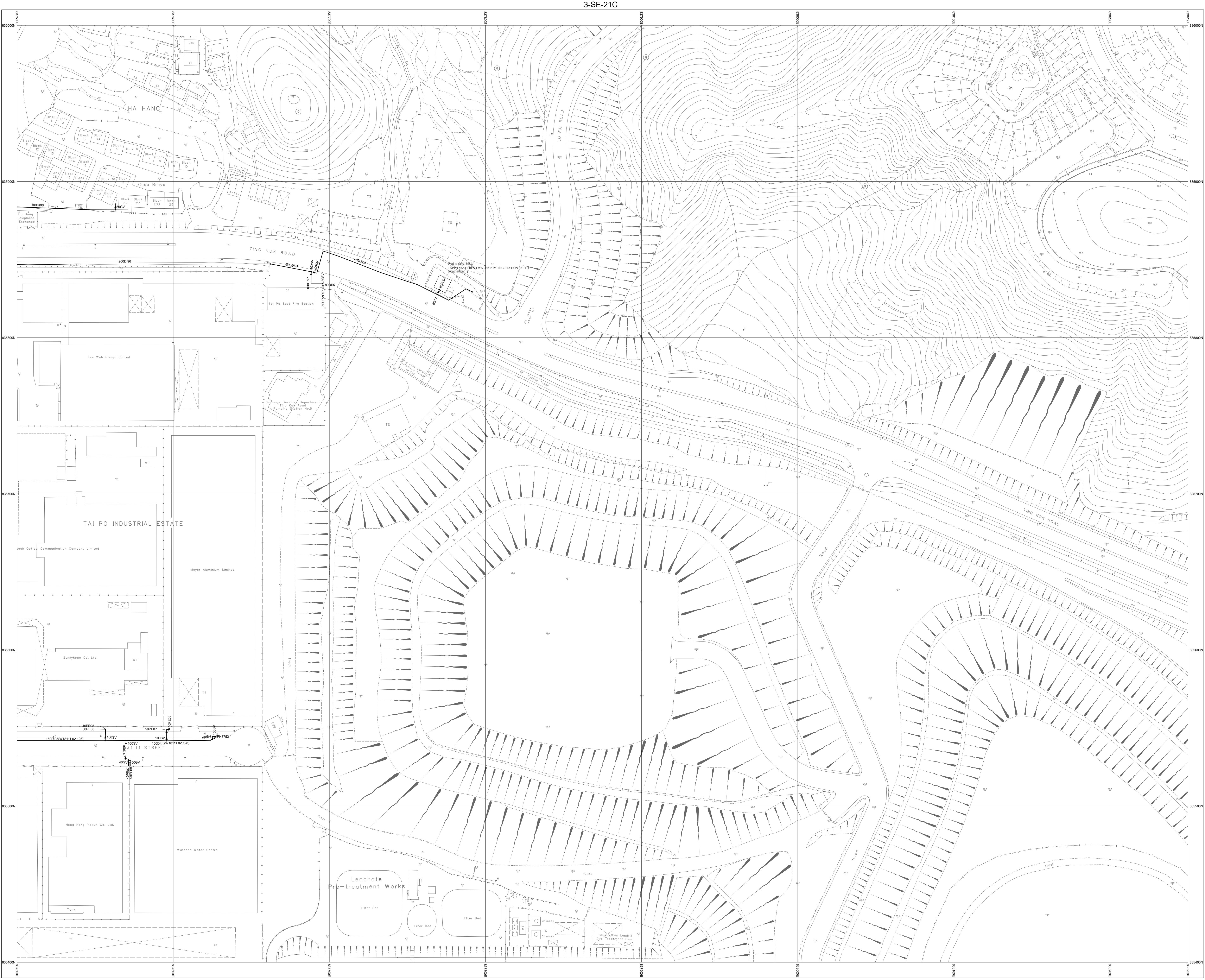
INSET 'B'

INSET 'C'

INSET 'D'

INSET 'E'

INSET 'F'



NOTES:  
1. FOR MAINS RECORDS SIGN CONVENTIONS AND DESIGNATIONS SEE SKETCH NO.3988.  
2. DIMENSIONS OF MAINS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.  
3. ALL LEVELS ARE IN METRES ABOVE PRINCIPAL DATUM.

7-NW-5B

7-NE-1B

7-NE-1C

THIS IS A COMPUTER PRINTOUT.  
NO SIGNATURE IS REQUIRED.

COPYRIGHT RESERVED

DATE REVISED : 20/04/2022

SIGNED  
C.S. CHIN  
CE/MNE  
DATE: 06/05/1999

DRAWING NO.

W67881/ 7-NE-1A

Water Supplies Department  
HONG KONG

SCALE 1:1 000

METRES 20 10 0 20 40 60 80 100 METRES

SALT WATER MAINS RECORD PLAN

TING KOK ROAD, HA HANG

© The Government of the Hong Kong SAR, Map reproduced with permission of the Director of Lands

## Andrew Lok

---

**From:** cy\_lau@wsd.gov.hk  
**Sent:** Friday, April 28, 2023 12:07 PM  
**To:** Andrew Lok  
**Cc:** Calvin Chiu; emily\_cy\_lee@wsd.gov.hk; Miko Wan; victoria\_wh\_suen@wsd.gov.hk; y\_lao@wsd.gov.hk  
**Subject:** Fw: Water Supply Impact Assessment for a Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP (Site A) & UDWYT Lot 11 RP (Site B), Wong Yue Tan, Tai Po - Enquiry for Existing Water Supply Network

Some people who received this message don't often get email from cy\_lau@wsd.gov.hk. [Learn why this is important](#)

Dear Andrew,

Please note that the design reliable output of Tai Po SWPS is 38 MLD and the maximum average daily output is around 32MLD between April 2019 and Feb 2023. Thanks.

Regards,  
Anthony CY Lau  
E/NTE(HW1), WSD  
Tel. No. 2152 5610

----- Forwarded by CY LAU/WSD/HKSARG on 28-04-2023 12:01 -----

**From:** Andrew Lok <ANDREWLOK@ramboll.com>  
**To:** "cy\_lau@wsd.gov.hk" <cy\_lau@wsd.gov.hk>  
**Cc:** Calvin Chiu <cchiu@ramboll.com>, "emily\_cy\_lee@wsd.gov.hk" <emily\_cy\_lee@wsd.gov.hk>, Miko Wan <MIKOWAN@ramboll.com>, "victoria\_wh\_suen@wsd.gov.hk" <victoria\_wh\_suen@wsd.gov.hk>  
**Date:** 27-04-2023 15:41  
**Subject:** RE: Water Supply Impact Assessment for a Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP (Site A) & UDWYT Lot 11 RP (Site B), Wong Yue Tan, Tai Po - Enquiry for Existing Water Supply Network

---

Dear Anthony,

Thank you for the previous email. Could you provide the capacity of the Tai Po SWPS?

Kind regards  
**Andrew Lok**  
Graduate Environmental Consultant  
D +852 3465 2820  
[andrewlok@ramboll.com](mailto:andrewlok@ramboll.com)  
Ramboll Hong Kong Limited

**From:** cy\_lau@wsd.gov.hk <cy\_lau@wsd.gov.hk>  
**Sent:** Wednesday, April 26, 2023 7:00 PM  
**To:** Andrew Lok <ANDREWLOK@ramboll.com>  
**Cc:** Calvin Chiu <cchiu@ramboll.com>; emily\_cy\_lee@wsd.gov.hk; Miko Wan <MIKOWAN@ramboll.com>; victoria\_wh\_suen@wsd.gov.hk  
**Subject:** RE: Water Supply Impact Assessment for a Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP (Site A) & UDWYT Lot 11 RP (Site B), Wong Yue Tan, Tai Po - Enquiry for Existing Water Supply Network

Dear Andrew,

The design capacity of Tai Po East Low Level Fresh Water Service Reservoir is 14600m<sup>3</sup>. The inflow data for the concerned FWSR is as follows:-

As for the SWSR, please note that the salt water supply system is operated as a balanced tank system and there are no data for consumption for individual SWSRs. The daily pumping data for Tai Po SWPS is instead provided for your information please. Thanks.

Regards,  
Anthony CY Lau  
E/NTE(HW1), WSD  
Tel. No. 2152 5610

From: Andrew Lok <[ANDREWLOK@ramboll.com](mailto:ANDREWLOK@ramboll.com)>  
To: "[cy\\_lau@wsd.gov.hk](mailto:cy_lau@wsd.gov.hk)" <[cy\\_lau@wsd.gov.hk](mailto:cy_lau@wsd.gov.hk)>, "[victoria\\_wh\\_suen@wsd.gov.hk](mailto:victoria_wh_suen@wsd.gov.hk)" <[victoria\\_wh\\_suen@wsd.gov.hk](mailto:victoria_wh_suen@wsd.gov.hk)>, "[emily\\_cy\\_lee@wsd.gov.hk](mailto:emily_cy_lee@wsd.gov.hk)" <[emily\\_cy\\_lee@wsd.gov.hk](mailto:emily_cy_lee@wsd.gov.hk)>  
Cc: Calvin Chiu <[cchiu@ramboll.com](mailto:cchiu@ramboll.com)>, Miko Wan <[MIKOWAN@ramboll.com](mailto:MIKOWAN@ramboll.com)>  
Date: 25-04-2023 16:43  
Subject: RE: Water Supply Impact Assessment for a Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP (Site A) & UDWYT Lot 11 RP (Site B), Wong Yue Tan, Tai Po - Enquiry for Existing Water Supply Network

---

Dear Mr. LAU, Ms. LEE and Ms. SUEN,

Thank you for providing information for item 1-3. We would like to request information for item 4-5:

4. The designed capacity, average water demand (daily consumption) and the spare capacity of the Fresh & Saltwater Service Reservoirs
5. Any planned development within the supply zone of Fresh & Saltwater Service Reservoirs serving the Subject Site that needs to be accounted in the future and their fresh & saltwater demand

Due to the urgency of the project, we would be much appreciated if you could provide the requested information at your earliest convenience.

Should you have any query, please do not hesitate to contact the undersigned or Mr. Calvin Chiu at 3465 2811 (email: [cchiu@ramboll.com](mailto:cchiu@ramboll.com)). We sincerely seek your feedback on this matter. Thank you in advance for any assistance you can provide.

Kind regards  
**Andrew Lok**  
Graduate Environmental Consultant  
D +852 3465 2820  
[andrewlok@ramboll.com](mailto:andrewlok@ramboll.com)  
Ramboll Hong Kong Limited

**From:** [emily\\_cy\\_lee@wsd.gov.hk](mailto:emily_cy_lee@wsd.gov.hk) <[emily\\_cy\\_lee@wsd.gov.hk](mailto:emily_cy_lee@wsd.gov.hk)>  
**Sent:** Tuesday, April 4, 2023 11:33 AM  
**To:** Andrew Lok <[ANDREWLOK@ramboll.com](mailto:ANDREWLOK@ramboll.com)>  
**Cc:** Calvin Chiu <[cchiu@ramboll.com](mailto:cchiu@ramboll.com)>; Miko Wan <[MIKOWAN@ramboll.com](mailto:MIKOWAN@ramboll.com)>; [cy\\_lau@wsd.gov.hk](mailto:cy_lau@wsd.gov.hk); [victoria\\_wh\\_suen@wsd.gov.hk](mailto:victoria_wh_suen@wsd.gov.hk)  
**Subject:** RE: Water Supply Impact Assessment for a Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP (Site A) & UDWYT Lot 11 RP (Site B), Wong Yue Tan, Tai Po - Enquiry for Existing Water Supply Network

Dear Andrew,

I refer to your email dated 09-03-2023 15:19 regarding captioned subject.



Prepared for

**Kam Luk Investment Company Limited**

Prepared by

**Ramboll Hong Kong Limited**

**PROPOSED PUBLIC RESIDENTIAL HOUSING / STARTER  
HOMES DEVELOPMENT AT UDWYT LOT 14RP AND  
ADJOINING GOVERNMENT LAND (SITE A) & PROPOSED  
PRIVATE RESIDENTIAL DEVELOPMENT AT UDWYT LOT 11  
RP AND ADJOINING GOVERNMENT LAND (SITE B), WONG  
YUE TAN, TAI PO**

**DRAINAGE IMPACT ASSESSMENT**

Date **February 2025**

Prepared by **Miko Wan**  
**Environmental Consultant**



Signed

Approved by **Calvin Chiu**  
**Technical Director**



Signed

Project Reference **NFDUDWYTEI00**

Document No. **R8256\_v1.8**

No part of this document may be reproduced or transmitted, in any form or by any means electronic, mechanical, photographic, recording or otherwise, or stored in a retrieval system of any nature without the written permission of Ramboll Hong Kong Ltd, application for which shall be made to Ramboll Hong Kong Ltd, 21/F, BEA Harbour View Centre, 56 Gloucester Road, Wan Chai, Hong Kong.

Disclaimer: This report is made on behalf of Ramboll Hong Kong Ltd. No individual is personally liable in connection with the preparation of this report. By receiving this report and acting on it, the client or any third party relying on it accepts that no individual is personally liable in contract, tort or breach of statutory duty (including negligence).

Ramboll Hong Kong Limited

21/F, BEA Harbour View Centre  
56 Gloucester Road, Wan Chai, Hong Kong

Tel: (852) 3465 2888  
Fax: (852) 3465 2899  
Email: hkinfo@ramboll.com

Q:\Projects\NFDUDWYTEI00\04 Deliverables\04 DIA Report\R8256\_v1.8\_no highlight.docx

## CHAPTERS

	Page
<b>1. INTRODUCTION .....</b>	<b>1-1</b>
1.1 Project Background .....	1-1
1.2 Site A and Site B and its Environ .....	1-1
1.3 Proposed Development.....	1-1
<b>2. DRAINAGE IMPACT ASSESSMENT .....</b>	<b>2-1</b>
2.1 Scope of Work.....	2-1
2.2 Assessment Criteria and Methodology .....	2-1
2.3 Existing Drainage System .....	2-1
2.4 Proposed Drainage System .....	2-1
2.5 Discussion .....	2-2
2.6 Temporary Drainage Impact and Mitigation Measures During Construction Stage.....	2-3
<b>3. OVERALL CONCLUSION .....</b>	<b>3-1</b>
3.1 Conclusion .....	3-1

## TABLES

Table 1	Summary of Surface Runoff under Proposed Conditions.....	2-2
Table 2	Potential Drainage Impacts and Mitigation Measures .....	2-3

## FIGURES

Figure 1	Location of Site A and Site B and its Environs
Figure 2	Existing Drainage System in the Vicinity and Proposed Drainage System
Figure 3	Existing Drainage System and Catchment Area in the Vicinity
Figure 4	Existing Drainage System in the Vicinity of Site A and Proposed Drainage Pipeline
Figure 5	Existing Drainage System in the Vicinity of Site B and Proposed Drainage Pipeline – Option 1
Figure 6	Existing Drainage System in the Vicinity of Site B and Proposed Drainage Pipeline – Option 2
Figure 7	Proposed Drainage Pipeline Location (Site A)
Figure 8	Proposed Drainage Pipeline Location (Site B)

## APPENDICES

Appendix 1	Detailed Drainage Impact Assessment Calculations
------------	--



## 1. INTRODUCTION

### 1.1 Project Background

- 1.1.1 Referring to the Lands Sharing Pilot Scheme ("LSPS") application at Lo Fai Road/ Ting Kok Road with application no. LSPS/001 on 19 July 2021, the applicant has revised the submission.
- 1.1.2 The application involves two private lots, namely Lot 14 RP and Lot 11 RP in Unserved District at Wong Yue Tan ("UDWYT") and adjoining Government Lands ("GL"). Lot 14 RP and adjoining Government Land (Site A) would be designated for public housing / Starter Homes Housing development, whereas Lot 11 RP and adjoining Government Land (Site B) would be designated for proposed private residential development.
- 1.1.3 As per request from Drainage Services Department (DSD) (dated 1 September 2021) and LSO, Drainage Impact Assessment (DIA) with calculation on drainage provisions is submitted herewith for further information.
- 1.1.4 Ramboll Hong Kong Limited has been commissioned by the Applicant to provide environmental consultancy services for the DIA for the Proposed Development at Site A and Site B.

### 1.2 Site A and Site B and its Environ

- 1.2.1 Site A and Site B are located at Ting Kok Road in Tai Po with residential developments and Tai Po Industrial Estate nearby. The existing use of the sites is vacant.
- 1.2.2 Site A is bounded by Ting Kok Road to the south, and Lo Fai Road to the west. The area to the north to east is vegetated slope area zoned Green Belt.
- 1.2.3 Site B is bounded by Ting Kok Road to the south. The area to the south to east is vegetated slope area zoned Green Belt.
- 1.2.4 The location and its environs are shown in **Figure 1**.

### 1.3 Proposed Development

- 1.3.1 Site A will consist of public residential housing / SH housing while Site B will have private residential tower. In addition, GIC uses such as residential care home for elderly (RCHE) and retail facilities will be included in Site A as well. Greenery portion which amounts to 20% of site area is assumed and applied to both Site A and Site B for assessment purpose, and is subject to detailed design and with reference to PNAP APP-152 Sustainable Building Design Guidelines. The expected year for completion of the Proposed Development is 2030 tentatively. Yet, it may take extra time to design and complete the development so that the project may be completed as late as by 2033.

## 2. DRAINAGE IMPACT ASSESSMENT

### 2.1 Scope of Work

- 2.1.1 The aim of this DIA is to assess whether the capacity of the existing drainage network serving Site A and Site B is sufficient to cope with the stormwater runoff from the proposed development. Drainage Record Plans was obtained from Drainage Services Department (DSD) for the purpose of this DIA.

### 2.2 Assessment Criteria and Methodology

- 2.2.1 The assessment standard complies with DSD Stormwater Drainage Manual (SDM) (2018 Edition), Corrigendum No. 1/2022 and Corrigendum No. 1/2024. Site A and Site B are situated in an area served by urban drainage trunk system, therefore, a 1 in 50 year return storm has been adopted for the DIA.
- 2.2.2 The catchment runoff has been calculated using the "Rational Method", as outlined in the DSD SDM:

$$Q = 0.278 C i A$$

Where	$Q$	=	peak runoff in m <sup>3</sup> /s
	$C$	=	runoff coefficient (dimensionless)
	$i$	=	rainfall intensity in mm/hr
	$A$	=	catchment area in km

- 2.2.3 Site A and Site B before the development was covered by steep vegetated land with runoff coefficient 0.35 adopted.
- 2.2.4 The proposed development will be mainly for residential use. Runoff coefficients of 0.95 and 0.15 (which is for grassland (sandy soil) – flat) are adopted for the future paved and unpaved areas respectively.
- 2.2.5 The rainfall intensity parameter "i" is dependent on the return period, rainfall duration and the time of concentration of the catchment under consideration. For the future upstream catchment containing the Site, there is no significant change to the flow path and the same time of concentration has been adopted as for the existing scenario. Runoff calculations are included in **Appendix 1**.

### 2.3 Existing Drainage System

- 2.3.1 For Site A, there are existing Ø 1650 mm stormwater drains along Lo Fai Road to the west. The pipe is then enlarged to Ø 1800 mm pipe along Ting Kok Road and then connects to a 4000 × 2700 mm box culvert (see **Figure 2**). Stormwater runoff collected eventually discharges to Tolo Harbour over 1.1 km to the south near Tai Po Waterfront Park.
- 2.3.2 For Site B, there are existing stormwater drains running across Ting Kok Road located to the east. The pipe connects to a 525 mm width stepped channel that discharges the collected runoff to Tolo Harbour over 200 m to the southeast near Fortune Garden (see **Figure 2**).

### 2.4 Proposed Drainage System

- 2.4.1 After development, both Site A and Site B would have 20% greenery assumed. A flat platform will be formed for the sites. Stormwater flow from Site A and Site B will be conveyed to the proposed terminal manholes (TA and TB) and then connected to the existing drainage system. For both Site A and B, peripheral channels with adequate capacity for both sites would provide and submit the design during detailed design

stage to DSD and seek for the DSD's comment. For Site A, a Ø 900 mm pipeline is proposed to connect manhole TA to existing manhole D1 (SMH1007476) at Lo Fai Road. Also, the peripheral channel will be proposed along the site boundary to divert the runoff from outside site. The proposed drainage system for Lot 14 RP is shown in **Figure 4**. For Site B, there are two options of proposed drainage system.

- 2.4.2 For Site B option 1, a Ø 600 mm pipe is proposed to connect terminal manhole TB to new manhole B1, then a new Ø 750 mm pipes will be constructed along Ting Kok Road to existing manhole E1 (SMH1042722). Existing drainage segment from manhole E1 to E2 will be upgraded to Ø 1200 mm and E2 to E3 will be upgraded to Ø 1350 mm. The invert level of the existing 525 mm width stepped channel (segment manhole E3 to E4) is unknown in Geoinfo Map, invert level adjustment work is proposed and subject to investigation at later stage. The proposed drainage system for Site B option 1 is shown in **Figure 5**.
- 2.4.3 For Site B option 2, a proposed Ø 600 mm drain will cross Ting Kok Road first (manhole TB to BC2) and then a proposed Ø 900 mm eastward to connect to the existing drain manhole E3. The stepped channel (segment from manhole E3 to E4) will be upgraded to 1350 mm width. The proposed drainage system for Site B option 2 is shown in **Figure 6**.
- 2.4.4 The proposed drainage pipeline location is shown in **Figure 7** and **Figure 8**. Detail pipeline alignment, invert level and size are tentative and will be subject to the detailed design stage. In all circumstances, the proposed drain pipes and manholes should not be constructed in planting areas and will be followed in detailed design stage.
- 2.4.5 Peripheral channel will be proposed for collect the surface runoff from the uphill catchment. Detail size, gradient, and layout will be subject to detailed design stage and included in drainage plan submission.
- 2.4.6 As Ting Kok Road is of considerable traffic, trenchless method not to disturb traffic (such as pipe jacking) is considered required for a section of pipeline crossing road for Site B. Total closure of road is not expected for the construction of the drainage system.
- 2.4.7 The surface runoff of the Site A and Site B upon completion of the Proposed Development is summarized in **Table 1**.

**Table 1 Summary of Surface Runoff under Proposed Conditions**

Catchment	Area (m <sup>2</sup> )	Runoff (m <sup>3</sup> /s) under 1 in 50 years scenario
SA	20,291	1.06
SB	5,696	0.29
<b>Total</b>	<b>25,987</b>	<b>1.36</b>

## 2.5 Discussion

- 2.5.1 The estimated surface runoff from the Proposed Development and surrounding catchment areas has been compared with the capacity of the existing drainage system. Detailed calculations are shown in **Appendix 1**. Catchment area in the vicinity of Site A and Site B is shown in **Figure 2**. Based on the assessment, it is found that the existing and proposed drainage system (including both options for Site B) with upgrading works should have sufficient capacity to cater the stormwater generated from the proposed development and related existing catchment areas (see **Appendix 1**). The exact alignment is subject to detailed design and feasibility is to be verified after underground utility survey. All new and updated drainage system except those directly connecting from the terminal manhole will be handed over to the Government after implementation.



## 2.6 Temporary Drainage Impact and Mitigation Measures During Construction Stage

- 2.6.1 During the construction period, sediments and building debris may be mixed with the surface runoff and block the entering location of existing stormwater drains.
- 2.6.2 For the permanent post-construction case, the surface channels within the subject site may be blocked by debris or illegal dumping. This could lead to flooding of the local area in the development site. The owner should take up the routine maintenance of surface channels and underground drainage pipes within the estate. Desilting the terminal manholes should also be carried out routinely.
- 2.6.3 The following summarizes the rating of potential impacts and mitigation measures.

**Table 2 Potential Drainage Impacts and Mitigation Measures**

Potential Impacts	Description	Rating of Impacts (H=High, M=Medium, L=Low)	Proposed Mitigation Measures
Flooding within development site and adjacent areas	Flooding may occur during severe rainstorm.	L	<ul style="list-style-type: none"> <li>- Formation levels shall have adequate gradients for gravitational discharge runoff.</li> <li>- Regular inspection of drainage facilities e.g.: U-channels, catchpits, underground drainage pipes and manholes.</li> </ul>
Obstruction of sediment and debris during the construction period	Generating the sedimentation materials during the construction period and/or debris wash-off from stockpiled materials which may cause obstruction to the downstream drainage system.	M	<ul style="list-style-type: none"> <li>- Regular inspection of drainage system.</li> <li>- Catchpits with desilting traps shall be constructed in the drainage system.</li> </ul>
Obstruction of sediments and debris post-construction and during operation	Blockage of U-channels within the subject site due to runoff debris and illegal dumping.	M	<ul style="list-style-type: none"> <li>- Routine maintenance of the drainage system.</li> <li>- Desilting of the drainage facilities, e.g.: surface channels, underground drainage pipes and manholes routinely.</li> <li>- Petrol interceptors and catchpits should be provided in the drainage system.</li> <li>- Petrol interceptors will be located within the lot and maintained by the lot owners.</li> </ul>

### Mitigation Measures

#### *Sediment deposition during the construction period*

- 2.6.4 Blockage of U-channels within the subject site due to runoff debris and illegal dumping is a common problem during operation and post-construction. Routine maintenance of the drainage system and desilting the drainage facilities, such as surface channels, underground drainage pipes and manholes, frequently, is recommended. Petrol interceptors and catchpits should be provided in the drainage system to ensure that

the drainage facilities function properly without obstruction especially in the wet season.

*Sediment deposition post-construction and during operation*

- 2.6.5 When the proposed pipes are under construction, the flow direction of the surface runoff follows the natural drain path or the temporary surface channels from the site formation drainage plan. All of the surface runoffs will pass through catchpits and terminal manholes with desilting traps where the sediment is screened before being discharged into the existing DSD drainage network system. Routine inspection of existing and temporary drainage works is recommended to be carried out during the construction period to ensure that the drainage facilities function properly without obstruction especially during the wet season.

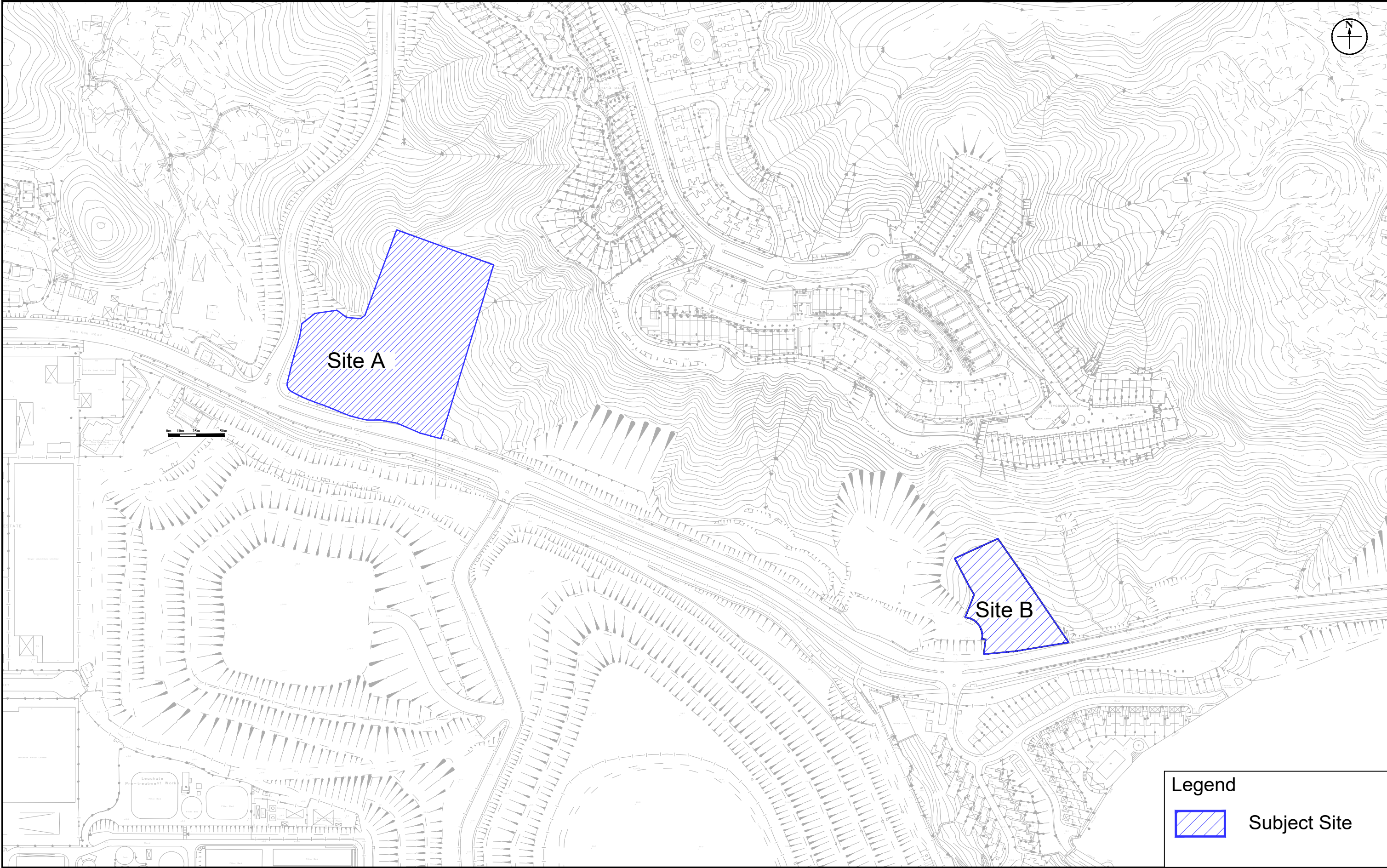
### **3. OVERALL CONCLUSION**

#### **3.1 Conclusion**

- 3.1.1 The potential drainage impact arisen from the Proposed Development has been assessed. Tentative connection to collect surface runoff from slope area has been proposed.
- 3.1.2 Based on the drainage impact assessment results, the existing and proposed drainage system with upgrading works will have adequate capacity to cater for stormwater generated from the proposed development and related existing catchment areas.
- 3.1.3 The proponent will be responsible for the upgrading work and associated monitoring programme during the construction stage for the purpose to ensure that the projects' expected drainage performance is achieved.



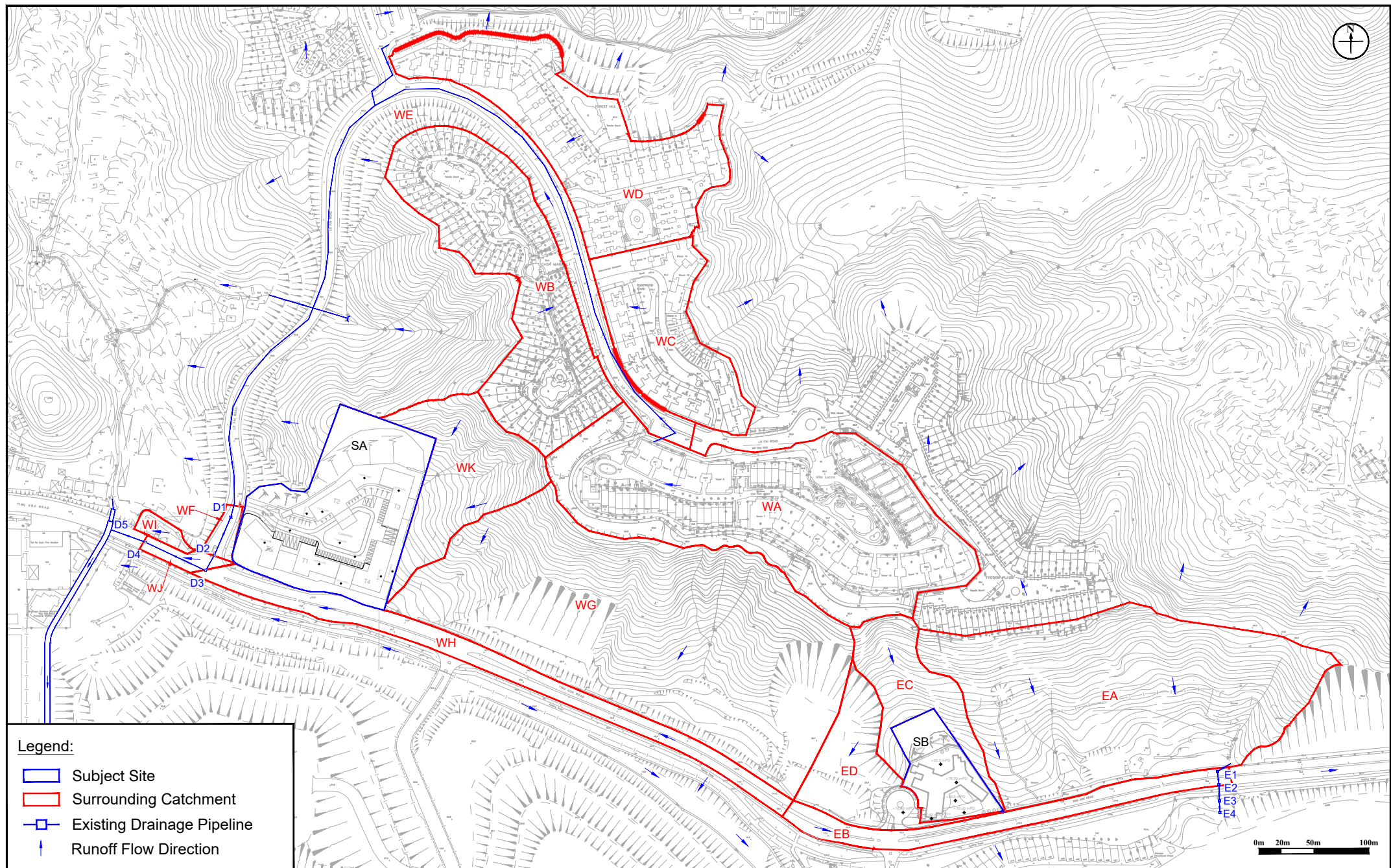
## Figures



**Figure: 1**  
**Title:** Location of the Subject Site and its Environ  
**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP (Site A) & UDWYT Lot 11 RP (Site B), Wong Yue Tan, Tai Po

RAMBOLL	
Drawn by:	MW
Checked by:	CC
Rev.:	1.4
Date:	Oct 2024





**Legend:**

- ▭ Subject Site
- ▭ Surrounding Catchment
- +— Existing Drainage Pipeline
- ↑ Runoff Flow Direction

**Figure:** 2

**Title:** Existing Drainage System and Catchment Area in the Vicinity of the Subject Site

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

**RAMBOLL**

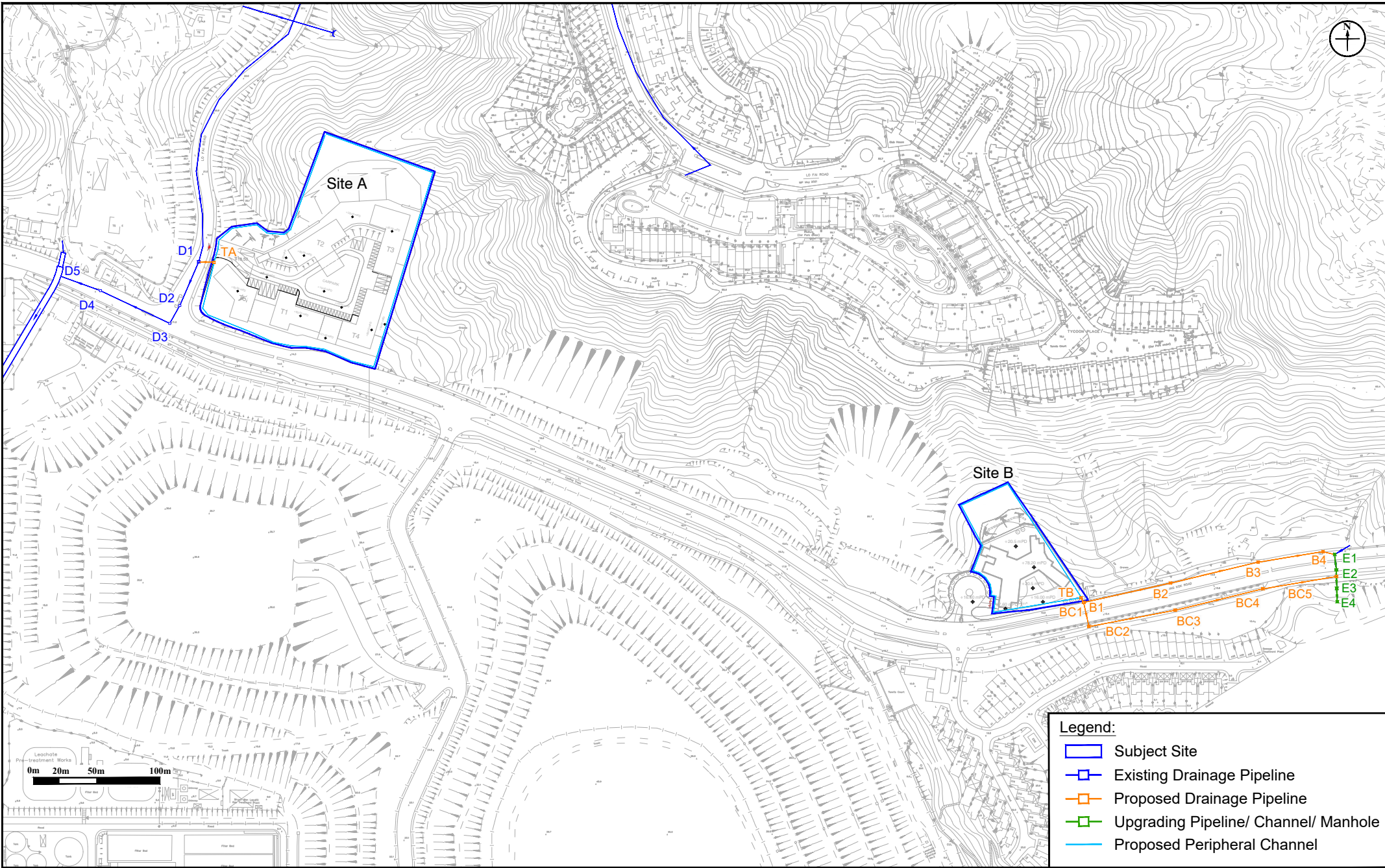
Drawn by: MW

Checked by: CC

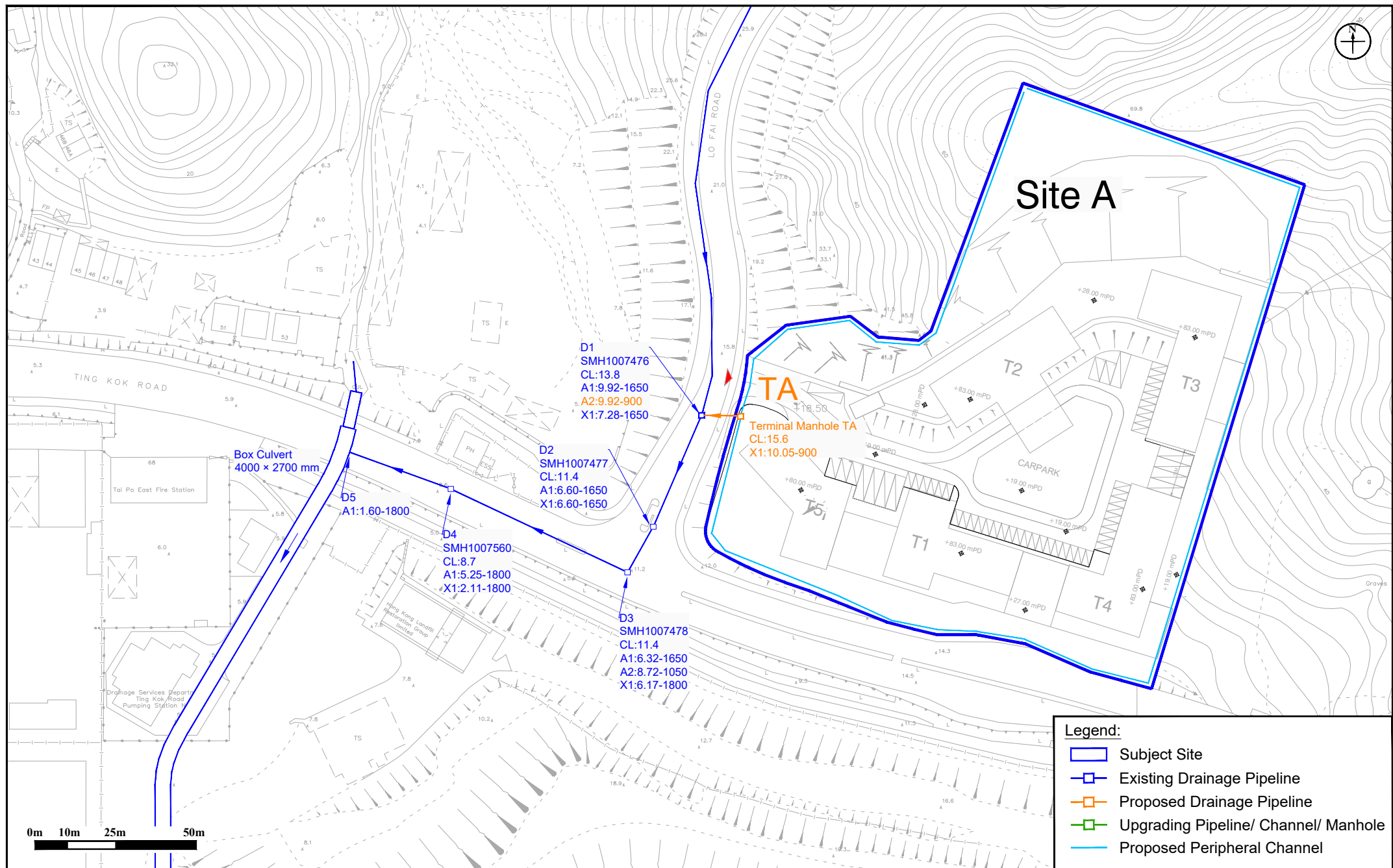
Rev.: 1.7

Date: Dec 2024



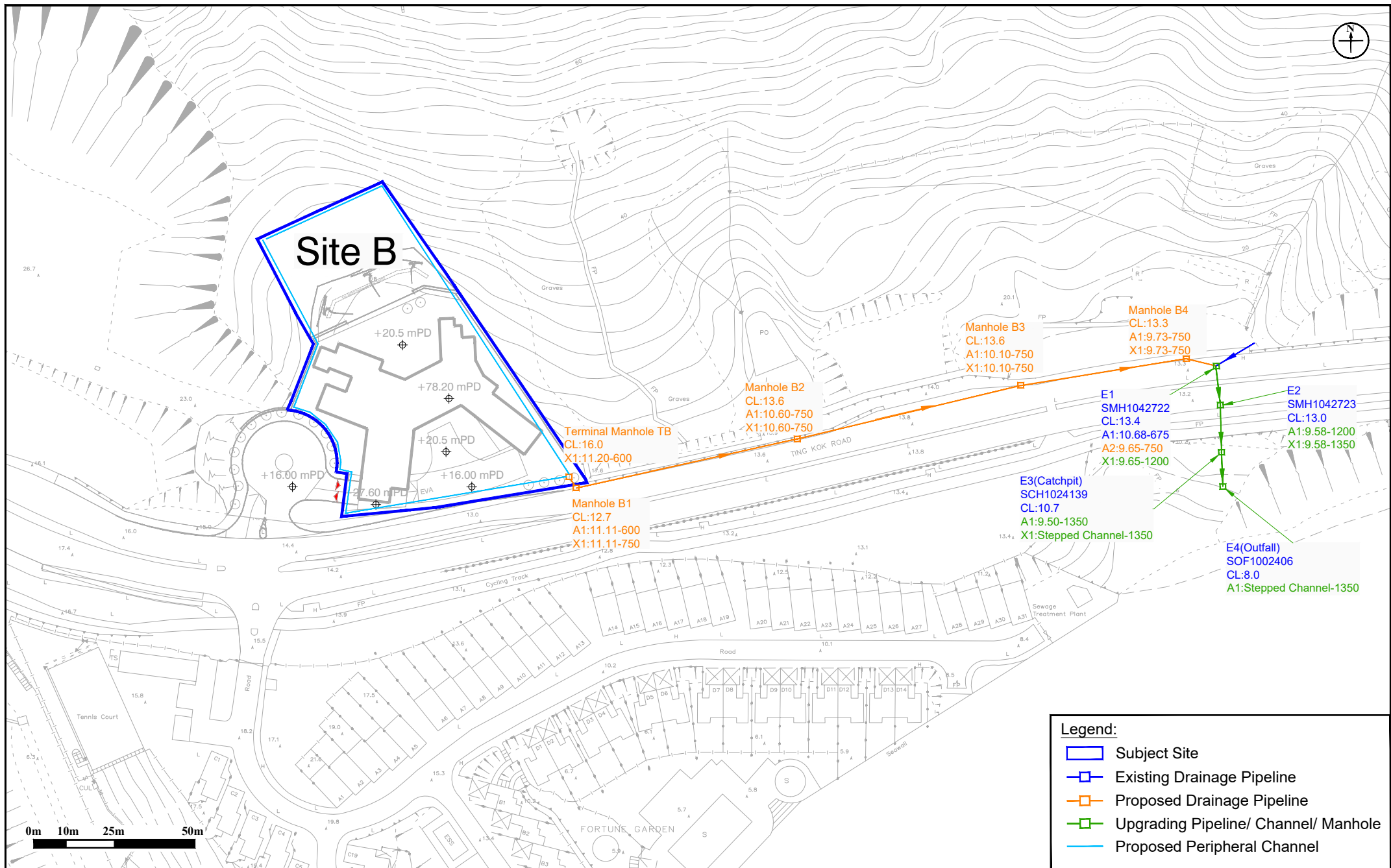


<b>Figure:</b> 3		RAMBOLL	
<b>Title:</b> Existing Drainage System in the Vicinity of the Subject Site and Proposed Drainage Pipeline		Drawn by: MW	
<b>Project:</b> Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP (Site A) & UDWYT Lot 11 RP (Site B), Wong Yue Tan, Tai Po		Checked by: CC	
		Rev.: 1.7	
		Date: Dec 2024	



<b>Figure:</b> 4	<b>RAMBOLL</b>
<b>Title:</b> Existing Drainage System in the Vicinity of Site A and Proposed Drainage Pipeline	<b>Drawn by:</b> MW
<b>Project:</b> Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po	<b>Checked by:</b> CC
	<b>Rev.:</b> 1.8 <b>Date:</b> Feb 2025





**Figure: 5**

**Title:** Existing Drainage System in the Vicinity of Site B and Proposed Drainage Pipeline – Option 1

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

**RAMBOLL**

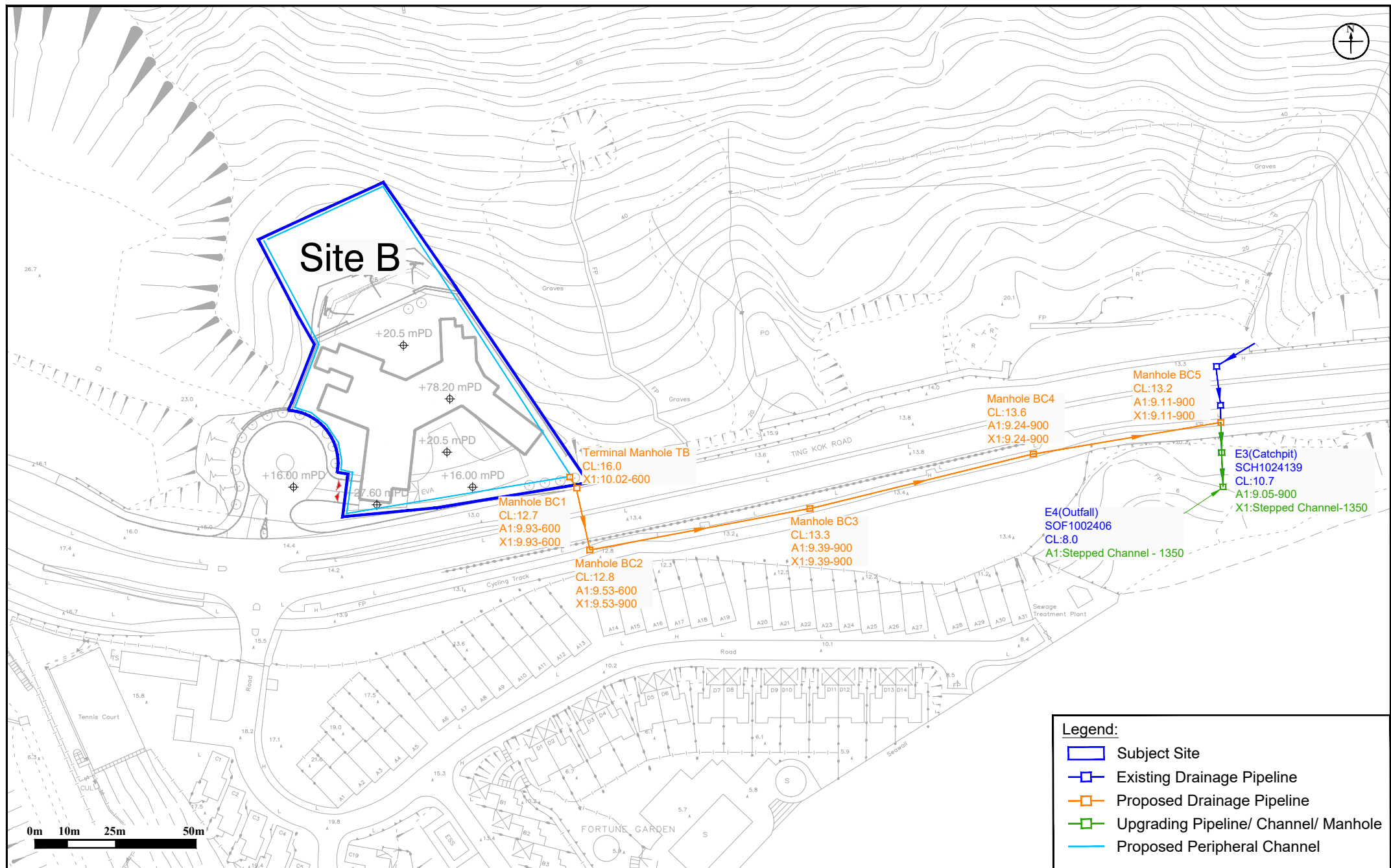
Drawn by: MW

Checked by: CC

Rev.: 1.8

Date: Feb 2025





**Figure: 6**

**Title:** Existing Drainage System in the Vicinity of Site B and Proposed Drainage Pipeline - Option 2

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

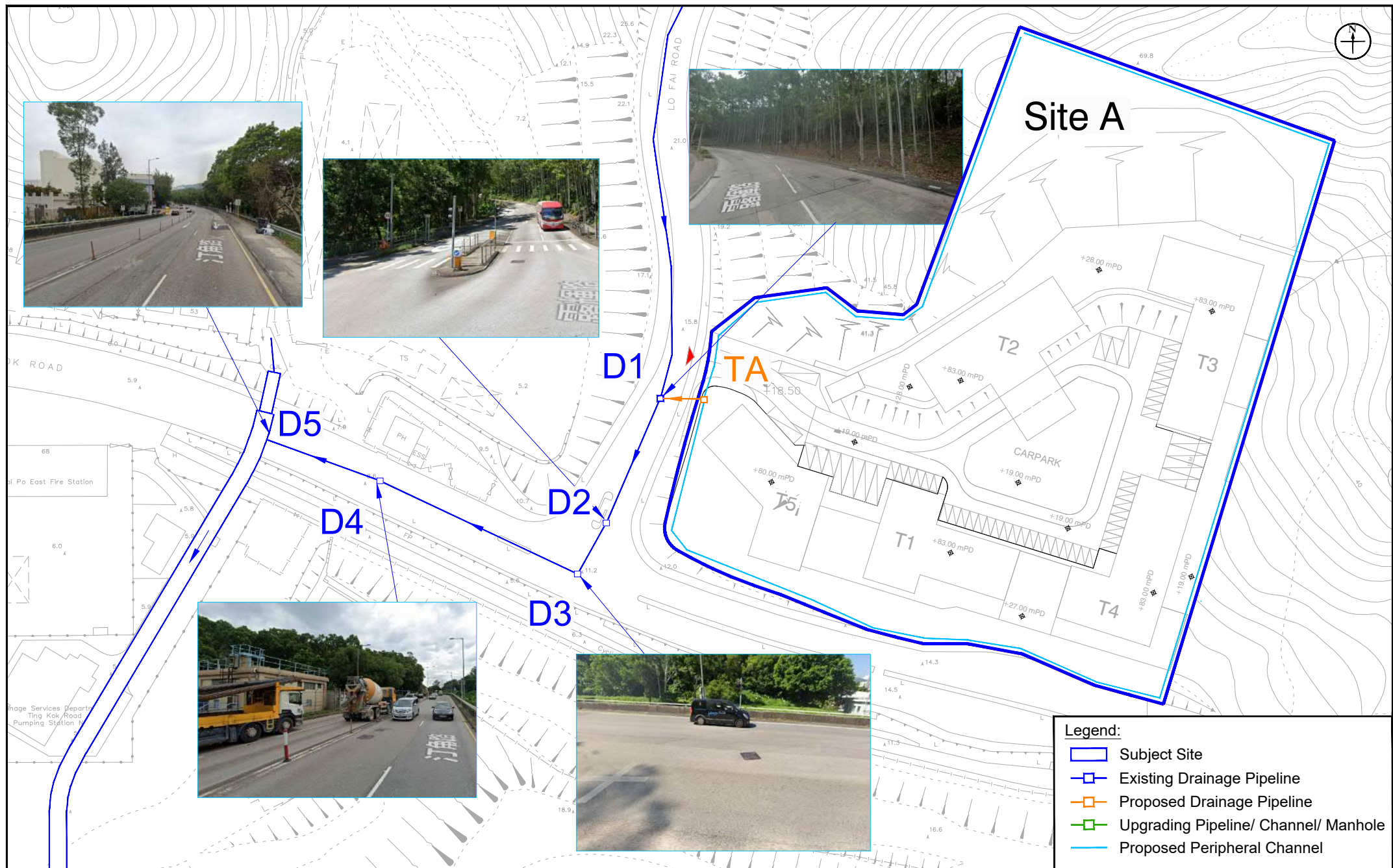
**RAMBOLL**

Drawn by: MW

Checked by: CC

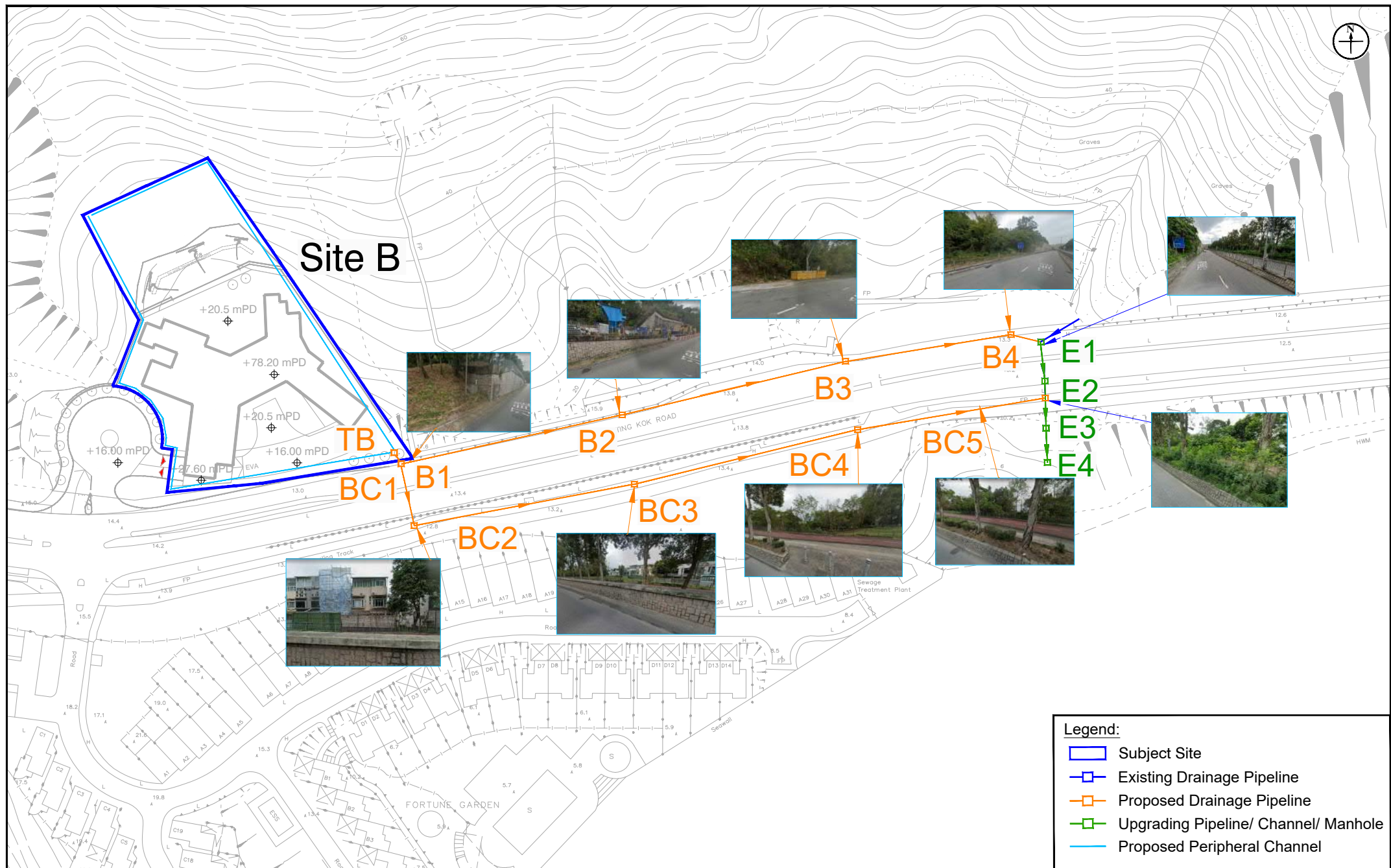
Rev.: 1.8

Date: Feb 2025



<p><b>Figure:</b> 7</p> <p><b>Title:</b> Proposed Drainage Pipeline Location (Site A)</p> <p><b>Project:</b> Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) &amp; Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po</p>	<p><b>RAMBOLL</b></p>
	<p>Drawn by: MW</p>
	<p>Checked by: CC</p>
	<p>Rev.: 1.5</p> <p>Date: Oct 2024</p>





**Figure: 8**

**Title:** Proposed Drainage Pipeline Location (Site B)

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

**RAMBOLL**

Drawn by: MW

Checked by: CC

Rev.: 1.7

Date: Dec 2024



**Appendix 1      Detailed Drainage Impact Assessment Calculations**

Promoted Public Residential Homine / Starter Homes Development at UDWTY Lot 14RP and Adjoining Government Land (Site A) & Promoted Private Residential Development at UDWTY Lot 11 RP and Adjoining Government Land (Site B), Wong Yee Tan, Tai Po  
Table 1 - Proposed Catchment Areas and Run-off (1 in-50 year)

Notes:

Site Area: 25,987 m<sup>2</sup> (Site A 20,291 m<sup>2</sup> & Site B 5,696 m<sup>2</sup>)

Future Site Development will include Paved Areas, C = 0.95, with Soft Landscaping, C = 0.15  
Catchments are small, so Rational Method is appropriate

1 in 50-year (according to Table 3 of DSD Manual)

a= 505.5

b= 3.29

c= 0.355

where  $Q_p$  = peak runoff in m<sup>3</sup>/s  
 $C$  = runoff coefficient (dimensionless)  
 $I$  = rainfall intensity in mm/hr  
 $A$  = catchment area in km<sup>2</sup>

Surface Characteristics Runoff-coefficients, C<sub>p</sub>  
Asphalt Concrete 0.70 - 0.95  
Concrete 0.80 - 0.95  
Brick 0.70 - 0.85  
Grassland (heavy soil) 0.15 - 0.25  
Flat 0.15 - 0.25  
Sloped (heavy soil) 0.25 - 0.35  
Flat 0.05 - 0.15  
Sloped 0.15 - 0.30

	Catchment	Discharge Manhole	Paved	Unpaved	Run-off at	Area (m <sup>2</sup> )	Levels (mPD)		Fall	Overland, L (m)	Fall, H (m/100m)	Overland L <sub>c</sub> (min)	L <sub>c</sub> (min)	Total L <sub>t</sub> (min)	Total L <sub>t</sub> <sup>2</sup> (min)	Intensity (mm/h)	Weighted Runoff Coefficient	Run-off (m <sup>3</sup> /s)
							Upstream	Downstream										
Site A related Catchment																		
Surrounding Catchment	WA	D1	70%	30%	D1	41,722								9.9	9.9	202	0.71	1.67
					D2									0.2	10.1	201	0.71	1.66
					D3									0.7	10.7	198	0.71	1.63
					D4									0.4	11.1	196	0.71	1.62
					D5	26,186								0.0	11.1	196	0.71	1.62
					D6									7.9	7.9	214	0.79	1.23
					D7									0.2	8.1	213	0.79	1.23
					D8									0.7	8.7	209	0.79	1.20
	WB	D1	80%	20%	D1	14,504								0.4	9.1	207	0.79	1.19
					D2									0.0	9.1	207	0.79	1.19
					D3									7.9	7.9	215	0.87	0.75
					D4									0.2	8.0	213	0.87	0.75
	WC	D1	90%	10%	D1	25,441								0.7	8.7	209	0.87	0.73
					D2									0.4	9.1	207	0.87	0.73
					D3									0.4	9.1	207	0.87	0.73
					D4									0.0	9.1	207	0.87	0.73
	WD	D1	80%	20%	D1	34,957	89.0	15.3	73.7	895.3	8.2	29.8	29.8	7.1	7.1	220	0.79	1.23
					D2									0.2	7.3	219	0.79	1.22
					D3									0.7	7.9	214	0.79	1.20
					D4									0.4	8.3	212	0.79	1.18
	WE	D1	40%	60%	D1	1,046	15.3	11.4	3.9	47.7	8.2	2.3	2.3	0.0	8.3	212	0.79	1.18
					D2									0.0	8.3	212	0.79	1.18
					D3									0.4	30.2	145	0.59	0.83
					D4									0.2	30.4	145	0.59	0.83
					D5	60,185	91.3	18.5	72.8	649.2	11.2	19.3	19.3	0.7	31.1	144	0.59	0.83
					D6									0.4	31.4	144	0.59	0.82
					D7									0.0	31.4	144	0.59	0.82
					D8									0.0	31.4	144	0.59	0.82
	WF	D2	100%	0%	D2	10,733	18.0	11.4	6.6	579.0	1.1	32.3	32.3	0.7	19.9	166	0.35	0.97
					D3									0.4	20.3	165	0.35	0.96
					D4									0.0	19.9	166	0.35	0.97
					D5									0.7	32.9	141	0.95	0.40
WH	D3	100%	0%	D3	921	10.7	8.7	2.0	47.4	4.2	2.6	2.6	0.4	33.3	141	0.95	0.40	
				D4									0.4	33.3	141	0.95	0.40	
				D5									0.0	33.3	141	0.95	0.40	
				D6									0.0	3.0	264	0.87	0.06	
WI	D4	90%	10%	D4	1,158	12.0	8.7	3.3	81.0	4.1	4.4	4.4	0.4	4.7	241	0.95	0.07	
				D5									0.0	4.7	241	0.95	0.07	
				D6									0.0	2.8	267	0.95	0.07	
				D7									0.4	3.2	261	0.15	0.14	
WJ	TA	0%	100%	TA	12,560	96.2	15.9	80.3	115	70.1	2.8	2.8	0.2	3.3	259	0.15	0.14	
				D1									0.7	4.0	250	0.15	0.13	
				D2									0.4	4.3	246	0.15	0.13	
				D3									0.0	4.3	246	0.15	0.13	
After Development	SA	TA	80%	20%	Overall	229,413								5.0	5.0	239	0.79	1.06
					TA	20,291							0.1	5.1	237	0.79	1.06	
					D1								0.2	5.3	236	0.79	1.05	
					D2								0.7	5.9	230	0.79	1.02	
					D3								0.4	6.3	227	0.79	1.01	
Site B related Catchment	EA	E1	0%	100%	E1	45,302	83.7	13.4	70.3	370.2	19.0	10.2	10.2	0.2	10.3	200	0.35	0.88
					E2									0.1	10.5	199	0.35	0.88
					E3									0.2	10.6	198	0.35	0.87
					E4									0.1	10.7	198	0.35	0.87
	EB	E2	100%	0%	E2	7,339	18.0	13.0	5.0	406.1	1.2	23.1	23.1	0.0	23.1	158	0.95	0.31
					E3									0.2	23.3	158	0.95	0.31
					E4									0.1	23.4	158	0.95	0.31
					E5									0.0	23.4	158	0.95	0.31
	EC	TB	0%	100%	TB	8,200	83.7	13.1	70.6	214.8	32.9	6.3	6.3	0.0	6.3	227	0.35	0.18
					B1									0.05	6.3	226	0.35	0.18
					B2									0.8	7.1	220	0.35	0.18
					B3									0.8	7.9	214	0.35	0.17
					B4									0.6	8.5	211	0.35	0.17
					E1									0.1	8.6	210	0.35	0.17
					E2									0.1	8.7	209	0.35	0.17
					E3									0.2	8.9	208	0.35	0.17
	ED	E2	80%	20%	E2	8,886	60.0	13.0	47.0	463.5	10.1	17.0	17.0	0.1	9.0	207	0.35	0.17
					E3									0.0	17.0	174	0.83	0.36
					E4									0.2	17.2	173	0.83	0.36
					E5									0.1	17.3	173	0.83	0.35
After Development	SB	TB	80%	20%	Overall	69,727								5.0	5.0	239	0.79	1.06
					TB	5,696							0.05	5.0	238	0.79	0.30	
					B1								0.8	5.8	231	0.79	0.29	
					B2								0.8	6.6	224	0.79	0.28	
					B3								0.6	7.2	219	0.79	0.27	
					B4								0.1	7.3	219	0.79	0.27	
					E1								0.1	7.4	218	0.79	0.27	
					E2								0.2	7.6	216	0.79	0.27	
					E3								0.1	7.7	216	0.79	0.27	
					E4								0.1	7.7	216	0.79	0.27	
					E5								0.1	7.7	216	0.79	0.27	
					E6								0.1	7.7	216	0.79	0.27	

Remarks:

1. Assumed Time of Concentration through stream flow

2. Assumed Time of Concentration

3. The Bransford-Williams's Equation is adopted for (t). For total (t), pipe length / pipe velocity / 60 is adopted to calculate the pipe flow rate. 1.5m/s of pipe velocity is adopted for a normal assumption. Total time of concentration is (t) plus (t).

4. Streamflow time (t) is meaning the pipe flow time and the pipe length / pipe velocity / 60 is adopted in the calculation. For the proposed development, 5 mins as the minimum times of concentration is adopted

Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po  
Hydraulic Calculations of Existing and Proposed Drainage System

Table 2a - 1 in 50-year Runoff of Future Site A related Catchments (m3/s)

Runoff at	Catchment												Total
	WA	WB	WC	WD	WE	WF	WG	WH	WI	WJ	WK	SA	
TA											0.14	1.06	1.20
D1	1.67	1.23	0.75	1.23	0.83						0.14	1.06	6.91
D2	1.66	1.23	0.75	1.22	0.83	0.08					0.14	1.05	6.95
D3	1.63	1.20	0.73	1.20	0.83	0.07	0.97	0.40			0.13	1.02	8.19
D4	1.62	1.19	0.73	1.18	0.82	0.07	0.96	0.40	0.06	0.07	0.13	1.01	8.25
D5	1.62	1.19	0.73	1.18	0.82	0.07	0.97	0.40	0.06	0.07	0.13	1.01	8.25

Table 2b - 1 in 50-year Runoff of Future Site B related Catchments (m3/s)

Runoff at	Catchment					Total
	EA	EB	EC	ED	SB	
TB			0.18		0.30	0.48
B1			0.18		0.30	0.48
B2			0.18		0.29	0.46
B3			0.17		0.28	0.45
B4			0.17		0.27	0.44
E1	0.88		0.17		0.27	1.32
E2	0.88	0.31	0.17	0.36	0.27	1.98
E3	0.87	0.31	0.17	0.36	0.27	1.97
E4	0.87	0.31	0.17	0.35	0.27	1.97

Table 3a - Hydraulic Capacities for Existing Drainage System (Site A)

Manhole ID	Manhole ID	Manhole Reference	Manhole Reference	Type of Channel	Pipe Dia.	Pipe Length	Invert Level 1	Invert Level 2	g	k <sub>s</sub>	s	Gradient	v	V	Area	Q	Q <sub>des</sub> <sup>1</sup>
					mm	m	mPD	mPD	m/s <sup>2</sup>	m		1 in	m <sup>2</sup> /s	m/s	m <sup>2</sup>	m <sup>3</sup> /s	m <sup>3</sup> /s
D1	D2	SMH1007476	SMH1007477	Circular	1650	36.1	7.28	6.60	9.81	0.0030	0.019	53	0.000001	5.18	2.14	11.08	9.97
D2	D3	SMH1007477	SMH1007478	Circular	1650	14.6	6.60	6.32	9.81	0.0030	0.019	53	0.000001	5.18	2.14	11.08	9.97
D3	D4	SMH1007478	SMH1007560	Circular	1800	59.1	6.17	5.25	9.81	0.0030	0.016	64	0.000001	4.96	2.54	12.62	11.36
D4	D5	SMH1007560	-	Circular	1800	31.8	2.11	1.60	9.81	0.0030	0.016	62	0.000001	5.03	2.54	12.81	11.53

Table 3b - Hydraulic Capacities for Proposed Drainage System (Site A)

Manhole ID	Manhole ID	Manhole Reference	Manhole Reference	Type of Channel	Pipe Dia.	Pipe Length	Invert Level 1	Invert Level 2	g	k <sub>s</sub>	s	Gradient	v	V	Area	Q	Q <sub>des</sub> <sup>1</sup>
					mm	m	mPD	mPD	m/s <sup>2</sup>	m		1 in	m <sup>2</sup> /s	m/s	m <sup>2</sup>	m <sup>3</sup> /s	m <sup>3</sup> /s
TA	D1	-	SMH1007476	Circular	900	10.1	10.05	9.92	9.81	0.0030	0.013	77	0.000001	2.91	0.64	1.85	1.67

Table 3c - Comparison of Runoff from Proposed Catchments and Hydraulic Capcities of Existing Drainage System (Site A)

Manhole ID	Manhole ID	Pipe Dia.	Q <sub>des</sub> <sup>1</sup>	Catchment Involved	Runoff	Occupancy	Sufficient Capacity?	Runoff [2]	Occupancy	Sufficient Capacity?	Runoff [3]	Occupancy	Sufficient Capacity?	Runoff [4]	Occupancy	Sufficient Capacity?
		mm	m <sup>3</sup> /s		m <sup>3</sup> /s			m <sup>3</sup> /s			m <sup>3</sup> /s			m <sup>3</sup> /s		
D1	D2	1650	9.97	WA-WE, SA, WK	6.91	69.3%	YES	7.67	76.9%	YES	8.01	80.4%	YES	8.85	88.8%	YES
D2	D3	1650	9.97	WA-WE, SA, WK	6.95	69.7%	YES	7.71	77.4%	YES	8.06	80.9%	YES	8.90	89.3%	YES
D3	D4	1800	11.36	WA-WF, SA, WK	8.19	72.1%	YES	9.09	80.0%	YES	9.50	83.6%	YES	10.49	92.3%	YES
D4	D5	1800	11.53	WA-WK, SA	8.25	71.5%	YES	9.16	79.4%	YES	9.57	83.0%	YES	10.57	91.6%	YES

Table 3d - Comparison of Runoff from Proposed Catchments and Hydraulic Capacities of Proposed Drainage System (Site A)

Manhole ID	Manhole ID	Pipe Dia.	Q <sub>des</sub> <sup>1</sup>	Catchment Involved	Runoff	Occupancy	Sufficient Capacity?	Runoff [2]	Occupancy	Sufficient Capacity?	Runoff [3]	Occupancy	Sufficient Capacity?	Runoff [4]	Occupancy	Sufficient Capacity?
		mm	m <sup>3</sup> /s		m <sup>3</sup> /s			m <sup>3</sup> /s			m <sup>3</sup> /s			m <sup>3</sup> /s		
TA	D1	900	1.67	SA	1.20	72.2%	YES	1.34	80.2%	YES	1.40	83.8%	YES	1.54	92.5%	YES



Table 4a - Hydraulic Capacities for Existing Stepped Channel (Site B)

Segment	Inlet	Outlet	Type of Channel	Design Gradient	Length	Depth	Width	C <sub>s</sub>	x	f <sub>s</sub>	Y <sub>99</sub>	d <sub>s</sub>	D <sub>91</sub>	V <sub>s</sub>	Q	Q <sub>des</sub> <sup>1</sup>
E3 - E4	E3	E4	Stepped Channel	α°	m	mm	mm				m	m	m	m/s	m <sup>3</sup> /s	m <sup>3</sup> /s
				20.0	10.7	615	525	0.31	0.60	0.77	0.58	0.40	0.63	2.36	0.49	0.47

Table 4b - Hydraulic Capacities for Proposed Drainage System (Site B - Option 1)

Manhole ID	Manhole ID	Manhole Reference	Manhole Reference	Type of Channel	Pipe Dia.	Pipe Length	Invert Level 1	Invert Level 2	g	k <sub>s</sub>	s	Gradient	v	V	Area	Q	Q <sub>des</sub> <sup>1</sup>
					mm	m	mPD	mPD	m/s <sup>2</sup>	m		1 in	m <sup>3</sup> /s	m/s	m <sup>2</sup>	m <sup>3</sup> /s	m <sup>3</sup> /s
TB	B1	-	-	Circular	600	4.1	11.20	11.11	9.81	0.0030	0.022	46	0.000001	2.91	0.28	0.82	0.74
B1	B2	-	-	Circular	750	70.5	11.11	10.60	9.81	0.0030	0.007	138	0.000001	1.93	0.44	0.85	0.77
B2	B3	-	-	Circular	750	71.7	10.60	10.10	9.81	0.0030	0.007	143	0.000001	1.90	0.44	0.84	0.75
B3	B4	-	-	Circular	750	52.2	10.10	9.73	9.81	0.0030	0.007	141	0.000001	1.91	0.44	0.85	0.76
B4	E1	-	SMH1042723	Circular	750	9.4	9.73	9.65	9.81	0.0030	0.009	118	0.000001	2.10	0.44	0.93	0.83

Table 4c - Hydraulic Capacities for Proposed Upgrading Workings (Site B - Option 1)

Manhole ID	Manhole ID	Manhole Reference	Manhole Reference	Type of Channel	Pipe Dia.	Pipe Length	Invert Level 1	Invert Level 2	g	k <sub>s</sub>	s	Gradient	v	V	Area	Q	Q <sub>des</sub> <sup>1</sup>
					mm	m	mPD	mPD	m/s <sup>2</sup>	m		1 in	m <sup>3</sup> /s	m/s	m <sup>2</sup>	m <sup>3</sup> /s	m <sup>3</sup> /s
E1	E2	SMH1042722	SMH1042723	Circular	1200	12.3	9.65	9.58	9.81	0.0030	0.006	176	0.000001	2.32	1.13	2.62	2.36
E2	E3	SMH1042723	SCH1024139	Circular	1350	14.7	9.58	9.50	9.81	0.0030	0.005	184	0.000001	2.44	1.43	3.50	3.15

Table 4d - Hydraulic Capacities for Upgrading Stepped Channel (Site B - Option 1)

Segment	Inlet	Outlet	Type of Channel	Design Gradient	Length	Depth	Width	C <sub>s</sub>	x	f <sub>s</sub>	Y <sub>99</sub>	d <sub>s</sub>	D <sub>91</sub>	V <sub>s</sub>	Q	Q <sub>des</sub> <sup>1</sup>	qw	dc	h	l	(dc)onset	qw<=2 m <sup>3</sup> /s?	dc >= (dc)onset?	acceptable?
				α°	m	mm	mm				m	m	m	m/s	m <sup>3</sup> /s	m <sup>3</sup> /s	m <sup>3</sup> /s							
E3 - E4	E3	E4	Stepped Channel	20.0	10.7	950	1350	0.31	0.60	0.77	0.89	0.62	1.29	3.36	2.80	2.66	1.97	0.73	109	300	0.10	TRUE	TRUE	TRUE

Table 4e - Comparison of Runoff from Proposed Catchments and Hydraulic Capacities of Existing Drainage System (Site B) (SC)

Manhole ID	Manhole ID	Pipe Dia.	Q <sub>des</sub> <sup>1</sup>	Catchment Involved	Runoff	Occupancy	Sufficient Capacity?	Runoff [2]	Occupancy	Sufficient Capacity?	Runoff [3]	Occupancy	Sufficient Capacity?	Runoff [4]	Occupancy	Sufficient Capacity?
		mm	m <sup>3</sup> /s		m <sup>3</sup> /s			m <sup>3</sup> /s			m <sup>3</sup> /s			m <sup>3</sup> /s		
E3	E4	525	0.47	EA-ED, SB	1.97	419.9%	NO	2.19	466.0%	NO	2.29	487.0%	NO	2.53	537.8%	NO

Table 4f - Comparison of Runoff from Proposed Catchments and Hydraulic Capacities of Proposed Drainage System (Site B - Option 1)

Manhole ID	Manhole ID	Pipe Dia.	Q <sub>des</sub> <sup>1</sup>	Catchment Involved	Runoff	Occupancy	Sufficient Capacity?	Runoff [2]	Occupancy	Sufficient Capacity?	Runoff [3]	Occupancy	Sufficient Capacity?	Runoff [4]	Occupancy	Sufficient Capacity?
		mm	m <sup>3</sup> /s		m <sup>3</sup> /s			m <sup>3</sup> /s			m <sup>3</sup> /s			m <sup>3</sup> /s		
TB	B1	600	0.74	EC, SB	0.48	64.6%	YES	0.53	71.7%	YES	0.56	75.0%	YES	0.61	82.8%	YES
B1	B2	750	0.77	EC, SB	0.48	62.4%	YES	0.53	69.2%	YES	0.56	72.4%	YES	0.61	79.9%	YES
B2	B3	750	0.75	EC, SB	0.48	63.5%	YES	0.53	70.5%	YES	0.56	73.7%	YES	0.61	81.4%	YES
B3	B4	750	0.76	EC, SB	0.48	63.0%	YES	0.53	70.0%	YES	0.56	73.1%	YES	0.61	80.7%	YES
B4	E1	750	0.83	EC, SB	0.48	57.5%	YES	0.53	63.9%	YES	0.56	66.7%	YES	0.61	73.7%	YES
E1	E2	1200	2.36	EA, EC, SB	1.32	56.1%	YES	1.47	62.2%	YES	1.53	65.0%	YES	1.69	71.8%	YES
E2	E3	1350	3.15	EA-ED, SB	1.98	62.9%	YES	2.20	69.8%	YES	2.30	73.0%	YES	2.54	80.6%	YES
E3	E4	525	3.33	EA-ED, SB	1.97	59.2%	YES	2.19	65.7%	YES	2.29	68.7%	YES	2.53	75.8%	YES

Table 4g - Comparison of Runoff from Proposed Catchments and Hydraulic Capacities of Proposed Drainage System (Site B - Option 1) (SC)

Manhole ID	Manhole ID	Pipe Dia.	Q <sub>des</sub> <sup>1</sup>	Catchment Involved	Runoff	Occupancy	Sufficient Capacity?	Runoff [2]	Occupancy	Sufficient Capacity?	Runoff [3]	Occupancy	Sufficient Capacity?	Runoff [4]	Occupancy	Sufficient Capacity?
		mm	m <sup>3</sup> /s		m <sup>3</sup> /s			m <sup>3</sup> /s			m <sup>3</sup> /s			m <sup>3</sup> /s		
E3	E4	1350	2.66	EA-ED, SB	1.97	74.1%	YES	2.19	82.2%	YES	2.29	85.9%	YES	2.57	96.3%	YES

Table 5a - Hydraulic Capacities for Proposed Drainage System (Site B - Option 2)

Manhole ID	Manhole ID	Manhole Reference	Manhole Reference	Type of Channel	Pipe Dia.	Pipe Length	Invert Level 1	Invert Level 2	g	k <sub>s</sub>	s	Gradient	v	V	Area	Q	Q <sub>av</sub> <sup>1</sup>
					mm	m	mPD	mPD	m/s <sup>2</sup>	m		1 in	m <sup>2</sup> /s	m/s	m <sup>2</sup>	m <sup>3</sup> /s	m <sup>3</sup> /s
TB	BC1	-	-	Circular	600	4.1	10.02	9.93	9.81	0.003	0.022	46	0.000001	2.91	0.28	0.82	0.74
BC1	BC2	-	-	Circular	600	19.6	9.93	9.53	9.81	0.003	0.020	49	0.000001	2.81	0.28	0.79	0.72
BC2	BC3	-	-	Circular	900	69.8	9.53	9.39	9.81	0.003	0.002	487	0.000001	1.16	0.64	0.74	0.66
BC3	BC4	-	-	Circular	900	71.7	9.39	9.24	9.81	0.003	0.002	500	0.000001	1.14	0.64	0.73	0.65
BC4	BC5	-	-	Circular	900	59.3	9.24	9.11	9.81	0.003	0.002	445	0.000001	1.21	0.64	0.77	0.69
BC5	E3	-	SCH1024139	Circular	900	9.4	9.11	9.05	9.81	0.003	0.006	157	0.000001	2.04	0.64	1.30	1.17

Table 5b - Hydraulic Capacities for Upgrading Stepped Channel (Site B - Option 2)

Segment	Inlet	Outlet	Type of Channel	Design Gradient	Length	Depth	Width	C <sub>s</sub>	x	f <sub>s</sub>	Y <sub>50</sub>	d <sub>s</sub>	D <sub>0</sub>	V <sub>s</sub>	Q	Q <sub>av</sub> <sup>1</sup>	qw	dc	h	l	(dc)onset	qw<=2 m <sup>3</sup> /s?	dc >= (dc)onset?	acceptable?
				α°	m	mm	mm				m	m	m	m/s	m <sup>3</sup> /s	m <sup>3</sup> /s	m <sup>2</sup> /s							
E3 - E4	E3	E4	Stepped Channel	20.0	10.7	950	1350	0.31	0.60	0.77	0.89	0.62	1.29	3.36	2.80	2.66	1.97	0.73	109	300	0.10	TRUE	TRUE	TRUE

Table 5c - Comparison of Runoff from Proposed Catchments and Hydraulic Capacities of Proposed Drainage System (Site B - Option 2)

Manhole ID	Manhole ID	Pipe Dia.	Q <sub>av</sub> <sup>1</sup>	Catchment Involved	Runoff	Occupancy	Sufficient Capacity?	Runoff [2]	Occupancy	Sufficient Capacity?	Runoff [3]	Occupancy	Sufficient Capacity?	Runoff [4]	Occupancy	Sufficient Capacity?
		mm	m <sup>3</sup> /s		m <sup>3</sup> /s			m <sup>3</sup> /s			m <sup>3</sup> /s			m <sup>3</sup> /s		
TB	BC1	600	0.74	EC, SB	0.48	64.6%	YES	0.53	71.7%	YES	0.56	75.0%	YES	0.61	82.8%	YES
BC1	BC2	600	0.72	EC, SB	0.48	67.0%	YES	0.53	74.4%	YES	0.56	77.8%	YES	0.61	85.9%	YES
BC2	BC3	900	0.66	EC, SB	0.48	72.4%	YES	0.53	80.3%	YES	0.56	83.9%	YES	0.61	92.7%	YES
BC3	BC4	900	0.65	EC, SB	0.48	73.3%	YES	0.53	81.4%	YES	0.56	85.1%	YES	0.61	93.9%	YES
BC4	BC5	900	0.69	EC, SB	0.48	69.1%	YES	0.53	76.8%	YES	0.56	80.2%	YES	0.61	88.6%	YES

Table 5d - Comparison of Runoff from Proposed Catchments and Hydraulic Capacities of Proposed Drainage System (Site B - Option 2) (SC)

Manhole ID	Manhole ID	Pipe Dia.	Q <sub>av</sub> <sup>1</sup>	Catchment Involved	Runoff	Occupancy	Sufficient Capacity?	Runoff [2]	Occupancy	Sufficient Capacity?	Runoff [3]	Occupancy	Sufficient Capacity?	Runoff [4]	Occupancy	Sufficient Capacity?
		mm	m <sup>3</sup> /s		m <sup>3</sup> /s			m <sup>3</sup> /s			m <sup>3</sup> /s			m <sup>3</sup> /s		
E3	E4	1350	2.66	EA-ED, SB	1.97	74.1%	YES	2.19	82.2%	YES	2.29	85.9%	YES	2.53	94.9%	YES

Remarks:

1. Qsilt: 10% reduction in flow for gradient is not greater than 1 in 25, 5% reduction in flow for gradient greater than 1 in 25.
2. Cross Section Area of Circular Pipe:  $D^2 \times \pi / 4$
3. Perimeter of Circular Pipe:  $(D \times 2 \times \pi) / 2$
4. Cross Section Area of U-channel:  $(D^2 \times \pi) / 4 / 2 + (H \times D) / 2$
5. Perimeter of U-channel:  $((D \times 2 \times \pi) / 2 + H \times 2) / 2$
6. The value of k<sub>s</sub> = 3mm is used for the calculation of slined precast concrete for the drains, poor condition (based on Table 5: Recommended roughness values in Sewerage Manual)

Runoff [2] represents the situation in Mid 21st Century due to climate change with additional runoff of 11.1%

Runoff [3] represents the situation in Late 21st Century due to climate change with additional runoff of 16.0%

Runoff [4] represents the situation in Late 21st Century due to design allowance with additional runoff of 12.1%

**Table 6 Freeboard between Pipe and Ground Level**

Site B (Option 1)

Manhole	Invert Level	Pipe Dia. (mm)	Outside Dia. (mm)	Pipe Top Level	Ground Level	Difference (m)
TB	11.20	600	790	11.99	16	4.01
B1	11.11	750	950	12.06	13.6	1.54
B2	10.60	750	950	11.55	13.6	2.05
B3	10.10	750	950	11.05	13.6	2.55
B4	9.73	750	950	10.68	13.3	2.62

Site B (Option 2)

Manhole	Invert Level	Pipe Dia. (mm)	Outside Dia. (mm)	Pipe Top Level	Ground Level	Difference (m)
TB	10.02	600	790	10.81	16	5.19
BC1	9.93	600	790	10.72	12.7	1.98
BC2	9.53	900	1120	10.65	12.8	2.15
BC3	9.39	900	1120	10.51	13.3	2.79
BC4	9.24	900	1120	10.36	13.6	3.24
BC5	9.11	900	1120	10.23	13.2	2.97



Prepared for

**Kam Luk Investment Company Limited**

Prepared by

**Ramboll Hong Kong Limited**

**PROPOSED PUBLIC RESIDENTIAL HOUSING / STARTER  
HOMES DEVELOPMENT AT UDWYT LOT 14RP AND  
ADJOINING GOVERNMENT LAND (SITE A) & PROPOSED  
PRIVATE RESIDENTIAL DEVELOPMENT AT UDWYT LOT 11  
RP AND ADJOINING GOVERNMENT LAND (SITE B), WONG  
YUE TAN, TAI PO**

**SEWERAGE IMPACT ASSESSMENT**

Date **February 2025**

Prepared by **Miko Wan**  
**Environmental Consultant**



Signed

Approved by **Calvin Chiu**  
**Technical Director**



Signed

Project Reference **NFDUDWYTEI00**

Document No. **R8255\_v1.9**

No part of this document may be reproduced or transmitted, in any form or by any means electronic, mechanical, photographic, recording or otherwise, or stored in a retrieval system of any nature without the written permission of Ramboll Hong Kong Ltd, application for which shall be made to Ramboll Hong Kong Ltd, 21/F, BEA Harbour View Centre, 56 Gloucester Road, Wan Chai, Hong Kong.

Disclaimer: This report is made on behalf of Ramboll Hong Kong Ltd. No individual is personally liable in connection with the preparation of this report. By receiving this report and acting on it, the client or any third party relying on it accepts that no individual is personally liable in contract, tort or breach of statutory duty (including negligence).

Ramboll Hong Kong Limited

21/F, BEA Harbour View Centre  
56 Gloucester Road, Wan Chai, Hong Kong

Tel: (852) 3465 2888  
Fax: (852) 3465 2899  
Email: [hkinfo@ramboll.com](mailto:hkinfo@ramboll.com)

Q:\Projects\NFDUDWYTEI00\04 Deliverables\03 SIA Report\R8255\_v1.9\_no highlight.docx

## CHAPTERS

	Page
<b>1. INTRODUCTION .....</b>	<b>1-1</b>
1.1 Project Background .....	1-1
1.2 Site A and Site B and its Environ .....	1-1
1.3 Proposed Development.....	1-1
<b>2. SEWERAGE IMPACT ASSESSMENT .....</b>	<b>2-1</b>
2.1 Scope of Work.....	2-1
2.2 Assessment Criteria and Methodology .....	2-1
2.3 Existing and Future Sewerage System .....	2-1
2.4 Wastewater Generated by the Proposed Development .....	2-1
2.5 Assessment of Sewerage Impact .....	2-2
2.6 Discussion .....	2-3
<b>3. OVERALL CONCLUSION .....</b>	<b>3-5</b>
3.1 Conclusion .....	3-5

## TABLES

Table 2.1	Estimated Peak Flow for Site A .....	2-2
Table 2.2	Estimated Peak Flow for Site B .....	2-2
Table 2.3	Proposed Upgrading Works .....	2-3
Table 2.4	Estimated Capacity for TKRSPS No.5 and TPSTW .....	2-4

## FIGURES

Figure 1	Location of Site A and Site B and its Environs
Figure 2	Existing Sewerage System in the Vicinity of Site A and Site B and Proposed Sewerage Pipeline
Figure 3	Existing Sewerage System in the Vicinity of Site A and Proposed Sewerage Pipeline
Figure 4	Existing Sewerage System in the Vicinity of Site B and Proposed Sewerage Pipeline
Figure 5	Existing Sewerage System and Catchment Area in the Vicinity of Site A and Site B and Proposed Sewerage Pipeline
Figure 6	Proposed Sewerage Pipeline Location (Site A)
Figure 7	Proposed Sewerage Pipeline Location (Site B)

## APPENDICES

Appendix 1	Detailed Sewerage Impact Assessment Calculations
Appendix 2	Relevant Information from DSD and EPD
Appendix 3	Indicative MLP of the Proposed Scheme



## 1. INTRODUCTION

### 1.1 Project Background

- 1.1.1 Referring to the Lands Sharing Pilot Scheme ("LSPS") application at Lo Fai Road/ Ting Kok Road with application no. LSPS/001 on 19 July 2021, the applicant has revised the submission.
- 1.1.2 The application involves two private lots, namely Lot 14 RP and Lot 11 RP in Unserved District at Wong Yue Tan ("UDWYT") and adjoining Government Lands ("GL"). Lot 14 RP and adjoining Government Land (Site A) would be designated for public housing / Starter Homes Housing development, whereas Lot 11 RP and adjoining Government Land (Site B) would be designated for proposed private residential development.
- 1.1.3 As per request from Drainage Services Department (DSD) (dated 1 September 2021) and LSO, Sewerage Impact Assessment (SIA) with calculation on drainage provisions is submitted herewith for further information.
- 1.1.4 Ramboll Hong Kong Limited has been commissioned by the Applicant to provide environmental consultancy services for the SIA for the Proposed Development at Site A and Site B.

### 1.2 Site A and Site B and its Environ

- 1.2.1 Site A and Site B are located at Ting Kok Road in Tai Po with residential developments and Tai Po Industrial Estate nearby. The existing use of the sites is vacant.
- 1.2.2 Site A is bounded by Ting Kok Road to the south, and Lo Fai Road to the west. The area to the north to east is vegetated slope area zoned Green Belt.
- 1.2.3 Site B is bounded by Ting Kok Road to the south. The area to the south to east is vegetated slope area zoned Green Belt.
- 1.2.4 The location and its environs are shown in **Figure 1**.

### 1.3 Proposed Development

- 1.3.1 Site A will consist of 1,290 public residential housing / SH housing units with population density of 2.8 (Average Household Size under LSPS) while Site B will have 460 private housing units with population density of 2.8 (based on 2021 population census average domestic household size in Tai Po New Town). In addition, GIC uses such as residential care home for elderly (RCHE) and retail facilities will be included in Site A as well. The expected year for completion of the Proposed Development is 2030 tentatively. Yet, it may take extra time to design and complete the development so that the project may be completed as late as by 2033.
- 1.3.2 **Appendix 3** shows the Indicative MLP of the Proposed Scheme.

## 2. SEWERAGE IMPACT ASSESSMENT

### 2.1 Scope of Work

- 2.1.1 The aim of this SIA is to assess whether the capacity of the existing sewerage network serving Site A and Site B is sufficient to cope with the sewage flow from the proposed development. Drainage Record Plans from Drainage Services Department (DSD) were obtained for the purposes of this SIA.

### 2.2 Assessment Criteria and Methodology

- 2.2.1 Environmental Protection Department's (EPD's) Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning, Version 1 (GESF) has been referred to for the purposes of estimating the quantity of the sewage generated from the proposed development and the existing catchment area. Sewage flow parameters and global peaking factors in this document have been adopted for this SIA.
- 2.2.2 Based on the building types in the area, the following unit flow factors are used in the SIA calculation:
- Public and private housing domestic residents: 0.27 m<sup>3</sup>/day (Private R2)
  - Clubhouse and G/IC Staff: 0.28 m<sup>3</sup>/day (J11 - Community, Social & Personal Services)
  - Office employee: 0.28 m<sup>3</sup>/day (General Territorial Average)
  - Retail employee: 0.28 m<sup>3</sup>/day (J4 Wholesale & Retail)
  - F&B employee: 1.58 m<sup>3</sup>/day (J10 Restaurant & Hotel)
  - G/IC residents: 0.27 m<sup>3</sup>/day (Private R2)
- 2.2.3 Catchment Inflow Factor ( $P_{CIF}$ ) of Tai Po (1.00) has been applied in the assessment.

### 2.3 Existing and Future Sewerage System

- 2.3.1 For Site A, there are existing Ø300 mm sewerage pipes along Lo Fai Road to the west. The pipe is then connected to the Ø600 mm sewerage pipes along Ting Kok Road. The existing sewers in the vicinity of Site A are shown in **Figure 2**.
- 2.3.2 For Site B, there are existing Ø600 mm sewerage pipes along Ting Kok Road to the south. The sewer eventually discharges the collected sewage to Ting Kok Road Pumping Station No. 5 (see **Figure 2**).
- 2.3.3 The sewage generated from Site A and Site B will be discharged to manhole N1 (FMH1005270) and S1 (FMH1027320) respectively as shown in **Figure 2**. It is noted that information about realignment of sewers and relocation of Ting Kok Road Sewage Pumping Station No. 5 under DSD's Contract No. DC/2018/02 is adopted.

### 2.4 Wastewater Generated by the Proposed Development

- 2.4.1 Wastewater arising from the proposed development will be primarily contributed by the domestic and G/IC residents; clubhouse, F&B, office and retail. Detailed calculation for the Proposed Development is given in **Table 2.1** and **Table 2.2** below and in **Appendix 1**.

**Table 2.1 Estimated Peak Flow for Site A**

Development Parameters	Proposed Development					
	Residential Units	Office	F&B	Retail	G/IC	G/IC residents
Area (m <sup>2</sup> )	-	128	350	650	3,226	-
Number of Residential Units	1,290	-	-	-	-	-
Number of Residential Units (+10%) <sup>(1)</sup>	1,419	-	-	-	-	-
Average Household Size	2.8 <sup>(7)</sup>	-	-	-	-	-
Assumed Population <sup>(1)</sup>	3,973	7	18	23	106	150
Design Flow (m <sup>3</sup> /person/day)	0.27 <sup>(2)</sup>	0.28 <sup>(3)</sup>	1.58 <sup>(6)</sup>	0.28 <sup>(4)</sup>	0.28 <sup>(5)</sup>	0.27 <sup>(2)</sup>
Flow Rate (m <sup>3</sup> /day)	1072.8	2.0	28.2	6.4	70.3	
Total Flow Rate (m <sup>3</sup> /day)	1179.6					
Peak Flow (L/s)	68.3					

**Table 2.2 Estimated Peak Flow for Site B**

Development Parameters	Proposed Development		
	Residential Units	Clubhouse	Office
Area (m <sup>2</sup> )	-	1,150	46
Number of Residential Units	460	-	-
Average Household Size	2.8 <sup>(8)</sup>	-	-
Assumed Population	1,288	38	3
Design Flow (m <sup>3</sup> /person/day)	0.27 <sup>(2)</sup>	0.28 <sup>(5)</sup>	0.28 <sup>(3)</sup>
<b>Flow Rate (m<sup>3</sup>/day)</b>	<b>347.8</b>	<b>10.6</b>	<b>0.7</b>
<b>Total Flow Rate (m<sup>3</sup>/day)</b>	<b>359.1</b>		
<b>Peak Flow (L/s)</b>	<b>20.8</b>		

(1) "+10%" variation is allowed for flexibility in detailed design stage

(2) Refer to Table T-1 of GESF – R2

(3) Refer to Table T-2 of GESF – General Territorial Average

(4) Refer to Table T-2 of GESF – J4

(5) Refer to Table T-2 of GESF – J11

(6) Refer to Table T-2 of GESF – J10

(7) Based on the Land Sharing Pilot Scheme

(8) Based on 2021 population census average domestic household size in Tai Po New Town

## 2.5 Assessment of Sewerage Impact

2.5.1 **Appendix 1** shows the detailed calculation on the estimated hydraulic capacity of the proposed sewer sections and existing downstream sewers and the calculation of the



amount of the sewage entering each segment of the said sewer network. Total flow from the Proposed Development is assessed in the calculations.

## 2.6 Discussion

- 2.6.1 The potential sewerage impact due to the Proposed Development has been quantitatively addressed. Total sewage generation rate from the Proposed Development (including Site A and Site B) is estimated to be 1538.7 m<sup>3</sup>/day (i.e. peak flow 89.0 litre/sec).
- 2.6.2 After calculating the appropriate capacities as mentioned above, the estimated sewage flow from the Proposed Development and contribution from other existing and planned (Sports Centre at the Education University of Hong Kong tentatively completed by 2029) developments has been compared with the capacity of the existing and proposed sewerage system to determine whether it has adequate spare capacity to accommodate the flow from the proposed development.
- 2.6.3 According to Table 4 of **Appendix 1**, regarding the sewage generation rate from the Proposed Development and surrounding catchment areas (**Figure 5**), it is found that 3 of the existing pipe segments (N1-N2 and N2-S14) are close to 100% capacity based on comparison with cumulative discharge.
- 2.6.4 For N1-N2 and N2-S14, the proposed upgrading works are summarized in **Table 2.3** below.

**Table 2.3 Proposed Upgrading Works**

Segment	Manhole Reference	Manhole Reference	Length (m)	Original Size (Ø)	Upgraded Size (Ø)
N1-N2	FMH1005270	FMH1005269	27.3	300	375
N2-S14	FMH1005269	FMH1027333	54.3	300	375

- 2.6.5 A Ø225 mm sewerage pipe is proposed to be constructed to connect the terminal manhole of the Site A (TA) to existing manhole N1. The Proposed sewerage connection of Site A is shown in **Figure 3**.
- 2.6.6 A Ø225 mm and Ø300 mm sewerage pipes is proposed to be constructed to connect the terminal manhole of the Site B (TB) to existing manhole S1. The Proposed sewerage connection of Site B is shown in **Figure 4**. It is noted that the section of sewer within the future roundabout will be concrete surrounded. In addition, it will ensure that the proposed sewers and manholes would not be constructed in planting areas.
- 2.6.7 The proposed sewer location is shown in **Figure 6** and **Figure 7**. The sewer alignment, invert level and size are tentative and will be subject to detailed design stage.
- 2.6.8 With the proposed new connection and upgrading works in place, the sewerage system will have adequate capacity to cater the sewerage from the Proposed Development and nearby catchments.
- 2.6.9 The key facility in the local sewerage system are the Ting Kok Road Pumping Station No.5 (TKRSPS No.5) and the Tai Po Sewage Treatment Works (TPSTW). Planned upgrade works would be carried out for TKRSPS No.5 to be completed in 2024. As the expected year for completion of the development is 2033 tentatively, the planned upgrading for TKRSPS No.5 is accounted in the assessment. Also, the flow from the proposed development in addition to the existing flow of existing Tai Po STW is lower than the design capacity of Tai Po STW. Detailed calculation for the capacities of TKRSPS No.5 and existing Tai Po STW are given in **Table 2.4** below and **Appendix 1**.

Therefore, the SPS and Tai Po STW would have sufficient capacity to cater the sewage generated from the proposed development and related existing and planned catchments. The applicant will be responsible for the implementation of the required sewerage connection and upgrading works.

**Table 2.4 Estimated Capacity for TKRSPS No.5 and TPSTW**

	<b>TKRSPS No.5 (after upgrade)</b>
Designed ADWF (m <sup>3</sup> /day)	21,194 <sup>^</sup>
Existing Average Daily Flow (m <sup>3</sup> /day)	7,682 <sup>^</sup>
Average Flow with Planned Developments <sup>#</sup> (m <sup>3</sup> /day)	12,032.5(56.8%*)
Average Flow with Planned Developments and the Proposed Development (m <sup>3</sup> /day)	13,571.3 (64.0%*)
	<b>TPSTW</b>
Designed ADWF (m <sup>3</sup> /day)	120,000
Existing Average Daily Flow (m <sup>3</sup> /day)	110,754 (92.3%*)
Average Flow with Planned Developments and the Proposed Development (m <sup>3</sup> /day)	112,293 (93.6%*)

<sup>^</sup> According to DSD (**Appendix 2**)

\* Contribution of flow to designed ADWF

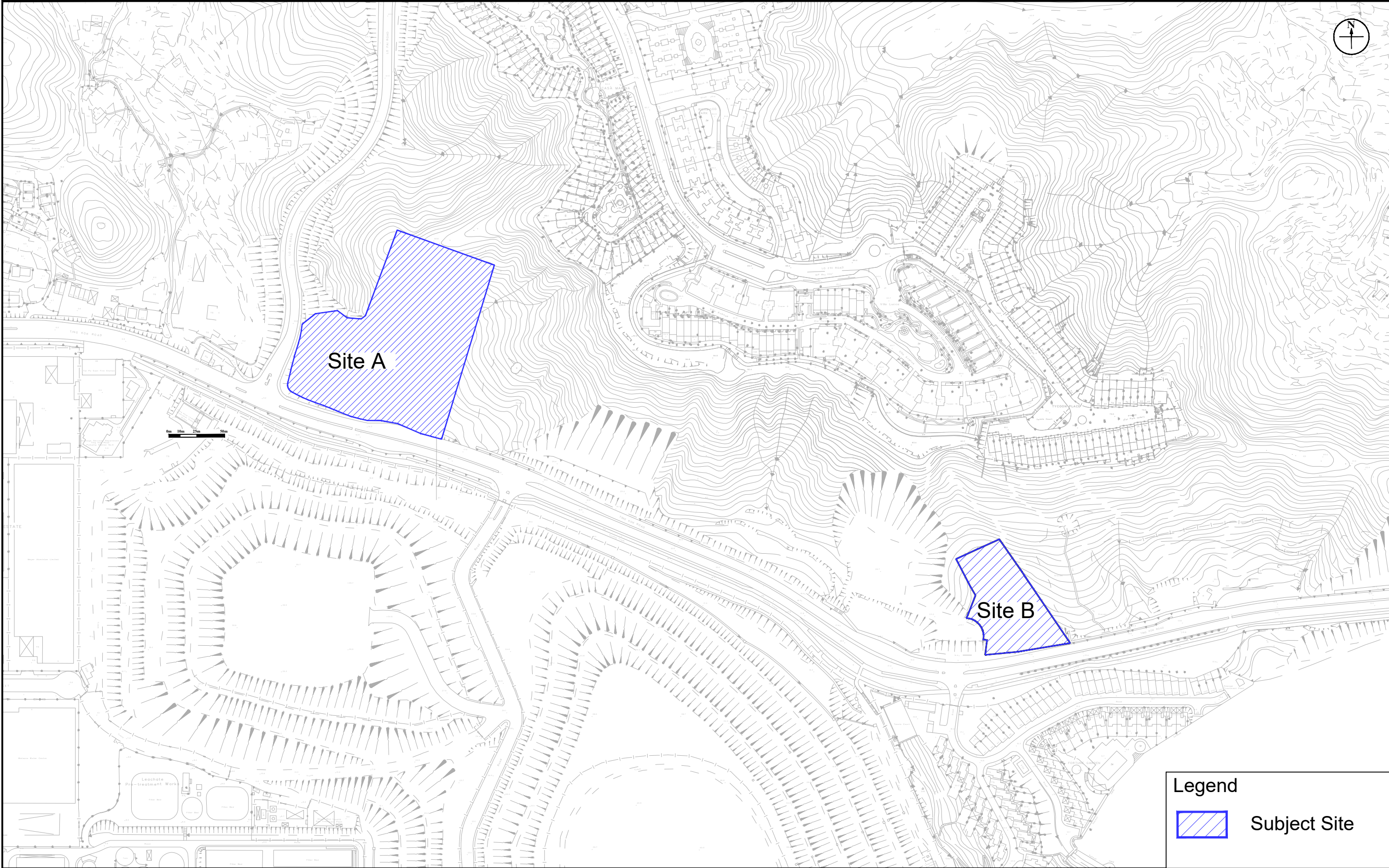
### 3. OVERALL CONCLUSION

#### 3.1 Conclusion

- 3.1.1 The potential sewerage impact arisen from the Proposed Development has been quantitatively assessed.
- 3.1.2 Based on the sewerage impact assessment results, the existing sewerage from FMH1005270 to FMH1027333 (N1-N2 and N2-S14) contributes close to 100% capacity.
- 3.1.3 Two of existing dia. 300mm sewerage pipe (N1-N2 and N2-S14) will be upgraded to dia. 375mm sewerage pipes. New dia. 225mm and dia. 300mm sewerage pipes and manhole will be proposed to connect the existing pipe.
- 3.1.4 TKRSPS No.5 and TPSTW that the sewerage system would be connecting to has adequate capacity for the expected daily flows from the Proposed Development based on the assessment results.
- 3.1.5 With the proposed new connection and upgrading works in place, this SIA confirms the feasibility of the Proposed Development with no adverse impacts imposed to the public sewerage system. For the design of the proposed sewerage system to be handed over to DSD, reference will be made to DSD Practice Note No. 1/2024 - Design Checklists on Operation & Maintenance Requirements where applicable.



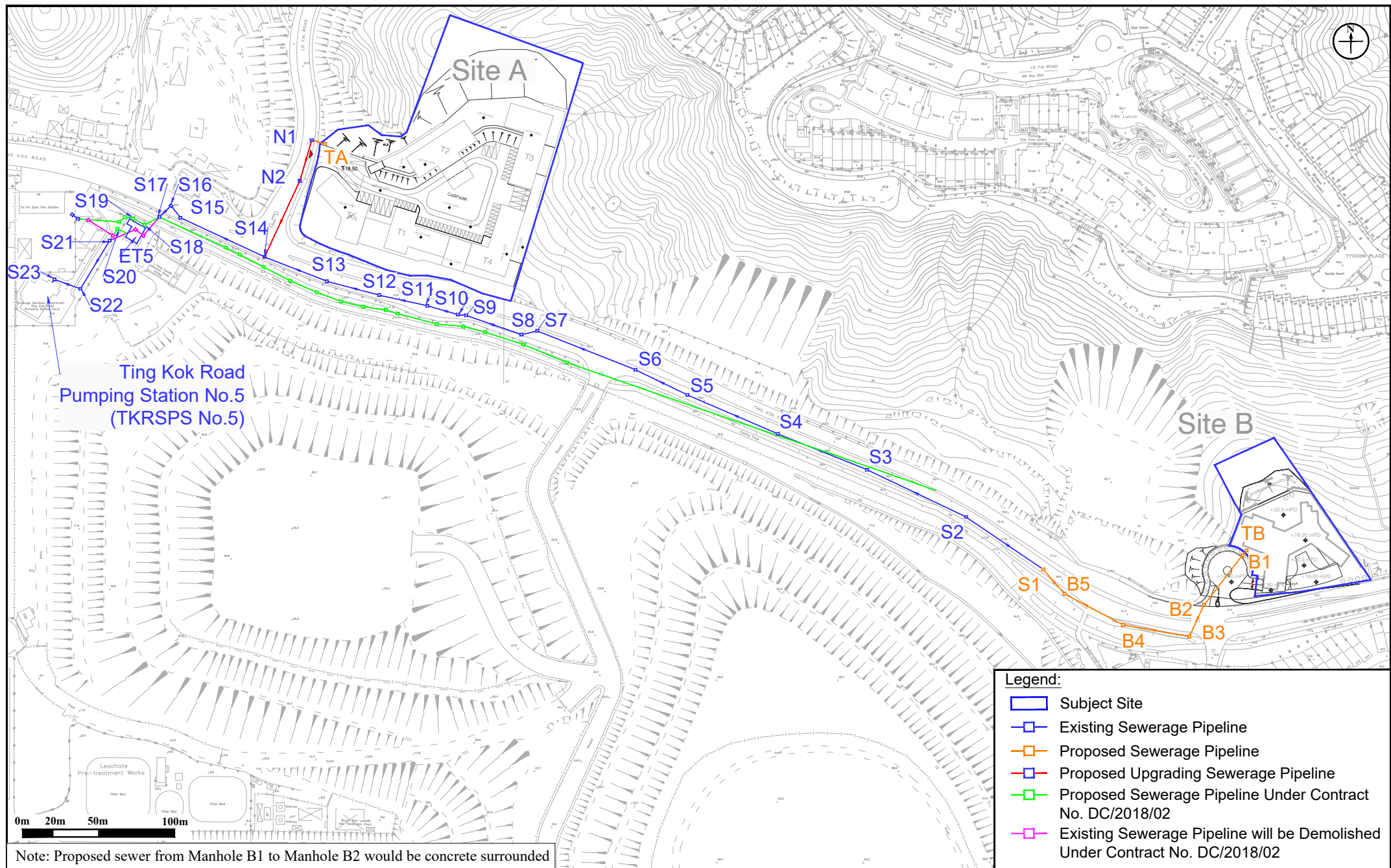
## Figures



**Figure: 1**  
**Title:** Location of the Subject Site and its Environ  
**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP (Site A) & UDWYT Lot 11 RP (Site B), Wong Yue Tan, Tai Po

RAMBOLL	
Drawn by:	MW
Checked by:	CC
Rev.:	1.4
Date:	Oct 2024





**Figure:** 2

**Title:** Existing Sewerage System in the Vicinity of Site A and Site B and Proposed Sewerage Pipeline

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

**RAMBOLL**

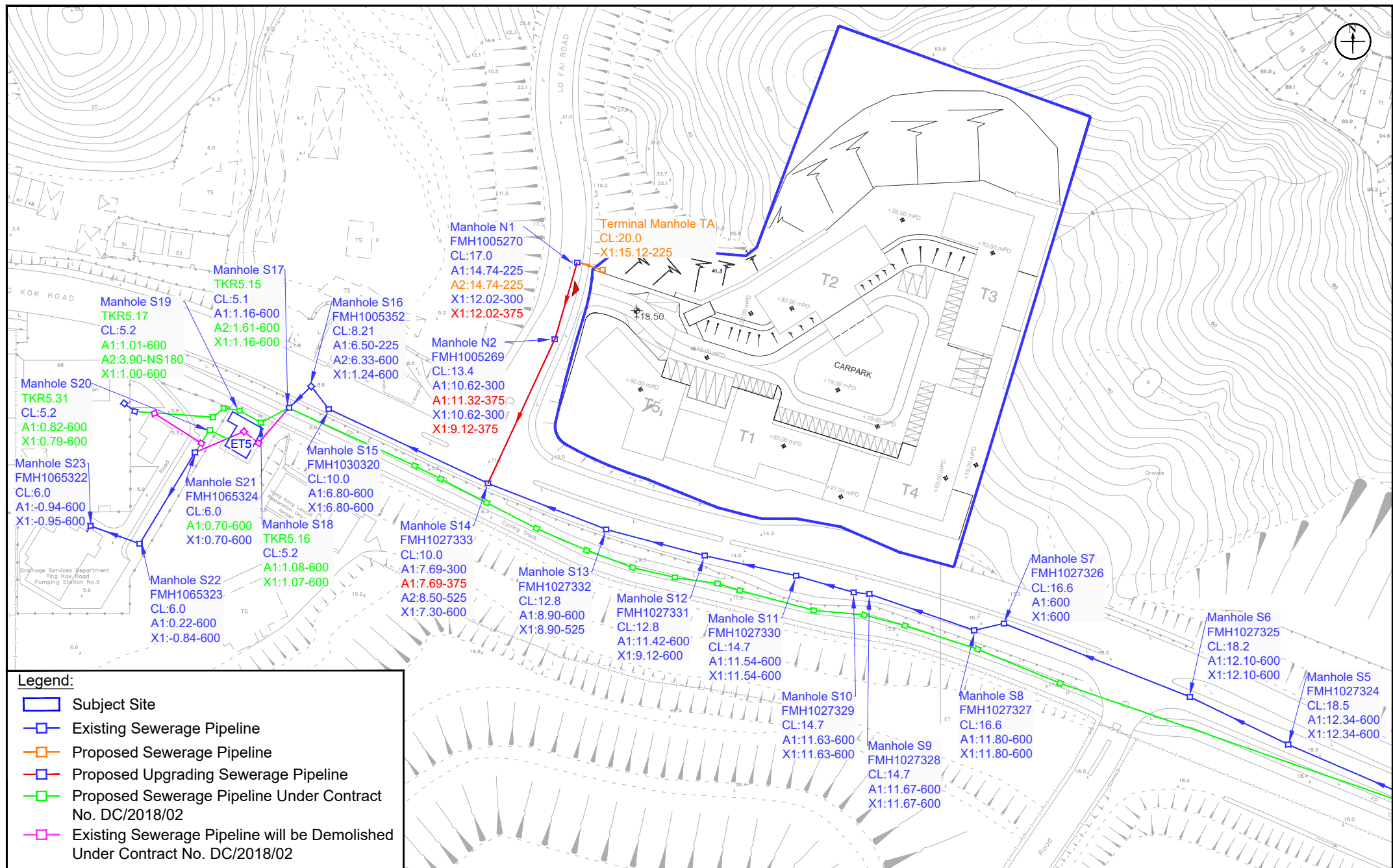
Drawn by: MW

Checked by: CC

Rev.: 1.4

Date: Nov 2023





**Figure:** 3

**Title:** Existing Sewerage System in the Vicinity of Site A and Proposed Sewerage Pipeline

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

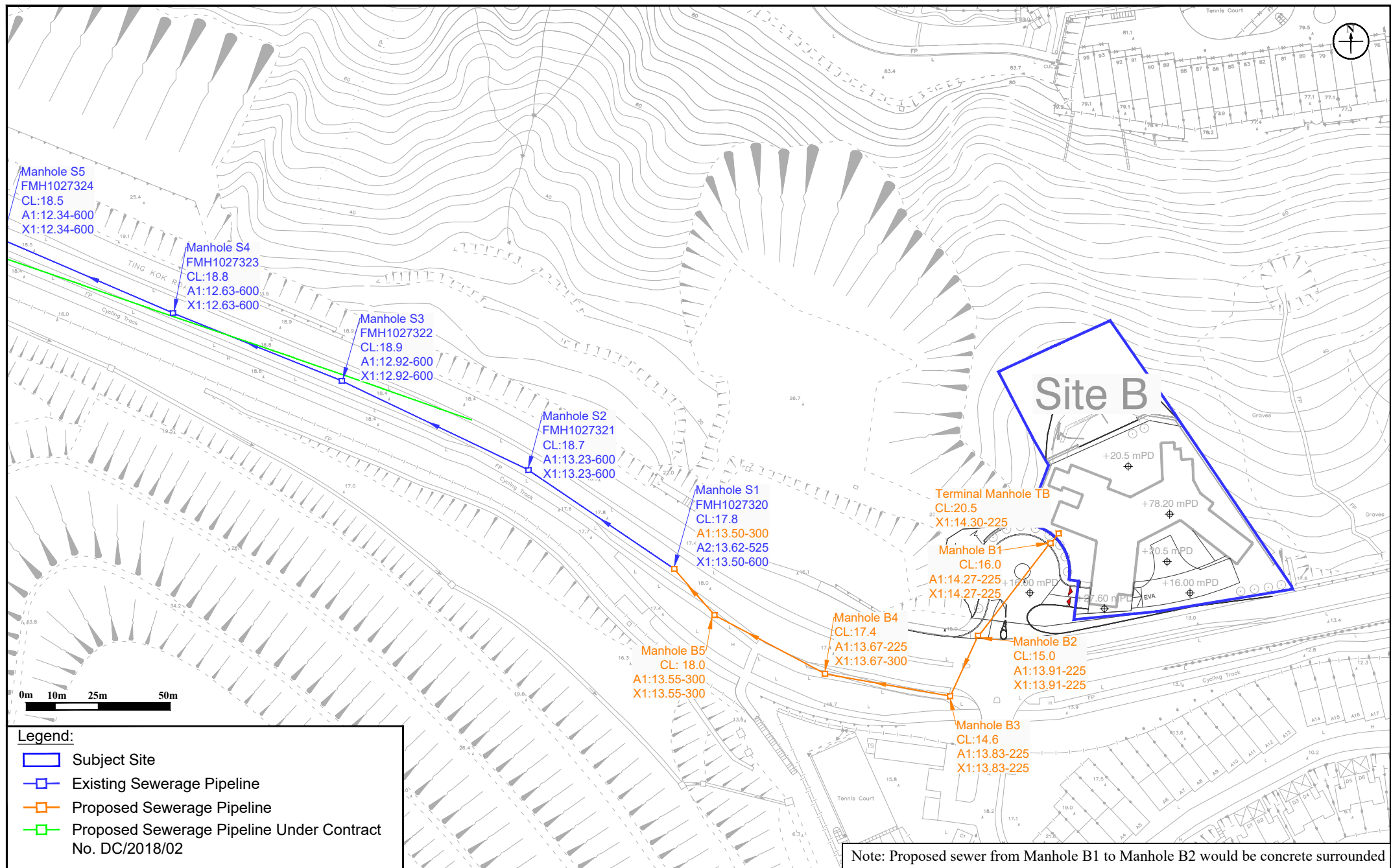
**RAMBOLL**

Drawn by: MW

Checked by: CC

Rev.: 1.4

Date: Nov 2023



**Figure:** 4

**Title:** Existing Sewerage System in the Vicinity of Site B and Proposed Sewerage Pipeline

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

**RAMBOLL**

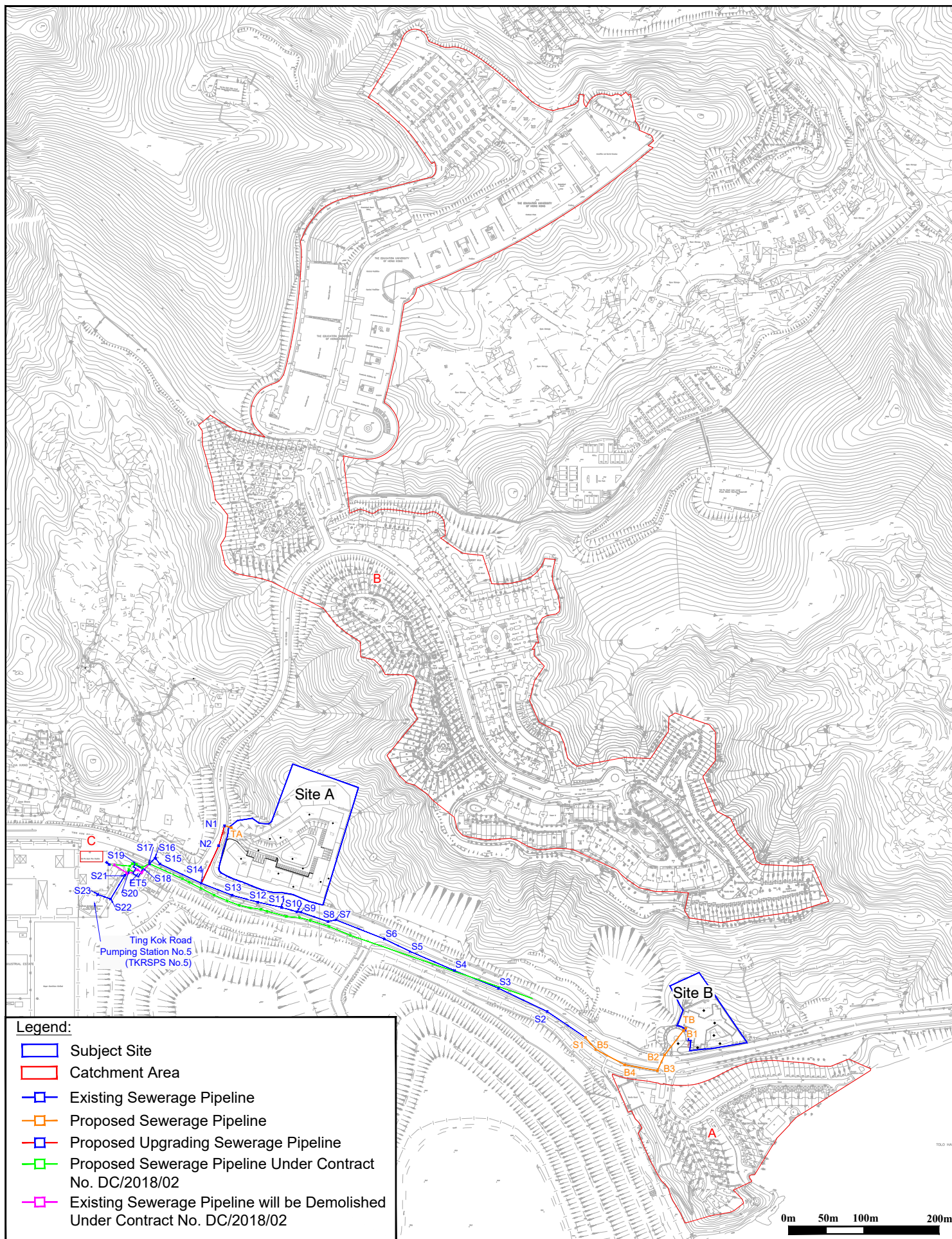
Drawn by: MW

Checked by: CC

Rev.: 1.4

Date: Nov 2023









**Figure: 6**

**Title:** Proposed Sewerage Pipeline Location (Site A)

**Project:** Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po

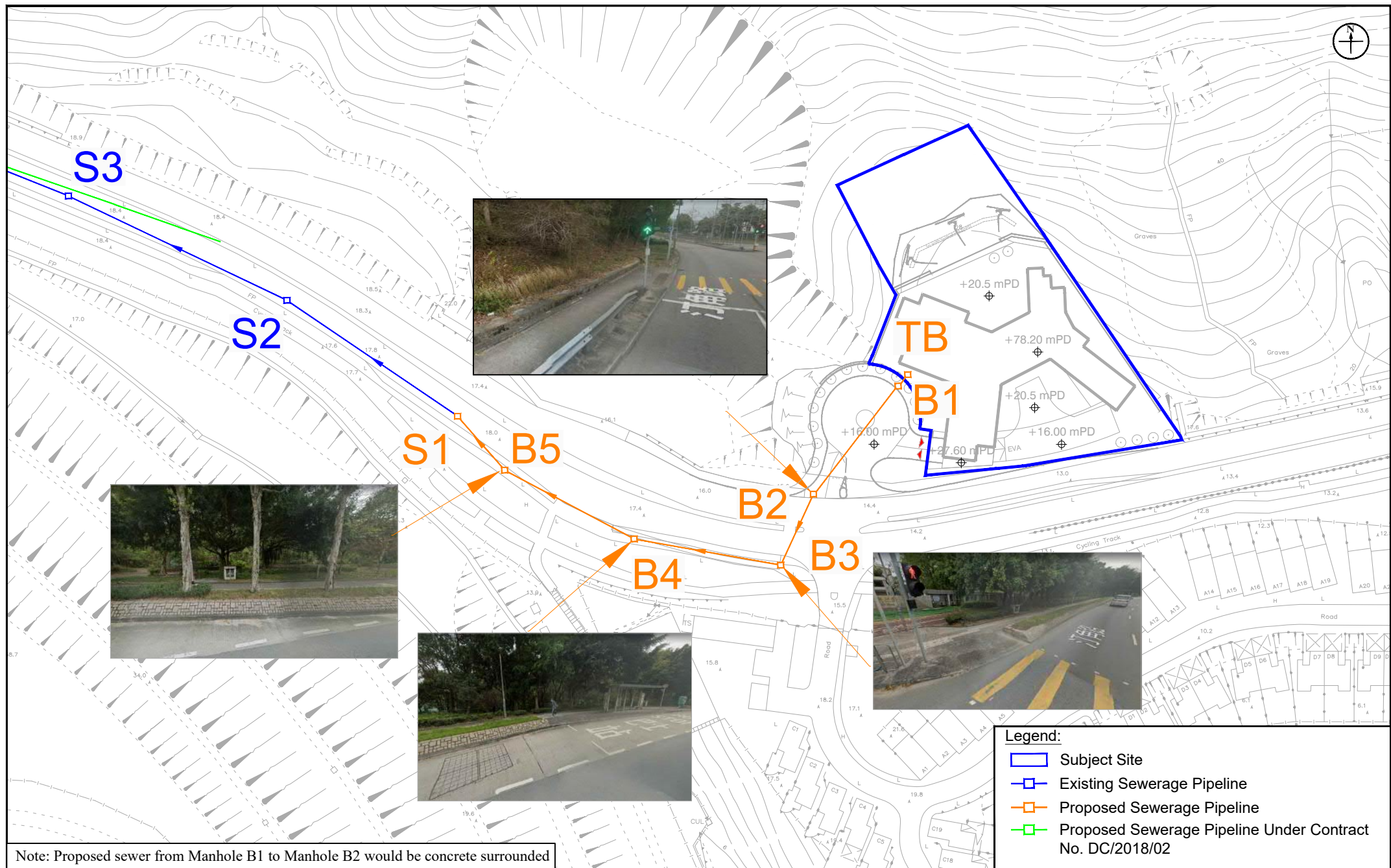
**RAMBOLL**

Drawn by: MW

Checked by: CC

Rev.: 1.8

Date: Dec 2024



<b>Figure:</b> 7	<b>RAMBOLL</b>
<b>Title:</b> Proposed Sewerage Pipeline Location (Site B)	Drawn by: MW
<b>Project:</b> Proposed Public Residential Housing / Starter Homes Development at UDWYT Lot 14RP and Adjoining Government Land (Site A) & Proposed Private Residential Development at UDWYT Lot 11 RP and Adjoining Government Land (Site B), Wong Yue Tan, Tai Po	Checked by: CC
	Rev.: 1.8
	Date: Dec 2024

**Appendix 1      Detailed Sewerage Impact Assessment Calculations**



**Table 1 Calculation for Sewage Generation Rate of the Proposed Development at the Subject Site**

**Site A**

**1. Residential Tower**

1a. Total number of residential units	=	1290 units
1a. Total number of residential units (+10%) <sup>(1)</sup>	=	1419 units
1b. Total number of residents <sup>(1)</sup>	=	3973 people -- (average housing size of 2.8- Under LSPS)
1d. Design flow	=	0.27 m <sup>3</sup> /person/day -- (refer to Table T-1 of GESF - Private R2)
1e. Sewage Generation rate	=	<b>1072.8</b> m <sup>3</sup> /day

**2. Management Office**

2a. Assumed Area	=	128 m <sup>2</sup>
2b. Assumed floor area per employee	=	18.2 m <sup>2</sup> per worker -- (refer to Table 8 of CIFSUS - Business Services)
2c. Total number of employees	=	7 employees
2d. Design flow for commercial activities	=	0.28 m <sup>3</sup> /employee/day -- (refer to Table T-2 of GESF - General territorial average)
2e. Sewage Generation rate	=	<b>2.0</b> m <sup>3</sup> /day

**3. Commercial Area (Retail) (65%)**

3a. Assumed Area	=	650 m <sup>2</sup>
3b. Assumed floor area per employee	=	28.6 m <sup>2</sup> per worker -- (refer to Table 8 of CIFSUS - Retail Trade)
3c. Total number of employees	=	23 employees
3d. Design flow for commercial activities	=	0.28 m <sup>3</sup> /employee/day -- (refer to Table T-2 of GESF - J4)
3e. Sewage Generation rate	=	<b>6.4</b> m <sup>3</sup> /day

**4. Commercial Area (F&B) (35%)**

4a. Assumed Area	=	350 m <sup>2</sup>
4b. Assumed floor area per employee	=	19.6 m <sup>2</sup> per worker -- (refer to Table 8 of CIFSUS - Restaurants)
4c. Total number of employees	=	18 employees
4d. Design flow for commercial activities	=	1.58 m <sup>3</sup> /employee/day -- (refer to Table T-2 of GESF - J10)
4e. Sewage Generation rate	=	<b>28.2</b> m <sup>3</sup> /day

**5. G/IC**

5a. Assumed Area	=	3226 m <sup>2</sup>
5b. Assumed floor area per employee	=	30.3 m <sup>2</sup> per worker -- (refer to Table 8 of CIFSUS - Community, Social & Personal Services)
5c. Total number of employees	=	106 employees
5d. Design flow for commercial activities	=	0.28 m <sup>3</sup> /employee/day -- (refer to Table T-2 of GESF - J11)
5e. Sewage Generation rate	=	<b>29.8</b> m <sup>3</sup> /day

**RCHE**

Total number of beds	=	150 beds
Design flow	=	0.27 m <sup>3</sup> /person/day -- (refer to Table T-1 of GESF - Private R2)
Sewage Generation rate	=	<b>40.5</b> m <sup>3</sup> /day

**Total Flow from Site A**

Flow Rate	=	1179.6 m <sup>3</sup> /day
Contributing Population	=	4369 people
Peaking factor	=	5 Refer to Table T-5 of GESF for population 1,000-5,000 excl. stormwater allowance
Peak Flow	=	<b>68.3</b> litre/sec

**Note**

(1) "+/-10%" variation is allowed for flexibility in detailed design stage

**Table 1 Calculation for Sewage Generation Rate of the Proposed Development at the Subject Site**

**Site B**

**1. Residential Tower**

1a. Total number of residential units	=	460 units
1b. Total number of residents	=	1288 people -- (2021 Population Census: Average Household Size of 2.8 - Tai Po District)
1c. Design flow	=	0.27 m <sup>3</sup> /person/day -- (refer to Table T-1 of GESF - Private R2)
1d. Sewage Generation rate	=	<b>347.8</b> m <sup>3</sup> /day

**2. Clubhouse**

2a. Assumed Area	=	1150 m <sup>2</sup>
2b. Assumed floor area per employee	=	30.3 m <sup>2</sup> per worker -- (refer to Table 8 of CIFSUS - Community & Social Services)
2c. Total number of employees	=	38 employees
2d. Design flow for commercial activities	=	0.28 m <sup>3</sup> /employee/day -- (refer to Table T-2 of GESF - J11 Community, Social & Personal Services)
2e. Sewage Generation rate	=	<b>10.6</b> m <sup>3</sup> /day

**3. Management Office**

3a. Assumed Area	=	46 m <sup>2</sup>
3b. Assumed floor area per employee	=	18.2 m <sup>2</sup> per worker -- (refer to Table 8 of CIFSUS - Business Services)
3c. Total number of employees	=	3 employees
3d. Design flow for commercial activities	=	0.28 m <sup>3</sup> /employee/day -- (refer to Table T-2 of GESF - General territorial average)
3e. Sewage Generation rate	=	<b>0.7</b> m <sup>3</sup> /day

**Total Flow from Site B**

Flow Rate	=	359.1 m <sup>3</sup> /day
Contributing Population	=	1330 people
Peaking factor	=	5 Refer to Table T-5 of GESF for population 1,000-5,000 excl. stormwater allowance
Peak Flow	=	<b>20.8</b> litre/sec

**Table 2a Hydraulic Capacity of Existing Sewers at Ting Kok Road, Tai Po**

Segment	Manhole Reference	Manhole Reference	Pipe Dia.	Pipe Length	Cover Level 1	Cover Level 2	Invert Level 1	Invert Level 2	g	k <sub>s</sub>	s	v	V	Area	Q	Estimated Capacity
			mm	m	mPD	mPD	mPD	mPD	m/s <sup>2</sup>	m		m <sup>2</sup> /s	m/s	m <sup>2</sup>	m <sup>3</sup> /s	L/s
S1-S2	FMH1027320	FMH1027321	600	60.4	17.8	18.7	13.50	13.23	9.81	0.00300	0.004	0.000001	1.30	0.28	0.37	368
S2-S3	FMH1027321	FMH1027322	600	70.8	18.7	18.9	13.23	12.92	9.81	0.00300	0.004	0.000001	1.30	0.28	0.37	368
S3-S4	FMH1027322	FMH1027323	600	62.3	18.9	18.8	12.92	12.63	9.81	0.00300	0.005	0.000001	1.34	0.28	0.38	379
S4-S5	FMH1027323	FMH1027324	600	63.4	18.8	18.5	12.63	12.34	9.81	0.00300	0.005	0.000001	1.33	0.28	0.38	376
S5-S6	FMH1027324	FMH1027325	600	37.0	18.5	18.2	12.34	12.10	9.81	0.00300	0.006	0.000001	1.58	0.28	0.45	448
S6-S7	FMH1027325	FMH1027326	600	65.7	18.2	16.6	12.10	-	9.81	0.00300	0.004	0.000001	1.24	0.28	0.35	352
S7-S8	FMH1027326	FMH1027327	600	9.2	16.6	16.6	-	11.80	9.81	0.00300	0.004	0.000001	1.24	0.28	0.35	352
S8-S9	FMH1027327	FMH1027328	600	37.7	16.6	14.7	11.80	11.67	9.81	0.00300	0.003	0.000001	1.15	0.28	0.33	326
S9-S10	FMH1027328	FMH1027329	600	4.1	14.7	14.7	11.67	11.63	9.81	0.00300	0.010	0.000001	1.95	0.28	0.55	552
S10-S11	FMH1027329	FMH1027330	600	19.8	14.7	14.7	11.63	11.54	9.81	0.00300	0.005	0.000001	1.32	0.28	0.37	374
S11-S12	FMH1027330	FMH1027331	600	31.5	14.7	12.8	11.54	11.42	9.81	0.00300	0.004	0.000001	1.21	0.28	0.34	343
S12-S13	FMH1027331	FMH1027332	600	34.4	12.8	12.8	9.12	8.90	9.81	0.00300	0.006	0.000001	1.57	0.28	0.44	444
S13-S14	FMH1027332	FMH1027333	525	43.5	12.8	10.0	8.90	8.50	9.81	0.00060	0.009	0.000001	2.15	0.22	0.46	465
S14-S15	FMH1027333	FMH1030320	600	60.5	10.0	10.0	7.30	6.80	9.81	0.00300	0.008	0.000001	1.79	0.28	0.51	506
S15-S16	FMH1030320	FMH1005352	600	11.8	10.0	8.2	6.80	6.33	9.81	0.00300	0.040	0.000001	3.93	0.28	1.11	1111
S16-S17	FMH1005352	TKR5.15	600	8.6	8.2	5.1	1.24	1.16	9.81	0.00300	0.009	0.000001	1.89	0.28	0.53	534
S17-S18	TKR5.15	TKR5.16	600	11.1	5.1	5.2	1.16	1.08	9.81	0.00300	0.007	0.000001	1.69	0.28	0.48	477
S18-S19	TKR5.16	TKR5.17	600	8.6	5.2	5.2	1.07	1.01	9.81	0.00300	0.007	0.000001	1.63	0.28	0.46	461
S19-ET5	TKR5.17	-	600	1.6	5.2	5.2	1.00	0.90	9.81	0.00015	0.064	0.000001	7.18	0.28	2.03	2029
ET5-S20	-	TKR5.31	600	7.4	5.2	5.2	0.90	0.82	9.81	0.00015	0.011	0.000001	2.94	0.28	0.83	830
S20-S21	TKR5.31	FMH1065324	600	8.8	6.0	6.0	0.79	0.70	9.81	0.00300	0.010	0.000001	1.99	0.28	0.56	562
S21-S22	FMH1065324	FMH1065323	600	34.4	6.0	6.0	0.70	0.22	9.81	0.00300	0.014	0.000001	2.32	0.28	0.66	656
S22-S23	FMH1065323	FMH1065322	600	15.8	6.0	-	-0.84	-0.94	9.81	0.00300	0.006	0.000001	1.57	0.28	0.44	443

**Table 2b Hydraulic Capacity of Existing Sewers at Lo Fai Road, Tai Po**

Segment	Manhole Reference	Manhole Reference	Pipe Dia.	Pipe Length	Cover Level 1	Cover Level 2	Invert Level 1	Invert Level 2	g	k <sub>s</sub>	s	v	V	Area	Q	Estimated Capacity
			mm	m	mPD	mPD	mPD	mPD	m/s <sup>2</sup>	m		m <sup>2</sup> /s	m/s	m <sup>2</sup>	m <sup>3</sup> /s	L/s
N1-N2	FMH1005270	FMH1005269	300	27.3	17.0	13.4	12.02	10.62	9.81	0.00060	0.051	0.000001	3.58	0.07	0.25	253
N2-S14	FMH1005269	FMH1027333	300	54.3	13.4	10.0	10.62	7.69	9.81	0.00060	0.054	0.000001	3.67	0.07	0.26	259

**Table 2c Hydraulic Capacity of Existing Sewers at Lo Fai Road, Tai Po (After Upgrade)**

Segment	Manhole Reference	Manhole Reference	Pipe Dia.	Pipe Length	Cover Level 1	Cover Level 2	Invert Level 1	Invert Level 2	g	k <sub>s</sub>	s	v	V	Area	Q	Estimated Capacity
			mm	m	mPD	mPD	mPD	mPD	m/s <sup>2</sup>	m		m <sup>2</sup> /s	m/s	m <sup>2</sup>	m <sup>3</sup> /s	L/s
N1-N2	FMH1005270	FMH1005269	375	27.3	17.0	13.4	12.02	11.32	9.81	0.00060	0.026	0.000001	2.91	0.11	0.32	321
N2-S14	FMH1005269	FMH1065324	375	54.3	13.4	10.0	9.12	7.69	9.81	0.00060	0.026	0.000001	2.95	0.11	0.33	326



**Table 2d Hydraulic Capacity of Proposed Sewers from the Terminal Manhole of the Proposed Development for Sewage generated from the Proposed Development**

Segment	Manhole Reference	Manhole Reference	Pipe Dia. mm	Pipe Length m	Cover Level 1 mPD	Cover Level 2 mPD	Invert Level 1 mPD	Invert Level 2 mPD	g m/s <sup>2</sup>	k <sub>s</sub> m	s	v m <sup>2</sup> /s	V m/s	Area m <sup>2</sup>	Q m <sup>3</sup> /s	Estimated Capacity L/s
TB-B1	-	-	225	4.5	20.5	16.0	14.30	14.27	9.81	0.00070	0.007	0.000001	1.05	0.04	0.04	42
B1-B2	-	-	225	40.9	16.0	15.0	14.27	13.91	9.81	0.00070	0.009	0.000001	1.20	0.04	0.05	48
B2-B3	-	-	225	23.3	15.0	14.6	13.91	13.83	9.81	0.00150	0.003	0.000001	0.67	0.04	0.03	27
B3-B4	-	-	225	44.4	14.6	17.4	13.83	13.67	9.81	0.00150	0.004	0.000001	0.70	0.04	0.03	28
B4-B5	-	-	300	43.7	17.4	18.0	13.67	13.55	9.81	0.00150	0.003	0.000001	0.70	0.07	0.05	49
B5-S1	-	FMH1027320	300	21.3	18.0	17.8	13.55	13.50	9.81	0.00137	0.002	0.000001	0.70	0.07	0.05	49
TA-N1	-	FMH1005270	225	9.3	20.0	17.0	15.12	14.74	9.81	0.00030	0.041	0.000001	2.90	0.04	0.12	115

- Notes:
- (1) TA & TB are the proposed terminal manholes as shown in Figure 2 of the SIA report. Nominal assumption of 1 in 100 gradient is applied for the proposed sewers. The exact invert levels of the proposed manholes are subject to change during detailed design stage.
  - (2) According to DSD Drainage Records, the invert levels of S7 are not available. Therefore, the gradient of S6-S8 is estimated by its overall gradient. The assumed outgoing level of S1 is included in table 2a & 2b.

- Remarks:
- (1) g=gravitational acceleration; k<sub>s</sub>=equivalent sand roughness; s=gradient; v=kinematic viscosity of water; V=mean velocity
  - (2) Table 2a & 2b: The value of k<sub>s</sub> = 3.0-0.6mm is used for the calculation of slimed clayware sewer, poor condition (Table 5: Recommended roughness values in Sewerage Manual)
  - (3) Table 2a & 2b: The value of k<sub>s</sub> = 6.0-3.0mm is used for the calculation of slimed precast concrete sewer, poor condition (Table 5: Recommended roughness values in Sewerage Manual)
  - (4) Table 2c & 2d: The value of k<sub>s</sub> = 1.5-0.3mm is used for the calculation of slimed polyethylene for the proposed sewers, poor condition (Table 5: Recommended roughness values in Sewerage Manual)
  - (5) Table 2: The value of k<sub>s</sub> is interpolated for pipe velocities between 0.75 m/s and 1.2 m/s.
  - (6) The value of velocity (V) is referred to the Tables for the hydraulic design of pipes, sewers and channels (8th edition)
  - (7) Equation used: 
$$V = -\sqrt{(8gDs)} \log\left(\frac{k_s}{3.7D} + \frac{2.51v}{D\sqrt{(2gDs)}}\right)$$

Table 3 Calculation for Sewage Generation Rate of the Existing Surrounding Building

[illegible]

Remarks:

- (2) Population Census, Average Household Size = 2.84 - Two Daughters
- (3) Public Restroom, TV, Traditional Village, MP, Modern Village, IS, Institutional and special class, TS, Temporary and non-dominant, MR, Mobile residential
- (4) Residential mobility is assumed to be 0.05 m/s per person for PR, IS and TS, 0.1 m/s per person for MR and 0.2 m/s per person for TS. MP = 0.05 m/s per person is adopted for R3 and R4. UPL = 0.1 m/s per person is adopted for TV and TVN (refer Table T-1 of CERS)
- (5) Churn rate for non-Chinese = 0.037 per month for TS and TSN, 0.025 per month for MR and MRN, 0.015 per month for PR and PRN, 0.015 per month for UPL and UPLN
- (6) Churn rate for Chinese = UPL = 0.26 m/s per person (refer to Table T-2 of CERS); J11 Community, Social & Personal Services
- (7) Assumed floor area per retail employee = 28.6 m<sup>2</sup> per worker (refer to Table 8 of CPBISL - Retail Trade)
- (8) Retail employees per floor = 0.035 m<sup>2</sup> per person (refer to Table T-2 of CERS; J4 Wholesale & Retail)
- (9) Assumed floor area per F&B employee = 154 m<sup>2</sup> per person (refer to Table T-2 of CERS; J5 Restaurants and F&B)
- (10) F&B/Hotel employee UPL = 1.5 m/s per person (refer to Table T-2 of CERS; J5 Restaurants & F&B)
- (11) Assumed floor area per G/C employee = teacher / 30.3 m<sup>2</sup> per worker (refer to Table 8 of CPBISL - Community & Social Services)
- (12) Assumed floor area per teacher = 0.26 m/s per person (refer to Table T-2 of CERS; J11 Community, Social & Personal Services)
- (13) Student UPL = 0.04 m/s per employee (refer to Table T-2 of CERS; School Studies)
- (14) Based on comparison with fire station
- (15) Outflow assumption
- (15) Turnover Rate = 4 hrs (indoor pool), 6 hrs (outdoor pool), Required Surface Loading Rate of Fire = 50 m/s per hour (based on 2 m/s) identical fires
- (16) ADNF assumption
- (16) Assuming 2 identical fires to be used and considered separately. Backwash Duration = 3 minutes, Backwash Flow Rate = 30 m/s per hour (based on 2 m/s) identical fires

- (a) Number of Residential Flats is referenced to Centamap. <http://hk.centamap.com>  
(b) Number of Teachers and Student of The Education University of Hong Kong is referenced to <https://www.edu.hk/en/about/facts-and-figures/student-enrollment>  
(c) Number of Teachers and Student of The Education University of Hong Kong Jockey Club Primary School is referenced to <https://www.eduhces.edu.hk/download/document/20221129165054225285-61315011.pdf>

**Table 4a Comparison of the Hydraulic Capacity of Existing Sewers for Sewerage generated from the Proposed Development and Surrounding Catchment Areas**

Segment	Pipe Dia. (mm)	Pipe Length (m)	Gradient	Estimated Capacity (L/s)	ADWF (m <sup>3</sup> /day)	Contributing Population	Peaking Factor	Swimming Pool/Public Toilet/Pumping Station (L/s)	Peak Flow from the Proposed Development and Catchment Areas (L/s)	Contribution from the Proposed Development and the Surrounding Catchment Areas (%)	Status
S1-S2	600	60.4	0.004	368	437.8	1622	6	144.8	175.2	47.7%	OK
S2-S3	600	70.8	0.004	368	437.8	1622	6	144.8	175.2	47.7%	OK
S3-S4	600	62.3	0.005	379	437.8	1622	6	144.8	175.2	46.2%	OK
S4-S5	600	63.4	0.005	376	437.8	1622	6	144.8	175.2	46.6%	OK
S5-S6	600	37.0	0.006	448	437.8	1622	6	144.8	175.2	39.1%	OK
S6-S7	600	65.7	0.004	352	437.8	1622	6	144.8	175.2	49.8%	OK
S7-S8	600	9.2	0.004	352	437.8	1622	6	144.8	175.2	49.8%	OK
S8-S9	600	37.7	0.003	326	437.8	1622	6	144.8	175.2	53.7%	OK
S9-S10	600	4.1	0.010	552	437.8	1622	6	144.8	175.2	31.7%	OK
S10-S11	600	19.8	0.005	374	437.8	1622	6	144.8	175.2	46.8%	OK
S11-S12	600	31.5	0.004	343	437.8	1622	6	144.8	175.2	51.1%	OK
S12-S13	600	34.4	0.006	444	437.8	1622	6	144.8	175.2	39.4%	OK
S13-S14	525	43.5	0.009	465	437.8	1622	6	144.8	175.2	37.7%	OK
S14-S15	600	60.5	0.008	506	5302.9	19640	4	158.3	403.8	79.9%	OK
S15-S16	600	11.8	0.040	1111	5302.9	19640	4	158.3	403.8	36.3%	OK
S16-S17	600	8.6	0.009	534	5302.9	19640	4	158.3	403.8	75.7%	OK
S17-S18	600	11.1	0.007	477	5302.9	19640	4	158.3	403.8	84.7%	OK
S18-S19	600	8.6	0.007	461	5302.9	19640	4	158.3	403.8	87.5%	OK
S19-ET5	600	1.6	0.064	2029	5314.6	19684	4	158.3	404.4	19.9%	OK
ET5-S20	600	7.4	0.011	830	5314.6	19684	4	158.3	404.4	48.7%	OK
S20-S21	600	8.8	0.010	562	5314.6	19684	4	158.3	404.4	72.0%	OK
S21-S22	600	34.4	0.014	656	5314.6	19684	4	158.3	404.4	61.6%	OK
S22-S23	600	15.8	0.006	443	5314.6	19684	4	158.3	404.4	91.3%	OK



**Table 4b Comparison of the Hydraulic Capacity of Existing Sewers for Sewerage generated from the Proposed Development and Surrounding Catchment Areas**

Segment	Pipe Dia. (mm)	Pipe Length (m)	Gradient	Estimated Capacity (L/s)	ADWF (m <sup>3</sup> /day)	Contributing Population	Peaking Factor	Swimming Pool/Public Toilet (L/s)	Peak Flow from the Proposed Development and Catchment Areas (L/s)	Contribution from the Proposed Development and the Surrounding Catchment Areas (%)	Status
N1-N2	300	27.3	0.051	253	4865.0	18019	4	26.8	252.0	99.7%	Not OK
N2-S14	300	54.3	0.054	259	4865.0	18019	4	26.8	252.0	97.2%	Not OK

**Table 4c Comparison of the Hydraulic Capacity of Existing Sewers for Sewerage generated from the Proposed Development and Surrounding Catchment Areas (After Upgrade)**

Segment	Pipe Dia. (mm)	Pipe Length (m)	Gradient	Estimated Capacity (L/s)	ADWF (m <sup>3</sup> /day)	Contributing Population	Peaking Factor	Swimming Pool/Public Toilet (L/s)	Peak Flow from the Proposed Development and Catchment Areas (L/s)	Contribution from the Proposed Development and the Surrounding Catchment Areas (%)	Status
N1-N2	375	27.3	0.026	321	4865.0	18019	4	26.8	252.0	78.5%	OK
N2-S14	375	54.3	0.026	326	4865.0	18019	4	26.8	252.0	77.4%	OK

Remarks: (1) The value of peaking factor = 6 is used for population 1,000-5,000 incl. stormwater allowance (refers to Table T-5 of GESF)  
(2) The value of peaking factor = 4 is used for population 10,000-50,000 incl. stormwater allowance (refers to Table T-5 of GESF)  
(3) For each sewer segment, only one upstream swimming pool in surrounding catchment with the highest peak flow is accounted

**Table 4c Comparison of the Hydraulic Capacity of Proposed Sewers from the Terminal Manhole of the Proposed Development for Sewage generated from the Proposed Development**

Segment	Pipe Dia. (mm)	Pipe Length (m)	Gradient	Estimated Capacity (L/s)	ADWF (m <sup>3</sup> /day)	Contributing Population	Peaking Factor	Swimming Pool/Public Toilet (L/s)	Peak Flow from the Proposed Development and Catchment Areas (L/s)	Contribution from the Proposed Development (%)	Status
TB-B1	225	4.5	0.007	42	359.1	1330	5	0.0	20.8	49.8%	OK
B1-B2	225	40.9	0.009	48	359.1	1330	5	0.0	20.8	43.5%	OK
B2-B3	225	23.3	0.003	27	359.1	1330	5	0.0	20.8	78.0%	OK
B3-B4	225	44.4	0.004	28	359.1	1330	5	0.0	20.8	74.9%	OK
B4-B5	300	43.7	0.003	49	359.1	1330	5	0.0	20.8	42.0%	OK
B5-S1	300	21.3	0.002	49	359.1	1330	5	0.0	20.8	42.1%	OK
TA-N1	225	9.3	0.041	115	1179.6	4369	5	0.0	68.3	59.2%	OK

Remarks: (1) The value of peaking factor = 5 is used for population 1,000-5,000 excl. stormwater allowance (refers to Table T-5 of GESF)

**Table 5 Existing & Future Flows to Ting Kok Road Pumping Station No.5 (TKRSPS No.5)**

**ADWF**

**1. Designed Capacity (after planned upgrading in 2024)**

Design Daily Flow = 21194 m<sup>3</sup>/day (DSD)

**2. Existing Situation**

Average Flow (2022) = 7682 m<sup>3</sup>/day (DSD)  
36.2% (of designed capacity)

**3. Future Situation (including sewerage generated by future planned development)**

Average Flow = 7682 m<sup>3</sup>/day  
Villa Lucca (TPTL 223 & 229) = 291 m<sup>3</sup>/day  
Planned Development Discharge to Ting Kok Road SPS No.5 = 4060 m<sup>3</sup>/day (EPD)  
  
Total = 12032.5 m<sup>3</sup>/day  
56.8% (of designed capacity)

**4. Future Situation (including sewerage generated by the Proposed Development)**

Existing and Planned Development = 12033 m<sup>3</sup>/day  
Proposed Development = 1539 m<sup>3</sup>/day  
  
Total = 13571.3 m<sup>3</sup>/day  
64.0% (of designed capacity)

Table 6 Existing & Future Flows to Tai Po Sewage Treatment Works (TPSTW)

ADWF

1. Designed Capacity

Design Daily Flow = 120000 m<sup>3</sup>/day (DSD)

2. Existing Situation

Average Flow (2022) = 110754 m<sup>3</sup>/day (DSD)  
92.3% (of designed capacity)

3. Future Situation (including sewerage generated by Proposed Development)

Existing Development = 110754 m<sup>3</sup>/day

Proposed Development = 1539 m<sup>3</sup>/day

Total = 112293 m<sup>3</sup>/day  
93.6% (of designed capacity)



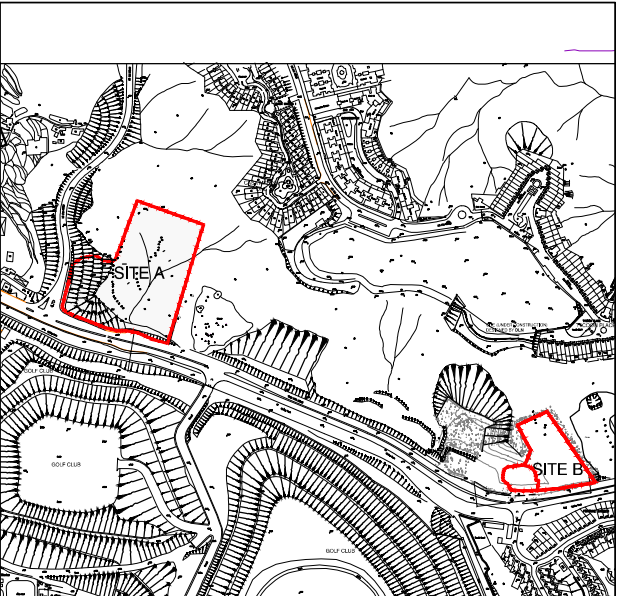
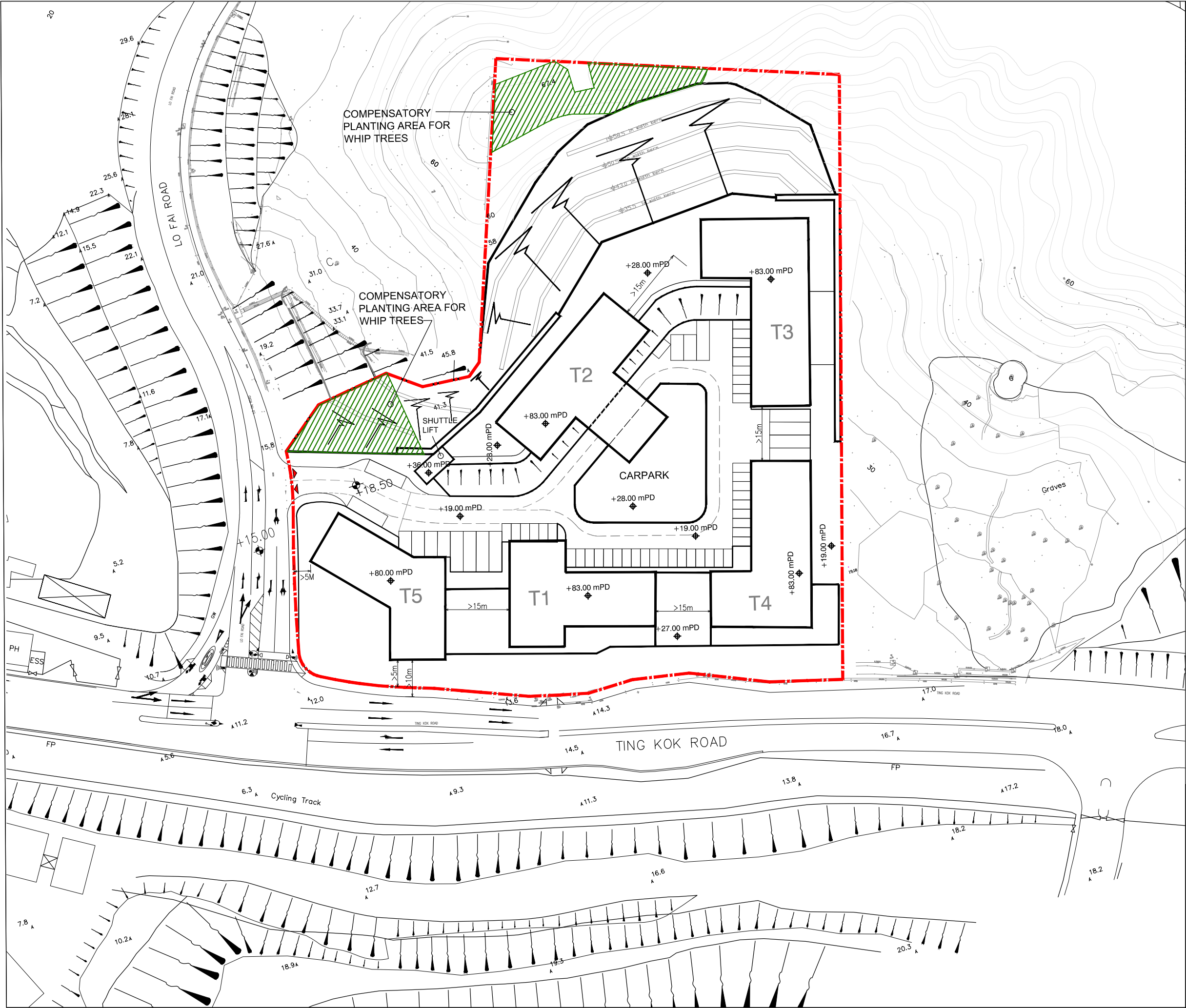
## **Appendix 2      Relevant Information from DSD and EPD**

Plant/Pumping Station	Pump Capacity (l/s)	Design daily flow (m3/day)	Year	Average daily flow in Jan	Average daily flow in Feb	Average daily flow in Mar	Average daily flow in April	Average daily flow in May	Average daily flow in June	Average daily flow in July	Average daily flow in Aug	Average daily flow in Sep	Average daily flow in Oct	Average daily flow in Nov	Average daily flow in Dec	Average daily flow
Ting Kok Road SPS No.5	200	11,500	2022	7,002.9	7,557.1	7,267.2	6,308.8	8,258.2	9,022.5	7,845.5	9,751.9	7,600.4	7,070.8	7,131.6	7,366.0	7,681.9
Ting Kok Road SPS No.6	220	6,330	2022	5,185.8	5,837.4	5,432.2	5,618.6	7,057.7	7,538.9	6,582.9	7,833.2	5,978.8	5,446.1	5,464.3	4,899.6	6,073.0
Ting Kok Road SPS No.7	88.5	5,060	2022	4,000.0	4,621.4	4,171.0	4,296.8	6,199.6	6,641.3	5,709.0	5,415.8	4,050.2	4,133.5	3,571.6	3,040.9	4,654.3
Tai Po STW Stage I/II & IV	-	120,000		101,465.6	109,601.5	108,134.0	102,661.1	123,908.2	118,778.8	109,569.5	116,195.2	113,329.4	107,001.1	106,327.6	112,078.5	110,754.2

TPSTW Planned Intake		
Target Intake Year	Estimated ADWF (m <sup>3</sup> /day)	Discharge Point
-	4060.0	Ting Kok Road SPS No.5

### **Appendix 3      Indicative MLP of the Proposed Scheme**






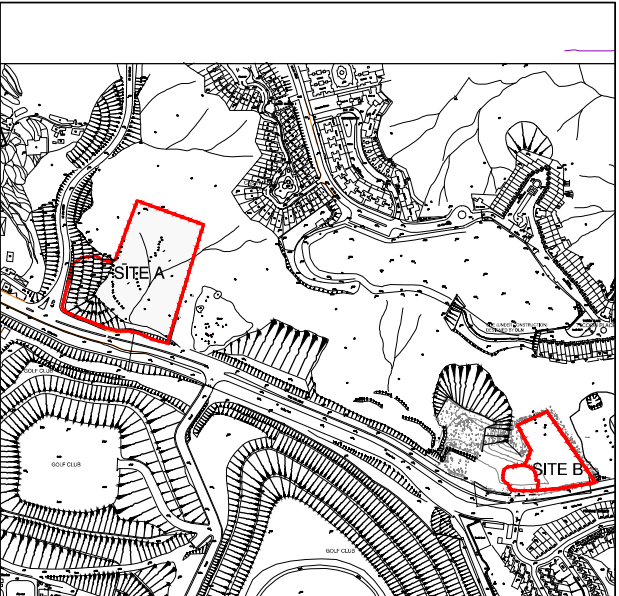
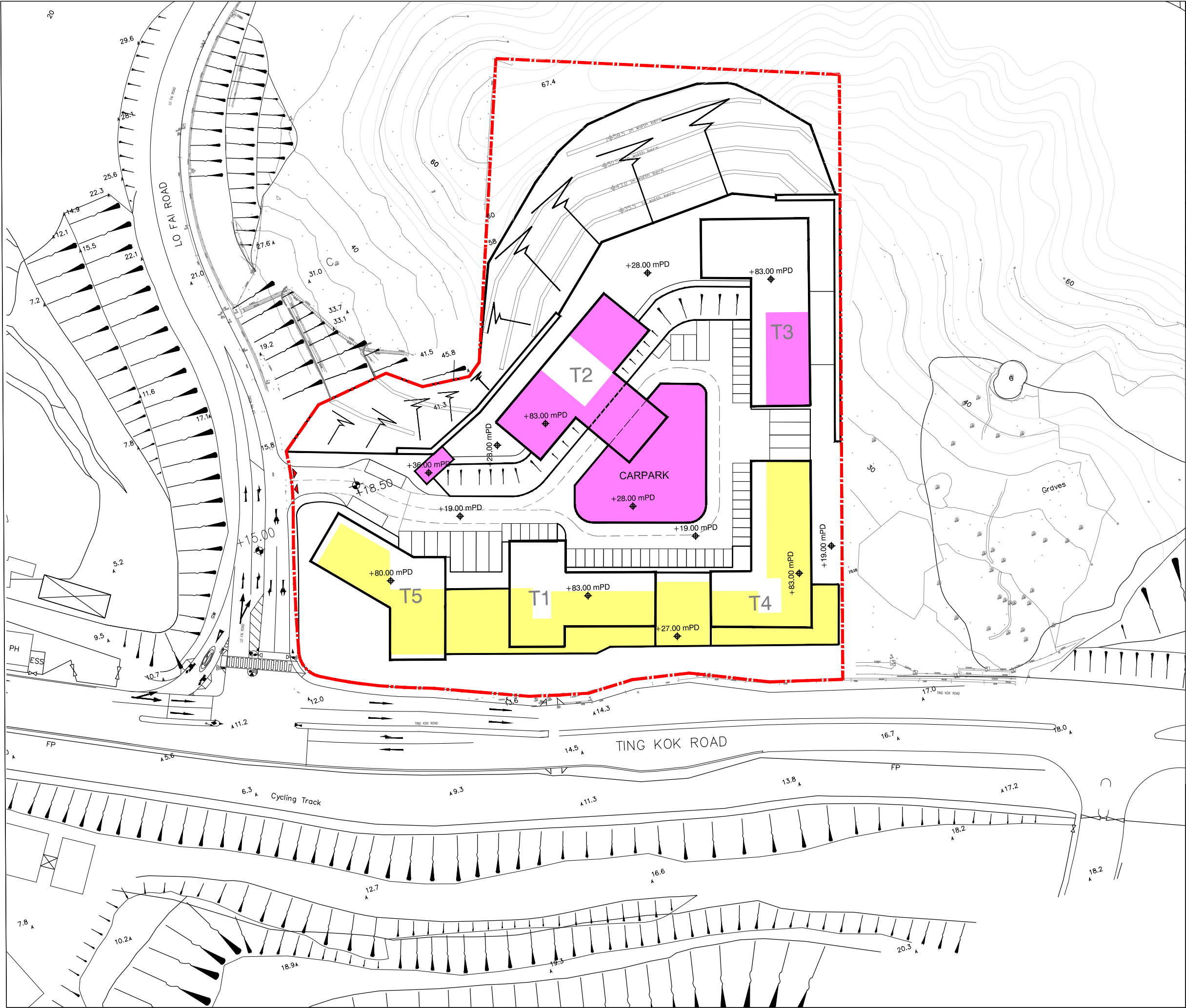


SITE KEY PLAN

DATE:20250206

LEGEND

-  PROPOSED SITE BOUNDARY
-  PROPOSED INGRESS AND EGRESS
-  PROPOSED WHIP TREE PLANTING AREA

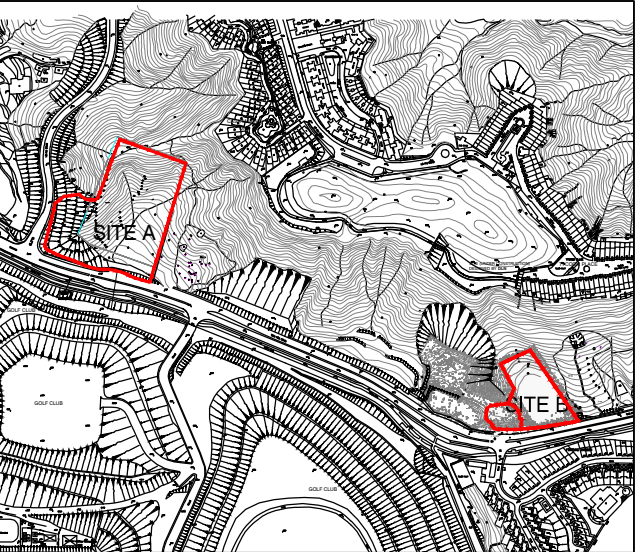
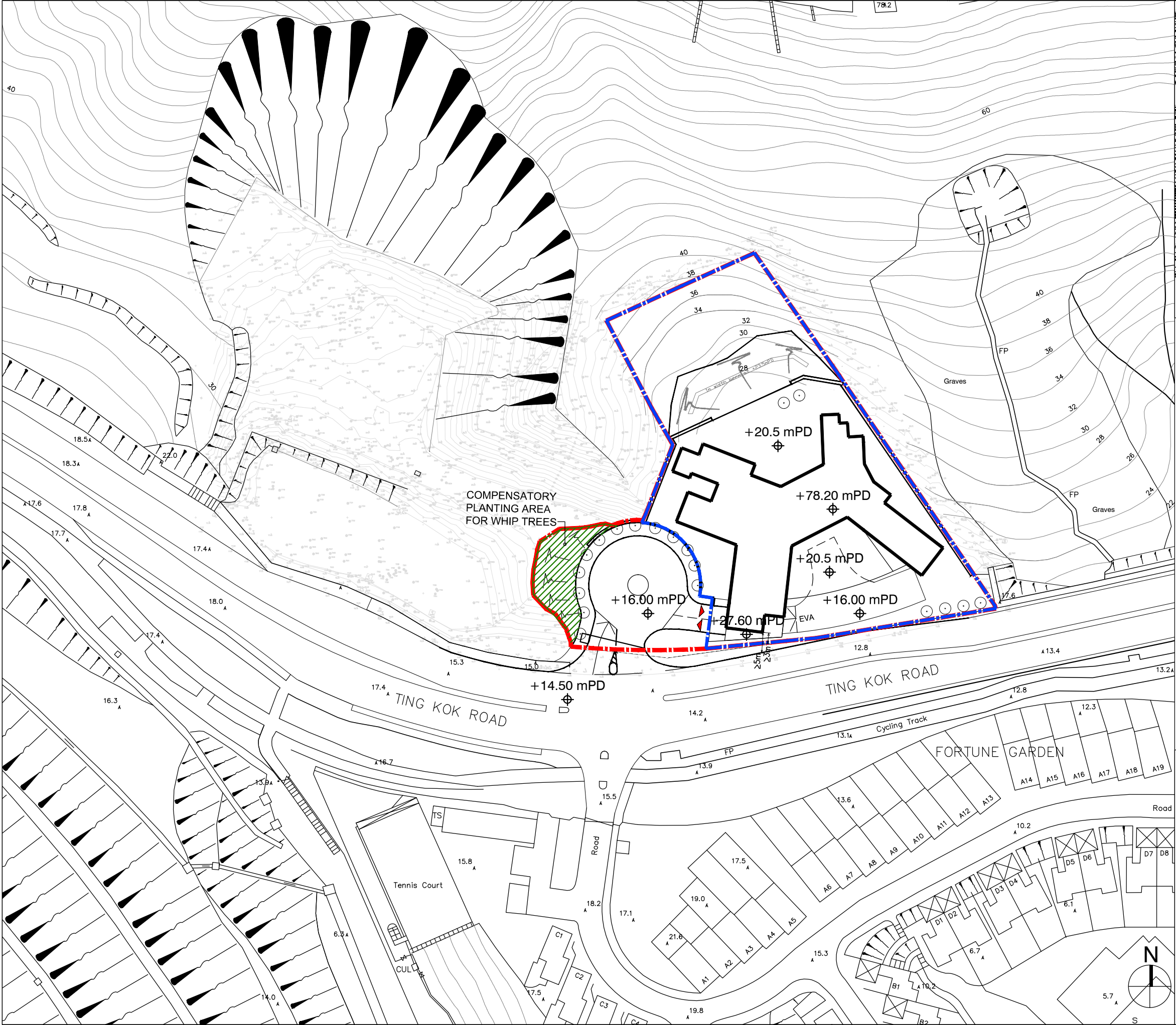


SITE KEY PLAN

DATE:20250210

- LEGEND**
- PROPOSED SITE BOUNDARY
  - PROPOSED INGRESS AND EGRESS
  - UPPER PODIUM
  - LOWER PODIUM





SITE KEY PLAN

LEGEND:

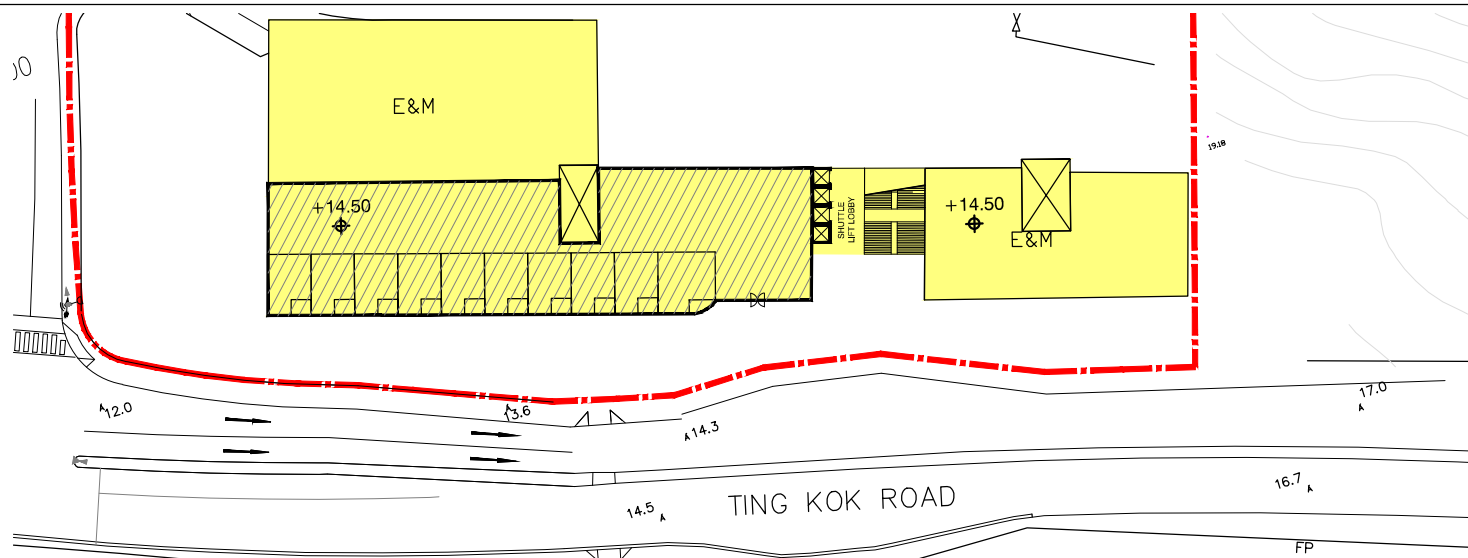
- PROPOSED REZONING SITE BOUNDARY
- PROPOSED DEVELOPMENT SITE BOUNDARY
- PROPOSED INGRESS AND EGRESS
- PROPOSED WHIP TREE PLANTING AREA

Site B - Master Layout Plan  
Scale 1:1000 (A3)

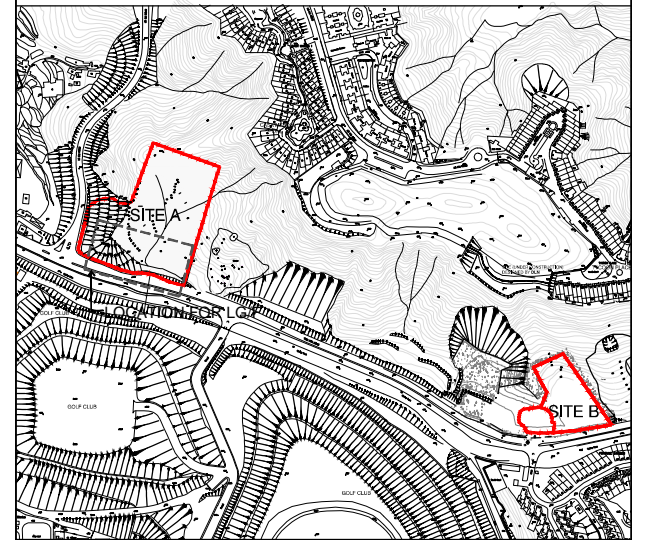




G/F



LG/F



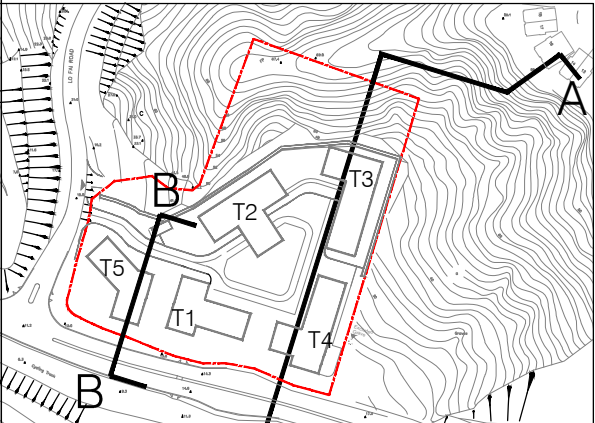
SITE KEY PLAN

DATE:20250210

LEGEND

- PROPOSED SITE BOUNDARY
- PROPOSED INGRESS AND EGRESS
- GIC
- RETAIL
- UPPER PODIUM
- LOWER PODIUM

Site A - LG/F & G/F Part Plan  
Scale 1:1000 (A3)

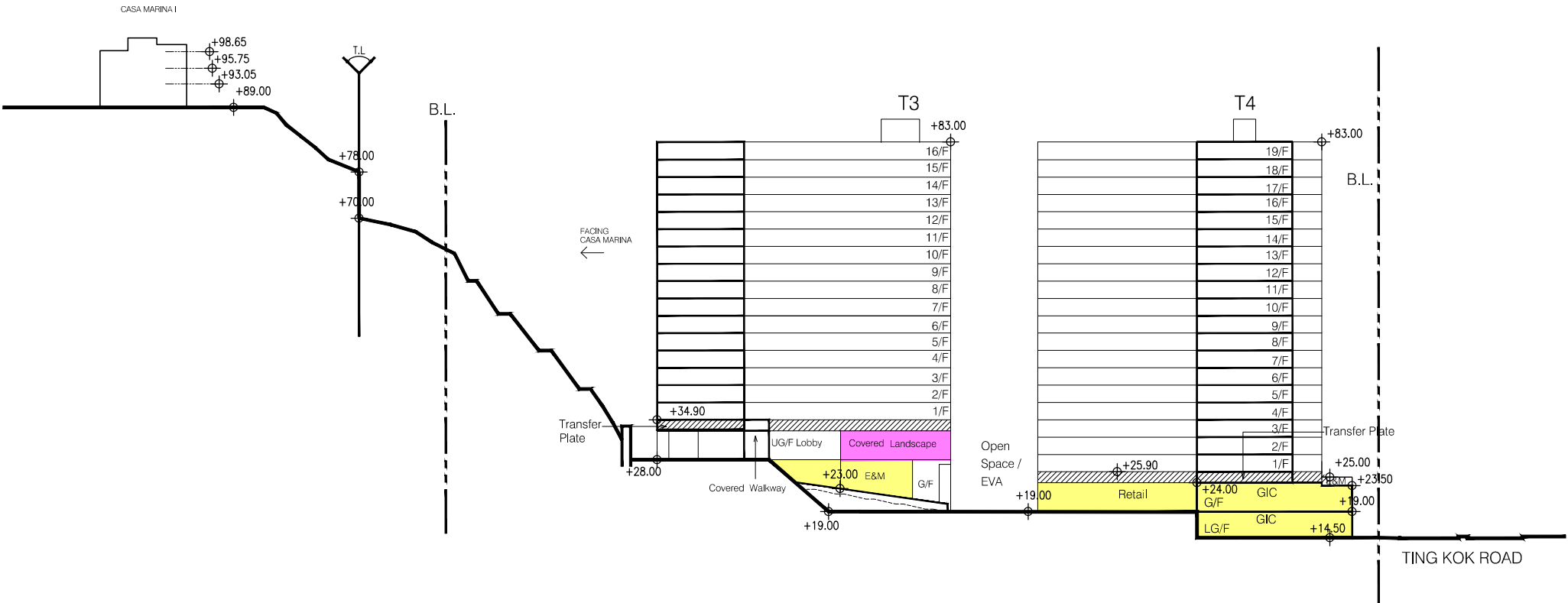


KEY PLAN

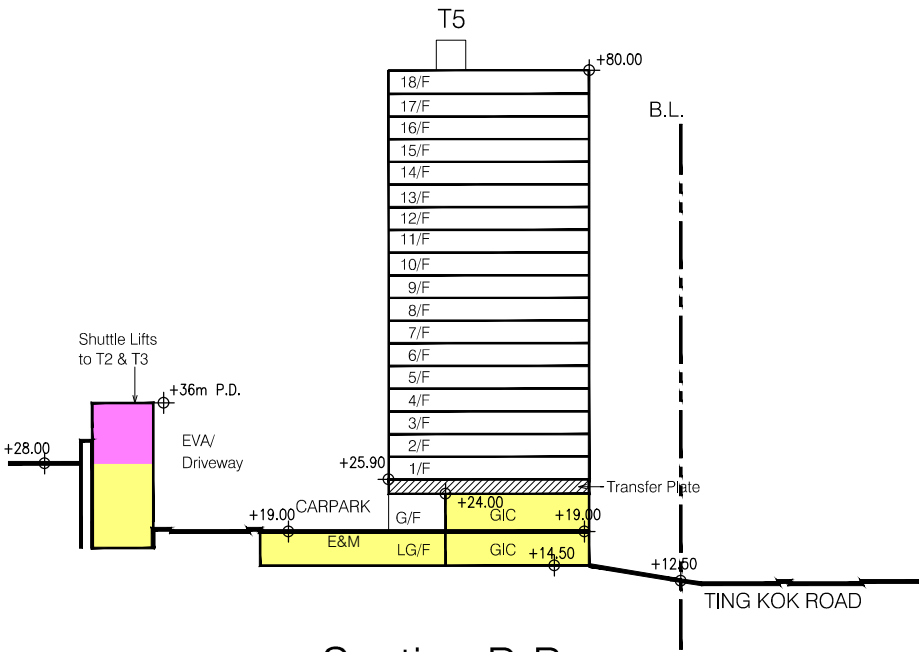
DATE:20240212

LEGEND

- UPPER PODIUM
- LOWER PODIUM

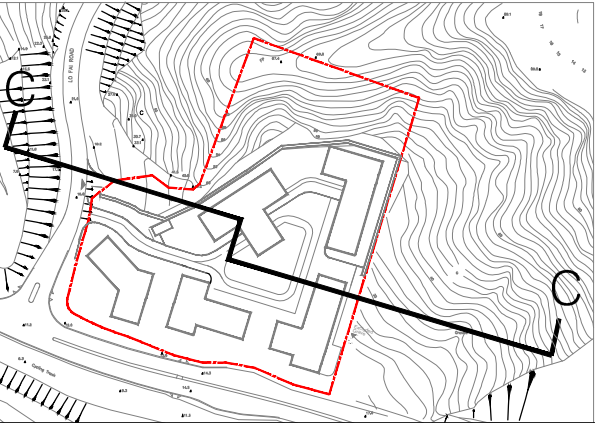


Section A-A

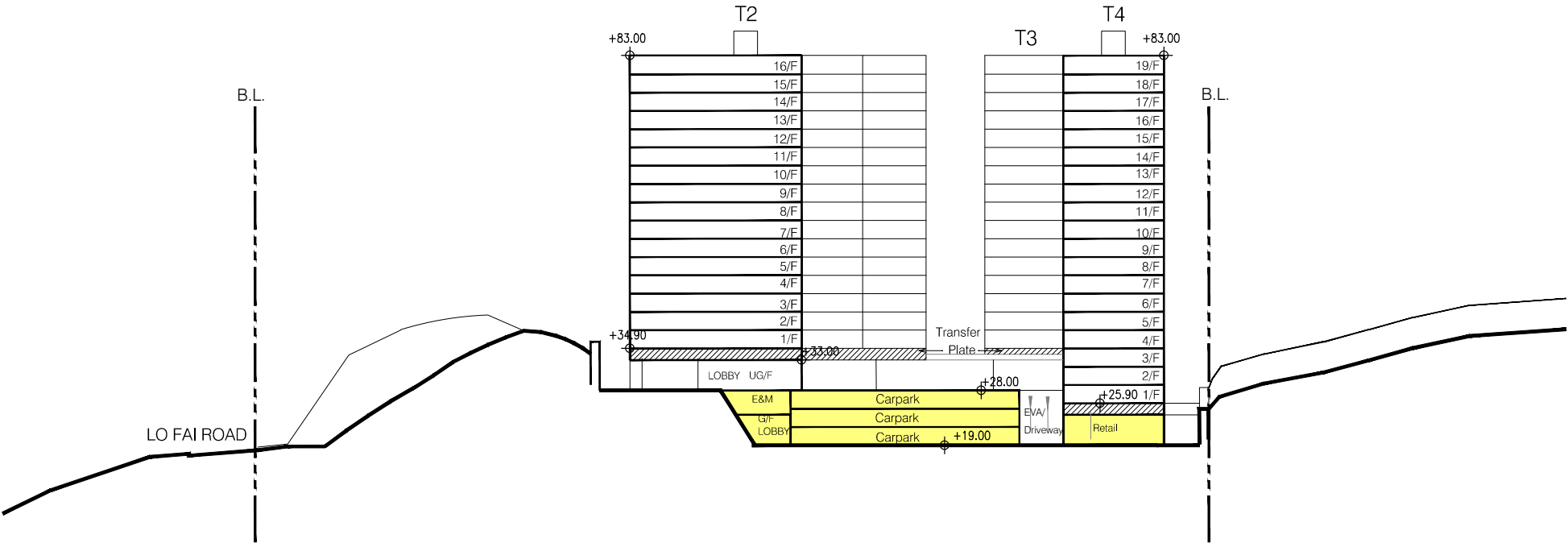


Section B-B

Site A - Section A-A & B-B  
Scale 1:1000 (A3)



KEY PLAN



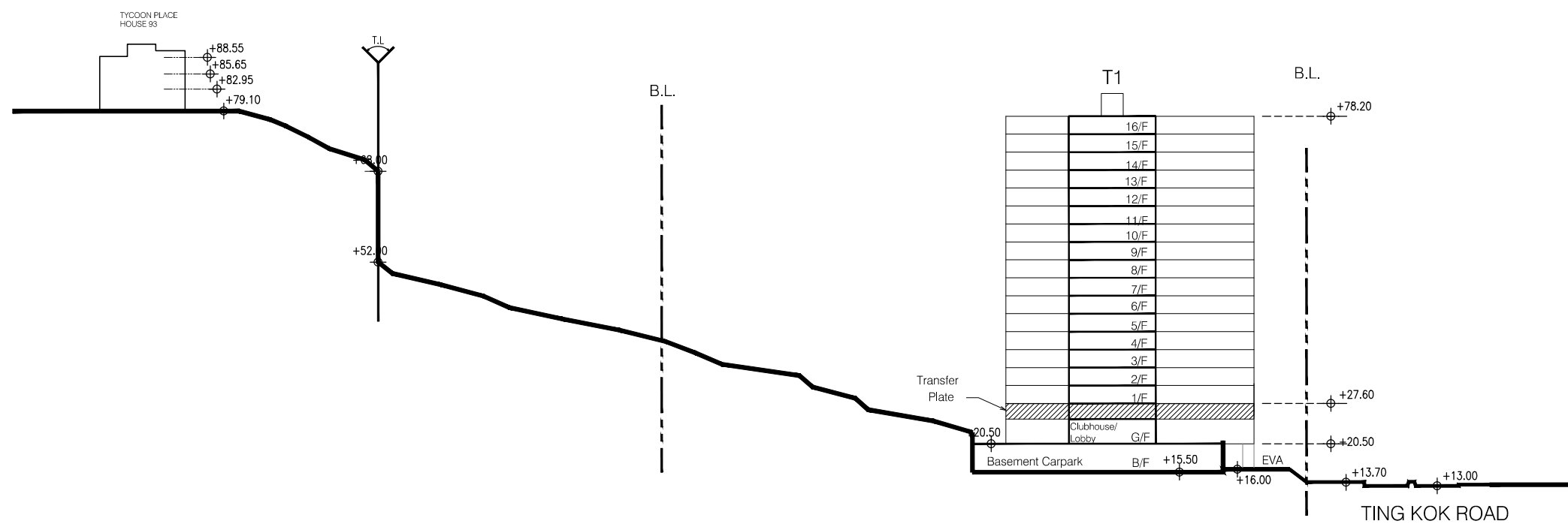
Section C-C

DATE:20250206

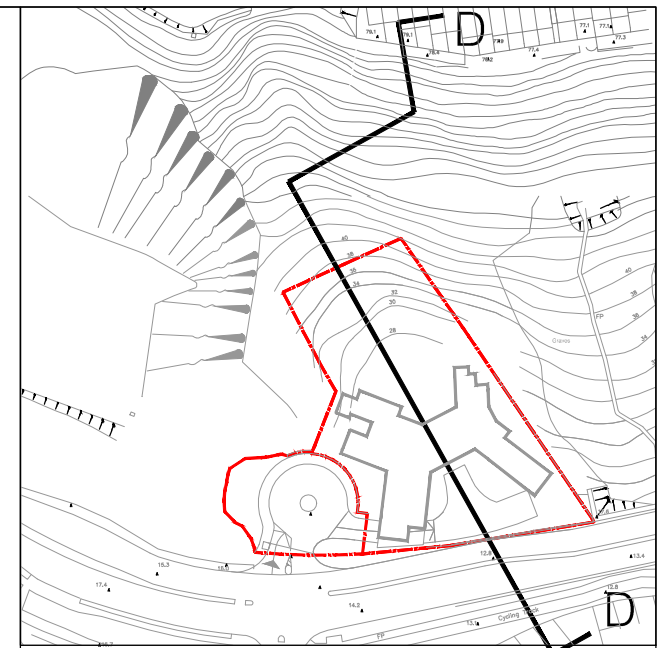
LEGEND

- UPPER PODIUM
- LOWER PODIUM





Section D-D



KEY PLAN

DATE:20250210

---

**Proposed Public Residential Housing/ Starter  
Homes Development at UDWYT Lot 14RP and  
Adjoining Government Land (Site A) &  
Proposed Private Residential Development at  
UDWYT Lot 11RP and Adjoining Government  
Land (Site B), Wong Yue Tan, Tai Po**

***Ecological Impact Assessment Report***

***December 2024***



**Ecosystems Limited**  
生態系統顧問有限公司

Unit B13, 12/F, Block B2, Yau Tong Industrial City  
17 Ko Fai Road  
Yau Tong, Kowloon.

Tel. 電話: (852) 2553 0468  
Fax 傳真: (852) 2552 9191  
Email 電郵: [info@ecosystems-ltd.com](mailto:info@ecosystems-ltd.com)

## Contents

1.	INTRODUCTION .....	2
2.	Approach of Evaluation of Ecological Baseline .....	3
2.1	Relevant legislation, Standards and Guidelines .....	3
2.2	Criteria of Evaluating Species of Conservation Importance .....	5
2.3	Impact Assessment Methodology .....	5
3.	METHODOLOGY .....	8
3.1	Application Site and Study Area .....	8
3.2	Literature Review .....	8
3.3	Ecological Survey Methodology .....	8
4.	ECOLOGICAL BASELINE .....	11
4.1	Literature Review of the Recognised Sites of Conservation Importance .....	11
4.2	Literature Review of the Habitats and Wildlife Groups of Conservation Interest .....	12
4.3	Ecological Survey Results and Evaluation of the Application Sites and the Study Area .....	16
5.	IMPACT IDENTIFICATION AND PREDICTION .....	28
5.1	General .....	28
5.2	Impact Evaluation Criteria .....	28
5.3	Construction phase .....	28
5.4	Operational Phase .....	32
6.	MITIGATION OF ECOLOGICAL IMPACTS .....	34
6.1	General .....	34
6.2	Avoidance .....	34
6.3	Minimization .....	35
6.4	Mitigation .....	35
7.	CONCLUSIONS .....	40
8.	REFERENCES .....	41

## LIST OF TABLES

Table 3.1	Ecological Survey Programme
Table 4.1	Counts of Collared Crow at "Shuen Wan" (data source: Hong Kong Bird Report)
Table 4.2	Evaluation of the Habitats of the Study Area and Application Site
Table 4.3	Evaluation of the Species of Conservation Importance Recorded within the Study Area
Table 6.1	Summary of Potential Ecological Impacts in Construction Phase and Operation Phase

## LIST OF FIGURES

Figure 3.1	The Application Sites, 500m Study Area, Transect and Aquatic Sampling Point
Figure 4.1	Habitat Map of the Application Sites and the 500m Study Area
Figure 4.2	Representative Photos of Habitat of Application Sites

## LIST OF APPENDICES

Appendix A	Flora Species Recorded within the Study Area
Appendix B	Abundance of Mammal Species Recorded within the Study Area
Appendix C	Abundance of Bird Species Recorded within the Study Area
Appendix D	Abundance of Reptile Species Recorded within the Study Area
Appendix E	Abundance of Amphibian Species Recorded within the Study Area
Appendix F	Abundance of Odonate Species Recorded within the Study Area
Appendix G	Abundance of Butterfly Species Recorded within the Study Area
Appendix H	Relative Abundance of Aquatic Community Species Recorded within the Study Area



---

## 1. INTRODUCTION

- 1.1.1 This Ecological Impact Assessment Report is prepared in support of a Land Sharing Pilot Scheme application of the proposed residential development in the “Green Belt” and ‘Road’ zones of Approved Tai Po Outline Zoning Plan No. S/TP/30 in the Lo Fai Road and Ting Kok Road, Tai Po, New Territories (The Remaining Portions of Unsurveyed District at Wong Yue Tan Lot Nos. 11 and 14 and adjoining Government land).
- 1.1.2 The Application Sites are located at the lots mentioned above, with a total site area of about 2.03 ha for Site A with government land of about 0.58 ha; and a total site area of about 0.57 ha for Site B with government land of about 0.14 ha. Site A is bounded by Lo Fai Road to its west and Ting Kok Road to the south; Site B is located to the north of the Ting Kok Road.
- 1.1.3 This report provided the results of review of relevant literature of the ecological information in the proximity of the Study Area, ecological baseline gathered from 6-month survey, the assessment of the potential ecological impacts of the proposed development on the latest proposed Master Layout Plan and is submitted as part of the technical assessment for the Application.

## 2. Approach of Evaluation of Ecological Baseline

### 2.1 Relevant legislation, Standards and Guidelines

2.1.1 The HKSAR ordinances and regulations relevant to the evaluation of ecological baseline for the Application include the following:

- Forests and Countryside Ordinance (Cap. 96) and its subsidiary legislation, the Forestry Regulations (Cap. 96A);
- Town Planning Ordinance (Cap. 131);
- Wild Animals Protection Ordinance (WAPO, Cap. 170);
- Country Parks Ordinance (Cap. 208) and its subsidiary legislation;
- Environmental Impact Assessment Ordinance ("the EIAO", Cap. 499) and the associated Technical Memorandum (EIAO-TM); and
- Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586) which is the local legislation that gives effect to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

2.1.2 The ecological baseline evaluation also makes reference to the following guidelines and standards:

- Hong Kong Planning Standards and Guidelines (HKPSG) Chapter 10, "Conservation";
- PELB Technical Circular 1/97 / Works Branch Technical Circular 4/97, "Guidelines for Implementing the Policy on Off-site Ecological Mitigation Measures";
- EIAO Guidance Note No. 3/2010 - Flexibility and Enforceability of Mitigation Measures Proposed in an EIA Report;
- EIAO Guidance Note No. 6/2010 - Some Observations on Ecological Assessment from the Environmental Impact Assessment Ordinance Perspective;
- EIAO Guidance Note No. 7/2023 - Ecological Baseline Survey for Ecological Assessment; and
- EIAO Guidance Note No. 10/2023 - Methodologies for Terrestrial and Freshwater Ecological Baseline Surveys.

2.1.3 The ecological baseline evaluation makes reference to the following Mainland legislations:

- List of Wild Animals under State Priority Conservation 國家重點保護野生動物名錄; and
- List of Wild Plants, promulgated by the State Council 國家重點保護野生植物名錄.

2.1.4 Other international conventions and guidelines that are relevant to the ecological baseline evaluation include the following:

- **Convention on International Trade in Endangered Species of Wild Fauna and Flora ("CITES")**. This Convention regulates international trade in animal and plant species

considered to be at risk from such trade. Depending on the degree of threat posed by international trade, CITES classifies endangered species of animals and plants into three Appendices. Appendix I includes highly endangered species threatened with extinction. Commercial trade in these species is prohibited. Appendix II includes species which are not presently threatened with extinction but may become so unless trade is controlled. Trade of these species is allowed but is subject to licensing controls. Appendix III species are species identified by any Party to CITES as requiring cooperation in controlling their trade. Their trade is subject to permits or certificates of origin. Hong Kong's obligations under this Convention are enforced via the Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586). The CITES authority for Hong Kong SAR is the Department of Agriculture, Fisheries and Conservation (AFCD).

- **The International Union for Conservation of Nature (IUCN) Red List of Threatened Species.** IUCN established the IUCN Red List of Threatened Species™, which has since evolved into the world's most comprehensive data source on the global extinction risk of species. The IUCN Red List is considered the authoritative publication to classify species into nine groups:
  - Extinct (EX) - No individuals remaining;
  - Extinct in the Wild (EW) - Known only to survive in captivity, or as a naturalized population outside its historic range;
  - Critically Endangered (CR) - Extremely high risk of extinction in the wild;
  - Endangered (EN) - Very high risk of extinction in the wild;
  - Vulnerable (VU) - High risk of extinction in the wild;
  - Near Threatened (NT) - Likely to become endangered in the near future;
  - Least Concern (LC) - Lowest risk. Does not qualify for a higher risk category.
  - Data Deficient (DD) - Knowledge of the species is inadequate to enable assessment its risk of extinction; and
  - Not Evaluated (NE) - Species not yet evaluated against the criteria.
- **The United Nations Convention on Biological Diversity.** This convention requires parties to regulate or manage biological resources important for the conservation of biological diversity whether within or outside protected areas, with a view to ensuring their conservation and sustainable use. It also requires parties to promote the protection of ecosystems, natural habitats and the maintenance of viable populations of species in natural surroundings. The People's Republic of China (PRC) ratified the Convention on Biological Diversity on 5th January 1993. The HKSAR Government has stated that it



---

is "committed to meeting the environmental objectives" of the Convention (PELB 1996).

- **Convention on the Conservation of Migratory Species of Wild Animals (the Bonn Convention)**, which requires parties to protect listed threatened or endangered migratory species occurring within their boundaries.

## 2.2 Criteria of Evaluating Species of Conservation Importance

2.2.1 Species listed under local legislation and international conventions for conservation of flora and fauna will be given special attention. In accordance with Table 3, Annex 8 of the EIAO-TM, the ecological value of species should be assessed in terms of protection status, species distribution, and rarity. For fauna species, criteria relating to these three aspects were considered, such as being protected under Cap. 170 (except birds), Cap. 586, and/or regional/global legislations/conventions (i.e. the protection status), whether they are endemic species (i.e. species distribution and being considered rare or restricted, and highlighted in publications such as Fellowes *et al.* (2002)) (i.e. rarity). References were also made to those protected by law in China. Flora species are considered of conservation importance when it is protected/listed under the regional/global legislations/conventions (e.g. listed under Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586); Forestry Regulations (Cap. 96A); Category I or II protected species in mainland China; listed by IUCN (2023) or CITES), and concerned due to species distribution and rarity (e.g. considered rare by Agriculture, Fisheries and Conservation Department (AFCD) (2003, 2007); Xing *et al.* (2000); Wu and Lee (2000); or Siu (2000)). However, this excludes exotic weeds, escaped cultivars or captive species, vagrants and introduced species which have lower ecological value. Species which are classified by IUCN as Near Threatened (NT), Least Concern (LC), Data Deficient (DD), or Not Evaluated (NE), and not covered by any other laws/regulations/conventions are not considered of conservation importance.

2.2.2 The species identified as having conservation importance will be further categorised in accordance with their relevance to potential impacts, which will be assessed in accordance with the EIAO-TM criteria.

## 2.3 Impact Assessment Methodology

2.3.1 According to the data from the reviewed literature and the ecological surveys being conducted, existing wildlife uses of various habitats with special attention to those wildlife groups and habitats with conservation importance as well as the key issues shall be investigated and described. The ecological data will form a basis to determine an optimal option in ecological perspective and evaluate

how the development affects the ecology within the Study Area. The assessment will identify and quantify as far as possible the potential terrestrial and aquatic ecological impacts associated with the proposed development, both direct and indirectly, on-site, off-site, primary, secondary and cumulative ecological impacts on the wildlife groups and habitats identified such as direct loss of habitats, destruction of habitat, disturbance to wildlife, reduction of species abundance/diversity, loss of roosting, feeding and breeding grounds, reduction of ecological carrying capacity, loss in ecological linkage and function, and habitat fragmentation.

2.3.2 Other possible disturbance caused by the proposed development will also be identified, in particular the following:

- a) Loss of habitats, feeding, breeding and roosting grounds of wildlife and recognised sites of conservation importance due to construction and operation phases of the proposed development;
- b) Indirect ecological impacts due to changes in the water quality and hydrology, as a result of surface run-off any associated disinfection activities, temporary sewage overflow, accidental discharge of untreated sewage, etc. in the water bodies, drainage channels and other wildlife habitats in the Study Area during construction and operation phases;
- c) Impacts arising from and/or associated with the proposed works e.g. direct mortality of fauna (e.g. road-kill), removal of plant species of conservation importance, barrier effect on mobile species, disturbance impacts;
- d) Impacts due to increase in human activities and disturbance during the construction and operation stages of the proposed development such as increase in light intensity, noise, glare, dust and traffic;
- e) Fragmentation of habitats and deterioration of environmental quality to the recognised sites
- f) Recognised sites of conservation importance and other ecologically important areas; and
- g) Cumulative impacts due to other planned and committed concurrent development projects at or near the area.

2.3.3 Predicted impacts will be quantified as far as possible and evaluated with reference to the criteria in Annexes 8 and 16 of the EIAO-TM. Ecological impacts will be assessed in the absence of mitigation. Impacts are generally ranked as "insignificant", "minor", "moderate" or "severe".

2.3.4 Where significant negative impacts are predicted, the strategy will follow the priority of "avoid, minimize, and compensate". The construction and operational phase impacts on ecology will be assessed individually, then cumulatively, in combination with other existing, committed and proposed developments. The study team, in consultation with the client, will follow the approaches as:

---

modifications to project design, consideration of alternative options (if any), special controls on construction methods and schedule.

- 2.3.5 After conducting the impact assessment from the proposed development, possible and practicable mitigation measures (such as alternative design and configuration of the Project, modification/change of construction methods, restriction of building height, provision of buffer areas, etc.) to avoid, minimize and/or compensate for the adverse ecological impacts identified during the construction and operation phases of the proposed development. The feasibility and effectiveness of the recommended mitigation measures shall be evaluated. The scope, type, location, implementation arrangement, resource requirement, subsequent management and maintenance of such measures shall be defined.
- 2.3.6 The acceptability of residual impacts following mitigation will be assessed. Finally, the assessment will evaluate the need for ecological monitoring and audit.



### 3. METHODOLOGY

#### 3.1 Application Site and Study Area

3.1.1 The Application Site A is bounded by Lo Fai Road to its west and Ting Kok Road to the south; the Application Site B is located to the north of the section of Ting Kok Road adjoining the Fortune Garden (**Figure 3.1**).

3.1.2 The Application Sites are currently zoned as “Green Belt” and ‘Road’ in the Approved Tai Po Outline Zoning Plan No. S/TP/30. The “Study Area” for this Ecological Impact Assessment covers the area within the 500m from the Application Site boundary and also the areas likely to be affected by the proposed development (**Figure 3.1**).

#### 3.2 Literature Review

3.2.1 The following available literature covering the Study Area and its vicinity was reviewed:

- Binnies (2022). AEIAR-244/2022 - Upgrading of Tai Po Sewage Treatment Works
- Arup (2019). AEIAR-221/2019 - Shuen Wan Golf Course
- Outline Zoning Plan
- Historical and latest government aerial photos
- Hong Kong Biodiversity Information Hub (2024)
- Rare and Precious Plant of Hong Kong (AFCD 2003a)
- Hong Kong Biodiversity - Newsletter of AFCD
- Memoirs of Hong Kong Natural History Society
- Porcupine! - Newsletter of Department of Ecology and Biodiversity, University of Hong Kong

#### 3.3 Ecological Survey Methodology

3.3.1 In accordance with EIAO Guidance Note No. 7/2010, the ecological baseline survey aims at collecting ecological data through sampling. Survey methods used shall be scientifically robust and appropriate for the habitats and target taxa groups under this study.

3.3.2 The ecological surveys shall cover but not be limited to flora, fauna and any other habitats/species of conservation importance. The team of specialists/ecologists shall have adequate knowledge and field experience of the target taxa groups surveyed. The ecological survey team leader should have at least 5 years of relevant experience in ecological survey/assessment. The proposed ecological surveys stated in this methodology paper will cover different habitats according to the results after ground-truthing. Detailed methodology is stated as below.

---

### ***Habitat and Vegetation***

- 3.3.3 Habitats within the Study Area were mapped based on the latest government aerial photos and database combined with field ground-truthing. Representative areas of each habitat type were surveyed on foot. Plant species of each habitat type encountered and their relative abundance were recorded with special attention to species of conservation importance. A plant list was produced, and the dominant plant species were reported as such information is a useful indication of the habitat quality. Nomenclature of plant species follows the latest Hong Kong Plant Database available from the website of the Hong Kong Herbarium.

### ***Terrestrial Mammal***

- 3.3.4 Mammal surveys (including day and night-time surveys) were carried out in representative habitats within the Study Area along the transect (**Figure 3.1**). All sightings, tracks, and signs of mammals (including droppings) were actively searched within the representative habitats of the Study Area. Night surveys were conducted to survey nocturnal mammal species (e.g., bats). As it is a common practice to conserve bat roost as direct impact on bat roost would affect the species population, attention was paid on bat roost location. Active search was carried out in the potential roosting locations (e.g. cave, mine, tunnel, abandoned buildings, palm trees etc.). Ultrasonic bat detector was used for locating and identifying bats after sunset. Camera traps were installed to survey the cryptic mammals at representative locations within the Study Area. Nomenclature for mammals follows that available from the Hong Kong Biodiversity Information Hub.

### ***Avifauna***

- 3.3.5 The avifauna of representative habitats within the Study Area were surveyed in the active period of bird activities (i.e. early morning and dusk) using transect count method (**Figure 3.1**). The presence and abundance of avifauna species at various habitats observed from survey transects were recorded. Behaviours relating to roosting (including night roosting sites, if any), breeding (e.g., nest building) and feeding observed during the surveys were recorded. Night surveys were also conducted to record nocturnal avifauna (e.g., owls). The location(s) of any encountered avifauna species of conservation importance were recorded, along with any notable behaviours. Ornithological nomenclature in this study follows the latest Hong Kong Bird Watching Society List of Hong Kong Birds.

### ***Herpetofauna***

- 3.3.6 Herpetofauna surveys (including day and night survey) were carried out and covered representative habitats within the Study Area along the transect (**Figure 3.1**). Particular attention was given to streams/watercourses or other water bodies. Herpetofauna surveys were conducted through direct observation and active searching in all potential hiding places such as among leaf litter, inside holes, under

stones and logs within the Study Area. During the surveys, all reptiles and amphibians sighted and heard were recorded. Nocturnal auditory detection of species-specific calls was used to survey frogs and toads during night surveys. The nomenclature follows that available from the Hong Kong Biodiversity Information Hub.

***Butterfly and Odonate***

- 3.3.7 Butterfly and Odonate surveys were conducted by transect survey (**Figure 3.1**) during daytime and under fine weather when most butterflies and dragonflies are active. All encountered dragonflies and butterflies were recorded by species by direct observation with binoculars and their abundance will be recorded. The nomenclature follows that available from the Hong Kong Biodiversity Information Hub.

***Fireflies***

- 3.3.8 Firefly survey was conducted monthly from Apr 2024 to June 2024. The survey was conducted following transect and near the aquatic sampling points within the Study Area (**Figure 3.1**). The firefly survey was conducted in the daytime and, at night (started shortly after sunset and continued until 120 minutes after sunset when the fireflies are most active). During the survey, any firefly observed was identified to the species level, where possible. The abundance and distribution of fireflies were recorded. Nomenclature and conservation status of fireflies (e.g. endemic to Hong Kong) follow Yiu (2023).

***Freshwater fish and invertebrates***

- 3.3.9 Surveys of freshwater communities were undertaken at streams/watercourses and other water bodies (either natural or man-made) within the Study Area by means of one or a combination of the following techniques: bank side observation; active searching with fish hand nets; and fish capturing using baited fish cages. The aquatic sampling locations are shown in **Figure 3.1**. All freshwater fauna found were identified to the lowest practicable taxonomic level and their abundance was recorded. The nomenclature for fish follows that available from the Hong Kong Biodiversity Information Hub.
- 3.3.10 Survey schedule of the 6-month survey programme is shown in **Table 3.1**. The ecological survey programme covered dry and wet seasons from 2023 to 2024.



**Table 3.1 Ecological Survey Programme**

Year	2023		2024			
Month#	1	2	3	4	5	6
Month	Aug	Sep	Jan	Apr	May	Jun
Season	Wet		Dry	Wet		
Habitat &Vegetation	D	D	D	D		D
Mammals	D+N	D+N	D+N	D+N	D+N	D+N
*Birds	D+N	D+N	D+N	D+N	D+N	D+N
Reptiles	D+N	D+N		D+N	D+N	D+N
Amphibians	D+N	D+N		D+N	D+N	D+N
Butterflies	D	D		D	D	D
Odonates	D	D		D	D	D
*Fireflies				D+N	D+N	D+N
Fish	D+N	D+N		D+N		D+N
Freshwater Invertebrates	D	D		D		D

\*Note: D: day time survey; N: night-time survey; surveys included early morning and dusk, night-time for bird; dusk and night-time surveys were conducted for fireflies.

## 4. ECOLOGICAL BASELINE

### 4.1 Literature Review of the Recognised Sites of Conservation Importance

4.1.1 There are six Sites of Special Scientific Interest (SSSIs) in Tai Po and Ting Kok areas including Fung Yuen SSSI, Shuen Wan Egrettry SSSI, Ting Kok SSSI, Sha Lo Tung SSSI, Yim Tin Tsai and Ma Shi Chau SSSI, and Centre Island SSSI. The first two are located about 1km from the Application Sites while others are at least 1.5 km from the Application Sites.

4.1.2 **Fung Yuen SSSI** - Fung Yuen SSSI was designated in 1980 because the forested ravine of about 42.8 ha behind Fung Yuen Village supports rare and/or protected plants such as *Illigera Illigera celebica* and also provides an important breeding site for some uncommon butterflies such as White *Dragonail Lamproptera curius*, Common Birdwing *Troides helena* and Common Rose *Pachliopta aristolochiae*. A Fung Yuen Butterfly Reserve (2 ha) has been managed by the Tai Po Environmental Association under the Management Agreement Scheme since November 2005.

4.1.3 **Shuen Wan Egrettry SSSI** - Shuen Wan Egrettry SSSI was designated in 1994. The site is a small fung shui wood behind the villages of Shuen Wan Tsim Uk and Shun Wan Lei Uk, covering an area about 2.1 ha. The site was once used for nesting by Little Egrets *Egretta garzetta*, Great Egrets *Ardea alba*, Eastern Cattle Egrets *Bubulcus*

*coromandus*, Black-crowned Night Herons *Nycticorax nycticorax* and Chinese Pond Heron *Ardeola bacchus* (Young and Cha 1995). More than 300 nests were recorded in 1993 (ibid.). Nesting ceased after 1995, and resumed in 2005, but the nesting population (3 nests in 2007, 2 nests in 2008, 3 nests in 2009) (Anon. 2007, 2008) was much smaller than those recorded in the 1990's and the egretty was abandoned again since 2010.

4.1.4 **Ting Kok SSSI** - covers an area of about 37.5 ha along the coastal area near Ting Kok Village, Tai Po and was designated in 1985. It is a mangrove habitat consisting of *Kandelia obovata*, *Aegiceras corniculatum*, *Lumnitzera racemosa*, *Avicennia marina* and *Bruguiera gymnorrhiza* and is typical example of mangrove habitat suitable for field studies.

4.1.5 **The Yim Tin Tsai and Ma Shi Chau SSSI** - was designated since September 1982 mainly for geological interest with about 50 hectares in area size, and covering the eastern tip of Yim Tin Tsai, the whole island of Ma Shi Chau, and the tombolo connecting them. Yim Tin Tsai and its surrounding area contain the best exposed, densest swarm of dyke varied from 3 to 20m wide. Yim Tin Tsai also contains unconformable contact of Tolo Harbour Formation with volcanic tuff of the Yim Tin Tsai Formation.

4.1.6 **Centre Island** - The whole Centre Island was designated as SSSI in 1982. The island is also of geological interest. It contains lant fossils of Permian Age, and geologically linked to Ma Shi Chau and contains the oldest rock formation known in Hong Kong.

4.1.7 Due to the characteristics of the proposed development and significant separation distance of these recognised sites of conservation importance from the Application Sites, adverse impacts are unlikely to be posed to the abovementioned recognised sites of conservation importance. Literature review and desktop assessment were deemed sufficient to assess whether these sites will be affected by the proposed development.

## 4.2 Literature Review of the Habitats and Wildlife Groups of Conservation Interest

4.2.1 **Habitats of conservation interest** - No habitat of conservation importance is identified as reported in the report for AEIAR-221/2019 and AEIAR-244/2022, such as continuous mature woodland, Fung Shui Wood and mangrove that are generally considered of higher ecological value with higher abundance and diversity of wildlife, either within the Application Sites or in the Study Area under the current Application.

4.2.2 The habitat of Site A was composed of secondary woodland and plantation, while Site B was only composed of plantation habitat as reported in the report for AEIAR-221/2019. Secondary woodland within the location of Site A, which originated from shrubland/grassland that managed to survive hillfires around burial site. This continuous patch of secondary woodland was majorly situated on hillsides outside of Site A with an extension to the northeast of Site B under the current Application. Most of these secondary woodland areas consisted of young stands of trees, ranging in canopy height from 6 to 10 meters. Some trees within these areas were heavily covered with climbers. In secondary woodlands located near villages and on foothills, more mature trees were documented. The secondary woodland comprised a mixture of both exotic and native plant species. Commonly observed species included *Alangium chinense*, *Ficus hispida*, *Mallotus paniculatus*, *Schefflera heptaphylla*, *Aporosa dioica*, *Rhus succedanea*, *Bauhinia championii*, *Mikania micrantha*, and *Alocasia macrorrhizos*.

4.2.3 **Species of Conservation Importance reported** - The Collared Crow (*Corvus torquatus*) is a relatively rare and localized resident species in Hong Kong. It holds a vulnerable status according to the IUCN Red List (IUCN 2023). This bird species is primarily observed in specific habitats such as rocky and sandy shores, mudflats, gei wais, and fish ponds within Hong Kong. It is infrequently documented in non-coastal areas (Carey *et al.* 2001). The Collared Crow may occasionally gather in areas where scavenging opportunities are available from human activities (*ibid.*).

4.2.4 Based on a previous population assessment conducted by BirdLife International in 2007, it was observed that the population of this species in China has experienced a significant decline over the past few decades (Leader *et al.* 2016). The decline was attributed to notable changes in agricultural practices, including the loss of food sources due to intensified farming methods and the excessive use of pesticides starting in the 1950s. Hong Kong, on the other hand, supported the second largest proportion (20%) of this species' population in China (*ibid.*). In Hong Kong, the Collared Crow is primarily concentrated in two major areas: Deep Bay and Tolo Harbour (Stanton 2017). Sightings of Collared Crow beyond Deep Bay and Tolo Harbour are infrequent, with rarely more than five individuals observed (*ibid.*).

4.2.5 The communal roosting behavior exhibited by corvids is widely recognised. Typically, these birds gather during the early evening hours at specific locations known as pre-roosting sites, which are situated in proximity to their final roosting sites. In Hong Kong, communal roost sites have been identified in two locations: Mai Po Nature Reserve and Shuen Wan (Stanton *et al.* 2014). A study conducted between 2004 and 2013 focused on the roosting behavior



at Mai Po Nature Reserve. The final roosting site was found within dense stands of mangrove trees, likely *Kandelia obovata*, situated outside the immigration fence. The number of birds observed roosting ranged from 31 individuals (in February 2005) to 167 individuals (in July 2013), with higher numbers recorded during the summer months compared to winter.

- 4.2.6 Shuen Wan is recognised as both a pre-roosting and roosting site for the Collared Crow species. In contrast to the study conducted at Mai Po Nature Reserve, the documentation of roosting bird counts in Shuen Wan primarily relied on anecdotal observations (**Table 4.1**). It appears that the population of Collared Crows are not utilizing the Shuen Wan Landfill located to the south of the Application Site for roosting purposes has been consistent for approximately a decade, as reports regarding the "Shuen Wan Landfill" site predominantly emerged after 2010. Roosting activities were also observed in nearby locations such as Sha Lan (with 77 birds sighted in August 2006) and Yim Tin Tsai (with 18 birds observed in October 2006 and 42 birds in October 2008).

**Table 4.1 Counts of Collared Crow at "Shuen Wan" (data source: Hong Kong Bird Report)**

Year	Peak Count
1997	36 (Jul), 25(Oct)
1998	28 (Jul), 20 (Sep)
1999	62 (Jul)*
2000	Regularly recorded
2001	17 (May), 19 (Sep)
2002	16 (Oct), 13 (Dec)
2003	Small numbers
2004	Small numbers (< 6 birds)
2005	18 (Nov)
2006	nil
2007	Present
2008	Present
2009	nil
2010	nil
2011	71 (April)*
2012	nil
2013	nil
2014	117 (June)*
2015	94 (June)*

\*specified as "Shuen Wan Landfill"

- 4.2.7 The majority of the local Collared Crow population appears to consist of non-breeding birds that are transient in nature (Carey *et al.* 2001, Leader *et al.* 2016). The breeding population of Collared Crows is primarily concentrated in the Deep Bay area (Carey *et al.* 2001). Anecdotal records suggest that courtship behaviors and nest-building activities of Collared Crows predominantly occur from mid-November to December, with young birds observed in nests during February and

fledglings sighted in late March. Nests are typically concealed within dense woody vegetation, such as fung shui woodland, intertidal mangroves, or plantation woodlands (Stanton 2017).

4.2.8 Scattered coral colonies were reported within Tolo Harbour and Tolo Channel, while one species of hard coral *Oulastrea crispata* was previously recorded on the coastline to the south of the current Application Site B and the adjacent Tai Po Industrial Estate (AECOM 2009). This species is commonly found in Hong Kong waters especially in turbid water.

4.2.9 A total of five seahorses (*Hippocampus kuda*) were documented along the coastlines of Tai Po Industrial Estate (AECOM 2009). *H. kuda* continues to exist in significant numbers within the eastern waters of Hong Kong. This species is classified as "Vulnerable" on the IUCN Red List, reflecting a worldwide decline in its population (IUCN 2023). All Hippocampus species, including *H. kuda*, are listed under Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Consequently, they receive protection under Cap. 586, ensuring conservation measures are in place.

4.2.10 **Pre-roosting and roosting sites of Collared Crow and Black Kite**

- As reported in the AEIAR-221/2019, the Shuen Wan Restored Landfill (SWRL), which is one of the main communal roosting sites for Collared Crows in Hong Kong, that has been identified as globally threatened and listed as Vulnerable due to a significant decline in the species' population in China over the past few decades. The study conducted by Stanton et al. (2014) and Stanton (2017) highlighted this fact. The study also found that the rooftops of buildings in Tai Po Sewage Treatment Works (TPSTW) were the primary pre-roosting sites for Collared Crows, as indicated in the Shuen Wan Golf Course (SWGC) EIA report. Additionally, pre-roosting was occasionally observed in northern and southwestern plantations, as well as turfgrass platforms in Temporary Golf Driving Range (TGDR). Within the SWRL plantation, a communal roost ranging from 12 to 100 birds was documented under the SWGC EIA. The survey results from the SWGC EIA revealed that the Collared Crows would change their pre-roost and final roost locations over time.

4.2.11 The Black Kite (*Milvus migrans*) is the most observed raptor species in Hong Kong, frequently found in various habitats, including urban areas (Carey et al. 2001). During winter, its population significantly increases, typically peaking in December and January (ibid.). It is likely that the birds seen in Hong Kong during autumn, winter, and spring include migratory individuals (ibid.). Additionally, as reported in the AEIAR-221/2019, a maximum count of 147 Black Kites roosting was observed within the SWRL plantation, with night roosts scattered throughout the woodland, primarily along the eastern to southern

---

boundary. However, the number of Black Kites roosting in the SWRL during the peak over-wintering season was relatively low.

4.2.12 For several decades, it has been recognised that the Black Kite exhibits colonial roosting behavior (Hutson 1930). However, in the reviewed literature (Hutson 1930, Humphreys 1960, Bovey 1972, Webb 1972, Melville 1976, Carey 1996), there was no mention of the utilization of pre-roosting sites by Black Kites. Based on survey observations reported in Carey (1996), it was found that Black Kites primarily roosted in Magazine Gap and on Stonecutters Island, which was the case in 1996. Night roosts were also identified in other areas such as Tai O, Ma Wan, and Ma Lam Wat (*ibid.*). In recent years, large numbers of Black Kites have been regularly observed roosting in Magazine Gap, Stonecutters Island, and Yeung Chau in Sai Kung. The tree species used as roosts at Yeung Chau included *Hibiscus tiliaceus* and *Acacia auriculiformis*. Only daytime roosting in Shuen Wan was mentioned in the literature (Carey *et al.* 2001). Occasional roosting populations were recorded at Yim Tin Tsai Island near Shuen Wan, with sightings of 23 birds on October 1, 2005, 70 birds on September 18, 2007, and 74-78 birds on February 16, 2008.

4.2.13 Specific surveys to identify the pre-roost and roost locations(s) with the abundance of Collared Crow and Black Kite were conducted twice a month (between August 2020 and January 2021) in the AEIAR-244/2022. Contrary to the findings of SWGC EIA, no proper pre-roost gathering was recorded within the Project Site, though up to 89 Collared Crows have been recorded in the TPSTW were of birds following their usual daytime activities. Pre-roosting sites were located in the adjacent SWRL. Pre-roosting of Collared Crow was recorded at the SWRL; either on the taller trees or on the grassy areas of the TGDR. The highest pre-roost count was of 114 Collared Crows recorded from the higher platform of the TGDR in early October 2020, with all staying at the grassland after sunset. Roosting of Collared Crow was mainly recorded at the eastern plantation of the SWRL. The highest count of roosting birds was 107, recorded in August 2020.

4.2.14 No pre-roosting or roosting behavior was identified within the habitats of the Application Sites of the current Application in the study of AEIAR-221/2019 and AEIAR-244/2022. The nearest pre-roosting site of Collared Crow was identified about 200m to the south of the Application Site B, and the roosting sites of Collared Crow and Black Kite were identified about 400m to the south of the Application Site B, which the Application Site A is located 400m further away from the Application B to the west.

#### **4.3 Ecological Survey Results and Evaluation of the Application Sites and the Study Area**

##### ***Habitat and vegetation Recorded within Study Area and Application Sites***



- 
- 4.3.1 There were 11 habitats found within Study Area, namely artificial hard shoreline, agricultural land, green urban area, natural rocky shoreline, other urban area, rural plantation, sea, soft shore, watercourse, woody shrubland and woodland (**Figure 4.1**). The sizes of the recorded habitats are summarized in **Table 4.2**.
- 4.3.2 **Agricultural Land** - Agricultural Land was found within Study Area. This habitat was comprised mainly of landscaping and agricultural species namely, *Archontophoenix alexandrae*, *Carica papaya*, *Hylocereus undatus* and ruderal species such as *Bidens alba* and *Ipomoea cairica*.
- 4.3.3 **Green Urban Area** - Green Urban Area was found extensive south of Ting Kok Road within Study Area. The habitat consisted of roadside plantation and turfgrass in golf course and had a simple floristic composition. The canopies of the roadside plantation stands were dominated by exotic species generally for landscaping and visual screening purposes such as *Acacia confusa*, *Lagerstroemia speciosa* and *Juniperus chinensis*. The turfgrass was comprised of mainly herb such as *Axonopus compressus* and weedy species such as *Ipomoea cairica* and *Wedelia trilobata*.
- 4.3.4 **Other Urban Area** - Other Urban Area was found in Study Area and comprised of roads, highways, engineered slopes, villages and housing estates. It was mainly concrete-paved and subject to frequent human and vehicular disturbance. In general, this habitat was characterized by landscape species for visual screening purposes such as *Archontophoenix alexandrae*, *Calliandra haematocephala*, *Schefflera arboricola* and *Terminalia mantaly*, and the domination of disturbance-tolerant and opportunistic herb species prospering in limited microhabitats, namely *Bidens alba* and *Wedelia trilobata*.
- 4.3.5 **Rural Plantation** - Rural plantation was found along Lo Fai Road and Ting Kok Road within Study Area. Mixed planting composed of both native and exotic tree species was found. *Acacia confusa*, *Casuarina equisetifolia* and *Eucalyptus citriodora* were abundantly planted and constituted the canopy of the plantation stands (12–15m). Other native tree species, including *Mallotus paniculatus*, *Celtis sinensis*, *Schefflera heptaphylla* were also found in the plantation, with their heights generally reaching the midstorey. Regeneration of native species such as *Psychotria asiatica* and *Sapium discolor* was observed in the understorey, possibly through seed dispersal of native species from woodland in the vicinity.
- 4.3.6 **Woody Shrubland** - Woody shrubland was found on the hillslopes from Lo Fai Road to Casa Marina. The habitat was dominated by shrub and herb species namely *Dicranopteris pedata* and *Polyspora axillaris*. On the hillsides, tree species such as *Macaranga tanarius* var. *tomentosa* and *Schefflera heptaphylla* formed a semi-shaded

---

understorey supporting herb species, for example, *Euphorbia hirta* and *Liriope spicata*. The floral species recorded in woody shrubland are mostly native to Hong Kong.

- 4.3.7 **Woodland** - A patch of woodland was found within Study Area. The canopy was dominated by native light-demanding and bird-dispersed tree species such as *Macaranga tanarius* var. *tomentosa*, *Schefflera heptaphylla* and *Sterculia lanceolata*. The tree canopies reached 10 to 13 meters. The midstorey and understorey were both recruited with saplings of common native tree and shrub species namely *Bridelia tomentosa*, *Ficus hispida* and *Zanthoxylum avicennae*. The understorey layer was intertwined with common native climbers such as *Gnetum luofuense* and *Tetracera asiatica*, and herb species including *Alocasia macrorrhizos* and *Lygodium japonicum*. The floral species recorded in woody shrubland are mostly native to Hong Kong.
- 4.3.8 **Watercourse** – Watercourse was found within Study Area. The watercourse was semi-modified with concrete bed and banks at downstream section. Human disturbance such as sewage discharge from nearby villages was observed. This habitat was dominated by opportunistic species such as *Microstegium ciliatum* and *Wedelia trilobata* at the embankment.
- 4.3.9 **Vegetation** - A total of 247 plant species were recorded within the Study Area, among which 157 and 89 are known to be native and exotic to Hong Kong respectively and the remaining 1 species is of uncertain origin (**Appendix A**). 3 flora species of conservation importance namely *Ailanthus fordii*, *Aquilaria sinensis* and *Fortunella hindsii* were recorded within the Study Area.

**Table 4.2 Recorded sizes of each habitat within the Study Area**

Habitat	Study Area (ha)	Length (m)	Site A (ha)	Site B (ha)
Artificial Hard Shoreline	0.12			
Agricultural Land	6.57			
Green Urban Area	33.33			
Natural Rocky Shoreline	0.12			
Other Urban Area	50.24			
Rural Plantation	42.38		0.66	0.57
Sea	18.61			
Soft Shore	0.38			
Watercourse	0.29	704		
Woodland	15.29		0.90	
Woody Shrubland	1.01		0.46	
<b>Total</b>	<b>168.34</b>	<b>704</b>	<b>2.03</b>	<b>0.57</b>

4.3.10 1 individual of *Ailanthus fordii* was recorded in woodland within Site A. It is a native tree species considered rare by Corlett *et al.* (2000). It is protected under Cap.96 Forests and Countryside Ordinance and listed as Near threatened in China in “Rare and Precious Plants of Hong Kong” (Hu *et al.* 2003).

4.3.11 2 individuals of *Aquilaria sinensis* were recorded in woodland and woody shrubland within Site A while 3 individuals of *Aquilaria sinensis* were recorded in rural plantation within Site B. It is a native tree species considered common in the lowland forests and fung shui woods of Hong Kong (Corlett *et al.* 2000) and was included in the book “Rare and Precious Plants of Hong Kong” (Hu *et al.* 2003). In South China, it is threatened by illegal felling and over-exploitation and is listed in Appendix II of CITES and protected under Cap. 586 Protection of Endangered Species of Animals and Plants Ordinance in Hong Kong. Moreover, it is included in China Plant Red Data Book (Fu and Chin 1992) and Illustration of Rare & Endangered plant in Guangdong Province (Wu and Hu 1988), and wild individuals are listed in Category II of the List of Wild Plants under State Protection (State Forestry Administration & Ministry of Agriculture 1999). It is also categorized as “Vulnerable” in China Red Data Book (Fu and Chin 1992), the Threatened Species List of China’s Higher Plants (Qin *et al.* 2017) and the IUCN Red List (IUCN 2023).

4.3.12 1 individual of *Fortunella hindsii* was recorded in woody shrubland within Site A. It is a native shrub species considered common in shrubland and forest in Hong Kong (Corlett *et al.* 2000). It is listed in Category II of the List of Wild Plants under State Protection (State Forestry Administration & Ministry of Agriculture 1999).

4.3.13 *Casuarina equisetifolia*, *Dimocarpus longan*, *Lagerstroemia speciosa*, *Litchi chinensis*, *Michelia x alba* and *Pterocarpus indicus* are exotic to Hong Kong and not considered of conservation importance, despite



being considered rare/ very rare by Corlett *et al.* (2000), listed as Vulnerable by IUCN (2023), listed as endangered or vulnerable in Threatened Species List of China's Higher Plants, listed as vulnerable in China Plant Red Data Book, listed under Category II in the List of Wild Plants under State Protection (Part 1), listed under Cap. 96 Forests and Countryside Ordinance, and/ or Cap. 586 Protection of Endangered Species of Animals and Plants Ordinance.

4.3.14 *Dalbergia spp.* are listed under Appendix II of CITES and protected under Cap. 586 Protection of Endangered Species of Animals and Plants Ordinance in Hong Kong as species in this genus is facing threat due to the overexploitation for its valuable wood (known as rosewood). In the current study, *Dalbergia benthamii* was recorded. As the recorded *Dalbergia* are climber which is not relevant to the timber exploitation. In addition, the species are considered 'common' in Hong Kong by Corlett *et al.* (2000). Thus, it is not considered as species of conservation importance in the current Study.

4.3.15 **Application Site A** - Site A is mainly comprised of rural plantation on engineered slope with woody shrubland and woodland on hillsides. A continuous patch of rural plantation was found within Site A along Ting Kok Road and Lo Fai Road. The canopy of rural plantation was dominated by exotic species such as *Acacia spp.*, *Eucalyptus spp.* and *Lophostemon confertus*. The tree canopies reached 10 to 12 meters. Other native tree species, including *Celtis sinensis* and *Ficus microcarpa* were also found in the plantation, with their heights generally reaching the midstorey. Woodland was found further uphill within Site A. The woodland canopy was dominated by native tree species such as *Macaranga tanarius var. tomentosa*, *Sterculia lanceolata* and *Schefflera heptaphylla*. The tree canopies reached 8 to 10 meters. The midstorey and understorey were both recruited with saplings of tree and shrub species namely *Ficus hispida*, *Sarcandra glabra* and *Psychotria asiatica*.

4.3.16 **Application Site B** - Site B is mainly comprised of rural plantation on roadside. The canopy of rural plantation was dominated by exotic species such as *Acacia spp.*, *Dimocarpus longan* as well as native species *Ficus microcarpa*. The tree canopies reached 8 to 12 meters. The understorey was comprised of mainly herb or weedy species such as *Microstegium bialistatum* and *Dicranopteris pedata*.

#### ***Fauna Recorded within the Study Area and Application Sites***

4.3.17 **Mammal** – 4 species of mammal were recorded within the Study Area. 2 individuals of Eurasian Wild Pig *Sus scrofa* were recorded within the rural plantation of the Application Site A. Eurasian Wild Pig is considered very widely distributed in countryside areas throughout Hong Kong (**Appendix B1**). 3 species of bat were recorded flying within Study Area but outside the Application Sites, including Chinese Noctule *Nyctalus plancyi*, Japanese Pipistrelle *Pipistrellus abramus*

and Least Pipistrelle *Pipistrellus tenuis* (**Appendix B2**). As the bats were recorded flying across multiple habitats, the exact location of the recorded bat species was not summarized in the figure.

4.3.18 **Bird** – 38 species of bird were recorded within the Study Area. The recorded birds within the Study Area are generally considered common and abundant throughout Hong Kong (**Appendix C**). Only 5 species of bird of conservation importance were recorded within the Study Area, i.e. Black-crowned Night Heron *Nycticorax nycticorax*, Little Egret *Egretta garzetta*, Black Kite *Milvus migrans*, Greater Coucal *Centropus sinensis* and Black-throated Laughingthrush *Garrulax chinensis*. None of the recorded bird species of conservation importance was recorded in Site A and Site B.

4.3.19 **Reptile and amphibian** – 5 species of reptile were recorded within the Study Area, including Changeable Lizard *Calotes versicolor*, Chinese Gecko *Gekko chinensis*, Garnot's Gecko *Hemidactylus garnotii*, Brown Forest Skink *Sphenomorphus incognitus* and Indian Forest Skink *Sphenomorphus indicus*. Brown Forest Skink and Indian Forest Skink are considered Local Concerned by Fellowes et al. (2002) (**Appendix D**).

4.3.20 9 species of amphibian were recorded within the Study Area, including but not limited to Asian Common Toad *Duttaphrynus melanostictus*, Spotted Narrow-mouthed Frog *Kalophrynus interlineatus*, Asiatic Painted Frog *Kaloula pulchra*, Ornate Pigmy Frog *Microhyla fissipes*, Paddy Frog *Fejervarya limnocharis*, Chinese Bullfrog *Hoplobatrachus chinensis*, Gunther's Frog *Hylarana guentheri*, Brown Tree Frog *Polypedates megacephalus* and Greenhouse frog *Eleutherodactylus planirostris*. All of them are generally considered widely distributed in Hong Kong. Only Chinese Bullfrog is considered as species of conservation importance. It was considered Potential Regional Concerned; List of Wild Animals under State Priority Conservation: Class II and Red List of China's Vertebrates: Endangered (**Appendix E**).

4.3.21 **Odonate** – 13 species of odonate were recorded within the Study Area, including but not limited to Orange-tailed Midget *Agriocnemis femina*, Orange-tailed Sprite *Ceriagrion auranticum*, Common Blue Skimmer *Orthetrum glaucum*, Marsh Skimmer *Orthetrum luzonicum*, Common Red Skimmer *Orthetrum pruinatum neglectum*, Green Skimmer *Orthetrum sabina sabina*, Wandering Glider *Pantala flavescens*, Variegated Flutterer *Rhyothemis variegata aria*, Indigo Dropwing *Trithemis festiva*, Yellow Featherlegs *Copera marginipes*, Emerald Cascader *Zygonyx iris*, Yellow Featherlegs *Copera marginipes*, Black Threadtail *Prodasineura autumnalis* (**Appendix F**). 1 odonate species of conservation importance was recorded within the Study Area, i.e. Emerald Cascader *Zygonyx iris* recorded in the watercourse within Study Area.

4.3.22 **Firefly** – 1 species of firefly was recorded in the agricultural land within the Study Area but outside the Application Site, i.e. Lunate Window Firefly *Pyrocoelia lunata*. Larva of Lunate Window Firefly was recorded near an irrigation ditch of a farmland about 200m to the northwest of Application Site A during the firefly survey.

4.3.23 **Butterfly** – 27 species of butterfly were recorded within the Study Area. The species includes but not limited to Formosan Swift *Borbo cinnara*, Banana Skipper *Erionota torus*, Chestnut Bob *Iambrix salsala*, Chinese Dart *Potanthus Confucius*, Lesser Band Dart *Potanthus trachala*, Water Snow Flat *Tagiades litigiousus*, Grass Demon *Udaspes folus*, Pale Grass Blue *Pseudozizeeria maha*, Plum Judy *Abisara echerius*, Common Indian Crow *Euploea core*, Blue-spotted Crow *Euploea midamus*, Angled Castor *Ariadne ariadne*, Common Mapwing *Cyrestis thyodamas*, Great Egg-fly *Hypolimnas bolina*, Common Sailer *Neptis hylas*, Five-dot Sergeant *Parathyma sulpitia*, Large Faun *Faunis eumeus*, Dark Evening Brown *Melanitis phedima*, Dark Brand Bush Brown *Mycalesis mineus*, South China Bush Brown *Mycalesis zonata*, Common Bluebottle *Graphium Sarpedon*, Paris Peacock *Papilio paris*, Common Mormon *Papilio polytes*, Spangle *Papilio protenor*, Common Birdwing *Troides Helena*, Lemon Emigrant *Catopsilia pomona* and Common Grass Yellow *Eurema hecabe*. All recorded butterfly species are considered widely distributed throughout Hong Kong (**Appendix G**). 3 species of butterfly recorded are considered rare/species of conservation importance, i.e. Lesser Band Dart *Potanthus trachala*, Grass Demon *Udaspes folus* and Common Birdwing *Troides Helena*. They were all recorded outside the Application Sites.

4.3.24 **Aquatic Fauna** – 10 species of aquatic community were recorded in the watercourse within the Study Area, including Snakehead murrel *Channa striata*, Mozambique tilapia *Oreochromis mossambicus*, Sharphead sleeper *Eleotris oxycephala*, Chinese Barb *Puntius semifasciolatus*, Fork tongue goby *Glossogobius giuris*, Mosquito fish *Gambusia affinis*, Guppy *Poecilia reticulata*, Backswimmer *Notonectidae* species, Water Striders *Gerridae* species and Sundaic paddler crab *Varuna yui* (**Appendix H**). No aquatic species of conservation importance was recorded within the Study Area.

#### 4.4 Evaluation of Habitats and Species of Conservation Importance

4.4.1 The ecological importance of habitats within the Study Area are evaluated in accordance with the criteria stipulated in Annex 8 of TM-EIAO (**Tables 4.3**).

4.4.2 In accordance with Table 3, Annex 8 of the TM-EIAO, the ecological value of species recorded within the Study Area was assessed in terms of protection status (e.g. fauna protected under WAPO (except



---

birds), and flora and fauna protected under regional/global legislation/conventions), species distribution (e.g. endemic), and rarity (e.g. rare or restricted).

4.4.3 Flora or fauna species protected by the following laws/regulations, listed under the following conventions and/or endemic to Hong Kong were considered to be species of conservation importance and are shown in **Table 4.4**. However, this excludes exotic weeds, escaped cultivars or captive species, vagrants and introduced species which have lower ecological value. Species which are classified by IUCN as Near Threatened (NT), Least Concern (LC), Data Deficient (DD), or Not Evaluated (NE), and not covered by any other laws/regulations/conventions are not considered of conservation importance in the present EcolA.

- The International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species;
- China Plant Red Data Book;
- China Species Red List;
- China Red Data Book of Endangered Animals;
- Category I or II protected species in mainland China;
- Threatened Species List of China's Higher Plants (Qin et al. 2017);
- The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES);
- Forestry Regulations (Cap. 96A) which are subsidiary legislation of the Forests and Countryside Ordinance (Cap. 96);
- Wild Animals Protection Ordinance (Cap. 170) (except birds as all wild birds are protected under the ordinance but their conservation importance is not equal);
- Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586);
- PRC Wild Animal Protection Law;
- Plant species considered 'Rare' or 'Very Rare' listed by Corlett et al. (2000) or Yip et al. (2010) where applicable; and
- Fauna species considered of concern in Fellowes et al. (2002).

**Table 4.3 Evaluation of the Habitats of the Study Area and Application Sites**

Habitats/Ap plication Sites	Artificial Hard Shoreline	Agricultural Land	Green Urban Area	Natural Rocky Shoreline	Other Urban Area	Rural Plantation	Sea	Soft Shore	Watercours e	Woodlan d	Woody Shrubland	Application Site A	Application Site B
<b>Naturalness</b>	Man-made	Man-made	Man-made	Natural	Man-made	Man-made with natural succession	Natural	Natural	Semi- natural	Semi- natural	Semi- natural	Man-made with semi-natural habitat	Man-made
<b>Size (ha)</b>	0.12	6.57	34.8	0.12	50.24	42.38	18.61	0.38	0.29	15.29	1.00	2.03  0.66 ha of rural plantation, 0.90 ha of woodland, 0.46 ha of woody shrubland	0.57
<b>Diversity</b>	Low	Low	Low	Low for terrestrial fauna	Low	Low to moderate	Low for terrestrial fauna	Low for terrestrial fauna	Low	Low	Low	Low to medium for flora; Low for fauna	Low
<b>Rarity</b>	Nil	Chinese Bullfrog, Black-throated Laughingthrush, Greater Coucal, Grass Demon, Lesser Band Dart, Common Birdwing	Black Kite	Nil	Black Kite	Indian Forest Skink	Nil	Nil	Black- crowned Night Heron, Brown Forest Skink, Little Egret, Emerald Cascader	<i>Ailanthus fordii</i> , <i>Aquilaria sinensis</i> ; Black Kite	<i>Fortunella hindsii</i>	<i>Ailanthus fordii</i> , <i>Aquilaria sinensis</i> and <i>Fortunella hindsii</i> ; Indian Forest Skink	<i>Aquilaria sinensis</i>
<b>Re- creatability</b>	Readily re- created	Readily re-created	Readily re- created	Hard to recreate	Readily re- created	Readily re- created, take time for succession	Difficult to recreate	Hard to recreate	Natural sections are difficult to recreate	Readily re- created, take time for successio n	Readily re- created, take time for succession	Readily re- created, take time for succession for the woodland	Readily re- created
<b>Fragmentati on</b>	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Patches of woodland are fragmente d	Nil	Nil	Nil

Habitats/Ap plication Sites	Artificial Hard Shoreline	Agricultural Land	Green Urban Area	Natural Rocky Shoreline	Other Urban Area	Rural Plantation	Sea	Soft Shore	Watercours e	Woodlan d	Woody Shrubland	Application Site A	Application Site B
<b>Ecological Linkage</b>	No	No	No	Marine water	No	Ecological linked to adjacent woodland	Other marine water	Marine water	Connected to Tolo Harbour	Connecte d to woody shrubland and plantation	Connected to woodland	Connected to woodland	Connected to woodland
<b>Potential Value</b>	Low	Low	Limited	Moderate	Limited	Low	Medium	Medium	Low to medium	Low to medium	Low	Low	Low
<b>Nursery/bre eding ground</b>	Nil	Nil	Nil	Nursery grounds for intertidal communiti es	Nil	Nil	Nursery grounds for fishes and invertebrat es	Nursery grounds for intertidal communiti es	Nil	Nil	Nil	Nil	Nil
<b>Age</b>	N/A	N/A	TGDR since 1999; Sheun Wan Landfill restored since 1997	N/A	Since 1979	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>Abundance/ Richness of wildlife</b>	Low	Low	Low	Low for fauna and flora	Very Low	Low	Low for flora and terrestrial fauna	Low for flora and terrestrial fauna	Low	Low	Low	Low to medium for flora; Very Low for fauna	Very Low
<b>Overall Ecological Value</b>	Low to medium	Low	Low; Medium for pre- roosting and roosting sites	Low to medium	Very Low; Medium for pre- roosting and roosting sites	Low to medium	Low	Low	Low	Low to medium	Low	Low	Low



**Table 4.4 Evaluation of the Species of Conservation Importance Recorded within the Study Area**

Common Name <sup>1</sup>	Scientific Name <sup>1</sup>	Rarity <sup>1</sup>	Distribution in Hong Kong <sup>1</sup>	Conservation Status <sup>1 - 16</sup>	Location
<b>Flora</b>					
Ailanthus	<i>Ailanthus fordii</i>	Rare	-	Rare and Precious Plants of Hong Kong (Near threatened in China) Cap.96	Site A: Woodland
Incense Tree	<i>Aquilaria sinensis</i>	Common	-	IUCN Red List (Vulnerable) CITES Appendix II Threatened Species List of China's Higher Plants (Vulnerable, endemic species) China Plant Red Data Book (Vulnerable) Illustrations of Rare & endangered plant in Guangdong Province Rare and Precious Plants of Hong Kong (Near threatened in China) Cap. 586 Wild plant under State protection (category II)	Site A: Woodland, Site B: Rural Plantation
Mountain Kumquat	<i>Fortunella hindsii</i>	Common	-	Wild plant under State protection (category II)	Site A: Woody Shrubland
<b>Mammal</b>					
Chinese Noctule	<i>Nyctalus plancyi</i>	-	Fairly widely distributed in countryside areas throughout Hong Kong.	Fellowes et al. (2002): PRC; Cap. 170	Within Study Area but outside Application Sites
Japanese Pipistrelle	<i>Pipistrellus abramus</i>	-	Widely distributed throughout Hong Kong.	Cap. 170	Within Study Area but outside Application Sites
Least Pipistrelle	<i>Pipistrellus tenuis</i>	-	Ten-something records found in Nam Chung, Sheung Wo Hang, Lin Ma Hang, Plover Cove Country Park, Yuen Long, Shek Pik, Deep Water Bay, Ho Pui and Ho Chung	Cap. 170	Within Study Area but outside Application Sites
<b>Bird</b>					
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	Common resident and migrant	Widely distributed in Hong Kong	Fellowes et al. (2002): Local Concern	Study Area: Watercourse
Little Egret	<i>Egretta garzetta</i>	Common resident, migrant and winter visitor.	Widely distributed in coastal area throughout Hong Kong.	Fellowes et al. (2002): PRC	Study Area: Watercourse
Black Kite	<i>Milvus migrans</i>	Common resident and winter visitor	Widely distributed in Hong Kong	Fellowes et al. (2002): (RC); Cap. 586; List of Wild Animals under State Priority Conservation: Class II; CITES: Appendix II	Study Area: Green Urban Area
Greater Coucal	<i>Centropus sinensis</i>	Common resident.	Widely distributed in Hong Kong.	List of Wild Animals under State Priority Conservation: Class II	Study Area: Agricultural Land
Black-throated Laughingthrush	<i>Garrulax chinensis</i>	Common resident.	Widely distributed in woodland and shrubland throughout Hong Kong.	List of Wild Animals under State Priority Conservation: Class II	Study Area: Agricultural Land
<b>Reptile</b>					
Brown Forest Skink	<i>Sphenomorphus incognitus</i>	-	Distributed in streams in the New Territories	Fellowes et al. (2002): Local Concern	Study Area: Watercourse

Common Name <sup>1</sup>	Scientific Name <sup>1</sup>	Rarity <sup>1</sup>	Distribution in Hong Kong <sup>1</sup>	Conservation Status <sup>1 - 16</sup>	Location
Indian Forest Skink	<i>Sphenomorphus indicus</i>	-	Distributed in woodlands in eastern and central New Territories	Fellowes et al. (2002): Local Concern	Application Site A: rural plantation; Study Area: rural plantation
<b>Amphibian</b>					
Chinese Bullfrog	<i>Hoplobatrachus chinensis</i>	-	Widely distributed in Lantau Island and New Territories	Fellowes et al. (2002): Potential Regional Concern: ; List of Wild Animals under State Priority Conservation: Class II; Red List of China's Vertebrates: Endangered	Study Area: agricultural land
<b>Butterfly</b>					
Lesser Band Dart	<i>Potanthus trachala</i>	Rare.	Widely distributed in grassland throughout Hong Kong	-	Study Area: agricultural land
Grass Demon	<i>Udaspes folus</i>	Rare.	Widely distributed throughout Hong Kong.	-	Study Area: agricultural land
Common Birdwing	<i>Troides Helena</i>	Uncommon.	Widely distributed throughout Hong Kong	Cap. 170; Cap. 586; CITES: Appendix II	Study Area: Rural Plantation, Agricultural Land
<b>Odonate</b>					
Emerald Cascader	<i>Zygonyx iris</i>	Abundant.	Widely distributed in moderately clean, rapidly flowing forested streams throughout Hong Kong.	Fellowes et al. (2002): PGC	Study Area: Watercourse

Notes:

1. AFCD (2024). Hong Kong Biodiversity Information Hub
2. Corlett et al. (2000). Hong Kong vascular plants: distribution and status.
3. International Union of Conservation for Nature. (2023). The IUCN Red List of Threatened Species. Version 2022-2.
4. Convention on International Trade in Endangered Species of Wild Flora and Fauna (2022). Appendices I, II and III.
5. Qin et al. (2017). Threatened Species List of China's Higher Plants.
6. Fu & Chin (1992). China Plant Red Data Book – Rare and Endangered Plants.
7. Wu et al. (1988). Illustration of Rare & endangered plant in Guangdong Province.
8. Hu et al. (2003). Rare and Precious Plants of Hong Kong.
9. Cap. 586 Protection of Endangered Species of Animals and Plants Ordinance.
10. State Forestry Administration & Ministry of Agriculture. (1999). List of Wild Plants under State Protection (Part 1).
11. Cap. 96A Forests and Countryside Ordinance.
12. Fellowes et al. (2002). Wild animals to watch: Terrestrial and freshwater fauna of conservation concern in Hong Kong
13. Cap. 170 Wild Animals Protection Ordinance
14. Convention on International Trade in Endangered Species of Wild Flora and Fauna (2022). Appendices I, II and III
15. National Forestry and Grassland Administration and the Ministry of Agricultural and Rural Affairs. (2023). List of Wild Animals under State Priority Conservation
16. Jiang et al. (2016). Red list of China's vertebrates.

---

## 5. IMPACT IDENTIFICATION AND PREDICTION

### 5.1 General

5.1.1 The proposed development has the following key project elements.

**Application Site A:**

- Residential towers;
- Covered walkway;
- Retaining wall;
- Space for parking and loading/unloading; and
- Roads.

**Application Site B:**

- Residential towers
- Retaining wall;

5.1.2 The potential impacts associated with the proposed development include:

- Direct habitat loss, either permanent or temporary, which may occur on-site and/or off-site, due to site formation and construction works within the Application Site or in off-site works areas;
- Direct impacts to flora and fauna species, in particular those of conservation importance, arising from mortality;
- Disturbance impacts to surrounding habitats and fauna during construction;
- Water quality impact due to construction site runoff;
- Disturbance impacts to surrounding fauna, habitats and recognised sites of conservation importance during operation;
- Potential bird collision or road-kill; and
- Night-time light impacts.

### 5.2 Impact Evaluation Criteria

5.2.1 The significance of ecological impacts has been evaluated based primarily on the criteria set out in Table 1 of Annex 8 of the TM-EIAO:

- habitat quality;
- species affected;
- size/abundance of habitats/species affected;
- duration of impacts;
- reversibility of impacts; and
- magnitude of environmental changes.

### 5.3 Construction phase

***Direct Impact – Construction Phase Habitat Loss***

5.3.1 Within the Application Site A, direct impact to habitats of the woodland, woody shrubland and rural plantation is anticipated. The size of the habitats that will be directly impacted by the development are



summarized in **Table 5.1**. Within the Application Site B, direct impact to habitat of rural plantation is anticipated. The woodland loss within Site A is about 0.90 ha. The potential ecological impact of the woodland loss is considered **Minor to Moderate** if unmitigated. Nevertheless, there shall be planting of whip tree and plant species with ecological enhancement to mitigate the habitat loss. The measures to mitigate the impacts are discussed in section 6.4.1. The detail of the planting of whip tree and plants shall be discussed in the Landscape Impact Assessment. The overall ecological value of both Application Sites are low. As the rural plantation within the Application Site is mainly the landscape plantation with low diversity of plantation, supporting low diversity of wildlife. Limited abundance and diversity of wildlife could be observed within the habitat within the Application Site. Due to the low overall ecological value, the overall potential ecological impact by permanent habitat loss of the Application Sites are ranked as **Minor**.

**Table 5.1 Habitat Loss by the Proposed Development within Site A and Site B**

Habitat	Site A (ha)	Site B (ha)
Rural plantation	0.66	0.57
Woodland	0.90	-
Woody Shrubland	0.46	-
<b>Total</b>	<b>2.03</b>	<b>0.57</b>

#### ***Fragmentation (habitats)***

- 5.3.2 Fragmentation is the discontinuities in habitat that render it lowered attractiveness to flora or fauna or isolate populations of a species, potentially leading to reduced viability of a population. This is most easily seen in infrastructural links, where roads and rail lines break up habitat into smaller units, but also arises from disturbance impacts, where organisms avoid certain areas due to secondary impacts from nearby development. Where these prevent mobility of organisms, fragmentation has occurred.
- 5.3.3 Fragmentation of habitats may occur during construction phase, resulting in the loss of ecological linkages between patches of habitats or habitats assemblages, especially in the cases where construction of the development cuts through one habitat or between two areas of similar habitat with significant migration of fauna. With regard to the current Application, however, there is little potential for habitat fragmentation. Currently the Application Site A is composed of rural plantation, woody shrubland and woodland with overall low ecological value and Application Site B is composed of rural plantation of low ecological value with no significant ecological linkage identified. The habitats outside the Application Site are also mainly extensive green urban area and rural plantation, and is also bounded by man-made other urban area. There is unlikely wildlife would need to go through the Application Site for accessing their preferred habitats.

- 5.3.4 Hence, the potential impact due to habitat fragmentation is not anticipated.

***Indirect Impacts – Construction Noise***

- 5.3.5 High level of disturbance could cause deterioration of habitat quality and decrease of wildlife usage. Sensitive wildlife e.g., birds might move away to areas which are less disturbed and within their noise tolerances or remain in the affected area if they are habituated to the disturbance, and subsequently reduce wildlife density in the wetland habitats with higher value in the vicinity. While the sensitivity of waterbirds to the same level of noise disturbance varies among different species, residents are typically more tolerant of disturbance than migrant birds (Klein *et al.* 1995). As such, the noise disturbance from construction activities of the proposed development on waterbirds that are present all year round (e.g. resident ardeids) are expected to be less significant than the disturbance impacts on migratory/overwintering waterbirds given the generally higher tolerance of residents to disturbance.
- 5.3.6 For many construction projects, waterbirds were found to be especially prone to 1) the intrusion of human activities into the wetland habitats and 2) high level of irregular construction noise. In general, construction noise which suddenly increases to high level is relatively more disturbing to waterbirds than constant background noise level. While intrusion of workers into the nearby wetland outside the Application Site is not expected, the piling works for the proposed development are expected to pose more disturbance comparing with other quieter construction procedures, and potentially cause the waterbirds to avoid using the habitats near the works area.
- 5.3.7 The habitats that are potentially the roosting and foraging habitats for waterbird are identified in the watercourse and to the east of the Application Site A. However, due to the separation distance of the watercourse and the Application Sites and the existing disturbance in the proximity of the watercourse. Potential disturbance impacts due to construction works with higher noise disturbance (such as piling) to these habitats are considered to be **Minor** if unmitigated.
- 5.3.8 Habitats potentially impacted by the proposed development involve open habitats which include only the other urban area, green urban area, agricultural land and immediately to the boundary of the Application Site. However, these habitats are considered of **Very Low to Low** overall ecological values and with limited potential value.
- 5.3.9 Isolated from the Application Site by other habitats and physical barriers, such as the rural plantation in the green urban area, the impacts from construction works with higher noise disturbance (such as piling) is considered **Insignificant** for the intertidal and aquatic

communities recorded as they are generally not considered as noise sensitive.

***Indirect Impacts – Dust***

5.3.10 Dust emission is generally expected during construction phase and might temporarily reduce the abundance and distribution of fauna in habitats adjacent to the works area.

5.3.11 Unmitigated construction works create significant levels of dust under certain weather conditions due to the construction vehicles and the phenomenon of wind-blown dust from works areas. Dust would be deposited on nearby habitats, which can cause vegetation damage and, as a secondary effect, have an impact on fauna such as insects and birds. Impacts from dust deposition of these types will, however, be temporary and reversible, and standard construction best practices as mitigation measures can be implemented to negate harmful impacts. Dust deposition impacts arising from the Proposed Development, therefore, considered **Insignificant**.

***Indirect Impacts – Light Glare***

5.3.12 If the construction site has strong lightings or flood light, there may be light glare impacts to nocturnal wildlife in the vicinity during any night time construction. However, no night time construction works are expected for the Application Site. In addition, the surrounding habitats (other urban area) was installed with urban lighting including street light posts and security lighting of the village. Species habituated the area in the vicinity of the Application Site could be considered well adapted to the urban lighting. The construction site would also be expected to only have limited lighting for security purpose. For the firefly species recorded within the Study Area, it was recorded near an irrigation ditch of a farmland about 200m to the northwest of Application Site A, separated from the Lo Fai Road and village houses with existing lighting. The impacts due to increased night-time light during construction phase will therefore be **Insignificant**. However, as a precautionary measure, implementation of good site practices would still be recommended to minimise the impacts of the artificial lighting/glare as much as possible such as limiting the angle of the security lighting.

***Indirect Impacts – Water Quality and Site Run-off***

5.3.13 During construction phase, surface site run-off containing sediments, lubricants, chemicals or other pollutants might be generated, and may lead to indirect impact on water quality in the surrounding aquatic habitats. Construction runoff may carry sediments and lead to temporary increases in local suspended solids for a short period of time and is potentially destructive to aquatic and intertidal communities, which include prey species of waterbirds.



5.3.14 The risk would be higher during periods of heavy rain, and accelerated by any inappropriate stock piling of construction materials, and incorrect handling of construction chemicals. The factors however could be controlled or prevented by standard site management and practices.

5.3.15 Because of the separation of the watercourses and the Application Sites, it is very unlikely that the run-off would affect the aquatic and intertidal habitats. As a precautionary approach, the potential impact is ranked precautionary as **Minor** if unmitigated. However, as a precautionary measure, potential impact due to site run-off will be minimized and controlled by implementation of good site practice.

#### ***Impacts on species of conservation importance***

##### ***Species of conservation importance***

5.3.16 3 floral species of conservation importance were recorded within the Study Area, i.e. *Ailanthus fordii*, *Aquilaria sinensis* and *Fortunella hindsii*, of which 1 no. of *Ailanthus fordii* and 2 nos. of *Aquilaria sinensis* were recorded within the woodland and 1 no. of *Fortunella hindsii* was recorded in woody shrubland of Site A. 3 nos. of *Aquilaria sinensis* were recorded in the rural plantation of Site B. There were only scarce records of floral species of conservation importance within Site A and Site B. 2 nos. of *Aquilaria sinensis* within Site A and 1 no. of *Aquilaria sinensis* within Site B are considered of “low suitability for transplanting” and are recommended to be felled due to their conditions according to the Tree Preservation and Removal Proposal. The direct ecological impact to these species are considered **Minor to Moderate** if unmitigated. The measures to mitigate the impacts are discussed in section 6.4.2.

5.3.17 15 faunal species of conservation importance were recorded within the Study Area, i.e., Chinese Noctule, Japanese Pipistrelle, Least Pipistrelle, Black-crowned Night Heron, Little Egret, Black Kite, Greater Coucal, Brown Forest Skink, Brown Forest Skink, Indian Forest Skink, Chinese Bullfrog, Lesser Band Dart, Grass Demon, Common Birdwing and Emerald Cascader. These species of conservation importance however were of very low abundance. Among the 15 faunal species of conservation importance, only 1 individual of Indian Forest Skink was recorded within the Application Site A. In addition, Indian Forest Skink is a highly mobile reptile species, with abundant readily available habitats (e.g. woodland and woody shrubland) outside Application Site. Thus, the direct impact to these species recorded within the Application Site is considered **Minor** overall.

## **5.4 Operational Phase**

### ***Operational Phase Permanent Habitat loss***

- 
- 5.4.1 Operational phase direct impacts would be the areas permanently occupied by the project elements during operation, and in this case would be the area occupied by the residential portion (i.e. the same as the permanent habitat loss during the construction phase). No additional habitat loss will occur during operational phase. Among the habitats being lost in construction phase, the habitats were of relatively lower ecological values. The potential impacts to the loss of these habitats are considered **Insignificant**.

***Indirect Impacts – Human Disturbance***

- 5.4.2 During the operational phase, there may be indirect disturbance impacts to wildlife in the surrounding habitats due to an increase in human activity from residents inside the Application Sites. The proposed development is however located in an area currently with high disturbance, and as such the surroundings have already been inhabited by species tolerant of human disturbance. Moreover, human activities will mainly be indoors and noise from residential uses will be screened by the landscape area within the Application Sites, and also the surrounding plantation and buildings. The latest design of the development would not have any dedicated paths/roads to allow the residents accessing to the nearby sensitive habitats directly. Also, residential development by nature has much lower disturbance impacts than other undesired uses including the factories and the roads. The indirect ecological impacts due to human disturbance is considered **Insignificant** during operational phase.

***Indirect Impacts – Water Quality***

- 5.4.3 There could be potential indirect impacts to the water quality of the surrounding waterbodies from surface run-off and pollution events from the development and their associated infrastructure. This nonpoint pollution, such as stormwater washed off from areas of hardstanding, roads and landscape area may have various impacts to the local aquatic environment. Magnitude of impacts would be dependent upon the pollution type and quantity of pollutant. Increased stormwater runoff may also lead to increased siltation if there are areas with bare soils.
- 5.4.4 The proposed development however is a residential development and pollutants on road surface would be very limited, and significant bare grounds will be unlikely. The built-in structures of the drain system within the Application Sites could also help isolate and collect sediment and pollutants. Point pollution would not be an issue for the proposed development as the sewerage will collect all domestic effluent and organic load. It is anticipated that any impacts of water quality will be **Insignificant**.

***Indirect Impacts – Light Glare***

- 5.4.5 The future buildings will have limited external lightings for security purposes. Strong external lightings such as flood light is not expected

from the residential buildings. There are existing lightings from Ting Kok Road to the south of the Application Sites, the villages nearby and other urban area outside the Application Site. Hence, the fauna habituated in the proximity are already exposed to the lighting. As there is no light sensitive fauna recorded in the proximity (e.g. firefly or nocturnal fauna), the plantation nearby has buffered the residential portion from the habitats outside the Application Sites. For the firefly species recorded within the Study Area, it was recorded near an irrigation ditch of a farmland about 200m to the northwest of Application Site A, separated from the Lo Fai Road and village houses with existing lighting. The potential of the fauna being influenced by lighting is considered **minor** during the operational phase.

***Indirect Impacts – Bird Collision***

- 5.4.6 Bird collision risk would be more prominent when the building consists of extensive reflective glass façade such that the birds flying nearby are confused by the reflected image inside the glass which is normally the image of the sky and/or nearby environment. Considering that the current residential development would not have extensive glass façade, the building design and lack of identified flight lines across the residential portion, and the potential bird collision impact is considered **minor**.

***Impacts on species of conservation importance***

Species of conservation importance

- 5.4.7 No additional ecological impact is expected further to the evaluation as in construction phase. Thus the potential ecological impacts are considered **Insignificant**.

## **6. MITIGATION OF ECOLOGICAL IMPACTS**

### **6.1 General**

- 6.1.1 According to the principles in the TM-EIAO Annex 16 and EIAO Guidance Note 3/2010, ecological impacts on important habitats and the associated wildlife caused by the proposed development should be avoided, minimized and mitigated where practicable.
- 6.1.2 The potential impacts arising from the construction and operation of the proposed development have been assessed. Since most of the potential ecological impacts are of minor or insignificant levels, specific ecological mitigation measures is not required for most impacts.

### **6.2 Avoidance**

- 6.2.1 The Application Sites are located beyond all the areas of conservation importance, including the SSSIs in Tai Po District. The Application also has avoided habitats of higher ecological values, or natural habitats. Only man-made / semi-natural habitats of **Low** ecological



value, including rural plantation, woody shrubland and woodland will be affected.

### 6.3 Minimization

#### Habitat Loss

- 6.3.1 Impacts from the direct impact of the loss of woodland (0.90 ha) within Site A is considered **Minor to Moderate** if unmitigated. Nevertheless, the layout of the development has minimized the impacts on the woodland within site, of which the majority of the habitats directly impacted are the rural plantation and the woody shrubland (1.12 ha in total) within site.

#### Construction Noise

- 6.3.2 Impacts from piling on other habitats are ranked as **Minor**. No specific mitigation measure is required. Only standard measures for site runoff and general human disturbances would be required. The measures are discussed in the following sections.

#### Site Hoarding and Good Site Practices

- 6.3.3 Site hoarding would be erected along the construction site boundary. Together with general good site practices which would be undertaken during the construction phase, potential disturbance to the wildlife inhabiting nearby areas could be minimized.
- 6.3.4 To minimise the contamination of wastewater discharge, accidental chemical spillage and construction site run-off, the below general good practices should be adopted:
- The good site practices outlined in ProPECC PN 1/94 "Construction Site Drainage" should be followed to minimize surface runoff;
  - Surface run-off from construction sites should be discharged into storm drains via adequately designed sand / silt removal facilities such as sand traps, silt traps and sedimentation basins;
  - Open stockpiles of construction materials (e.g. aggregates, sand and fill material) on sites should be covered with tarpaulin or similar fabric during rainstorms;
  - Good construction and site management practices should be observed to ensure that litter, fuels and solvents do not enter the storm water drains;
  - Chemical toilets should be provided within the construction site and properly maintained. All effluent discharged from the construction site should comply with the standards stipulated in the "Technical Memorandum on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters" (TM-DSS)

### 6.4 Mitigation

---

Floral species of conservation importance

- 6.4.1 The ecological impacts on the recorded floral species of conservation importance (i.e. sapling of *Ailanthus fordii*, sapling of *Aquilaria sinensis* and *Fortunella hindsii*) within Sites should be mitigated by transplantation to suitable habitats prior to any construction work as far as feasible. The potential ecological impacts of such species could be fully mitigated to acceptable level.

Planting of whip tree and plant within Sites

- 6.4.2 The loss of the woodland shall be mitigated by planting of whip trees and plant species within Site A and Site B. The space available for the planting is maximized under the latest layout plan to include the whip tree planting area, landscape planting area and the open space in the proximity of Site A and Site B. The planting of native species, as the provision of ecological enhancement and function, is recommended in the planting area where feasible. The details are provided in Landscape and Visual Impact Assessment. With the implementation of the planting of whip trees and plants in the Sites, the potential ecological impacts of woodland loss and the direct impact to the floral species of conservation importance could be fully mitigated.

Good Practice of Night-time Light

- 6.4.3 Although mitigation measures would not be required for the potential night-time light impact, it is recommended to avoid orientating any external flood light outside the Application Site during both construction and operational phases to minimize any potential disturbance.
- 6.4.4 A summary of the impacts in construction and operational phases, with sources, receivers, nature, significance and mitigation required, are provided in **Table 6.1**.

**Table 6.1 Summary of Potential Ecological Impacts in Construction Phase and Operation Phase**

Impact	Sources	Receivers	Nature of impacts						Significance of ecological impact	Mitigation required
			Habitat quality	Species affected	Size / abundance	Duration	Reversibility	Magnitude		
Construction Phase										
Habitat loss	Construction works of the proposed development	Application Site A: Woodland, woody shrubland and rural plantation;  Application Site B: Rural plantation	Low in general	Low abundance and diversity of wildlife in general	0.90 ha of woodland; Low abundance of wildlife	Construction Phase	Not reversible	Low	Minor to moderate for the loss of woodland;  Minor for woody shrubland and rural plantation	Planting of whip trees and plant with majority of native species  No mitigation is required for other habitats
Fragmentation (habitats)	The proposed development	Adjacent habitats	Low ecological value	Vary	Vary	Construction Phase	Not reversible	Very Low	Negligible for the habitat fragmentation	No mitigation required
Construction noise	Piling Construction works	Sensitive habitats near the works area	Vary with habitat types	Mainly waterbirds and the fauna habituated	Vary	Temporary	Reversible	Minor	Minor	No mitigation required, standard construction best practices as precautionary measures
Dust	Construction works	Sensitive habitats near the works area	Vary with habitat types	Fauna in habitats adjacent to the works area	Vary	Temporary	Reversible	Low	Insignificant	No mitigation required, standard construction best practices
Light Glare	Security lighting of the works area	Light sensitive species or habitats	Vary	No light sensitive species reported	Vary	Temporary	Reversible	Insignificant	Insignificant	No mitigation required, precaution on lighting angle
Water quality and site run-off	Construction works	Aquatic wetland or habitats	Vary	Aquatic fauna and wetland dependent species	Vary	Temporary	Reversible	Minor	Minor	No mitigation required, follow precautionary water quality mitigation measures
Species conservation importance of	Construction works	Recorded floral and faunal species of conservation importance	N/A	Recorded species of conservation importance	Vary	Temporary	Reversible	Minor	Minor to moderate for flora;  Minor for fauna	Transplantation for floral species of conservation importance within Sites as far as feasible (i.e. sapling of <i>Ailanthus fordii</i> , sapling



Impact	Sources	Receivers	Nature of impacts						Significance of ecological impact	Mitigation required
			Habitat quality	Species affected	Size / abundance	Duration	Reversibility	Magnitude		
										<p>of <i>Aquilaria sinensis</i> and <i>Fortunella hindsii</i>)</p> <p>Planting of whip trees and plant with majority of native species to provide ecological function</p> <p>No mitigation required for fauna, follow precautionary standard construction best practices</p>
<b>Operational Phase</b>										
Permanent habitat loss	Proposed senior residential development area	<p>Application Site A: Woodland, woody shrubland and rural plantation;</p> <p>Application Site B: Rural plantation</p>	Low in general	Low abundance and diversity of wildlife in general	Low abundance of wildlife	Permanent	Not reversible	Low	Insignificant	No mitigation is required
Human disturbance	The proposed development	Sensitive habitats near the residential area	Vary with habitat types	Terrestrial fauna including those species of conservation importance	Vary	Transient	Reversible	Low	Minor	No mitigation is required
Water quality	Runoff from the proposed development	Wetland habitats	Vary	Aquatic fauna and intertidal species	Vary	Transient	Reversible	Insignificant	Insignificant	No mitigation is required
Light Glare	Buildings of the proposed development	Light sensitive species or habitats	Vary	No light sensitive species reported	Vary	Permanent	Reversible	Insignificant	Minor	No mitigation is required

Impact	Sources	Receivers	Nature of impacts						Significance of ecological impact	Mitigation required
			Habitat quality	Species affected	Size / abundance	Duration	Reversibility	Magnitude		
Bird collision	The proposed development	N/A	N/A	Birds	Vary	Permanent	Not reversible	Low	Minor	No mitigation is required
Impacts on Species conservation importance	Operational disturbance of the proposed development	Recorded floral and faunal species of conservation importance	N/A	Recorded faunal species of conservation importance	Vary	Temporary	Reversible	Minor	Insignificant	No mitigation is required

---

## 7. CONCLUSIONS

- 7.1.1 Information on the ecological baseline conditions of the Application Sites was collected through literature review and the 6-month ecological surveys, and they were integrated into the present Ecological Impact Assessment. All Application Sites were not identified with any recognised site of conservation importance or habitat of conservation interest and are considered of **Low** overall ecological value.
- 7.1.2 No observation of pre-roosting or roosting behavior of Collared Crow and Black Kite was recorded in Site A and Site B during the ecological surveys. Site A and Site B were also not identified as pre-roosting or roosting sites for Collared Crow and Black Kite by EIA studies in the proximity.
- 7.1.3 With the implementation of planting of whip tree and plants of a majority of native species, and transplantation of floral species of conservation importance within Sites, the potential ecological impacts due to the proposed development could be fully mitigated to acceptable level. The ecological surveys also shows that the Sites are of records of **Low** abundance of wildlife and **Low** overall ecological values. The overall potential ecological impacts to the Application Sites by the proposed development are considered **Insignificant**.



---

## 8. REFERENCES

AECOM 2009. Sediment Removal at Yim Tin Tsai, Tim Tin Tsai East Fish Culture Zones and Shuen Wan Typhoon Shelter. Project Profile submitted to EPD.

AFCD. 2003. *Rare and Precious Plants of Hong Kong*. Hong Kong: Friends of the Country Parks: Cosmos Books Ltd.

AFCD. 2007. *Flora of Hong Kong*. Agriculture, Fisheries and Conservation Department, Hong Kong.

AFCD. 2024. Hong Kong Biodiversity Information Hub. Available at: <https://bih.gov.hk/tc/home/index.html>

Arup. 2019. AEIAR-221/2019 - Shuen Wan Golf Course

Anon, 2007. Summer 2007 Report: Egretty Counts in Hong Kong with particular reference to the Mai Po Inner Deep Bay Ramsar Site. Report by Hong Kong Bird Watching Society to the Agriculture, Fisheries and Conservation Department, Hong Kong Special Administrative Region Government.

Anon, 2008. Summer 2008 Report: Egretty Counts in Hong Kong with particular reference to the Mai Po Inner Deep Bay Ramsar Site. Report by Hong Kong Bird Watching Society to the Agriculture, Fisheries and Conservation Department, Hong Kong Special Administrative Region Government.

Binnies. 2022. AEIAR-244/2022 - Upgrading of Tai Po Sewage Treatment Works.

Black & Veatch Hong Kong Ltd. 2005. Proposed Extension of Public Golf Course at Kau Sai Chau Island, Sai Kung – Environmental Impact Assessment Final Report. Prepared for The Hong Kong Jockey Club.

Bovey, D.J. 1972. Report on Kite Counts 1970s. Hong Kong Bird Report 1970-71: 71-73.

Carey, G. J. 1996. Black Kite counts during 1995. Hong Kong Bird Report 1995: 204-209.

Carey, G.J., Chalmers, M.L., Diskin, D.A., Kennerley, P.R., Leader, P.J., Leven, M.R., Lewthwaite, R. W., Melville, D.S., Turbull, M. and Young, L. 2001. *The Avifauna of Hong Kong*. Hong Kong Bird Watching Society, Hong Kong.

Chan, A., Cheung J., Sze P., Wong A., Wong, E. & Yau, E. 2011. A Review of the Local Restrictedness of Hong Kong Butterflies. *Hong Kong Biodiversity* 21: 1-12.

Chan, K.F., Cheung K.S., Ho C.Y., Lam F.N., Tang W.S., Lau W.N. & Bogadek A. 2005b. *Field Guide to the Amphibians of Hong Kong*. AFCD

Chan, K.F., Cheung K.S., Ho C.Y., Lam F.N., Tang W.S., Tse M.L. 2006. *A Field Guide to the Venomous Land Snakes of Hong Kong*. AFCD

Chan, A. Cheung, J., Sze, P., Wong, A., Wong, E. and Yau, E. 2011. A review of the local restrictedness of Hong Kong Butterflies. *Hong Kong Biodiversity* 21: 1-12.

Cheng, T.-y. 1965. On a new fish of the genus *Gobiopterus* from Kwangtung, China. *Acta Zootaxonomica Sinica*, 2(2), 173–177.

Corlett, R. T., Xing, F. W., Ng, S. C., Chau, L. K. C., & Wong, L. M. Y. (2000). Hong Kong vascular plants: distribution and status. *Memoirs of the Hong Kong Natural History Society* 23:1-157.

Fellowes, J.R., Lau, M.W.N., Dudgeon, D., Reels, G.T., Ades, G.W.J., Carey, G.J., Chan, B.P.L., Kendrick, R.C., Lee, K.S., Leven, M.R., Wilson, K.D.P. and Yu, Y.T. 2002. Wild animals to watch: Terrestrial and freshwater fauna of conservation concern in Hong Kong. *Memoirs of the Hong Kong Natural History Society* 25: 123-159.

Fu, L.G. 1992. China Plant Red Data Book-Rare and Endangered Plants, Vol. 1. Science Press, Beijing.

HKBWS 2016. Hong Kong Bird Report 2014. Humphreys, J.N. 1960. Report on Kite Count on 30th December 1959. Hong Kong Bird Report 1959: 50-55.

Hong Kong Herbarium. (2021). HK Plant Database.  
[https://www.herbarium.gov.hk/Search\\_Form.aspx](https://www.herbarium.gov.hk/Search_Form.aspx)

Hu, Q.M, Wu, T.L., Xia, N.H., Xing F.W., Lai, C.C.P., Yip, K.W. (2003). Rare and Precious Plants of Hong Kong. Agriculture, Fisheries and Conservation Department, The Government of the Hong Kong Special Administrative Region.

Humphreys, J. N. 1960. Report on Kite count held on 30th December, 1959. Hong Kong Bird Report 1959: 50-55.

Hutson, H.P.W. 1930. The Birds of Hong Kong, Part III. The Black-eared Kite. The Hong Kong Naturalist 1(3): 98-101.

IUCN 2023. The IUCN Red List of Threatened Species. Version 2023. Available at: <http://www.iucnredlist.org>

Jiang, Z.G., Jiang, J.P., Wang, Y.Z., Zhang, E., Zhang, Y.Y., Li, L.L., Xie, F., Cai, B., Cao, L., Zheng, G.M., Dong, L., Zhang, Z.W., Ding, P., Luo, Z.H., Ding, C.Q., Ma, Z.J., Tang, S.H., Cao, W.X., Li, C.W., Hu, H.J., Ma, Y., Wu, Y., Wang, Y.X., Zhou, K.Y., Liu, S.Y., Chen, Y.Y., Li, J.T., Feng, Z.J., Wang, Y., Wang, B., Li, C., Song, X.L., Cai, L., Zang, C.X., Zeng, Y., Meng, Z.B., Fang, H.X., and Ping, X.G., 2016. Red List of China's Vertebrates. *Biodiversity Science*, 24 (5), 500-551.

Karsen, S.J., Lau M.W.N. & Bogadek A. 1998. *Hong Kong Amphibians and Reptiles*. Urban Council, Hong Kong.

Leader P.J., Stanton D.J., Lewthwaite R.W. and Martinez J. 2016. A review of the distribution and population of the Collared Crow *Corvus torquatus*. *Forktail* 32: 41-53.

Melville, D. 1976. Kite Counts 1975. Hong Kong Bird Report 1975: 44-49.

National Forestry and Grassland Administration and the Ministry of Agricultural and Rural Affairs. (2021). List of Wild Plants under the State Priority Protection. The State Council, Beijing (promulgated on 7 August 2021).

Planning Department undated. Sites of Special Scientific Interest of Hong Kong.

---

Qin, H. N., Yang, Y., Dong, S. Y., He, Q., Jia, Y., Zhao, L. N., Yu, S. X., Liu, H. Y., Liu, B., Yan, Y. H., Xiang, J. Y., Xia, N. H., Peng, H., Li, Z. Y., Zhang, Z. X., He, X. J., Yin, L. K., Lin, Y. L., Liu, Q. R., Hou, Y. T., Liu, Y., Liu, Q. X., Cao, W., Li, J. Q., Chen, S. L., Jin, X. H., Gao, T. G., Chen, W. L., Ma, H. Y., Geng, Y. Y., Jin, X. F., Chang, C. Y., Jiang, H., Cai, L., Zang, C. X., Wu, J. Y., Ye, J. F., Lai, Y. J., Liu, B., Lin, Q., W. & Xue, N. X. (2017). Threatened species list of China's higher plants. *Biodiversity science*, 25(7), 696-744.

Shek, C.T. 2006. A Field Guide to the Terrestrial Mammals of Hong Kong. Agriculture, Fisheries and Conservation Department, Hong Kong.

Siu, L.P.G. 2000. Orchidaceae of Hong Kong. *Memoirs of the Hong Kong Natural History Society* 23: 137-148.

Stanton, D.J. 2017. Notes on the Collared Crow *Corvus torquatus* population structure at Mai Po Nature Reserve, Hong Kong *Birding Asia* 27:43-47.

Stanton, D.J., Benar. S. & Leung K.K. S. 2014. Status and roosting characteristics of Collared Crow *Corvus torquatus* at the Mai Po Nature Reserve, Hong Kong. *FORKTAIL* 30 (2014): 79–83

Tam, T.W., Leung, K.K., Kwan, B.S.P., Wu, K.K.Y., Tang, S.S.H., So, I.W.Y., Cheng, J.C.Y., Yuen, E.F.M., Tsang, Y.M., & Hui, W.L. 2011. *The Hong Kong Dragonflies*. AFCD, Friends of Country Park and Cosmos Books Ltd. Hong Kong. P.367.

Wang S., Zheng G.M. and Wang Q.S. (1998) China Red Data Book of Endangered Animals: Aves.

Webb, E.D. 1972. Kite Count on Tai Mo Shan. *Hong Kong Bird Report* 1970/1971: 76.

Welch G. (2015) Systematic List 2013. *Hong Kong Bird Report* 2013: 24 – 242.

Wong L.S., R. Corlett, L. Young and J.S.Y. Lee 1992. Comparative Feeding Ecology of Little Egrets on Intertidal Mudflats in Hong Kong, South China. *The International Journal of Waterbird Biology*, Vol. 23, No. 2 (2000), pp.214-225.

Wu, D.L., and C.X. Hu. 1988. Illustrations of Rare and Endangered Plants in Guangdong Province. China Environmental. Science Press, Beijing.

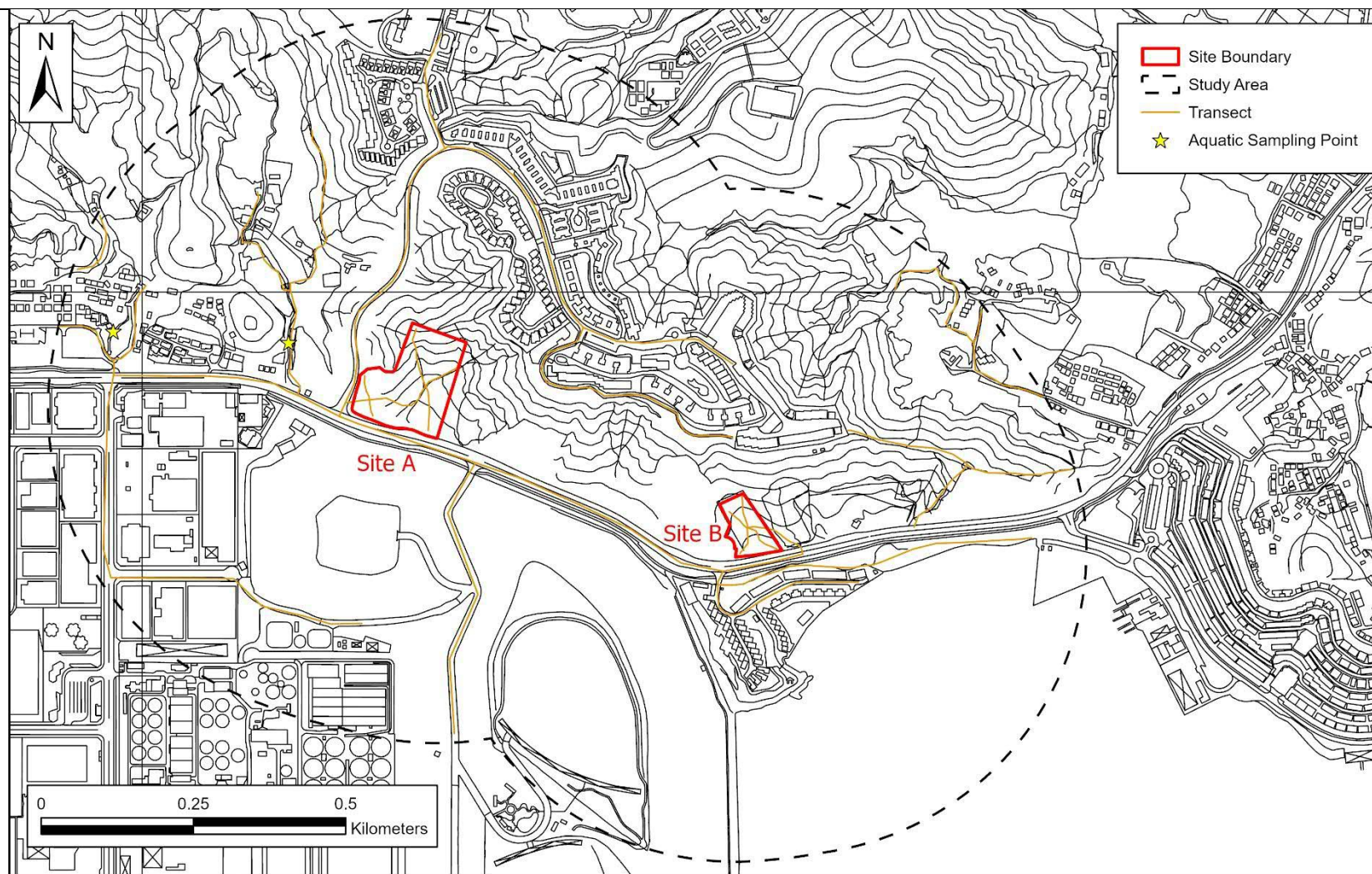
Wu, S.H., Lee T.C. 2000. Pteridophytes of Hong Kong. *Memoirs of the Hong Kong Natural History Society* 23: 5-20.

Xing, F.W., Ng S.C., Chau L.K.C. 2000. Gymnosperms and angiosperms of Hong Kong. *Memoirs of the Hong Kong Natural History Society* 23: 21-13.

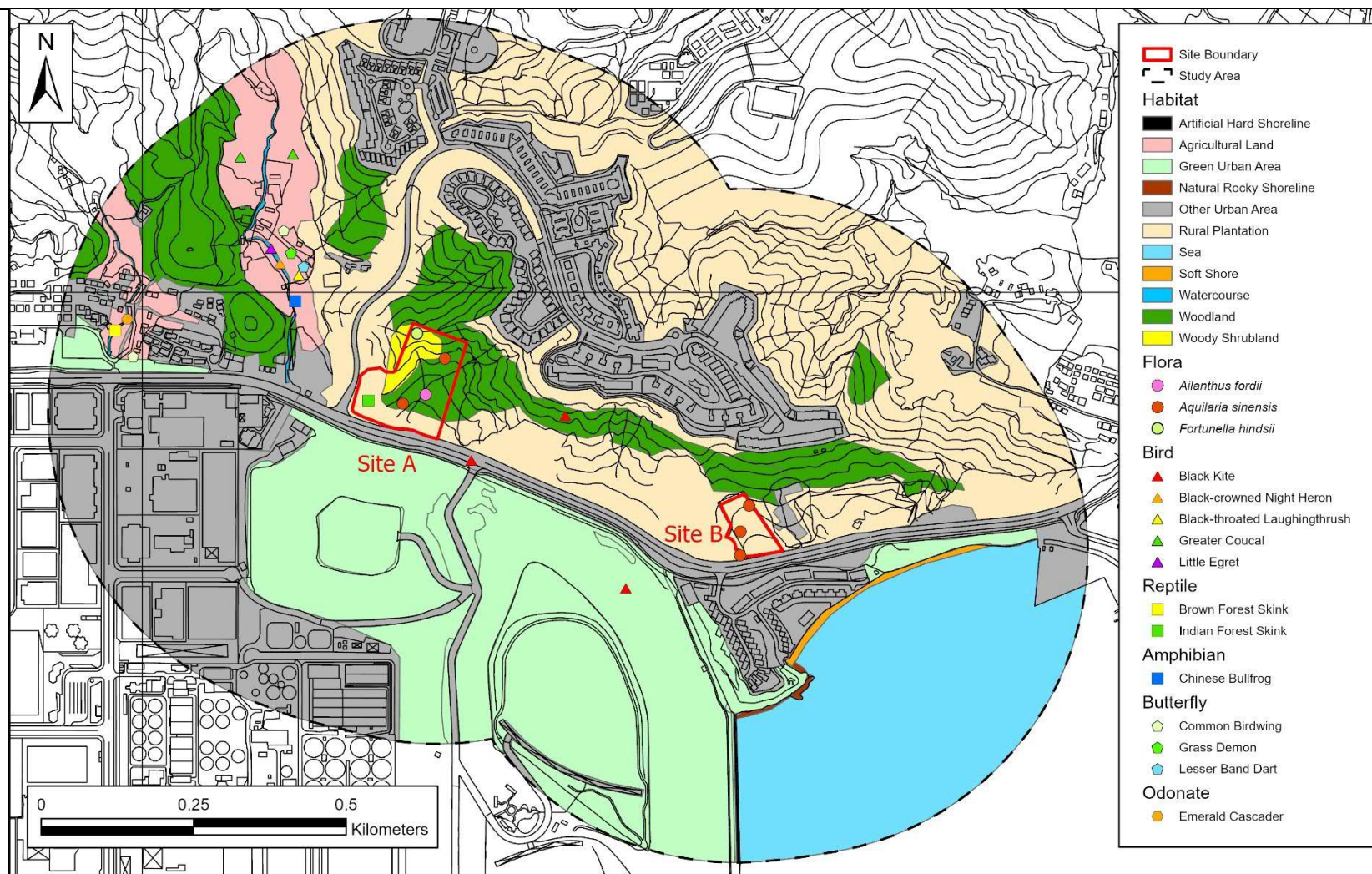
Yiu, V. 2023. Hong Kong Fireflies. Retrieved from: <http://fireflies.hk>



## Figures











Application Site A



Application Site B

## **Appendices**

## Appendix A Relative Abundance of the Floral Species Recorded within Site A, Site B and 500m Study Area

Scientific name	Growth form	Origin	Rarity in Hong Kong <sup>1</sup>	Protection/Conservation status <sup>2 3</sup> 4 5 6 7 8 9 10	Relative Abundance										
					Site A			Site B	Study Area including Site A and Site B						
					RP	WS	WO	RP	AG	GUA	OUA	RP	WS	WO	WAT
<i>Abrus mollis</i>	Climber	Native	Restricted	-				S				S		S	
<i>Acacia auriculiformis</i>	Tree	Exotic	-		S		O	O				O	S		
<i>Acacia confusa</i>	Tree	Exotic	-		C		S	C		O	O	C		S	
<i>Acacia mangium</i>	Tree	Exotic	-		S		S	S			S	S		S	
<i>Acronychia pedunculata</i>	Tree	Native	Very common		S		O								
<i>Ageratum conyzoides</i>	Herb	Exotic	Common		S			S		S	S	S			
<i>Aglaia odorata</i>	Shrub	Exotic	-								S				
<i>Ailanthus fordii</i>	Tree	Native	Rare	Rare and Precious Plants of Hong Kong (Near threatened in China) <sup>7</sup>  Cap.96 <sup>10</sup>			S								
<i>Alangium chinense</i>	Tree	Native	Common				S	O				O		O	
<i>Alchornea trewioides</i>	Shrub	Native	Common											S	
<i>Aleurites moluccana</i>	Tree	Exotic	-								S	S			
<i>Allamanda cathartica</i>	Climber	Exotic	-								S	S			
<i>Alocasia macrorrhizos</i>	Herb	Native	Very common		S		S	O			S	O		O	S
<i>Alternanthera sessilis</i>	Herb	native	Common						S			S			S
<i>Amaranthus viridis</i>	Herb	native	Very common								S				S
<i>Aporosa dioica</i>	Tree	Native	Very common		O		C	O				O		O	
<i>Aquilaria sinensis</i>	Tree	Native	Common	IUCN Red List (Vulnerable) <sup>2</sup>  CITES Appendix II <sup>3</sup>  Threatened Species List of China's Higher Plants (Vulnerable, endemic species) <sup>4</sup>  China Plant Red Data Book (Vulnerable) <sup>5</sup>  Illustrations of Rare & endangered plant in Guangdong Province <sup>6</sup>			S	S							



Scientific name	Growth form	Origin	Rarity in Hong Kong <sup>1</sup>	Protection/Conservation status <sup>2 3</sup> <small>4 5 5 6 7 8 9 10</small>	Relative Abundance										
					Site A			Site B	Study Area including Site A and Site B						
					RP	WS	WO	RP	AG	GUA	OUA	RP	WS	WO	WAT
				Rare and Precious Plants of Hong Kong (Near threatened in China) <sup>7</sup>  Cap. 586 <sup>8</sup>  Wild plant under State protection (category II)											
<i>Araucaria heterophylla</i>	Tree	Exotic	-	IUCN Red List (Vulnerable)							S	S			
<i>Archidendron lucidum</i>	Tree	native	Common				S	O						O	
<i>Archontophoenix alexandrae</i>	Tree	Exotic	-						O		C				
<i>Ardisia lindleyana</i>	Shrub	native	Common			S								S	
<i>Ardisia quinquegona</i>	Shrub	native	Very common					O							
<i>Artocarpus heterophyllus</i>	Tree	Exotic	-					S			S	S			
<i>Axonopus compressus</i>	Herb	Exotic	Common							C					
<i>Baeckea frutescens</i>	Tree	Native	Very common		S	O								O	
<i>Bambusa</i> sp.	Herb	-	-		S		S				O	O		S	
<i>Bauhinia championii</i>	Climber	Native	Common								S	S			
<i>Bauhinia variegata</i>	Tree	Exotic	-								S				
<i>Bauhinia x blakeana</i>	Tree	Native	-							S		O			
<i>Bidens alba</i>	Herb	Exotic	Very common		S	S		O	O	O	O	S		S	O
<i>Bischofia javanica</i>	Tree	Native	Common		S			S			O	S			
<i>Blechnum orientale</i>	Herb	Native	Very common		S			O				O		O	
<i>Boehmeria nivea</i>	Shrub	Exotic	Restricted					O			S			O	
<i>Bombax ceiba</i>	Tree	Exotic	-					S			S	S			
<i>Bougainvillea spectabilis</i>	Climber	Exotic	-								S				
<i>Breynia fruticosa</i>	Shrub	Native	Very common											S	
<i>Bridelia tomentosa</i>	Shrub	Native	Very common			S	O	C			O	O	S	C	
<i>Broussonetia papyrifera</i>	Tree	Native	Very common				S				S	S			

Scientific name	Growth form	Origin	Rarity in Hong Kong <sup>1</sup>	Protection/Conservation status <sup>2 3</sup> 4 5 6 7 8 9 10	Relative Abundance										
					Site A			Site B	Study Area including Site A and Site B						
					RP	WS	WO	RP	AG	GUA	OUA	RP	WS	WO	WAT
<i>Caesalpinia crista</i>	Climber	Native	Very common									S			
<i>Calliandra haematocephala</i>	Shrub	Exotic	-								O				
<i>Canarium album</i>	Tree	Exotic	Restricted								S				
<i>Canarium pimela</i>	Tree	Exotic	Rare					S							
<i>Cansjera rheedii</i>	Climber	Native	Restricted		S		O	S							
<i>Carallia brachiata</i>	Tree	Native	Common				S	S							
<i>Carica papaya</i>	Tree	Exotic	-						O			S			
<i>Caryota mitis</i>	Tree	Exotic	-								S	S			
<i>Castanopsis fissa</i>	Tree	Native	Common		S		S							S	
<i>Castanopsis lamontii</i>	Tree	Native	0									S			
<i>Casuarina equisetifolia</i>	Tree	Exotic	Rare		S			S		S	O	C			
<i>Celastrus aculeatus</i>	Climber	Native	0										S		
<i>Celastrus hindsii</i>	Climber	Native	Very common											S	
<i>Celosia argentea</i>	Herb	Native	Very common												S
<i>Celtis sinensis</i>	Tree	Native	Common		S	O	C	O			O	C	S	S	
<i>Celtis timorensis</i>	Tree	Native	Restricted		S							S		S	
<i>Chukrasia tabularia</i>	Tree	Exotic	-				S	O				S		S	
<i>Cinnamomum aromaticum</i>	Tree	Exotic	-		S							S			
<i>Cinnamomum burmannii</i>	Tree	Native	-								S				
<i>Cinnamomum camphora</i>	Tree	Native	Common		S		S	O				S		O	
<i>Cinnamomum parthenoxylon</i>	Tree	Native	Common				S							S	
<i>Citrus limonia</i>	Tree	Exotic	-						S		S				
<i>Citrus maxima</i>	Tree	Exotic	-						S		S				
<i>Clerodendrum cyrtophyllum</i>	Shrub	Native	Common					O							
<i>Cocculus orbiculatus</i>	Climber	Native	Common									S			

Scientific name	Growth form	Origin	Rarity in Hong Kong <sup>1</sup>	Protection/Conservation status <sup>2 3</sup> <small>4 5 5 6 7 8 9 10</small>	Relative Abundance										
					Site A			Site B	Study Area including Site A and Site B						
					RP	WS	WO	RP	AG	GUA	OUA	RP	WS	WO	WAT
<i>Colocasia esculenta</i>	Herb	Exotic	-						S						O
<i>Commelina diffusa</i>	Herb	Native	Common						S						
<i>Conyza canadensis</i>	Herb	Exotic	Very common												S
<i>Cratoxylum cochinchinense</i>	Tree	native	Very common		O	S	S	O				S			
<i>Cyclobalanopsis edithiae</i>	Tree	Native	Restricted				S							S	
<i>Cyclosorus parasiticus</i>	Herb	Native	Very common				S				S	O		O	S
<i>Cynodon dactylon</i>	Herb	native	Very common							O					
<i>Cyperus involucratus</i>	Herb	Exotic	Restricted												S
<i>Cyrtococcum patens</i>	Herb	Native	Very common									O			
<i>Dactyloctenium aegyptium</i>	Herb	Native	Common								S				
<i>Dalbergia benthamii</i>	Climber	Native	Common	Cap. 586 CITES Appendix II			S	S						S	
<i>Daphniphyllum calycinum</i>	Tree	Native	Common		S	S		S				O		O	
<i>Daphniphyllum pentandrum</i>	Tree	Native	Common		S	C	S					S		S	
<i>Delonix regia</i>	Tree	Exotic	-					S			O				
<i>Dendrotrophe varians</i>	Climber	Native	Very common										S		
<i>Desmodium heterocarpon</i>	Shrub	Native	Very common					O							
<i>Desmodium triflorum</i>	Herb	Native	Very common							S		O			
<i>Desmos chinensis</i>	Shrub	Native	Common		S		C	S			S	O		C	
<i>Dicranopteris pedata</i>	Herb	native	Very common			C		O				O	C	O	
<i>Dimocarpus longan</i>	Tree	Exotic	Restricted	China Plant Red Data Book (Vulnerable) Wild plant under State protection (category II) Threatened Species List of China's Higher Plants (Vulnerable)				C			O	O		O	
<i>Diospyros kaki</i>	Tree	Native	-											S	
<i>Diospyros morrisiana</i>	Tree	Native	Very common				O								
<i>Dracaena fragrans</i>	Shrub	Exotic	-								S				
<i>Duranta erecta</i>	Climber	Exotic	-		S						S	S			



Scientific name	Growth form	Origin	Rarity in Hong Kong <sup>1</sup>	Protection/Conservation status <sup>2 3</sup> <small>4 5 5 6 7 8 9 10</small>	Relative Abundance										
					Site A			Site B	Study Area including Site A and Site B						
					RP	WS	WO	RP	AG	GUA	OUA	RP	WS	WO	WAT
<i>Dypsis lutescens</i>	Shrub	Exotic	-								O				
<i>Eclipta prostrata</i>	Herb	Native	Common								S				
<i>Eleusine indica</i>	Herb	Native	Very common							O					
<i>Embelia laeta</i>	Climber	Native	Very common			S						S		S	
<i>Emilia sonchifolia</i>	Herb	Native	Very common								S				
<i>Endospermum chinense</i>	Tree	Native	Restricted			S	S								
<i>Engelhardia roxburghiana</i>	Tree	Native	Common			S	S							S	
<i>Epipremnum aureum</i>	Climber	Exotic	-			S						S		S	
<i>Eriobotrya fragrans</i>	Shrub	Native	Common											S	
<i>Eriobotrya japonica</i>	Tree	Exotic	-											S	
<i>Eucalyptus camaldulensis</i>	Tree	Exotic	-									S			
<i>Eucalyptus citriodora</i>	Tree	Exotic	-		O		S				S	C		S	
<i>Eucalyptus exserta</i>	Tree	Exotic	-		S		S								
<i>Eucalyptus robusta</i>	Tree	Exotic	-		O							S			
<i>Eucalyptus tereticornis</i>	Tree	Exotic	-									C			
<i>Eucalyptus torelliana</i>	Tree	Exotic	-		C							S			
<i>Eucalyptus urophylla</i>	Tree	Exotic	-				S								
<i>Euphorbia hirta</i>	Herb	Exotic	Very common			S			O	S	S		S		
<i>Eurya chinensis</i>	Shrub	Native	Very common				S					O	S		
<i>Ficus elastica</i>	Tree	Exotic	-								O				
<i>Ficus hirta</i>	Shrub	Native	Common		S		O	S						S	
<i>Ficus hispida</i>	Shrub	Native	Very common		C		S	O			O	O		C	S
<i>Ficus microcarpa</i>	Tree	Native	Common		O		O	S			O	O		S	
<i>Ficus pumila</i>	Climber	Native	Very common				S	S				S		S	
<i>Ficus variegata</i> var. <i>chlorocarpa</i>	Tree	Native	Common				S	O						O	
<i>Fimbristylis subbispicata</i>	Herb	Native	Common								S				
<b><i>Fortunella hindsii</i></b>	<b>Shrub</b>	<b>Native</b>	<b>Common</b>	<b>Wild plant under State protection (category II)</b>		<b>S</b>									
<i>Garcinia oblongifolia</i>	Tree	Native	Very common		S		S	S						S	

Scientific name	Growth form	Origin	Rarity in Hong Kong <sup>1</sup>	Protection/Conservation status <sup>2 3</sup> <small>4 5 5 6 7 8 9 10</small>	Relative Abundance										
					Site A			Site B	Study Area including Site A and Site B						
					RP	WS	WO	RP	AG	GUA	OUA	RP	WS	WO	WAT
<i>Gardenia jasminoides</i>	Shrub	Native	Common		S		O								
<i>Gardenia jasminoides</i> var. <i>fortuniana</i>	Shrub	Exotic	Common								S				
<i>Glochidion eriocarpum</i>	Shrub	Native	Very common		S		S					S		S	
<i>Glochidion lanceolarium</i>	Tree	Native	Common					S							
<i>Gnetum luofuense</i>	Climber	Native	Very common				O					S		O	
<i>Grevillea robusta</i>	Tree	Exotic	-								S	S			
<i>Hedyotis auricularia</i>	Herb	Native	Common			S					S			S	
<i>Heterosmilax japonica</i>	Climber	Native	Common											S	
<i>Hibiscus rosa-sinensis</i>	Shrub	Exotic	-		S			S			S	S			
<i>Hylocereus undatus</i>	Herb	Exotic	-						S		S				
<i>Hyophorbe lagenicaulis</i>	Tree	Exotic	-								O				
<i>Ilex asprella</i>	Shrub	Native	Very common		S		S					S		S	
<i>Ilex rotunda</i>	Tree	Exotic	Common					S							
<i>Ilex viridis</i>	Tree	Native	Common		S		O					S		S	
<i>Imperata cylindrica</i>	Herb	Native	Very common								O				
<i>Ipomoea cairica</i>	Climber	Exotic	Very common				S	O	C	O	S			O	S
<i>Itea chinensis</i>	Shrub	Native	Very common				S							S	
<i>Ixora chinensis</i>	Shrub	Native	Restricted							S	O				
<i>Juniperus chinensis</i>	Tree	Exotic	-							O	C				
<i>Kyllinga polyphylla</i>	Herb	Exotic	Common								O	S			S
<i>Lagerstroemia speciosa</i>	Tree	Exotic	-	Cap.96				O		S		O			
<i>Lantana camara</i>	Shrub	Exotic	Very common		S			O		O	S	O	S	O	S
<i>Lepidagathis incurva</i>	Herb	Native	Common										S		
<i>Leucaena leucocephala</i>	Tree	Exotic	Common		S		O	O			O	O	S	S	O
<i>Ligustrum sinense</i>	Tree	Native	Common		S			O				O		O	
<i>Lindernia crustacea</i>	Herb	Native	Restricted										S		
<i>Liquidambar formosana</i>	Tree	Native	Common				S	S				S			

Scientific name	Growth form	Origin	Rarity in Hong Kong <sup>1</sup>	Protection/Conservation status <sup>2 3</sup> <small>4 5 5 6 7 8 9 10</small>	Relative Abundance										
					Site A			Site B	Study Area including Site A and Site B						
					RP	WS	WO	RP	AG	GUA	OUA	RP	WS	WO	WAT
<i>Liriope spicata</i>	Herb	Native	Very common			S							S		
<i>Litchi chinensis</i>	Tree	Exotic	Restricted	China Plant Red Data Book (Vulnerable) Threatened Species List of China's Higher Plants (Endangered)				S				S			
<i>Litsea cubeba</i>	Shrub	Native	Common		O		S	O				S			
<i>Litsea glutinosa</i>	Tree	Native	Very common				S	S				O		O	
<i>Litsea monopetala</i>	Tree	Native	Restricted				S	S						S	
<i>Litsea rotundifolia</i> var. <i>oblongifolia</i>	Shrub	Native	Very common		S	O	S					O	S	S	
<i>Livistona chinensis</i>	Tree	Exotic	-					S			O				
<i>Lophatherum gracile</i>	Herb	Native	Very common				S							O	
<i>Lophostemon confertus</i>	Tree	Exotic	-		C			O			O	C			
<i>Lygodium japonicum</i>	Herb	Native	Very common		O		S				S	S		S	
<i>Lygodium scandens</i>	Herb	Native	Common				O	O				S			
<i>Macaranga tanarius</i> var. <i>tomentosa</i>	Tree	Native	Common		O	O	C	O				O	O	O	
<i>Machilus brevipflora</i>	Tree	Native	Very common				S	S							
<i>Machilus chekiangensis</i>	Tree	Native	Very common				S	S				S		S	
<i>Machilus pauhoi</i>	Tree	Native	-				S							S	
<i>Machilus velutina</i>	Tree	Native	Common				S								
<i>Maesa perlarius</i>	Shrub	Native	Common					O				S		O	
<i>Mallotus paniculatus</i>	Tree	Native	Very common		S		S	O				O		O	
<i>Mangifera indica</i>	Tree	Exotic	-								S				
<i>Melaleuca cajuputi</i> subsp. <i>cumingiana</i>	Tree	Exotic	-		S						S	S			
<i>Melastoma malabathricum</i>	Shrub	Native	Common			O									
<i>Melastoma sanguineum</i>	Shrub	Native	Common			O		S					O		
<i>Melia azedarach</i>	Tree	Exotic	Common				C	O			O	S			
<i>Melicope pteleifolia</i>	Shrub	Native	Common				S							S	
<i>Melinis repens</i>	Herb	Exotic	Very common							S	O				
<i>Michelia x alba</i>	Tree	Exotic	-	Cap.96							O	S			
<i>Microcos nervosa</i>	Shrub	Native	Common		O		O	S				O		S	



Scientific name	Growth form	Origin	Rarity in Hong Kong <sup>1</sup>	Protection/Conservation status <sup>2 3</sup> <small>4 5 5 6 7 8 9 10</small>	Relative Abundance										
					Site A			Site B	Study Area including Site A and Site B						
					RP	WS	WO	RP	AG	GUA	OUA	RP	WS	WO	WAT
<i>Microstegium ciliatum</i>	Herb	Native	Very common					C	O			S		S	C
<i>Mikania micrantha</i>	Herb	Exotic	Very common				S	C	O	O	O	S		S	C
<i>Millettia speciosa</i>	Climber	Native	Common										S		
<i>Mimosa pudica</i>	Herb	Exotic	Very common								S				
<i>Miscanthus floridulus</i>	Herb	Native	Common								S	S	S		
<i>Murraya paniculata</i>	Tree	Exotic	-		S		S	S			S	S		S	
<i>Musa x paradisiaca</i>	Herb	Exotic	-						S		S			S	
<i>Oxalis corniculata</i>	Herb	Native	Very common								S				
<i>Paederia scandens</i>	Climber	Native	Very common								O	S			
<i>Pandanus tectorius</i>	Shrub	Native	Very common			S	S	S						S	
<i>Panicum maximum</i>	Herb	Exotic	Common				O	O		S	O	S	O		S
<i>Paspalum distichum</i>	Herb	Native	Common							O	S				
<i>Passiflora foetida</i>	Climber	Exotic	Very common								S				
<i>Passiflora suberosa</i>	Climber	Exotic	Common									S			
<i>Phoenix loureiroi</i>	Tree	Native	Common								O	S			
<i>Phyllanthus cochinchinensis</i>	Shrub	Native	Very common					S							
<i>Phyllanthus emblica</i>	Tree	Native	Very common					S							
<i>Phyllanthus reticulatus</i>	Shrub	Native	Common				S					S		O	
<i>Pilea microphylla</i>	Herb	Exotic	Very common								S				
<i>Pinus elliotii</i>	Tree	Exotic	-									S			
<i>Piper hancei</i>	Climber	Native	Very common					S						S	
<i>Platycladus orientalis</i>	Tree	Exotic	-								S				
<i>Polyspora axillaris</i>	Shrub	Native	Very common			O	S					S	O		
<i>Pothos chinensis</i>	Herb	Native	Very common											S	
<i>Pottsia laxiflora</i>	Climber	Native	Common					S				S		S	
<i>Praxelis clematidea</i>	Herb	Exotic	Very common								O	O			S
<i>Psychotria asiatica</i>	Tree	Native	Very common		S	S	O	O				O		O	
<i>Pteris semipinnata</i>	Herb	Native	Very common				S	S				O		S	
<i>Pteris vittata</i>	Herb	Native	Very common								S			S	
<i>Pterocarpus indicus</i>	Tree	Exotic	-	Threatened Species List of China's							S	S			

Scientific name	Growth form	Origin	Rarity in Hong Kong <sup>1</sup>	Protection/Conservation status <sup>2 3</sup> <small>4 5 5 6 7 8 9 10</small>	Relative Abundance										
					Site A			Site B	Study Area including Site A and Site B						
					RP	WS	WO	RP	AG	GUA	OUA	RP	WS	WO	WAT
				Higher Plants (Critically endangered) IUCN Red List (Critically endangered)											
<i>Pueraria lobata</i> var. <i>montana</i>	Climber	Native	Common		S		S	S				S		O	
<i>Pueraria lobata</i> var. <i>thomsonii</i>	Climber	Exotic	-				S				O			O	S
<i>Pueraria phaseoloides</i>	Climber	Native	Very common									S			
<i>Rhaphiolepis indica</i>	Shrub	Native	Very common		S	O	S	O				O			
<i>Rhodomyrtus tomentosa</i>	Shrub	Native	Very common			S						O		O	
<i>Rhus chinensis</i>	Tree	Native	Common				S					O			
<i>Rhus hypoleuca</i>	Shrub	Native	Common				S	S				O		O	
<i>Rhus succedanea</i>	Shrub	Native	Common		S	S	S	S						O	S
<i>Rhynchospora rubra</i>	Herb	Native	Very common			S				S					
<i>Ricinus communis</i>	Shrub	Exotic	Restricted									S			S
<i>Rourea microphylla</i>	Climber	Native	Common		S	O								S	
<i>Sageretia thea</i>	Shrub	Native	Very common				S							S	
<i>Sapium discolor</i>	Tree	Native	Very common			O	S	S				O		O	
<i>Sapium sebiferum</i>	Tree	Native	Common		S	S		S				S		O	
<i>Sarcandra glabra</i>	Shrub	Native	Very common		S		C	O						O	
<i>Schefflera arboricola</i>	Climber	Exotic	-								O				
<i>Schefflera heptaphylla</i>	Tree	Native	Very common		O		C	O				O	O	C	
<i>Schima superba</i>	Tree	Native	Common				S	S						O	
<i>Scolopia chinensis</i>	Tree	Native	Common				S								
<i>Scolopia saeva</i>	Tree	Native	Common					S							
<i>Scoparia dulcis</i>	Herb	Exotic	Common								S				
<i>Senna surattensis</i>	Shrub	Exotic	-								O				
<i>Smilax glabra</i>	Climber	Native	Very common		O		S							S	
<i>Solanum nigrum</i>	Herb	Native	-												
<i>Solanum torvum</i>	Shrub	Exotic	Common		S						S				S
<i>Spathodea campanulata</i>	Tree	Exotic	-								S				
<i>Spilanthes paniculata</i>	Herb	Native	Common							O	S				

Scientific name	Growth form	Origin	Rarity in Hong Kong <sup>1</sup>	Protection/Conservation status <sup>2 3</sup> <small>4 5 5 6 7 8 9 10</small>	Relative Abundance										
					Site A			Site B	Study Area including Site A and Site B						
					RP	WS	WO	RP	AG	GUA	OUA	RP	WS	WO	WAT
<i>Stephania longa</i>	Climber	Native	Common					S						S	
<i>Sterculia lanceolata</i>	Tree	Native	Very common		S	O	C	O				O	S	C	
<i>Strychnos angustiflora</i>	Climber	Native	Common		S		O	S						S	
<i>Symplocos glauca</i>	Tree	Native	Common					S						S	
<i>Syngonium podophyllum</i>	Herb	Exotic	-					S				S			
<i>Syzygium hancei</i>	Tree	Native	Common				S	S						O	
<i>Syzygium jambos</i>	Tree	Exotic	Common		S		S	S			S	S		O	
<i>Syzygium levinei</i>	Tree	Native	Common				S							O	
<i>Terminalia mantaly</i>	Tree	Exotic	-								C	S			
<i>Tetracera asiatica</i>	Climber	Native	Very common		S		O					S		S	
<i>Tetradium glabrifolium</i>	Tree	Native	Common				S	S				S		S	
<i>Tibouchina</i> sp.	Herb	Exotic	-		S		S							S	
<i>Trema tomentosa</i>	Shrub	Native	Common		O		S							S	
<i>Urena lobata</i>	Herb	Native	Common											S	
<i>Uvaria macrophylla</i>	Climber	Native	Common				S							O	
<i>Vernonia cinerea</i>	Herb	Native	Very common							S			S	O	
<i>Viburnum odoratissimum</i>	Shrub	Native	Very common				S	S						O	
<i>Vitex quinata</i>	Tree	Native	Common				S								
<i>Wedelia trilobata</i>	Herb	Exotic	Common				S	S		O	C	O	O		C
<i>Zanthoxylum avicennae</i>	Tree	Native	Common		S		O	S				O		C	
<i>Zanthoxylum nitidum</i>	Climber	Native	Very common								S				
Number of species recorded within the habitat					66	28	98	101	14	23	93	115	24	108	23

Notes:

1. Corlett *et al.* (2000). Hong Kong vascular plants: distribution and status.
2. International Union of Conservation for Nature. (2023). The IUCN Red List of Threatened Species. Version 2022-2
3. Convention on International Trade in Endangered Species of Wild Flora and Fauna (2020). Appendices I, II and III.
4. Qin *et al.* (2017). Threatened Species List of China's Higher Plants.
5. Fu & Chin (1992). China Plant Red Data Book – Rare and Endangered Plants.
6. Wu *et al.* (1988). Illustration of Rare & endangered plant in Guangdong Province.
7. Hu *et al.* (2003). Rare and Precious Plants of Hong Kong.
8. Cap. 586 Protection of Endangered Species of Animals and Plants Ordinance.
9. State Forestry Administration & Ministry of Agriculture. (1999). List of Wild Plants under State Protection (Part 1).
10. Cap. 96 Forests and Countryside Ordinance.



- 
- **Species in bold are considered of conservation importance.**
  - \**Casuarina equisetifolia*, *Dimocarpus longan*, *Lagerstroemia speciosa*, *Litchi chinensis*, *Michelia x alba* and *Pterocarpus indicus* are exotic to Hong Kong and not considered of conservation importance, despite being considered rare/ very rare by Corlett *et al.* (2000), listed as Vulnerable by IUCN (2023), listed as endangered or vulnerable in Threatened Species List of China's Higher Plants, listed as vulnerable in China Plant Red Data Book, listed under Category II in the List of Wild Plants under State Protection (Part 1), listed under Cap. 96 Forests and Countryside Ordinance, and/ or Cap. 586 Protection of Endangered Species of Animals and Plants Ordinance.
  - #*Dalbergia spp.* are listed under Appendix II of CITES and protected under Cap. 586 Protection of Endangered Species of Animals and Plants Ordinance in Hong Kong as species in this genus is facing threat due to the overexploitation for its valuable wood (known as rosewood). In the current study, *Dalbergia benthamii* was recorded. As the recorded *Dalbergia* are climber which is not relevant to the timber exploitation. In addition, the species are considered 'common' in Hong Kong by Corlett *et al.* (2000). Thus, it is not considered as species of conservation importance in the current Study.

Abbreviations:

- Habitats: AG: Agricultural Land; GUA: Green Urban Area; OUA: Other Urban Area; RP: Rural Plantation; WS: Woody Shrubland; WO: Woodland, WAT: Watercourse
- Relative abundance: C = Common; O = Occasional; S = Scarce

Appendix B1 Abundance of Mammals Recorded within Site A, Site B and 500m Study Area (except bats)

Common Names <sup>1</sup>	Scientific Names <sup>1</sup>	Rarity and Distribution in Hong Kong <sup>1</sup>	Conservation status	Site A	Study Area including the Application Sites
				RP	RP
Eurasian Wild Pig	<i>Sus scrofa</i>	Very widely distributed in countryside areas throughout Hong Kong.	-	2	2

Note:

1. AFCD (2024). Hong Kong Biodiversity Information Hub

Appendix B2 Records of Bats within 500m Study Area

Common Names <sup>1</sup>	Scientific Names <sup>1</sup>	Rarity and Distribution in Hong Kong <sup>1</sup>	Conservation status <sup>1,2,3</sup>
Chinese Noctule	<i>Nyctalus plancyi</i>	Fairly widely distributed in countryside areas throughout Hong Kong.	Fellowes et al. (2002): PRC; Cap. 170
Japanese Pipistrelle	<i>Pipistrellus abramus</i>	Widely distributed throughout Hong Kong.	Cap. 170
Least Pipistrelle	<i>Pipistrellus tenuis</i>	Ten-something records found in Nam Chung, Sheung Wo Hang, Lin Ma Hang, Plover Cove Country Park, Yuen Long, Shek Pik, Deep Water Bay, Ho Pui and Ho Chung.	Cap. 170

Notes:

1. AFCD (2024). Hong Kong Biodiversity Information Hub
2. Fellowes et al. (2002). Wild animals to watch: Terrestrial and freshwater fauna of conservation concern in Hong Kong: PRC: Potential Regional Concern
3. Cap. 170 Wild Animals Protection Ordinance
- Species in bold are considered of conservation importance.

## Appendix C Abundance of Birds Recorded within Site A, Site B and 500m Study Area

Common Names <sup>1</sup>	Scientific Names <sup>1</sup>	Rarity and Distribution in Hong Kong <sup>1</sup>	Conservation status <sup>1,2,3,4,5,6</sup>	Site A			Site B	Study Area Including the Application Sites						
				RP	WO	WS	RP	AG	GUA	OUA	RP	WAT	WO	WS
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	Common resident and migrant. Widely distributed in Hong Kong.	Fellowes et al. (2002): LC									2		
Little Egret	<i>Egretta garzetta</i>	Common resident, migrant and winter visitor. Widely distributed in coastal area throughout Hong Kong.	Fellowes et al. (2002): PRC									2		
Black Kite	<i>Milvus migrans</i>	Common resident and winter visitor. Widely distributed in Hong Kong.	Fellowes et al. (2002): (RC); Cap. 586; List of Wild Animals under State Priority Conservation: Class II; CITES: Appendix II						1	1			1	
White-breasted Waterhen	<i>Amaurornis phoenicurus</i>	Common resident. Widely distributed in wetland throughout Hong Kong.	-									2		
Domestic Pigeon	<i>Columba livia</i>	Locally common resident. Widely distributed in urban area throughout Hong Kong.	-											6
Spotted Dove	<i>Spilopelia chinensis</i>	Abundant resident. Widely distributed in Hong Kong.	-	2		4	5	4		23	7	3	5	4
Greater Coucal	<i>Centropus sinensis</i>	Common resident. Widely distributed in Hong Kong.	List of Wild Animals under State Priority Conservation: Class II					1						
Chestnut-winged Cuckoo	<i>Clamator coromandus</i>	Uncommon spring and summer visitor. Widely distributed in woodland throughout Hong Kong.	-										1	
Asian Koel	<i>Eudynamis scolopaceus</i>	Common resident. Widely distributed in Hong Kong.	-							1				
Plaintive Cuckoo	<i>Cacomantis merulinus</i>	Passage migrant and common visitor. Widely distributed in open area throughout Hong Kong.	-					1		1				
Large Hawk-Cuckoo	<i>Hierococcyx sparveroides</i>	Locally common spring and summer visitor. Widely distributed in woodland throughout in Hong Kong.	-							1				
Savanna Nightjar	<i>Caprimulgus affinis</i>	Uncommon resident. Widely distributed in Hong Kong.	-							1				
House Swift	<i>Apus nipalensis</i>	Abundant spring migrant and common resident. Widely distributed in Hong Kong.	-							11	12			



Common Names <sup>1</sup>	Scientific Names <sup>1</sup>	Rarity and Distribution in Hong Kong <sup>1</sup>	Conservation status <sup>1,2,3,4,5,6</sup>	Site A			Site B	Study Area Including the Application Sites						
				RP	WO	WS	RP	AG	GUA	OUA	RP	WAT	WO	WS
Common Kingfisher	<i>Alcedo atthis</i>	Common passage migrant and winter visitor. Widely distributed in wetland habitat throughout Hong Kong.	-									1		
Scarlet Minivet	<i>Pericrocotus speciosus</i>	Common resident. Found in Tai Po Kau, the Peak, Lam Tsuen, Cape D'Aguilar Road, Peel Rise, Shing Mun.	-							2				
Hair-crested Drongo	<i>Dicrurus hottentottus</i>	Common migrant and winter visitor, and locally common resident. Widely distributed in wooded area throughout Hong Kong.	-							3				
Red-billed Blue Magpie	<i>Urocissa erythroryncha</i>	Common resident. Widely distributed in woodland edges throughout Hong Kong	-	2				1		5	4			
Large-billed Crow	<i>Corvus macrorhynchos</i>	Common resident. Widely distributed in Hong Kong	-							1				
Cinereous Tit	<i>Parus cinereus</i>	Common resident. Widely distributed in Hong Kong.	-		2	2	2		1	10	3	2	3	2
Red-whiskered Bulbul	<i>Pycnonotus jocosus</i>	Abundant resident. Widely distributed in Hong Kong.	-	10	4	7	11	4		19	21		13	7
Chinese Bulbul	<i>Pycnonotus sinensis</i>	Abundant resident. Widely distributed in Hong Kong.	-		1		2			7	5	1	2	
Barn Swallow	<i>Hirundo rustica</i>	Abundant passage migrant and summer visitor. Widely distributed in Hong Kong.	-							6	2			
Dusky Warbler	<i>Phylloscopus fuscatus</i>	Abundant winter visitor and migrant. Widely distributed in shrubland and waterside vegetation throughout Hong Kong.	-								1	1		
Yellow-bellied Prinia	<i>Prinia flaviventris</i>	Common resident. Widely distributed in Hong Kong.	-							5				
Common Tailorbird	<i>Orthotomus sutorius</i>	Common resident. Widely distributed in Hong Kong.	-		2	1			1		1	2	3	1

Common Names <sup>1</sup>	Scientific Names <sup>1</sup>	Rarity and Distribution in Hong Kong <sup>1</sup>	Conservation status <sup>1,2,3,4,5,6</sup>	Site A			Site B	Study Area Including the Application Sites						
				RP	WO	WS	RP	AG	GUA	OUA	RP	WAT	WO	WS
Masked Laughingthrush	<i>Pterorhinus perspicillatus</i>	Abundant resident. Widely distributed in shrubland throughout Hong Kong.	-	1	3	3		9		12	5	4	3	10
<b>Black-throated Laughingthrush</b>	<b><i>Garrulax chinensis</i></b>	<b>Common resident. Widely distributed in woodland and shrubland throughout Hong Kong.</b>	<b>List of Wild Animals under State Priority Conservation: Class II</b>					<b>1</b>						
Japanese White-eye	<i>Zosterops simplex</i>	Abundant resident. Widely distributed in Hong Kong.	-	12	5		15		2	26	35		7	
Crested Myna	<i>Acridotheres cristatellus</i>	Abundant resident. Widely distributed in Hong Kong.	-							2	10		3	
Black-collared Starling	<i>Gracupica nigricollis</i>	Common resident. Widely distributed in Hong Kong.	-		2		2	4		2	4		4	
Oriental Magpie-Robin	<i>Copsychus saularis</i>	Abundant resident. Widely distributed in Hong Kong.	-							2	2	3	1	
Daurian Redstart	<i>Phoenicurus aureus</i>	Common winter visitor. Widely distributed in Hong Kong.	-								1			
Fork-tailed Sunbird	<i>Aethopyga christinae</i>	Common resident and winter visitor. Widely distributed in Hong Kong.	-							1				
Eurasian Tree Sparrow	<i>Passer montanus</i>	Abundant resident. Widely distributed in Hong Kong.	-	2	2		6	16		14	15	1	2	2
Scaly-breasted Munia	<i>Lonchura punctulata</i>	Abundant resident. Widely distributed in Hong Kong.	-					6					3	
Grey Wagtail	<i>Motacilla cinerea</i>	Common passage migrant and winter visitor. Widely distributed in hill streams throughout Hong Kong.	-							1			2	
White Wagtail	<i>Motacilla alba</i>	Resident, common passage migrant and winter visitor. Widely distributed in Hong Kong.	-							2		4		
Olive-backed Pipit	<i>Anthus godlewskii</i>	Common passage migrant and winter visitor. Widely distributed in Hong Kong.	-						1					

Notes:

1. AFCD (2024). Hong Kong Biodiversity Information Hub
2. Fellowes et al. (2002). Wild animals to watch: Terrestrial and freshwater fauna of conservation concern in Hong Kong: PRC: Potential Regional Concern, LC: Local Concern
3. Cap. 170 Wild Animals Protection Ordinance
4. Cap. 586 Protection of Endangered Species of Animals and Plants Ordinance.
5. Convention on International Trade in Endangered Species of Wild Flora and Fauna. Appendices I, II and III.
6. List of Wild Animals under State Priority Conservation (2021).

- 
- Species in bold are considered of conservation importance.



Appendix D Abundance of Reptiles Recorded within Site A, Site B and 500m Study Area

Common Names	Scientific Names	Rarity and Distribution in Hong Kong	Conservation status	Site A	Study Area Including the Application Sites			
				RP	RP	WAT	OUA	AG
Changeable Lizard	<i>Calotes versicolor</i>	Widely distributed throughout Hong Kong.	-	1	1			
Chinese Gecko	<i>Gekko chinensis</i>	Widely distributed throughout Hong Kong.	-	1	1		2	1
Garnot's Gecko	<i>Hemidactylus garnotii</i>	Distributed in Lantau Island, Hong Kong Island and eastern New Territories.	-		2			1
<b>Brown Forest Skink</b>	<b><i>Sphenomorphus incognitus</i></b>	<b>Distributed in streams in the New Territories.</b>	<b>Fellowes et al. (2002): LC</b>			1		
<b>Indian Forest Skink</b>	<b><i>Sphenomorphus indicus</i></b>	<b>Distributed in woodlands in eastern and central New Territories.</b>	<b>Fellowes et al. (2002): LC</b>	1	1			

- Notes:
- 1. AFCD (2024). Hong Kong Biodiversity Information Hub
  - 2. Fellowes et al. (2002). Wild animals to watch: Terrestrial and freshwater fauna of conservation concern in Hong Kong: LC: Local Concern
  - **Species in bold are considered of conservation importance.**

Appendix E Abundance of Amphibians Recorded within Site A, Site B and 500m Study Area

Common Names <sup>1</sup>	Scientific Names <sup>1</sup>	Rarity and Distribution in Hong Kong <sup>1</sup>	Conservation status <sup>1,2,3,4,5,6</sup>	Site A	Site B	Study Area Including the Application Sites			
				RP	RP	RP	WAT	AG	OUA
Asian Common Toad	<i>Duttaphrynus melanostictus</i>	Widely distributed in Hong Kong.	-	2		2	1		
Spotted Narrow-mouthed Frog	<i>Kalophrynus interlineatus</i>	Widely distributed from low to moderate altitudes in northern and central New Territories.	-	1		1	2		
Asiatic Painted Frog	<i>Kaloula pulchra</i>	Widely distributed in Hong Kong.	-				1		1
Ornate Pigmy Frog	<i>Microhyla fissipes</i>	Widely distributed in Hong Kong.	-		14	14	2		
Paddy Frog	<i>Fejervarya limnocharis</i>	Widely distributed in Hong Kong.	-	3		3			
Chinese Bullfrog	<b><i>Hoplobatrachus chinensis</i></b>	<b>Widely distributed in Lantau Island and New Territories.</b>	<b>Fellowes et al. (2002): PRC: ; List of Wild Animals under State Priority Conservation: Class II; Red List of China's Vertebrates: EN</b>					<b>2</b>	
Gunther's Frog	<i>Hylarana guentheri</i>	Widely distributed throughout Hong Kong.	-				25		
Brown Tree Frog	<i>Polypedates megacephalus</i>	Widely distributed throughout Hong Kong.	-		1	1	5	3	
Greenhouse frog	<i>Eleutherodactylus planirostris</i>	Widely distributed throughout Hong Kong.	-	16	7	23	30	25	

Notes:

- 1. AFCD (2024). Hong Kong Biodiversity Information Hub
- 2. Fellowes et al. (2002). Wild animals to watch: Terrestrial and freshwater fauna of conservation concern in Hong Kong: PRC: Potential Regional Concern
- 3. Cap. 170 Wild Animals Protection Ordinance
- 4. Cap. 586 Protection of Endangered Species of Animals and Plants Ordinance.
- 5. Convention on International Trade in Endangered Species of Wild Flora and Fauna. Appendices I, II and III.
- 6. List of Wild Animals under State Priority Conservation (2021).
- Species in bold are considered of conservation importance.

## Appendix F Abundance of Odonates Recorded within Site A, Site B and 500m Study Area

Common Names <sup>1</sup>	Scientific Names <sup>1</sup>	Rarity and Distribution in Hong Kong <sup>1</sup>	Conservation status <sup>1,2</sup>	Site A	Site B	Study Area			
				RP	RP	OUA	RP	WAT	AG
Orange-tailed Midget	<i>Agriocnemis femina</i>	Abundant. Widely distributed in disused paddy fields, marshes, ditches and weedy ponds margins.	-					20	
Orange-tailed Sprite	<i>Ceragrion auranticum</i>	Abundant. Widely distributed in weedy ponds, marshes, abandoned fields or grasslands adjacent to waters.	-					5	
Common Blue Skimmer	<i>Orthetrum glaucum</i>	Abundant. Widely distributed in streams, conduits, drainage channels, seepages and road gutters throughout Hong Kong.	-			6		6	
Marsh Skimmer	<i>Orthetrum luzonicum</i>	Abundant. Widely distributed in abandoned paddies, marshy swampy and boggy locations.	-					2	
Common Red Skimmer	<i>Orthetrum pruinatum neglectum</i>	Abundant. Widely distributed in slow streams, ponds, rain puddles and irrigation conduits.	-					11	1
Green Skimmer	<i>Orthetrum sabina sabina</i>	Abundant. Widely distributed in all wetland habitats throughout Hong Kong.	-					5	
Wandering Glider	<i>Pantala flavescens</i>	Abundant. Widely distributed all over Hong Kong.	-	7	8		33	18	
Variegated Flutterer	<i>Rhyothemis variegata arria</i>	Common. Widely distributed in marshes, ponds and tanks throughout Hong Kong.	-					6	
Crimson Dropwing	<i>Trithemis aurora</i>	Abundant. Found in marshes, ponds, streams, and/or even ornamental ponds in urban areas. Widely distributed throughout Hong Kong.	-					2	1
Indigo Dropwing	<i>Trithemis festiva</i>	Abundant. Favours sluggish sections of streams with a strong current or the small rock pools in mountain streams. Widespread in Hong Kong.	-					6	
<b>Emerald Cascader</b>	<b><i>Zygonyx iris</i></b>	<b>Abundant. Widely distributed in moderately clean, rapidly flowing forested streams throughout Hong Kong.</b>	<b>Fellowes et al. (2002): PGC</b>					1	
Yellow Featherlegs	<i>Copera marginipes</i>	Abundant. Widely distributed in lowland streams, ditches, and weedy margins of pond throughout Hong Kong.	-					5	
Black Threadtail	<i>Prodasineura autumnalis</i>	Abundant. Often perches on the plants near streams. Widely distributed in streams throughout Hong Kong.	-					2	

Notes:



- 
1. AFCD (2024). Hong Kong Biodiversity Information Hub
  2. Fellowes et al. (2002). Wild animals to watch: Terrestrial and freshwater fauna of conservation concern in Hong Kong: PGC: Potential Global Concern
- **Species in bold are considered of conservation importance.**

## Appendix G Abundance of Butterflies Recorded within Site A, Site B and 500m Study Area

Common Names <sup>1</sup>	Scientific Names <sup>1</sup>	Rarity and Distribution in Hong Kong <sup>1</sup>	Conservation status <sup>1,2,3,4,5</sup>	Site A			Site B	Study Area Including the Application Sites					
				RP	WO	WS	RP	OUA	RP	WAT	WO	WS	AG
Formosan Swift	<i>Borbo cinnara</i>	Common. Widely distributed throughout Hong Kong.	-	1					1				
Banana Skipper	<i>Erionota torus</i>	Uncommon. Widely distributed in agricultural field throughout Hong Kong	-										2
Chestnut Bob	<i>Iambrix salsala</i>	Uncommon. Widely distributed throughout Hong Kong.	-	12					12				
Chinese Dart	<i>Potanthus confucius</i>	Uncommon. Widely distributed throughout Hong Kong.	-							1			
<b>Lesser Band Dart</b>	<b><i>Potanthus trachala</i></b>	<b>Rare. Widely distributed in grassland throughout Hong Kong</b>	-										<b>1</b>
Water Snow Flat	<i>Tagiades litigiosus</i>	Common. Widely distributed throughout Hong Kong.	-	1					1				1
<b>Grass Demon</b>	<b><i>Udaspes folus</i></b>	<b>Rare. Widely distributed throughout Hong Kong.</b>	-										<b>4</b>
Pale Grass Blue	<i>Pseudozizeeria maha</i>	Very common. Widely distributed throughout Hong Kong	-				12	8	16				6
Plum Judy	<i>Abisara echerius</i>	Very common. Widely distributed throughout Hong Kong	-	1			4		6				
Common Indian Crow	<i>Euploea core</i>	Common. Widely distributed throughout Hong Kong	-										2
Blue-spotted Crow	<i>Euploea midamus</i>	Very common. Widely distributed throughout Hong Kong	-										2
Angled Castor	<i>Ariadne ariadne</i>	Common. Widely distributed throughout Hong Kong	-								2		
Common Mapwing	<i>Cyrestis thyodamas</i>	Common. Widely distributed throughout Hong Kong.	-	1				1	1				
Great Eggfly	<i>Hypolimnas bolina</i>	Common. Widely distributed throughout Hong Kong	-		1			4			1		1
Common Sailer	<i>Neptis hylas</i>	Very common. Widely distributed throughout Hong Kong	-					1					
Five-dot Sergeant	<i>Parathyma sulpitia</i>	Common. Widely distributed throughout Hong Kong	-							1			
Large Faun	<i>Faunis eumeus</i>	Common. Widely distributed throughout Hong Kong.	-	1			3		4				
Dark Evening Brown	<i>Melanitis phedima</i>	Uncommon. Widely distributed throughout Hong Kong.	-	2					2				
Dark-brand Bush Brown	<i>Mycalesis mineus</i>	Very common. Widely distributed throughout Hong Kong	-	2		2	5	4	9			2	
South China Bush Brown	<i>Mycalesis zonata</i>	Common. Widely distributed throughout Hong Kong.	-	4					4				
Common Bluebottle	<i>Graphium sarpedon</i>	Very common. Widely distributed throughout Hong Kong	-	1					1				
Paris Peacock	<i>Papilio paris</i>	Very common. Widely distributed throughout Hong Kong	-	1					1				

Common Names <sup>1</sup>	Scientific Names <sup>1</sup>	Rarity and Distribution in Hong Kong <sup>1</sup>	Conservation status <sup>1,2,3,4,5</sup>	Site A			Site B	Study Area Including the Application Sites					
				RP	WO	WS	RP	OUA	RP	WAT	WO	WS	AG
Common Mormon	<i>Papilio polytes</i>	Very common. Widely distributed throughout Hong Kong	-	3	1			2	3	2	1	2	
Spangle	<i>Papilio protenor</i>	Very common. Widely distributed throughout Hong Kong	-	1	1			1	2	4	1		1
<b>Common Birdwing</b>	<b><i>Troides helena</i></b>	<b>Uncommon. Widely distributed throughout Hong Kong</b>	<b>Cap. 170; Cap. 586; CITES: Appendix II</b>						<b>1</b>				<b>2</b>
Lemon Emigrant	<i>Catopsilia pomona</i>	Common. Widely distributed throughout Hong Kong	-				5		5		1		8
Common Grass Yellow	<i>Eurema hecabe</i>	Very common. Widely distributed throughout Hong Kong	-	1			6		7			1	4

- Notes:
- 1. AFCD (2024). Hong Kong Biodiversity Information Hub
  - 2. Fellowes et al. (2002). Wild animals to watch: Terrestrial and freshwater fauna of conservation concern in Hong Kong: PRC: Potential Regional Concern
  - 3. Cap. 170 Wild Animals Protection Ordinance
  - 4. Cap. 586 Protection of Endangered Species of Animals and Plants Ordinance.
  - 5. Convention on International Trade in Endangered Species of Wild Flora and Fauna. Appendices I, II and III.
- Species in bold are considered of conservation importance.

## Appendix H Relative Abundance of Freshwater Communities Recorded within 500m Study Area

Scientific Names	Common Names	Rarity and Distribution in Hong Kong	Relative Abundance
<i>Channa striata</i>	Snakehead murrel	Uncommon in the wild and is an introduced species. Records from a few streams in North District and on Lantau Island.	+
<i>Eleotris oxycephala</i>	Sharphead sleeper	Records from streams and estuaries in North District, Sai Kung on Hong Kong Island and Lantau Island.	+
<i>Gambusia affinis</i>	Mosquito fish	Introduced as a mosquito-control agent, widespread in local freshwater bodies	+++
Gerridae species	Water Striders	-	+++
<i>Glossogobius giuris</i>	Fork tongue goby	Widespread in local estuaries, lowland streams and coastal waters.	+
Notonectidae species	Backswimmer	-	+++
<i>Oreochromis mossambicus</i>	Mozambique tilapia	Widespread in brackish waters, freshwater ponds, ditches, rivers and reservoirs. The fish is also cultivated in some local fish farms.	++
<i>Poecilia reticulata</i>	Guppy	Occurs in large number in many local streams and ponds.	+++
<i>Puntius semifasciolatus</i>	Chinese Barb	Widely distributed in most of local freshwater streams, rivers and reservoirs.	+
<i>Varuna yui</i>	Sundaic paddler crab	-	++