

Appendix 2

Environmental Assessment

Prepared for

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**PROPOSED HOUSE DEVELOPMENT AT T.M.T.L. 550, TUEN
MUN, NEW TERRITORIES**

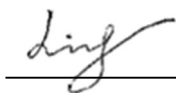
S16 PLANNING APPLICATION

ENVIRONMENTAL ASSESSMENT

Date **August 2025**

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Project Reference

RILTM550EI00

Document No.

R8944_v2.0

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1. INTRODUCTION

1.1 Project Background

- 1.1.1 The Application Site is located at T.M.T.L. 550, Tuen Mun, New Territories, zoned as "Recreation" ("REC") under the Approved Tuen Mun Outline Zoning Plan No. S/TM/41. The Subject Site is about 1,852 m². A planning application for the use of "Holiday Camp" was approved in May 2015 (A/TM/469).
- 1.1.2 The purpose of the submission is to develop the Application Site to a 2-storey house.
- 1.1.3 In order to support the planning application of the proposed development, an environmental assessment (EA) shall be prepared to support the proposed development from the environmental points of view.
- 1.1.4 Ramboll Hong Kong Limited (the Consultant) has been commissioned by the applicant to conduct this environmental assessment in relation to the planning application. Architectural drawings and technical information of the Subject Site were provided by Design Consultants Limited and Lawson David & Sung Surveyors Limited respectively whereas information on road traffic forecast was provided by CKM Asia Limited (the Traffic Consultant).

1.2 Application Site and its Environs

- 1.2.1 The Application Site is located at T.M.T.L. 550 in Tuen Mun. The site is currently zoned "Recreation".
- 1.2.2 The Subject Site is bounded by road carriageways on three sides. Lung Fu Road and Lung Mun Road are aligned on the northwest and southeast sides of the Subject Site respectively.
- 1.2.3 The Application Site is vacant currently and situated more than 1 km away from any existing/planned industrial developments.
- 1.2.4 **Figure 1** shows the location of the Application Site and the surrounding environs.

1.3 Proposed Development

- 1.3.1 Under the current application, the Proposed Development consists of one 2-storey house for residential purpose. The maximum building height is 36.6 mPD. A proposed underground septic tank which follows the same treatment strategy proposed in the previous approved holiday camp application, will be located at the north of House. The master layout plan and sections of the Proposed Development are shown in **Appendix 1**.
- 1.3.2 The tentative completion year for the Proposed Development is 2031.

1.4 Key Environmental Issues and Study Approach

- 1.4.1 Key Environmental issues and concerns as identified for the Project include:
Air Quality
- 1.4.2 For the construction phase, the potential air quality impacts would be caused by the dust emissions generated during construction activities. For the operation phase, the potential air quality impacts arising from the vehicular emissions of the nearby roads, and the chimney emissions (if any) of the nearby industrial activities should be addressed.

Noise

- 1.4.3 Site visits were conducted on 27 June 2025 to identify whether there is any potential industrial noise source in the vicinity (i.e. 300m) of the Application Site. No industrial activities are identified in the vicinity.
- 1.4.4 The identified noise source in the vicinity of the Application Site is the road traffic noise from nearby road network. Practical noise mitigation measures should be recommended where required in order to satisfy the requirement of the Hong Kong Planning Standards and Guidelines (HKPSG).

Water Quality

- 1.4.5 For the construction and operation phase, potential water quality impact arising from the Application Site on the Water Sensitive Receiver in the vicinity (i.e. 500m) of the site boundary of Application Site will be discussed in **Section 4**. Practical mitigation measures should be recommended, where necessary, to reduce the potential water quality impacts in order to control the residual impacts to acceptable levels.

Waste Management

- 1.4.6 Potential waste management issues in connection with construction and operation of the Project will be discussed in **Section 5**. It also recommends mitigation measures to alleviate impacts, where necessary.

Land Contamination

- 1.4.7 The historical landuse and existing condition have been studied for the purpose to identify if there is/was any potentially land contaminating activity held onsite, and actions recommended to be taken afterwards. A land contamination appraisal is included in **Section 6**.

2. AIR QUALITY IMPACT ASSESSMENT

2.1 Introduction

2.1.1 This section examines the potential air quality impacts that could arise from the construction phase and operation phase of the Project.

2.2 Environmental Legislation and Guidelines

2.2.1 The following legislation and regulations provide the standards and guidelines for evaluation of air quality impacts and the type of works that are subject to air pollution control:

- Air Pollution Control Ordinance (APCO) (Cap. 311) and the Air Quality Objectives (AQO)
- Air Pollution Control (Construction Dust) Regulation
- Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation
- Air Pollution Control (Fuel Restriction) Regulations
- Hong Kong Planning Standards and Guidelines (HKPSG)

Air Pollution Control Ordinance (CAP 311)

2.2.2 To achieve as soon as reasonably practicable and to maintain thereafter to safeguard the health of the community, a set of Air Quality Objectives (AQOs) is established under the Air Pollution Control Ordinance (Cap. 311). The prevailing AQOs that came into effect on 11 April 2025 are listed in **Table 2.1**.

Table 2.1 The Hong Kong Air Quality Objectives for Government Projects (HKAQOs)

Pollutant	Averaging time	Concentration limit ^[i] (µg/m ³)	Number of exceedances allowed per calendar year
Sulphur dioxide, SO ₂	10-min	500	3
	24-Hour	40	3
Respirable suspended particulates, RSP (PM ₁₀) ^[ii]	24-Hour	75	9
	Annual	30	NA
Fine suspended Particulates, FSP (PM _{2.5}) ^[iii]	24-Hour	37.5	18
	Annual	15	NA
Nitrogen dioxide, NO ₂	1-Hour	200	18
	24-Hour	120	9
	Annual	40	NA
Ozone, O ₃	8-Hour	160	9
	Peak Season	100	NA
Carbon monoxide, CO	1-Hour	30,000	0
	8-Hour	10,000	0
	24-Hour	4,000	0
Lead	Annual	0.5	NA

Notes:

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

- [ii] *Respirable suspended particulates means suspended particles in air with a nominal aerodynamic diameter of 10 µm or less.*
- [iii] *Fine suspended particulates means suspended particles in air with a nominal aerodynamic diameter of 2.5 µm or less.*

- 2.2.3 For odour impact assessment, Annex 4 of TM-EIAO stipulates an odour limit of 5 odour units based on an averaging time of 5 seconds at an air sensitive receiver should be met.

Air Pollution Control (Construction Dust) Regulation

- 2.2.4 Made under Section 43 of the APCO, this Regulation defines notifiable and regulatory works for achieving the purpose of dust control for a number of activities. The Regulation requires that any notifiable work shall give advance notice to EPD, and the Contractors shall ensure that the notifiable and regulatory works are carried out in accordance with the Schedule of the Regulation. Dust control and suppression measures are also provided in the Schedule.
- 2.2.5 The proposed construction works for the proposed Project are both regulatory and notifiable works due to activities including material stockpiling and dusty material handling as potential sources of fugitive dust emissions as detailed under Parts I to IV of the Schedule on Dust Control Requirements.

Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation

- 2.2.6 The Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation, which aims to control emissions from non-road mobile machinery (NRMMS) to improve air quality, became effective on 1 June 2015. NRMMS include non-road vehicles, as well as mobile machines and equipment (regulated machines) such as crawler cranes, excavators and air compressors.
- 2.2.7 Under the regulation, regulated machines have to comply with the Stage IIIA emission standards of the European Union (EU). It also requires all regulated machines sold or leased for use in Hong Kong to bear an approval or exemption label issued to them by the EPD, started from 1 September 2015. It restricts specified activities and locations including construction sites, designed waste disposal facilities and specified processes to use only NRMMS that bear an approval or exemption label issued to them by the EPD, with effect from 1 December 2015.

Air Pollution Control (Fuel Restriction) Regulations

- 2.2.1 The Air Pollution Control (Fuel Restriction) Regulation was enacted in 1990 to impose legal control on the type of fuels allowed for use and their sulphur contents in commercial and industrial processes to reduce sulphur dioxide (SO₂) emissions. In April 2025, the Regulation was amended to tighten the control requirements of liquid fuels. The Regulation does not apply to any fuel-using equipment that is used or operated in premises used solely as a dwelling, or is used or operated in or on a vessel, motor vehicle, railway locomotive or aircraft.

Hong Kong Planning Standard and Guidelines (HKPSG)

- 2.2.2 Potential air quality impacts associated with the surrounding road carriageways and chimney emission from industrial stack shall be evaluated in accordance with the guidelines set out in HKPSG.
- 2.2.3 **Table 2.2** below is the extract of Table 3.1 in Chapter 9 "Environment" of Hong Kong Planning Standard and Guidelines (HKPSG) stating the recommended minimum horizontal buffer distance against pollution sources generated from road & highways and industrial areas.

Table 2.2 Guidelines on Usage of Open Space Site

Pollution Source	Parameter	Buffer Distance	Permitted Uses
Road and Highways	Type of Road		
	Trunk Road and Primary Distributor	>20 m	Active and passive recreational uses
		3 – 20 m	Passive recreational uses
		<3 m	Amenity areas
	District Distributor	>10 m	Active and passive recreational uses
		<10 m	Passive recreational uses
	Local Distributor	>5 m	Active and passive recreational uses
		<5 m	Passive recreational uses
	Under Flyovers		Passive recreational uses
Industrial Areas	Difference in Height between Industrial Chimney Exit and the Site		
	<20 m	>200 m	Active and passive recreational uses
		5 – 200 m	Passive recreational uses
	20 – 30 m (*)	>100 m	Active and passive recreational uses
		5 – 100 m	Passive recreational uses
	30 – 40 m	>50 m	Active and passive recreational uses
		5 – 50m	Passive recreational uses
	>40 m	>10 m	Active and passive recreational uses
Construction and Earth Moving Activities	-	<50 m	Passive recreational uses
		>50 m	Active and passive recreational uses

Note:

- (i) In situations which the height of chimneys is not known, use the set of guidelines marked with an asterisk for preliminary planning purpose and refine as and when more information is available.
- (ii) The buffer distance is the horizontal, shortest distance from the boundary of the industrial lot, the position of existing chimneys or the edge of road kerb, to the boundary of open space sites.
- (iii) The guidelines are generally applicable to major industrial areas but NOT individual large industrial establishment which are likely to be significant air pollution sources. Consult EPD should be consulted when planning open spaces close to such establishments.
- (iv) Amenity areas are permitted in any situation.

2.3 Construction Phase

Impact Brought during Construction Phase

- 2.3.1 Construction activities will bring potential temporary air quality impact to the surrounding area. Significant emissions are not anticipated from other criteria air pollutants - NO₂, SO₂, and CO, etc. as the number of on-site diesel/petroleum fuelled machinery (1-2 machineries) to be used for construction works is limited owing to the small size of the work site with an area of 1,852 m². However, electric power supply shall be provided for on-site machinery as far as practicable and diesel generators shall be avoided to minimize the gaseous and PM emissions. Travelling of the dump trucks is another potential source of construction dust. As this planning application stage, there is no detailed information on the construction program; however, with reference to other similar scale projects, there is likely to be around 2 dump trucks per hour during the site formation stage of the Proposed Development. Watering the haul road

and the site once per hour would be implemented to minimize the potential dust emission during the traveling of the dump trucks within the site.

- 2.3.2 Furthermore, there is a potential concurrent project "Proposed Public Housing Development at Wu Shan Road" within the 500m study area from the site boundary which would contribute to the cumulative impact during the construction phase. According to the available public information, the tentative completion year of the potential concurrent project would be 2025/26. Nevertheless, with the adoption of good practices, it is expected that emission of construction fugitive dust can be kept to an acceptable level. In addition, the applicant will liaise with the relevant parties of the concurrent project, if any, to avoid any heavy dusty activities to be conducted at the same time to minimize the cumulative dust impact at the area. The location of the potential concurrent project is shown in **Figure 2**.

Representative Air Sensitive Receivers

- 2.3.3 There are a number of village houses, planned public housing development, golf centre, sitting-out area and riding school located within 500m of the Proposed Development. The representative ASRs are tabulated below. The relative location and distance between the representative ASRs and the Subject Site can be referred to **Figure 3**.

Table 2.3 Representative ASRs during Construction Phase

Ref	Descriptions	Type	Use	Distance from the Project Boundary
A1	Tuen Mun Golf Centre	Existing	Recreation	~212m
A2	Public Housing Development at Wu Shan Road	Planned	Residential	~302m
A3	Hung Lau Sitting-out Area	Existing	Recreation	~107m
A4	Tuen Mun Public Riding School	Existing	Education	~216m
A5	Tsing Shan Tsuen San Shek Wan South	Existing	Residential	~256m

- 2.3.4 It is necessary to adopt a management strategy for controlling the construction dust generated from the construction of the Proposed Development. Where appropriate, air quality control measures for avoiding and minimising the potential impacts are recommended.

General Requirements during Construction Phase

- 2.3.5 The assessment criteria for aerial emission is based on the Hong Kong Air Quality Objectives (AQO) for air pollutants under APCO and the AQOs for the pollutants relevant to the construction phase air quality impact are listed in **Table 2.1**.

Control Measures Recommended during Construction Phase

- 2.3.6 Appropriate dust reduction measures should be adopted as required under the Air Pollution Control (Construction Dust) Regulation. Essential dust mitigation measures must be implemented to minimize the potential dust impact. Dust impact could be

effectively mitigated by inclusion of appropriate contract clauses for dust minimisation in the work contracts. Mitigation measures may include:

- dump trucks for material transport should be totally enclosed using impervious sheeting;
- any excavated dusty materials or stockpile of dusty materials should be covered entirely by impervious sheeting or sprayed with water so as to maintain the entire surface wet, and recovered or backfilled or reinstated within 24 hours of the excavation or unloading;
- the stockpiled malodorous materials should be removed from Application Site as soon as possible, and they should be covered entirely by plastic tarpaulin sheets;
- dusty materials remaining after a stockpile is removed should be wetted with water;
- the area where vehicle washing takes place and the section of the road between the washing facilities and the exit point should be paved with e.g. concrete, bituminous materials or hardcore or similar;
- stockpile of dusty materials to be either covered entirely by impervious sheeting, placed in an area sheltered on the top and the 3 sides; or sprayed with water so as to maintain the entire surface wet;
- all dusty materials to be sprayed with water prior to any loading, unloading or transfer operation so as to maintain the dusty material wet;
- vehicle speed to be limited to 10 km/hr except on completed access roads;
- the portion of road leading only to a construction site that is within 30 m of a designated vehicle entrance or exit should be kept clear of dusty materials;
- every vehicle should be washed to remove any dusty materials from its body and wheels before leaving the construction sites;
- the load of dusty materials carried by vehicle leaving a construction site should be covered entirely by clean impervious sheeting to ensure that the dusty materials would not leak from the vehicle;
- the working area of excavation should be sprayed with water immediately before, during and immediately after (as necessary) the operations so as to maintain the entire surface wet; and
- use of effective dust screens, sheeting or netting to be provided to enclose dry scaffolding which may be provided from the ground floor level of the building or if a canopy is provided at the first floor level, from the first floor level, up to the highest level (maximum four floors for this Project) of the scaffolding where scaffolding is erected around the perimeter of a building under construction.

2.3.7 In addition to the dust control measures described above, dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices listed below shall be carried out to further minimize construction dust impact:

- Plan site layout so that machinery and dust causing activities (e.g. haul roads and stockpiling areas) are located away from receptors as far as possible;
- Consider connecting construction plant and equipment to main electricity supply and avoid use of diesel generators and diesel-powered equipment as far as practicable;
- Provision of not less than 2.4m high hoarding from ground level along site boundary where adjoins a road, streets or other accessible to the public except for a site entrance or exit;

- Implement phasing of the excavation work to avoid large scale excavation at the same time in vicinity of nearby ASRs; and
 - Erect solid screens or barriers around dusty activities, etc.
- 2.3.8 A monitoring programme could also be instigated to monitor the construction process in order to enforce dust controls and modify methods of works to reduce the dust emission down to an acceptable level.
- 2.3.9 Good site management is important for reducing potential air quality impact down to an acceptable level. As a general guidance, the contractor shall maintain high standard of site management to prevent potential emission of fugitive dust emission. Loading, unloading, handling and storage of fuel, raw materials, products, wastes or by-products should also be carried out in a manner so as to minimise the release of visible dust emission.
- 2.3.10 A high standard of site management shall be maintained. Any piles of materials accumulated on or around the work areas shall be cleaned up regularly. Cleaning, repair and maintenance of all plant facilities within the work areas shall be carried out in a manner without generating fugitive dust emissions. The material shall be handled properly to prevent fugitive dust emission before cleaning.
- 2.3.11 "Recommended Pollution Control Clauses for Construction Contracts" is available on EPD website. It contains the recommended air pollution control measures to be implemented by the contractor during the construction stage.

2.4 Operation Phase

Review on Odour Impact

- 2.4.1 All sewage and wastewater generated from the proposed development would be treated by the proposed underground septic tank and treated effluent would be percolated to surrounding subsoil in the soakaway pit. Further sewerage treatment arrangement will be submitted to Environmental Protection Department for approval at the detailed design stage. In view of that the development and effluent volume are small in scale; with distance of >100m between Subject Site and nearby ASRs; no exhaust on the proposed underground septic tank; the system is same as that adopted in the previous approved Holiday Camp application (A/TM/469) and all the requirement as stipulated in ProPECC PN 1/23 would be followed, it is anticipated that the proposed underground septic tank would not cause any adverse odour impact to the proposed development and nearby ASRs.

Review on Industrial Emission Impact

- 2.4.2 Onsite surveys were conducted on 27 June 2025 to verify the presence of chimneys. There was no chimney identified within 200m from the boundary of Proposed Development. As such, it is anticipated that the Proposed Development would not be subject to adverse industrial emission impact.

Review on Vehicular Emission Impact

- 2.4.3 In accordance with above table as stipulated in HKPSG, the minimum requirements on the buffer distance from Lung Fu Road and Lung Mun Road is >10m, from San Shek Wan Road and Proposed Access Road is >5m.

Table 2.4 **Buffer Distances between Kerb Side of Concerned Road Links
and Proposed Air Sensitive Uses**

Road Name	Road Type	Recommended Buffer Distance (m)	Shortest Horizontal Distances Between Kerb Side of Concerned Road Links and the Application Site (m)
Lung Fu Road	District Distributor	>10m	~70m
Lung Mun Road	District Distributor	>10m	~211m
San Shek Wan Road	Local Distributor	>5m	~79m
Proposed Access Road	Local Distributor	>5m	~4.7m

- 2.4.4 As shown in **Table 2.4** and **Figure 4**, the recommended buffer distance requirement for Lung Fu Road, Lung Mun Road and San Shek Wan Road in the HKPSG would be complied. For the proposed access road, a small portion of the application site is within 5m buffer distance of the access road, however, no air sensitive uses (including fresh air intake, openable window, and open space for recreational use, etc.) would be located within 5m buffer distance. In conclusion, there would be no air sensitive uses within the above-mentioned 10m and 5m buffer zones. Since the recommended minimum buffer distance of the vehicular emission in the HKPSG can be met, the future residents and occupants of Proposed Development and existing air sensitive receivers will not be subjected to insurmountable vehicular emission impact.

3. NOISE IMPACT ASSESSMENT

3.1 Introduction

- 3.1.1 This section assesses the potential industrial noise and road traffic noise impacts on the noise sensitive uses of the Proposed Development. Practical mitigation measures are proposed to mitigate the potential noise impacts, where necessary.

3.2 Industrial Noise Impact Assessment

- 3.2.1 Onsite surveys were conducted on 27 June 2025 to verify the presence of industrial noise sources. There was no industrial noise source identified within 300m from the boundary of Proposed Development. As such, it is anticipated that the Proposed Development would not be subject to adverse industrial noise impact.

3.3 Railway Noise Impact Assessment

- 3.3.1 According to the desktop studies and onsite surveys conducted on 27 June 2025, light rail transit as a potential noise source is identified with distance of ~200m, located to the southeast of the Application Site. However, the direct line of sight between proposed development and identified light rail (e.g. Butterfly Station) is blocked by natural terrain (Approximate 40mPD or higher). In view of the separation distance of 25m is met and existing topographic screening, it is anticipated that the Proposed Development would not be subject to adverse railway noise impact. Location of the light rail transit and separation distance from the Application Site is shown in **Figure 5**.

3.4 Road Traffic Noise Impact Assessment

3.4.1 Assessment Criteria

- 3.4.1.1 Noise standards are recommended in the HKPSG for planning against possible noise impact from road traffic.
- 3.4.1.2 Domestic dwellings of the Proposed Development will rely on openable window for ventilation. 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 of new domestic dwellings.

3.4.2 Assessment Methodology

- 3.4.2.1 The methodology involves the prediction of future noise impacts on Noise Sensitive Receivers (NSRs) arising from road traffic of the existing and future road carriageways in the 300m assessment area. The 300m assessment area is shown in **Figure 6**.
- 3.4.2.2 The U.K. Department of Transport's procedure "Calculation of Road Traffic Noise" was applied to predict the hourly L_{10} noise level generated from road traffic at selected representative facades (NSRs) of the Proposed Development. The predicted noise levels were then compared with the HKPSG noise criterion for assessing the impact.
- 3.4.2.3 Based on the tentative completion year of Proposed Development (Year 2031), traffic forecast for the Year 2046 (AM Peak) on the road carriageways in the vicinity of the Proposed Development, which has the maximum traffic projection within 15 years from the completion of the Proposed Development, was provided by CKM (the project traffic consultant) for prediction of the worst-case traffic noise impact. The projected traffic flows and vehicle composition are shown in **Appendix 2**.
- 3.4.3 Road Characteristics
- 3.4.3.1 All roads surrounding the Application Site are assumed with a speed limit of 50km/hr with an impervious surface.

3.4.4 Noise Sensitive Receivers

3.4.4.1 The representative facades with openable windows/doors were identified as NSRs in the assessment. Locations of proposed NSRs are shown in **Figure 7**. The assessment points are taken at 1.2 m above the floors of the selected storey and 1m away from the facades of openable windows.

3.4.5 Review of Road Traffic Noise Impact for Proposed Development

3.4.5.1 A road traffic noise impact assessment has been prepared to estimate the traffic noise level at all representative NSRs.

3.4.6 The assessment results show that full compliance rate is achieved. Maximum predicted traffic noise level is 70 dB(A), which complies with the 70 dB(A) noise criterion as listed in HKPSG for residential units. Therefore, no adverse road traffic noise impact is anticipated at the proposed NSRs.

3.4.6.1 The predicted road traffic noise result is summarised in **Appendix 3**.

4. WATER QUALITY ASSESSMENT

4.1 Introduction

- 4.1.1 This section presents the water quality impact assessment for the construction and operational phases of the Project. Potential impacts have been identified and their significance on the Water Sensitive Receivers (WSRs) evaluated. The location of these WSRs can be referred to **Figure 8**. Appropriate mitigation measures and good site practices are recommended, where necessary, to reduce the potential water quality impacts in order to control the residual impacts to acceptable levels.

4.2 Environmental Legislation, Standards and Guidelines on Construction Phase Water Quality Impact

- 4.2.1 Construction activities may induce potential water quality impact due to the discharge of the effluent generated from the construction site. Effluent discharges from construction site are subject to control under the Water Pollution Control Ordinance and the Technical Memorandum Standards for Effluents Discharged in Drainage and Sewerage Systems, Inland and Coastal Water issued by EPD. Information in the ProPECC PN2/24 Construction Site Drainage will also be considered to provide some basic environmental guidelines for handling and disposal of construction site discharges.

4.3 Construction Phase Water Quality Impacts

- 4.3.1 Site construction activities will inevitably have the potential to generate wastewater. As such works should be carried out in such a manner as to minimize potential impacts on the water quality. Pollution sources could include:
- Construction runoff and drainage;
 - Sewage effluent from construction site; and
 - Liquid spillage, e.g. oil, diesel and solvents etc.

Construction Runoff and Drainage

- 4.3.2 Construction runoff contains increased loads of sediments, other suspended solids and contaminants. Potential sources of pollution include runoff and erosion from the site surfaces, drainage channels; bentonite slurries and other grouting materials, concrete washout and drainage from dust suppression sprays, fuel, oil and lubricants from construction vehicles and other equipment.
- 4.3.3 Sufficient silt removal facilities should be installed to settle out sediment prior to discharge. Such facilities shall be properly designed in accordance with guidelines from the Civil Engineering and Development Department (CEDD) to achieve the desired mitigating effect. Typically, a detention time not less than 5 minutes for maximum design flow of inlet should achieve adequate sediment removal. 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 so that potential impacts on WSR can be minimized.

Sewage Effluent from Construction Site

- 4.3.4 Water pollution due to site facilities e.g. toilets could be source of pollution if appropriate measures are not implemented properly in respect of storage and discharge.
- 4.3.5 In this construction site, portable chemical toilets will be provided. Chemical toilets should be provided at a minimum rate of about 1 per 50 workers. The facility should be serviced and cleaned by a specialist contractor at regular intervals. Sewage generated from the construction workforce will be contained in chemical toilets and be tanked away. Therefore, no adverse water quality impact is anticipated on WSR.

Liquid Spillage

- 4.3.6 To prevent spillage of fuel oils or other polluting fluids at sources, it is recommended that all the stocks should be stored inside proper containers and sited on sealed areas, preferably surrounded by bunds.
- 4.3.7 "Recommended Pollution Control Clauses for Construction Contracts" (RPCC) also recommends appropriate wastewater control measures to be implemented at the construction site by the contractor. The RPCC is available on EPD website.
- 4.3.8 The quality of the discharge wastewater should meet the standards specified in the Technical Memorandum – Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters. The above proposed mitigation measures and control measures should be implemented and an environmental monitoring and audit should be carried out to ensure the effectiveness of the proposed mitigation measures and subsequently ensure the water quality of the nearby water sensitive receivers would not be adversely affected by the construction of the project.

4.4 Best Management Practices (BMPs) for Stormwater Discharge

- 4.4.1 The BMPs given in the ProPECC PN 2/24 shall be implemented in controlling water pollution during the whole construction phase to minimize the impact on WSR. The main practices provided in the above-mentioned document (i.e. ProPECC PN 2/24) are also summarized in the following paragraphs which should be implemented by the contractor during the construction phase, where practicable:
- High loading of suspended solids (SS) in construction site runoff will be prevented through proper site management by the contractor;
 - The boundary of critical work areas will be surrounded by ditches or embankment. Accidental release of soil or refuse into the adjoining lands should be prevented by the provision of site hoarding or earth bunds, etc. at the site boundary. These facilities should be constructed in advance of the site formation works and roadworks;
 - Consideration will be given to plan construction activities to allow the use of natural topography of the Project Site as a barrier to minimize uncontrolled non-point discharge of construction runoff;
 - Temporary ditches, earth bunds should be provided to facilitate controlled discharge of runoff into storm drains via sand/ silt removal facilities such as sand traps and sedimentation basins. Oil and grease removal facilities should also be provided where appropriate, for example, in area near plant workshop/ maintenance areas;
 - Sedimentation basins and sand traps designed in accordance with the requirements of ProPECC Note PN 2/24 should be installed at the construction site for collecting surface runoff;

- Sand and silt removal facilities, channels and manholes should be maintained and the deposited silt and grit should be removed regularly by the contractor, and at the onset of and after each rainstorm to ensure that these facilities are functioning properly;
- Slope exposure should be minimized where practicable especially during the wet season. Exposed soil surfaces should be protected from rainfall through covering the temporarily exposed slope surfaces or stockpiles with tarpaulin or the like;
- Haul roads should be protected by crushed rock, gravel or other granular materials (i.e. hard paved) to minimize discharge of contaminated runoff;
- Slow down water run-off flowing across exposed soil surfaces;
- Plant workshop/ maintenance areas should be bonded and constructed on a hard standing. Sediment traps and oil interceptors should be provided at appropriate locations;
- 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 operate in dry seasons and minimize soil excavation works where practicable during the rainy days;
- Chemical stores will be contained (bonded) to prevent any spills from contact with water bodies. All fuel tanks and/ or storage areas should be provided with locks and be sited on hard surface;
- Chemical waste arising from the Project Site should be properly stored, handled, treated and disposed of in compliance with the requirements stipulated under the Waste Disposal (Chemical Waste) (General) Regulation;
- Drainage facilities must be adequate for the controlled release of storm flows;
- Vehicle wheel washing facilities should be provided at the site exit such that mud, debris, etc. attached to the vehicle wheels or body can be washed off before the vehicle leaves the work site;
- Section of the road between the wheel washing bay and the public road will be paved to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains; and
- Bentonite slurries, if any to be generated, shall be reconditioned and reused as far as practicable. Spent bentonite should be kept in a separate slurry collection system for disposal at a marine spoil grounds subject to obtaining a marine dumping licence from EPD. If used bentonite slurry is to be disposed of through public drainage system, it should be treated to meet the respective applicable effluent standards for discharges into sewers, storm drains or the receiving waters.

4.5 Potential Operation Phase Water Quality Impacts

- 4.5.1 According to the major operation phase activities in the Proposed Development, the key potential water quality impact is due to the surface runoff and treated effluent discharge from the Proposed Development.
- 4.5.2 The management and mitigation strategy of the potential water quality impact is addressed below, with appropriate environmental control measures recommended.
- 4.5.3 Best practices as stated in ProPECC PN 1/23 "Drainage Plans Subject to Comment by the Environmental Protection Department" shall be followed. It states out the handling,

treatment and disposal of various effluent discharges to stormwater drains and foul sewers during the operation phase. Some examples of the recommendations listed in the ProPECC PN 1/23 are as below.

- Drainage in covered car parks should be connected to foul sewers via petrol interceptors;
- Disposal of commercial and industrial wastewater by injection into the ground (e.g. by soakaway pits) is normally not allowed; and
- All wastewater collected from a restaurant kitchen, including that from basins, sinks and floor drains, should be discharged via a grease trap capable of providing at least 20 minutes retention during peak flow.

4.6 Surface Runoff Discharge/ Stormwater Discharge

- 4.6.1 During operation, the irrigation runoff and surface runoff during rainfall events, which is known as non-point source of pollution, may be the cause potential water quality impact. Fallen leaves, particles, litter from open areas, which is a source of organic and nutrient pollutants, can be washed into the drainage system during heavy rainfall if it is not properly controlled. Pollutants, contributed by non-point source are often bound or adsorbed onto particles, thus an effective stormwater management system will be required for the removal of pollution sources prior to rainstorm and the provision of degritting/screening facilities will be required for sediment collection. As the particles settle out, the associated pollutants will also settle out and removed from stormwater.
- 4.6.2 Under normal condition, runoff carrying pollutants will not be generated in low rainfall intensity, but increased runoff may occur during heavy rainfall condition. The first flush flow would carry most of the pollutants and the subsequent overland flow generated from rainstorms is expected to be uncontaminated. Thus, prevention of "first flush" pollution in stormwater runoff will be an effective way in controlling pollution at source and to abate pollutants.
- 4.6.3 Relevant assessment on the total peak flow of stormwater of the Proposed Development and the capacity of proposed drainage system are provided in a separate Drainage Proposal.

4.7 Sewage Effluent from Proposed Development

- 4.7.1 At present, there is no existing or planned public sewer for connections in the vicinity of the Application Site. Given that the development is small in scale. All sewage and wastewater generated from the proposed development would be treated by the proposed underground septic tank and treated effluent would be percolated to surrounding subsoil in the soakaway pit. This system is same as that adopted in the previous approved Holiday Camp application (A/TM/469) and all the requirement as stipulated in ProPECC PN 1/23 would be followed. It is expected that the operation of the proposed development would not cause operational phase water quality impact. Further sewerage treatment arrangement will be submitted to Environmental Protection Department for approval at the detailed design stage.
- 4.7.2 There will not be any greywater recycling activities planned due to hygienic considerations.

4.8 Implementation of Best Management Practices (BMPs)

- 4.8.1 Surface runoff can be controlled by good drainage design and implementation of BMPs. The Proposed Development shall adopt the following BMPs.

Runoff Control

- 4.8.2 Site drainage system of the development shall be reviewed regularly in such way that surface runoff shall be directed towards the internal access road. If necessary, additional paved U-channels with screening facilities shall also be provided along the edge of Proposed Development to avoid uncontrolled spillage of runoff.

Prevention of Pollution at Source

- 4.8.3 Regular cleaning and sweeping of road surface/ open areas is suggested so as to minimize exposure of pollutants to stormwater. The road surface/ open area cleaning should also be carried out prior to occurrence of rainstorm.
- 4.8.4 With the above measures, the amount of pollutants at source has been largely reduced/ avoided as far as possible so that the impact on WSR would not be adverse.

Devices for Removal of Pollutants

- 4.8.5 In addition to the above, screening facilities such as standard gully grating and trash grille, with spacing which is capable of screening off large substances such as fallen leaves and rubbish should be provided at the inlet of drainage system as well as at upstream location of the u-channels. It is expected that most of the large substances in stormwater runoff would be removed with such devices so as to prevent it from entering the drainage system. Road gullies with standard design should be incorporated during the detailed design to remove particles present in stormwater runoff.
- 4.8.6 In the event of emergency (e.g. car accident) where there is a major spillage of oil, chemical or fuel, dispersants or firefighting foam, etc., a system of contaminant bunding will be implemented as appropriate.

Management Measures

- 4.8.7 Good management measures such as regular cleaning and sweeping of road surface/ open areas is suggested. The road surface/ open area cleaning should also be carried out prior to occurrence of rainstorm.
- 4.8.8 Stormwater gullies and ditches provided among the Proposed Development will be regularly inspected and cleaned by the property management company.
- 4.8.9 With the removal of pollutants, the pollution levels from stormwater would be much reduced, and given the stochastic nature of non-point source pollution and the proposed management measures, there will be no significant impact expected on WSR.
- 4.8.10 With appropriate management measures in place, the risk of untreated sewage effluent discharge to North Western Control Zone due to emergency events is considered to be negligible.

5. WASTE MANGEMENT

5.1 Introduction

- 5.1.1 This section presents an assessment of the potential waste management issues in connection with construction and operation of the Project. The options for waste minimization, reuse, recycling, collection, transport and disposal of wastes arising from the construction and demolition work have been examined. Where appropriate, procedures for waste reduction and management are considered and environmental control measures for avoiding and minimising the potential impacts are recommended.
- 5.1.2 Recommended Pollution Control Clauses for Construction Contracts published by Environmental Protection Department would be implemented during the construction phase of the proposed development. Waste generated from the Proposed Development would be properly controlled and adverse waste management would not be anticipated.

5.2 Relevant Legislation, Standards & Guidelines

- 5.2.1 In carrying out the assessment, reference has been made to the following relevant Hong Kong legislation governing waste management and disposal. Directly relevant legislation include:
1. The Waste Disposal Ordinance (Cap. 354) and subsidiary legislation such as the Waste Disposal (Chemical Waste) (General) Regulation, and the Waste Disposal (Clinical Waste) (General) Regulation, set out requirements for the storage, handling and transportation of all types of wastes;
 2. Dumping at Sea Ordinance (Cap. 466) regulating marine disposal of sediment;
 3. Land (Miscellaneous Provisions) Ordinance (Cap 28); and
 4. Public Health and Municipal Services Ordinance (Cap 132) – Public Cleansing and Prevention of Nuisance Regulation – control of disposal of general refuse.
- 5.2.2 Other relevant documents and guidelines that are applicable to waste management and disposal include:
5. PNAP 243 ADV-19 - Construction and Demolition Waste;
 6. PNAP 252 ADV-21 - Management Framework for Disposal of Dredged/ Excavated Sediment;
 7. Development Bureau Technical Circular (Works) No. 8/2010 - Enhanced Specification for Site Cleanliness and Tidiness;
 8. ETWB TCW No. 22/2003A - Additional Measures to Improve Site Cleanliness and Control Mosquito Breeding on Construction Sites;
 9. Development Bureau Technical Circular (Works) No. 6/2010 - Trip-ticket System for Disposal of Construction and Demolition Materials;
 10. WBTC No. 19/2001 - Metallic Site Hoardings and Signboards;
 11. Works Bureau Technical Circular No. 12/2000 - Fill Management;
 12. Works Branch Technical Circular No. 2/93 - Public Dumps;
 13. Works Branch Technical Circular No. 2/93B - Public Filling Facilities; and
 14. Project Administration Handbook for Civil Engineering concerning Management of Construction and Demolition Materials Including Rock.

5.3 Identification and Evaluation of Potential Waste Impact during Construction Phase

5.3.1 The construction activities to be carried out for the proposed Project would generate a variety of wastes that can be divided into distinct categories based on their composition and ultimate method of disposal. The identified waste types include:

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

C&D Materials

5.3.2 C&D materials comprise mainly of unwanted materials, including surplus materials arising from excavations that are generated from the works (e.g. site clearance, site formation works, excavation work for basement). Inert soft C&D materials comprise of soil, sand, clay, slurry, etc., while hard C&D materials comprise of crushed concrete, asphalt, rock, etc. The amount of non-inert C&D materials generated during site clearance would be minor (as there is little vegetation at the Subject Site). C&D materials may comprise different types of materials, including:

- Non-inert C&D materials (e.g. bamboo, timber, paper, metal, glass, plastic, packaging wastes, etc.) decompose and are not suitable for land reclamation. Non-inert C&D materials should be reused or recycled as far as possible. For those non-inert C&D materials that cannot be reused or recycled should be disposed of at landfill as last resort;
- Inert C&D materials do not decompose (e.g. soil, rock debris, rubble earth, concrete, etc.) and is suitable to reuse as filling materials for land reclamation and site formation. Inert C&D materials could be reused on-site as filling materials. For those inert C&D materials that cannot be reused should be disposed at a Public Fill Reception Facilities.

5.3.3 The general waste management strategy is to avoid waste generation in the first place. Should it be unavoidable, reduction and segregation at-source should be exercised as far as practicable, and recycling and reuse should be adopted at the same time to salvage all the recyclable and reusable materials as much as possible.

5.3.4 Inert C&D materials should be re-used on-site (e.g for backfilling) if it is practical and/or disposed of at public filling area or other CEDD designated public fill reception facilities. Non-inert C&D materials (i.e. C&D waste) should be re-used or recycled. For those that cannot be reused or recycled, they should be disposed of at designated landfill sites as last resort.

5.3.5 The Contractor(s) should be responsible for ensuring that all on-site wastes will be collected by approved waste collectors and appropriate measures should be undertaken to minimise adverse impacts to the surrounding environment, such as dust generation. The Contractor(s) must also ensure that all necessary waste disposal permits have been obtained before actions.

5.3.6 Prior to disposal of non-inert C&D materials, it is recommended that wood, steel, glass and other metals will be collected separately for re-use and/or recycling and inert C&D materials utilized as fill materials to minimize the quantity of waste to be disposed of at the Public Fill Reception Facilities and landfill.

Chemical Waste

5.3.7 Construction plant and equipment will require regular maintenance and servicing, which would generate waste such as solvents, lubrication oil and fuel, etc. Chemical wastes arising during the construction phase may pose serious environmental, health and safety hazards if not stored and disposed of in an appropriate manner.

- 5.3.8 It is difficult to quantify the amount of chemical wastes as it will solely depend on the contractor's on-site maintenance practice and the quantities of plant and vehicles utilized at the construction site. Nevertheless, it is anticipated that the quantity of chemical waste such as lubrication oil and solvent produced from equipment maintenance would be small and less than hundred litres per month.
- 5.3.9 The contractor is required to register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes.
- 5.3.10 Storage, handling, transport and disposal of chemical waste should be arranged in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Waste published by the EPD. Chemical wastes such as wasted solvents, lubrication oil and fuel, etc. will need special handling and storage arrangements and should be collected by licensed collectors for subsequent disposal and appropriate treatment at licensed waste disposal facilities, for example the Chemical Waste Treatment Centre (CWTC) in Tsing Yi. Mitigation and control requirements for chemical waste are provided in the "Recommended Pollution Control Clauses for Construction Contracts" available in EPD website mentioned the handling, storage and disposal of chemical wastes. With good management and site particles, adverse environmental impacts should not result.

General Refuse

- 5.3.11 Throughout the construction stage, the workforce would generate general refuse comprising food scraps, waste paper, empty containers, etc. Release of general refuse into watercourses or marine waters should not be permitted as introduction of these wastes is likely to have detrimental effects on water quality in the area. Effective collection of site wastes would be required to prevent waste materials being blown around by wind, flushed or leached into the marine environment, and odour nuisance. The work sites may also attract pests and vermin if the waste storage area is not well maintained and cleaned regularly. Disposal of refuse at sites other than approved waste transfer or disposal facilities can also result in similar impacts. The number of work force to be employed for the Project is around 10. Based on the generation rate of 0.65kg/person/day, the estimated total refuse generated per day (maximum) would be about 6.5kg/day.
- 5.3.12 Recyclable materials (i.e. paper, plastic bottles and aluminium cans) will be collected separately for recycling, in order to reduce the amount of general refuse to be disposed into the landfill. Adequate number of enclosed waste containers will be provided to avoid over-spillage of waste. The non-recyclable refuse will be placed in bags and stored in enclosed containers, and disposed of on a daily basis to the designated landfill. Given that the quantity of general refuse to be disposed will be small, no adverse impact on the operation of these waste disposal facilities is anticipated. With the implementation of the recommended waste management practices at the site, adverse environmental impacts would not arise from the storage, handling and transportation of refuse.
- 5.3.13 Preliminary quantity estimation of construction waste involved and disposal method is summarised in the **Table 5.1** below.

Table 5.1 Summary of Estimated Construction Waste and Disposal Method

Waste Material Type		Estimated Quantity Generated	Disposal Method
Inert C&D Materials	Excavation	~6500 m ³	To be reused or recycled on site or in other projects; and delivered to Public Fill Reception Facilities for other beneficial reuse
	Construction of New Buildings/Structures	~500 m ³	
Non-inert C&D Materials	Excavation	~500 m ³	To be reused, recycled or disposed of at landfill as the last resort
	Construction of New Buildings/Structures	~80 m ³	
Chemical Waste	-	Less than hundred litres /month (preliminary estimate)	For treatment at licensed facilities
General Refuse	-	6.5kg/day (preliminary estimate, assuming there are 10 workers at any one time with generation rate of 0.65kg per worker per day)	Disposal to landfill

5.4 Waste Disposal and Mitigation Measures

5.4.1 Waste generated by construction activities should be properly sorted and certain waste management requirements must be followed to minimize the impacts arising because of the generation, storage, handling, transport and disposal of wastes. Good site management and control can prevent the generation of significant amounts of "mixed waste". For unavoidable wastes, reuse, recycling and optimal disposal are most practical when segregation occurs on the construction site, categorized as follows:

- Inert C&D materials for reuse on-site or delivering to Public Fill Reception Facilities for beneficial reuse at other projects;
- Non-inert C&D materials for reuse or recycle or disposal at landfill as last resort;
- Chemical waste for treatment at licensed facilities; and
- General refuse for disposal at landfill.

C&D Material

5.4.2 Proper storage and site practices should be adopted to minimize the damage to, or contamination of, C&D materials that may reduce their recyclability and suitability for disposal in public fill reception facilities. The inert C&D materials shall be reused in earth filling, reclamation or site formation works. The non-inert C&D materials shall be reused or recycled and, as the last resort, disposed of at landfills.

5.4.3 Appropriate measures should also be employed to minimize windblown litter and dust during transportation by either covering trucks with tarpaulin or transporting wastes in enclosed containers. Waste should only be disposed at licensed sites. Resident site staff and the contractors should develop procedures to ensure that illegal disposal of waste does not occur. In addition, waste storage areas within the Project should be well maintained and cleaned regularly to prevent cross-contamination. The disposal of inert C&D materials and non-inert C&D materials to public fill reception facilities/sorting

facilities respectively through a trip-ticket system, while general refuse will be disposed of at landfill.

Chemical Waste

- 5.4.4 Chemical and oily wastes generated from the construction activities, vehicle and plant maintenance should be disposed of as chemical waste in strict compliance with the Waste Disposal (Chemical Waste) (General) Regulations.

General Refuse

- 5.4.5 For general refuse, mitigation measures should include provision of a collection area where waste can be sorted, stored and loaded prior to removal from the site during construction phase.
- 5.4.6 In addition, with the implementation of the recommended mitigation measures in the "Recommended Pollution Control Clauses for Construction Contracts" available in EPD website, the potential environmental impacts resulting from the storage, handling and transportation of inert C&D materials, non-inert C&D materials, chemical wastes and general site wastes would be minimal. Below are the examples of the relevant measures:-

Waste Minimisation

- The Contractor shall submit to the Engineer for approval a waste management plan with appropriate mitigation measures including the allocation of an area for waste segregation and shall ensure that the day-to-day site operations comply with the approved waste management plan.
- The Contractor shall minimise the generation of waste from his work. Avoidance and minimisation of waste generation can be achieved through changing or improving design and practices, careful planning and good site management.
- The Contractor shall ensure that different types of wastes are segregated on-site and stored in different containers, skips or stockpiles to facilitate reuse/recycling of waste and, as the last resort, disposal at different outlets as appropriate.
- The reuse and recycling of waste shall be practised as far as possible.
- The Contractor shall record the amount of wastes generated, recycled and disposed of (including the disposal sites).
- The Contractor shall use a trip ticket system for the disposal of C&D materials to any designated public filling facility and/or landfill.

Waste Nuisance Control

- 5.4.7 The Contractor shall not permit any sewage, waste water or effluent containing sand, cement, silt or any other suspended or dissolved material to flow from the Site onto any adjoining land or allow any waste matter (or refuse) which is not part of the final product from waste processing plants to be deposited anywhere within the Site (or onto any adjoining land). He shall arrange removal of such matter from the site (or any building erected or to be erected thereon) in a proper manner to the satisfaction of the Engineer in consultation with the Director of Environmental Protection.

Chemical Waste Control

- The Contractor shall observe and comply with the Waste Disposal (Chemical Waste) (General) Regulation.
- The Contractor shall apply for registration as chemical waste producer under the Waste Disposal (Chemical Waste) (General) Regulation when chemical waste is produced. All chemical waste shall be properly stored, labelled, packaged and collected in accordance with the Regulation.

5.5 Identification and Evaluation of Potential Impact during Operational Phase

5.5.1 During operational phase of the proposed development, since the proposed use is residential only, disposal of chemical, livestock and clinical waste are not anticipated. Instead, general waste is anticipated to be the major type of waste generated during the operation of the proposed development.

5.5.2 Release of general refuse into watercourses or marine waters should not be permitted as introduction of these wastes is likely to have detrimental effects on water quality in the area. Effective collection of site wastes is suggested to prevent waste materials being blown around by wind, flushed or leached into the marine environment, and odour nuisance.

General Refuse

5.5.3 With the implementation of the *Producer Responsibility Scheme on Waste Electrical and Electronic Equipment* (WPRS), the amount of domestic electrical waste being disposed would not be significant as customers are encouraged to contact the WEEE recycling firm for the recycling of electrical equipment. The disposal of electrical equipment and its impact is not anticipated to be significant.

5.5.4 For other general waste such as metal, paper, plastic and glass, recycling bins for each type of wastes will be placed at prominent locations such as areas near lobby to reduce waste disposal amount. Also, the waste collection frequency is recommended to be at least once a day to reduce chances of hygiene issue.

5.5.5 For wastes such as leftover, an adequate number of enclosed waste containers will be provided to avoid over-spillage of waste. Also, leftover will be placed in bags and stored in enclosed containers, and disposed of on a daily basis to the designated landfill. In addition, the project proponent is recommended to deliver leftover generated to Organic Resources Recovery Centre (ORRC) or installation of food waste recycling machines for composting treatment, etc. Therefore, the chances of odour nuisance and hygiene issue are reduced.

5.5.6 As the generation rate of the general refuse at the proposed development is anticipated to be similar to those of the domestic use in Hong Kong, the impact from the waste disposal of the operational phase is anticipated to be insignificant with the implementation of the above measures.

5.6 Environmental Monitoring & Audit Requirements

5.6.1 The foregoing assessment has concluded that proper handling, storage, collection, transportation and disposal of waste materials generated during construction of the Project will not give rise to significant impacts to nearby sensitive receivers.

5.6.2 Whilst no specific environmental monitoring requirements are considered necessary, it is recommended that during the construction phase, site inspections and supervisions of waste management procedures and auditing of the effectiveness of implemented mitigation measures should be undertaken on a regular basis.

5.6.3 These tasks shall be scheduled in a Waste Management Plan ("WMP") to be prepared by the contractor and updated regularly. The WMP shall be submitted to the Architect/Engineer for approval. A summary of the site audits shall be presented in the monthly EM&A reports.

5.7 Conclusion and Recommendation

- 5.7.1 The potential impacts of wastes arising from the construction and operation of the Proposed Development have been assessed. The construction activities will generate a variety of wastes including materials from site clearance, excavated materials, construction wastes, chemical and general refuse.
- 5.7.1 Recommended Pollution Control Clauses for Construction Contracts published by Environmental Protection Department would be implemented during the construction phase of the proposed development.
- 5.7.2 With the recommended waste management practices put in place, no unacceptable impacts associated with waste management during the construction and operation phase are envisaged.

6. LAND CONTAMINATION

6.1 Scope of Work

- 6.1.1 The aim of this study is to assess the potential land contamination impact under the Proposed Development due to the previous land uses and/ or the existing operations.

6.2 Assessment Criteria

- 6.2.1 The following guidelines published by EPD have been followed:
- Guidance Manual for Use of Risk-based Remediation Goals (RBRGs) for Contaminated Land Management (Guidance Manual), EPD, Revised in April 2023;
 - Guidance Note for Contaminated Land Assessment and Remediation (Guidance Note), EPD, Revised in April 2023; and
 - Practice Guide for Investigation and Remediation of Contaminated Land (Practice Guide), EPD, Revised in April 2023.
- 6.2.2 As the RBRGs and the Practice Guide are the latest guidelines promulgated for use in April 2023, the RBRGs criteria and the requirements stated in the Practice Guide will be adopted in this Land Contamination Review.

6.3 Review of Historical and Current Available Information

- 6.3.1 The Application Site is a natural terrain and currently zoned as "Recreation" under the approved Tuen Mun Outline Zoning Plan No. S/TM/41.
- 6.3.2 Historical aerial photos of the Application Site have been reviewed to identify if any possible land contamination related activities or uses have been carried out. **Table 6.1** shows the description of each aerial photos. Besides, the original version of each aerial photo is presented in **Appendix 4**.

Table 6.1 Landuse Summary of Proposed Development

Period/ Year	Description
1949	The whole Application Site was a natural terrain.
1961	The land use of the whole Application Site remained unchanged.
1980	The land use of the whole Application Site remained unchanged.
2001	The land use of the whole Application Site remained unchanged.
2021	The land use of the whole Application Site remained unchanged.

- 6.3.3 From the landuse summary and aerial photos, the Application Site has been a natural terrain since 1949 and no landuse change related to potential contamination works and activities is observed. Therefore, land contamination issue within the Application Site is not anticipated. Further site investigation is not required.

7. CONCLUSION

- 7.1.1 The key environmental issues associated with both operation and construction phase of the Application Site are qualitatively discusses in this report.

Air Quality

- 7.1.2 With sufficient buffer distance from the surrounding road network and Proposed New Access Road, and there would be no air sensitive uses within the buffer zones, the future occupants of the Proposed Development will not be subject to significant vehicular emission impact.
- 7.1.3 There was no chimney identified within 200m from the site boundary of Application Site. As such, it is anticipated that Proposed Development would not be subject to adverse industrial emission impact.
- 7.1.4 All sewage and wastewater generated from the proposed development would be treated by the proposed underground septic tank and treated effluent would be percolated to surrounding subsoil in the soakaway pit. Further sewerage treatment arrangement will be submitted to Environmental Protection Department for approval at the detailed design stage. In view of that the development and effluent volume are small in scale; with distance of >100m between Subject Site and nearby ASRs; no exhaust on the proposed underground septic tank; the system is same as that adopted in the previous approved Holiday Camp application (A/TM/469) and all the requirement as stipulated in ProPECC PN 1/23 would be followed, it is anticipated that the proposed underground septic tank would not cause any adverse odour impact to the proposed development and nearby ASRs.

Noise

- 7.1.5 There was no industrial noise source identified within 300m from the boundary of Proposed Development. As such, it is anticipated that the Proposed Development would not be subject to adverse industrial noise impact.
- 7.1.6 According to the desktop studies and onsite surveys conducted in June 2025, light rail transit as a potential noise source is identified with distance of ~200m, located to the southeast of the Application Site. However, the direct line of sight between proposed development and identified light rail (e.g. Butterfly Station) is blocked by natural terrain (Approximate 40mPD or higher). In view of the separation distance of 25m is met and existing topographic screening, it is anticipated that the Proposed Development would not be subject to adverse railway noise impact.
- 7.1.7 A road traffic noise impact assessment has been carried out for the Proposed Development and existing NSRs. According to the result of base scenario at Proposed Development, the predicted noise level of all selected NSRs would comply with the relevant Noise Control Ordinance standard. Therefore, no adverse road traffic noise impact is anticipated on the Proposed Development.

Water Quality

- 7.1.8 With proper implementation of the recommended mitigation measures, good construction site practices as recommended in relevant regulatory guidelines, adverse water quality impacts are not expected at the identified WSRs.
- 7.1.9 An underground septic tank is proposed to handle the sewage generation by the Proposed Development during the operation phase. With appropriate management measures in place, it is anticipated that the Proposed Development would not pose significant impact on the water quality of identified WSRs.

Waste Management

- 7.1.10 With the recommended waste management practices put in place, no unacceptable impacts associated with waste management during the construction and operation phases are envisaged.

Land Contamination

- 7.1.11 The Application Site has been a natural terrain since 1949 and no landuse change related to potential contamination works and activities is observed. Therefore, land contamination issue within the Application Site is not anticipated.
- 7.1.12 The environmental assessment study confirms the acceptability of Proposed Development from environmental point of view.

Figures

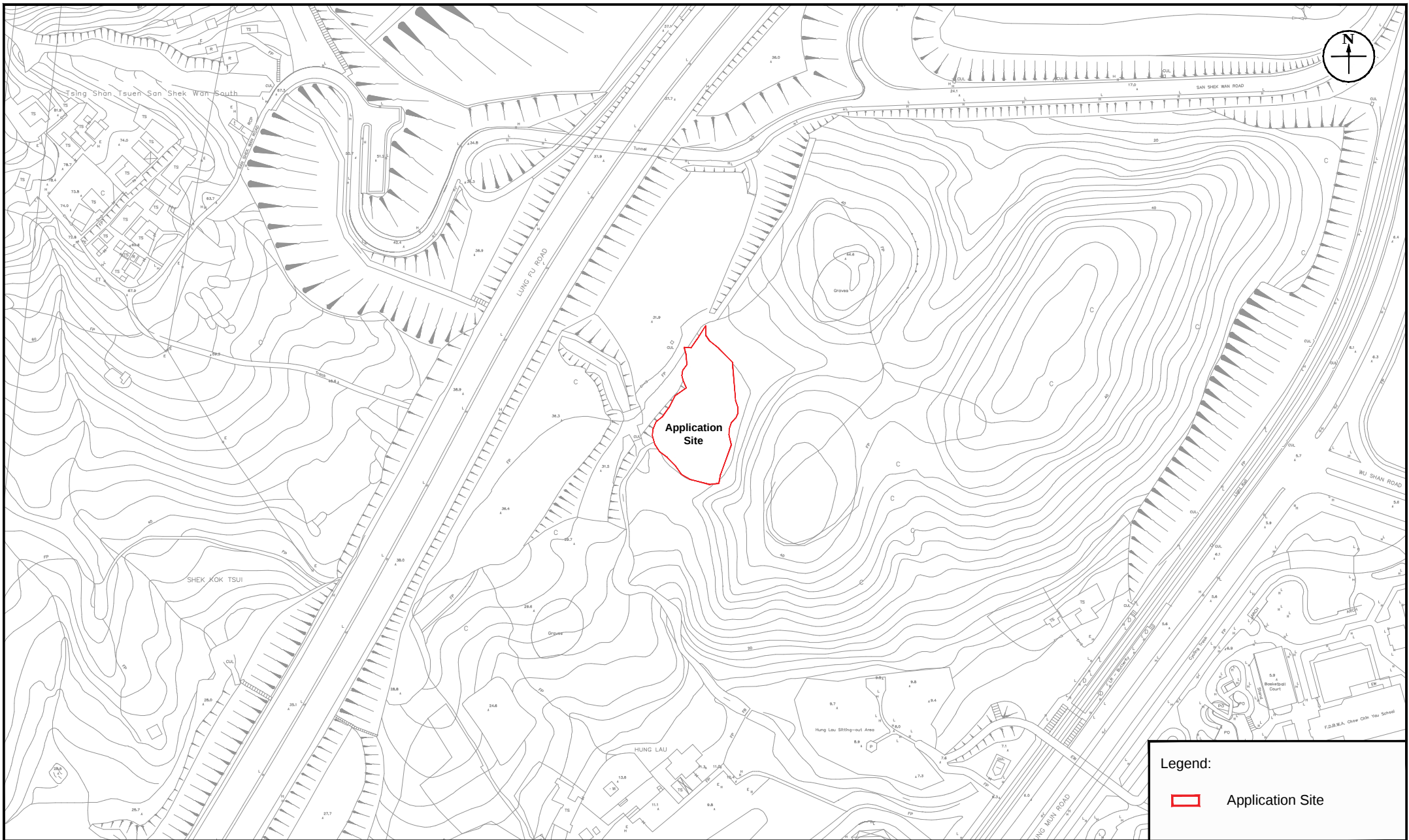


Figure: 1

Title: Location of the Application Site and its Environs

Project: Proposed House Development at T.M.T.L. 550, Tuen Mun, New Territories

Legend:

Application Site

RAMBOLL

Drawn by: TL

Checked by: TC

Rev.: 2.0

Date: Aug 2025

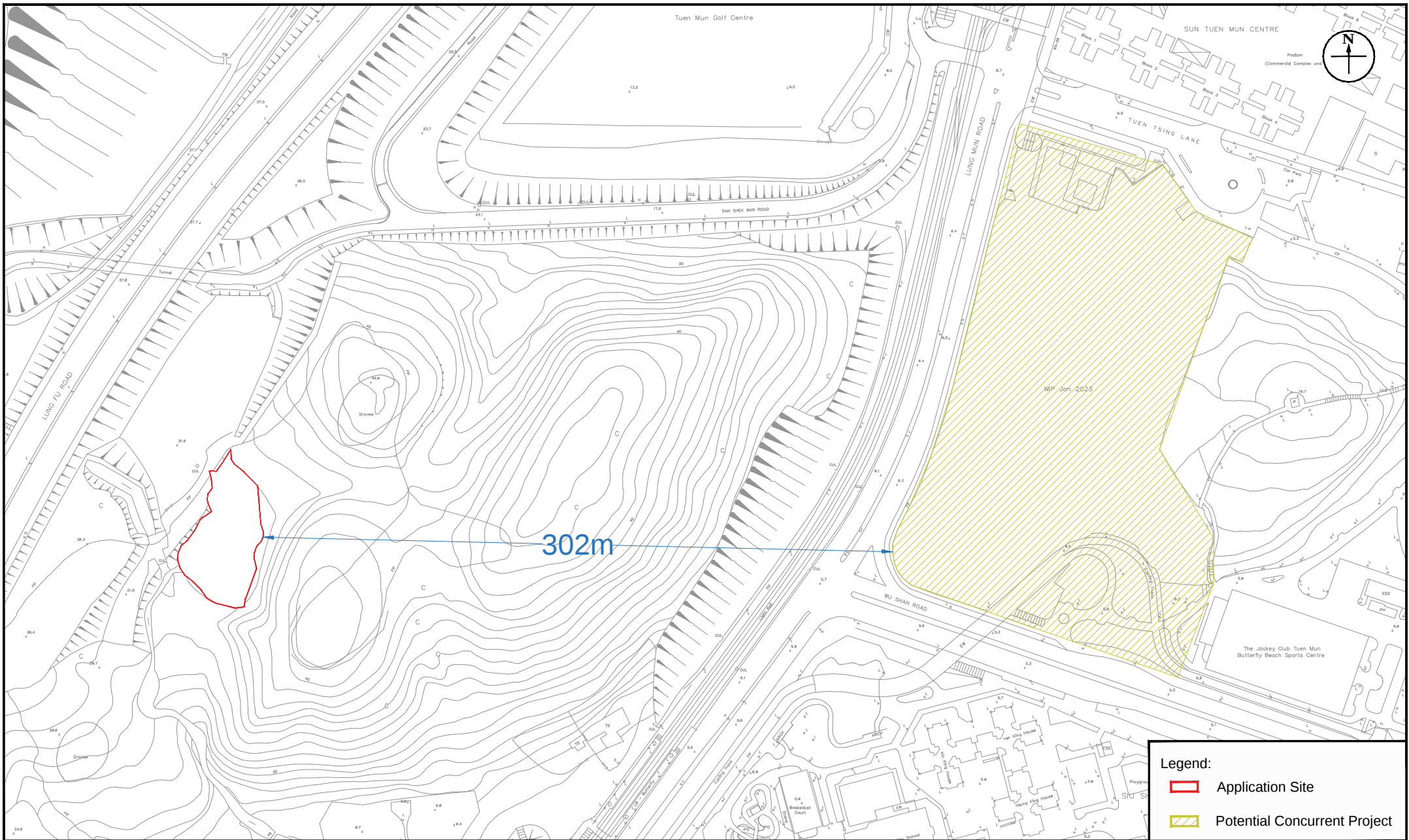


Figure: 2	
Title: Location of the Potential Concurrent Project	
Project: Proposed House Development at T.M.T.L. 550, Tuen Mun, New Territories	Drawn by: TL
	Checked by: TC
	Rev.: 2.0
	Date: Aug 2025

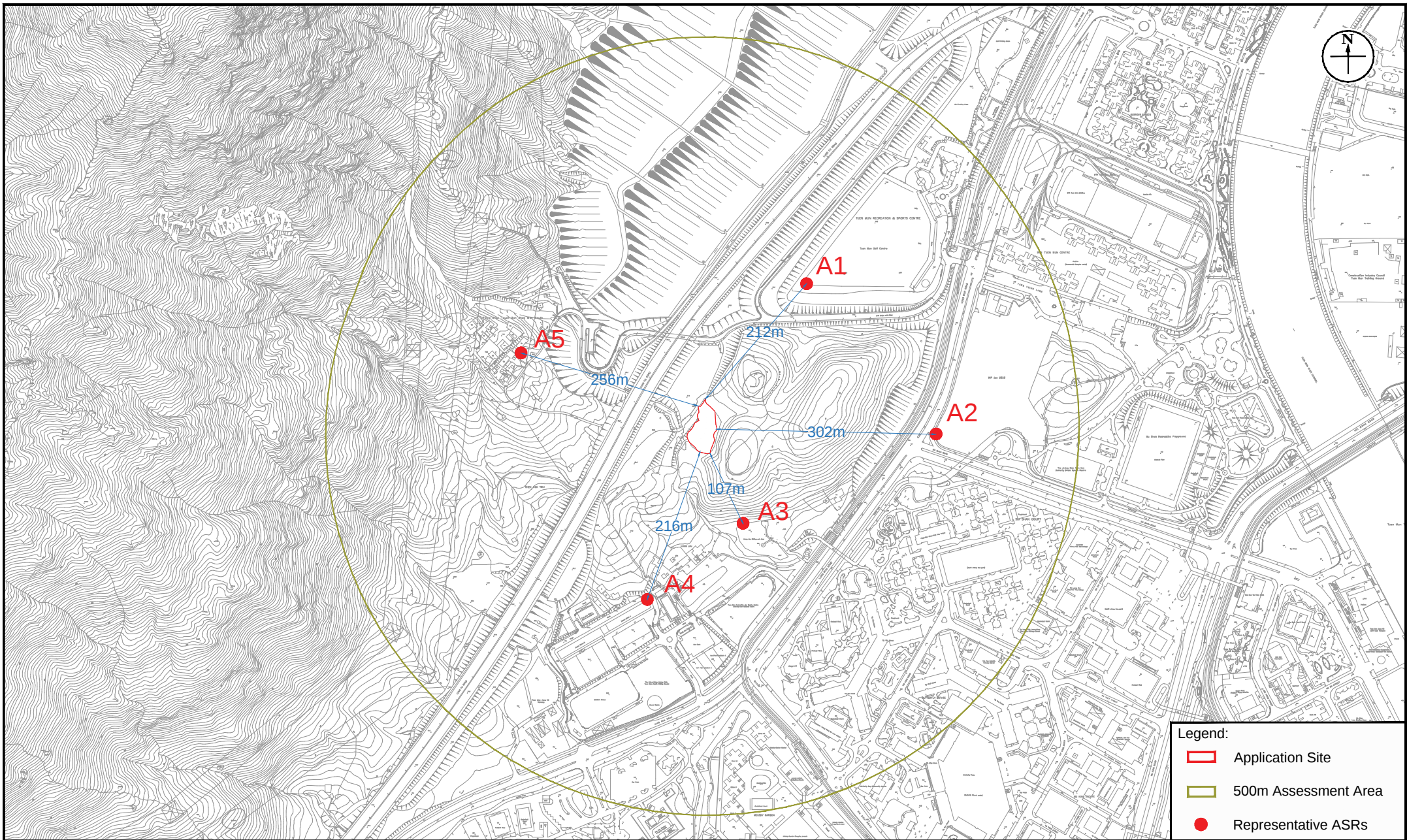


Figure: 3	Drawn by: TL Checked by: TC Rev.: 2.0 Date: Aug 2025
Title: Location of the Representative Air Sensitive Receivers	
Project: Proposed House Development at T.M.T.L. 550, Tuen Mun, New Territories	

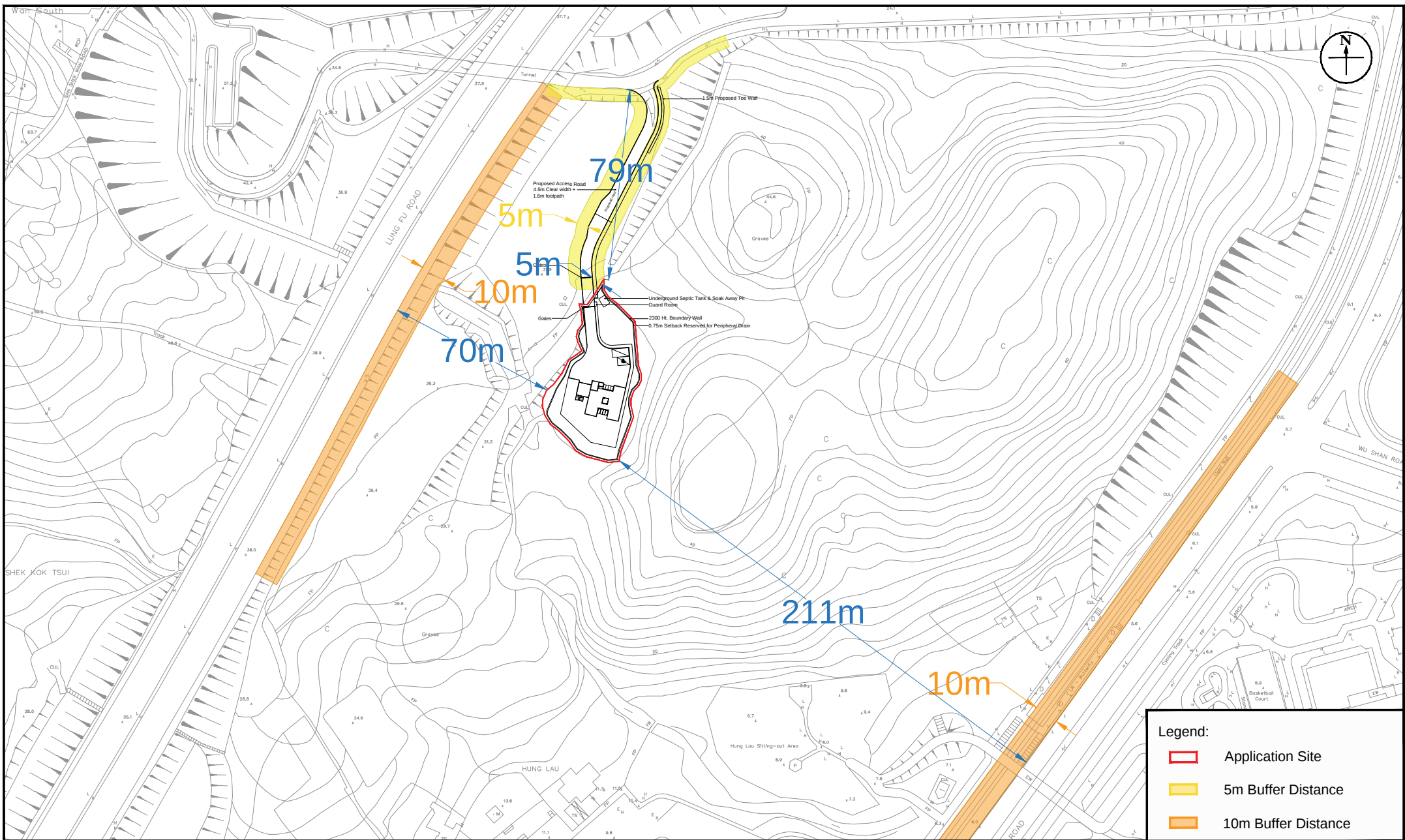


Figure: 4

Title: Buffer Distance between the Proposed Development and the Kerb Side of the Nearest Carriageway

Project: Proposed House Development at T.M.T.L. 550, Tuen Mun, New Territories

RAMBOLL

Drawn by: TL

Checked by: TC

Rev.: 2.0

Date: Aug 2025

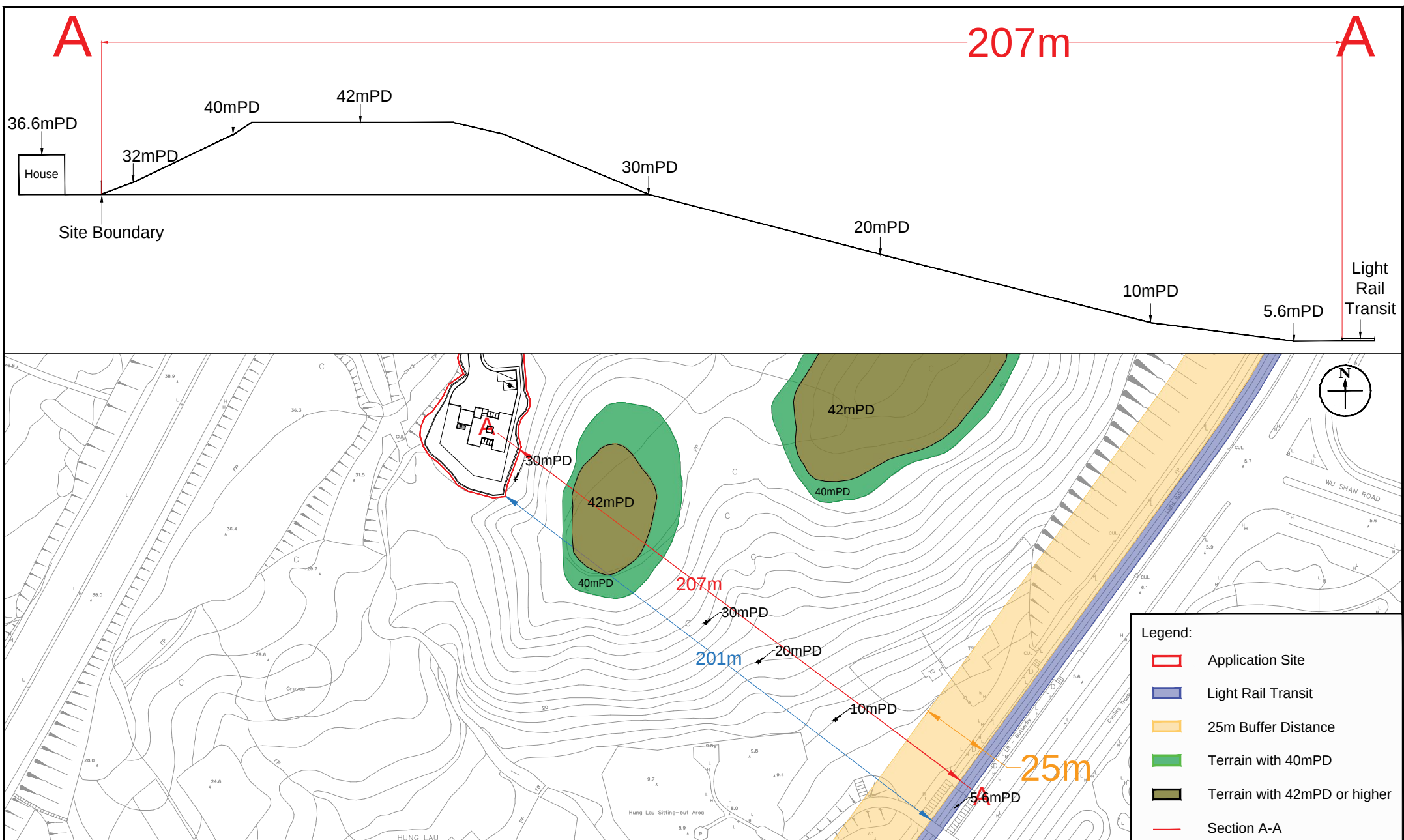


Figure: 5

Title: Location of Light Rail Transit and Separation Distance from the Application Site

Project: Proposed House Development at T.M.T.L. 550, Tuen Mun, New Territories

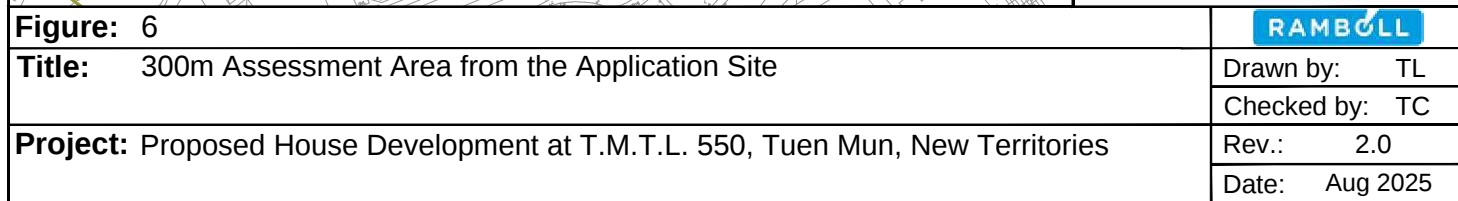
RAMBOLL

Drawn by: TL

Checked by: TC

Rev.: 2.0

Date: Aug 2025



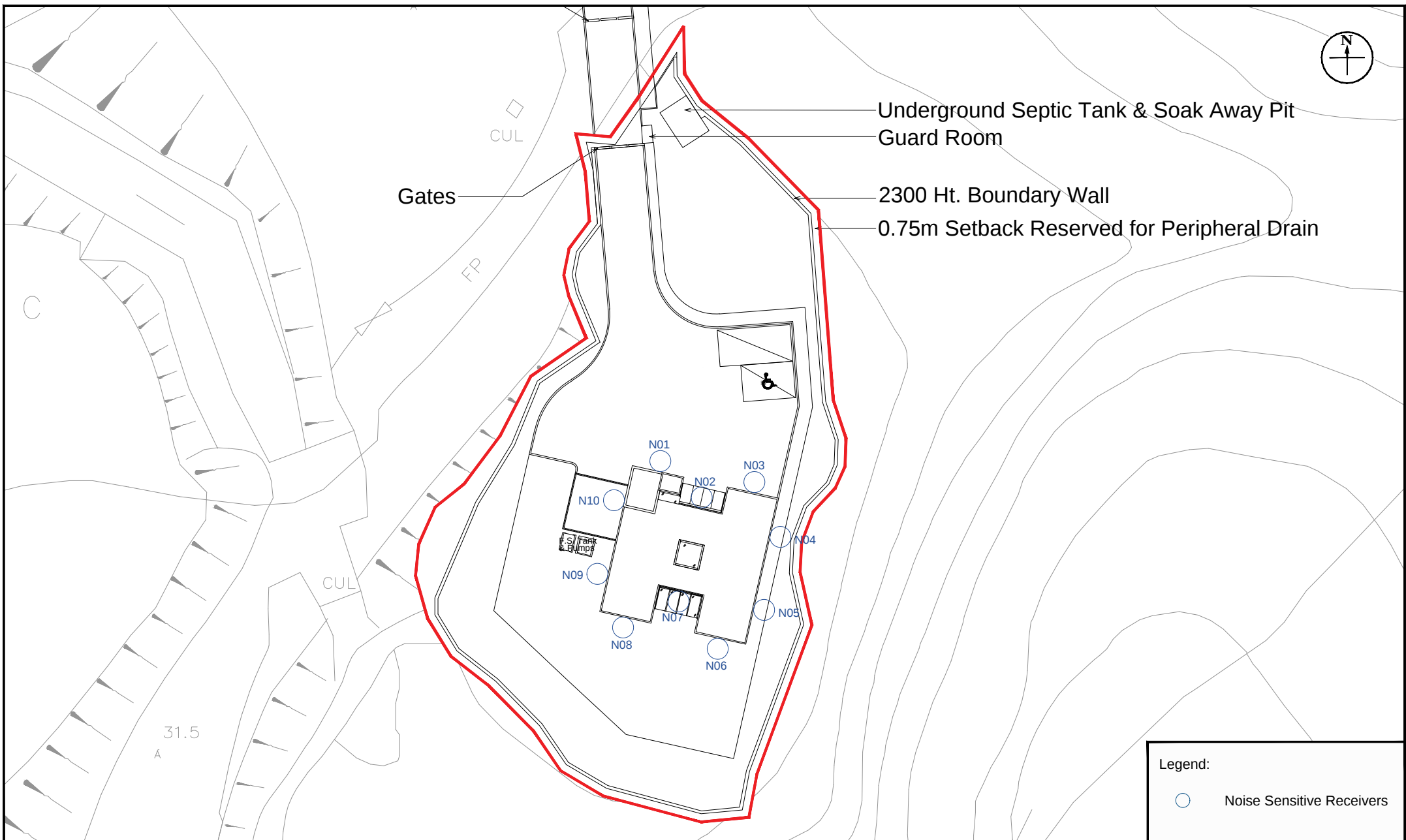
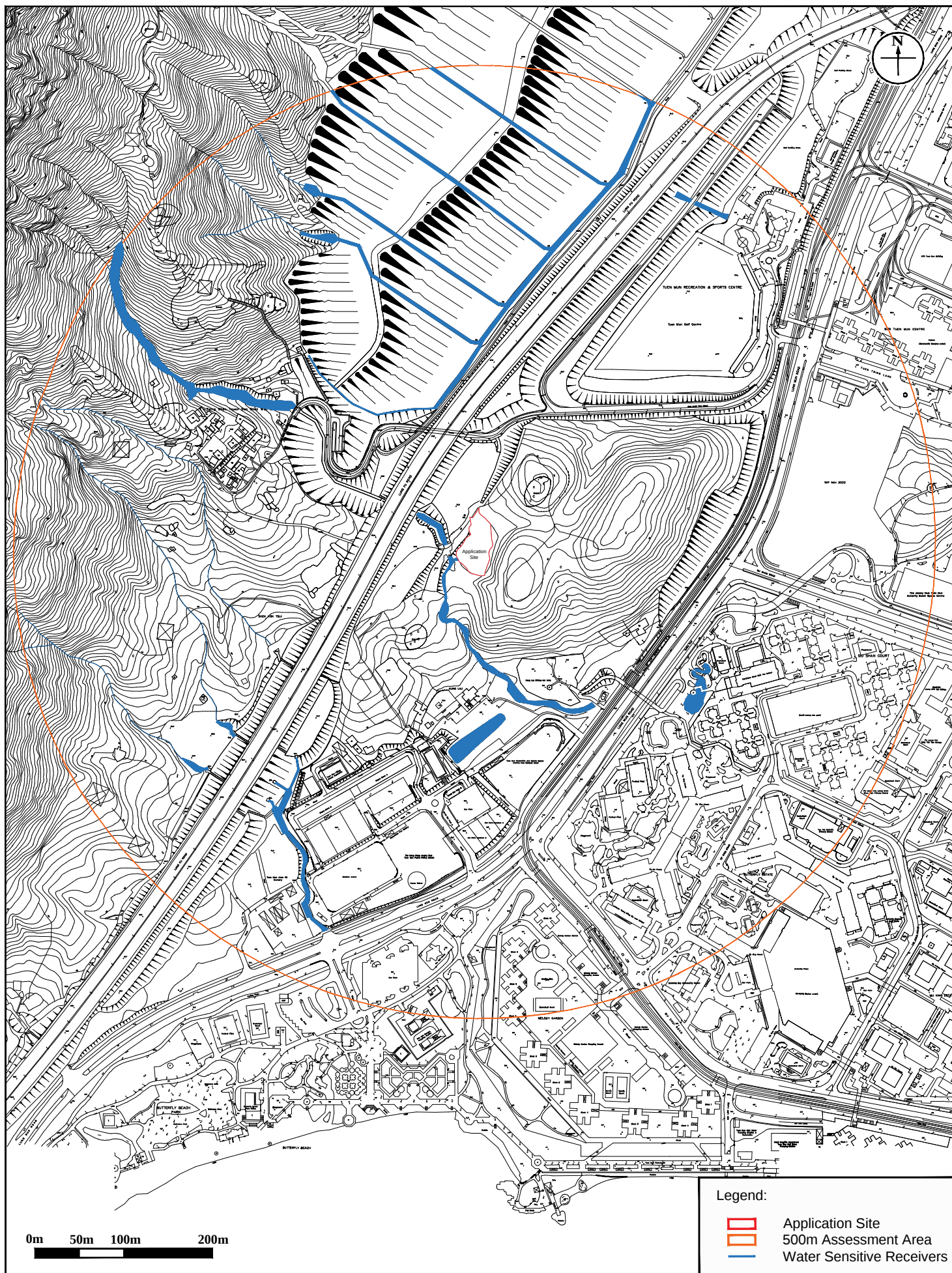


Figure: 7	RAMBOLL
Title: Location of Proposed Noise Sensitive Receivers	Drawn by: TL Checked by: TC
Project: Proposed House Development at T.M.T.L. 550, Tuen Mun, New Territories	Rev.: 2.0
	Date: Aug 2025



Legend:

- ▭ Application Site
- ▭ 500m Assessment Area
- Water Sensitive Receivers

Figure: 8

Title: Locations of Representative Water Sensitive Receivers

Project: Proposed House Development at T.M.T.L. 550, Tuen Mun, New Territories

RAMBOLL

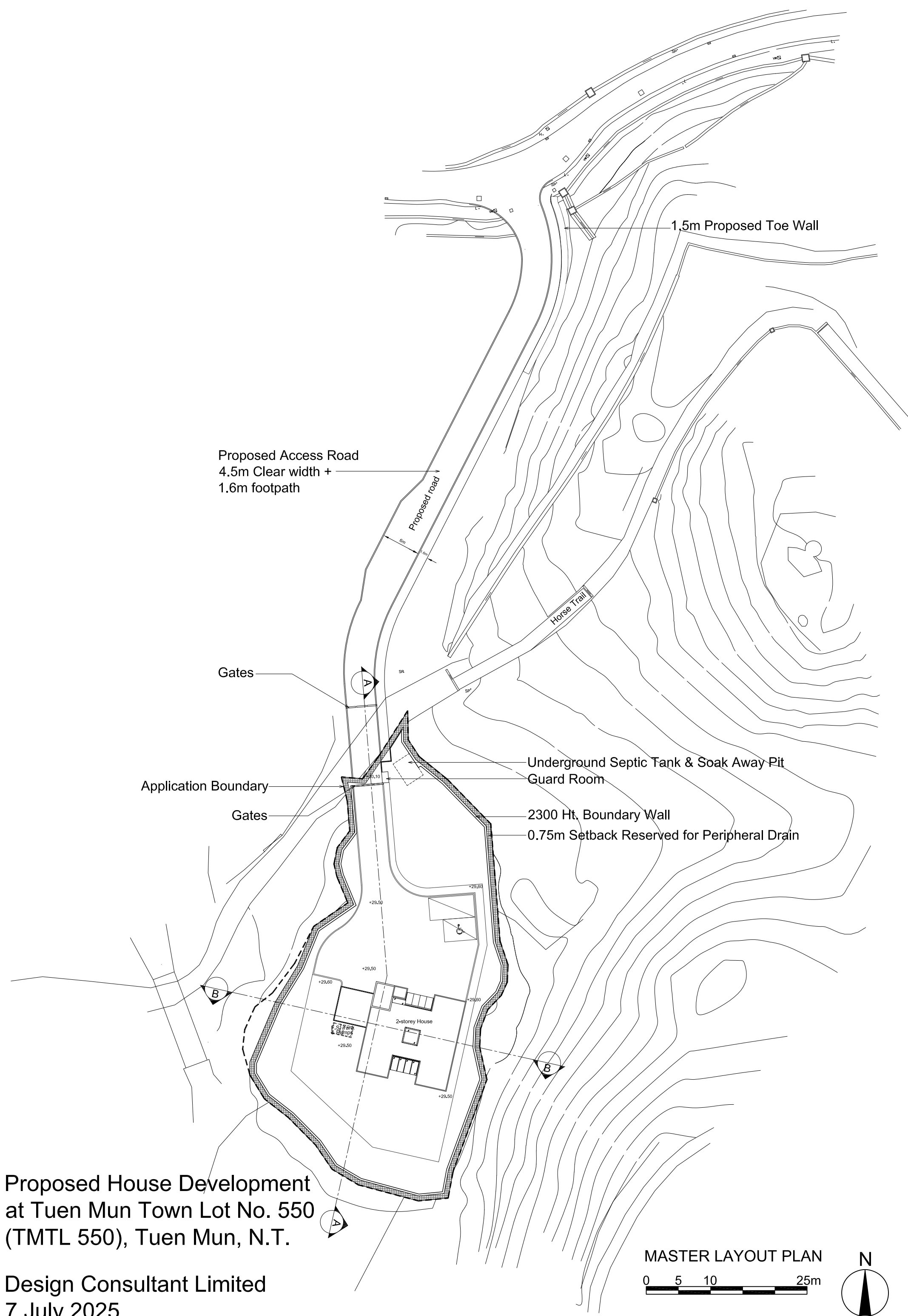
Drawn by: TL

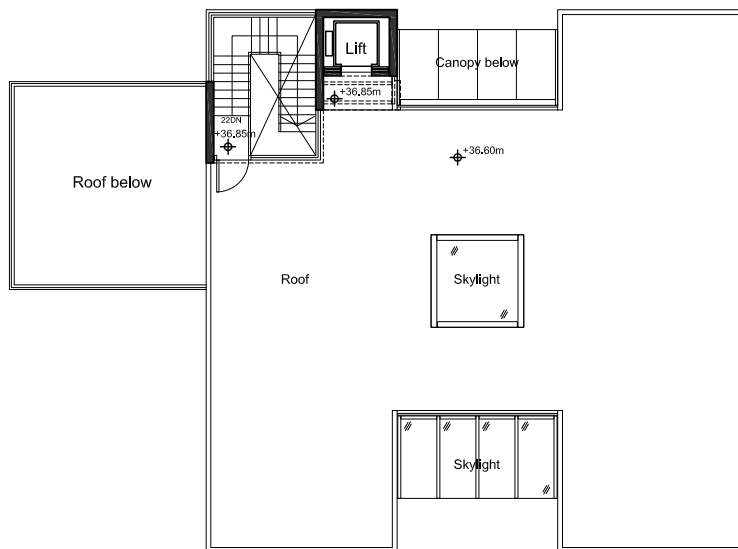
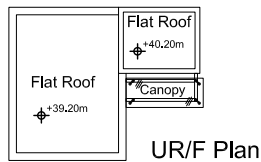
Checked by: TC

Rev.: 2.0

Date: Aug 2025

Appendix 1 Master Layout Plan and Section





GFA & Plot Ratio Calculation

Total GFA

= G/F 189.135 + 1.69 - 0.741

[Exemption for F.S. Tank & Pumps Enclosure, Guardroom (0.741), Carport (28.60), and area covered by canopy (8.181) to be applied to BD and LD]

+ 1/F 180.316

[Exemption for 1/F Void near South Elevation (8.819) & R/F Stair Hood and Lift (17.723) to be applied to BD and LD]

= 370.400 m²

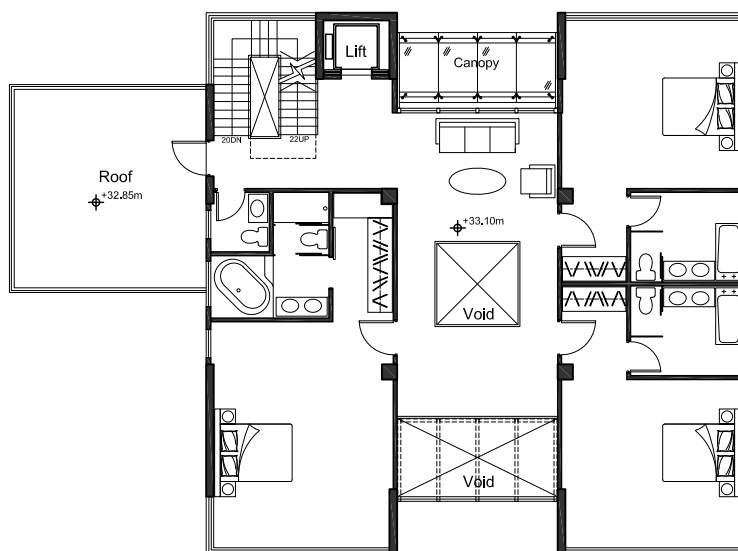
Site Area

= 1852 m²

Plot Ratio

= 370.400 / 1852

= 0.2000



Site Coverage Calculation

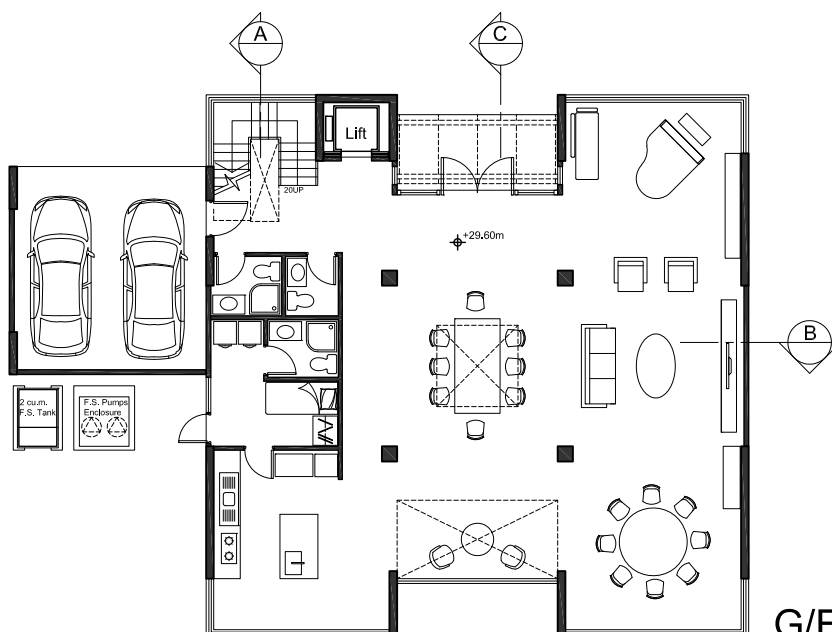
Site Coverage

= (217.735 + 1.69)

[Exemption for area covered by canopy (8.181) to be applied]

/ 1852 x 100%

= 11.848% < 20%

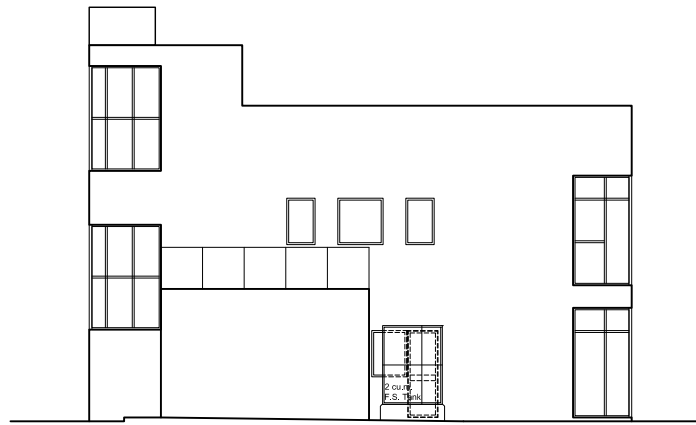


Proposed House Development
at Tuen Mun Town Lot No. 550
(TMTL 550), Tuen Mun, N.T.

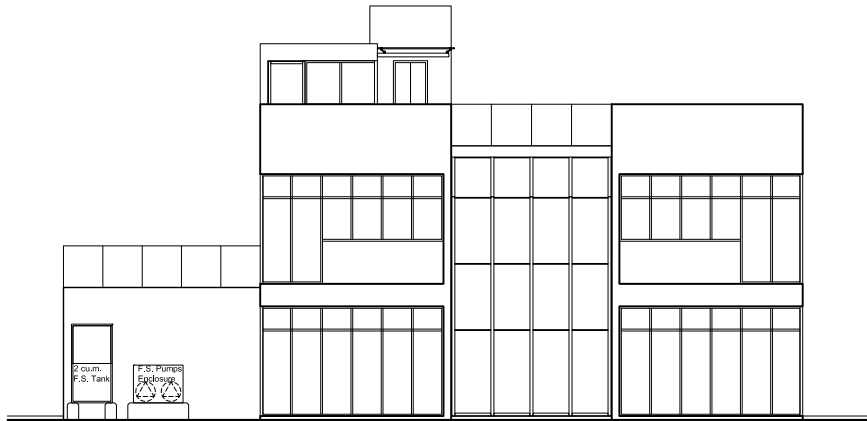
Design Consultant Limited
7 July 2025

0 2 4 6 8 10m

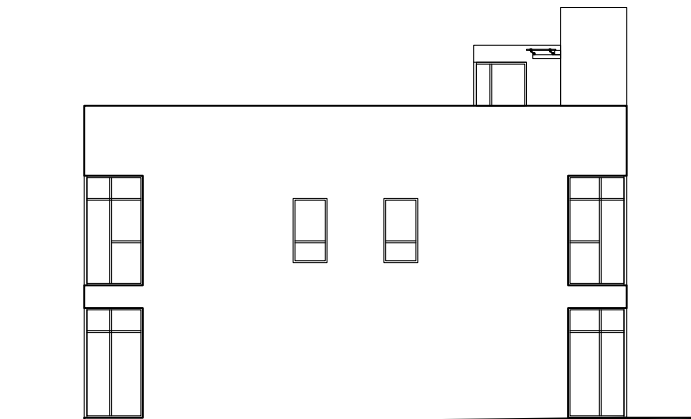




West Elevation



South Elevation



East Elevation

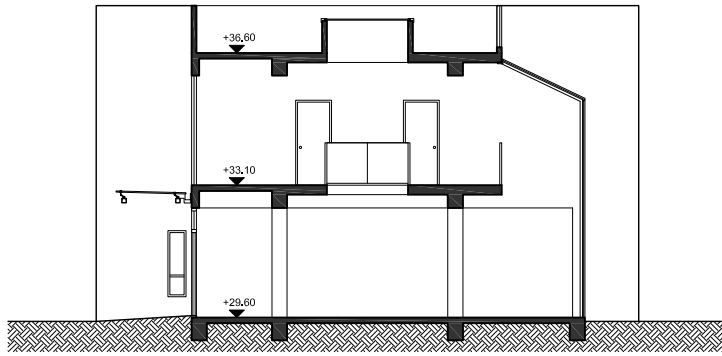


North Elevation

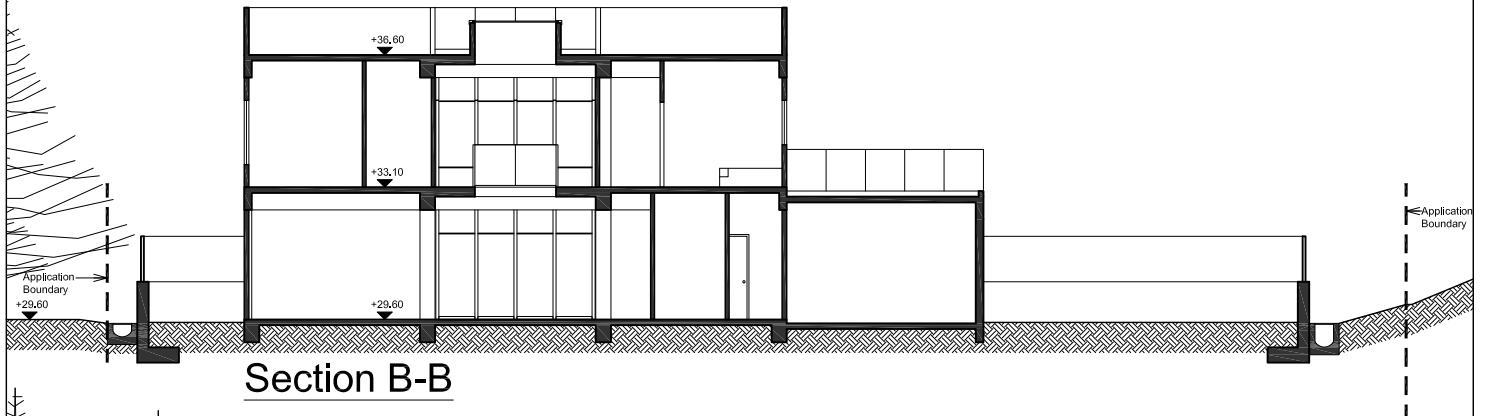
Proposed House Development
at Tuen Mun Town Lot No. 550
(TMTL 550), Tuen Mun, N.T.

Design Consultant Limited
7 July 2025

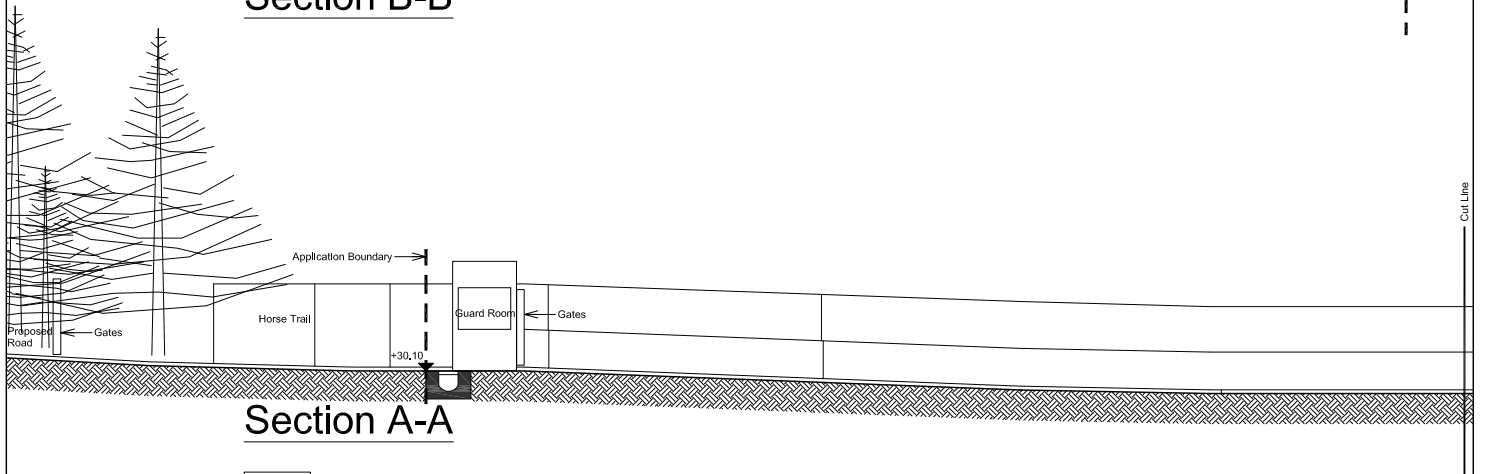
0 2 4 6 8 10m



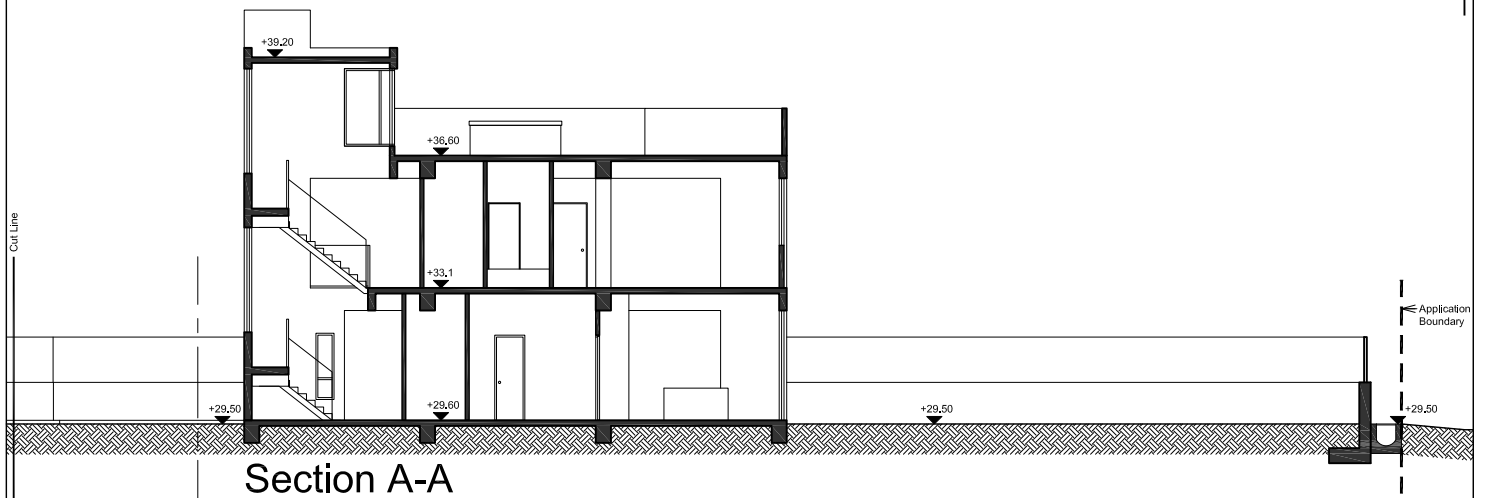
Section C-C



Section B-B



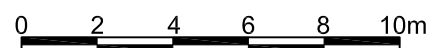
Section A-A



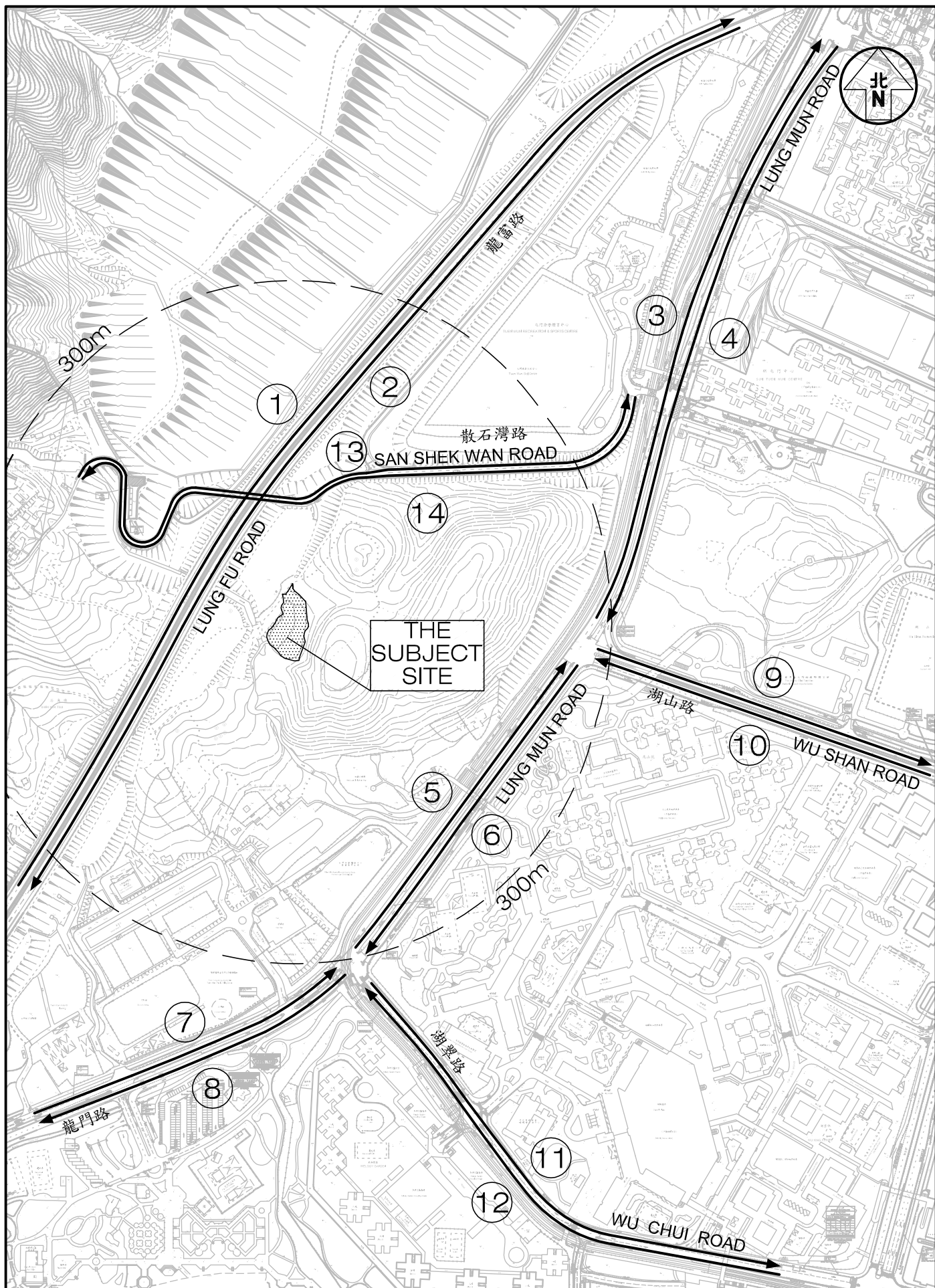
Section A-A

Proposed House Development
at Tuen Mun Town Lot No. 550
(TMTL 550), Tuen Mun, N.T.

Design Consultant Limited
7 July 2025



Appendix 2 Traffic Forecast



Project Title
SECTION 16 PLANNING APPLICATION FOR HOUSE DEVELOPMENT
AT T.M.T.L. 550, TUEN MUN, NEW TERRITORIES

Figure Title
LOCATION OF TRAFFIC DATA

Job No. J7406	Figure No. NIA1	Scale in A4 1 : 5000	
Designed by L C H	Drawn by N C M	Checked by K C	Revision A
		Date 15 AUG 2025	

CKM Asia Limited
Traffic and Transportation Planning Consultants
21st Floor, Methodist House, 36 Hennessy Road, Wan Chai, Hong Kong
Tel : (852) 2520 5990 Fax : (852) 2528 6343 Email : mail@ckmasia.com.hk

T:\JOB\J7400-J7449\J7406\2025 05\Fig NIA1 RevA.dwg

YEAR 2046 TRAFFIC FORECAST
Date: 31 JULY 2025
Job No.: J7406

No.	Road	From	To	2046 AM Peak Hour Traffic Flows			
				Veh/hr	Vehicle Type for Noise Assessment (%)		
					PV	HV	Total
L001	Lung Fu Road NB	Wong Chu Road	Lung Mun Road	1100	66%	34%	100%
L002	Lung Fu Road SB	Wong Chu Road	Lung Mun Road	1250	63%	37%	100%
L003	Lung Mun Road NB	Tuen Tsing Lane	Wu Shan Road	1000	74%	26%	100%
L004	Lung Mun Road SB	Tuen Tsing Lane	Wu Shan Road	1050	64%	36%	100%
L005	Lung Mun Road NB	Wu Shan Road	Wu Chui Road	700	77%	23%	100%
L006	Lung Mun Road SB	Wu Shan Road	Wu Chui Road	1150	63%	37%	100%
L007	Lung Mun Road NB	Wu Chui Road	Lung Fu Road	450	83%	17%	100%
L008	Lung Mun Road SB	Wu Chui Road	Lung Fu Road	750	62%	38%	100%
L009	Wu Shan Road EB	Lung Mun Road	Wu King Road	400	78%	22%	100%
L010	Wu Shan Road WB	Lung Mun Road	Wu King Road	800	72%	28%	100%
L011	Wu Chui Road EB	Lung Mun Road	Tip King Road	400	66%	34%	100%
L012	Wu Chui Road WB	Lung Mun Road	Tip King Road	300	67%	33%	100%
L013	San Shek Wan Road EB	San Shek Wan San Tsuen	Lung Mun Road	50	86%	14%	100%
L014	San Shek Wan Road WB	Lung Mun Road	San Shek Wan San Tsuen	50	83%	17%	100%

Note: "LV" includes motorcycle, private car and taxi

"HV" includes light / medium / heavy goods vehicle, public / private light bus, non-franchised bus and franchised bus

YEAR 2046 TRAFFIC FORECAST
Date: 31 JULY 2025
Job No.: J7406

No.	Road	From	To	2046 PM Peak Hour Traffic Flows			
				Veh/hr	Vehicle Type for Noise Assessment (%)		
					PV	HV	Total
L001	Lung Fu Road NB	Wong Chu Road	Lung Mun Road	1400	63%	37%	100%
L002	Lung Fu Road SB	Wong Chu Road	Lung Mun Road	1100	63%	37%	100%
L003	Lung Mun Road NB	Tuen Tsing Lane	Wu Shan Road	950	59%	41%	100%
L004	Lung Mun Road SB	Tuen Tsing Lane	Wu Shan Road	950	71%	29%	100%
L005	Lung Mun Road NB	Wu Shan Road	Wu Chui Road	1100	65%	35%	100%
L006	Lung Mun Road SB	Wu Shan Road	Wu Chui Road	800	69%	31%	100%
L007	Lung Mun Road NB	Wu Chui Road	Lung Fu Road	850	65%	35%	100%
L008	Lung Mun Road SB	Wu Chui Road	Lung Fu Road	250	65%	35%	100%
L009	Wu Shan Road EB	Lung Mun Road	Wu King Road	600	80%	20%	100%
L010	Wu Shan Road WB	Lung Mun Road	Wu King Road	350	69%	31%	100%
L011	Wu Chui Road EB	Lung Mun Road	Tip King Road	550	71%	29%	100%
L012	Wu Chui Road WB	Lung Mun Road	Tip King Road	250	63%	37%	100%
L013	San Shek Wan Road EB	San Shek Wan San Tsuen	Lung Mun Road	50	91%	9%	100%
L014	San Shek Wan Road WB	Lung Mun Road	San Shek Wan San Tsuen	50	80%	20%	100%

Note: "LV" includes motorcycle, private car and taxi

"HV" includes light / medium / heavy goods vehicle, public / private light bus, non-franchised bus and franchised bus

Appendix 3 Traffic Noise Impact Assessment Result for the Proposed NSRs

Proposed House Development at T.M.T.L. 550,Tuen Mun, New Territories

Predicted Road Traffic Noise Level at Proposed Representative Noise Sensitive Receivers

1. Base Case (AM)

Floor	mPD	House 1									
		N01	N02	N03	N04	N05	N06	N07	N08	N09	N10
G/F	29.60	66	63	65	59	57	62	53	63	66	66
1/F	33.10	67	64	66	61	59	63	57	65	68	68
Max. Noise Level		67	64	66	61	59	63	57	65	68	68
No. of Exceedance		0	0	0	0	0	0	0	0	0	0
No. of Exceedance Unit		0									
No. of Unit		1									

Max. Noise Level	68
Compliance Rate	100%

Remarks:

Shaded cell denotes noise level exceeding the limit of 70 dB(A)

Appendix 4 Aerial Photos for Land Contamination Assessment

Aerial Photos for Land Contamination Assessment

Year	Aerial Photo
1949 Photo No.: 81A_125-5070	

1961

Photo No.: F43_625-0147



1980

Photo No.: 30633



2001

Photo No.: CW31699



2021

Photo No.: E129466C

