Appendix 5

Environmental Assessment

Prepared by

Ramboll Hong Kong Limited

PROPOSED MINOR RELAXATION OF BUILDING HEIGHT RESTRICTION FOR THE PERMITTED SOCIAL WELFARE FACILITY (REDEVELOPMENT OF THE SALVATION ARMY LAI KING HOME) AT NOS. 200 - 210 LAI KING HILL ROAD, KWAI CHUNG, NEW TERRITORIES – S16 PLANNING APPLICATION

ENVIRONMENTAL ASSESSMENT

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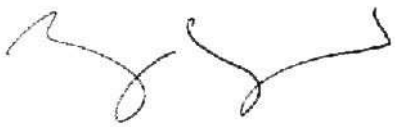
Signed	
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1. INTRODUCTION

1.1 Background

1.1.1 The Project Site is situated at No.200 – 210 Lai King Hill Road, Kwai Chung, which is currently occupied by the Salvation Army Lai King Home. The redevelopment at the Project Site comprises two 7-storey buildings (excluding LG/F) with a building height of approximately 63.45mPD (hereafter referred to as the "Proposed Development").

1.1.2 Ramboll Hong Kong Limited has been commissioned by the Salvation Army to conduct this Environmental Assessment (EA) in order to demonstrate that the Proposed Development will be environmentally acceptable.

1.2 Project Site and its Environs

1.2.1 The Project Site is currently the Salvation Army Lai King Home. **Figure 1.1** shows the location of the Project Site and its environs. The Project Site is bounded by Lai King Hill Road to the North, Kwai Chung Road to the South and some housing estates to the East and West.

1.3 Proposed Development

1.3.1 The Project Site will be redeveloped into two 7-storey buildings (excluding LG/F) with a total GFA of about 12,888 m^2. The maximum building height is at 63.45 mPD. The occupation year of the Proposed Development is anticipated to be in 2029.

1.3.2 The Proposed Development will comprise the following facilities:

- Day Activity Centre (DAC);
- Integrated Vocational Rehabilitation Services Centre (IVRSC);
- Hostel for Severely Mentally Handicapped Persons (HSMH);
- Hostel for Moderately Mentally Handicapped Persons (HMMH);
- Care & Attention Home for Severely Disabled Persons (C&A);
- Residential Respite Service (RRS);
- Extended Care Programme; and
- Ancillary facilities.

1.3.3 The indicative layout plan of the Proposed Development is shown in **Appendix 1.1**.

1.4 Scope

1.4.1 The scope of this EA includes the assessment of the key potential environmental impacts of the Proposed Development:

- Air quality impact;
- Noise impact;
- Water quality impact; and
- Waste management.

1.4.2 The existing buildings were built in late 1970s, and the building structure has remained unchanged as of present. Prior to the 1970s, the land was vacant. Based on the approved floor plans of the existing buildings, no sign of obvious or suspected land contamination sources, such as chemical storage tank and storage area for chemical waste and dangerous goods, have been identified on the ground floor of the buildings.

1.4.3 For the transformer room located on ground floor, site inspection conducted on 2nd February 2024 did not identify sign of oil stain or spillage/leakage of chemicals. Photo of the transformer room at the Application site is presented in **Appendix 1.2**. CLP Power Hong Kong Limited (CLP) has been consulted and they confirmed that the transformer inside the transformer room of the Site is free from the chemical polychlorinated biphenyl (PCB) and there is no record of reported incident of spillage/leakage of chemicals within the Application Site. Email of CLP's reply is given in **Appendix 1.3**. Therefore, it is anticipated that there would be no potential land contamination issue associated with the existing transformer room at the Application Site.

1.4.4 To date, the Project Site is being used as a social service centre, which does not involve land contaminating activities. No land contamination concern at the Project Site is identified.

2. AIR QUALITY IMPACT ASSESSMENT

2.1 Introduction

2.1.1 This section identifies potential impacts on air quality that may arise from the construction phase and operation phase of the Project.

2.2 Environmental Legislation, Policies, Standards and Criteria

Air Pollution Control Ordinance (Cap.311)

2.2.1 The Air Pollution Control Ordinance (APCO) and its subsidiary regulations provide the statutory control on air pollutants from a variety of sources. The APCO makes provision for abating, prohibiting and controlling emissions of any solid, particulate, liquid, vapour, objectionable odours or gaseous substances into the atmosphere. The whole of the HKSAR has been covered by Air Control Zones.

2.2.2 The APCO specifies Air Quality Objectives (AQOs), which are statutory limits for a number of pollutants, and the maximum number of times that they may be exceeded in a year for specified averaging periods. The Air Pollution Control (Amendment) Ordinance 2021 has come into operation since 1 January 2022 to tighten three AQOs. The prevailing AQOs is shown in **Table 2.1**.

Table 2.1 Hong Kong Quality Objectives (AQO)

Pollutant	Averaging time	Concentration limit [1] (μg/m³)	Number of exceedances allowed per year
Sulphur dioxide, SO_2	10-minute	500	3
	24-hour	50	3
Respirable suspended particulates, RSP (PM_{10}) [2]	24-hour	100	9
	Annual	50	Not applicable
Fine suspended Particulates, FSP ($PM_{2.5}$) [3]	24-hour	50	35
	Annual	25	Not applicable
Nitrogen dioxide, NO_2	1-hour	200	18
	Annual	40	Not applicable
Ozone, O_3	8-hour	160	9
Carbon monoxide, CO	1-hour	30,000	0
	8-hour	10,000	0
Lead	Annual	0.5	Not applicable

Notes:

[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 293Kelvin and a reference pressure of 101.325 kilopascal.

[2] Respirable suspended particulates means suspended particles in air with a nominal aerodynamic diameter of 10 μm or less.

[3] Fine suspended particulates means suspended particles in air with a nominal aerodynamic diameter of 2.5 μm or less.

Air Pollution Control (Construction Dust) Regulation

2.2.3 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.

2.2.4 The construction works for the Proposed Development 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

2.2.5 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.

2.2.6 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.

Hong Kong Planning Standards and Guidelines (HKPSG)

2.2.7 The Hong Kong Planning Standards and Guidelines (HKPSG) is a Government manual of criteria for determining the scale, location and site requirements of various land uses and facilities. The purpose of the HKPSG is to provide general guidelines to ensure that, during the planning process, the Government will reserve adequate land to facilitate social and economic development and provide appropriate public facilities to meet the needs of the public.

2.2.8 Table 3.1 of the HKPSG provides the broad guidelines for locating active open spaces close to potentially polluting uses, viz. road traffic. The recommended buffer distances are reproduced in **Table 2.2**.

Table 2.2 Recommended Minimum Buffer Distance from Roads

Pollution Source	Parameter	Buffer Distance	Permitted Uses
Road and Highways	Type of Road		
	Trunk Road and Primary Distributor	> 20 m	Active and passive recreation 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

Source: "Guidelines on Usage of Open Space Site", HKPSG Table 3.1.

2.3 Baseline Conditions

Description of the Environment

2.3.1 As shown in **Figure 1.1**, the Project Site is situated within an area surrounded mainly by some housing estates.

2.3.2 The assessment area for the air quality impact assessment is defined as the area within 500m from the boundary of the Application Site, as shown in **Figure 2.1**. The prevailing air quality of the Application Site is primarily affected by vehicular emissions from the nearby road network. A site survey was carried out in February 2022. There

are no active chimneys located within 200m of the Proposed Development. Impact from chimney emissions is not anticipated.

Existing Air Quality in Kwai Tsing District

2.3.3 The nearest Air Quality Monitoring Station (AQMS) to the Project Site is the Kwai Chung AQMS, which is located approximately 1.3km north of the Project Site. The air quality data of the past five years, i.e. 2018 to 2022, obtained from Kwai Chung AQMS are summarised in **Table 2.3** to depict the trend in air quality.

Table 2.3 EPD Air Quality Monitoring Data at Kwai Chung AQMS (Year 2018 to 2022)

Pollutant	Averaging time	AQO (μg/m³)	Parameter	Concentration (μg/m³)				
				2018	2019	2020	2021	2022
RSP (PM_{10})	24-hour	100 (9)	10th highest	62	59	46	56	53
	Annual	50	--	32	29	23	26	23
FSP ($PM_{2.5}$)	24-hour	50 (35)	36th highest	30	29	24	27	38
	Annual	25	--	20	18	14	16	15
NO_2	1-hour	200 (18)	19th highest	196	184	184	180	168
	Annual	40	--	**55**	**54**	**48**	**52**	**44**
SO_2	10-minute	500 (3)	4th highest	134	53	43	45	59
	24-hour	50 (3)	4th highest	27	18	12	14	17
O_3	8-hour	160 (9)	10th highest	133	143	124	124	139
CO	1-hour	30,000 (0)	Maximum	-	-	-	-	-
	8-hour	10,000 (0)	Maximum	-	-	-	-	-

Notes:
[1] The monitoring data is benchmarked against the AQOs at the year of the air quality monitoring.
[2] "-" denotes no data available.

2.3.4 The monitoring results are indicative of the prevailing baseline air quality in the assessment area. Exceedance of annual average NO_2 concentration were recorded in all years. NO_2 is mainly formed from the oxidation of nitric oxide (NO) emitted from fuel combustion. The high NO_2 level in Kwai Chung is likely due to the emission from road traffic.

2.4 Air Sensitive Receivers (ASRs)

2.4.1 Air Sensitive Receivers (ASRs) have been identified in accordance with the HKPSG.

2.4.2 The existing ASRs are identified with reference to the latest information provided on the survey maps, Outline Zoning Plan, topographic maps, aerial photos and land status. The first layer of existing ASRs located closest to the Project Site have been identified as the representative ASRs. Details of the representative ASRs are summarised in **Table 2.4** and indicated in **Figure 2.1**.

Table 2.4 Summary of Representative ASRs

ASR ID	Descriptions	Use	No. of Storeys	Approximate Minimum Horizontal Distance to Project Site (m)
Existing ASRs				
A01	Heng King House, Lai King Estate	Residential	40	110
A02	Lok King House, Lai King Estate	Residential	21	51

ASR ID	Descriptions	Use	No. of Storeys	Approximate Minimum Horizontal Distance to Project Site (m)
A03	Asbury Methodist Primary School	Educational	8	25
A04	Basketball Court	Recreational	1	21
A05	Restaurant at Cho Yiu Centre	Commercial	1	40
A06	Basketball Court	Recreational	1	84
A07	Hong Chi Winfred Mary Cheung Morninghope School	Educational	8	121
Planned ASR				
A-P1	Proposed Development	Hostel	8	N/A

2.5 Identification of Potential Air Quality Impacts

Construction Phase

2.5.1 During the demolition of the existing buildings and construction of the Proposed Development, potential air quality impact on the nearby existing ASRs is related to dust nuisance from material handling and wind erosion of exposed area and gaseous emissions (sulphur dioxide (SO_2) and nitrogen dioxide (NO_2)) from construction equipment and vehicles.

2.5.2 The total area of the Project Site is only about 3,830 m^2, where the scale of excavation is relatively small and localised. With the implementation of dust control measures recommended in **Section 2.6**, fugitive dust emissions would be controlled and no adverse dust impact onto the nearby existing ASRs is expected.

Given the limited number of construction plant required on-site for a development of this scale, the associated gaseous emissions are expected to be limited. Nonetheless, requirements stipulated in the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation and Air Pollution Control (Fuel Restriction) Regulations will be followed to control potential emissions from non-road mobile machinery during construction phase. Therefore, the air quality impact arising from gaseous emissions by construction plants is considered minimal.

Operation Phase

Air Quality Impact on the Existing ASRs

2.5.3 As the operation of the Proposed Development will not involve any industrial emission sources and odour-generating activities, adverse air quality impact on the existing ASRs is therefore not anticipated during operation phase of the Proposed Development.

Air Quality Impact on the Planned ASRs (Proposed Development)

2.5.4 The Project Site is bounded by Lai King Hill Road to the North and Kwai Chung Road to the South. Based on the Annual Traffic Census 2022, Lai King Hill Road is categorised as a District Distributor (DD) while Kwai Chung Road is an Urban Trunk (**Appendix 2.1** refers). According to **Table 2.2** (Chapter 9 of HKPSG, Table 1), a buffer separation of more than 10m and 20m is recommended between the kerb side of a DD and a Trunk Road, respectively, and the air sensitive uses.

2.5.5 **Figure 2.2** shows the buffer distances from Lai King Hill Road and Kwai Chung Road to the Project Site. The Project Site is located more than 20m from Kwai Chung Road. A thin edge along the northern façade of the proposed building will be located within the buffer area. It is confirmed that there will be no fresh air intake/ openable windows

within the 10m buffer area. With the implementation of this design measure in place, no adverse or unacceptable vehicular emission impact is anticipated.

2.5.6 Besides, based on the site visit carried out in February 2022, there are no active chimneys located within 200m of the Proposed Development. Impact from chimney emissions is not anticipated.

2.6 Mitigation Measures and Recommendations

Construction Phase

2.6.1 Dust control measures stipulated under the Air Pollution Control (Construction Dust) Regulation and Air Pollution Control (Fuel Restriction) Regulations, together with proper site management/practice and good housekeeping are required to mitigate the potential dust impacts on the nearby ASRs. Requirements stipulated in the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation will also be followed to control potential emissions from non-road mobile machinery during construction phase. "Recommended Pollution Control Clauses for Construction Contracts" available on EPD website also contains the recommended control measures to be implemented during construction. The dust control measures detailed below shall also be incorporated into the Contract Specification where practicable as an integral part of good construction practices:

- All demolished items (including trees, shrubs, vegetation, boulders, poles, pillars, structures, debris, rubbish and other items arising from site clearance) that may dislodge dust particles shall be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides within a day of demolition;
- Where a site boundary adjoins a road, streets or other accesses to the public, hoarding of not less than 2.4 m high from ground level should be provided along the entire length except for a site entrance or exit;
- The working area of any excavation or earth moving operation shall be sprayed with water or a dust suppression chemical immediately before, during and immediately after the operation so as to maintain the entire surface wet;
- 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 and areas close to ASRs;
- Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines;
- Open stockpiles (if any) shall be avoided or covered. Prevent placing dusty material storage piles near ASRs;
- Any stockpile of dusty materials shall be either covered entirely by impervious sheeting; placed in an area sheltered on the top and the 3 sides; or sprayed with water or a dust suppression chemical so as to maintain the entire surface wet.
- 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 per hour is the recommended limit;

- Routing of vehicles and position of construction plant should be at the maximum possible distance from ASRs;
- Every stock of more than 20 bags of cement or dry pulverized fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides;
- Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high-level alarm which is interlocked with the material filling line and no overfilling is allowed;
- Cement, PFA or any other dusty materials collected by fabric filters or other air pollution control system or equipment shall be disposed of in totally enclosed containers;
- Silos used for the storage of cement or dry pulverized fuel ash shall not be overfilled; and
- Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system.

Operation Phase

2.6.2 As mentioned in **Sections 2.5.4** - **2.5.5**, the location of openable windows and fresh air intakes of the Proposed Development have been designed to satisfy HKPSG's recommended minimum buffer distance from existing road carriageways, adverse air quality impact on the Proposed Development is not anticipated.

2.7 Monitoring and Audit Requirements

2.7.1 With the implementation of mitigation measures as defined in the Air Pollution Control (Construction Dust) regulation and good site practices as stated in **Section 2.6.1**, no adverse construction dust impact is anticipated. Air quality monitoring is considered unnecessary for the Proposed Development. However, it is recommended that regular site environmental audits be undertaken to inspect the construction activities and works area in order to ensure all the recommended mitigation measures are properly implemented.

3. NOISE

3.1 Introduction

3.1.1 This section summarises the potential noise impacts on sensitive uses that could be affected by the construction and operation of the Proposed Development. It also recommends the corresponding control measures, where necessary.

3.2 Relevant Legislation, Standards & Guidelines

3.2.1 The Noise Control Ordinance (NCO) provides the statutory framework for noise control. The construction noise impact assessment for the Development has referred to the relevant guidelines, Practice Note (PN) and Technical Memorandum (TM) as follows:

- Noise Control Ordinance ("NCO") (Cap. 400);
- Technical Memorandum on Noise from Construction Work other than Percussive Piling (GW-TM)
- Technical Memorandum for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites (IND-TM)
- Practice Note for Professional Persons on Noise from Construction Activities – Non-statutory Controls (ProPECC PN 2/93)
- Hong Kong Planning Standards and Guidelines (HKPSG)

Construction Phase

Noise Standards for Non-restricted Hours

3.2.2 Daytime construction noise (excluding percussive piling) between the hours of 0700 and 1900 on Monday to Saturday (not being a general holiday), i.e. non-restricted hours, is not governed by the NCO. However, ProPECC PN 2/93 provided an assessment criteria and requirements for construction works not controlled by the NCO. The ProPECC PN 2/93 sets out the construction noise assessment limits, which are Leq 30 min 75dB(A) for domestic dwellings, and Leq 30 min 70dB(A) for school (or 65dB(A) during examination periods). The recommended noise standards are summarized in **Table 3.1** below.

Table 3.1 Noise Standards for General Construction Activities during Non-restricted Hours

Uses	Noise Standard, Leq 30 min, dB(A)
Domestic Dwellings	75
School	70 (65 during examination period)

3.2.3 All the proposed construction works are expected to be carried out during non-restricted hours. In case of any construction activities during restricted hours, it is the Contractor's responsibility to ensure compliance with the NCO and the relevant TMs. The Contractor will be required to submit a construction noise permit (CNP) application to the Noise Control Authority and abide by any conditions stated in the CNP, should one be issued.

Operation Phase

Road Traffic Noise Impact Assessment

3.2.4 The HKPSG provides guidance on the acceptable road traffic noise levels at the NSRs which rely on the opened windows for ventilation. The relevant criteria are shown in **Table 3.2**.

Table 3.2 Road Traffic Noise Planning Criteria

Uses	Road Traffic Noise, L_{10} (1 hour), dB(A)
All domestic premises including temporary housing accommodation	70
Hotels and hostels	70
Offices	70
Educational institutions including kindergartens, childcare centers and all others where unaided voice communication is required	65
Places of public worship and courts of law	65
Hospitals, clinics, convalescences and residential care homes for the elderly • diagnostic rooms • wards	55

Note: The above criteria apply to noise sensitive uses which rely on open window for ventilation and should be viewed as the maximum permissible noise levels assessed at 1 m from the external facades.

Fixed Noise Source Impact Assessment

3.2.5 The NCO requires that fixed noise source impacts shall comply with the Acceptable Noise Levels (ANL) laid down in Table 2 of IND-TM. In setting the ANL, reference has been made to the Area Sensitivity Rating (ASR) in Table 1 of the IND-TM (reproduced in **Table 3.3**) corresponding to the nature of the area where the NSRs are situated and the presence of Influencing Factor (such as industrial area, major roads, or area within the boundary of Hong Kong International Airport).

Table 3.3 Area Sensitivity Ratings (ASRs)

Type of Area Containing NSR	Degree to which NSR is affected by Influencing Factor		
	Not Affected	Indirectly Affected	Directly Affected
(i) Rural area, including country parks or village type developments	A	B	B
(ii) Low density residential area consisting of low-rise or isolated high-rise developments	A	B	C
(iii) Urban area	B	C	C
(iv) Area other than those above	B	B	C

Source: Table 1 of Technical Memorandum for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites

3.2.6 **Table 3.4** shows the appropriate ANLs for impacts by fixed noise sources.

Table 3.4 Acceptable Noise Levels (ANLs), dB(A)

Area Sensitivity Ratings in relevant Time Periods	ASR		
	A	B	C
Day (0700 to 1900 hours)	60	65	70
Evening (1900 to 2300 hours)			
Night (2300 to 0700 hours)	50	55	60

Source: Table 2 of Technical Memorandum for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites

Rail Noise Impact Assessment

3.2.7 Rail noise is controlled under the NCO. The NCO requires that rail noise source impacts shall comply with the Acceptable Noise Levels (ANL) laid down in Table 2 of IND-TM (**Table 3.4** refers). Table 4.1 of the Chapter 9 HKPSG provides additional criteria for assessing rail noise. These noise criteria are specified in terms of A-weighted maximum noise level and daily rail noise exposure level, as shown in **Table 3.5**.

Table 3.5 HKPSG Recommended Railway Noise Standard

Parameter	Standard Noise Level dB(A)
L_{max} (2300 to 0700)	85
$L_{eq\ (24\ hour)}$	65

3.3 Description of the Environment

3.3.1 As shown in **Figure 1.1**, the Project Site is bounded by Kwai Chung Road and Tsing Kwai Highway to the South and located in an urban area.

3.3.2 Kwai Chung Road and Tsing Kwai Highway have an annual average daily traffic (AADT) flow higher than 30,000. As the AADT is an excess of 30,000, Kwai Chung Road and Tsing Kwai Highway are considered as the influencing factor. According to **Table 3.3**, the type of area where the Proposed Development located is considered as "Urban Area". For facades overlooking Kwai Chung Road and Tsing Kwai Highway, the proposed Area Sensitivity Rating will be "C", otherwise Rating "B" will be adopted for façade without sightline to Kwai Chung Road and Tsing Kwai Highway.

3.3.3 The prevailing background noise level at the Project Site is primarily dominated by road traffic noise from Kwai Chung Road and Tsing Kwai Highway. Fixed noise sources from the container terminals, open storage site and ventilation equipment (e.g. chillers and cooling tower) of the nearby premises shown in **Figure 3.6** have been identified as existing noise sources in the vicinity.

3.4 Noise Sensitive Receivers (NSRs)

3.4.1 Noise sensitive receivers (NSRs) within the noise impact assessment area have been identified in accordance with the HKPSG and Annex 13 of the EIAO-TM. The representative NSRs have been identified with reference to the latest information provided on the survey maps, topographic maps, aerial photos and land status plans. No planned development is proposed in the vicinity of the Project Site.

Construction Phase

3.4.2 The assessment area for the noise impact assessment is defined as 300m from the boundary of the Project Site, as shown in **Figure 3.1**. The first layer of existing NSRs located closest to the Project Site have been identified as the representative NSRs.

Details of the representative NSRs are summarised in **Table 3.6** and indicated in **Figure 3.2**.

Table 3.6 Summary of Representation Noise Sensitive Receivers

NSR ID	Descriptions	Use	No. of Storeys	Approximate Minimum Horizontal Distance to Project Site (m)
Existing NSRs				
N01	Heng King House, Lai King Estate	Residential	40	110
N02	Lok King House, Lai King Estate	Residential	21	51
N03	Asbury Methodist Primary School	Educational	8	25
N04	Hong Chi Winfred Mary Cheung Morninghope School	Educational	8	121

Operation Phase

Road Traffic Noise Impact Assessment

3.4.3 The assessment area for road traffic noise impact assessment is defined as the area within 300m from the Project Site as shown in **Figure 3.1**.

3.4.4 Based on the preliminary layout of the Proposed Development, the noise sensitive uses are the dormitories within the Project Site. Other activity and multifunction rooms and offices will be provided with central air conditioning and thus will not rely on openable window for ventilation. The locations and details of the representative NSRs selected for assessment are provided in **Figure 3.3a** to **3.3f** and **Table 3.7** below, respectively.

Table 3.7 Representative NSRs for Road Traffic Noise Assessment

NSR	Description	Number of Storeys
N01	Dormitory (2/F, 4/F, 6/F)	3
N02	Dormitory (1/F - 6/F)	6
N03	Dormitory (1/F - 6/F)	6
N04	Dormitory (1/F - 6/F)	6
N05	Dormitory (1/F - 6/F)	6
N06	Dormitory(1/F - 6/F)	6
N07	Dormitory (1/F - 6/F)	6
N08	Dormitory (1/F - 6/F)	6
N09	Dormitory(2/F - 6/F)	5
N10a	Dormitory (2/F, 3/F)	2
N10b	Dormitory (4/F, 5/F, 6/F)	3
N11a	Dormitory (2/F, 3/F)	2
N11b	Dormitory (4/F, 5/F, 6/F)	3
N12a	Dormitory (2/F, 3/F)	2
N12b	Dormitory (4/F, 5/F, 6/F)	3
N13a	Dormitory (2/F, 3/F)	2
N13b	Dormitory (4/F, 5/F, 6/F)	3
N14a	Dormitory (2/F, 3/F)	2
N14b	Dormitory (4/F, 5/F, 6/F)	3
N15a	Dormitory (2/F, 3/F)	2
N15b	Dormitory (4/F, 5/F, 6/F)	3
N16a	Dormitory (2/F, 3/F)	2
N16b	Dormitory (4/F, 5/F, 6/F)	3
N17a	Dormitory (2/F, 3/F)	2
N17b	Dormitory (4/F, 5/F, 6/F)	3

NSR	Description	Number of Storeys
N18	Dormitory (2/F, 3/F)	2

Fixed Noise Source Impact Assessment

3.4.5 The dormitories within the Project Site are considered as NSRs of potential industrial noise impact. Representative assessment points have been assigned to those units overlooking the industrial premises. The NSRs are selected at 1m away from the façade of openable window for ventilation purpose.

3.4.6 As discussed in **Section 3.3.2**, the Project Site is classified as "Urban Area" with Kwai Chung Road and Tsing Kwai Highway as the influencing factor. For facades overlooking Kwai Chung Road and Tsing Kwai Highway, the proposed Area Sensitivity Rating will be "C", otherwise Rating "B" will be adopted for facades facing away from Kwai Chung Road and Tsing Kwai Highway.

3.4.7 According to **Table 3.4**, the ANL would be 70 dB(A) during daytime/evening time (between 0700 to 2300 hours) and 60 dB(A) during night time (between 2300 to 0700 hours) for facades facing Kwai Chung Road and Tsing Kwai Highway; while the ANL would be 65 dB(A) during daytime/evening time (between 0700 to 2300 hours) and 55 dB(A) during night time (between 2300 to 0700 hours) for facades facing away from Kwai Chung Road and Tsing Kwai Highway.

3.4.8 The locations and details of the representative NSRs selected for assessment are provided in **Figure 3.6** and **Table 3.8** below, respectively.

Table 3.8 Representative NSRs for Industrial Noise Assessment

NSR	Description	No. of Storeys	Area Sensitivity Rating
N02	Dormitory (1/F - 6/F)	6	C
N04	Dormitory (1/F - 6/F)	6	C
N08	Dormitory (1/F - 6/F)	6	B
N09	Dormitory(2/F - 6/F)	5	B
N16a	Dormitory (2/F, 3/F)	2	C
N16b	Dormitory (4/F, 5/F, 6/F)	3	C

Railway Noise Source Impact Assessment

3.4.9 The dormitories within the Project Site are considered as NSRs with potential railway noise impact. The NSRs are selected at 1m away from the façade of openable window for ventilation purpose.

3.4.10 As discussed in **Section 3.3.2,** the Project Site is classified as "Urban Area" with Kwai Chung Road and Tsing Kwai Highway as the influencing factor. Area Sensitivity Rating of "C" will be adopted for the representative noise assessment points they are either directly or indirectly affected by Kwai Chung Road and Tsing Kwai Highway.

3.4.11 According to **Table 3.4**, the ANL would be 70 dB(A) during daytime/evening time (between 0700 to 2300 hours) and 60 dB(A) during night-time (between 2300 to 0700 hours) for the representative noise assessment points. According to **Table 3.5** (HKPSG Table 4.1), the noise impact due to rail noise shall also meet the following noise standard:

- L_{eq} (24 hr) = 65 dB(A) and
- L_{max} (2300 to 0700 hours) = 85 dB(A)

3.4.12 The locations and details of representative NSRs selected for railway noise assessment are provided in **Figure 3.7** and **Table 3.9** below, respectively.

Table 3.9 Representative NSRs for Railway Noise Assessment

NSR	Description	No. of Storeys	Area Sensitivity Rating
RN01	Dormitory (2/F - 3/F)	2	C
RN02	Dormitory (2/F – 3/F)	2	C
RN03	Dormitory (4/F – 6/F)	3	C
RN04	Dormitory (4/F - 6/F)	3	C

3.5 Identification of Potential Noise Impacts

Construction Phase

3.5.1 Noise generated from demolition and construction activities would be of primary concern to the local environment. Given that the Project scale is minor, the number of plants required for construction activities will be limited. The key construction activities involving the use of Power Mechanical Equipment (PME), such as air compressor, excavators, trucks, concrete trucks, pokers, rollers, etc., include the following:

- Demolition of the existing buildings; and
- Foundation and structural works for the Proposed Development.

3.5.2 The major noise impact during the construction phase of the Proposed Development will be the noise generated by the use of PME on-site for works such as demolition and excavation. Given the limited number of construction plant required on-site for a development of this scale, the associated noise impact is expected to be limited. With the implementation of mitigation measures stated in **Section 3.9**, it is anticipated that the noise nuisance will be minimized and no adverse noise impact on the nearby NSRs will arise during the construction phase.

Operation Phase

3.5.3 The Proposed Development is bounded by Lai King Hill Road to the North, Kwai Chung Road and Tsing Kwai Highway to the South. These road networks in the vicinity of the Proposed Development have been identified as the road traffic noise emission sources.

3.5.4 The container terminals, open storage site and ventilation equipment (e.g. chillers and cooling towers) of the nearby premises have been identified as the potential industrial noise sources.

3.5.5 The Proposed Development is situated in the vicinity of Tung Chung Line (TCL) and Airport Express Line (AEL). These railway tracks have been identified as the potential railway noise.

3.6 Road Traffic Noise Impact Assessment

Assessment Methodology

3.6.1 According to **Table 3.2**, the standard for road traffic noise level expressed in terms of L_{10}(1 hr) at the typical façades of the Proposed Development is recommended to be 70 dB(A). The assessment is based on the prediction of the maximum L_{10} (1 hr) traffic noise level at NSRs of the Proposed Development due to the projected traffic on the adjacent road network for year 2044, which is considered as the maximum traffic projections within 15 years upon occupation of the Proposed Development in 2029. Traffic data was predicted by the project traffic consultant. The traffic forecast includes traffic flow in morning peak and afternoon peak scenarios. Details of information on

peak hour traffic volume and percentage of heavy vehicle of the road network within the 300m assessment area provided by the Project traffic consultant is presented in **Appendix 3.1**, which represents the worst-case scenario of the projected traffic flows.

3.6.2 The UK Department of Transport's procedures - "Calculation of Road Traffic Noise" (CRTN) has been used in the prediction of the road traffic noise at the representative NSRs of the proposed development within the Project Site. The existing topographic details, such as the existing houses and structures near the Project Site, have been considered in the assessment.

3.6.3 The noise prediction has been carried out using the *Road Noise Module 2.7.2 of Noise Map Enterprise Edition* software, which is a computerised model developed on the basis of the U.K. Department of Transport's CRTN procedures, and is acceptable to the EPD.

3.6.4 Existing mitigation measures such as noise barriers and low noise road surfacing along Tsing Kwai Highway and Kwai Chung Road have been incorporated in the noise model as the base scenario. The locations, extent and height of these existing mitigation measures are shown in **Figure 3.5**.

Assessment Results

Unmitigated Scenario

3.6.5 Precautionary noise mitigation measures, i.e. building orientation and staggering have been incorporated into the design of the layout, and considered in the unmitigated scenario. As shown in **Table 3.10** (with details provided in **Appendix 3.2**, road traffic noise levels at most of the NSRs would exceed the noise criterion of 70 dB(A). Mitigation measures shall be considered for those NSRs.

Table 3.10 Predicted Unmitigated Road Traffic Noise Levels at Representative NSRs

NSR[1]	Predicted Road Traffic Noise Level, $L_{10\ (1\text{-hour})}$, dB(A) (Unmitigated)[2][3]	
	AM Peak	PM Peak
N01	**74**	**73**
N02	**76**	**75-76**
N03	**75-76**	**75-76**
N04	**76**	**75**
N05	70-**71**	70-**72**
N06	**71-72**	**71-73**
N07	**72-73**	**72-73**
N08	**71-72**	**71-72**
N09	**72**	**72**
N10a	**72**	**72**
N10b	**73-74**	**73-74**
N11a	**73**	**73**
N11b	**73**	**73**
N12a	**72**	**72**
N12b	**71-72**	**71-72**
N13a	70-**71**	70-**71**
N13b	70-**71**	70-**71**
N14a	**78**	**77**
N14b	**78**	**78**
N15a	**76**	**76**
N15b	**77**	**76**
N16a	**76**	**76**
N16b	**78**	**77**
N17a	**75-76**	**74-75**
N17b	**77**	**76**
N18	**77**	**76**

Notes:
[1] The assessment only includes NSRs which reply on opened windows for ventilation.
[2] Bolded values mean exceedance of the relevant noise criteria.
[3] Predicted noise levels is expressed in range unless the minimum and maximum values (rounded to the nearest whole number for noise impacts) are the same.

Mitigated Scenario

3.6.6 Architectural fins of absorptive material are proposed in order to alleviate the noise levels to comply with the noise criteria. The proposed architectural fins would shield the line of sight from the NSRs to the roads and provide noise reduction to the NSRs. The location and extent of the proposed mitigation measures are indicated in **Figure 3.4**.

3.6.7 The summary of the road traffic noise impact assessment results under mitigated scenario is presented in **Table 3.11**, and the details are presented in **Appendix 3.3**.

Table 3.11 Predicted Mitigated Road Traffic Noise Levels at Representative NSRs

NSR[1]	Predicted Road Traffic Noise Level, $L_{10\ (1\text{-hour})}$, dB(A) (Mitigated)[2][3]	
	AM Peak	PM Peak
N01	**74**	**73**
N02	**73-74**	**73-74**
N03	**75-76**	**75-76**
N04	**76**	**75**
N05	70-**71**	70-**72**
N06	**71-72**	**71-73**
N07	**72-73**	**72-73**
N08	**71-72**	**71-72**
N09	**72**	**72**
N10a	**72**	**72**
N10b	**73-74**	**73-74**
N11a	**73**	**73**
N11b	**73**	**73**
N12a	**72**	**72**
N12b	**71-72**	**71-72**
N13a	70-**71**	70-**71**
N13b	70-**71**	70-**71**
N14a	**75**	**75**
N14b	**76**	**75**
N15a	**73**	**73**
N15b	**74**	**73**
N16a	**73**	**73**
N16b	**75**	**74**
N17a	**72-73**	**71-72**
N17b	**74**	**73**
N18	**74**	**73**

Notes:
[1] The assessment only includes NSRs which reply on opened windows for ventilation.
[2] Bolded values mean exceedance of the relevant noise criteria.
[3] Predicted noise levels is expressed in range unless the minimum and maximum values (rounded to the nearest whole number for noise impacts) are the same.

3.6.8 Under the mitigated scenario, exceedances of the noise criteria are still predicted at most of the NSRs, with a maximum predicted noise level of 76 dB(A). As such, the use of acoustic windows with up to 5.6 dB(A) noise attenuation is recommended to further mitigate the noise level. According to EPD's website on Innovative Noise Mitigation Designs and Measures, acoustic windows (baffle-type) applied in the Public Residential Development at San Po Kong are capable of achieving a noise reduction of 4 to 8 dB(A). Therefore, the use of acoustic windows is considered feasible to alleviate the

predicted road traffic noise impact. The location of the proposed mitigation measures is indicated in **Figures 3.4a** and **3.4b**.

3.6.9 To further minimise sound reflection, building façades opposite the architectural fins will be provided with absorptive material as far as practicable so that sound propagating to indoor area will be mostly absorbed and the sound attenuation performance can be improved.

3.6.10 Noise impacts due to road traffic within 300m radius from the Project Site have been assessed. With the implementation of the proposed noise mitigation measures in terms of architectural fins with sound absorptive materials and acoustic windows, the predicted road traffic noise levels at NSRs within the Project Site would comply with the relevant noise criteria. No adverse traffic noise impact on the Proposed Development is therefore anticipated.

3.7 Fixed Noise Impact Assessment

Existing Fixed Noise Sources

3.7.1 Within 300m radius from the boundary of the Project Site, cooling tower, chillers and ventilation plants at the rooftop of some buildings, container terminals and open storage site have been identified as potential sources of industrial noise. The locations of the existing industrial noise sources are indicated in **Figure 3.6**. A summary of the industrial noise sources is presented in **Table 3.12** and the details of the industrial noise sources are presented in **Appendix 3.4.** The type and number of equipment adopted for the assessment were based on site observation. Although not all equipment will operate together and some are intermittently used only, the noise assessment assumed all equipment will be operating simultaneously and continuously as a worst-case scenario. On-site noise measurement of the sound power of S01 was conducted, while noise measurement for the other equipment was not permitted by the site operators. The sound power level of other noise sources was referenced from product catalogue or similar equipment adopted in an approved EIA Report. According to the site surveys conducted in January 2022 and verified in November 2023, most of the industrial noise sources do not have night-time operation, except S01 and S03.

3.7.2 MTR's Lai King Ventilation Building and Mid-Tunnel Ventilation Building are located at about 66m and 240m, respectively, to the east of the Project Site. As confirmed by MTRC (**Appendix 3.7** refers), ventilation mode at these buildings are only initiated on as-needed basis during congestion and emergency occasions and are not regularly scheduled. Considering the irregular and transient nature of the operation of the ventilation buildings, adverse noise impact on the Proposed Development is not anticipated and hence, they are not included in the industrial noise assessment.

Table 3.12 Summary of Potential Industrial Noise Sources

Noise Source	Description	Operation Hours		Sound power levels, dB(A)
		Daytime/ Evening	Night-time	
S01a_01	Container Lifting at Kwai Chung Container Terminal III	Y	Y	105
S01a_02	Lorry Movement at Kwai Chung Container Terminal III	Y	Y	99
S01b_01	Container Lifting at Kwai Chung Container Terminal III	Y	N	105
S01b_02	Lorry Movement at Kwai Chung Container Terminal III	Y	Y	99
S01c_01	Container Lifting at Kwai Chung Container Terminal III	Y	N	105

Noise Source	Description	Operation Hours		Sound power levels, dB(A)
		Daytime/ Evening	Night-time	
S01c_02	Lorry Movement at Kwai Chung Container Terminal III	Y	Y	99
S02a	Mobile Crane at DSD Container Port Road Maintenance Depot	Y	N	97
S02b	Lorry Movement DSD Container Port Road Maintenance Depot	Y	N	99
S03a	Container Lifting at Kwai Chung Container Terminal IV	Y	Y	105
S03b	Lorry Movement at Kwai Chung Container Terminal IV	Y	Y	99
S04a	Cooling Tower at Dragon Delicious, Cho Yiu Estate	Y	N	91
S04b	Ventilation Plant No.1, at Dragon Delicious, Cho Yiu Estate	Y	N	89
S04c	Ventilation Plant No.2, at Dragon Delicious, Cho Yiu Estate	Y	N	84
S05a	Chiller No.1 at Lai King Community Hall	Y	N	84
S05b	Chiller No.2 at Lai King Community Hall	Y	N	84

3.7.3 The window location and building orientation would provide self-screening to the noise sources at Kwai Chung Container Terminal III (S01a, S01b and S01c). Hence, the assessment has excluded these sources.

Assessment Methodology

3.7.4 Sound Power Levels (SWL) of the identified industrial noise sources are determined based on site measurement and general acoustic principal, which are also used for the noise calculation. (**Appendix 3.4** refers). During the noise measurement, the noise level was dominated by the identified noise source.

3.7.5 As some of the industrial facilities were not accessible for site measurement, information such as types of noise source and Sound Power Levels (SWLs) of noisy equipment were referenced from product catalogue or information of similar operation adopted in an approved EIA Report (**Appendix 3.4** refers). The potential type of noise sources and SWLs were assumed to be same as other facilities of similar operation.

3.7.6 To predict the noise level at the future noise sensitive uses, the following correction factors have been accounted for:

- Distance correction: based on the shortest horizontal distance between the identified noise sources and the NSR, the distance correction is projected based on standard acoustical principle for point source;
- As observed during the site visits, the noise sources were found to operate occasionally. Although it is unlikely that all the identified industrial sources will be in operation simultaneously, to be conservative, it has been assumed that all the identified noise sources are in operation at the same time, which also represents a worst-case scenario. Noise sources are assumed to operate continuously instead of in occasion as observed onsite and all noise sources are regarded as point source;
- Façade correction: a +3dB(A) correction is applied to account for noise reflection from façade; and

- Path difference: path difference is considered in the mitigated scenario for NSRs protected by architectural fins, and their line of sight to the noise source can be shielded by the proposed architectural fins under the mitigated scenario. It is calculated based on the barrier corrections stated in ISO 9613.

3.7.7 Corrected Noise Level (CNL) at the representative NSRs of the proposed development can be calculated by applying the above corrections to the measured SWL of the noise sources in accordance with the following formula:

$$\mathbf{CNL = SWL + C_{dist} + C_{fac} + C_{bar} + C_{PD}}$$

Where,

CNL is the corrected noise level at the Assessment Point in dB(A)

SWL is the sound power level of the industrial plant in dB(A)

$\mathbf{C_{dist}}$ is the distance correction in dB(A) in accordance with the Technical Memorandum on Noise from Construction Works Other than Percussive Piling

$\mathbf{C_{fac}}$ is façade correction, +3 dB(A)

$\mathbf{C_{bar}}$ is screening correction, -5 dB(A) for partial screening and -10 dB(A) for complete screening by structure

$\mathbf{C_{PD}}$ is the path difference offered by the architectural fins

Assessment Results

3.7.8 Based on the assumptions mentioned above and information of noise sources in **Section 3.7.1 - 3.7.2**, noise level estimation for the selected NSRs at the Project Site has been conducted. The predicted industrial noise levels at the representative NSRs are summarised **Table 3.13**. The details are presented in **Appendix 3.5**.

Table 3.13 Predicted Unmitigated Industrial Noise Levels at Representative NSRs

NSR[1]	Acceptable Noise Level (ANL)		Predicted Unmitigated Noise Level, dB(A)[2][3][4]	
	Day and Evening	Night	Day and Evening	Night
N02	70	60	49-50	-
N04	70	60	49	-
N08	65	55	48	-
N09	65	55	50	-
N16a & N16b	70	60	54-55	52

Notes:
[1] The assessment only includes NSRs which reply on opened windows for ventilation.
[2] Bolded values mean exceedance of the relevant noise criteria.
[3] Predicted noise levels is expressed in range unless the minimum and maximum values (rounded to the nearest whole number for noise impacts) are the same.
[4] Site visits were conducted, and it was found that the identified noise sources have no night-time operation.

3.7.9 The estimated industrial noise levels at all APs can comply with the noise criteria. No adverse industrial noise impact is anticipated at the Proposed Development.

3.8 Rail Noise Impact Assessment

3.8.1 The dormitories within the Project Site are considered as noise sensitive receivers (NSRs) of rail noise impact. The nearest NSR is located about 114m and 112m to the northwest of the AEL and TCL track respectively, as shown in **Figure 3.8**. The planned NSRs at the Project Site may potentially be subject to rail noise impact. With the long

separation distance and the traffic noise mitigation in the form of architectural fins recommended at the Project Site as mentioned in **Section 3.6.6**, the line of sight from the NSRs to the TCL and AEL tracks will be minimised.

On-site Noise Measurement

3.8.2 On-site noise measurements were conducted from 06:10 to 06:40 and 23:00 to 01:00 to assess the potential railway noise impact of AEL and TCL. The noise measurement location is shown in **Figure 3.9**. The measurement data collected from the noise measurement during the period of 06:10 to 06:40 are provided in **Table 3.14** and **Table 3.15**, including the number of trains recorded during every 30-minute interval and the result of noise measurement. The respective data collected from the noise measurement during the period of 23:00 to 01:00 are provided in **Table 3.16** and **Table 3.17**. According to the latest AEL and TCL operational information obtained from the MTRC (**Appendix 3.7** refers), the current peak train headways at AEL and TCL during the period of 23:00 – 07:00 hours are 12 minutes and 10 minutes for one direction respectively.

Table 3.14 Number of Trains Recorded in Noise Measurement During the Period of 06:10 to 06:40

30-minute Interval	Number of Trains Recorded in the Noise Measurement			
	AEL (to Hong Kong Station)	AEL (to AsiaWorld-Expo Station)	TCL (to Hong Kong Station)	TCL (to Tung Chung Station)
06:10 – 06:40	2	1	3	3

Table 3.15 Measured Noise Levels at Project Site in Noise Measurement During the Period of 06:10 to 06:40

Total Impact Level, $L_{eq\ (30min)}$, dB(A) [1]	Background Level, $L_{eq\ (30min)}$, dB(A) [2]	L_{max}, dB(A)
70.1	70.1	76.5

Notes:

1. The total impact level is based on the measurement of $L_{eq\ (30\ min)}$ noise level at the Project Site due to the railway noise of AEL and TCL and background noise. Correction factors such as train speed, distance, crossing joints/crossovers and façade correction have been captured during the measurement.

2. The background level is based on the measurement of $L_{eq\ (30\ min)}$ noise level at the Project Site due to the background noise only (i.e. without train events).

Table 3.16 Number of Trains Recorded in Noise Measurement During the Period of 23:00 to 01:00

30-minute Interval	Number of Trains Recorded in the Noise Measurement			
	AEL (to Hong Kong Station)	AEL (to AsiaWorld-Expo Station)	TCL (to Hong Kong Station)	TCL (to Tung Chung Station)
23:00 – 23:29	3	3	2	3
23:30 – 23:59	3	3	3	3
00:00 – 00:29	2	2	3	3
00:30 – 00:59	3	3	2	2
Total	11	11	10	11

Table 3.17 Measured Noise Levels at Project site in Noise Measurement during the period of 23:00 to 01:00

Total Impact Level, $L_{eq\ (30min)}$, dB(A) [1]	Background Level, $L_{eq\ (30min)}$, dB(A) [2]	L_{max}, dB(A)
70.7	70.6	76.5

Notes:

1. The total impact level is based on the measurement of $L_{eq\ (30\ min)}$ noise level at the Project Site due to the railway noise of AEL and TCL and background noise. Correction factors such as train speed, distance, crossing joints/crossovers and façade correction have been captured during the measurement.

2. The background level is based on the measurement of $L_{eq\ (30\ min)}$ noise level at the Project Site due to the background noise only (i.e. without train events).

3.8.3 The on-site noise measurement findings indicate that the total impact level is similar to the background level at the Project Site. Rail noise from AEL and TCL does not contribute detectable impact at the Project Site. In fact, the background noise level at the Project Site is currently dominated by the busy road traffic of Kwai Chung Road and Tsing Kwai Highway. Thus, adverse rail noise impact is not anticipated at the Proposed Development based on site measurement data.

3.8.4 The measured L_{max} at the Project Site is 76.5 dB(A). After accounting for track deterioration and correction for potential increase of number of cars of AEL from 8 cars to 10 cars (+3 dB(A) and +1 dB(A) respectively), the corrected L_{max} still remains below the criteria 85 dB(A) (**Table 3.5** refers). Hence, rail noise impact from the AEL and TCL are considered insignificant to the Proposed Development and quantitative assessment on L_{max} level is not considered further.

3.8.5 To cater for future operation scenario of AEL and TCL with different train frequency and increase in number of cars for AEL, potential rail noise impact in $L_{eq\ (30min)}$ and L_{24hr} are also predicted and provided below.

Quantitative Assessment Methodology

3.8.6 Quantitative rail noise assessment has been conducted with reference to the "Calculation of Railway Noise 1995" (CRN) issued by the Department of Transport, UK

is referenced for this rail noise assessment. The railway will be divided into number of segments to address changes in traffic flow, speed, gradient of the track, turnout, or due to progress variation in screening along the railway lines. The propagation of rail noise to the NSRs will be corrected by distance, ground and air absorption, screening effect by barriers, reflection, angle of view at the reception point, train speed, number of trains, etc.

3.8.7 The rail noise source terms of AEL and TCL are referenced from the approved EIA Report for the Tung Chung Line Extension (AEIAR-235/2022). The report aims to assess the noise impact of AEL and TCL due to the development of new/modified railway system in Tung Chung. Multiple scenarios with respective source terms are proposed in the report. For this assessment, the source term associated with Scenario D, which have most frequent train service and ultimate number of cars of AEL, are adopted as the most conservative scenario.

3.8.8 **Table 3.18** summarises each step of calculation and the assumptions in the assessment. **Table 3.19** includes the source term information extracted from relevant studies and information from MTRC (**Appendix 3.7** refers).

Table 3.18 Procedures for Rail Noise Assessment

Steps	Assumptions / Remarks	Reference
Identify the extent of the site area to be affected by the air-borne noise from the rail operation; locate the assessment points at the representative NSRs	The first layer of planned NSRs overlooking TCL and AEL will be selected for rail noise prediction and evaluation	-
Identify the noise source of rail operation	The rolling noise is emitted through the gap between the train and the walkway on the viaduct of TCL and AEL.	a
Identify the train type and the source term of the train	Refers to **Table 3.19**	-
Evaluate the correction due to train speed	$+20\log_{10}(V/V_{ref})$ in dB(A) Where V = Train speed, V_{ref} = Reference train speed	b
Correction of train frequency for 30 mins	+10 log10(N/1800) in dB(A) where N = No. of trains per 30 minutes per direction	-
Correction of train frequency for 24 hours	+10 log10(N/86400) in dB(A) where N = No. of trains per 24 hours per direction	-
Correction of number cars	- 10 log10(N/N_{ref}) in dB(A)	-

Steps	Assumptions / Remarks	Reference
	where N = No. of cars in the measured events, N_{ref} = No. of cars in the reference	
Incorporate Track Wear Correction	+3 dB(A)	b
Incorporate Joint/Turnout Correction (to represent the augmentation in noise due to thermal expansion joints)	With conservative assumption, +7 dB(A) for a representative 20m segment	a
Evaluate the distance between the NSR and the track and make distance correction	$-10 \log_{10}(d'/d_{ref})$ in dB(A) where d' = Slant distance from track to NSR and d_{ref} = Reference distance	b
Evaluate the angle of view and calculate angle of view correction	$+10 \log_{10}(\pi\theta/180 - \cos2\alpha \sin\theta) - 5$ in dB(A) where θ = Angle of view and α = Acute angle between a line drawn through the NSR, parallel to the track, and the line bisecting the angle of view, θ	b
Incorporate Barrier Correction	Shadow Zone: -21 dB(A) for δ > 2.5 m where δ is the path difference in meter $-7.75 \log_{10}(5.2 + 203\ \delta)$ dB(A) for 0≤ δ <2.5 m Illuminated Zone: 0 dB(A) for δ > 0.4 m $0.88 + 2.14 \log10(10^{-3} + \delta)$ dB(A) for 0 ≤ δ <0.4 m	Chart 6(a) of b
Calculate the overall noise level from all rail segments ($L_{eq\ (30min)}$)	$L_{eq(30mins),\ overall}$ at NSR= $L_{eq(30mins),\ rolling}$ $L_{eq(30mins),\ rolling}$ at NSR = SEL + C_{speed} + C_{freq} + C_{track} + C_{joint} + $C_{distance}$ + C_{angle} + $C_{Barrier}$	-
Incorporate Façade Correction	+2.5 dB(A)	b
Calculate L_{max}	$L_{max,\ overall}$ at NSR= $L_{max,\ rolling}$ $L_{max,\ rolling}$ at NSR = SEL + C_{speed} + C_{freq} + C_{track} + C_{joint} + $C_{distance}$ + C_{angle} + $C_{Barrier}$	-
Calculate the overall noise level	$L_{eq(24hrs),\ overall}$ at NSR= $L_{eq(24hrs),\ rolling}$	-

Steps	Assumptions / Remarks	Reference
from all rail segments ($L_{eq(24\ hour)}$)	$L_{eq(24hrs),\ rolling}$ at NSR = SEL + C_{speed} + C_{freq} + C_{track} + C_{joint} + $C_{distance}$ + C_{angle} + $C_{Barrier}$	
Reference *(a) EIA Report (Register No. AEIAR-235/2022) of "Tung Chung Line Extension".* *(b) Calculation of Railway Noise 1995" issued by the Department of Transport, UK.*		

Table 3.19 Input for Rail Noise Assessment

Parameters	Input
Train type and no. of cars	AEL: Adtranz-CAF EMU, 10-car train (229.2m long)[1] TCL: Adtranz-CAF EMU and K-Stocks Trains, 8-car train (184.2m long)[1]
Rolling Noise	AEL: SEL for northbound and southbound: 94.9 dB(A)[1,2] (10 cars running 135 km per hour at 25m)[1] TCL: SEL for northbound and southbound: 93.9 dB(A)[1,2] (8 cars running 135 km per hour at 25m)[1]
Train frequency per 30 minutes per direction	AEL: 5 numbers during peak daytime[3] 5 numbers during peak night-time[3] TCL: 13 numbers during peak daytime[3] 7 numbers during peak night-time[3]
24 hours train frequency per direction	AEL: 320[3] TCL: 600[3]
Train Speed for tracks within Assessment Area	135 km per hour[3]
Note: *1. EIA Report (Register No. AEIAR-235/2022) of "Tung Chung Line Extension".* *2. Corrections have been made for slab track (+2 dB(A)) and concrete viaducts (+1 dB(A)) with reference to CRN due the nature of the rail tracks in this assessment.* *3. Information provided by MTR (**Appendix 3.7** refers)*		

Assessment Result

3.8.9 The predicted rail noise level at the representative NSR is presented in **Table 3.20** with details is provided in **Appendix 3.8**. The predicted rail noise levels comply with the relevant criteria. Hence, no adverse rail noise impact on the planned NSR within the Proposed Development is anticipated.

Table 3.20 Predicted Rail Noise Impact

NSR/ NAP	Unit	Daytime/ Evening Period (0700-2300)		Night-time Period (2300-0700)		Leq (24hr)	
		Criteria	Impact	Criteria	Impact	Criteria	Impact
RN01	$L_{eq\ (30\ min)}$ dB(A)	70	50	60	48	-	-
	$L_{eq\ (24\ hr)}$ dB(A)	-	-	-	-	65	50
RN02	$L_{eq\ (30\ min)}$ dB(A)	70	55	60	53	-	-
	$L_{eq\ (24\ hr)}$ dB(A)	-	-	-	-	65	55
RN03	$L_{eq\ (30\ min)}$ dB(A)	70	49	60	48	-	-
	$L_{eq\ (24\ hrs)}$ dB(A)	-	-	-	-	65	50
RN04	$L_{eq\ (30\ min)}$ dB(A)	70	54	60	52-53	-	-
	$L_{eq\ (24\ hr)}$ dB(A)	-	-	-	-	65	54-55

3.9 Mitigated Measures

Construction Phase

3.9.1 The following good site practices should be adopted as far as practicable to minimize the noise impact of construction activities on the nearby NSRs.

- Use of Quality PMEs with lower SWL;
- Use of noise insulating fabric, movable barriers and enclosures to noisy PMEs as far as practicable;
- Only well-maintained plant should be operated on-site, and plants should be serviced regularly during the construction period;
- Noisy equipment and activities should be located as far away from NSRs as practicable;
- Plant known to emit noise strongly in one direction should, wherever possible, be properly orientated so that the noise is directed away from the nearby NSRs;
- Use of site hoarding as a noise barrier to screen noise at low level NSRs;
- Any material stockpiles and other structures should be effectively utilized, wherever practicable, to screen the noise from on-site construction activities;
- Unused equipment should be turned off or throttled down. PME should be kept to a minimum and the parallel use of noisy equipment/ machinery should be avoided;
- Regular maintenance of all plant and equipment, and use of material stockpiles and other existing structures as effective noise barriers, where practicable; and
- The Contractor shall devise, arrange methods of working and carry out the Works in such a manner so as to minimize noise impacts on the surrounding environment,

and shall provide experienced personnel with suitable training to ensure that these methods are implemented.

Operation Phase

3.9.2 No adverse industrial and rail noise impacts within the Proposed Development are anticipated. Hence, no mitigation measures are recommended.

3.9.3 With the implementation of the proposed noise mitigation measures in the form architectural fins with sound absorptive material and acoustic windows, the predicted road traffic noise levels at NSRs within the Project Site would comply with the relevant noise criteria. No adverse traffic noise impact on the Proposed Development is therefore anticipated.

3.10 Monitoring and Audit Requirement

With the recommended mitigation measures in place, the construction noise impact due to the Proposed Development is anticipated to be acceptable. No specific noise monitoring would be recommended for the Proposed Development. It is recommended that regular site environmental audits should be undertaken to inspect the construction activities and works area in order to ensure the recommended mitigation measures are properly implemented.

4. WATER QUALITY IMPACT ASSESSMENT

4.1 Introduction

4.1.1 This section identifies water quality impact that may arise during construction and operation of the Proposed Development. Recommendations for mitigation measures have been provided, where necessary, to minimise the identified water quality impacts to an acceptable level.

4.2 Environmental Legislation, Policies, Standards and Criteria

Water Pollution Control Ordinance (Cap. 358)

4.2.1 The Water Pollution Control Ordinance (Cap. 358), in existence since 1980, is the major legislation relating to the protection and control of water quality in Hong Kong. According to the Ordinance and its subsidiary legislation, Hong Kong waters are divided into ten water control zones (WCZ). Corresponding statements of Water Quality Objectives (WQO) 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.

4.2.2 The Project Site is located within the Victoria Harbour (Phase One) WCZ. The corresponding WQOs should be met.

ProPECC Note PN 2/23

4.2.3 The other relevant guideline is the Professional Persons Environmental Consultative Committee Practice Note 2/23 – "Construction Site Drainage" which provides guidelines for the handling and disposal of construction discharges. This ProPECC Note is generally applicable for control of site runoff and wastewater generated during the construction phase of the Proposed Development.

ProPECC Note PN 1/23

4.2.4 ProPECC Note PN 1/23 "Drainage Plans subject to Comment by the Environmental Protection Department (Standards of Sanitary Fitments, Plumbing, Drainage Works and Latrines) Regulations" provides guidelines on the preparation of drainage plans.

Technical Memorandum

4.2.5 Besides setting the WQOs, the WPCO controls effluent discharging into the WCZs through a licensing system. The Technical Memorandum on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters (TM-DSS) issued under Section 21 of the WPCO gives guidance on the permissible effluent discharges based on the type of receiving waters (foul sewers, storm water drains, inland and coastal waters). The limits given in the TM-DSS control the physical, chemical and microbial quality of effluents. Under the TM-DSS, effluents discharged into the sewerage system and the inshore and marine waters of the WCZ are subject to standards for particular quantities of discharge. These standards are defined by the EPD and specified in licence conditions for any discharge within a WCZ. Any effluent discharge during operation of the Proposed Development would be required to comply with the required discharge standards.

4.3 Baseline Water Quality Conditions

Description of the Environment

4.3.1 The Project Site is located at Lai King Hill Road and surrounded predominantly by residential uses. Stormwater will be collected and discharged into the existing drainage system along Lai King Hill Road, which will finally be discharged to Victoria Harbour. The Victoria Harbour is located approximately 650m from the Project Site boundary.

Marine Water Quality

4.3.2 With reference to the Marine Water Quality in Hong Kong in 2022 issued by EPD, the overall WQO compliance rate of Victoria Harbour WCZ in 2022 was 93%. **Table 4.1** shows a summary of EPD's water quality statistics of two marine water quality monitoring stations (VM12 and VM14) which are closest to the Project Site location. Location of the marine water quality monitoring stations are indicated in **Figure 4.1**.

Table 4.1 Summary of EPD Marine Water Quality Data of the Victoria Harbour WCZ at Selected Stations in 2022

Parameters		Victoria Harbour	
		VM12	VM14
Temperature (°C)		24.5 (18.0 - 28.5)	25 (18.1 - 28.8)
Salinity (psu)		30.6 (25.8 - 33.7)	28.7 (20.6 - 33.7)
Dissolved Oxygen (DO) (mg/L)	Depth-averaged	5.2 (4.2 - 6.6)	5.8 (4.6 - 8.3)
	Bottom	4.8 (3.1 - 6.6)	5.4 (4.3 - 7.5)
Dissolved Oxygen (DO) (% saturation)	Depth-averaged	74 (60 - 86)	82 (68 - 124)
	Bottom	68 (46 - 85)	77 (65 - 112)
pH		7.6 (7.1 - 8.3)	7.7 (7.1 - 8.3)
Secchi Disc Depth (m)		2.5 (1.7 - 4.2)	2.1 (1.5 - 3.7)
Turbidity (NTU)		19.6 (4.2 - 68.4)	15.7 (4.2 - 42.1)
Suspended Solids (SS) (mg/L)		6.7 (3.6 - 11.6)	4.8 (2.4 - 7.4)
5-day Biochemical Oxygen Demand (BOD_5) (mg/L)		0.7 (<0.1 - 1.2)	0.8 (<0.1 – 2.2)
Ammonia Nitrogen (mg/L)		0.148 (0.069 - 0.217)	0.108 (0.024 - 0.18)
Unionised Ammonia (UIA) (mg/L)		0.005 (<0.001 - 0.016)	0.005 (<0.001 – 0.011)
Nitrite Nitrogen (mg/L)		0.03 (0.009 - 0.047)	0.041 (0.013 - 0.098)
Nitrate Nitrogen (mg/L)		0.222 (0.071 - 0.537)	0.335 (0.079 - 0.96)
Total Inorganic Nitrogen (TIN) (mg/L)		0.4 (0.23 - 0.65)	0.48 (0.29 - 1.08)
Total Kjeldahl Nitrogen (mg/L)		0.42 (0.15 - 1.01)	0.31 (0.11 - 0.69)
Total Nitrogen (mg/L)		0.67 (0.39 - 1.12)	0.68 (0.34 - 1.24)
Orthophosphate Phosphorus (mg/L)		0.02 (0.01 - 0.03)	0.02 (<0.002 - 0.03)
Total Phosphorus (mg/L)		0.07 (0.04 - 0.14)	0.06 (0.03 - 0.09)
Silica (as SiO2) (mg/L)		1.36 (0.54 - 3.20)	1.83 (0.53 - 4.83)
Chlorophyll-*a* (µg/L)		3.0 (0.6 – 14.0)	5.2 (0.7 - 28.7)
E. coli (count/100 mL)		1300 (200 - 12100)	400 (100 - 3900)
Faecal Coliforms (count/100 mL)		3100 (400 - 22000)	900 (100 - 9400)

Source: Adopted from EPD Marine Water Quality in Hong Kong in 2022 (downloaded online)
Notes:

[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 of the depth-averaged results except for E. coli and faecal coliforms which are annual geometric means.
[3] Data in brackets indicate the ranges.

Assessment Area and Water Sensitive Receivers

4.3.3 The assessment area is defined as all areas within 500 m from the boundary of the Project Site.

4.3.4 Water sensitive receivers (WSRs) are defined as those users/occupants of the aquatic/marine environment whose use of the environment could be impaired as a result of the Proposed Development. The watercourses (manmade channels for collected stormwater runoff) within 500m assessment area are identified as the existing water sensitive receivers, as shown in **Figure 4.2**.

4.4 Potential Water Quality Impacts

Construction Phase (Demolition and Construction Works)

4.4.1 Runoff from the areas involving demolition and construction works may contain increased loads of sediments, suspended solids and contaminants. Non-point sediment laden runoff during the construction of the Proposed Development, if uncontrolled, may carry pollutants into the stormwater drainage systems. This will lead to increased suspended solids levels in the receiving waters, and hence measures should be implemented to control construction site runoff from the works areas, and to prevent runoff with high levels of suspended solids from entering the drainage systems.

4.4.2 Wastewater would also be generated from the sewage effluent from the construction workforce and accidental chemical spills. If uncontrolled, these could lead to deterioration in water quality of the nearby drainages. Contaminated discharge and sewage effluent could lead to increase in nutrient levels such as ammonia and nitrogen concentration, and lead to secondary water quality impacts including decreases in DO concentrations.

4.4.3 Considering that the demolition works and construction activities will be entirely land-based on developed area, with good site practices and mitigation measures as outlined in **Section 4.5**, adverse water quality impact resulting from discharge and pollutants generated from the demolition and construction activities of the Proposed Development is not anticipated. The good site practices outlined in ProPECC PN 2/23 Construction Site Drainage should be adopted as far as practicable to minimise the potential water quality impacts from various construction activities and construction site runoff.

Operation Phase

4.4.4 During operation phase, sewage generated from the Proposed Development will be properly collected by the proposed sewers and conveyed away from the site via existing public sewerage system. According to the SIA Report for the Proposed Development, the estimated quantity of sewage generation is 185.6 m^3/day, which is only 0.09 % of the average daily treatment capacity of the downstream Kwai Chung Preliminary Treatment Works (201,000 m^3/day). The SIA report demonstrated that the downstream sewerage network is capable of handling the generated sewage flow with upgrading works proposed to some sewer segments.

4.4.5 Given the nature of the Proposed Development, major potential sources that would cause pollution to the surface runoff is not anticipated. As the Proposed Development will be built at the Project Site which is currently occupied by the Salvation Army Lai King Home, increase in surface runoff from paved surface of the Proposed

Development is not anticipated. Surface runoff from the Project Site will be collected by properly designed drainage system.

4.4.6 With a properly designed sewerage and drainage system, together with the implementation of mitigation measures presented in **Section 4.5**, no adverse water quality impact is expected to arise from the operation of the Proposed Development.

4.5 Mitigation Measures

Construction Phase

Construction Site Runoff and Discharge

4.5.1 There is a need to apply to EPD for a discharge licence under the WPCO for discharging effluent from the construction site. The Contractor shall obtain a discharge licence from the EPD and shall comply with the terms and conditions of the valid WPCO licence issued by the EPD.

4.5.2 In order to meet the requirements of the Technical Memorandum standard under the Water Pollution Control Ordinance, surface runoff from construction site should be discharged into storm drains via adequately designed sand/silt removal facilities such as sand traps, silt traps and sedimentation basins.

4.5.3 Exposed soil surfaces should be covered by a tarpaulin or similar material during rainstorms to prevent the washing away of construction materials into any drainage system, watercourses and inshore water. Other measures which are proposed to be implemented before, during, and after rainstorms, as appropriate, are summarized in ProPECC Note PN 2/23.

4.5.4 The mitigation measures as detailed below shall also be incorporated for the construction site drainage where practicable as an integral part of good practice:

- 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 sediment basins. Channels or earth bunds or sand bag barriers should be provided on site to properly direct stormwater to such silt removal facilities. Perimeter channels at site boundaries should be provided where necessary.
- Silt removal facilities, channels and manholes should be maintained, and the deposited silt and grit should be removed regularly.
- Earthworks final surfaces should be well compacted, and the subsequent permanent work or surface protection should be carried out immediately after the final surfaces are formed.
- Measures should be taken to minimize the ingress of rainwater into trenches. If excavation of trenches in wet seasons is necessary, they should be dug and backfilled in short sections. Rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities.
- Open stockpiles of construction materials (e.g. aggregates, sand and fill material) on sites should be covered with tarpaulin or similar fabric. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system.
- Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and to prevent storm run-off from getting into foul sewers.

- Precautions should be taken at any time of year when rainstorms are likely; actions should be taken when rainstorms are imminent or forecasted, and during or after rainstorms.
- All vehicles and plant should be cleaned before they leave a construction site to ensure no earth、mud、debris and the like is deposited by them on roads. A wheel washing bay should be provided at every site exit if practicable and wash-water should have sand and silt settled out or removed before discharging into storm drains. The section of construction 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 run-off from entering public road drains.

Accidental Spillage

4.5.5 Oils and fuels should only be used and stored in designated areas which have pollution prevention facilities. All fuel tanks and storage areas should be sited on sealed areas to prevent spillage of fuels and solvents to the nearby storm drains. All waste oils and fuels should be collected in designated tanks prior to disposal.

4.5.6 The storage areas should be surrounded by bunds with a capacity equal to 110% of the storage capacity of the largest tank to contain accidental spillage of fuel, chemicals or chemical waste.

4.5.7 Chemical waste arising from the site should be properly stored, handled, treated and disposed of in compliance with the requirements stipulated under the Waste Disposal (Chemical Waste)(General) Regulation.

Sewage

4.5.8 Temporary sanitary facilities, such as sufficient chemical toilets, should be employed in the works areas. A licensed contractor would be responsible for cleaning and maintenance of the chemical toilets on a regular basis. The number of the temporary sanitary facilities required for the construction sites would be subject to later detailed design, the capacity of the chemical toilets, and contractor's site practices.

4.5.9 Provided that sewage is not discharged directly into stormwater drain and temporary sanitary facilities are used and properly maintained, with the proper implementation of good site practices and the abovementioned recommendations, no adverse water quality impact is anticipated.

Operation Phase

4.5.10 All sewage from the Project Site would be discharged into the public sewer.

4.5.11 Sufficient drainage system and pollution control facilities, such as gullies and silt traps shall be provided as appropriate to handle the urban runoff. Regular cleaning and maintenance of these pollution control facilities should take place to ensure their effectiveness in minimizing water pollution. Also, additional inspection and cleansing should be carried out before heavy rainfall forecasted.

4.5.12 The ProPECC Note PN 1/23 provides guidelines and practices for handling, treatment and disposal of various effluent discharges to stormwater drains and foul sewers. The design of site drainage and disposal of various effluents generated within the new development area should follow the relevant guidelines and practices as given in the ProPECC Note PN 1/23.

4.5.13 Screening facilities such as standard gully grating and trash grille, with spacing which is capable of screening large substances such as fallen leaves and rubbish should be provided at the inlet of drainage system. Manholes, as well as stormwater gullies, provided at the Project Site should be regularly inspected and cleaned. Additional inspection and cleansing should be carried out before forthcoming heavy rainfall.

4.5.14 With the implementation of control measures and the provision of properly designed sewerage and drainage system, no adverse water quality impact is anticipated.

4.6 Monitoring and Audit Requirements

4.6.1 Water quality impact during the construction phase can be readily mitigated through the implementation of standard mitigation measures and good housekeeping practices. The recommended mitigation measures should be included in the Works Contract. It is recommended that regular site inspection be undertaken to inspect the construction activities and works area to ensure the recommended mitigation measures are properly implemented.

4.6.2 With all the sewage from the Proposed Development discharged into public sewer, together with the implementation of proper control measures, no adverse water quality impact is anticipated during the operation phase.

4.6.3 Thus, monitoring and audit is not considered necessary during construction and operation phase of the Proposed Development.

5. WASTE MANAGEMENT

5.1 Introduction

5.1.1 This section reviews the types and quantities of potential sources of waste that will arise during the operation and construction phases of the Proposed Development. Potential environmental impacts associated with the handling and disposal of waste have been identified. Options for avoidance, minimization, reuse, recycling, treatment, storage, collection, transport and disposal of such wastes are examined.

5.2 Environmental Legislation, Policies, Standards and Criteria and other Relevant Guidelines

5.2.1 There are various types of waste which may arise during construction works. The various types of waste may require a different approach for management according to their specific characteristics. The regulations and requirements regarding waste management (collection, storage, transfer and disposal) of the various waste streams are summarised below.

Waste Disposal Ordinance (Cap. 354)

5.2.2 The principal legislation regulating waste is the Waste Disposal Ordinance (WDO). The WDO prohibits the unauthorised disposal of wastes, and waste must be disposed of at locations licensed by the Environmental Protection Department (EPD).

Waste Disposal (Chemical Waste) (General) Regulation

5.2.3 Chemical waste producers must register with EPD and either treat chemical waste produced through the use of an on-site plant licensed by EPD, or via a licensed contractor to collect and transfer the waste to a licensed facility. The Regulation also prescribes necessary storage facilities to be provided on site, and all requirements for waste labelling and the posting of warning signs.

Air Pollution Control Ordinance (Cap.311)

5.2.4 The Air Pollution Control Ordinance (APCO) and its subsidiary regulations provide the statutory control on air pollutants from a variety of sources. The APCO makes provision for abating, prohibiting and controlling emissions of any solid, particulate, liquid, vapour, objectionable odours or gaseous substances into the atmosphere. The whole of the HKSAR has been covered by Air Control Zones.

Code of Practice on the Handling, Transportation and Disposal of Asbestos Waste

5.2.5 The purpose of this Code is to provide guidance and advice on the collection, storage, treatment, transportation and disposal of asbestos waste.

Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes

5.2.6 The purpose of this Code is to provide guidance for complying with the requirements of the Waste Disposal (Chemical Waste) (General) Regulation on the packaging, labelling and storage of chemical waste.

Other Relevant Guidelines

5.2.7 The following documents and guidelines also relate to waste management disposal:

- Development Bureau Technical Circular (Works) No.6/2010 (DEVB TCW No. 6/2010)
- Works Branch Technical Circular No. 2/93 - Public Dumps (WBTC No. 2/93)

- Environment, Transport and Works Bureau Technical Circular (Works) No. 19/2005 "Environmental Management on Construction Sites" (ETWB TC(W) No. 19/2005)
- Handling of Asbestos Containing Materials in Buildings (ProPECC PN 2/97)

5.3 Waste Management Hierarchy

5.3.1 The waste management strategy for this Proposed Development has been based on the following hierarchy in descending order of priority for developing the appropriate mitigation measures for waste management, viz.:

- **Avoid** - complete avoidance of waste generation;
- **Reduce** - reduction of waste, generally within the confines of the project, through changes in processes or procedures. It also includes the reuse of materials without additional processing;
- **Recycle** - recycling of wastes for other purposes, such as input materials or materials recovery;
- **Treat** - destruction, detoxification, neutralization, etc. of wastes into less harmful substances that are suitable for disposal; and
- **Dispose** - release of waste to air, water, or land in a properly controlled and safe manner to render them harmless. Land disposal may involve volume reduction, encapsulation, leachate containment and monitoring.

5.3.2 Waste generation will be avoided as far as possible 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.

5.4 Identification and Evaluation of Potential Impacts

Construction Phase

5.4.1 The construction activities to be carried out for the Proposed Development 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;
- General refuse; and
- Chemical wastes, including asbestos.

5.4.2 The nature of each type of waste arising is described in the following sections, together with an evaluation of the potential environmental impacts associated with these wastes.

Construction and Demolition (C&D) Materials

5.4.3 C&D materials are categorized to "inert C&D materials" and "non-inert C&D materials". C&D materials that are wholly inert, namely public fill, should not be disposed of to landfill, but taken to public filling areas, which usually form part of reclamation schemes. The Land (Miscellaneous Provisions) Ordinance requires that dumping licences be obtained by 'individuals or companies who deliver public fill to public filling areas. The Civil Engineering & Development Department (CEDD) issues the licences under delegated powers from the Director of Lands.

5.4.4 Under the Waste Disposal (Charges for Disposal of Construction Waste) Regulation, enacted in January 2006, construction waste delivered to a landfill for disposal must not contain more than 50% by weight of inert material. Construction waste delivered

to a sorting facility for disposal must contain more than 50% by weight of inert material, and construction waste delivered to a public fill reception facility for disposal must consist entirely of inert material.

5.4.5 The estimated quantity of C&D materials generated from the demolition works and construction works associated with the Proposed Development is presented in **Table 5.1**.

Table 5.1 Estimated Quantity of C&D Materials

Activities	Inert C&D Waste to be delivered off-site for reuse	Non-inert C&D Waste to be disposed of
Demolition of Existing Buildings	1,452 m^3	363 m^3
Construction of Proposed Development	5,618 m^3	279 m^3
Total	**7,070 m^3**	**642 m^3**

5.4.6 The scale and design of the Proposed Development limits the opportunity to reuse C&D material. Nevertheless, no major site formation work is required for the construction of the Proposed Development, and the quantity of C&D materials to be generated is small. Inert C&D materials would be delivered off-site for reuse in other construction contractors or to designated public fill reception facilities. The Contractor should timely notify the estimated volumes of excavated materials to be generated and make agreement with the PFC on the handling of the inert C&D materials. Inert C&D materials should be segregated from other wastes to avoid contamination and to ensure acceptability at public fill reception facilities and other construction sites. All inert C&D materials will need to be carefully stockpiled if it cannot be removed directly to avoid dust and other nuisance impacts. The inert C&D materials to be delivered to public fill reception facilities shall be materials consisting of soil, concrete, etc. The materials shall be free from plastics, chemical waste, industrial metals and other materials that are considered as C&D wastes. A designated temporary storage area of inert C&D materials shall be provided on site.

5.4.7 Non-inert C&D materials comprise materials including mixture of topsoil and dead vegetative materials, timber, glass, steel and plastics, etc. arising from construction and demolition that are not suitable for backfilling. Non-inert C&D materials would be segregated on site to facilitate recycling as far as possible by designating specific areas/bins for the temporary storage of the segregated material. Disposal of non-inert C&D material at designated landfills will be the last resort.

5.4.8 The Contractor should separate non-inert C&D materials from inert C&D materials on-site. All segregated recyclable materials (e.g. metal) should be collected by reputable licensed recyclers. The remaining non-inert C&D materials should be disposed of at designated landfill by dump trucks.

5.4.9 The potential environmental impacts arising from the handling of inert C&D materials, such as dust and odour emissions, and potential hazards, would be controllable through implementation of mitigation measures and good site practises.

General Refuse

5.4.10 Throughout construction, the workforce would generate general refuse comprising food scraps, wastepaper, empty containers, etc. Assuming there would be a maximum of 50 workers working on-site and based on the generation rate of 0.65 kg per worker per day, the estimated amount of general refuse to be produced during the construction phase is 32.5 kg/day. Release of general refuse into the nearby storm drain 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 surrounding environment, and odour nuisance. The work site may also attract pests and vermin if the waste storage area is not well maintained and cleaned regularly.

5.4.11 Recyclable materials (i.e. paper, plastic bottles and aluminium cans) will be separated for recycling, in order to reduce the amount of general refuse to be disposed of at 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, stored in enclosed containers, and disposed of at designated landfill on a daily basis.

5.4.12 With the implementation of the recommended waste management practices on site, adverse environmental impacts would not arise from the storage, handling and transportation of general refuse.

Chemical Waste

5.4.13 Asbestos, which is classified as chemical waste, was widely used in the construction industry prior to the early 1980s for fireproofing, thermal, and electrical insulation, as well as in sound absorption materials. However, asbestos is currently recognized as a hazardous material, due to its etiological effects on human respiratory system.

5.4.14 As the existing buildings proposed to be demolished were constructed before 1980's, ACM may be present in the buildings. Thus, ACM which may be disturbed during the demolition activities, should be removed and disposed of in a proper manner prior to the demolition work, so as to avoid the release of harmful asbestos fibres to the environment and minimise potential hazard.

5.4.15 All ACM if confirmed to be present within the existing premises must be removed and disposed of in accordance with the Air Pollution Control Ordinance and the Waste Disposal Ordinance prior to the demolition work. A Registered Asbestos Consultant and Registered Asbestos Laboratory shall be engaged to conduct investigation for the presence of ACM. An Asbestos Investigation Report, an Asbestos Abatement Plan (AAP) (if required) and a notification of commencement of asbestos abatement works shall be submitted to EPD at least 28 days before the asbestos abatement works commences. Also, the removal of ACM should be carried out by a Registered Asbestos Contractor according to the approved AAP under the supervision of a Registered Asbestos Consultant. The asbestos waste generated shall be disposed of by a licensed waste collector in compliance with the Waste Disposal Ordinance.

5.4.16 Apart from asbestos, maintenance and servicing of construction plant and equipment may generate chemical wastes such as cleaning fluids, solvents, lubrication oil and fuel. Maintenance of vehicles may also involve the use of a variety of chemicals, oil and lubricants. The amount of chemical waste generated will be small, in the order of a few cubic metres per month. It will be quantified in the Environmental Management Plan (EMP) to be prepared by the Contractor. For the disposal of chemical wastes, the Contractor would be required to register with the EPD as a Chemical Waste Producer and to follow the requirements stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Chemical waste should be collected by a licensed collector and to be disposed of at a licensed chemical waste treatment and disposal facility.

5.4.17 Chemical waste arising during the construction phase may pose environmental, health and safety hazards if not stored and disposed of in an appropriate manner as stipulated in the Waste Disposal (Chemical Waste) (General) Regulations. The potential hazards include:

- Toxic effects to workers;
- Adverse impacts on water quality from spills; and

- Fire hazards.

5.4.18 Materials classified as chemical wastes will require special handling and storage arrangements before removal for appropriate treatment at the approved Chemical Waste Treatment Facility. Provided that the handling, storage and disposal of chemical wastes are in accordance with these requirements, adverse environmental impacts are not expected.

Operation Phase

5.4.19 It is anticipated that general refuse will be generated during operation of the Proposed Development. General refuse, such as food waste, packaging materials, etc., will be generated by residents, employees and users during the operation of the Proposed Development. As advised by the Salvation Army, the total number of residents, employees and users is 586. With reference to the latest data from "monitoring of Solid Waste in Hong Kong 2022" by EPD, the domestic waste disposal rate was 0.93 kg/person/day in Year 2022. Applying the same per capita disposal rate, the estimated quantity of general refuse is about 545 kg/day. General refuse will be properly managed by suitable waste collectors so that intentional or accidental release to the surrounding environment will not occur. Storage of general refuse would generate odour nuisance and visual impact if they are not managed in a proper manner. Vermin and pests may also be attracted if the waste containers are not cleaned or maintained properly and frequently. Therefore, general refuse should be temporarily stored in proper containers with covers to avoid adverse impact on the surroundings. To reduce waste generation and enhance waste recycling, sufficient properly labelled recycling bins for paper, plastic and aluminium should be provided at appropriate locations of the Proposed Development to collect recyclables for off-site recycling. Regular (e.g. daily) waste removal and recyclables collecting should be arranged to avoid odour nuisance or pest/vermin problem.

5.4.20 With proper implementation of waste management practices, adverse environmental impacts from handling and disposal of general refuse are not anticipated.

5.5 Mitigation Measures

Construction Phase

Good Site Practices

5.5.1 Appropriate waste handling, transportation and disposal methods for all waste generated during the construction works should be implemented to ensure that construction wastes do not enter the nearby water bodies.

5.5.2 With the implementation of good site practices, Adverse environmental impact arising from waste management is not anticipated during construction phase of the Project. Recommendations for good site practices during construction include but are not limited to the followings:

- nomination of approved personnel, such as a site manager, to be responsible for good site practices, and making arrangements for collection of all wastes generated at the site and effective disposal to an appropriate facility;
- training of site personnel in proper waste management and chemical waste handling procedures;
- provision of sufficient waste disposal points and regular collection for disposal;
- appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers;

- regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors;
- an Environmental Management Plan (EMP) should be prepared by the Contractor with reference to the ETWB TC(W) No. 19/2005 "Environmental Management on Construction Sites" and should be submitted to the Engineer and/or Architect for approval before construction;
- a Waste Management Plan (WMP) should be submitted by the Contractor as a part of the EMP prior to the commencement of construction works with reference to the ETWB TC(W) No. 19/2005; and
- a recording system for the amount of wastes generated, recycled and disposed of (including the disposal sites) should be updated on monthly basis and submitted to the Engineer for approval and record.

5.5.3 In order to monitor the disposal of C&D material at landfills and public fill reception facilities, as appropriate, and to control fly tipping, a trip-ticket system should be included as one of the contractual requirements to be implemented by the Contractor. One may make reference to DEVB TCW No. 6/2010 for details.

Waste Reduction Measures

5.5.4 Good management and control can prevent the generation of significant amounts of waste. Waste reduction is best achieved at the planning and design stage, as well as by ensuring the implementation of good site practices. Recommendations to achieve waste reduction include:

- segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal;
- separate labelled bins shall be provided to segregate recyclables including but not limited to aluminium cans, wastepaper, and plastic bottles from other general refuse generated by the work force, and to encourage collection for recycling by by individual collectors;
- any unused chemicals or those with remaining functional capacity shall be recycled;
- maximising the use of reusable steel formwork to reduce the amount of C&D material;
- prior to disposal of C&D waste, it is recommended that wood, steel and other metals shall be separated for re-use and / or recycling to minimise the quantity of waste to be disposed of to landfill;
- proper storage and site practices to minimise the potential for damage or contamination of construction materials;
- plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste; and
- minimize over ordering of concrete, mortars and cement grout by doing careful check before ordering.

5.5.5 In addition to the above good site practices and waste reduction measures, specific mitigation measures are recommended for the identified waste to minimise environmental impacts during handling, transportation and disposal of these wastes.

General Refuse

5.5.6 General refuse should be stored in enclosed bins or compaction units separated from C&D materials. A reputable waste collector should be employed by the contractor for

regular removal of general refuse, separated from C&D materials. An enclosed and covered area is preferred to reduce the occurrence of windblown light material.

Construction and Demolition Material

5.5.7 The C&D material generated from the site formation should be sorted on-site into inert C&D material (that is, public fill) and non-inert C&D material. Non-inert C&D material, such as wood, plastic, steel and other metals should be reused or recycled and, as a last resort, disposed of to landfill.

5.5.8 A suitable area should be designated within the site for temporary stockpiling of C&D material and to facilitate the sorting process. Within stockpile areas, the following measures should be taken to control potential environmental impacts or nuisance:

- covering material during heavy rainfall;
- locating stockpiles to minimise potential air quality, water quality and visual impacts; and
- minimizing land intake of stockpile areas as far as possible.

5.5.9 When delivering C&D material to a public fill reception facility, it shall be noted that the material should only consist of soil, rock, concrete, brick, cement plaster/mortar, inert building debris, aggregates and asphalt. The material should be free from marine mud, household refuse, plastic, metals, industrial and chemical waste, animal and vegetable matter, and other material considered to be unsuitable by the Filling Supervisor.

Chemical Wastes

5.5.10 If chemical wastes are produced at the construction site, the Contractor would be required to register with the EPD as a Chemical Waste Producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Good quality containers compatible with the chemical wastes should be used. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosives, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor shall use a licensed collector to transport and dispose of the generated chemical wastes at the Chemical Waste Treatment Centre at Tsing Yi, or other licenced facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.

5.5.11 Due to the potential presence of ACM during the building demolition stage, asbestos investigation is required. An asbestos specialist shall be employed during the design and construction stage to investigate this issue. Sufficient and reasonable lead time shall be allowed for preparation, vetting and implementation of asbestos investigation report and asbestos abatement plan in accordance with Air Pollution Control Ordinance, Cap. 311, before commencement of any demolition or site clearance work.

5.5.12 Disposal of asbestos waste is controlled under the Waste Disposal Ordinance which governs its packaging, labelling, storage, collection and disposal. The asbestos waste, if any, shall be disposed of by a licensed waste collector in compliance with the Waste Disposal Ordinance.

5.5.13 Asbestos wastes, if identified, should be handled in accordance with the Code of Practice on the Handling, Transportation and Disposal of Asbestos Waste. Also, the key precautionary measures related to the handling and disposal of asbestos specified in the Handling of Asbestos Containing Materials in Buildings (ProPECC PN 2/97) listed below should be undertaken as far as practicable to minimize the associated environmental impact and hazards:

- Adoption of protection, such as full containment, mini containment, or segregation of work area;
- Provision of decontamination facilities for cleaning of workings, equipment and bagged waste before leaving the work area;
- Adoption of engineering control techniques to prevent fibre release from work area, such as use of negative pressure equipment with high efficiency particulate air (HEPA) filters to control air flow between the work area and the outside environment;
- Wetting of asbestos containing materials before and during disturbance, minimising the breakage and dropping of asbestos containing materials, and packing of debris and waste immediately after it is produced;
- Cleaning of work area by wet wiping and vacuuming with HEPA filtered vacuum cleaner;
- Coating on any surfaces previously in contact with or contained by asbestos with a sealant;
- Proper bagging, safe storage and disposal of asbestos and asbestos contaminated waste;
- Pre-treatment of all effluent from the work area before discharged; and
- Air monitoring strategy to check the leakage and clearance of the work area during and after the asbestos work.

Operation Phase

5.5.14 General refuse generated from the Proposed Development should be collected on a daily basis and delivered to the refuse collection point accordingly. A reputable waste collector should be employed to remove general refuse on a daily basis to avoid odour nuisance or pest/vermin problem. Adequate recycling containers are recommended to be provided at suitable locations of the Proposed Development to facilitate recycling of waste such as aluminium cans, plastics and wastepaper.

5.5.15 As for the operational phase, given that only a limited amount of waste will be generated from the Proposed Development, with the implementation of the aforementioned good waste management practices, no adverse environmental impact associated with waste is anticipated.

5.6 Environmental Audit

5.6.1 The recommended mitigation measures should be included in the Works Contract. During construction of the Proposed Development, site inspection and audit should be carried out periodically ensure that waste generated is properly managed in accordance with the prescribed waste management procedures. The audit should examine all aspects of waste management, including waste generation, storage, recycling, treatment, transportation, and disposal. General site inspections should be conducted to ensure construction activities to be carried out in compliance with the appropriate environmental protection and pollution control measures.

6. OVERALL CONCLUSION

6.1.1 An environmental assessment has been conducted for the Proposed Development in the aspects of air quality, noise, water quality and waste management in accordance with relevant legislations and guidelines.

6.1.2 Environmental sensitive uses and sources of environmental impacts have been identified. Potential environmental impacts on the sensitive uses have been assessed with mitigation measures proposed as appropriate to minimize the potential environmental impacts.

6.1.3 With the recommended mitigation measures in place, no adverse environmental impacts are anticipated from the construction and operation of the Proposed Development.

Figures

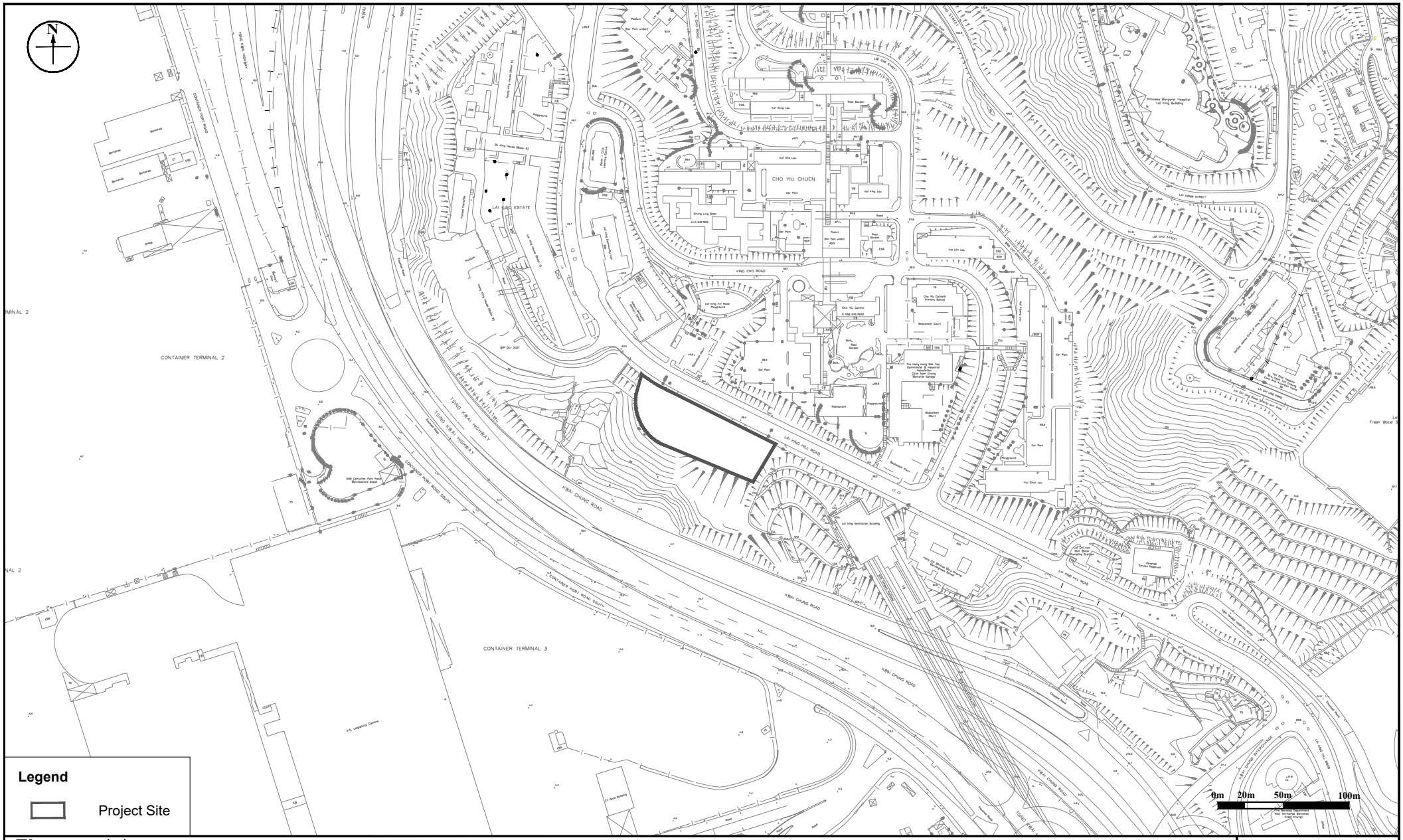

Figure: 1.1

Title: Location of the Project Site and Its Environs

Project: Proposed Minor Relaxation of Building Height Restriction for the Permitted Social Welfare Facility (Redevelopment of The Salvation Army Lai King Home) at Nos. 200 - 210 Lai King Hill Road, Kwai Chung, New Territories - S16 Planning Application

RAMBOLL

Drawn by: VS

Checked by: KY

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Date: Aug 2023

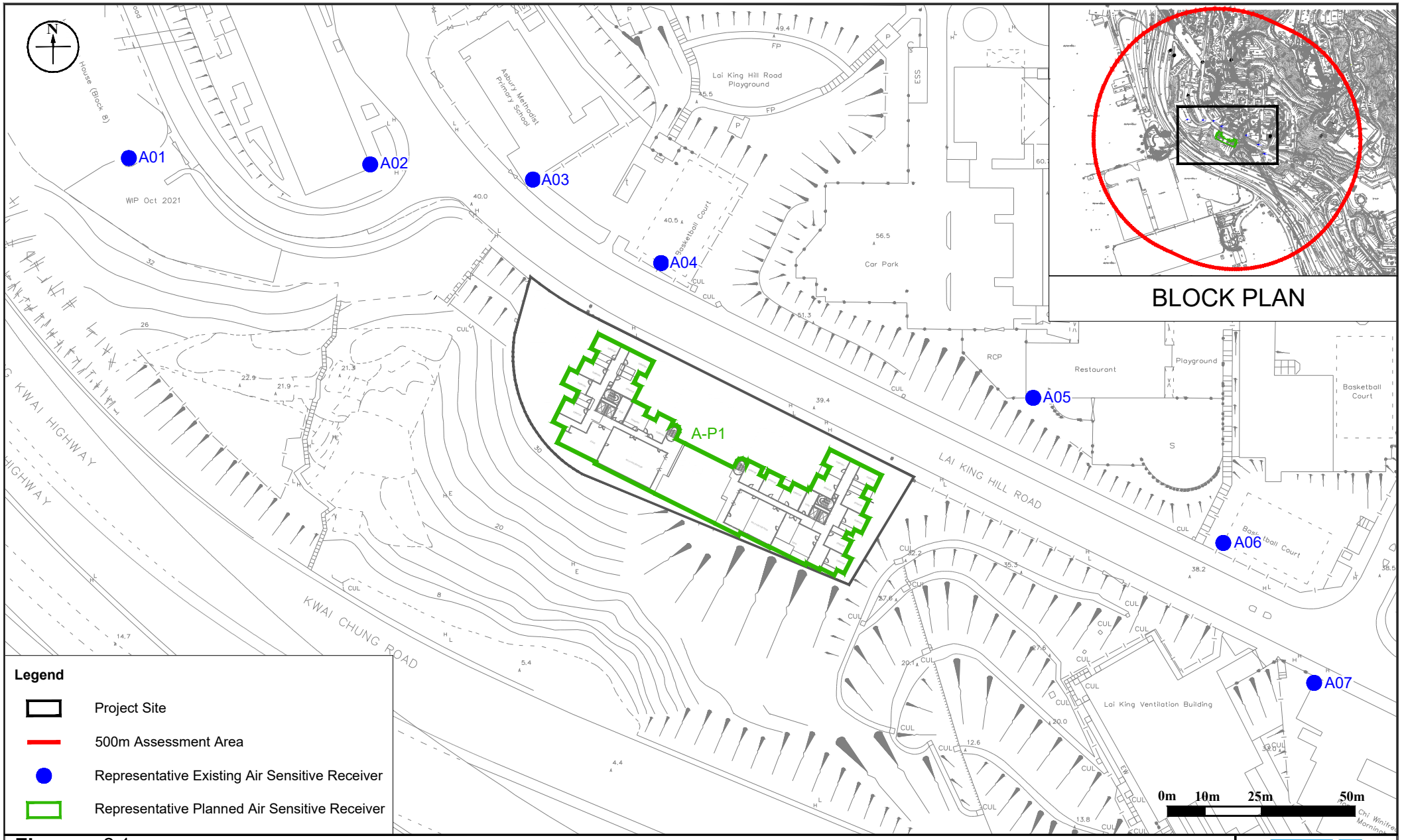

Figure: 2.1

Title: Location of Representative Air Sensitive Receivers

Project: Proposed Minor Relaxation of Building Height Restriction for the Permitted Social Welfare Facility (Redevelopment of The Salvation Army Lai King Home) at Nos. 200 - 210 Lai King Hill Road, Kwai Chung, New Territories - S16 Planning Application

RAMBOLL

Drawn by: VS

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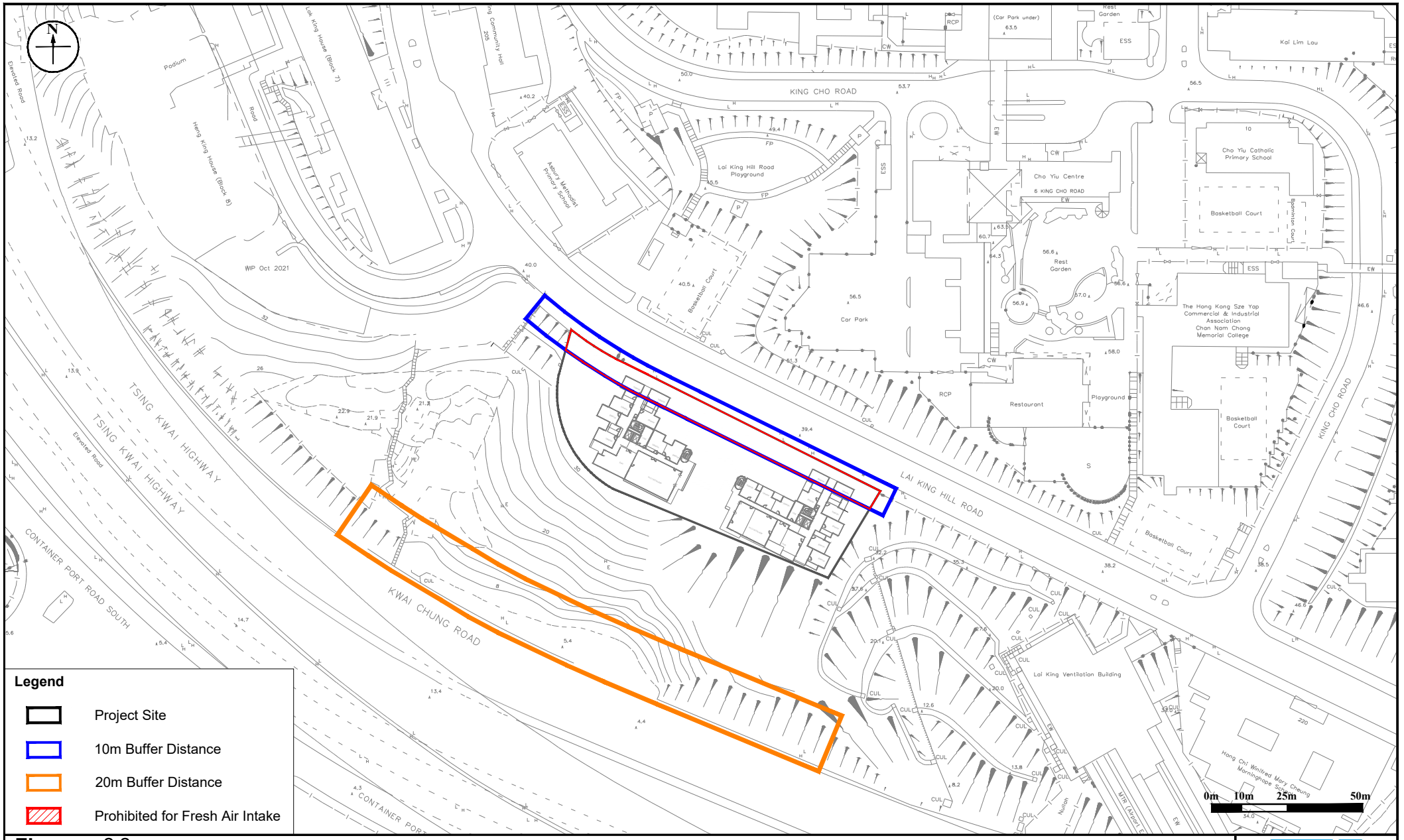

Figure: 2.2

Title: Horizontal Buffer Distances Between Road Kerb and the Project Site

Project: Proposed Minor Relaxation of Building Height Restriction for the Permitted Social Welfare Facility (Redevelopment of The Salvation Army Lai King Home) at Nos. 200 - 210 Lai King Hill Road, Kwai Chung, New Territories - S16 Planning Application

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Figure: 3.1

Title: Noise Impact Assessment Area

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Date: Aug 2023

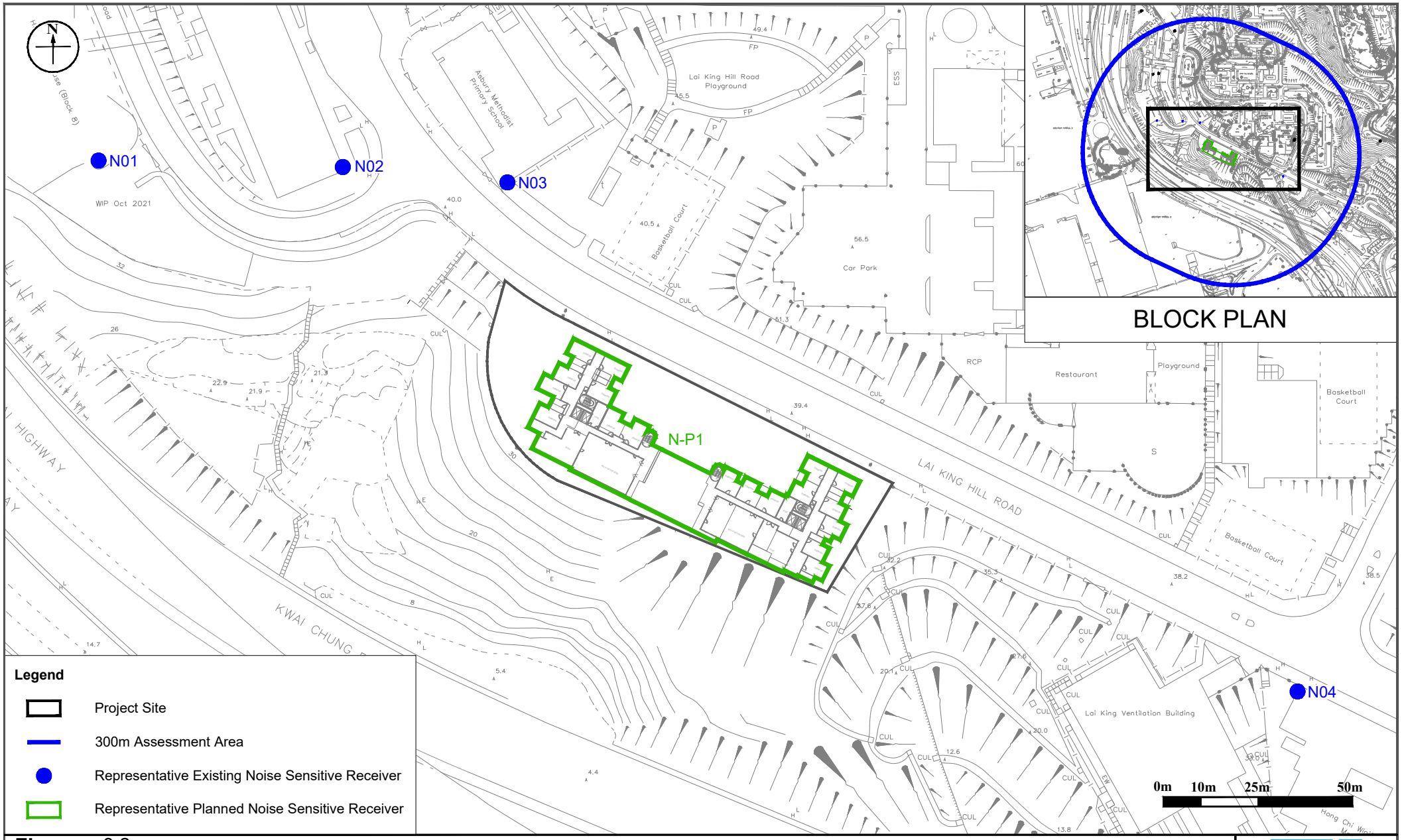

Figure: 3.2

Title: Location of Representative Noise Sensitive Receivers for Construction Phase

Project: Proposed Minor Relaxation of Building Height Restriction for the Permitted Social Welfare Facility (Redevelopment of The Salvation Army Lai King Home) at Nos. 200 - 210 Lai King Hill Road, Kwai Chung, New Territories - S16 Planning Application

RAMBOLL

Drawn by: VS
Checked by: KY
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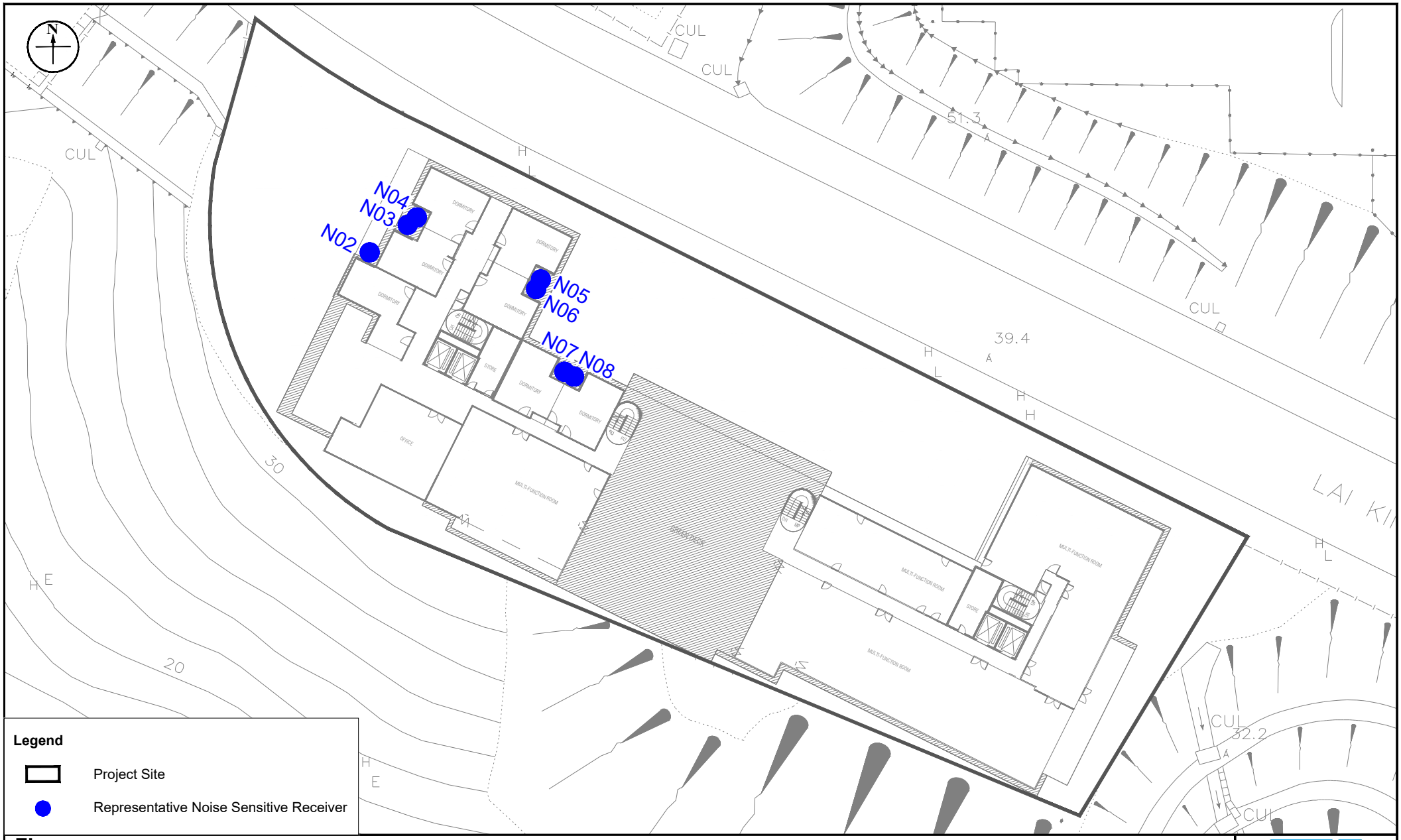

Figure: 3.3a

Title: Representative Noise Sensitive Receivers for Traffic Noise Impact Assessment (1/F)

Project: Proposed Minor Relaxation of Building Height Restriction for the Permitted Social Welfare Facility (Redevelopment of The Salvation Army Lai King Home) at Nos. 200 - 210 Lai King Hill Road, Kwai Chung, New Territories - S16 Planning Application

RAMBOLL

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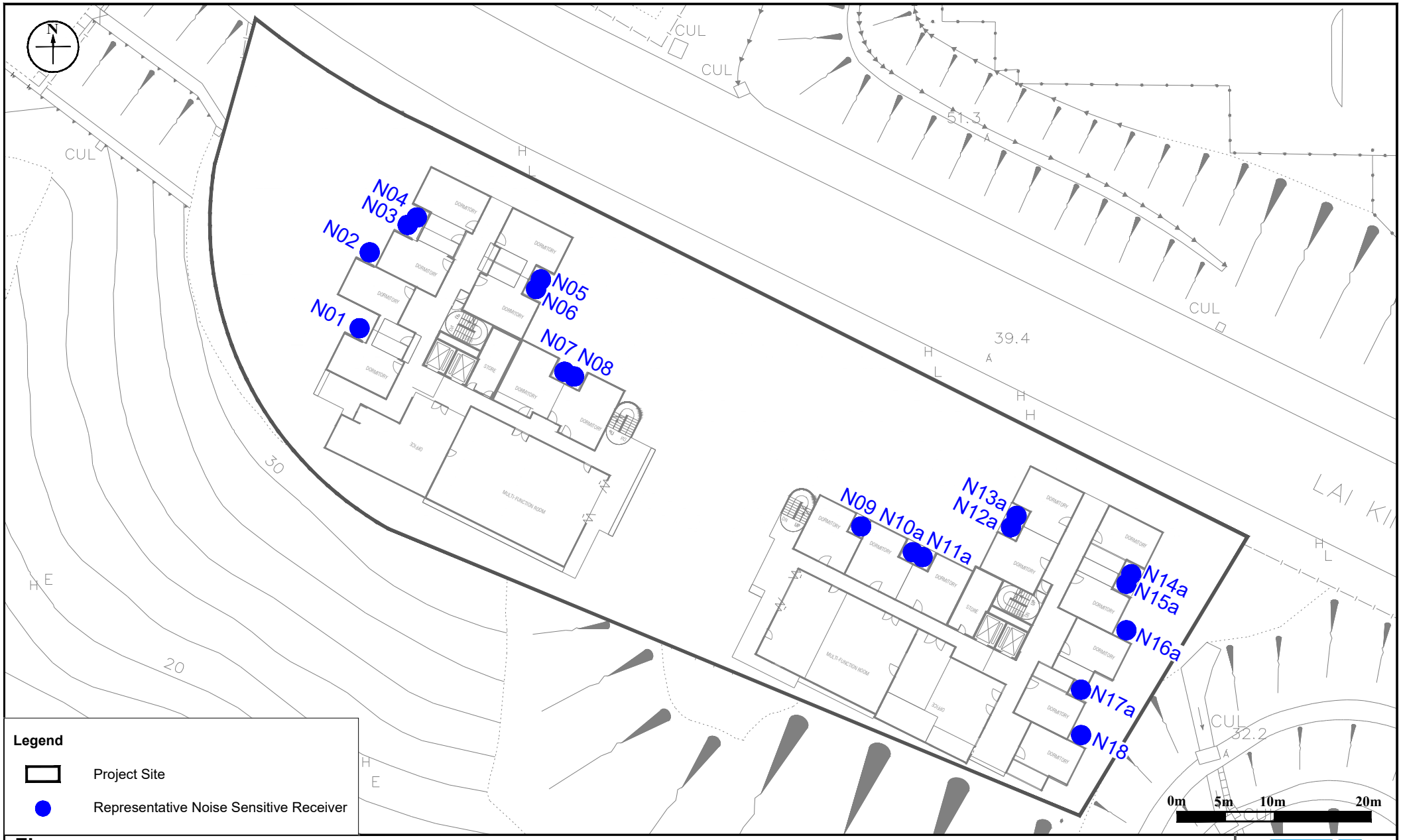

Figure: 3.3b	RAMBOLL
Title: Representative Noise Sensitive Receivers for Traffic Noise Impact Assessment (2/F)	Drawn by: VS Checked by: KY
Project: Proposed Minor Relaxation of Building Height Restriction for the Permitted Social Welfare Facility (Redevelopment of The Salvation Army Lai King Home) at Nos. 200 - 210 Lai King Hill Road, Kwai Chung, New Territories - S16 Planning Application	Rev.: 2.0 Date: Aug 2023

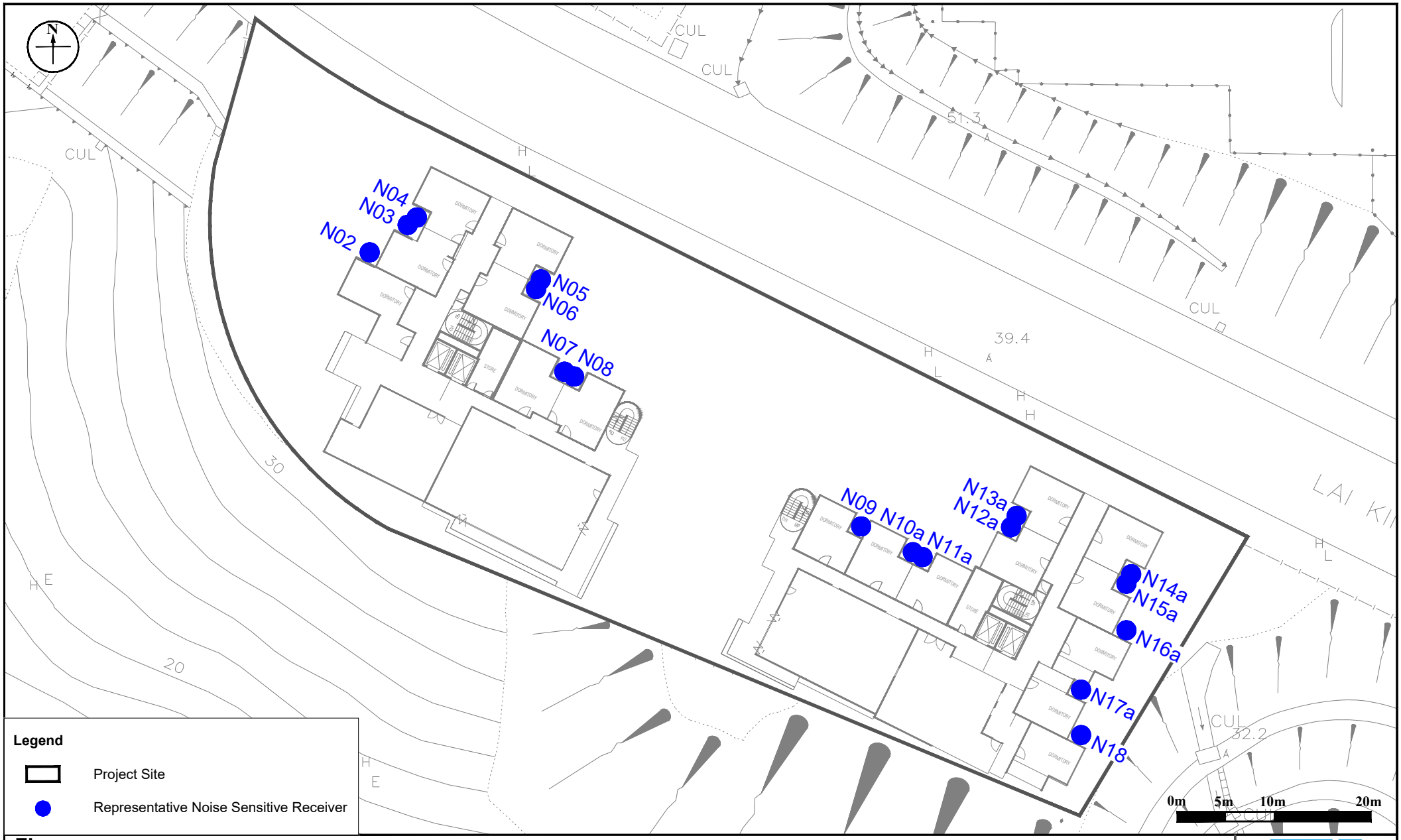

Figure: 3.3c	RAMBOLL
Title: Representative Noise Sensitive Receivers for Traffic Noise Impact Assessment (3/F)	Drawn by: VS Checked by: KY
Project: Proposed Minor Relaxation of Building Height Restriction for the Permitted Social Welfare Facility (Redevelopment of The Salvation Army Lai King Home) at Nos. 200 - 210 Lai King Hill Road, Kwai Chung, New Territories - S16 Planning Application	Rev.: 2.0 Date: Aug 2023

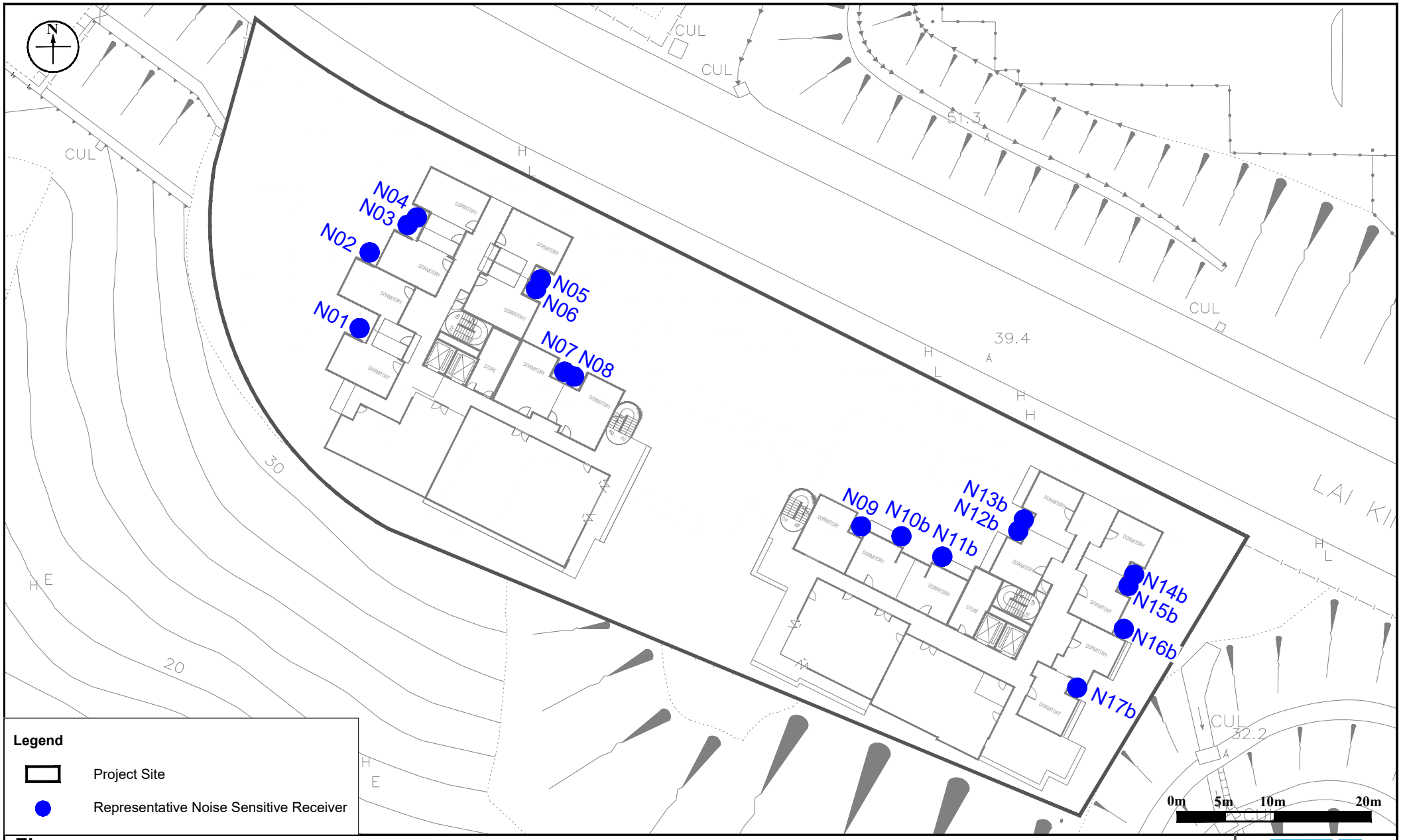

Figure: 3.3d	RAMBOLL
Title: Representative Noise Sensitive Receivers for Traffic Noise Impact Assessment (4/F)	Drawn by: VS Checked by: KY
Project: Proposed Minor Relaxation of Building Height Restriction for the Permitted Social Welfare Facility (Redevelopment of The Salvation Army Lai King Home) at Nos. 200 - 210 Lai King Hill Road, Kwai Chung, New Territories - S16 Planning Application	Rev.: 2.0 Date: Aug 2023

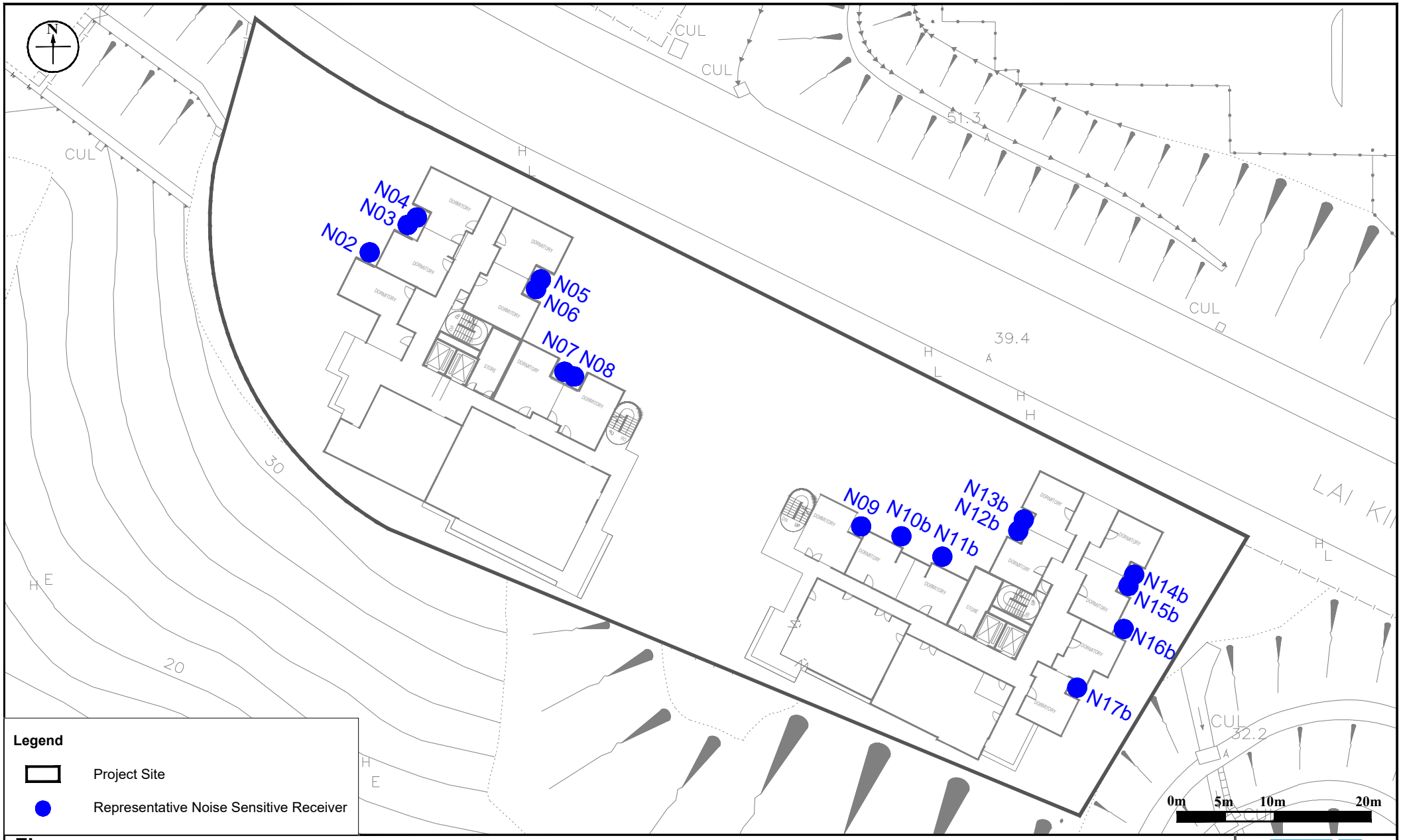

Figure: 3.3e

Title: Representative Noise Sensitive Receivers for Traffic Noise Impact Assessment (5/F)

Project: Proposed Minor Relaxation of Building Height Restriction for the Permitted Social Welfare Facility (Redevelopment of The Salvation Army Lai King Home) at Nos. 200 - 210 Lai King Hill Road, Kwai Chung, New Territories - S16 Planning Application

RAMBOLL

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Date: Aug 2023

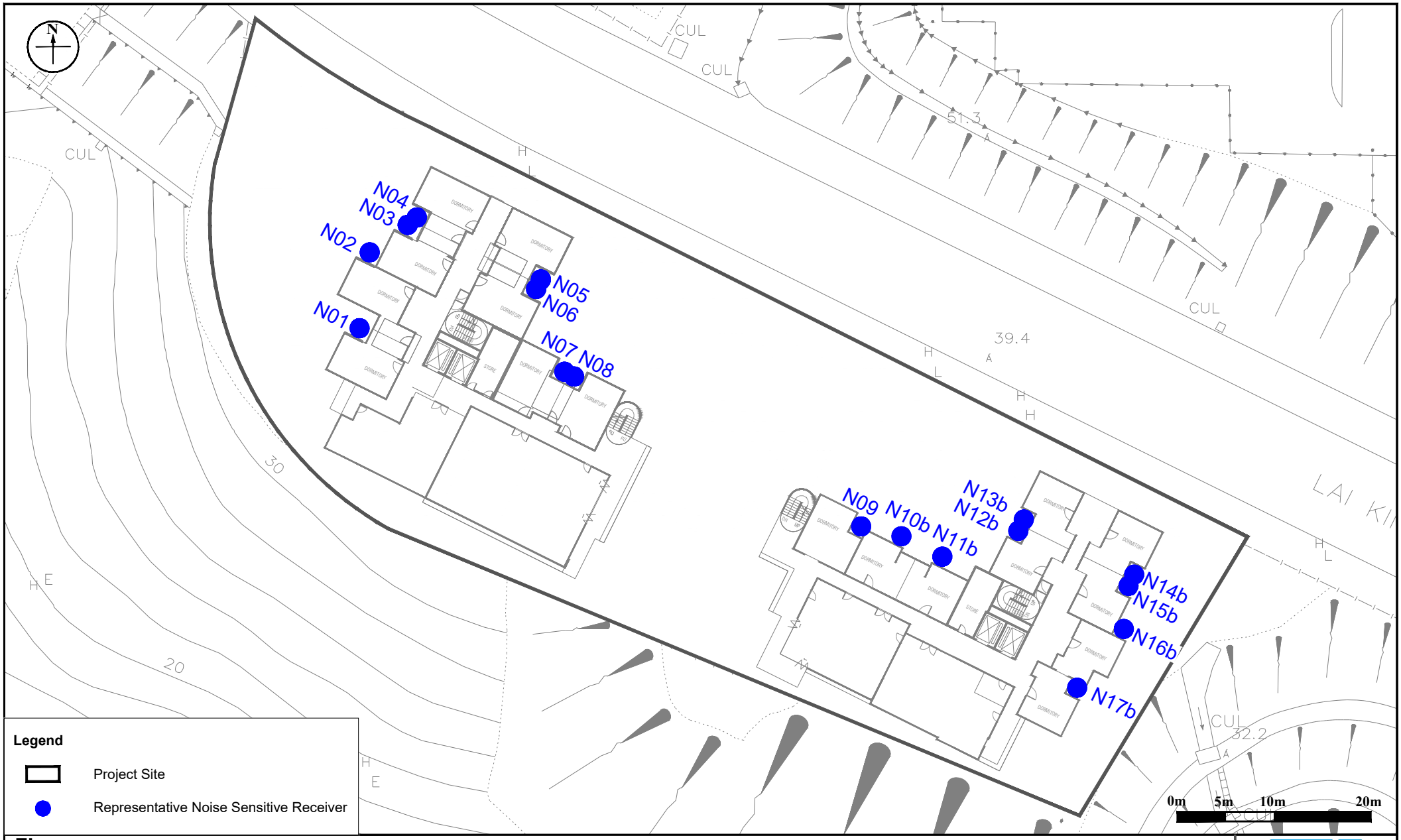

Figure: 3.3f	RAMBOLL
Title: Representative Noise Sensitive Receivers for Traffic Noise Impact Assessment (6/F)	Drawn by: VS Checked by: KY
Project: Proposed Minor Relaxation of Building Height Restriction for the Permitted Social Welfare Facility (Redevelopment of The Salvation Army Lai King Home) at Nos. 200 - 210 Lai King Hill Road, Kwai Chung, New Territories - S16 Planning Application	Rev.: 2.0 Date: Aug 2023

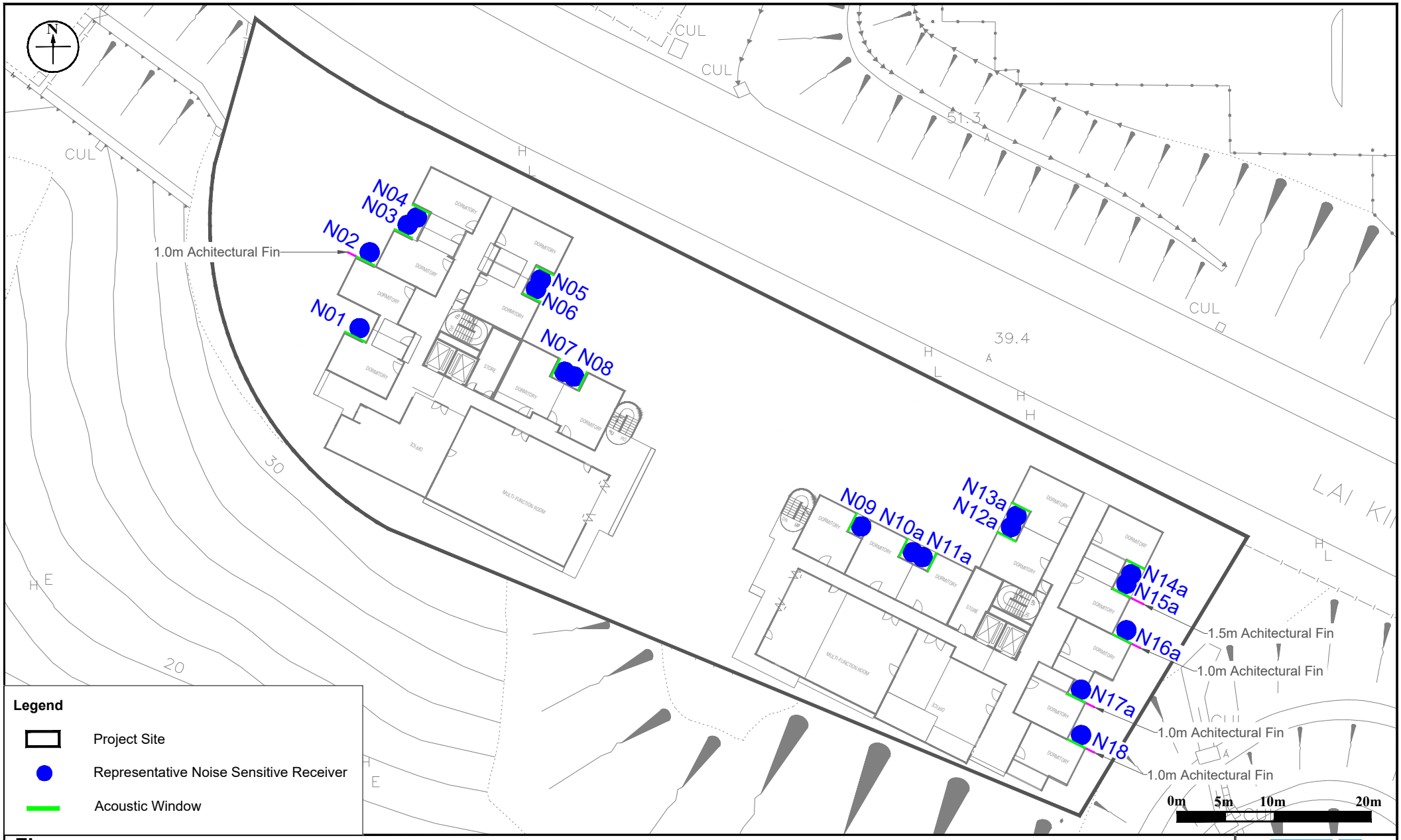

Figure: 3.4a

Title: Proposed Location of Road Traffic Noise Mitigation Measures (1F, 2F & 3F)

Project: Proposed Minor Relaxation of Building Height Restriction for the Permitted Social Welfare Facility (Redevelopment of The Salvation Army Lai King Home) at Nos. 200 - 210 Lai King Hill Road, Kwai Chung, New Territories - S16 Planning Application

RAMBOLL

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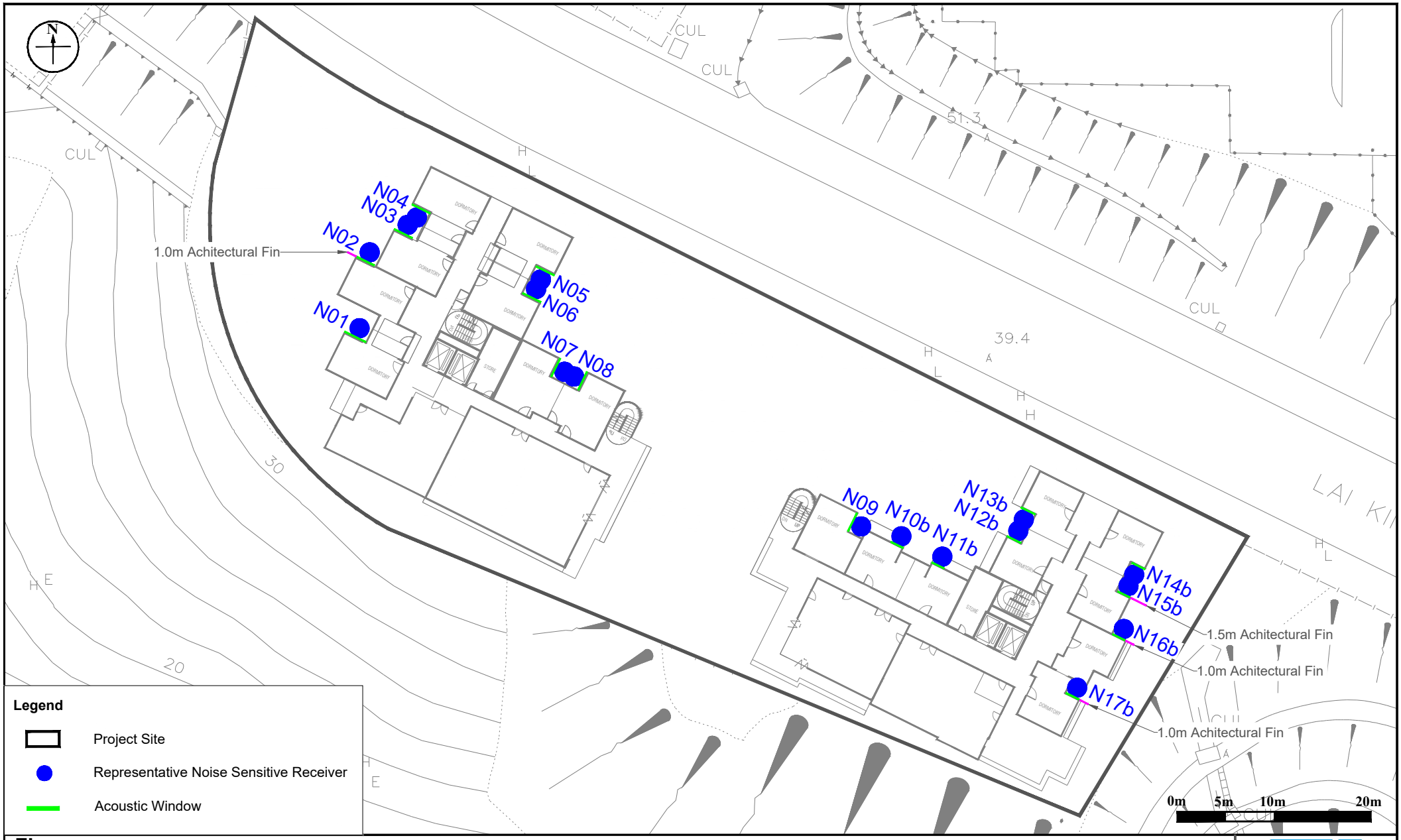

Figure: 3.4b

Title: Proposed Location of Road Traffic Noise Mitigation Measures (4F, 5F & 6F)

RAMBOLL

Drawn by: VS

Checked by: KY

Project: Proposed Minor Relaxation of Building Height Restriction for the Permitted Social Welfare Facility (Redevelopment of The Salvation Army Lai King Home) at Nos. 200 - 210 Lai King Hill Road, Kwai Chung, New Territories - S16 Planning Application

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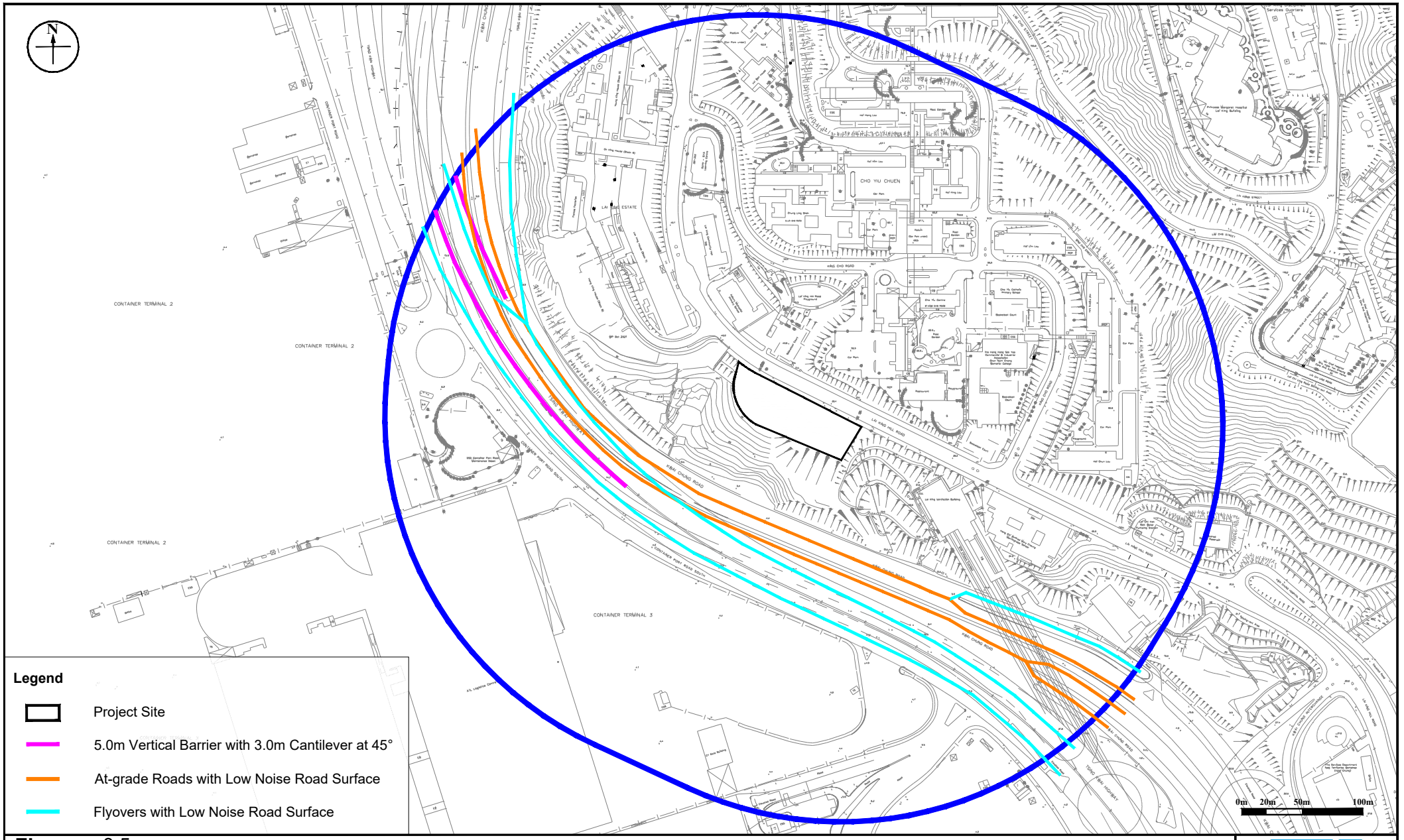

Figure: 3.5

Title: Locations, Extent and Height of Existing Noise Mitigation Measures

Project: Proposed Minor Relaxation of Building Height Restriction for the Permitted Social Welfare Facility (Redevelopment of The Salvation Army Lai King Home) at Nos. 200 - 210 Lai King Hill Road, Kwai Chung, New Territories - S16 Planning Application

RAMBOLL

Drawn by: VS

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Date: Aug 2023

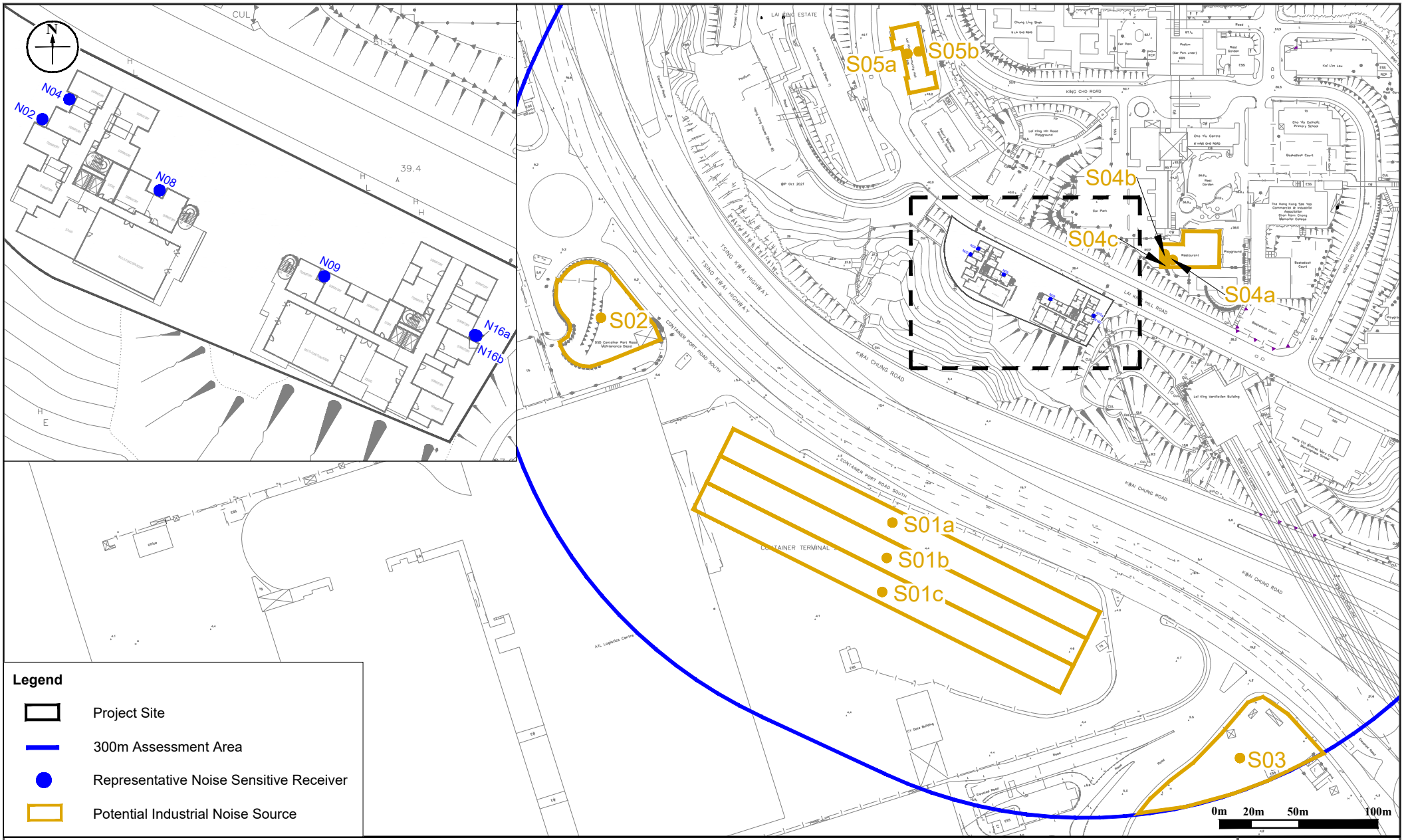

Figure: 3.6

Title: Location of Industrial Noise Sources and Representative Noise Sensitive Receivers

Project: Proposed Minor Relaxation of Building Height Restriction for the Permitted Social Welfare Facility (Redevelopment of The Salvation Army Lai King Home) at Nos. 200 - 210 Lai King Hill Road, Kwai Chung, New Territories - S16 Planning Application

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Drawn by: VS

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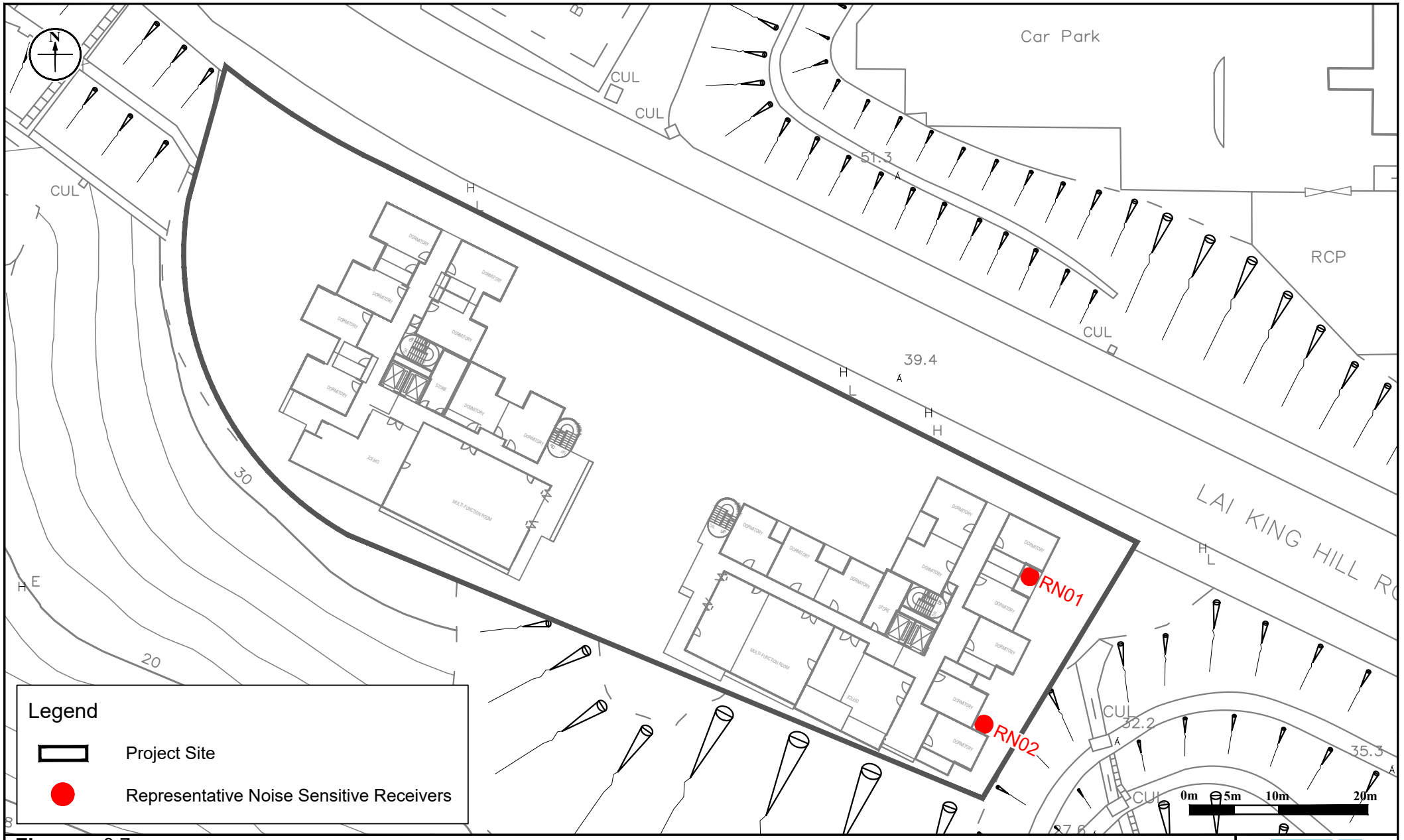

Figure: 3.7a	RAMBOLL
Title: Representative Noise Sensitive Receivers for Rail Noise Impact Assessment (2/F)	Drawn by: EC Checked by: KY
Project: Proposed Minor Relaxation of Building Height Restriction for the Permitted Social Welfare Facility (Redevelopment of The Salvation Army Lai King Home) at Nos. 200 - 210 Lai King Hill Road, Kwai Chung, New Territories - S16 Planning Application	Rev.: 3.0 Date: Nov 2023

Figure: 3.7b	RAMBOLL
Title: Representative Noise Sensitive Receivers for Rail Noise Impact Assessment (3/F)	Drawn by: EC Checked by: KY
Project: Proposed Minor Relaxation of Building Height Restriction for the Permitted Social Welfare Facility (Redevelopment of The Salvation Army Lai King Home) at Nos. 200 - 210 Lai King Hill Road, Kwai Chung, New Territories - S16 Planning Application	Rev.: 3.0 Date: Nov 2023

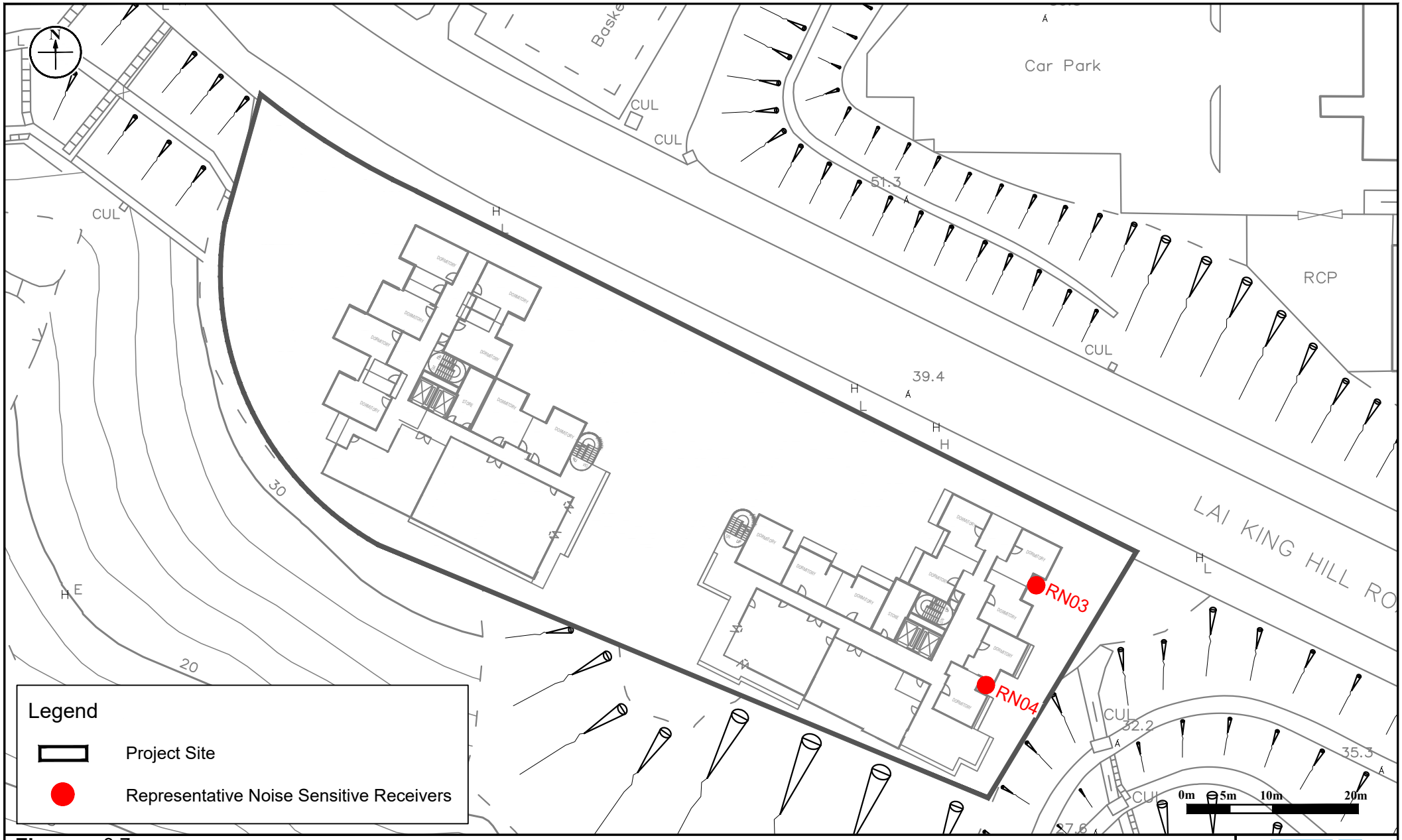

Figure: 3.7c	RAMBOLL
Title: Representative Noise Sensitive Receivers for Rail Noise Impact Assessment (4/F)	Drawn by: EC Checked by: KY
Project: Proposed Minor Relaxation of Building Height Restriction for the Permitted Social Welfare Facility (Redevelopment of The Salvation Army Lai King Home) at Nos. 200 - 210 Lai King Hill Road, Kwai Chung, New Territories - S16 Planning Application	Rev.: 3.0 Date: Nov 2023

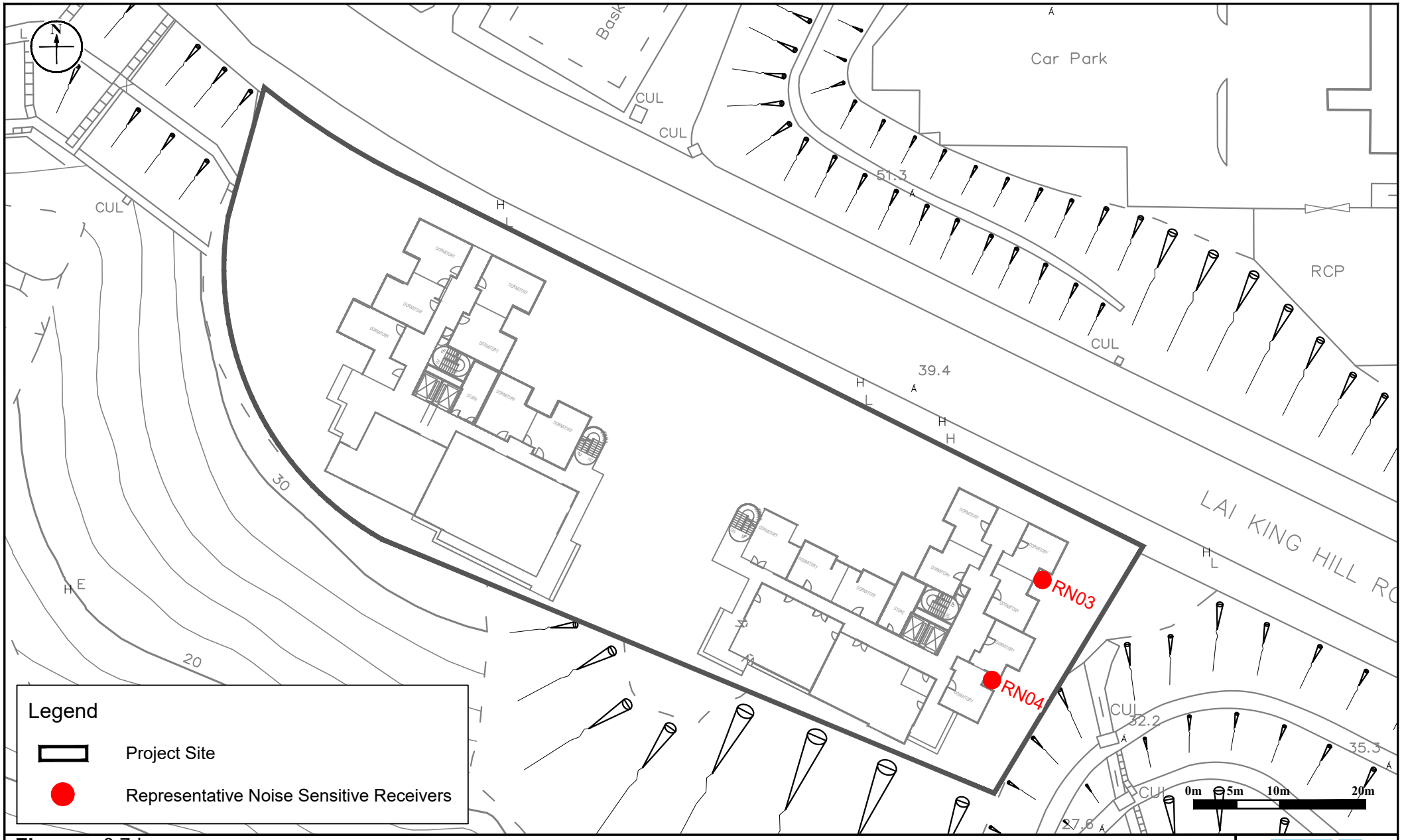

Figure: 3.7d

Title: Representative Noise Sensitive Receivers for Rail Noise Impact Assessment (5/F)

Project: Proposed Minor Relaxation of Building Height Restriction for the Permitted Social Welfare Facility (Redevelopment of The Salvation Army Lai King Home) at Nos. 200 - 210 Lai King Hill Road, Kwai Chung, New Territories - S16 Planning Application

RAMBOLL

Drawn by: EC

Checked by: KY

Rev.: 3.0

Date: Nov 2023

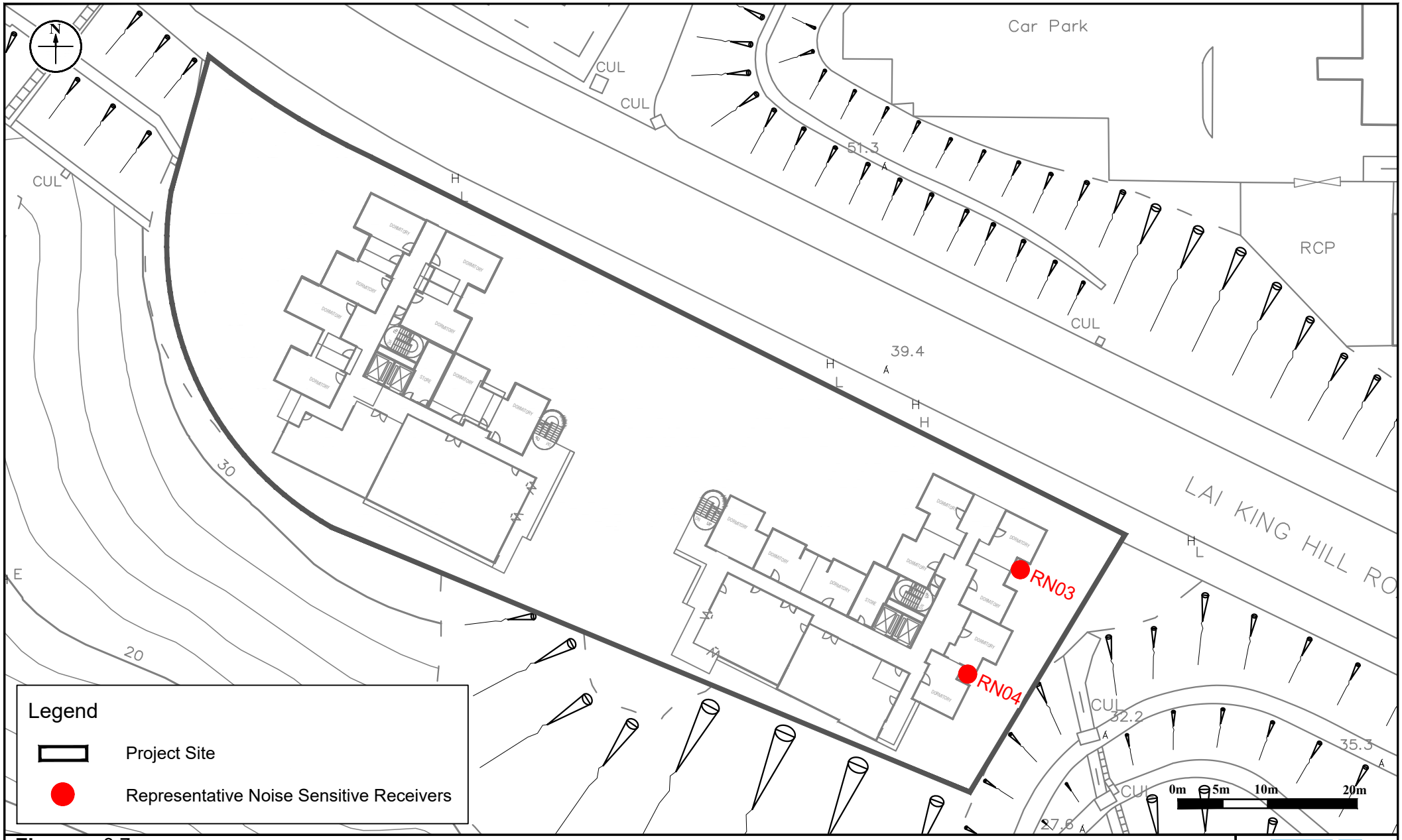

Figure: 3.7e	RAMBOLL
Title: Representative Noise Sensitive Receivers for Rail Noise Impact Assessment (6/F)	Drawn by: EC Checked by: KY
Project: Proposed Minor Relaxation of Building Height Restriction for the Permitted Social Welfare Facility (Redevelopment of The Salvation Army Lai King Home) at Nos. 200 - 210 Lai King Hill Road, Kwai Chung, New Territories - S16 Planning Application	Rev.: 3.0 Date: Nov 2023

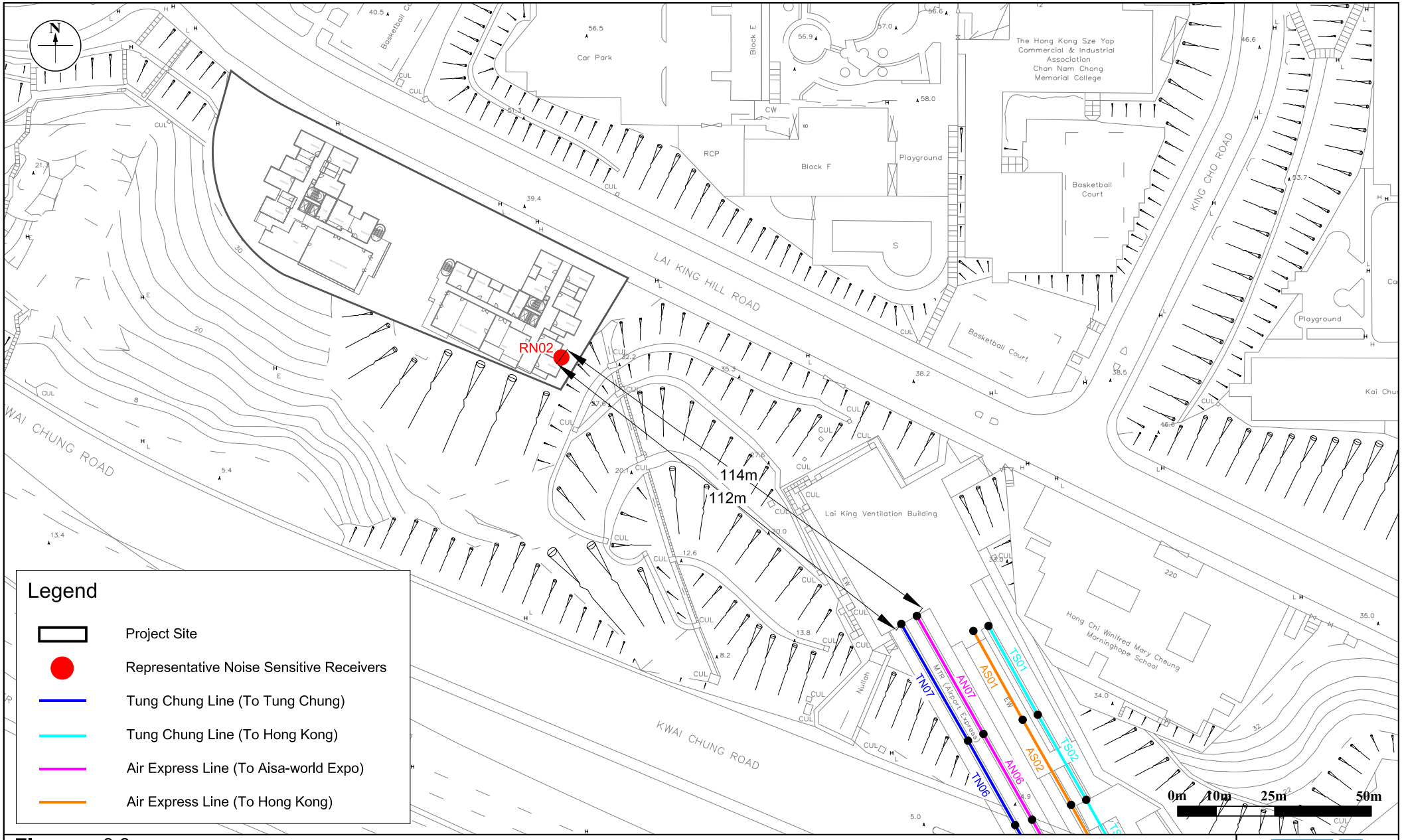

Figure: 3.8

Title: Horizontal Distance between Representative Noise Sensitive Receiver and Railway Track

Project: Proposed Minor Relaxation of Building Height Restriction for the Permitted Social Welfare Facility (Redevelopment of The Salvation Army Lai King Home) at Nos. 200 - 210 Lai King Hill Road, Kwai Chung, New Territories - S16 Planning Application

RAMBOLL

Drawn by: EC

Checked by: KY

Rev.: 3.0

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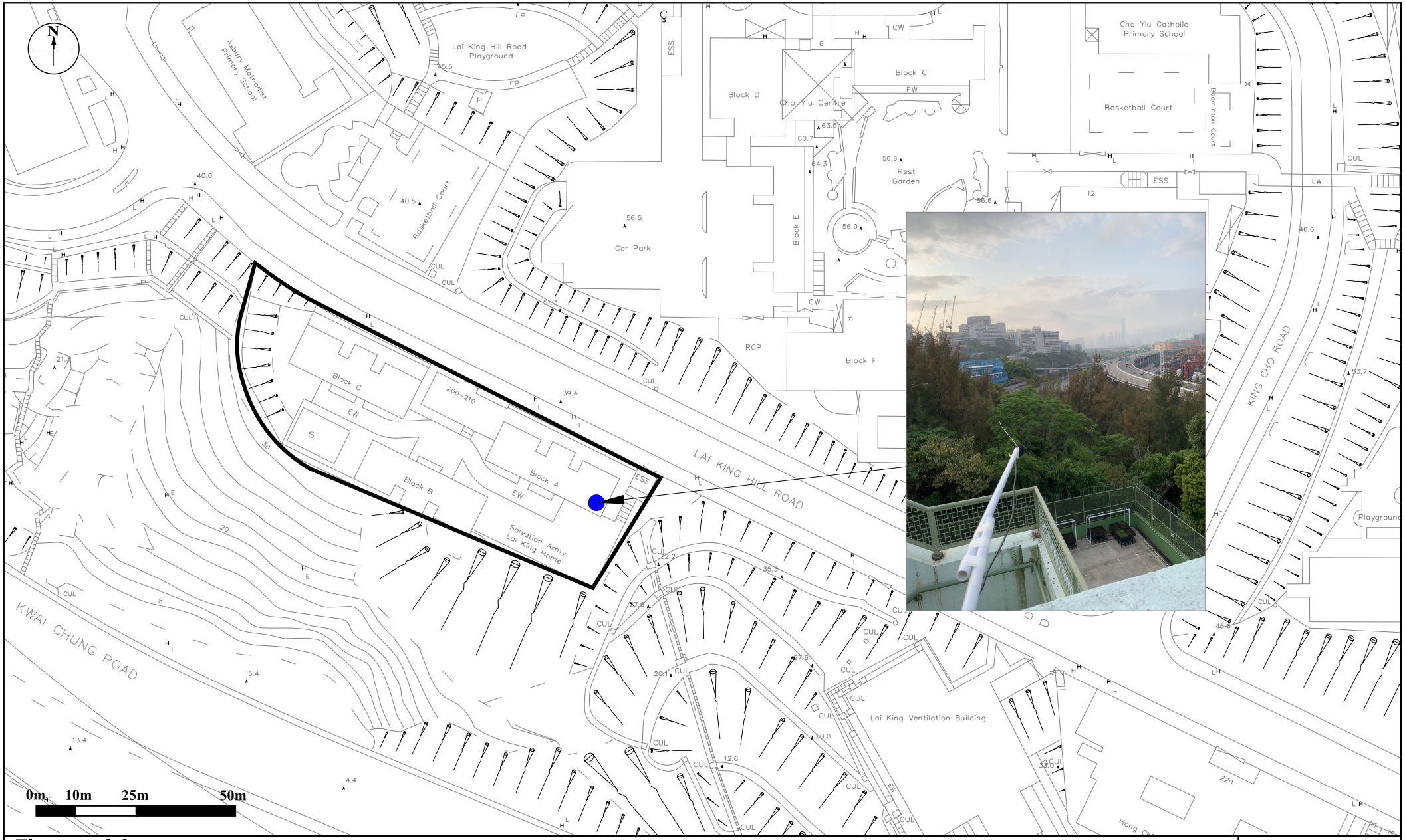


Figure: 3.9	RAMBOLL
Title: Location of On-site Railway Noise Measurement at Project Site	Drawn by: EC Checked by: KY
Project: Proposed Minor Relaxation of Building Height Restriction for the Permitted Social Welfare Facility (Redevelopment of The Salvation Army Lai King Home) at Nos. 200 - 210 Lai King Hill Road, Kwai Chung, New Territories - S16 Planning Application	Rev.: 3.0 Date: Nov 2023

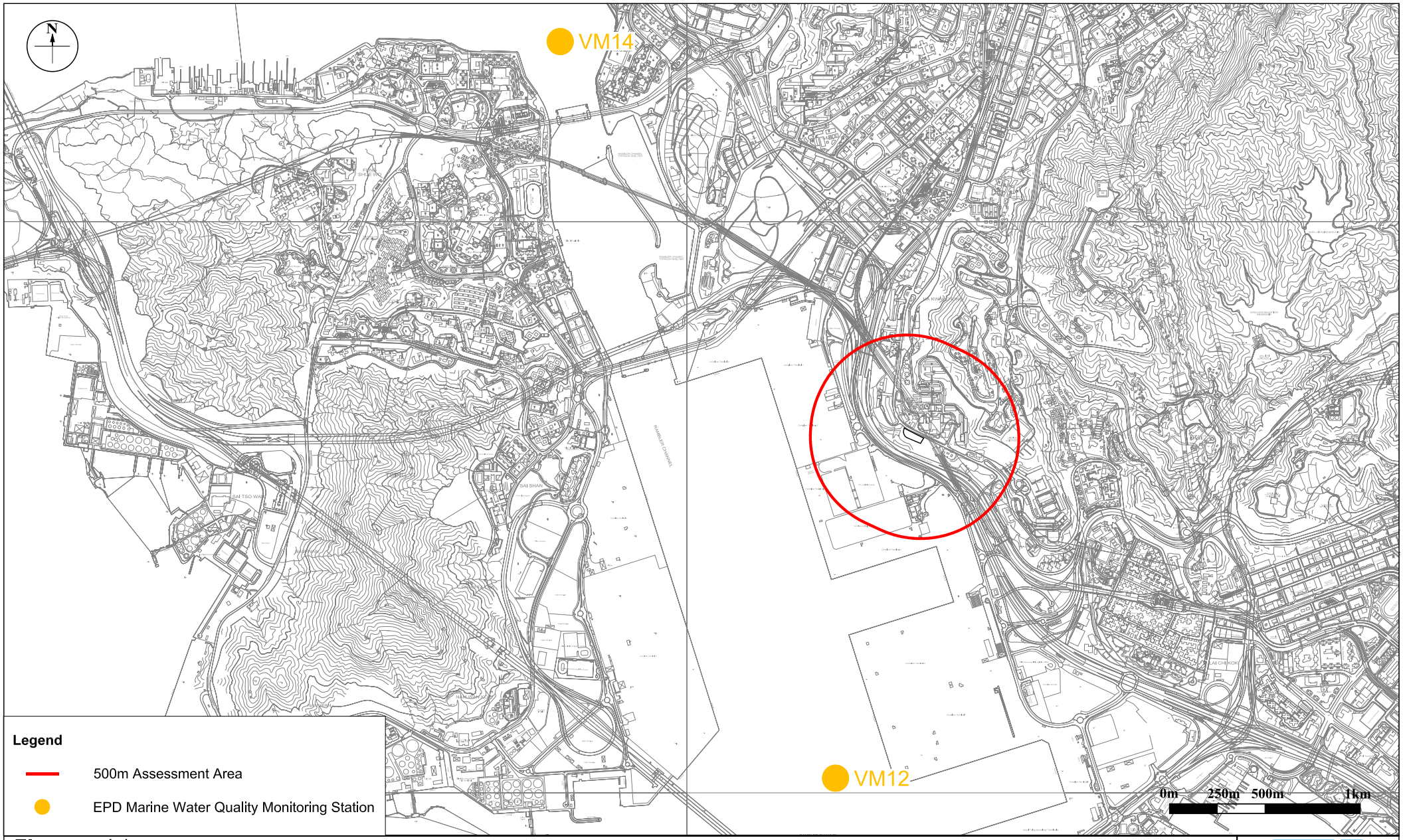


Figure: 4.1

Title: Locations of EPD's Marine Water Quality Monitoring Stations

Project: Proposed Minor Relaxation of Building Height Restriction for the Permitted Social Welfare Facility (Redevelopment of The Salvation Army Lai King Home) at Nos. 200 - 210 Lai King Hill Road, Kwai Chung, New Territories - S16 Planning Application

RAMBOLL

Drawn by: SM

Checked by: KY

Rev.: 1.0

Date: Jul 2022

Figure: 4.2

Title: Locations of Water Sensitive Receivers

Project: Proposed Minor Relaxation of Building Height Restriction for the Permitted Social Welfare Facility (Redevelopment of The Salvation Army Lai King Home) at Nos. 200 - 210 Lai King Hill Road, Kwai Chung, New Territories - S16 Planning Application

RAMBOLL

Drawn by: SM

Checked by: KY

Rev.: 1.0

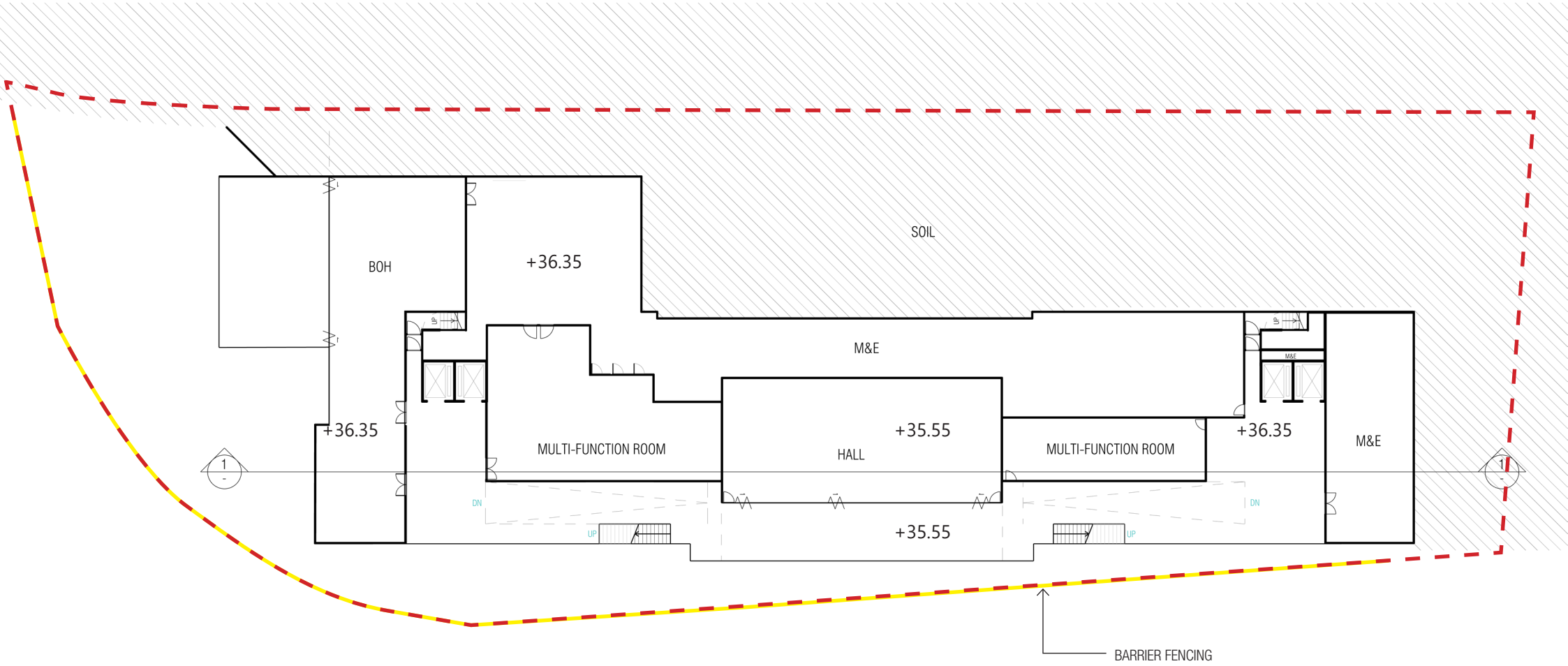
Date: Jul 2022

Appendix

Appendix 1.1 Indicative Layout Plan of the Proposed Development

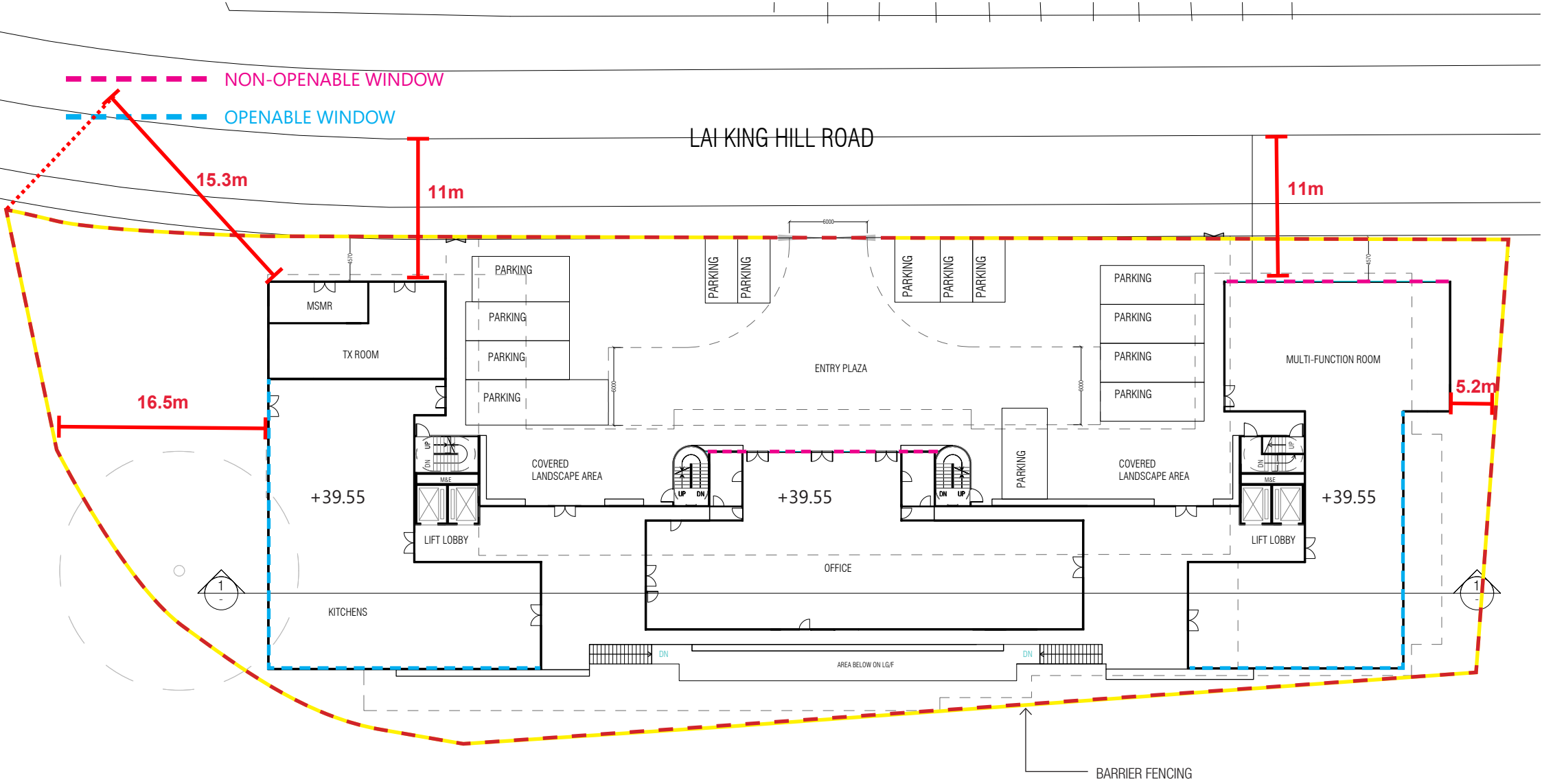
NON-OPENABLE WINDOW

OPENABLE WINDOW



1 GENERAL LAYOUT PLAN - LG/F

Scale 1:400@A4

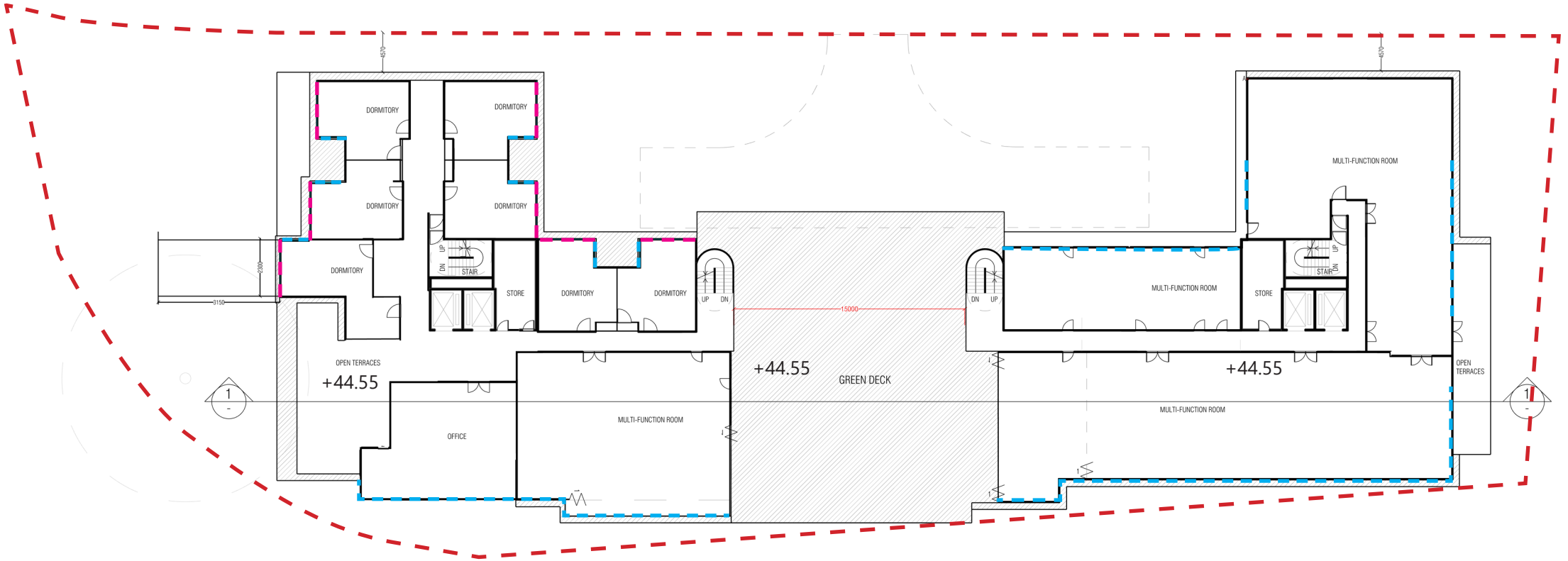


1 GENERAL LAYOUT PLAN - G/F

Scale 1:400@A4

NON-OPENABLE WINDOW

OPENABLE WINDOW

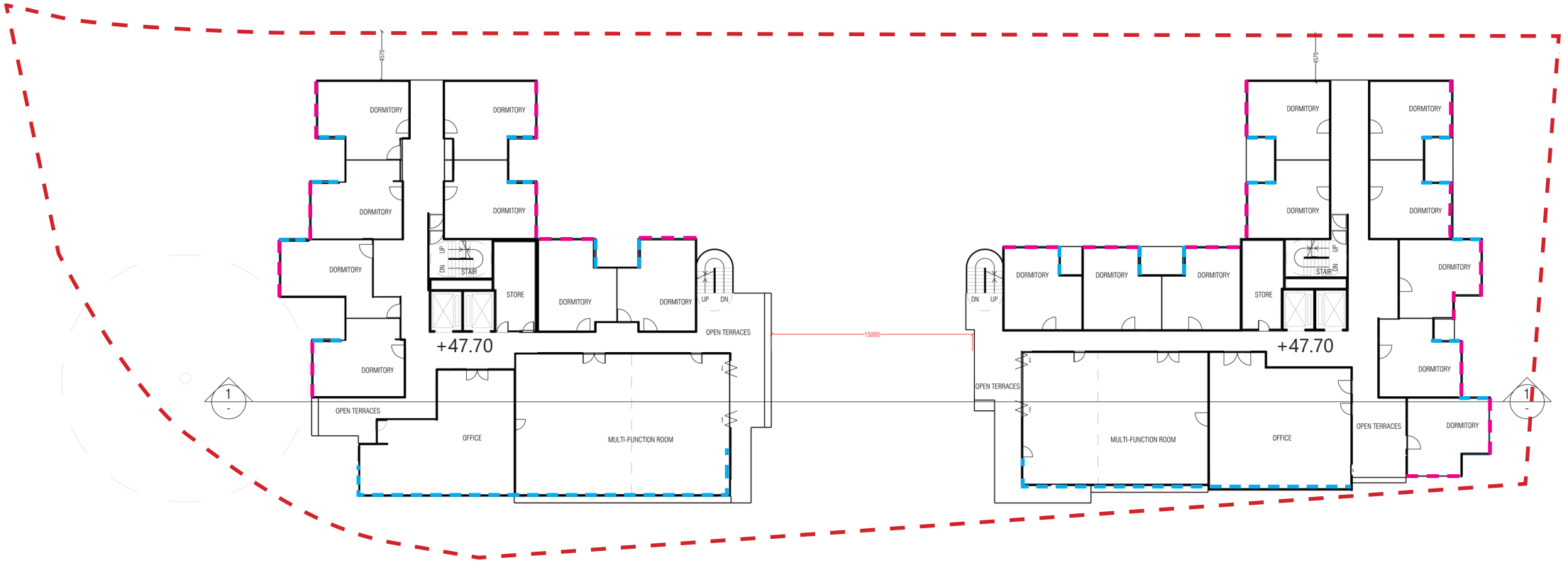


1 GENERAL LAYOUT PLAN - 1/F (HSMH & DAC & IV)

Scale 1:400@A4

NON-OPENABLE WINDOW

OPENABLE WINDOW



BLOCK 2

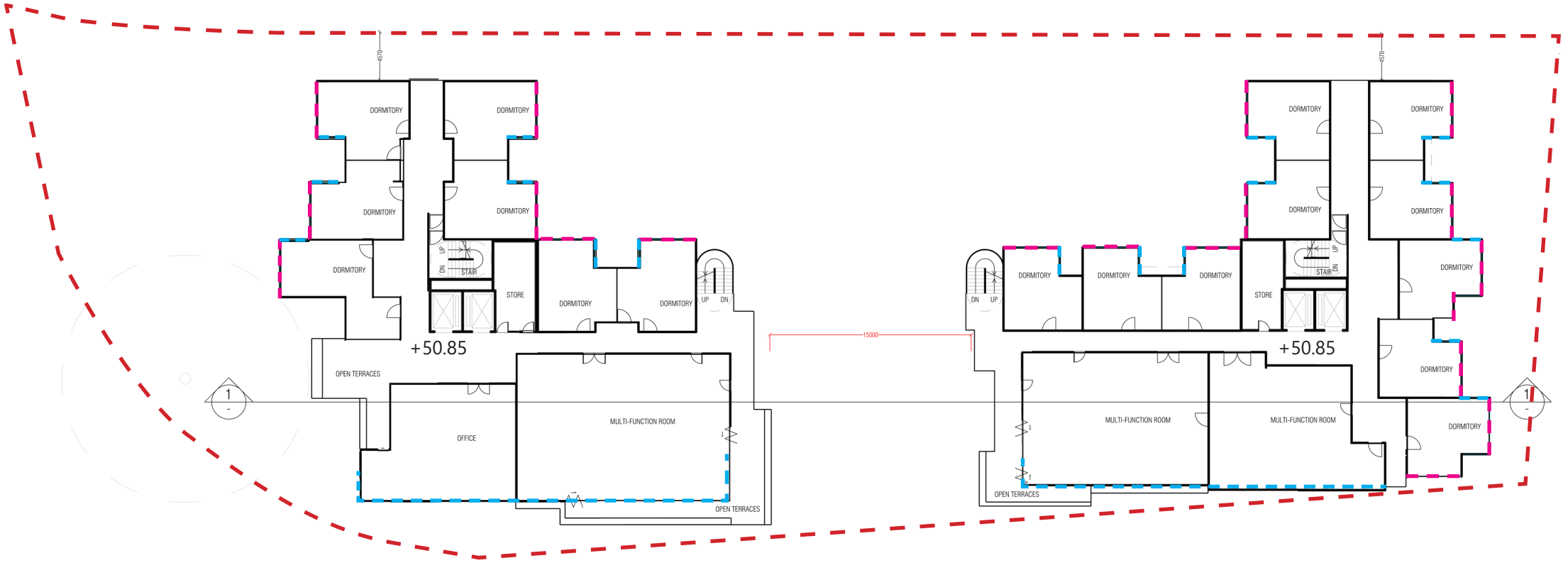
BLOCK 1

1 GENERAL LAYOUT PLAN - 2/F (HSMH & HMMH)

Scale 1:400@A4

NON-OPENABLE WINDOW

OPENABLE WINDOW

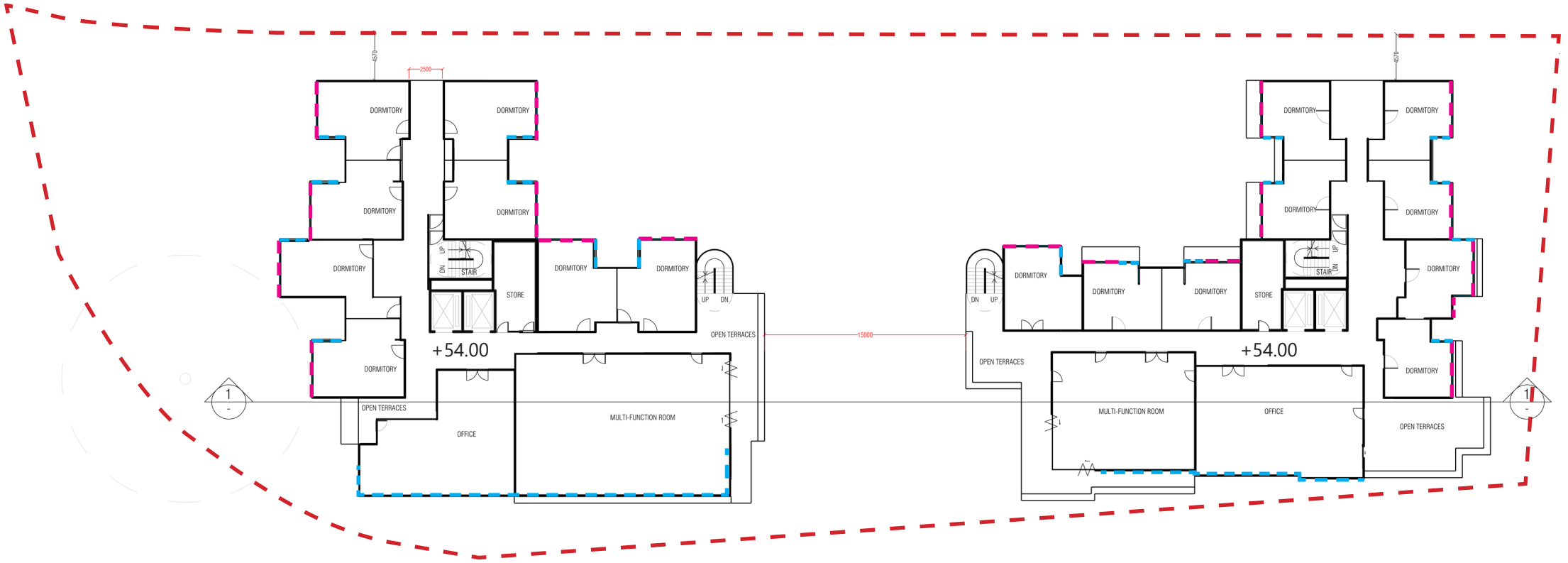


1 GENERAL LAYOUT PLAN - 3/F (HSMH & HMMH)

Scale 1:400@A4

NON-OPENABLE WINDOW

OPENABLE WINDOW

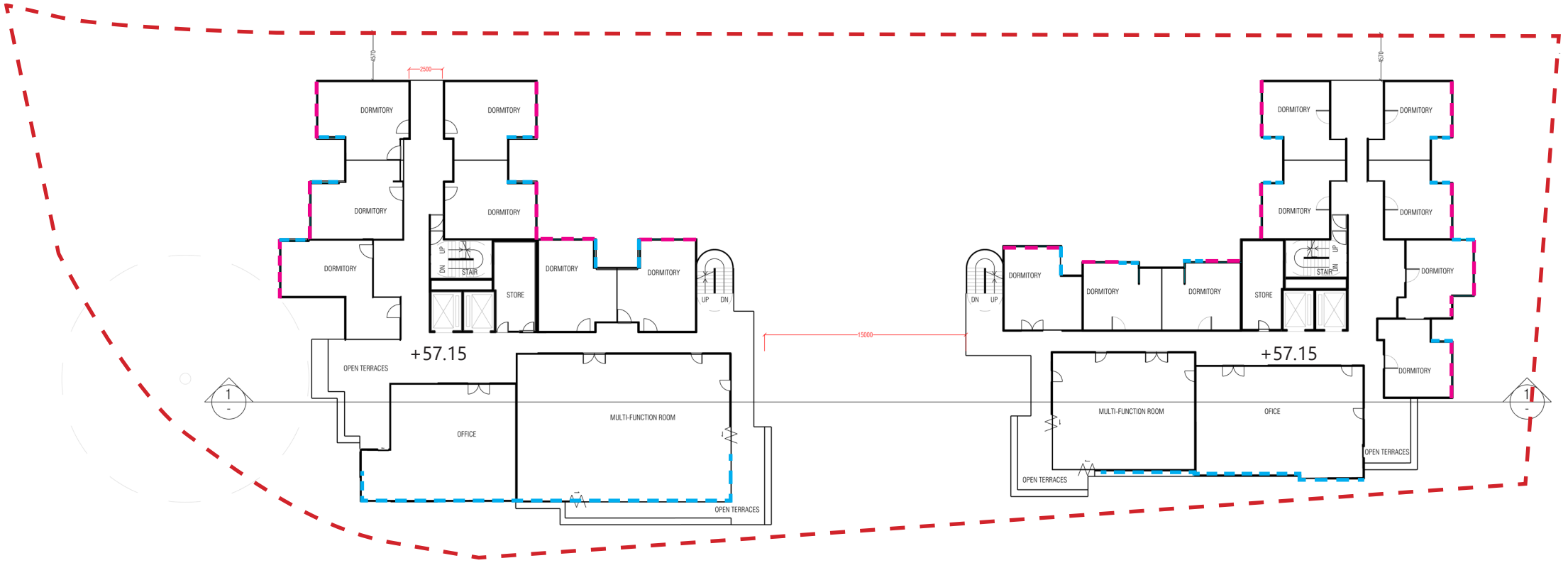


1 GENERAL LAYOUT PLAN - 4/F (HSMH & C&A/SD)

Scale 1:400@A4

NON-OPENABLE WINDOW

OPENABLE WINDOW

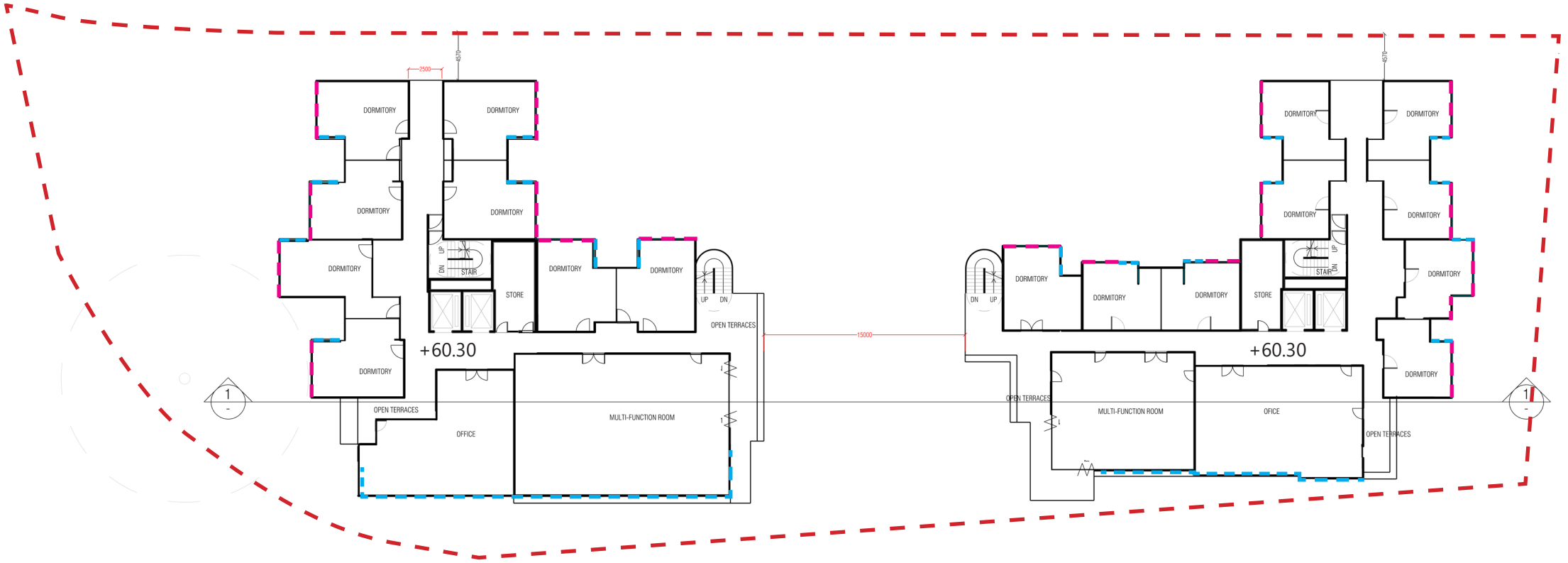


1 GENERAL LAYOUT PLAN - 5/F (HSMH & C&A/SD)

Scale 1:400@A4

NON-OPENABLE WINDOW

OPENABLE WINDOW

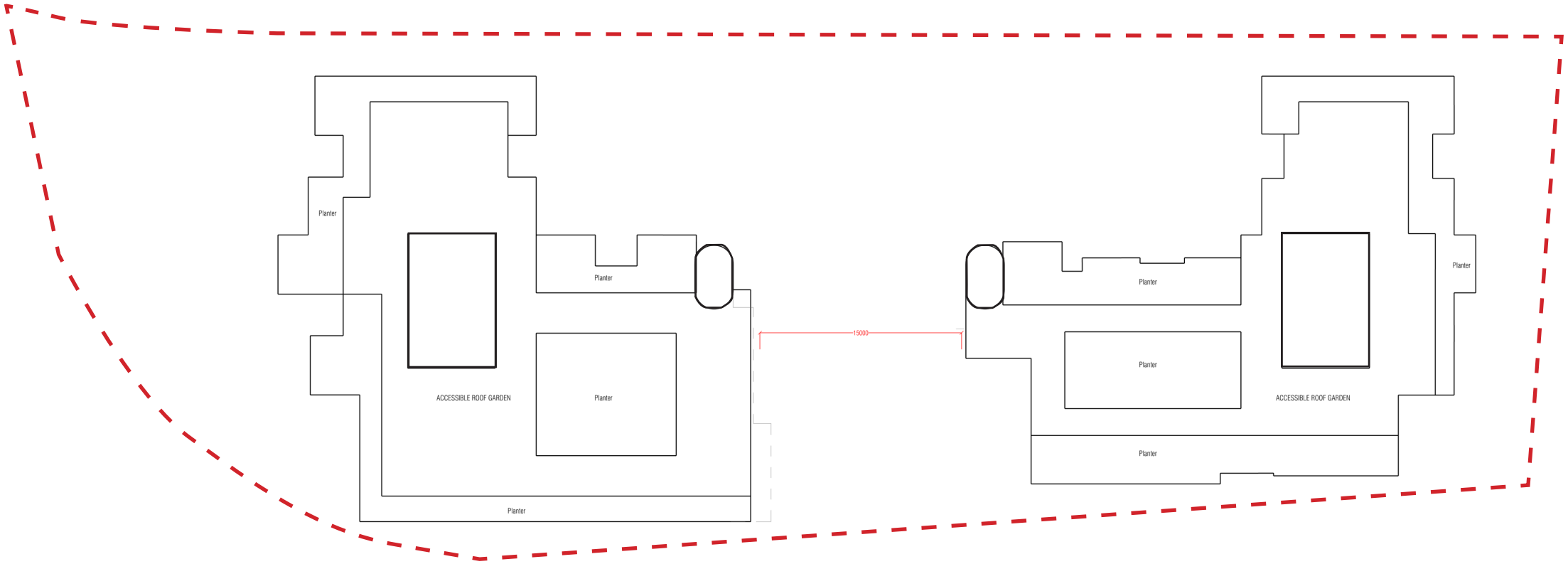


1 GENERAL LAYOUT PLAN - 6/F (HSMH & C&A/SD)

Scale 1:400@A4

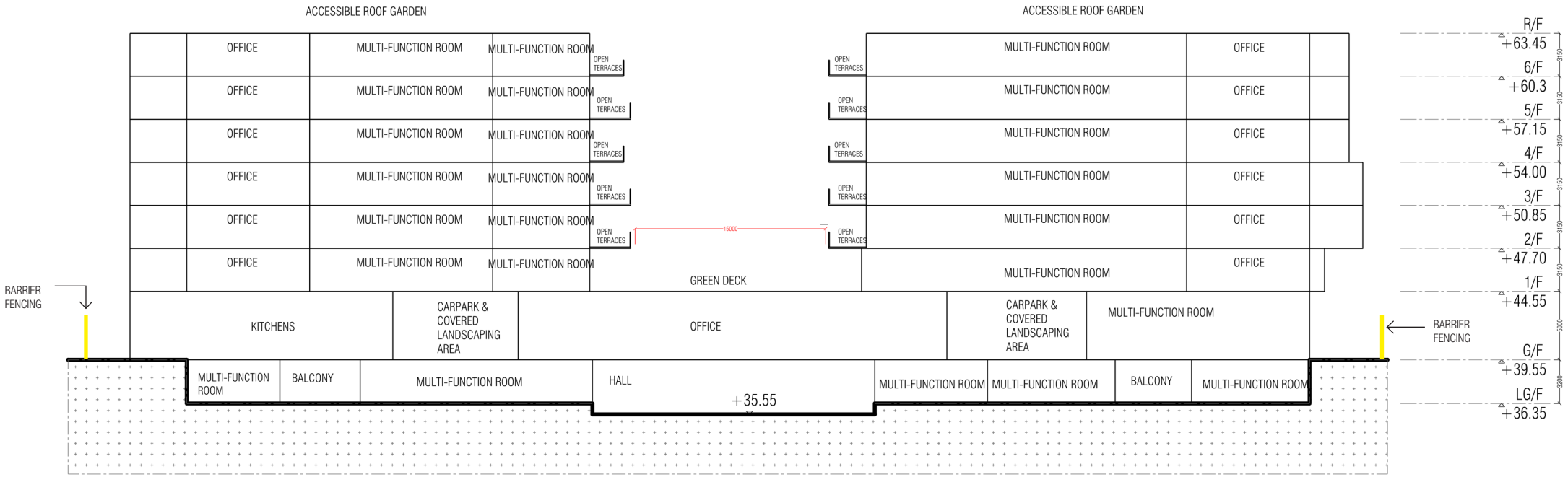
NON-OPENABLE WINDOW

OPENABLE WINDOW



1 GENERAL LAYOUT PLAN - R/F

Scale 1:400@A4



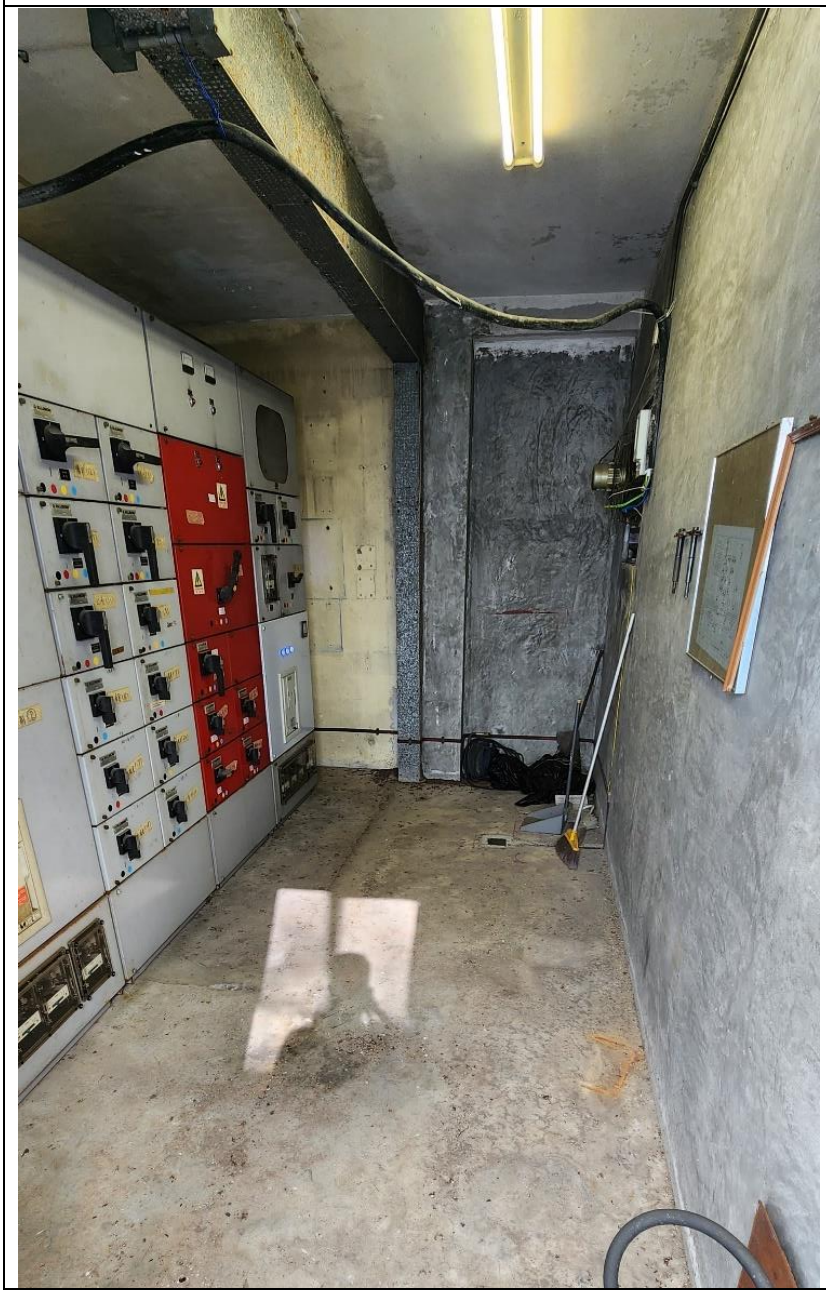
1 SECTION 1

Scale 1:400@A4

For indicative layout plan, please refer to the Planning Statement

Appendix 1.2 Current Site Photos

Photolog (Site visit on 2 February 2024)



Appendix 1.3 Email from CLP

Vicky Shek

From: Chan, Irvin Yiu Keung <irvinchan@clp.com.hk>
Sent: Wednesday, February 28, 2024 11:55 AM
To: AEM_SVC_EMAIL; Vicky Shek
Subject: FW: Submit enquiry or Feedback 20240215071801670

Morning Vicky Shek:

Reply as below, thanks.

Location: Salvation Army Lai King Home at Nos. 200-210 Lai King Hill Road, Kwai Chung
Substation: SALVATION ARMY HOME (No. 082252)

1. One transformer inside with mineral oil as transformer insulant, and it is free from PCB
2. No such leakage incident record

Regards,
Irvin Chan
WE/OB/TWOC
[Document Classification: PROPRIETARY 專有]

From: Yau, Gloria Ka Ying
Sent: Saturday, February 17, 2024 9:17 AM
To: East & West Region <we@clp.com.hk>
Subject: FW: Submit enquiry or Feedback 20240215071801670

From: AEM_SVC_EMAIL <aem_svc_email@clp.com.hk>
Sent: Thursday, February 15, 2024 4:48 PM
To: CSD <CSD@clp.com.hk>
Subject: Submit enquiry or Feedback

Dear CLP team,

ApplicationID: 20240215071801670
Subject: Feedback, Suggestion, and Other Enquiry
Title: Miss
Name: Vicky Shek
Mobile: 51717500
Email: vytshek@ramboll.com
Existing CLP Customer: Non-CLP Customer
Account Number:
Address: Salvation Army Lai King Home at Nos. 200-210 Lai King Hill Road, Kwai Chung
District: Kwai Chung / Tsing Yi / Tsuen Wan
Message: We are the environmental consultant engaged by the Salvation Army to carry out an Environmental Assessment (EA) for Salvation Army Lai King Home at Nos. 200-210 Lai King Hill Road, Kwai Chung. To facilitate our EA study, we would be grateful if you could provide the following information for our analysis of potential land contamination issues at the transformer room on G/F of Salvation Army Lai King Home. Please advise if, 1. the transformer equipment contains the chemical polychlorinated biphenyl (PCB). 2. chemical / oil spill and incident /

maintenance record (including records of fire) at the transformer room on G/F of the Site can be provided. Thank you for your attention.
Company Name:
Nature of Business:
Meter Number:
Language: en
Wait to call back: No
TCOM Call ID:
TCOM Return Code:

Thanks.

Appendix 2.1 Extracted Pages from Annual Traffic Census 2022

Appendix B - AADT of Counting Stations - ordered by Station Nos.

Stn. No.	Stn. Type	Road Type	Road Name	From	To	AADT 2021	AADT 2022	Change of 2022 as % of 2021
5023	A	DD	Po Lam Rd	Anderson Rd	Tsui Lam Rd	16,120	14,950	-7.2
5024	A	UT	Lion Rock Tunnel	Toll Plaza	South Portal	90,970	85,880	-5.6
5025	A	EX	Yuen Long Highway	Tin Shui Wai West INT	Lam Tei INT	113,690	109,410	-3.8
5026	A	EX	Tsing Kwai Highway	Ching Lai Court slip rds to & from Ching Cheung Rd	Cho Yiu Chuen slip rds to & from Kwai Chung Rd & Tsuen Wan Rd	102,730	99,460	-3.2
5027	A	EX	Lantau Link	Tsing Ma Bridge eastern end at Tsing Yi	Ngong Shuen Au	48,370	52,380	+8.3
5029	A	EX	Tsing Long Highway - Tai Lam Tunnel	Au Tau INT	Tuen Mun Rd	44,500	38,840	-12.7
5030	A	UT	Kwai Chung Rd	Kwai Chung INT	Tsuen Wan Rd	109,350	104,480	-4.5
5031	A	EX	North Lantau Highway	Tung Chung Eastern INT	Western End at Chek Lap Kok	19,700	20,330	+3.2
5032	A	DD	Chek Lap Kok S Rd	Eastern End at Tung Chung	Western End at Chek Lap Kok	15,060	15,560	+3.3
5033	A	EX	Tsing Long Highway - Ting Kau Bridge	NW Tsing Yi INT southern tip	Tuen Mun Rd	95,230	89,310	-6.2
5034	A	EX	Cheung Tsing Tunnel & Cheung Tsing Bridge	Cheung Tsing Bridge eastern end	Western end of Cheung Tsing Tunnel slip rds to & from Tsing Yi Rd W	69,020	66,500	-3.6
5035	A	EX	Tuen Mun Rd	Castle Peak Rd - Tsuen Wan	Tsing Long Highway - Ting Kau Bridge	79,600	75,060	-5.7
5036	A	DD	Shun Tung Rd	Yu Tung Rd	Tat Tung Rd	20,180	19,480	-3.5
5037	A	EX	Eagle's Nest Tunnel	Toll Plaza	South Portal	61,210	56,110	-8.3
5038	A	EX	Nam Wan Tunnel	East Tsing Yi Viaduct	Cheung Tsing Highway	41,090	41,060	-0.1
5039	A	EX	Stonecutters Bridge	East Tsing Yi Viaduct	Container Port Rd S nr Container Terminal 8	39,960	40,130	+0.4
5040	A	EX	Shenzhen Bay Bridge	Nr Deep Bay Rd	Shenzhen Bay Bridge (China Section - End)	9,620	6,640	-31.0
5041	A	RT	Lung Shan Tunnel	Fanling Highway	Sha Tau Kok Road	16,870	16,400	-2.8
5042	A	UT	Tuen Mun Chek Lap Kok Tunnel	Lung Fu Rd	Hong Kong Boundary Crossing Facilities (BCF)	17,420	19,670	+12.9
5101	A	LD	Chui Tin St	Che Kung Miu Rd	Hung Mui Kuk Rd	11,980	11,300	-5.7
5102	A	LD	Tseng Choi St	Castle Peak Rd northern junction	Castle Peak Rd southern junction	5,690	5,410	-4.8
5103	A	LD	Shing Mun Rd	Texaco Rd N	Cheung Shan Est Rd E	1,930	1,860	-4.0
5104	A	LD	Chap Wai Kon St	Bus Terminus	Siu Lek Yuen Rd	5,260	5,280	+0.4

*** AADT estimated by Growth Factor**

Appendix B - AADT of Counting Stations - ordered by Station Nos.

Stn. No.	Stn. Type	Road Type	Road Name	From	To	AADT 2021	AADT 2022	Change of 2022 as % of 2021
6095	C	EX	Yuen Long Highway	Tong Yan San Tsuen INT	Hung Tin Rd INT	91,980 *	99,080	+7.7
6096	C	LD	Tin Shing Rd	Tin Wah Rd	Tin Wing Rd	4,960 *	4,560	-8.0
6099	C	EX	Tsing Kwai Highway	Cho Yiu Estate slip rds to & from Kwai Chung Rd & Tsuen Wan Rd	Rambler Bridge eastern end	64,300 *	83,080	+29.2
6100	C	DD	Kwai Tsing Rd	Kwai King Rd	Tsuen Wan Rd	37,980 *	36,660	-3.5
6102	C	LD	On Ming St	On Muk St	Siu Lek Yuen Rd	8,180 *	9,450	+15.5
6103	C	DD	Wan Po Rd	Po Shun Rd	Chiu Shun Rd	37,820 *	38,940	+3.0
6104	C	DD	Tuen Mun Heung Sze Wui Rd	Hoi Chu Rd	Hoi Wing Rd	10,360 *	11,970	+15.6
6105	C	DD	Ling Hong Rd	Po Hong Rd	Po Shun Rd	3,160 *	3,220	+1.7
6106	C	DD	Tong Ming St	Po Shun Rd	Po Hong Rd	17,780 *	17,960	+1.1
6107	C	DD	Mau Yip Rd	Po Fung Rd	Wan Hang Rd	6,740 *	9,280	+37.5
6108	C	PD	Tsing Yi N Coastal Rd	Tam Kon Shan INT W End	Slip Rds to & from Tam Kon Shan Rd	18,860 *	21,030	+11.5
6109	C	RR	Kam Ho Rd	Kam Tin Rd	Tung Wui Rd	10,660 *	10,560	-1.0
6110	C	RT	Kam Tin Bypass	Kam Tin Rd	Kam Tin Rd	12,450 *	12,980	+4.3
6111	C	LD	Ching Hiu Rd	Pak Wo Rd	Po Kin Rd	6,300 *	8,790	+39.6
6112	C	LD	Tsing Yi Hong Wan Rd	Tsing Yi Rd	Tsing Sheung Rd	26,620 *	22,690	-14.8
6113	C	DD	Tsing Yi Rd	Tsing Yi Rd nr. Dow Chemical	Tsing Yi Hong Wan Rd	12,020 *	11,520	-4.1
6114	C	LD	Sunny Bay Rd	Magic Rd	North Lantau Highway	4,880 *	4,900	+0.3
6115	C	EX	Penny's Bay Highway	Magic Rd	North Lantau Highway	9,230 *	8,790	-4.8
6116	C	DD	Fo Shing Rd	Chong San Rd	Fo Chun Rd	-	9,400	-
6117	C	DD	Fo Yin Rd	Chong San Rd	End	-	8,080	-
6118	C	LD	Tong Chun St	Po Yap Rd	End	-	7,670	-
6119	C	LD	Chi Shin St	Po Hong Rd (Roundabout)	End	-	10,350	-
6203	B	PD	Castle Peak Rd - Kwai Chung	Ching Cheung Rd	Tai Wo INT	27,400	25,970	-5.2
6204	B	DD	Lai King Hill Rd	Kwai Chung INT slip rds	King Cho Rd	16,050	15,560	-3.0
6206	B	PD	Jockey Club Rd	Lok Yip Rd	Wo Hop Shek INT	37,380	36,240	-3.1
6207	B	RR	Kam Tin Rd	Kam Sheung Rd western junction	Fan Kam Rd	20,490	20,520	+0.2
6208	B	RR	Kam Sheung Rd	Kam Tin Rd	Kam Tin Rd	8,960	9,600	+7.1
6209	B	RR	Castle Peak Rd - Tsuen Wan, Ting Kau & Sham Tseng	Tuen Mun Rd	Sham Tseng	11,360	10,070	-11.4
6210	B	RR	Tai Po Rd - Ma Liu Shui	Entrance to Chung Chi College, CUHK	Yuen Chau Tsai INT	8,260	7,650	-7.3

*** AADT estimated by Growth Factor**

Appendix 3.1 Traffic Forecast

21149HK
2044 Traffic Forecasts for Traffic Noise Impact Assessment

14-Mar-24

Road Link	Road Name	Direction	Road Speed	AM Peak		PM Peak	
				2044 Peak Hour Traffic Flows (in veh/hr)	% of HV	2044 Peak Hour Traffic Flows (in veh/hr)	% of HV
1	Lai King Hill Road (From King Cho Road to Kwai Fuk Road)	NB	50	680	32%	560	52%
		SB	50	750	36%	630	35%
2	Lai Cho Road	NB	50	90	86%	130	84%
		SB	50	140	75%	130	66%
3	Lim Cho Street (From Lai Chi Ling Road to Cho Yiu Chuen Kai Hang Lau)	NB	50	260	38%	270	27%
		SB	50	320	35%	220	38%
4	Lim Cho Street (From Cho Yiu Chuen Kai Hang Lau to Lai Cho Road)	NWB	50	260	38%	270	27%
		SEB	50	320	35%	220	38%
5	Lim Cho Street (To Cho Yiu Chuen Car Park)	NB	50	10	10%	10	10%
		SB	50	10	10%	10	10%
6	Lim Cho Street (From Lai Cho Road to Wing Cho Street)	NB	50	340	60%	300	57%
		SB	50	340	51%	250	61%
7	Wing Cho Street (Near to Cho Yiu Chuen Chung Ling Sheh)	EB	50	10	10%	10	10%
		WB	50	10	10%	10	10%
8	Wing Cho Street (Near to Cho Yiu Chuen Kai Lim Lau)	EB	50	10	10%	10	10%
		SB	50	10	10%	10	10%
9	Lim Cho Street (From Wing Cho Street to King Cho Road)	NB	50	340	60%	300	57%
		SB	50	340	51%	250	61%
10	King Cho Road (From Lim Cho Street to Lai King Hill Road, Near to Cho Yiu Chuen Kai Kwong Lau)	NB	50	210	62%	220	72%
		SB	50	320	55%	190	72%
11	King Cho Road (From Lim Cho Street to Lai King Hill Road, Near to Cho Yiu Chuen Chung Ling Sheh)	SEB	50	150	69%	120	56%
12	King Cho Road (From Lim Cho Street to Cho Yiu Chuen Commercial Centre Bus Stop)	WB	50	200	49%	200	48%
13	King Cho Road (Outside Cho Yiu Chuen Commercial Center Bus Station)	WB	50	200	49%	200	48%
14	King Cho Road (Inside Cho Yiu Chuen Commercial Center Bus Station)	WB	50	10	10%	10	10%
15	King Cho Road (From Cho Yiu Chuen Commercial Center Bus Station to Cho Yiu Chuen Car Park)	WB	50	200	49%	200	48%
16	King Cho Road (To Cho Yiu Chuen Car Park)	NB	50	10	10%	10	10%
		SB	50	10	10%	10	10%
17	King Cho Road (From Cho Yiu Chuen Car Park to Lai King Hill Road)	NWB	50	200	49%	200	48%
18	Lai King Hill Road (From King Cho Road to Lai King Estate Car Park, Near to Lai King Estate On King House)	NB	50	590	29%	440	59%
		SB	50	760	26%	640	24%
19	Lai King Hill Road (To Lai King Estate Car Park)	NWB	50	160	10%	160	20%
		SEB	50	150	10%	60	13%
20	Lai King Hill Road (From King Cho Road to Lai King Estate Car Park, Near to Lai King Hill Road Playground)	EB	50	820	25%	650	25%
		WB	50	590	29%	440	59%
21	Lai King Hill Road (From King Cho Road to Kwai Chung Hospital Road)	EB	50	1,050	36%	780	31%
		WB	50	740	41%	660	70%

Road Link	Road Name	Direction	Road Speed	AM Peak		PM Peak	
				2044 Peak Hour Traffic Flows (in veh/hr)	% of HV	2044 Peak Hour Traffic Flows (in veh/hr)	% of HV
22	Kwai Chung Road (To Lai King Ventilation Building)	NWB	50	10	10%	10	10%
		SEB	50	10	10%	10	10%
23	Kwai Chung Road (Near Side, To Container Port Road S.)	SEB	70	70	85%	380	25%
24	Kwai Chung Road (Near Side, Near to Lai King Ventilation Building)	SEB	70	8,400	41%	5,290	43%
25	Kwai Chung Road(Near Side, Near to Lai King Ventilation Building)	NWB	70	5,490	20%	5,030	25%
26	Kwai Chung Road (Far Side, Near to Lai King Ventilation Building)	NWB	70	1,240	72%	870	74%
27	Kwai Chung Road (From Roundabout no.3)	NWB	70	640	72%	450	74%
28	Tsing Kwai Highway (Near to Kwai Chung Container Terminal III)	SEB	80	8,060	53%	6,960	34%
29	Container Port Road S. (Near to Roundabout no.3)	SKB	50	1,850	78%	3,200	57%
30	Tsing Kwai Highway	NWB	80	7,320	41%	6,610	40%
31	Kwai Chung Road (Near Side)	SEB	70	8,470	42%	5,680	41%
32	Kwai Chung Road(Merged by Road Link 25,26,27)	NWB	70	7,020	49%	6,730	56%
33	Tsing Kwai Highway (Near Side, Near to Lai King MTR Station)	SEB	80	1,860	49%	1,970	30%
34	Tsing Kwai Highway (Far Side, Near to Lai King MTR Station)	SEB	80	6,200	55%	4,990	35%
35	Container Port Road S. (To Roundabout no.2)	SEB	50	790	49%	690	35%
36	Containter Port Road S. (From Roundabout no.3)	NWB	50	1,830	46%	1,380	42%
37	Containter Port Road S. (From Kwai Chung Container Terminal II to Roundabout no.2)	SB	50	210	53%	190	48%
38	Containter Port Road S. (From Roundabout no.2 to Kwai Chung Container Terminal II)	NB	50	10	10%	10	10%
39	Containter Port Road S. (Inside Roundabout no.2)	EB	50	2,020	47%	1,550	42%
40	Containter Port Road S. (Inside Roundabout no.2)	SEB	50	190	52%	170	46%
41	Containter Port Road S. (Inside Roundabout no.2)	SB	50	980	50%	860	37%
42	Containter Port Road S. (Inside Roundabout no.2)	SWB	50	30	49%	20	36%
43	Containter Port Road S. (Inside Roundabout no.2)	WB	50	1,830	46%	1,360	41%
44	Containter Port Road S. (Inside Roundabout no.2)	NWB	50	1,770	46%	1,310	41%
45	Containter Port Road S. (Inside Roundabout no.2)	NB	50	1,810	46%	1,360	41%
46	Containter Port Road S. (Inside Roundabout no.2)	NEB	50	1,810	46%	1,360	41%
47	Containter Port Road S. (From ATL Logistics Centre Hong Kong Limited Lay-by to Roundabout no.2)	NB	50	40	53%	50	39%
48	Containter Port Road S. (From Roundabout no.2 to ATL Logistics Centre Hong Kong Limited Lay-by)	SB	50	60	47%	50	40%
49	Containter Port Road S. (From ATL Logistics Centre Hong Kong Limited to Roundabout no.2)	NWB	50	1,800	46%	1,340	41%
50	Containter Port Road S. (Exit of ATL Logistics Centre Hong Kong Limited)	NEB	50	30	53%	20	53%
51	Containter Port Road S. (Between Entrance and Exit of ATL Logistics Centre Hong Kong Limited)	NWB	50	1,790	50%	1,350	43%
52	Containter Port Road S. (Entrance of ATL Logistics Center Hong Kong Limited)	SWB	50	30	53%	20	53%
53	Containter Port Road S. (Near to Kwai Chung Container Terminal III)	NWB	50	1,790	50%	1,350	43%
54	Containter Port Road S. (Exit of Jetco - Hong Kong Internation Terminal, Near to Kwai Chung Container Terminal III)	NB	50	10	55%	90	45%
55	Containter Port Road S. (Between Entrance and Exit of Jetco - Hong Kong International Terminal, Near to Kwai Chung Container Terminal III)	NWB	50	1,780	50%	1,260	43%
56	Containter Port Road S. (Between Entrance and Exit of Jetco - Hong Kong International Terminal, Between the two entrances)	NWB	50	1,800	50%	1,300	43%
57	Containter Port Road S. (Between Entrance and Exit of Jetco - Hong Kong International Terminal, Near to Roundabout no.3)	NWB	50	1,160	76%	900	59%
58	Containter Port Road S. (From Roundabout no.3 to Jetco - Hong Kong Internation Terminal)	NWB	50	1,870	65%	1,450	54%
59	Containter Port Road S. (Entrance of Jetco - Hong Kong Internation Terminal, Near to Kwai Chung Container Terminal III)	SWB	50	20	48%	40	47%
60	Containter Port Road S. (Exit of Jetco - Hong Kong Internation Terminal, Near to Roundabout no.3)	NB	50	680	49%	560	45%

Road Link	Road Name	Direction	Road Speed	AM Peak		PM Peak	
				2044 Peak Hour Traffic Flows (in veh/hr)	% of HV	2044 Peak Hour Traffic Flows (in veh/hr)	% of HV
61	Containter Port Road S. (Entrance of Jetco - Hong Kong Internation Terminal, Near to Roundabout no.3)	SWB	50	710	47%	550	47%
62	Containter Port Road S. (From Road Link 61 to Jetco - Hong Kong Internetion Terminal)	SWB	50	350	47%	280	47%
63	Containter Port Road S. (From Road Link 61 to Hong Kong Internetion Terminal Linited)	SWB	50	350	47%	280	47%
64	Containter Port Road S. (From Road Link 63 to Jetco - Hong Kong International Terminal)	SWB	50	180	47%	140	47%
65	Containter Port Road S. (From Jetco - Hong Kong Internation Terminal merged to Road Link 64)	NEB	50	30	53%	20	53%
66	Containter Port Road S. (From Road Link 64 to Hong Kong Internetion Terminal)	SWB	50	200	48%	160	48%
67	Containter Port Road S. (From Road Link 63 to Hong Kong Internetion Terminal)	SWB	50	180	47%	140	47%

(1) HV includes Light Van, Public Light Bus, Light Goods Vehicle, Medium Goods Vehicle, Heavy Goods Vehicle and Container/Tractor, Coach and Bus.

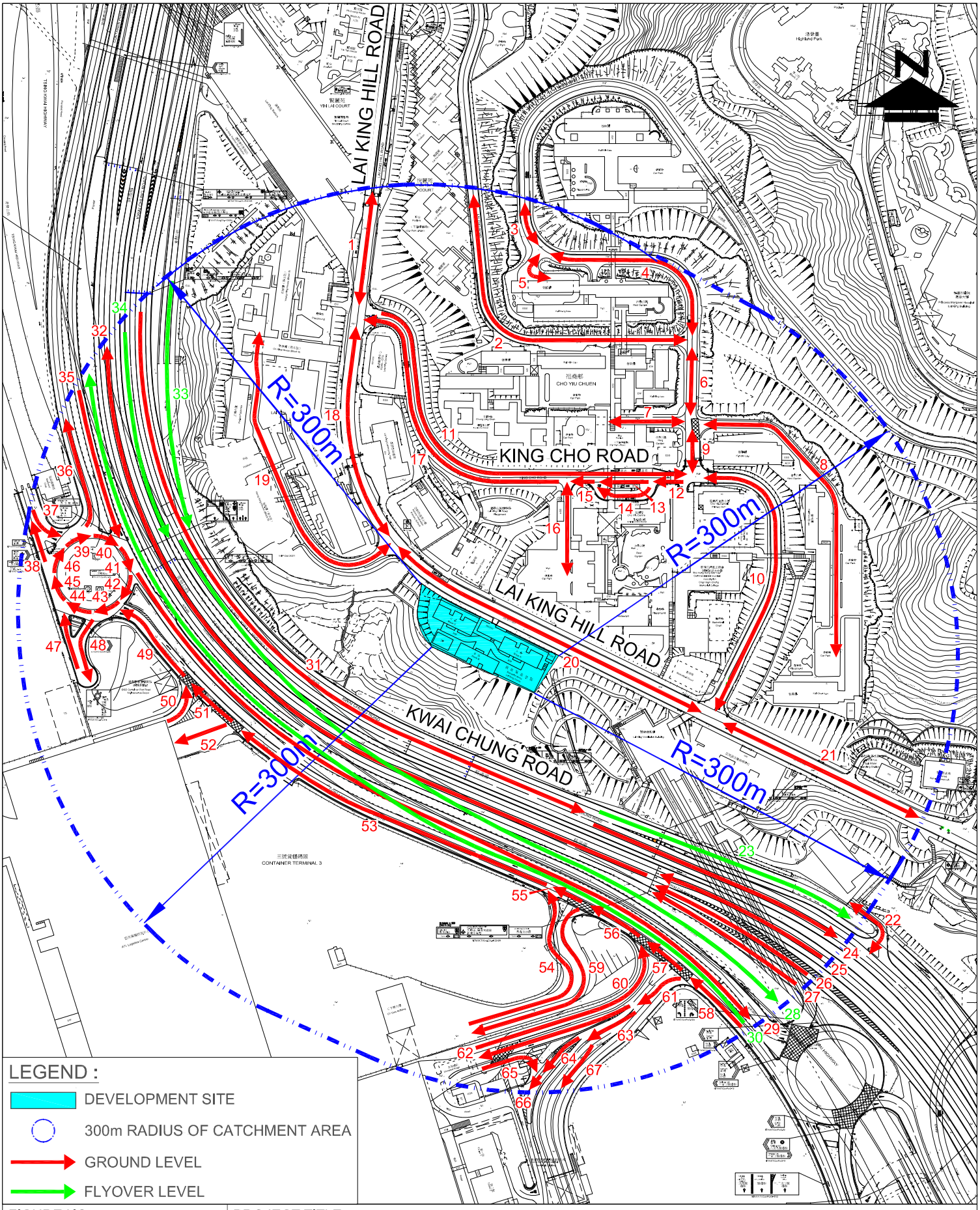


FIGURE NO.: 1	PROJECT TITLE: Technical Feasibility Study For Redevelopment of The Salvation Army Lai King Home
PROJECT NO.: 21149HK	DRAWING TITLE: INDEX PLAN
SCALE: 1 : 3700 @A4	DATE: 26 JAN 2022

CTA Consultants Limited
志達顧問有限公司

Appendix 3.2 Road Traffic Noise Impact Assessment Results (Unmitigated)

Predicted Road Traffic Noise at Selected Sensitive Receivers (Unmitigated Scenario - AM)

Floor	mPD	N01	N02	N03	N04	N05	N06	N07	N08	N09	N10a	N10b	N11a	N11b	N12a	N12b	N13a	N13b	N14a	N14b	N15a	N15b	N16a	N16b	N17a	N17b	N18
1/F	45.8	-	76	76	76	71	72	73	72	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2/F	48.9	74	76	76	76	71	72	73	72	72	72	-	73	-	72	-	71	-	78	-	76	-	76	-	76	-	77
3/F	52.1	-	76	76	76	71	72	73	72	72	72	-	73	-	72	-	70	-	78	-	76	-	76	-	75	-	77
4/F	55.2	74	76	76	76	70	71	73	72	72	-	74	-	73	-	72	-	71	-	78	-	77	-	78	-	77	-
5/F	58.4	-	76	76	76	70	71	72	72	72	-	74	-	73	-	72	-	70	-	78	-	77	-	78	-	77	-
6/F	61.5	74	76	75	76	70	71	72	71	72	-	73	-	73	-	71	-	70	-	78	-	77	-	78	-	77	-
Maximum		74	76	76	76	71	72	73	72	72	72	74	73	73	72	72	71	71	78	78	76	77	76	78	76	77	77

Total no. of unit: 92
Total no. of exceedance: 86
% Compliance: 7%

Note:

-- Non noise sensitive point

Predicted Road Traffic Noise at Selected Sensitive Receivers (Unmitigated Scenario - PM)

Floor	mPD	N01	N02	N03	N04	N05	N06	N07	N08	N09	N10a	N10b	N11a	N11b	N12a	N12b	N13a	N13b	N14a	N14b	N15a	N15b	N16a	N16b	N17a	N17b	N18
1/F	45.8	-	76	76	75	72	73	73	72	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2/F	48.9	73	76	75	75	71	72	73	72	72	72	-	73	-	72	-	71	-	77	-	76	-	76	-	75	-	76
3/F	52.1	-	76	75	75	71	72	73	72	72	72	-	73	-	72	-	70	-	77	-	76	-	76	-	74	-	76
4/F	55.2	73	76	75	75	71	72	73	72	72	-	74	-	73	-	72	-	71	-	78	-	76	-	77	-	76	-
5/F	58.4	-	76	75	75	70	71	72	72	72	-	74	-	73	-	72	-	70	-	78	-	76	-	77	-	76	-
6/F	61.5	73	75	75	75	70	71	72	71	72	-	73	-	73	-	71	-	70	-	78	-	76	-	77	-	76	-
Maximum		73	76	76	75	72	73	73	72	72	72	74	73	73	72	72	71	71	77	78	76	76	76	77	75	76	76

Total no. of unit: 92
Total no. of exceedance: 87
% Compliance: 5%

Note:

-- Non noise sensitive point

Appendix 3.3 Road Traffic Noise Impact Assessment Results (Mitigated)

Predicted Road Traffic Noise at Selected Sensitive Receivers (Mitigated Scenario - AM)

Floor	mPD	N01	N02	N03	N04	N05	N06	N07	N08	N09	N10a	N10b	N11a	N11b	N12a	N12b	N13a	N13b	N14a	N14b	N15a	N15b	N16a	N16b	N17a	N17b	N18
1/F	45.8	-	74	76	76	71	72	73	72	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2/F	48.9	74	74	76	76	71	72	73	72	72	72	-	73	-	72	-	71	-	75	-	73	-	73	-	73	-	74
3/F	52.1	-	74	76	76	71	72	73	72	72	72	-	73	-	72	-	70	-	75	-	73	-	73	-	72	-	74
4/F	55.2	74	74	76	76	70	71	73	72	72	-	74	-	73	-	72	-	71	-	76	-	74	-	75	-	74	-
5/F	58.4	-	74	75	76	70	71	72	72	72	-	74	-	73	-	72	-	70	-	76	-	74	-	75	-	74	-
6/F	61.5	74	73	75	76	70	71	72	71	72	-	73	-	73	-	71	-	70	-	76	-	74	-	75	-	74	-
Maximum		74	74	76	76	71	72	73	72	72	72	74	73	73	72	72	71	71	75	76	73	74	73	75	73	74	74

Total no. of unit: 92
Total no. of exceedance: 86
% Compliance: 7%

Note:

-- Non noise sensitive point

Predicted Road Traffic Noise at Selected Sensitive Receivers (Mitigated Scenario - PM)

Floor	mPD	N01	N02	N03	N04	N05	N06	N07	N08	N09	N10a	N10b	N11a	N11b	N12a	N12b	N13a	N13b	N14a	N14b	N15a	N15b	N16a	N16b	N17a	N17b	N18
1/F	45.8	-	74	76	75	72	73	73	72	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2/F	48.9	73	74	75	75	71	72	73	72	72	72	-	73	-	72	-	71	-	75	-	73	-	73	-	72	-	73
3/F	52.1	-	74	75	75	71	72	73	72	72	72	-	73	-	72	-	70	-	75	-	73	-	73	-	71	-	73
4/F	55.2	73	73	75	75	71	72	73	72	72	-	74	-	73	-	72	-	71	-	75	-	73	-	74	-	73	-
5/F	58.4	-	73	75	75	70	71	72	72	72	-	74	-	73	-	72	-	70	-	75	-	73	-	74	-	73	-
6/F	61.5	73	73	75	75	70	71	72	71	72	-	73	-	73	-	71	-	70	-	75	-	73	-	74	-	73	-
Maximum		73	74	76	75	72	73	73	72	72	72	74	73	73	72	72	71	71	75	75	73	73	73	74	72	73	73

Total no. of unit: 92
Total no. of exceedance: 87
% Compliance: 5%

Note:
-- Non noise sensitive point

Appendix 3.4 Inventory of Potential Industrial Noise Sources

Noise Source ID	Description of Noise Sources	Sources		Measured SPL, dB(A) (free-field)	Distance from Source (m)	Unmitigated SWL, dB(A), L_{eq} (30 min)				Source Location			Directivity Factor (Q)	No. of Plant
		Nature of Business	Existing/ Planned			Daytime & Evening Time (0700-2300)	Ref	Nighttime (2300-0700)	Ref	X	Y	Z, mPD		
S01a_01	Container Lifting at Kwai Chung Container Terminal III	Container Lifting	Existing	87.9	3.8	105	[1]	105	[1]	831104	822723	5.3	2	1
S01a_02	Lorry Movement at Kwai Chung Container Terminal III	Lorry Movement	Existing	-	-	99	[2]	99	[2]	831104	822723	5.3	2	1
S01b_01	Container Lifting at Kwai Chung Container Terminal III	Container Lifting	Existing	87.9	3.8	105	[1]	OFF	[1]	831101	822700	5.3	2	1
S01b_02	Lorry Movement at Kwai Chung Container Terminal III	Lorry Movement	Existing	-	-	99	[2]	99	[2]	831101	822700	5.3	2	1
S01c_01	Container Lifting at Kwai Chung Container Terminal III	Container Lifting	Existing	87.9	3.8	105	[1]	OFF	[1]	831098	822679	5.3	2	1
S01c_02	Lorry Movement at Kwai Chung Container Terminal III	Lorry Movement	Existing	-	-	99	[2]	99	[2]	831098	822679	5.3	2	1
S02a	Mobile Crane at DSD Container Port Road Maintenance Depot	Mobile Crane	Existing	-	-	97	[2]	OFF	[2]	830920	822853	6.3	2	1
S02b	Lorry Movement DSD Container Port Road Maintenance Depot	Lorry Movement	Existing	-	-	99	[2]	OFF	[2]	830920	822853	6.3	2	1
S03a	Container Lifting at Kwai Chung Container Terminal IV	Container Lifting	Existing	87.9	3.8	105	[3]	105	[3]	831325	822573	6.5	2	1
S03b	Lorry Movement at Kwai Chung Container Terminal IV	Lorry Movement	Existing	-	-	99	[2]	99	[2]	831325	822573	6.5	2	1
S04a	Cooling Tower at Dragon Delicious, Cho Yiu Estate	Cooling Tower	Existing	-	-	91	[4]	OFF	[4]	831282	822889	75.0	2	1
S04b	Ventilation Plant No.1, at Dragon Delicious, Cho Yiu Estate	Ventilation Plant	Existing	84	1	89	[1]	OFF	[1]	831277	822893	73.0	2	1
S04c	Ventilation Plant No.2, at Dragon Delicious, Cho Yiu Estate	Ventilation Plant	Existing	79	1	84	[1]	OFF	[1]	831277	822887	73.0	2	1
S05a	Chiller No.1 at Lai King Community Hall	Chiller	Existing	-	-	84	[5]	OFF	[5]	831114	823020	54.5	2	1
S05b	Chiller No.2 at Lai King Community Hall	Chiller	Existing	-	-	84	[5]	OFF	[5]	831118	823021	54.5	2	1

Notes:

[1] By on site measurement. Noise measurements were conducted by using Norsonic AS Nor139, which complies with International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1). The weather condition was good with calm wind condition (<5m/s) during measurement, which satisfies the required criteria. The equipment was properly calibrated immediately prior to and following each measurement by a Norsonic AS calibrator. The noise levels before and after measurement agreed to within 1.0dB.

[2] Reference is made to the approved EIA report for "Proposed Residential Cum Recreation Development within "Recreation" Zone and "Residential (Group C) Zone at Variou Lots in D104, Yuen Long, N.T." (AEIA-182/2014).

[3] Reference is made to Noise Source S01 as it is similar operation.

[4] Reference is made to Ryowo FT Product Catalogue: FT-150 for similar dimension .

[5] Reference is made to Flaktwoods KCSD Product Catalogue: KCSD-180F for similar dimension.

Appendix 3.5 Industrial Noise Impact Assessment Results

Prediction of Unmitigated Fixed Noise Source Impact on Planned NSR

NSR Labels	Existing/ Planned Uses	Location			ASR	Noise Criteria (ANL), L_{eq} (30 min)		Noise Source ID	Description of Noise Sources	Unmitigated SWL, dB(A), L_{eq} (30 min)		Notional Source Location			Directivity Factor (Q)	No. of Plant	Distance to NSR, d (m)	Correction for, dB(A)			Noise Impact at NSR, dB(A)	
		X	Y	Z, mPD		Daytime & Evening Time (0700-2300)	Nighttime (2300-0700)			Daytime & Evening Time (0700-2300)	Nighttime (2300-0700)	X	Y	Z, mPD				Distance	No.	Facade	Daytime & Evening Period	Night-time[3]
N02-01	Planned	831154	822893	46	C	70	60	S02a	Mobile Crane at DSD Container Port Road Maintenance Depot	97	OFF	830932	822856	6.3	2	1	228	-55.1	0	3	44.9	N.A.
								S02b	Lorry Movement DSD Container Port Road Maintenance Depot	99	OFF	830932	822856	6.3	2	1	228	-55.1	0	3	46.9	N.A.
								S05a	Chiller No.1 at Lai King Community Hall	84	OFF	831121	823007	54.5	2	1	119	-49.5	0	3	37.5	N.A.
								S05b	Chiller No.2 at Lai King Community Hall	84	OFF	831121	823007	54.5	2	1	119	-49.5	0	3	37.5	N.A.
																				Total =	50	-
N02-02	Planned	831154	822893	49	C	70	60	S02a	Mobile Crane at DSD Container Port Road Maintenance Depot	97	OFF	830932	822856	6.3	2	1	229	-55.2	0	3	44.8	N.A.
								S02b	Lorry Movement DSD Container Port Road Maintenance Depot	99	OFF	830932	822856	6.3	2	1	229	-55.2	0	3	46.8	N.A.
								S05a	Chiller No.1 at Lai King Community Hall	84	OFF	831121	823007	54.5	2	1	119	-49.5	0	3	37.5	N.A.
								S05b	Chiller No.2 at Lai King Community Hall	84	OFF	831121	823007	54.5	2	1	119	-49.5	0	3	37.5	N.A.
																				Total =	50	-
N02-03	Planned	831154	822893	52	C	70	60	S02a	Mobile Crane at DSD Container Port Road Maintenance Depot	97	OFF	830932	822856	6.3	2	1	229	-55.2	0	3	44.8	N.A.
								S02b	Lorry Movement DSD Container Port Road Maintenance Depot	99	OFF	830932	822856	6.3	2	1	229	-55.2	0	3	46.8	N.A.
								S05a	Chiller No.1 at Lai King Community Hall	84	OFF	831121	823007	54.5	2	1	119	-49.5	0	3	37.5	N.A.
								S05b	Chiller No.2 at Lai King Community Hall	84	OFF	831121	823007	54.5	2	1	119	-49.5	0	3	37.5	N.A.
																				Total =	50	-
N02-04	Planned	831154	822893	55	C	70	60	S02a	Mobile Crane at DSD Container Port Road Maintenance Depot	97	OFF	830932	822856	6.3	2	1	230	-55.2	0	3	44.8	N.A.
								S02b	Lorry Movement DSD Container Port Road Maintenance Depot	99	OFF	830932	822856	6.3	2	1	230	-55.2	0	3	46.8	N.A.
								S05a	Chiller No.1 at Lai King Community Hall	84	OFF	831121	823007	54.5	2	1	119	-49.5	0	3	37.5	N.A.
								S05b	Chiller No.2 at Lai King Community Hall	84	OFF	831121	823007	54.5	2	1	119	-49.5	0	3	37.5	N.A.
																				Total =	50	-
N02-05	Planned	831154	822893	58	C	70	60	S02a	Mobile Crane at DSD Container Port Road Maintenance Depot	97	OFF	830932	822856	6.3	2	1	231	-55.2	0	3	44.8	N.A.
								S02b	Lorry Movement DSD Container Port Road Maintenance Depot	99	OFF	830932	822856	6.3	2	1	231	-55.2	0	3	46.8	N.A.
								S05a	Chiller No.1 at Lai King Community Hall	84	OFF	831121	823007	54.5	2	1	119	-49.5	0	3	37.5	N.A.
								S05b	Chiller No.2 at Lai King Community Hall	84	OFF	831121	823007	54.5	2	1	119	-49.5	0	3	37.5	N.A.
																				Total =	50	-
N02-06	Planned	831154	822893	62	C	70	60	S02a	Mobile Crane at DSD Container Port Road Maintenance Depot	97	OFF	830932	822856	6.3	2	1	231	-55.3	0	3	44.7	N.A.
								S02b	Lorry Movement DSD Container Port Road Maintenance Depot	99	OFF	830932	822856	6.3	2	1	231	-55.3	0	3	46.7	N.A.
								S05a	Chiller No.1 at Lai King Community Hall	84	OFF	831121	823007	54.5	2	1	119	-49.5	0	3	37.5	N.A.
								S05b	Chiller No.2 at Lai King Community Hall	84	OFF	831121	823007	54.5	2	1	119	-49.5	0	3	37.5	N.A.
																				Total =	49	-
N04-01	Planned	831159	822897	46	C	70	60	S02a	Mobile Crane at DSD Container Port Road Maintenance Depot	97	OFF	830932	822856	6.3	2	1	234	-55.4	0	3	44.6	N.A.
								S02b	Lorry Movement DSD Container Port Road Maintenance Depot	99	OFF	830932	822856	6.3	2	1	234	-55.4	0	3	46.6	N.A.
								S05a	Chiller No.1 at Lai King Community Hall	84	OFF	831121	823007	54.5	2	1	117	-49.4	0	3	37.6	N.A.
								S05b	Chiller No.2 at Lai King Community Hall	84	OFF	831121	823007	54.5	2	1	117	-49.4	0	3	37.6	N.A.
																				Total =	49	-
N04-02	Planned	831159	822897	49	C	70	60	S02a	Mobile Crane at DSD Container Port Road Maintenance Depot	97	OFF	830932	822856	6.3	2	1	234	-55.4	0	3	44.6	N.A.
								S02b	Lorry Movement DSD Container Port Road Maintenance Depot	99	OFF	830932	822856	6.3	2	1	234	-55.4	0	3	46.6	N.A.
								S05a	Chiller No.1 at Lai King Community Hall	84	OFF	831121	823007	54.5	2	1	117	-49.4	0	3	37.6	N.A.
								S05b	Chiller No.2 at Lai King Community Hall	84	OFF	831121	823007	54.5	2	1	117	-49.4	0	3	37.6	N.A.
																				Total =	49	-
N04-03	Planned	831159	822897	52	C	70	60	S02a	Mobile Crane at DSD Container Port Road Maintenance Depot	97	OFF	830932	822856	6.3	2	1	235	-55.4	0	3	44.6	N.A.
								S02b	Lorry Movement DSD Container Port Road Maintenance Depot	99	OFF	830932	822856	6.3	2	1	235	-55.4	0	3	46.6	N.A.
								S05a	Chiller No.1 at Lai King Community Hall	84	OFF	831121	823007	54.5	2	1	117	-49.3	0	3	37.7	N.A.
								S05b	Chiller No.2 at Lai King Community Hall	84	OFF	831121	823007	54.5	2	1	117	-49.3	0	3	37.7	N.A.
																				Total =	49	-
N04-04	Planned	831159	822897	55	C	70	60	S02a	Mobile Crane at DSD Container Port Road Maintenance Depot	97	OFF	830932	822856	6.3	2	1	235	-55.4	0	3	44.6	N.A.
								S02b	Lorry Movement DSD Container Port Road Maintenance Depot	99	OFF	830932	822856	6.3	2	1	235	-55.4	0	3	46.6	N.A.
								S05a	Chiller No.1 at Lai King Community Hall	84	OFF	831121	823007	54.5	2	1	117	-49.3	0	3	37.7	N.A.
								S05b	Chiller No.2 at Lai King Community Hall	84	OFF	831121	823007	54.5	2	1	117	-49.3	0	3	37.7	N.A.
																				Total =	49	-
N04-05	Planned	831159	822897	58	C	70	60	S02a	Mobile Crane at DSD Container Port Road Maintenance Depot	97	OFF	830932	822856	6.3	2	1	232	-55.3	0	3	44.7	N.A.
								S02b	Lorry Movement DSD Container Port Road Maintenance Depot	99	OFF	830932	822856	6.3	2	1	232	-55.3	0	3	46.7	N.A.
								S05a	Chiller No.1 at Lai King Community Hall	84	OFF	831121	823007	54.5	2	1	119	-49.5	0	3	37.5	N.A.
								S05b	Chiller No.2 at Lai King Community Hall	84	OFF	831121	823007	54.5	2	1	119	-49.5	0	3	37.5	N.A.
																				Total =	49	-
N04-06	Planned	831159	822897	62	C	70	60	S02a	Mobile Crane at DSD Container Port Road Maintenance Depot	97	OFF	830932	822856	6.3	2	1	232	-55.3	0	3	44.7	N.A.
								S02b	Lorry Movement DSD Container Port Road Maintenance Depot	99	OFF	830932	822856	6.3	2	1	232	-55.3	0	3	46.7	N.A.
								S05a	Chiller No.1 at Lai King Community Hall	84	OFF	831121	823007	54.5	2	1	119	-49.5	0	3	37.5	N.A.
								S05b	Chiller No.2 at Lai King Community Hall	84	OFF	831121	823007	54.5	2	1	119	-49.5	0	3	37.5	N.A.
																				Total =	49	-

Prediction of Unmitigated Fixed Noise Source Impact on Planned NSR

NSR Labels	Existing/ Planned Uses	Location			ASR	Noise Criteria (ANL), L_{eq} (30 min)		Noise Source ID	Description of Noise Sources	Unmitigated SWL, dB(A), L_{eq} (30 min)		Notional Source Location			Directivity Factor (Q)	No. of Plant	Distance to NSR, d (m)	Correction for, dB(A)			Noise Impact at NSR, dB(A)	
		X	Y	Z, mPD		Daytime & Evening Time (0700-2300)	Nighttime (2300-0700)			Daytime & Evening Time (0700-2300)	Nighttime (2300-0700)	X	Y	Z, mPD				Distance	No.	Facade	Daytime & Evening Period	Night-time[3]
N08-01	Planned	831175	822880	46	B	65	55	S04a	Cooling Tower at Dragon Delicious, Cho Yiu Estate	91	OFF	831285	822894	75.0	2	1	114	-49.2	0	3	44.9	N.A.
								S04b	Ventilation Plant No.1, at Dragon Delicious, Cho Yiu Estate	89	OFF	831285	822894	73.0	2	1	114	-49.1	0	3	42.9	N.A.
								S04c	Ventilation Plant No.2, at Dragon Delicious, Cho Yiu Estate	84	OFF	831285	822894	73.0	2	1	114	-49.1	0	3	37.9	N.A.
																				Total =	**48**	**-**
N08-02	Planned	831175	822880	49	B	65	55	S04a	Cooling Tower at Dragon Delicious, Cho Yiu Estate	91	OFF	831285	822894	75.0	2	1	114	-49.1	0	3	45.0	N.A.
								S04b	Ventilation Plant No.1, at Dragon Delicious, Cho Yiu Estate	89	OFF	831285	822894	73.0	2	1	113	-49.1	0	3	42.9	N.A.
								S04c	Ventilation Plant No.2, at Dragon Delicious, Cho Yiu Estate	84	OFF	831285	822894	73.0	2	1	113	-49.1	0	3	37.9	N.A.
																				Total =	**48**	**-**
N08-03	Planned	831175	822880	52	B	65	55	S04a	Cooling Tower at Dragon Delicious, Cho Yiu Estate	91	OFF	831285	822894	75.0	2	1	113	-49.0	0	3	45.1	N.A.
								S04b	Ventilation Plant No.1, at Dragon Delicious, Cho Yiu Estate	89	OFF	831285	822894	73.0	2	1	113	-49.0	0	3	43.0	N.A.
								S04c	Ventilation Plant No.2, at Dragon Delicious, Cho Yiu Estate	84	OFF	831285	822894	73.0	2	1	113	-49.0	0	3	38.0	N.A.
																				Total =	**48**	**-**
N08-04	Planned	831175	822880	55	B	65	55	S04a	Cooling Tower at Dragon Delicious, Cho Yiu Estate	91	OFF	831285	822894	75.0	2	1	112	-49.0	0	3	45.1	N.A.
								S04b	Ventilation Plant No.1, at Dragon Delicious, Cho Yiu Estate	89	OFF	831285	822894	73.0	2	1	112	-49.0	0	3	43.0	N.A.
								S04c	Ventilation Plant No.2, at Dragon Delicious, Cho Yiu Estate	84	OFF	831285	822894	73.0	2	1	112	-49.0	0	3	38.0	N.A.
																				Total =	**48**	**-**
N08-05	Planned	831175	822880	58	B	65	55	S04a	Cooling Tower at Dragon Delicious, Cho Yiu Estate	91	OFF	831285	822894	75.0	2	1	112	-49.0	0	3	45.1	N.A.
								S04b	Ventilation Plant No.1, at Dragon Delicious, Cho Yiu Estate	89	OFF	831285	822894	73.0	2	1	112	-48.9	0	3	43.1	N.A.
								S04c	Ventilation Plant No.2, at Dragon Delicious, Cho Yiu Estate	84	OFF	831285	822894	73.0	2	1	112	-48.9	0	3	38.1	N.A.
																				Total =	**48**	**-**
N08-06	Planned	831175	822880	62	B	65	55	S04a	Cooling Tower at Dragon Delicious, Cho Yiu Estate	91	OFF	831285	822894	75.0	2	1	112	-48.9	0	3	45.2	N.A.
								S04b	Ventilation Plant No.1, at Dragon Delicious, Cho Yiu Estate	89	OFF	831285	822894	73.0	2	1	111	-48.9	0	3	43.1	N.A.
								S04c	Ventilation Plant No.2, at Dragon Delicious, Cho Yiu Estate	84	OFF	831285	822894	73.0	2	1	111	-48.9	0	3	38.1	N.A.
																				Total =	**48**	**-**
N09-02	Planned	831205	822865	49	B	65	55	S04a	Cooling Tower at Dragon Delicious, Cho Yiu Estate	91	OFF	831285	822892	75.0	2	1	88	-46.9	0	3	47.2	N.A.
								S04b	Ventilation Plant No.1, at Dragon Delicious, Cho Yiu Estate	89	OFF	831285	822892	73.0	2	1	88	-46.9	0	3	45.1	N.A.
								S04c	Ventilation Plant No.2, at Dragon Delicious, Cho Yiu Estate	84	OFF	831285	822892	73.0	2	1	88	-46.9	0	3	40.1	N.A.
								S05a	Chiller No.1 at Lai King Community Hall	84	OFF	831123	823008	54.5	2	1	165	-52.3	0	3	34.7	N.A.
								S05b	Chiller No.2 at Lai King Community Hall	84	OFF	831123	823008	54.5	2	1	165	-52.3	0	3	34.7	N.A.
																				Total =	**50**	**-**
N09-03	Planned	831205	822865	52	B	65	55	S04a	Cooling Tower at Dragon Delicious, Cho Yiu Estate	91	OFF	831285	822892	75.0	2	1	88	-46.8	0	3	47.3	N.A.
								S04b	Ventilation Plant No.1, at Dragon Delicious, Cho Yiu Estate	89	OFF	831285	822892	73.0	2	1	87	-46.8	0	3	45.2	N.A.
								S04c	Ventilation Plant No.2, at Dragon Delicious, Cho Yiu Estate	84	OFF	831285	822892	73.0	2	1	87	-46.8	0	3	40.2	N.A.
								S05a	Chiller No.1 at Lai King Community Hall	84	OFF	831123	823008	54.5	2	1	165	-52.3	0	3	34.7	N.A.
								S05b	Chiller No.2 at Lai King Community Hall	84	OFF	831123	823008	54.5	2	1	165	-52.3	0	3	34.7	N.A.
																				Total =	**50**	**-**
N09-04	Planned	831205	822865	55	B	65	55	S04a	Cooling Tower at Dragon Delicious, Cho Yiu Estate	91	OFF	831285	822892	75.0	2	1	87	-46.8	0	3	47.3	N.A.
								S04b	Ventilation Plant No.1, at Dragon Delicious, Cho Yiu Estate	89	OFF	831285	822892	73.0	2	1	86	-46.7	0	3	45.3	N.A.
								S04c	Ventilation Plant No.2, at Dragon Delicious, Cho Yiu Estate	84	OFF	831285	822892	73.0	2	1	86	-46.7	0	3	40.3	N.A.
								S05a	Chiller No.1 at Lai King Community Hall	84	OFF	831123	823008	54.5	2	1	165	-52.3	0	3	34.7	N.A.
								S05b	Chiller No.2 at Lai King Community Hall	84	OFF	831123	823008	54.5	2	1	165	-52.3	0	3	34.7	N.A.
																				Total =	**50**	**-**
N09-05	Planned	831205	822865	58	B	65	55	S04a	Cooling Tower at Dragon Delicious, Cho Yiu Estate	91	OFF	831285	822892	75.0	2	1	86	-46.7	0	3	47.4	N.A.
								S04b	Ventilation Plant No.1, at Dragon Delicious, Cho Yiu Estate	89	OFF	831285	822892	73.0	2	1	86	-46.7	0	3	45.3	N.A.
								S04c	Ventilation Plant No.2, at Dragon Delicious, Cho Yiu Estate	84	OFF	831285	822892	73.0	2	1	86	-46.7	0	3	40.3	N.A.
								S05a	Chiller No.1 at Lai King Community Hall	84	OFF	831123	823008	54.5	2	1	165	-52.3	0	3	34.7	N.A.
								S05b	Chiller No.2 at Lai King Community Hall	84	OFF	831123	823008	54.5	2	1	165	-52.3	0	3	34.7	N.A.
																				Total =	**50**	**-**
N09-06	Planned	831205	822865	62	B	65	55	S04a	Cooling Tower at Dragon Delicious, Cho Yiu Estate	91	OFF	831285	822892	75.0	2	1	86	-46.6	0	3	47.5	N.A.
								S04b	Ventilation Plant No.1, at Dragon Delicious, Cho Yiu Estate	89	OFF	831285	822892	73.0	2	1	85	-46.6	0	3	45.4	N.A.
								S04c	Ventilation Plant No.2, at Dragon Delicious, Cho Yiu Estate	84	OFF	831285	822892	73.0	2	1	85	-46.6	0	3	40.4	N.A.
								S05a	Chiller No.1 at Lai King Community Hall	84	OFF	831123	823008	54.5	2	1	165	-52.3	0	3	34.7	N.A.
								S05b	Chiller No.2 at Lai King Community Hall	84	OFF	831123	823008	54.5	2	1	165	-52.3	0	3	34.7	N.A.
																				Total =	**50**	**-**

Prediction of Unmitigated Fixed Noise Source Impact on Planned NSR

NSR Labels	Existing/ Planned Uses	Location			ASR	Noise Criteria (ANL), L_{eq} (30 min)		Noise Source ID	Description of Noise Sources	Unmitigated SWL, dB(A), L_{eq} (30 min)		Notional Source Location			Directivity Factor (Q)	No. of Plant	Distance to NSR, d (m)	Correction for, dB(A)			Noise Impact at NSR, dB(A)	
		X	Y	Z, mPD		Daytime & Evening Time (0700-2300)	Nighttime (2300-0700)			Daytime & Evening Time (0700-2300)	Nighttime (2300-0700)	X	Y	Z, mPD				Distance	No.	Facade	Daytime & Evening Period	Night-time[3]
N16a-02	Planned	831232	822854	49	C	70	60	S03a	Container Lifting at Kwai Chung Container Terminal IV	105	105	831321	822584	6.5	2	1	288	-57.2	0	3	50.4	50.8
								S03b	Lorry Movement at Kwai Chung Container Terminal IV	99	99	831321	822584	6.5	2	1	288	-57.2	0	3	44.8	44.8
								S04a	Cooling Tower at Dragon Delicious, Cho Yiu Estate	91	OFF	831291	822892	75.0	2	1	75	-45.5	0	3	48.6	N.A.
								S04b	Ventilation Plant No.1, at Dragon Delicious, Cho Yiu Estate	89	OFF	831291	822892	73.0	2	1	74	-45.4	0	3	46.6	N.A.
								S04c	Ventilation Plant No.2, at Dragon Delicious, Cho Yiu Estate	84	OFF	831291	822892	73.0	2	1	74	-45.4	0	3	41.6	N.A.
																				Total =	**54**	**52**
N16a-03	Planned	831232	822854	52	C	70	60	S03a	Container Lifting at Kwai Chung Container Terminal IV	105	105	831321	822584	6.5	2	1	288	-57.2	0	3	50.4	50.8
								S03b	Lorry Movement at Kwai Chung Container Terminal IV	99	99	831321	822584	6.5	2	1	288	-57.2	0	3	44.8	44.8
								S04a	Cooling Tower at Dragon Delicious, Cho Yiu Estate	91	OFF	831291	822892	75.0	2	1	74	-45.3	0	3	48.8	N.A.
								S04b	Ventilation Plant No.1, at Dragon Delicious, Cho Yiu Estate	89	OFF	831291	822892	73.0	2	1	73	-45.3	0	3	46.7	N.A.
								S04c	Ventilation Plant No.2, at Dragon Delicious, Cho Yiu Estate	84	OFF	831291	822892	73.0	2	1	73	-45.3	0	3	41.7	N.A.
																				Total =	**54**	**52**
N16b-04	Planned	831232	822854	55	C	70	60	S03a	Container Lifting at Kwai Chung Container Terminal IV	105	105	831321	822584	6.5	2	1	289	-57.2	0	3	50.4	50.8
								S03b	Lorry Movement at Kwai Chung Container Terminal IV	99	99	831321	822584	6.5	2	1	289	-57.2	0	3	44.8	44.8
								S04a	Cooling Tower at Dragon Delicious, Cho Yiu Estate	91	OFF	831287	822890	75.0	2	1	69	-44.7	0	3	49.4	N.A.
								S04b	Ventilation Plant No.1, at Dragon Delicious, Cho Yiu Estate	89	OFF	831287	822890	73.0	2	1	68	-44.7	0	3	47.3	N.A.
								S04c	Ventilation Plant No.2, at Dragon Delicious, Cho Yiu Estate	84	OFF	831287	822890	73.0	2	1	68	-44.7	0	3	42.3	N.A.
																				Total =	**55**	**52**
N16b-05	Planned	831232	822854	58	C	70	60	S03a	Container Lifting at Kwai Chung Container Terminal IV	105	105	831321	822584	6.5	2	1	289	-57.2	0	3	50.4	50.8
								S03b	Lorry Movement at Kwai Chung Container Terminal IV	99	99	831321	822584	6.5	2	1	289	-57.2	0	3	44.8	44.8
								S04a	Cooling Tower at Dragon Delicious, Cho Yiu Estate	91	OFF	831287	822890	75.0	2	1	68	-44.6	0	3	49.5	N.A.
								S04b	Ventilation Plant No.1, at Dragon Delicious, Cho Yiu Estate	89	OFF	831287	822890	73.0	2	1	68	-44.6	0	3	47.4	N.A.
								S04c	Ventilation Plant No.2, at Dragon Delicious, Cho Yiu Estate	84	OFF	831287	822890	73.0	2	1	68	-44.6	0	3	42.4	N.A.
																				Total =	**55**	**52**
N16b-06	Planned	831232	822854	62	C	70	60	S03a	Container Lifting at Kwai Chung Container Terminal IV	105	105	831321	822584	6.5	2	1	290	-57.2	0	3	50.4	50.8
								S03b	Lorry Movement at Kwai Chung Container Terminal IV	99	99	831321	822584	6.5	2	1	290	-57.2	0	3	44.8	44.8
								S04a	Cooling Tower at Dragon Delicious, Cho Yiu Estate	91	OFF	831287	822890	75.0	2	1	67	-44.5	0	3	49.6	N.A.
								S04b	Ventilation Plant No.1, at Dragon Delicious, Cho Yiu Estate	89	OFF	831287	822890	73.0	2	1	67	-44.5	0	3	47.5	N.A.
								S04c	Ventilation Plant No.2, at Dragon Delicious, Cho Yiu Estate	84	OFF	831287	822890	73.0	2	1	67	-44.5	0	3	42.5	N.A.
																				Total =	**55**	**52**

Notes:

[1] It is considered that all noise sources on-site are steady, and will not generate sudden noise impulse. Impulsive noise correction are therefore not applicable in the calculation.

[2] Cells highlighted in red denote exceedance of the relevant criteria.

[3] Site visits were conducted, and it was found that the identified noise sources have no night-time operation.

Appendix 3.6 Catalogue of Chiller and Cooling Tower

Flaktwoods KCSD Product Catalogue (KCSD-180F)

KCSD - CONDENSING UNIT

SIZE 65D-180F

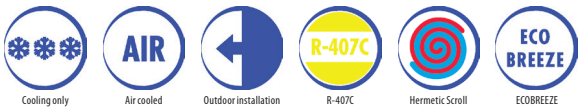
Cooling Only - Air cooled - Outdoor installation - Capacity from 210 to 588 kW

The **KCSD** presents a new concept of condensing unit offering:

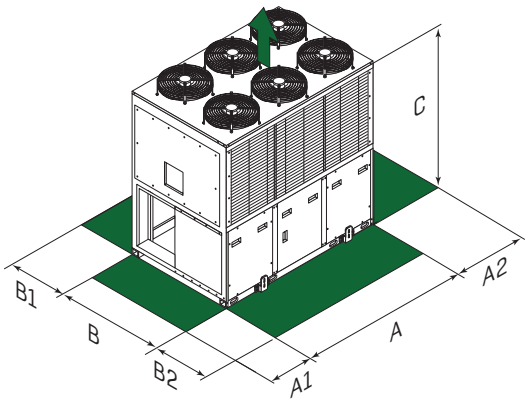
- **EFFICIENCY** that increases as the heating load decreases, while guaranteeing maximum requested load when necessary. KCSD always ensures maximum comfort with very high efficiency and consequently considerable energy savings;
- **Customisation** of the unit with the ECOBreeze accessory, which enhances the qualities of flexibility and energy efficiency;
- **Easy connection** to the service system plus a simple control system and easy maintenance drastically reduce work requiring specialised personnel with consequent reduction in installation costs;
- **Customisation of the unit**, also for special requirements both in the civil and technological air-conditioning sphere, thanks to the many available optional accessories.

The innovative and hi-tech features of KCSD give this series a much higher quality than can generally be found on the market today. **KCSD** is a condensing unit series for use together with a remote evaporating section.

FUNCTIONS AND FEATURES



DIMENSIONS AND CLEARANCES



CAUTION! For trouble-free operation of the unit it is essential to maintain the safety distances indicated by the green areas.

Size – KCSD		65D	70D	75D	80D	90D	100D	110D	120D	135F	150F	165F	180F
A - Length	mm	2950	2950	2950	2950	2950	2950	4250	4250	4250	4250	4250	4250
B - Width	mm	2195	2195	2195	2195	2195	2195	2195	2195	2195	2195	2195	2195
C - Height	mm	2410	2410	2410	2410	2410	2410	2410	2410	2410	2410	2410	2410
A1	mm	700	700	700	700	700	700	700	700	700	700	700	700
A2	mm	700	700	700	700	700	700	700	700	700	700	700	700
B1	mm	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300
B2	mm	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
SC Operating weight	kg	2102	2164	2226	2288	2293	2298	2926	2984	3113	3120	3506	3670
EN Operating weight	kg	2112	2184	2246	2308	2313	2318	2876	3009	3203	3300	3596	3650

The above mentioned data are referred to standard units for the constructive configurations indicated. For all the other configurations contact your Fläkt Woods representative.

SC - Compressors soundproofing EN - Super-silenced

VERSIONS AND CONFIGURATIONS

ENERGY RECOVERY:

- **-** Energy recovery: not required (Standard)
- **D** Partial Energy Recovery

ACOUSTIC CONFIGURATION:

- **SC** Acoustic configuration with compressor soundproofing (Standard)
- **EN** Extremely low noise acoustic configuration

EXTERNAL SECTION FAN CONSUMPTION REDUCTION:

- **CREFP** Device for consumption reduction of the external section at variable speed (phase-cutting) (Standard)
- **CREFB** Device for consumption reduction of the external section ECOBREEZE fans

TECHNICAL DATA

Size – KCSD			65D	70D	75D	80D	90D	100D	110D	120D	135F	150F	165F	180F
Cooling capacity	(1)	kW	210	226	240	255	278	318	364	386	429	462	518	588
Compressor power input		kW	56,5	61,2	67,6	73,9	81,2	88,5	99,5	114	124	140	157	172
Total power input	(2)	kW	64,8	69,5	75,9	82,2	89,5	96,8	112	126	138	156	179	193
EER		-	3,25	3,25	3,17	3,10	3,10	3,29	3,25	3,06	3,10	2,95	2,90	3,04
Refrigeration circuits		Nr	2	2	2	2	2	2	2	2	2	2	2	2
No. of compressors		Nr	4	4	4	4	4	4	4	4	6	6	6	6
Type of compressors		-	SCROLL											
Standard power supply		V	400/3/50											
Sound pressure level	(3)	dB(A)	76	76	76	76	76	76	78	78	78	78	79	79

Notes

(1) Data referred to the following conditions: Saturated suction temperature (SST) = 9.5°C (Dew Point); Outdoor air temperature 35°C

(2) Total absorbed power is given by the compressor absorbed power + fan absorbed power + auxiliary circuit absorbed power.

(3) Measures according to UNI EN ISO 9614-2 regulations, with respect to the EUROVENT 8/1 certification. The sound levels refer to the unit at full load, in the rated test conditions.

The sound pressure level refers to a distance of 1m from the external surface of the units operating in an open field. Data referred to the following conditions: Saturated suction temperature (SST) = 9.5 °C (Dew Point); Outdoor air temperature 35°C

ACCESSORIES

A full list of accessories is available on page 71.

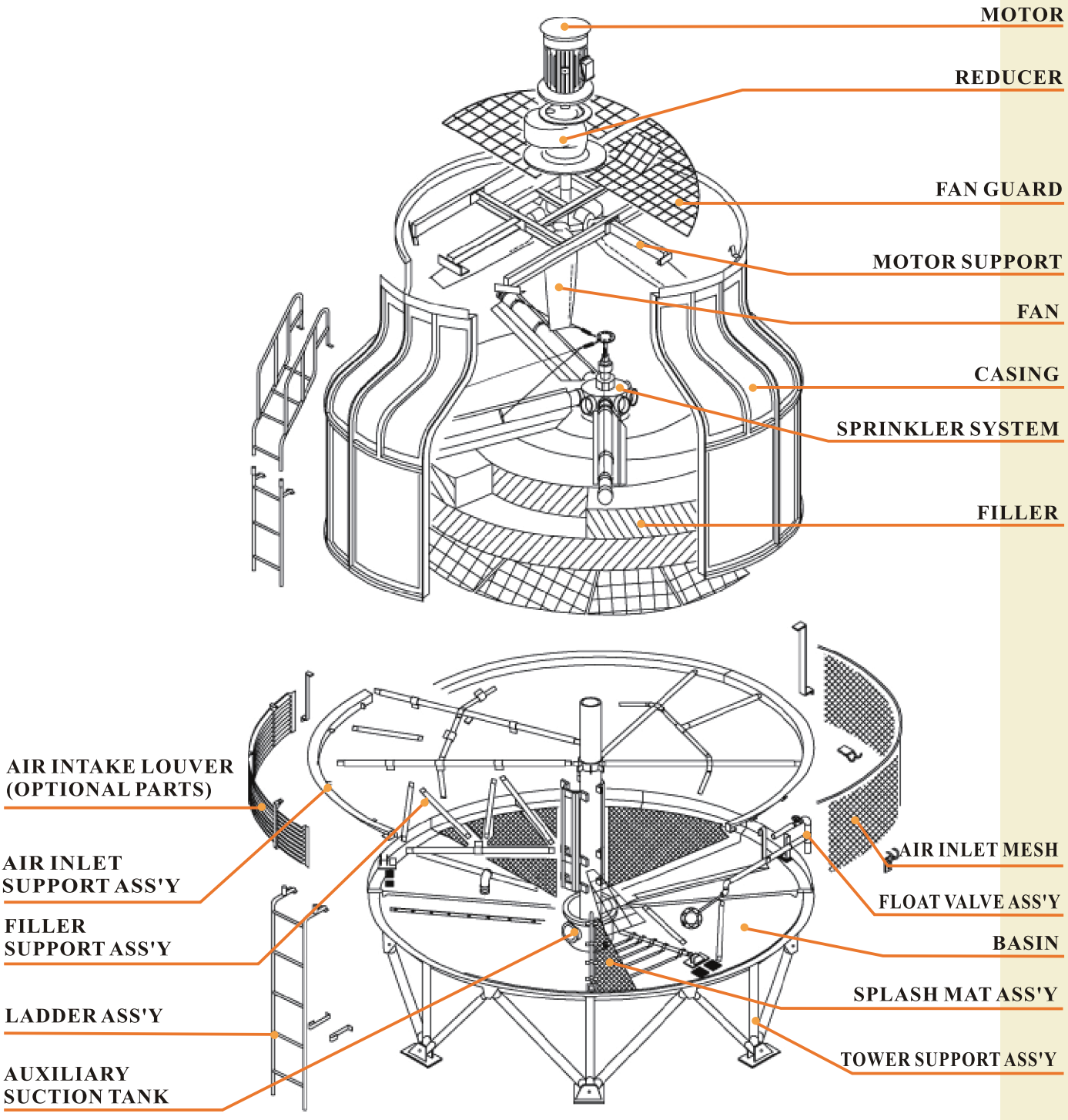
Ryowo FT Product Catalogue
(FT-150)

菱和
ryowo™

FRP COUNTER FLOW FT SERIES

COOLING TOWER

STRUCTURE



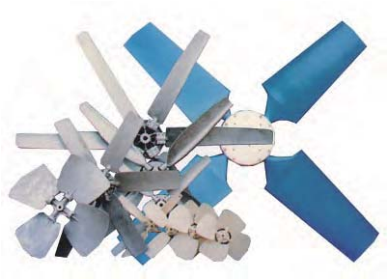
PRINCIPLE OF OPERATION

Hot water is distributed over the filler through the low velocity automatic sprinkler system and is mixed with the upward draft of ambient air causing evaporation and thus heat is removed from the water. The cooled water falls into the basin and is pumped to the heat sources for recirculation.

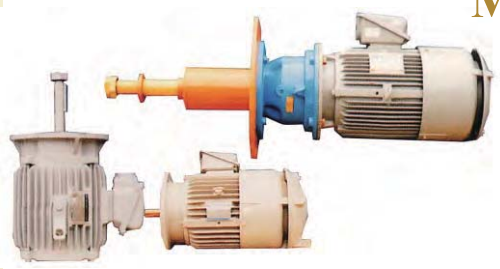
COMPONENT FUNCTION & FEATURE

AXIAL FAN

All fans are induced-draft axial type with adjustable pitch. Material chosen are non-corrosion of plastic, FRP or alu-minium alloy. The high efficiency design ensures low running cost and the lowest possible noise level . Fan blade pitches is factory set and balanced.



MOTOR



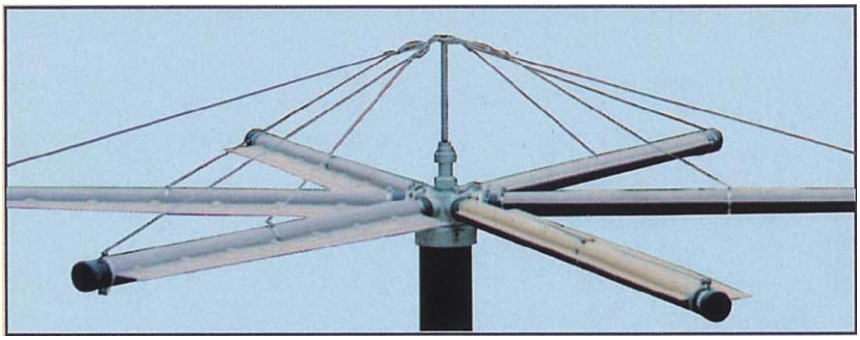
The motors, totally enclosed, fan cooled flange type, 380V/ 3ph/ 50 Hz, induction weather proof, are specially designed for RYOWO. Motors from 5.5 kw and up are Y- start and below are direct-on-line start.

TRANSMISSION SYSTEM

The fans of small models are designed to be driven by low speed motor of 6,8,10 or 12 poles which can minimise the numbers of transmission parts used. For large models, the fans are vee-belt or gear driven with 4 poles motors so the speed of fans can be adjustable to suit various application.

SPRINKLER SYSTEM

Automatic rotary sprinkler system with rotary head and sprinkler pipe distributes the hot water over the entire face area of the filler. Sprinkler pipes are non-clogging, require low-pressure to operate, and assures uniform water flow with minimal operating pump head. The F.R.P. eliminators attached to sprinkler pipes are specifically designed for Low pre Ssure drop and minimises the drift loss of water.

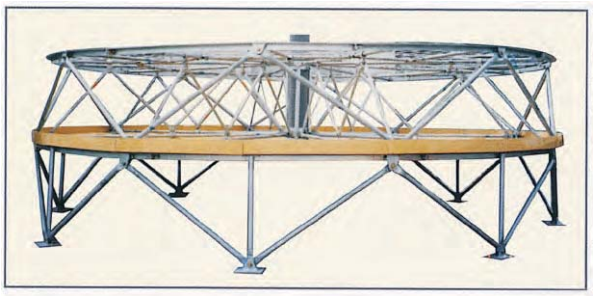


COMPONENT FUNCTION & FEATURE

CASING & BASIN

F.R.P. (fibreglass reinforced polyester) formed casings are durable, non-corrosive, weather-proof, and light weight. Cylindrical form is shaped to fully withstand wind pressure, vibration and such F.R.P. casings obliviate need for painting, reduce maintenance costs and guarantee long dependable service.

Bowl-shape basins are also made from F.R.P. with built in socket or flanged outlets for piping connections. For large models, a F.R.P. aux. suction tank is employed and fitted with piping flanges or sockets.



STEEL STRUCTURE

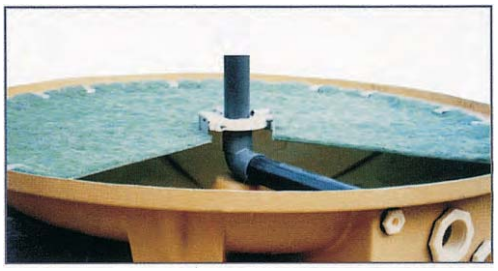
All supporting steel members are hot-dip galvanized to minimise rusting and corrosion ensuring long service life even in corrosive atmosphere. The stainless hardware members are also available upon request.

FILLER

High performance RYOWO V-30 film filler is the heart of the tower. The specially formed PVC sheets maximize the air/water contact area and minimise air pressure drop to assure efficient heat transfer while keeping fan power requirement low. It is virtually immune to corrosion and decay.

Eliminator

Specially made drift eliminator consisted of 2 types of sheets forms a “v” shape path for the transmission of the cooling tower discharge air stream. The small water droplets in the stream impact the surfaces of the drift eliminator sheets and are separated from the stream such that the drift loss ratio maintain at less than 0.001% of circulating water flow rate.



SPLASH MAT (LOW NOISE MODELS)

Specially designed noise absorbing splash mat is provided for low noise models on the water basin to minimise the unpleasant water dripping noise in the basin.

SPECIFICATION FOR FT SERIES

SPECIFICATION FOR FT SERIES

ITEM	MODEL			FT-8	FT-10	FT-15	FT-20	FT-25	FT-30	FT-40	FT-50	FT-60	FT-80	FT-100	FT-125	FT-150	FT-175	FT-200	FT-225	FT-250	FT-300	FT-350	FT-400	FT-500	FT-600	FT-700	FT-800	FT-1000
Capacity	27 ºC WB	Circulating water flow rate	m^3/ hr	6.2	7.8	11.7	15.6	19.5	23.4	31.2	39.1	46.9	62.5	78.1	97.7	117.2	136.7	156.2	175.8	195.3	234.4	273.4	312.5	390.6	468.7	546.8	625.0	781.2
		Make-up water (Approx.)	m^3/ hr	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.6	0.7	0.9	1.1	1.4	1.7	2.0	2.2	2.5	2.8	3.4	3.9	4.5	5.6	6.7	7.8	8.9	11.2
	28 ºC WB	Circulating water flow rate	m^3/ hr	5.6	7.4	10.6	14.4	17.8	21.5	28.7	36.3	42.5	58.8	70.6	88.2	107.5	125.0	142.5	160.0	176.2	212.5	250.0	287.5	337.5	431.2	512.4	575.0	718.7
		Make-up water (Approx.)	m^3/ hr	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.5	0.6	0.8	1.0	1.3	1.5	1.8	2.0	2.3	2.5	3.0	3.6	4.1	4.8	6.2	7.3	8.2	10.3
	Air flow rate (Approx.)		m^3/ min	70	85	140	160	230	280	330	420	450	700	830	950	1150	1200	1250	1600	1750	2000	2200	2450	2700	3500	3750	5000	5400
	Hot water temperature		ºC	37																								
	Cold water temperature		ºC	32																								
Overall Dimension	Diameter (ϕ)		mm	920	920	1160	1160	1490	1660	1660	1890	2100	2100	2900	2900	2900	3310	3310	3960	3960	4360	4760	4760	5600	6600	6600	7600	7600
	Height (H)		mm	1560	1700	1585	1835	1945	1885	2035	2110	2300	2475	2910	3110	3110	3300	3450	3920	3920	3990	4195	4255	4590	5310	5510	5660	5860
	Height (w/o motor) (m)		mm	1390	1530	1395	1645	1760	1720	1785	1860	1980	2155	2590	2790	2790	2880	3030	3300	3300	3290	3495	3495	3830	4470	4670	4720	4940
Material	Air inlet mesh			PVC																								
	Basin			FRP																								
	Casing			FRP																								
	Eliminator			FRP																								
	Fan			ABS Plastic								FRP					Aluminium alloy							FRP				
	Filler			PVC																								
	Motor support			Steel (Hot-dip galvanized)																								
	Sprinkler head			ABS Plastic											Aluminium alloy													
	Sprinkler pipe			PVC pipe																								
	Stand pipe			PVC pipe																								
	Structure			Steel (Hot-dip galvanized)																								
Fan	TYPE			Axial-flow																								
	Diameter		mm	550	640		770			930		1200			1500		1800		2400			3000		3400		3700		
	Speed		rpm	970								750					600		450			375		314				
	Driven type			Direct driven															Belt driven					Gear driven				
Motor	TYPE			Totally enclosed fan cooled outdoor 3 phase induction motor																								
	Power source			380V / 3 / 50Hz																								
	Rated output		kw	0.18		0.37		0.75		1.5					2.2		3.7		5.5		7.5		11		15		22	
	No of pole		Pole	6								8					10		4									
Distribution System	TYPE			Automatic sprinkler system																								
	Inlet dia		mm	40		50		80				100			125		150		200					250		300		
	Outlet dia			15		20		40							65				75					100	75		100	
	No of outlet			4								6			4				6						8		10	
Piping	Inlet		mm	40		50		80				100			125		150		200					250		300		
	Outlet		mm	40		50		80				100			125		150		200					250		300		
	Drain		mm	25												50			80					100				
	Overflow		mm	25												50			80					100				
	Float valve		mm	15								20					25		32					50		80		
	Manual make-up		mm	15										20			25		32					50		80		
Weight	Dry weight		Kg	56	65	75	85	105	130	150	180	250	270	500	540	580	870	900	1300	1350	1550	1720	2050	2450	3950	4050	4700	4900
	Operating weight		Kg	140	150	200	210	290	370	390	550	840	860	1600	1640	1680	2170	2200	2700	2750	3350	3720	3950	6150	9350	9450	11900	12100
Noise Level	Sound pressure level		dBA	45.5	47	48	50	52	54	58	59	58	59	61	61.5	62	62	62	63	63	64	64.5	61.5	62	65	66	73	74

NOTE : Nominal cooling capacity is based on 13 ℓ / min / RT (1 RT=3,900 Kcal / hr) at 37ºC inlet water tpmperature, 32ºC outlet water temperature and 27ºC ambient wet bulb temperature.

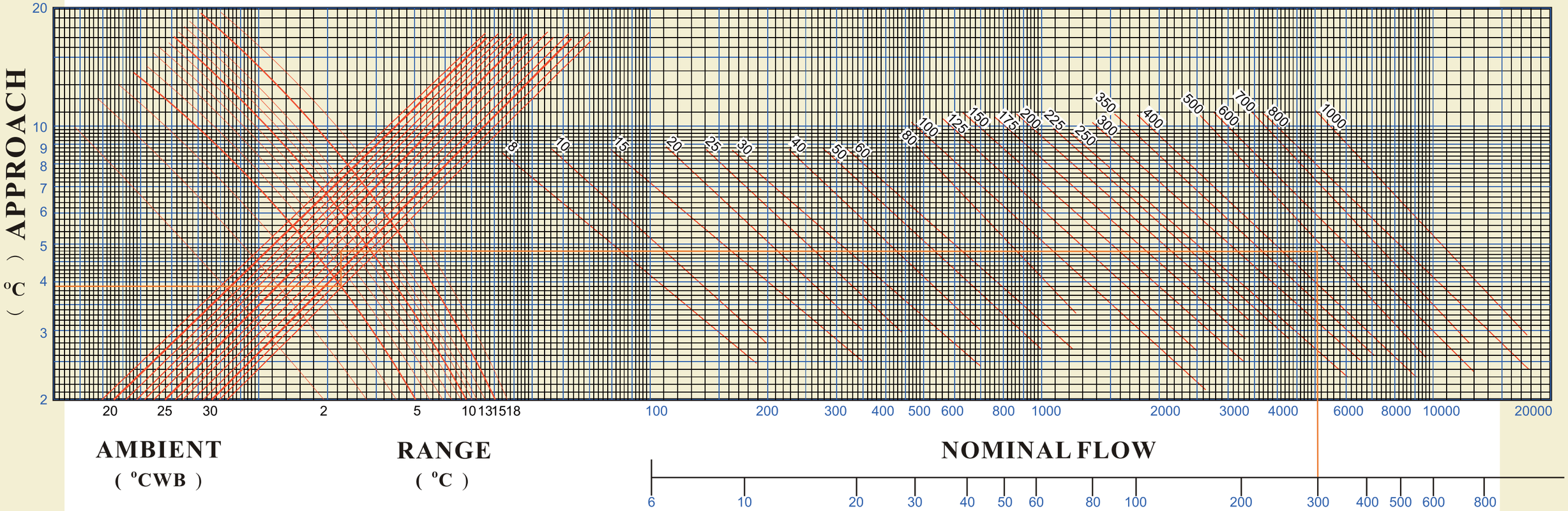
The SPLs are measured 16m horizontally from the edge of the tower at 1.5m above the foundation level.

Pump head is obtained by adding resistance of piping/condenser and the tower height(H).

The unit dimension in this catalogue is metric. Specifications listed in this catalogue are subject to change without further noticefor technical improvement of our products.

FT OR FT/LN SERIES QUICK SELECTION TABLE

(20°CWB~30°CWB)



EXAMPLE:

RATE :300m³/hr

INLET WATER TEMP :37°C

OUTLET WATER TEMP :32°C

WET BULB TEMP :28°C

RANGE: INLET WATER TEMP-OUTLET WATER TEMP
: 37°C - 32°C = 5°C

APPROACH: OUTLET WATER TEMP-WET BULB TEMP
: 37°C - 32°C = 5°C

TOWER SELECTED: FT - 500 OR FT/LN - 500

COOLING TOWER	CT							
NOMINAL FLOW	m³/hr							
INLET WATER	HWT°C							
OUTLET WATER	CWT°C							
AMBIENT WB	WB°C							
RANGE	(HWT-CWT)°C							
APPROACH	(CWT-WB)°C							
MODEL								

SPECIFICATION FOR FT/LN(LOW NOISE TYPE)

SPECIFICATION FOR FT/LN(LOW NOISE TYPE)

ITEM	MODEL			FT/LN 8	FT/LN 10	FT/LN 15	FT/LN 20	FT/LN 25	FT/LN 30	FT/LN 40	FT/LN 50	FT/LN 60	FT/LN 80	FT/LN 100	FT/LN 125	FT/LN 150	FT/LN 175	FT/LN 200	FT/LN 225	FT/LN 250	FT/LN 300	FT/LN 350	FT/LN 400	FT/LN 500	FT/LN 600	FT/LN 700	FT/LN 800	FT/LN 1000
Capacity	27 ºC WB	Circulating water flow rate	m^3/ hr	6.2	7.8	11.7	15.6	19.5	23.4	31.2	39.1	46.9	62.5	78.1	97.7	117.2	136.7	156.2	175.8	195.3	234.4	273.4	312.5	390.6	468.7	546.8	625.0	781.2
		Make-up water (Approx.)	m^3/ hr	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.6	0.7	0.9	1.1	1.4	1.7	2.0	2.2	2.5	2.8	3.4	3.9	4.5	5.6	6.7	7.8	8.9	11.2
	28 ºC WB	Circulating water flow rate	m^3/ hr	5.6	7.1	10.6	14.4	17.8	21.5	28.7	36.3	42.5	58.8	70.6	88.2	107.5	125.0	142.5	160.0	176.2	212.5	250.0	287.5	337.5	431.2	512.4	575.0	718.7
		Make-up water (Approx.)	m^3/ hr	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.5	0.6	0.8	1.0	1.3	1.5	1.8	2.0	2.3	2.5	3.0	3.6	4.1	4.8	6.2	7.3	8.2	10.3
	Air flow rate (Approx.)		m^3/ min	70	85	140	160	230	280	330	420	450	700	830	950	1150	1200	1250	1600	1750	2000	2200	2450	2700	3500	3750	5000	5400
	Hot water temperature		ºC	37																								
	Cold water temperature		ºC	32																								
Overall Dimension	Diameter		mm	920	1160	1160	1490	1660	1660	1890	1890	2100	2100	2900	2900	2900	3310	3310	3960	3960	4360	4760	4760	5600	6600	6600	7600	7600
	Height （H）		mm	1755	1620	1870	1945	1885	2145	2220	2220	2340	2515	3060	3260	3260	3450	3600	3920	3920	3990	4195	4255	4590	5310	5510	5660	5860
	Height (w/o motor) (m)		mm	1530	1395	1645	1760	1720	1785	1860	1860	1980	2155	2590	2790	2790	2880	3030	3300	3300	3290	3495	3495	3830	4470	4670	4720	4940
Material	Air inlet mesh			PVC																								
	Basin			FRP																								
	Casing			FRP																								
	Eliminator			FRP																								
	Fan			ABS Plastic								Aluminium alloy													FRP			
	Filler			PVC																								
	Motor support			Steel (Hot-dip galvanized)																								
	Sprinkler head			ABS Plastic											Aluminium alloy													
	Sprinkler pipe			PVC pipe																								
	Stand pipe			PVC pipe																								
	Structure			Steel (Hot-dip galvanized)																								
	Splash mat			Nylon																								
Fan	TYPE			Axial-flow																								
	Diameter		mm	640		770			930			1200		1500			1800		2400			3000		3400		3700		
	Speed		rpm	750					600			500		440			375					314		257				
	Driven type			Direct driven										Belt driven										Gear driven				
Motor	TYPE			Totally enclosed fan cooled outdoor 3 phase induction motor																								
	Power source			380V / 3 / 50Hz																								
	Rated output		kw	0.2		0.37			1.1			1.5		3.7				5.5		7.5		11		15			22	
	No of pole		Pole	8					10			12		4														
Distribution System	TYPE			Automatic sprinkler system																								
	Inlet dia		mm	40	50			80				100		125		150			200				250			300		
	Outlet dia			15	20			40						65					75				100	75		100		
	No of outlet			4								6		4					6					8		10		
Piping	Inlet		mm	40	50			80				100		125		150			200				250			300		
	Outlet		mm	40	50			80				100		125		150			200				250			300		
	Drain		mm	25										50					80				100					
	Overflow		mm	25										50					80				100					
	Float valve		mm	15								20					25		32				50			80		
	Manual make-up		mm	15										20			25		32				50			80		
Weight	Dry weight		Kg	80	85	100	125	145	240	280	290	380	400	600	640	680	970	1000	1400	1450	1700	1920	2250	2650	4250	4350	5100	5300
	Operating weight		Kg	160	205	220	290	375	470	625	635	970	990	1700	1740	1780	2270	2300	2800	2850	3500	3920	4250	6350	9650	9750	12300	12500
Noise Level	Sound pressure level		dBA	40	41	42.5	43.5	44.5	46	47	48	48	49.5	52	52.5	53	54	54.5	55	55	56	57	58	60	62	62.5	65	66

GUARANTEE:

All components are guaranteed against defective material for a period of one (1) year.

When return to RYOWO with transportation prepaid , all parts found by factory inspection to be defective will be repaired replaced without charge , FOB HONG KONG.

No liability will be assumed for loss or damage resulting from misuse of products.

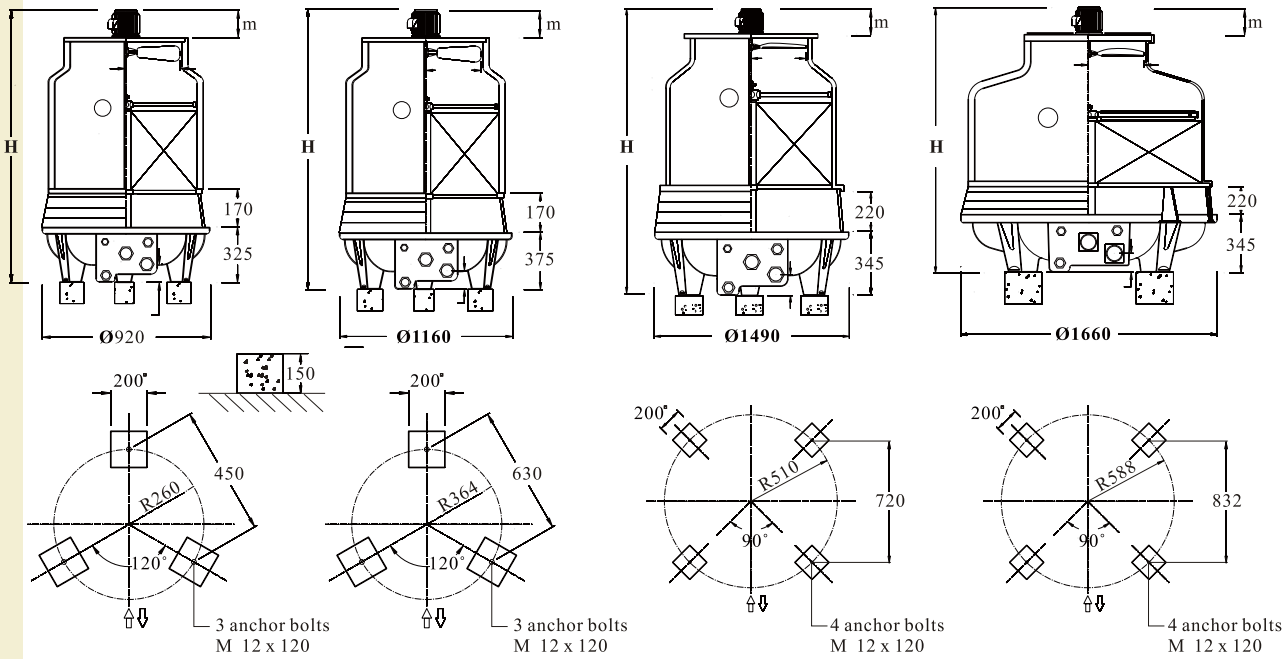
APPLICATION

For inquiry on RYOWO cooling towers , please contact local agents and specify the following conditions:

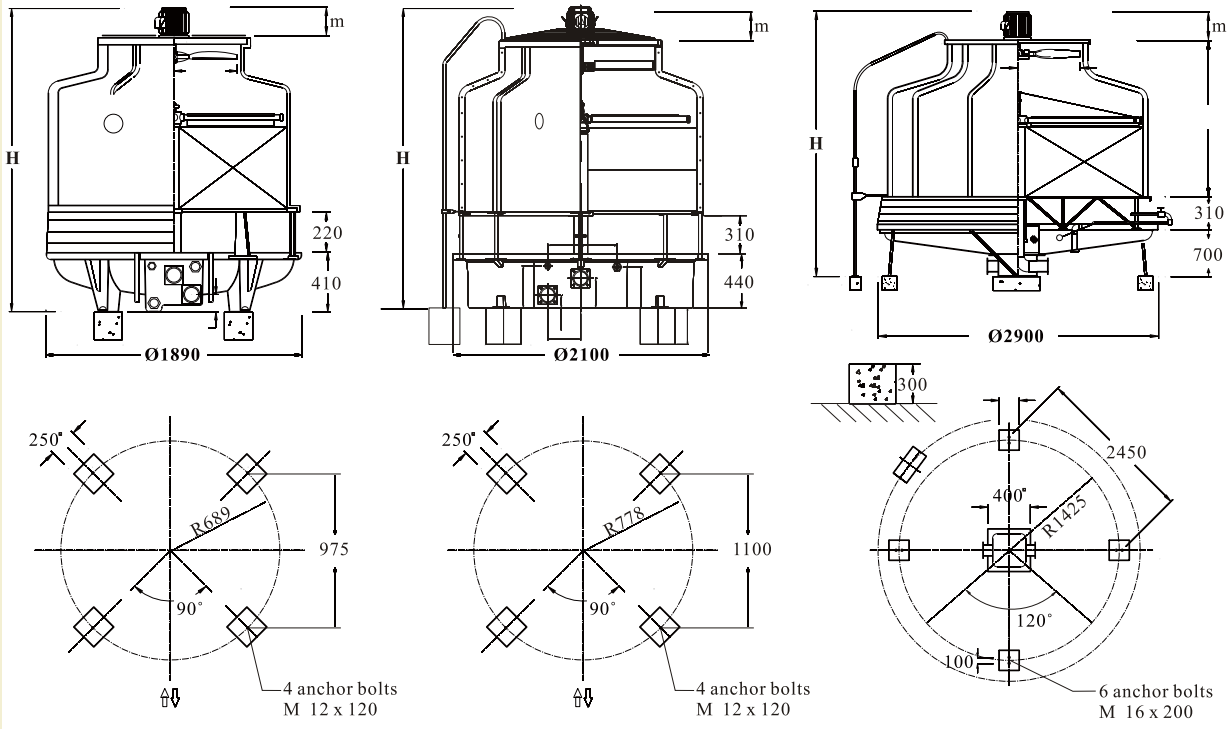
a). Circulating water flow
b). Inlet water temperature
c). outlet water temperature
d). ambient wet bulb temperature
e). power sources-voltage & frequency

TOWER FOUNDATION

FT-8 10 FT/LN-8 FT-15·20 FT/LN-10 15 FT-25 FT/LN-20 FT-30 40 FT/LN-25 30

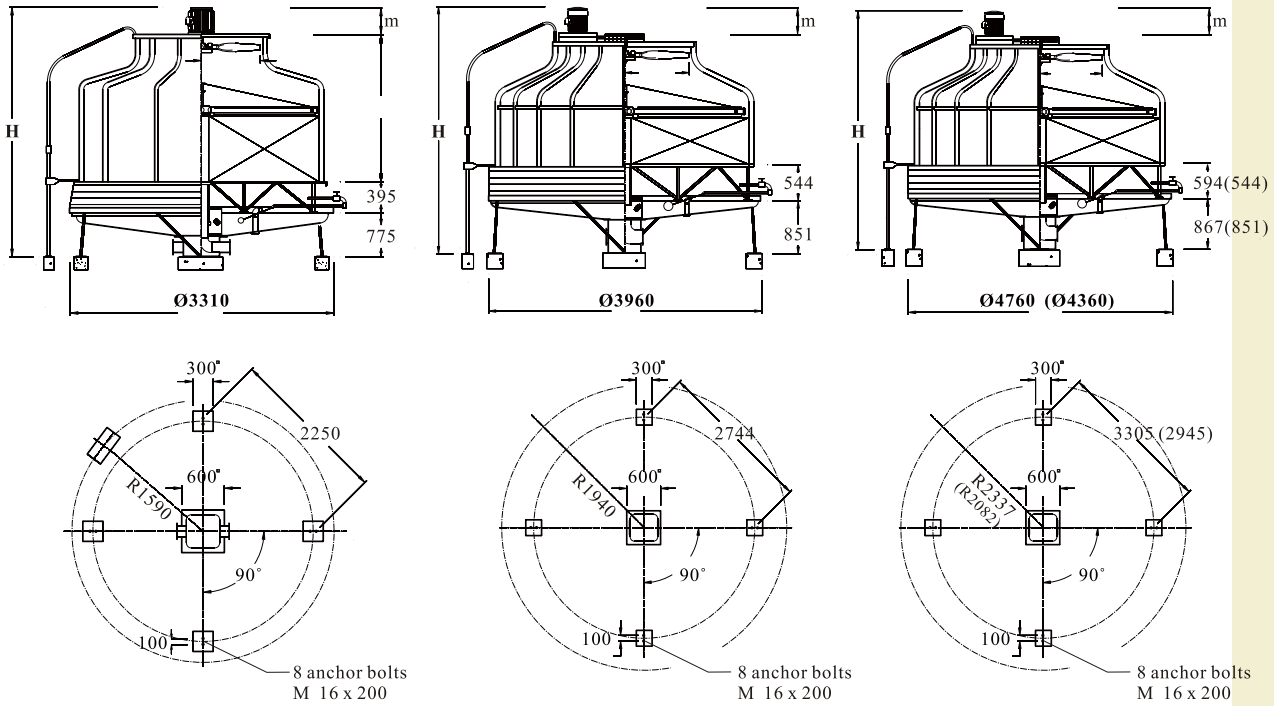


FT-50 FT/LN-40·50 FT· FT/LN-60·80 FT· FT/LN-100·125·150

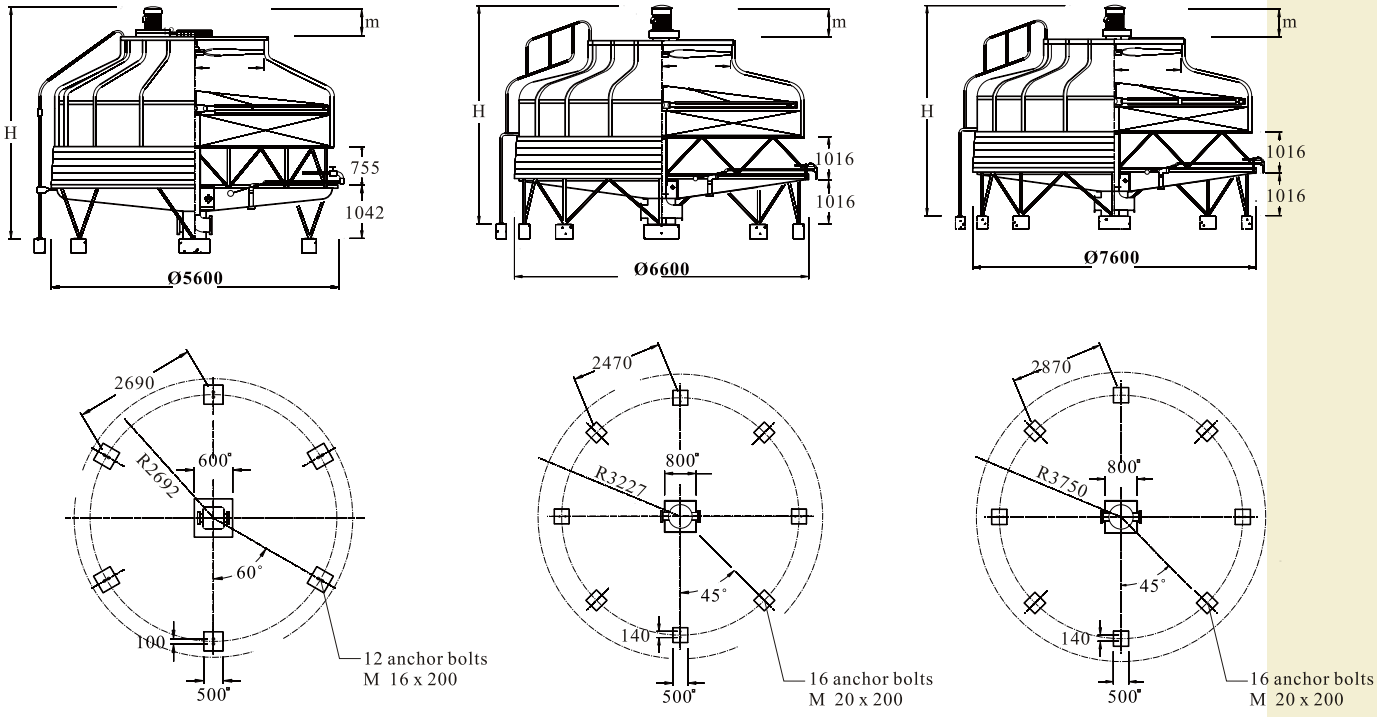


TOWER FOUNDATION

FT· FT/LN-175· 200 **FT· FT/LN-225·250** **FT· FT/LN-(300) ·350·400**



FT· FT/LN- 500 **FT· FT/LN-600 · 700** **FT· FT/LN-800 · 1000**



AVAILABLE OPTIONAL ACCESSORIES

DISCHARGE HOOD

This option is available on small models. It provides another direction of discharge air leaving the tower. It is made of F.R.P. with services door and wiring mesh on the air outlet.

HIGH TEMPERATURE FILLER

For high temperature operation such as waste water treatment , P.P. filler can withstand up to 80℃inlet water. (Special arrangement should be made for other components, please contact us for details.)

STAINLESS STEEL COMPONENTS

As an option, we can provide type 304 stainless steel major steel members, bolts and nuts.

TWO-SPEED MOTOR

As an option, two-speed motor can be provided in 4P/6P single winding configeration. A considerable reduction in noise and energy management can be achieved.

F.R.P. AIR INLET LOUVER

Inlet louver constructed of F.R.P. material can be provided, which matches the rest of tower and prevents water splashing out from the tower.

BASIN HEATERS

Electric immersion heaters with thermostat and control box are available to keep the basin water from freezing in sub-zero weather.

BODY COLOR

Cooling tower installed on the roof of building may be barely noticeable from the ground, and a colored cooling tower matching to building color will make it "good look".

JOB REFERENCES

FT-400 X 2
Bank of China, Shen Zhen

FT/LN-600 X 11
Hotel Lisboa, Macau

FT-1000 X 3
FT-500 X 10
CITIC Plaza, Guangzhou

FT/LN-300 X 6
Hong Kong University

FT-200 X 2
Miami University, U.S.A

RYOWO (HOLDING) CO .,LTD.

Rm. 1218, Angyle Centre 1,
688 Nathan Rd., MongKok,
Kowloon, Hong Kong

Tel : (852) 23918381
Fax: (852) 27893802

Http://www.ryowo.com
e-mail: ryinfo@ryowo.com

DONGGUAN RYOWO COOLING TOWER CO., LTD.

No.263 MeiJing Road West,Dalang,Dongguan,Guangdong,PRC

Tel : (86)-769 89399698
Fax: (86)-769 82973398

(86)-769 89399699
Postal Code: 523795

COOLING TOWER MANUFACTURER SINCE 1978

BROCH -EN-(03)-2013

Appendix 3.7 Rail Operation Information provided by MTRC

MTR Corporation Limited
香港鐵路有限公司
www.mtr.com.hk

Ramboll Hong Kong Limited
21/F, BEA Harbour View Center,
56 Gloucester Road,
Wan Chai, Hong Kong

Our ref: T&ESD/E&IC/ES/EnvE/L1219

Date: 29 NOV 2023

Attention: Ms. Katie Yu

By Post and Fax
(Fax no.: 3465 2899)

Dear Ms. Yu,

Re: Architectural and Associated Consultancy Services for Technical Feasibility Study (TFS) for the Redevelopment Project of The Salvation Army Lai King Home at Nos. 200-201 Lai King Hill Road, Kwai Chung, New Territories
Request for Railway and Ventilation Building Information

We refer to your letter (ref.: TCASALKHEI00_0_0007L.23.docx) dated 6 November 2023 requesting operational information regarding Tung Chung Line (TCL) and Airport Express Line (AEL).

Please be informed that the information provided in our letter dated 10 March 2022 (ref.: T&ESD/HKTS/E&IC/ES/EnvE/L1115) is still valid as of the date of this reply, except the following updates:

- The current peak train headways at the concerned section of AEL during the period of 07:00-23:00 hours is about 10 minutes for one direction.
- The current train frequency for both directions in one-day operation for AEL is about 232 trains.
- The current train frequency for both directions in one-day operation for TCL is about 378 trains.

Please be reminded that any information that may come to your knowledge or come into your possession from MTR Corporation Limited shall only be used solely as reference for this captioned project. Further distribution and/or publication of the above information for purposes not connected with the captioned project are strictly prohibited without the prior consent of MTR Corporation Limited. Please also note that any such information is subject to change without prior notification.

Should you have any additional enquiries, please feel free to contact the undersigned at 2993-4127.

Yours sincerely,

Catherine Leung
Lead Environmental Manager

MTR Corporation Limited
香港鐵路有限公司
www.mtr.com.hk

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

Our ref: T&ESD/HKTS/E&IC/ES/EnvE/L1115

Date: 10 March 2022

Attention: Ms. Katie Yu

By Email

Dear Ms. Yu,

Re: Architectural and Associated Consultancy Services for Technical Feasibility Study (TFS) for the Redevelopment Project of The Salvation Army Lai King Home at Nos. 200-201 Lai King Hill Road, Kwai Chung, New Territories
Request for Railway and Ventilation Building Information

We refer to your letter dated 5 January 2022 (ref.: TCASALKHEI00_0_0001L.21.docx) requesting operational information regarding Tung Chung Line (TCL) and Airport Express Line (AEL).

Design and Operation Parameters of Lai King Ventilation Building (LKVB) and Mid-Tunnel Ventilation Building (MTVB)

The operation of the LKVB and MTVB consist of different ventilation modes including congestion and emergency. Please note that the congestion and emergency modes are only initiated on as-needed basis and are not regularly scheduled. We suggest that you contact us to arrange the checking of respective drawings on the requested information suitable for your study if necessary, such as the operation status of equipment under different modes, dimensions and locations of louvres, etc.

Noise Measurement Records of LKVB and MTVB

We suggest that your organization conduct its own survey or noise measurements to collect specific and representative on-site noise source data to suit the individual needs of your study.

Operational Information for TCL

- The daily operating hours of TCL are from approximately 06:01 to 01:16 hours.
- The current peak train headways at the concerned section during the period of 07:00-23:00 hours and 23:00-07:00 hours are 3.6 minutes and 10 minutes for one direction respectively.
- The current train frequency for both directions in one-day operation is about 339 trains.
- The future ultimate peak train headways at the concerned section during the period of 07:00-23:00 hours and 23:00-07:00 hours are 2.5 minutes and 5 minutes for one direction respectively.
- It is estimated that the future ultimate train frequency for both directions in one-day operation is about 600 trains.

MTR Headquarters Building, Telford Plaza, Kowloon Bay,
Kowloon, Hong Kong. GPO Box 9916, Hong Kong
Tel (852) 2993 2111 Fax (852) 2798 8822

香港九龍灣德福廣場港鐵總部大樓
香港郵政總局信箱9916號
電話 (852) 2993 2111 傳真 (852) 2798 8822

MTR Corporation Limited
香港鐵路有限公司
www.mtr.com.hk

Our ref: T&ESD/HKTS/E&IC/ES/EnvE/L1115
Date: 10 March 2022

Operational Information for AEL

- The daily operating hours of AEL are from approximately 05:50 to 01:16 hours.
- The current peak train headways at the concerned section during the period of 07:00-23:00 hours and 23:00-07:00 hours are 15 minutes and 12 minutes for one direction respectively.
- The current train frequency for both directions in one-day operation is about 101 trains.
- The future ultimate peak train headways at the concerned section during the period of 07:00-23:00 hours and 23:00-07:00 hours are both 7.5 minutes for one direction respectively.
- It is estimated that the future ultimate train frequency for both directions in one-day operation is about 320 trains.
- Please note that the AEL would be allowed for 10 cars per train for the future operating condition.

Rail Maintenance Records

Please note that rail maintenance records are considered as internal information and will not be provided to outside or third party organizations. Nevertheless, you may want to consider allowing appropriate additional correction factors within your calculations based on your organization's professional judgement to cater for any possible rail condition variations.

Speed Profile

For TCL, the current maximum train speed for the section of track between Nam Cheong Station and Lai King Station is 135km/h for both directions. No change in the future speed profile is expected.

For AEL, the current maximum train speed for the section of track between Kowloon Station and Tsing Yi Station is 135km/hr for both directions. No change in the future speed profile is expected.

Noise Mitigation Measures

There are no trackside noise barriers or enclosures along the concerned track sections of TCL and AEL.

Train Noise Data

We suggest that your organization conduct its own survey or noise measurements to collect specific and representative on-site noise source data to suit the individual needs of your study.

MTR Headquarters Building, Telford Plaza, Kowloon Bay,
Kowloon, Hong Kong. GPO Box 9916, Hong Kong
Tel (852) 2993 2111 Fax (852) 2798 8822
香港九龍灣德福廣場港鐵總部大樓
香港郵政總局信箱9916號
電話 (852) 2993 2111 傳真 (852) 2798 8822

MTR Corporation Limited
香港鐵路有限公司
www.mtr.com.hk

Our ref: T&ESD/HKTS/E&IC/ES/EnvE/L1115
Date: 10 March 2022

Please be reminded that any information that may come to your knowledge or come into your possession from MTR Corporation Limited shall only be used solely as reference for this captioned project. Further distribution and/or publication of the above information for purposes not connected with the captioned project are strictly prohibited without the prior consent of MTR Corporation Limited. Please also note that any such information is subject to change without prior notification.

Should you have any additional enquiries, please feel free to contact our Acting Lead Environmental Manager, Ms. Catherine Leung at 2993 4127.

Yours sincerely,

HK Chan
General Manager –Engineering & Innovation Centre

MTR Headquarters Building, Telford Plaza, Kowloon Bay,
Kowloon, Hong Kong. GPO Box 9916, Hong Kong
Tel (852) 2993 2111 Fax (852) 2798 8822

香港九龍灣德福廣場港鐵總部大樓
香港郵政總局信箱9916號
電話 (852) 2993 2111 傳真 (852) 2798 8822

Appendix 3.8 Detailed Rail Noise Assessment Result

RNIA Results (Daytime, Unmitigated)

NSR ID	Floor	mPD*	Criteria	Overall LAeq, dB(A)
RN01	2/F	48.9	70	50
RN01	3/F	52.1	70	50
RN02	2/F	48.9	70	55
RN02	3/F	52.1	70	55
RN03	4/F	48.9	70	49
RN03	5/F	52.1	70	49
RN03	6/F	55.2	70	49
RN04	4/F	48.9	70	54
RN04	5/F	52.1	70	54
RN04	6/F	55.2	70	54

NSR ID	Criteria	Overall LAeq, dB(A)
RN01	70	50
RN02	70	55
RN03	70	49
RN04	70	54

RNIA Results (Night Time, Unmitigated)

NAR ID	Floor	mPD*	Criteria	Overall LAeq, dB(A)
RN01	2/F	48.9	60	48
RN01	3/F	52.1	60	48
RN02	2/F	48.9	60	53
RN02	3/F	52.1	60	53
RN03	4/F	55.2	60	48
RN03	5/F	58.4	60	48
RN03	6/F	61.5	60	48
RN04	4/F	55.2	60	52
RN04	5/F	58.4	60	53
RN04	6/F	61.5	60	53

NSR ID	Criteria	Overall LAeq, dB(A)
RN01	60	48
RN02	60	53
RN03	60	48
RN04	60	52-53

RNIA Results (24 hours, Unmitigated)

NSR ID	Floor	mPD*	Criteria	Overall LAeq, dB(A)
RN01	2/F	48.9	65	50
RN01	3/F	52.1	65	50
RN02	2/F	48.9	65	55
RN02	3/F	52.1	65	55
RN03	4/F	55.2	65	50
RN03	5/F	58.4	65	50
RN03	6/F	61.5	65	50
RN04	4/F	55.2	65	54
RN04	5/F	58.4	65	55
RN04	6/F	61.5	65	55

NSR ID	Criteria	Leq 24 hours, dB(A)
RN01	65	50
RN02	65	55
RN03	65	50
RN04	65	54-55