

Attachment 9

Revised Environmental Assessment

Prepared for

Lo Hing Investment Company Limited

Prepared by

Ramboll Hong Kong Limited

PROPOSED MINOR RELAXATION OF PLOT RATIO (PR) AND SITE COVERAGE (SC) FOR PROPOSED SOCIAL WELFARE FACILITY (RESIDENTIAL CARE HOME FOR THE ELDERLY) (RCHE(S)), TRAINING CENTRE WITH RESIDENTIAL INSTITUTION AND PERMITTED RESIDENTIAL DEVELOPMENT (FLAT) IN LOT 94 IN D.D. 388 AND ADJOINING GOVERNMENT LAND, CASTLE PEAK ROAD – TSING LUNG TAU, TSUEN WAN

ENVIRONMENTAL ASSESSMENT

Date **November 2024**

Prepared by **Coco Ma**
Assistant Environmental Consultant



Signed

Approved by **Calvin Chiu**
Technical Director



Signed

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

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

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CHAPTERS

	Page
1. INTRODUCTION	1-1
1.1 Background	1-1
1.2 Application Site and its Environs.....	1-1
1.3 Proposed Development.....	1-2
1.4 Environmental Appraisal of the Proposed Development	1-2
2. AIR QUALITY IMPACT ASSESSMENT	2-1
2.1 Buffer Separation Requirement under HKPSG.....	2-1
2.2 Surrounding Environment.....	2-1
2.3 Appraisal of Chimney Stack Emission Impact on the Proposed Development	2-1
2.4 Appraisal of Vehicular Emission Impact on the Proposed Development	2-1
2.5 Appraisal of Air Quality Impact Arising from the Proposed Development	2-2
2.6 Air Quality Impact during Construction of the Project	2-2
2.7 Conclusion	2-4
3. CONSTRUCTION NOISE IMPACT ASSESSMENT	3-1
3.1 Scope of Work.....	3-1
3.2 Legislation	3-1
3.3 Identification of Potential Noise Impact	3-1
3.4 Identification of Noise Sensitive Receivers	3-2
3.5 Mitigation Measures for Construction Noise	3-2
3.6 Conclusions	3-3
4. ROAD TRAFFIC NOISE IMPACT ASSESSMENT.....	4-1
4.1 Scope of Work.....	4-1
4.2 Assessment Criteria	4-1
4.3 Assessment Methodology.....	4-1
4.4 Noise Sensitive Receivers	4-1
4.5 Existing At-Source Mitigation Measures	4-1
4.6 Base Case Design and Predicted Unmitigated Noise Level	4-2
4.7 Proposed Noise Mitigation Measures.....	4-2
4.8 Assessment Result with At-Receiver Noise Mitigation Measures (Mitigated Scenario).....	4-3
4.9 Conclusions	4-3
5. FIXED NOISE IMPACT ASSESSMENT	5-1
5.1 Scope of Work.....	5-1
5.2 Assessment Criteria	5-1
5.3 Fixed Noise Sources.....	5-1
5.4 Noise Sensitive Receivers	5-2
5.5 Assessment Methodology.....	5-2
5.6 Evaluation of Noise Impact under Unmitigated Scenario	5-2
5.7 Mitigation Measure.....	5-3
5.8 Evaluation of Noise Impact under Mitigated Scenario	5-3

5.9	Conclusion	5-4
6.	LAND CONTAMINATION REVIEW	6-1
6.1	Legislations, Standards & Guidelines	6-1
6.2	Background and Site Description	6-1
6.3	Review of Historical Land Use.....	6-1
6.4	Acquisition of Local Authority Records	6-2
6.5	Site Observation.....	6-2
6.6	Discussion and Observation	6-3
6.7	Conclusion.....	6-3
7.	WASTE MANAGEMENT.....	7-1
7.1	Legislations, Standards & Guidelines	7-1
7.2	Waste Generation and Mitigation Measures	7-1
7.3	Conclusion	7-5
8.	OVERALL CONCLUSION.....	8-7

TABLES

Table 5.1	Fixed Noise Impact Assessment Criteria	5-1
Table 5.2	Summary of the Identified Fixed Noise Sources	5-2
Table 5.3	Predicted Fixed Noise Level (Unmitigated Scenario)	5-3
Table 5.4	Predicted Fixed Noise Level (Mitigated Scenario)	5-4
Table 6.1	Land Use Summary on the Application Site	6-1
Table 7.1	Estimated Quantities of Waste during Construction Phase.....	7-4

FIGURES

Figure 1.1	Application Site and its Environ
Figure 2.1	200m Study Area from the Site
Figure 2.2	HKPSG Vehicular Emission Buffer Distance for Nearby and Major Road Network
Figure 2.3	Existing ASR/NSR in the Surrounding
Figure 2.4	Location of the Exhaust Outlets
Figure 4.1	Location of Representative Noise Sensitive Receivers for Road Traffic Noise Impact Assessment

- Figure 4.2 Locations of Proposed Mitigation Measures on Traffic Noise
- Figure 5.1 Location of the Fixed Noise Sources Identified Within 300m of the Application Site
- Figure 5.2 Location of Representative Noise Sensitive Receivers for Fixed Noise Impact Assessment

APPENDICES

- Appendix 1.1 Master Layout Plan of the Proposed Development
- Appendix 1.2 Approved Environmental Assessment Report under S16 Planning Application (No. A/TW/122) – extracts of Land Contamination Review
- Appendix 1.3 Board Paper with Approval from Metro Planning Committee
- Appendix 4.1 Traffic Forecast for Year 2047 and Reply from Transport Department
- Appendix 4.2 On-site Laser Distance Measurements for the Semi-Enclosures at Castle Peak Road – Tsing Lung Tau
- Appendix 4.3 Predicted Road Traffic Noise [$L_{10}(1hr)$ dB(A)] at Selected Noise Sensitive Receivers for Unmitigated Scenario and Mitigated Scenario
- Appendix 4.4 Reference Figures of Acoustic Window/Enhanced Acoustic Balcony (Baffle Type)
- Appendix 4.5 Schedule of Noise Mitigation Measures on Traffic Noise
- Appendix 4.6 Draft Undertaking Letter of Noise Mitigation Measures on Traffic Noise
- Appendix 5.1 Site Visit and Fixed Noise Sources surveys
- Appendix 5.2 Detailed Calculations of Fixed Noise Impact Assessment
- Appendix 5.3 Undertaking Letter from the Operator of Hong Kong Garden Commercial Complex (HKGCC)
- Appendix 6.1 Aerial Photographs
- Appendix 6.2 Previous Correspondence with HKSAR Government Departments
- Appendix 6.3 Photo Records

1. INTRODUCTION

1.1 Background

- 1.1.1 The Application Site is zoned “Residential (Group B)” (“R(B)”) under the Approved Tsuen Wan West Outline Zoning Plan (No. S/TWW/21) with building height restriction of 60 mPD. It is also the subject of a previous planning application (No. A/TWW/122) for proposed minor relaxation of PR from 2.1 to 2.52 for a permitted residential development, which was approved with conditions by the Town Planning Board (TPB) on 12 Aug 2022.
- 1.1.2 The Government has launched the enhanced Incentive Scheme to Encourage Provision of Residential Care Homes for the Elderly (RCHEs) in New Private Developments – Time-limited Enhancements (LandsD’s Practice Note Issue No. 5/2023). Echoing the incentive scheme, the applicant has now proposed a composite development which contains both private residential use and RCHE.
- 1.1.3 Ramboll Hong Kong Limited was responsible for the previous approved planning application (No. A/TWW/122) and prepared the environmental assessment report (EAR) as one of the technical supporting documents. The same has been appointed to update the EAR with respect to the current proposal (including private residential use and RCHE) to address environmental noise impact, air quality impact on the Proposed Development during its construction and operational phase, potential land contamination problem and demonstrate the acceptability of the proposal.
- 1.1.4 Architectural drawings and technical information of the development are provided by the applicant and its project architect. The relevant traffic forecast is provided by the project traffic consultant (CKM).

1.2 Application Site and its Environs

- 1.2.1 The Application Site was formerly occupied by an Acid Factory which was already demolished. Currently, the Application Site is for open storage purpose without building structure. The existing condition is the same as in the previous planning application.
- 1.2.2 The Application Site is bounded by Castle Peak Road (Tsing Lung Tau) on southern side. It is surrounded by Vale Villa – Hong Kong Garden to the north, Hong Kong Garden to the west and Hong Kong Garden Commercial Complex (shopping mall) to the east. Seashore is on the opposite side of Castle Peak Road at over 40m apart. There is no change on the surrounding context when compared to the observation in the previous planning application.
- 1.2.3 The surrounding is dominated by existing residential development and associated facilities (e.g. shopping mall of the residential development). A vacant site is located to the further north for G/IC uses. **Figure 1.1** shows the location of the Application Site.
- 1.2.4 There is no industrial use and no I/R interface problem is anticipated.
- 1.2.5 A section of Castle Peak Road is provided with semi-enclosure of about 175m length in front of Blocks 22 to 24 of Hong Kong Garden which is on west side of the Application Site.

1.3 Proposed Development

- 1.3.1 The Proposed Development consists of a RCHE (G/F to 7/F; 8 floors) and a residential tower (8/F to 15/F) with maximum building height of 60mPD. There is also 1 basement floor to cater for car parking area for RCHE, residential and visitor uses.
- 1.3.2 It is noted that according to the Best Practices Guidelines issued by Social Welfare Development, RCHE including any part of it, shall not be situated at a height more than 24m above the street level, measuring vertically from the street level to the floor of the premises in which the RCHE is or is to be situated, unless otherwise approved by the Director of Social Welfare. Therefore, the RCHE portion already makes full use of the zone from G/F to 24m above ground.
- 1.3.3 Regarding the RCHE, there will be 284 beds provided in dormitories located at 3/F to 7/F based on the current proposal. Other ancillary facilities are mainly located at G/F to 2/F.
- 1.3.4 Regarding the residential portion, clubhouse including an outdoor swimming pool is located at 8/F. A total of 112 flat units are located at 9/F to 15/F (7 floors).
- 1.3.5 The tentative completion year is 2032.
- 1.3.6 The Master Layout Plan (MLP), typical floor plan and section of the Proposed Development are shown in **Appendix 1.1**. It is assumed that ancillary facilities of the RCHE (e.g. training centre, rehabilitation area, multi-purposed room, office, etc.) and clubhouse of the residential portion would be provided with central air conditioning system without reliance on openable window for natural ventilation.

1.4 Environmental Appraisal of the Proposed Development

Environmental Air Quality

- 1.4.1 As discussed in the EAR and based on updated survey on 3/7/2024, there is no industrial use identified in the vicinity and no I/R interface problem anticipated. Within 200m from the boundary of the Application Site, it is characterised by residential and associated use, as well as a retail use adjacent to the Application Site. There is no chimney stack emission identified within 200m from the Application Site.
- 1.4.2 On the other hand, the Application Site is bounded by Castle Peak Road – Tsing Lung Tau to the south and Lung Tang Road (with restricted access and considered as internal access road of Hong Kong Garden) to the north. Other carriageways are further apart.
- 1.4.3 Discussion is included in this report to demonstrate that the horizontal buffer separation requirement stipulated under Table 3.1 in Chapter 9 of the HKPSG can be fulfilled.

Environmental Noise

- 1.4.4 There is no railway system in the vicinity of the Application Site. Railway noise is not a concern.
- 1.4.5 While there is no industrial premises and activities in the vicinity, there is a shopping mall (i.e. Hong Kong Garden Commercial Complex) to the immediate east of the Application Site. An onsite survey was conducted for the EAR to identify any potential noise source, quantify impact through direct noise measurement and assess the impact to demonstrate compliance, or to devise appropriate mitigation measures in case the fixed noise impact is found to be unacceptable under base scenario without noise mitigation measure in place. Based on updated survey on 3/7/2024, there is no change on the type and number of noisy facilities identified in the vicinity.

- 1.4.6 The Application Site is surrounded by carriageways including Castle Peak Road – Tsing Lung Tau, Lung Tang Road and Lung Yu Road further apart. Castle Peak Road – Tsing Lung Tau is considered the major carriageway that would generate considerable noise impact. Despite that a section of Castle Peak Road – Tsing Lung Tau is already provided with semi-enclosure (with south side opened) so that the residual noise contribution should be insignificant, the remaining section of Castle Peak Road – Tsing Lung Tau (mainly on east side of the Application Site) would still impose noise impact on future noise sensitive uses of the development. An assessment of road traffic noise is therefore conducted to assess whether the traffic noise level at the Proposed Development could fulfil the criteria of HKPSG.

Land Contamination

- 1.4.7 As given, the Application Site was formerly used as an Acid Factory. As suggested by historical aerial photos, it was suspected that the site was occupied by Acid Factory from 1963 to 1989. However, there is absence of any further details such as type of process, raw material and product, storage arrangement, etc. The site was already vacant, unpaved and partially covered by vegetation at the time of preparation of the approved EAR. After the approved EAR (see Section 6 of **Appendix 1.2**) and till now, the Application Site is still abandoned and not used. The status is confirmed to be the same based on updated survey on 3/7/2024. There is no onsite observation of any trace of land contamination, the historical use of the Application Site was preliminarily checked for the purpose to evaluate any possible risk of land contamination in the EAR. The recommendation in the approved EAR is considered still applicable. The approved EAR and its board paper with the response of no objection to the application with respect to the environmental aspect from EPD are shown in **Appendix 1.2** and **Appendix 1.3**.

2. AIR QUALITY IMPACT ASSESSMENT

2.1 Buffer Separation Requirement under HKPSG

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

2.2 Surrounding Environment

- 2.2.1 The Application Site is located in urbanised residential area in Sham Tseng/Tsing Lung Tau. It is surrounded by Vale Villa – Hong Kong Garden to the north, Hong Kong Garden to the west and Hong Kong Garden Commercial Complex (shopping mall) to the east. There is no industrial site in the vicinity.
- 2.2.2 The nearest major road is Castle Peak Road – Tsing Lung Tau (classified as rural road in Annual Traffic Census 2022) bounding the Application Site on southern side. Another major road is Tuen Mun Road (classified as expressway in Annual Traffic Census 2022) which is 260m to the north of the Site. Details are shown on **Figure 2.1**.

2.3 Appraisal of Chimney Stack Emission Impact on the Proposed Development

- 2.3.1 According to both site survey conducted on 7/6/2021 for the EAR and updated survey on 3/7/2024, there is no chimney stack identified within 200m from the Application Site as shown on **Figure 2.1**, which is characterised by residential uses. As such, the horizontal buffer distance is deemed to have complied with the recommended buffer distance of industrial chimney under HKPSG. Hence, no adverse air quality impact due to chimney stack emission is anticipated.
- 2.3.2 It is fully understood that it should be the responsibility of the applicant and consultants to ensure the validity of the chimney data in site surveys.

2.4 Appraisal of Vehicular Emission Impact on the Proposed Development

- 2.4.1 As shown on **Figure 2.2**, Castle Peak Road – Tsing Lung Tau is located to the immediately south of the Application Site whereas Tuen Mun Road is located about 260m away from the Site. On the other hand, access roads inside Hong Kong Garden is to the immediate north and northwest of the Application Site. There is entrance gate setup to restrict using this access road to/from Hong Kong Garden and is not a public road in nature.
- 2.4.2 With reference to the Annual Traffic Census 2022, Castle Peak Road - Tsing Lung Tau is classified as rural road and Tuen Mun Road is classified as expressway. There is no specific buffer requirement on the rural road under HKPSG. However, as conservative approach, 10m buffer distance (i.e. recommended buffer distance of district distributor) was adopted in the EAR and also adopted in the assessment. On the other hand, the expressway is similar to the trunk road and the primary distributor, 20m buffer distance would be adopted. According to **Appendix 4.1**, the peak traffic flows of the access roads bounding the site on the northwestern (Road ID: L023&L024), northern (Road ID: L019&L020) and eastern (Road ID: L011&L012) sides are

200veh/hr, 250veh/hr and 550veh/hr and is comparable to ordinary local distributor or lower classification. Given that there is no specific requirement for the access road of the surrounding under HKPSG, 5m buffer distance (applicable for local distributor) is assumed applicable as the traffic volume of the access roads are minimal and analogous to local distributor or lower classification.

- 2.4.3 **Figure 2.2** shows the separation distance provided. There is no air sensitive use of the proposed development within the buffer zones. Thus, no adverse air quality impact on the Proposed Development from the vehicular emission is anticipated.

2.5 Appraisal of Air Quality Impact Arising from the Proposed Development

- 2.5.1 While the proposed development is not environmentally polluting in nature, for the future basement car park within the Proposed Development, the applicant will observe and follow EPD's ProPECC PN2/96 on Control of Air Pollution in Car Parks for the design and operation of the car parks. Car Parks will be designed such that the air quality guidelines set out in the PN are met under all conditions and with exhaust located to minimise impact on surrounding air sensitive uses. The kitchen of RCHE will also be provided with separate exhaust system and will follow the same objective. Tentative location of exhaust outlet of the ventilation system is indicated in **Figure 2.4**. This is tentatively designed so that it is away from all air sensitive uses of the proposed development or existing and planned air sensitive receivers, and subject to revision during detailed design of the project in future.

2.6 Air Quality Impact during Construction of the Project

Legislation

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

Identification of Potential Air Quality Impacts

- 2.6.2 Site formation, excavation, foundation and superstructure construction works would be required for the construction of the project.
- 2.6.3 Fugitive dust will be the potential major source of air quality impact during the construction phase. The Proposed Development consists of a RCHE of 8 storeys and a residential tower of 8 storeys with 1 storey of basement carpark. Therefore, excavation work (dusty activity) is required for the Proposed Development. It is estimated about 17,410m³ of excavated materials will be generated for excavation and site formation. Assuming a period of 1 year for excavation and site formation, about 1 truckload per hour will be generated. In general, dump truck and mechanical equipment such as excavator, piling rig and drilling rig will be used for site formation and excavation work. Since the area of the Application Site is small, the number of mechanical equipment operated simultaneously will be limited. It is estimated that the number of mechanical equipment of same type operated simultaneously within the Application Site will be around 3 numbers only.
- 2.6.4 Other than fugitive dust emission, under the Air Pollutant Control (Non-road Mobile Machinery) (Emission) Regulation, only approved or exempted non-road mobile machineries (including mobile generator, air compressor, crawler crane, bulldozer, and etc.) with a proper label are allowed to be used in the construction site. For SO₂ emission, under Air Pollution Control (Fuel Restriction) Regulation, only liquid fuel with a sulphur content of less than 0.005% by weight are allowed to be used in the construction site. Therefore, impact due to emission of other criteria pollutants – NO₂, SO₂, and CO, etc. is not considered significant.

2.6.5 According to desktop research, no concurrent projects are identified with 500m assessment area of the site. Therefore, there is no air quality impact due to the concurrent projects.

Identification of Air Sensitive Receivers

2.6.6 The Application Site is surrounded by residential and commercial developments on three sides. The nearest air sensitive receivers (ASRs) (and separation from nearest boundary of the Application Site) are: Hong Kong Garden Commercial Complex to the immediate east (about 4m), Hong Kong Garden Block 22 (Queen's Height) to the west (about 22m), Block 15 (Yale Villa) to the north (about 29m), Block 14 (Jade Heights) to the northeast (about 45m) and Block 1 to the east (about 79m) (see **Figure 2.3**).

Mitigation Measures for Construction Phase Air Quality Impact

2.6.7 Adequate and practical mitigation measures will be adopted during construction of the project to suppress dust and gaseous emission. With the implementation of sufficient suppression measures as stipulated under the APCO, Air Pollution Control (Construction Dust) Regulation (Cap 311R) and good site practices, fugitive dust and gaseous emission arising from construction can be effectively suppressed through contractual clauses and close enforcement of the resident engineers. The Contractor(s) shall be required to follow the requirements of the Air Pollution Control (Construction Dust) Regulation which requires notification before carrying out construction works and to adopt air quality control measures while carrying out demolition activities or construction activities.

2.6.8 The recommended mitigation measures for protection of nearby ASRs are described below:

- Use of regular watering, to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather;
- Use of frequent watering for particularly dusty construction areas close to ASRs;
- Open temporary stockpiles should be avoided or covered. Prevent placing dusty material storage plies near ASRs;
- Dusty material stockpiled onsite, if any, should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3-sides;
- Where this is not practicable owing to frequent usage, watering should be applied to aggregate fines;
- Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations;
- Establishment and use of vehicle wheel and body washing facilities at the exit points of the site;
- Imposition of speed controls for vehicles on unpaved site roads. 8 km/hr is the recommended limit;
- Routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs;
- Provide hoarding of not less than 3.6m high from ground level along site boundary which is close to the ASRs to further protect the ASRs.
- Location all the dusty activities away from any nearby ASRs as far as practicable

- Avoid using exempted NRMMS where possible

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

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

2.7 Conclusion

2.7.1 As confirmed in site survey, there is no chimney identified within 200m from the Application Site. In addition, the air sensitive uses in the development scheme can meet the buffer separation requirement with respect to nearest carriageways. Therefore, it is anticipated that the Proposed Development at the Application Site would not be subject to adverse air quality impact.

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

3. CONSTRUCTION NOISE IMPACT ASSESSMENT

3.1 Scope of Work

- 3.1.1 The section of this study is to review the potential construction noise impact due to the Proposed Development on the surrounding noise sensitive uses, and to recommend mitigation measures where are practicable to attenuate the impact.

3.2 Legislation

General Construction Activities during Restricted Hours

- 3.2.1 Noise impacts arising from general construction activities (excluding percussive piling) conducted during the restricted hours (19:00-07:00 hours on any day and anytime on Sunday or general holiday) and percussive piling during anytime are governed by the Noise Control Ordinance (NCO).
- 3.2.2 For carrying out of any general construction activities involving the use of any Powered Mechanical Equipment (PME) within the restricted hours, a Construction Noise Permit (CNP) issued by the Authority must be obtained under the NCO. The noise criteria and the assessment procedures for issuing a CNP are specified in following Technical Memoranda published under the NCO –
- Technical Memorandum on Noise from Percussive Piling (PP-TM).
 - Technical Memorandum on Noise from Construction Work other than Percussive Piling (GW-TM).
 - Technical Memorandum on Noise from Construction Work in Designated Area (DA-TM)
- 3.2.3 As the Site is fall within Designated Area (DA) in accordance with EPD's Plan No. EPD/AN/K&NT-03 for Tuen Mun, Sham Tseng and Ma Wan, the DA-TM is applicable. Therefore, the use of Specified Powered Mechanical Equipment (SPME) and carry out of Prescribed Construction Work (PCW) within the Site during the restricted hours shall require a valid CNP.

General Construction Activities during Non-Restricted Hours

- 3.2.4 There is no statutory control for noise arising from construction activities (other than percussive piling) during non-restricted hours (7am to 7pm from Monday to Saturday, not including general holidays). Noise limits are set out in ProPECC Practice Note PN2/93 Noise from Construction Activities – Non-statutory Controls.

Noise Emission Label for Air Compressor and Handheld Percussive Breaker

- 3.2.5 The Noise Control (Hand Held Percussive Breakers) and (Air Compressors) Regulations under NCO also limit the emission from hand held breakers having a mass of above 10 kg and air compressor capable of supplying compressed air at 500 kPa or above for carrying out construction work. The above equipment must be fitted with noise emission labels (NELs) when in operation.

3.3 Identification of Potential Noise Impact

- 3.3.1 The potential source of noise impact for construction of the Project would be the use of PME for various activities, such as site clearance, excavation works, site formation works and construction of buildings.

3.4 Identification of Noise Sensitive Receivers

3.4.1 The Application Site is surrounded by residential and commercial developments on three sides. The nearest noise sensitive receivers (NSRs) (and separation from nearest boundary of the Application Site) are: Hong Kong Garden Block 22 (Queen's Height) to the west (about 22m), Block 15 (Yale Villa) to the north (about 29m), Block 14 (Jade Heights) to the northeast (about 45m) and Block 1 to the east (about 79m) (see **Figure 2.3**).

3.5 Mitigation Measures for Construction Noise

3.5.1 Construction works shall be carried out during non-restricted hours as far as practicable. The mitigation measures recommended in ProPECC PN1/24 should be implemented where applicable. In addition, the following measures and on-site practice are recommended and will be incorporated into contract for implementation by future contractors so as to minimise the potential construction noise impacts during daytime:

- Use Quality Powered Mechanical Equipment (QPME) type equipment
- Use noise barrier or enclosure for noisy plants
- Switch off idling equipment
- Close all engine doors of equipment
- Fit muffler or silencer for noisy machines
- Carry out routine maintenance of plant and equipment
- Use quiet construction method where possible (e.g. non-percussive equipment for demolition and concrete breaking works)
- Mobile plant, if any, should be sited as far from noise sensitive receivers (NSRs) as possible
- Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs;

3.5.2 Furthermore, the same practice note and EPD's Recommended Pollution Control Clauses (RPCC) for Construction Contract should be incorporated in the relevant works contract as well. The RPCC are generally good engineering practice to minimise inconvenience and environmental nuisance to nearby residents and other sensitive receivers.

3.5.3 All in all, the Contractor shall observe and comply with the Noise Control Ordinance and its subsidiary regulations. The followings will be required in contractual document for future contractors.

3.5.4 Before the commencement of any work, the Engineer may require the methods of working, plant equipment and sound-reducing measures to be used on the Site to be made available for trial demonstration inspection and approval to ensure that they are suitable for the project.

3.5.5 The Contractor shall devise, arrange methods of working and carry out the Works in such a manner so as to minimise noise impacts on the surrounding environment, and shall provide experienced personnel with suitable training to ensure that these methods are implemented.

3.5.6 Notwithstanding the requirements and limitations set out in above, the Engineer may upon application in writing by the Contractor, allow the use of equipment and the carrying out of any construction activities for any duration provided that he is satisfied with the application which, in his opinion, is considered to be of absolute necessity and

adequate noise insulation has been provided to the schools to be affected, or of emergency nature, and not in contravention with the Noise Control Ordinance in any respect.

- 3.5.7 The Contractor shall, when necessary, apply for a construction noise permit in accordance with the Noise Control (General) Regulations prior to the commencement of the relevant part(s) of the works, display the permit as required and provide a copy to the Engineer.
- 3.5.8 Measures that are to be taken to protect adjacent noise sensitive receivers, if necessary, shall include, but not be limited to, adequate noise barriers. The barriers shall be of substantial construction and designed to reduce transmission of noise (simple plywood hoarding will not be sufficient). The barriers shall be surmounted with baffle boxes designed to reduce transmission of noise. The barriers shall be designed to BS 5228(1984). The location and details of the barriers shall be submitted to the Engineer for approval before works commence adjacent to schools and other noise sensitive receivers.
- 3.5.9 With the implementation of the abovementioned mitigation measures, no insurmountable construction noise impact is anticipated. The Project Proponent and relevant Contractor are reminded to look into the extent and practicability of proposed noise mitigation measures required and propose the package of noise mitigation measures for meeting the 75dB(A) standard for the surrounding NSRs (e.g. residential units of Hong Kong Garden) during the construction stage for agreement with the applicant before commencement of construction work.

3.6 Conclusions

- 3.6.1 The potential source of noise impact for construction of the Project would be the use of PME for various activities, such as site clearance, excavation works, site formation works and construction of buildings. With the implementation of the mitigation measures as mentioned in **Section 3.5**, no insurmountable construction noise impact is anticipated.

4. ROAD TRAFFIC NOISE IMPACT ASSESSMENT

4.1 Scope of Work

- 4.1.1 The section of this study is to review the potential road noise impacts (i.e. road traffic noise impact) on the noise sensitive uses of the Proposed Development, and to recommend mitigation measures where are practicable to attenuate the impact.

4.2 Assessment Criteria

- 4.2.1 Noise standards are recommended in Chapter 9, "Environment", of the Hong Kong Planning Standards and Guidelines (HKPSG) for planning against possible noise impact from road traffic, railway and aircrafts. According to the guidelines, the maximum road traffic noise level, measured in terms of $L_{10}(1\text{-hr})$, at façades of residential development and dormitories of RCHE is 70 dB(A) whereas that for façade of diagnostic room (sick room) of RCHE is 55 dB(A). As mentioned before, other than residential units, dormitories and diagnostic rooms of RCHE, all other uses (e.g. clubhouse, ancillary facilities of RCHE) would not rely on openable window for ventilation purpose.

4.3 Assessment Methodology

- 4.3.1 The assessment concerns the prediction of the maximum hourly L_{10} traffic noise level at noise sensitive receivers (NSRs) of the Proposed Development due to the projected traffic flow on the adjacent major road networks within 15 years from the operation year of the Proposed Development. The traffic data provided by the project traffic consultant for year 2047 is considered as the worst case scenario within 15 years upon completion of the Proposed Development in 2032. Traffic forecast is attached in **Appendix 4.1**. The endorsement of the traffic forecast data from Transport Department and the confirming letter for the traffic forecast from the Traffic Consultant is also attached in **Appendix 4.1**.
- 4.3.2 The U.K. Department of Transport's procedure "Calculation of Road Traffic Noise" has been applied to predict the hourly L_{10} noise level generated from road traffic at selected representative noise sensitive receivers (NSRs) of the Proposed Development. The predicted noise levels were then compared with the HKPSG noise criterion for assessing the impact.

4.4 Noise Sensitive Receivers

- 4.4.1 Noise Sensitive Receivers (NSRs) representing habitable room of the Proposed Development relying on openable window for ventilation have been selected for this assessment. They include living room and bedroom of residential portion, dormitories and diagnostic room of the RCHE. The locations of the representative NSRs are shown in **Figure 4.1**. The assessment points were taken at 1.2 m above the floors of the selected storeys and 1m away from the façades of openable windows.

4.5 Existing At-Source Mitigation Measures

Semi Enclosure at Castle Peak Road – Tsing Lung Tau

- 4.5.1 Semi enclosures were found at the Castle Peak Road in the vicinity of the Proposed Development. However, no relevant information could be found at the Highway Department of Ho Man Tin Government Offices. Thus, on-site measurements for the heights of the semi enclosures were conducted as shown in **Appendix 4.2**. The semi enclosures have been incorporated into the noise model.

Cantilever Barriers at Tuen Mun Road

- 4.5.2 Cantilever barriers were found at Tuen Mun Road. Given that the building height of the Proposed Development is lower than the elevation levels of Tuen Mun Road, it is considered that the natural topography could provide sufficient screening effect to the Proposed Development. As such, the cantilever barriers along Tuen Mun Road would not be incorporated into the noise model for simplification and conservatism.

4.6 Base Case Design and Predicted Unmitigated Noise Level

- 4.6.1 The Proposed Development takes advantage of the sea view to the south so that the major façades would be exposed to south side and therefore would be affected by road traffic along Castle Peak Road on the same side. It is understood that the diagnostic room of the RCHE has most stringent road traffic noise standard. In order to cater so, the RCHE is designed so that there is an internal courtyard at the middle of the block. The internal courtyard also serves to provide outdoor leisure area for elderly. All sick rooms and some dormitories are located with openable window facing the internal courtyard to minimise exposure to road traffic noise.
- 4.6.2 The potential road traffic noise impact under the base case (without any other direct noise mitigation measures) has been assessed. According to the base case result, scenario for AM peak flow is considered to be the worst case scenario. Noise mitigation measures are recommended based on the AM scenario to attenuate the road traffic noise impact.
- 4.6.3 The maximum predicted road traffic noise level is 75 dB(A) for locations representing residential portion and dormitories of the RCHE and is 53 dB(A) for locations representing diagnostic rooms of the RCHE. (see **Appendix 4.3**).
- 4.6.4 Regarding the residential portion, there are 14 out of 112 flat units with exceedance, equivalent to compliance level of 88%.

4.7 Proposed Noise Mitigation Measures

- 4.7.1 Based on the assessment result under base case scenario, acoustic window and enhanced acoustic balcony are considered and incorporated. The locations of the proposed mitigation measures are shown in **Figure 4.2** and the schedule of the mitigation measure is shown in **Appendix 4.5**.
- 1) Acoustic Window/Enhanced Acoustic Balcony (Baffle Type)
- 4.7.2 Acoustic window/Enhanced acoustic balcony (baffle type) has been proposed as an innovative mitigation measures for the residential development. According to EPD's practice note, ProPECC PN5/23 "Application of Innovative Noise Mitigation Designs in Planning Private Residential Developments against Road Traffic Noise Impact", reference design of acoustic window/enhanced acoustic balcony for achieving noise reduction (relative noise reduction, RNR) is available (see **Appendix 4.4**). The reference design also complies with the Registered Structural Engineers and Registered Geotechnical Engineers (PNAP) APP-130 "Lighting and Ventilation Requirements – Performance-based Approach" regarding the configuration of the proposed acoustic window.
- 4.7.3 The reference design of acoustic window/enhanced acoustic balcony in ProPECC PN5/23 can cater for range of room size (8m² and 18m² for acoustic window; 14m² and 18m² for enhanced acoustic balcony). The configuration which can fit the living room/bedroom/dormitories/diagnostic room will be adopted.

4.8 Assessment Result with At-Receiver Noise Mitigation Measures (Mitigated Scenario)

- 4.8.1 The quoted reference design of acoustic window/enhanced acoustic balcony would have noise reduction of at least 6dB(A). Further, addition of SAM of NRC ≥ 0.7 at top and outer opening side of the mullion can offer an additional 1.5 dB(A). Given that the maximum exceedance for the Base Case is around 5dB(A) only, it is practicable to mitigate the road traffic noise impact to the acceptable level by using acoustic window/enhanced acoustic balcony. In this assessment, it is assumed that acoustic window/enhanced acoustic balcony can reduce noise by 4.5dB(A).
- 4.8.2 The predicted road traffic noise impact at the representative NSRs with the noise mitigation measures discussed above were assessed. The mitigated result in **Appendix 4.3** indicates full compliance of road traffic noise standard with the proposed noise mitigation measures in place.

4.9 Conclusions

- 4.9.1 A road traffic noise impact assessment has been carried out to evaluate the potential traffic noise impact to the Proposed Development. The design of the proposed development has due consideration on traffic noise impact. Internal courtyard is created for the RCHE to accommodate particularly noise sensitive uses (sick room).
- 4.9.2 Furthermore, noise mitigation measures, in terms of acoustic window/enhanced acoustic balcony, have been proposed and incorporated to mitigate the adverse road traffic noise impact.
- 4.9.1 With the implementation of the above mentioned noise mitigation measures as described in **Appendix 4.5** and illustrated in **Figure 4.2**, the predicted noise level would comply with the noise standards of L_{10} (1-hour) 70 dB(A) (for residential portion and dormitories of the RCHE) and 55 dB(A) (for sick room of the RCHE). A copy of undertaking letter by the Applicant is included in **Appendix 4.6** for implementation of the proposed noise mitigation measures.
- 4.9.2 Therefore, the Proposed Development would not be subject to any adverse road traffic noise impact with proper noise mitigations in place.

5. FIXED NOISE IMPACT ASSESSMENT

5.1 Scope of Work

5.1.1 The aim of this study is to review potential noise impacts arising from the nearby fixed noise sources, including industrial buildings and activities, within 300m of the Proposed Development. Practicable noise mitigation measures would be recommended, where necessary.

5.2 Assessment Criteria

5.2.1 The Application Site is located in urbanised residential area in Sham Tseng/Tsing Lung Tau. There is no industrial site in the vicinity. Among road carriageways within 300m from the Application Site, only Tuen Mun Road New Territories Circular Road is of AADT more than 30,000 veh/day and considered as Influencing Factor (IF) according to the *Technical Memorandum for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites* (herein referred as TM). However, as it is sited over 250m away, it is conservatively assumed that the Application Site is not directly or indirectly affected by it. Therefore, Area Sensitivity Rating "B" is assumed applicable for urban area not affected by IF.

5.2.2 **Table 5.1** below shows the details of the fixed noise impact assessment criteria for this study.

Table 5.1 Fixed Noise Impact Assessment Criteria

Standard	ASRs ^[1]	Criteria	Acceptable Noise Level (ANL) ^[2]	Noise Criteria in Current Assessment Leq (30mins), dB(A)
NCO	B	Leq (30 mins) (07:00 – 23:00)	65 dB(A)	65 dB(A)
		Leq (30 mins) (23:00 – 07:00)	55 dB(A)	55 dB(A)

Notes:

[1] Acceptable Noise Level for Area Sensitivity Ratings "B" & "C" stipulated in the *Technical Memorandum for the Assessment from Places other than Domestic Premises, Public Places or Construction Sites*. Under the "Urban Area" type of the area containing NSR, an ASR of "B" is assigned to the NSR "Not Affected" by IF, while an ASR of "C" is assigned to the NSR "Directly Affected" or "Indirectly Affected" by IF.

[2] The assigned ASRs are for assessment purpose only and not to affect the Authority's discretion on the enforcement based on the temporary conditions.

5.3 Fixed Noise Sources

5.3.1 Noise survey was conducted on 7/6/2021 for the EAR to identify the fixed noise sources within 300m from the Application Site.

5.3.2 The noise environment of the Application Site is observed to be dominated by road traffic noise. The surrounding is dominated by residential uses and no industrial operation can be observed. The only potential fixed noise source was identified at the rooftop of Hong Kong Garden Commercial Complex (HKGCC) to the immediate east of the Application Site as shown in **Figure 5.1**.

5.3.3 Based on updated survey on 3/7/2024, the observation in the EAR is still valid. The number of noise sources and their nature remains unchanged. The operator of HKGCC

also confirmed that there is no change of the identified noise sources and the period of operation remains the same as before.

- 5.3.4 **Table 5.2** summarised the key information of the identified fixed noise sources. The locations of the fixed noise sources are shown on **Figure 5.1** and **Figure 5.2**. Details of the site survey including the on-site noise measurements are shown in **Appendix 5.1**.

Table 5.2 Summary of the Identified Fixed Noise Sources

Fixed Source ID	Description	Location	Operation Hours	SWL, dB(A)
CT1	Cooling Towers for Commercial Complex (Either one of CT1 and CT2 in standby mode as advised by operator)	Roof of HKGCC	7 AM to 11 PM	96.9
CT2				96.9
CT3	Cooling Towers for Individual Tenants			96.9
CT4				96.9
VO1	Ventilation Openings			82.2
VO2				88.1
VO3				85.2
VO4				87.5

5.4 Noise Sensitive Receivers

- 5.4.1 All identified noise sources are concentrated on east side of the Application Site. Therefore, representative Noise Sensitive Receivers (NSRs) on east side nearest to the identified noise sources have been selected for the assessment. **Figure 5.2** shows the location of the representative NSRs.

5.5 Assessment Methodology

- 5.5.1 Standard acoustic principles were adopted for prediction of cumulative industrial noise impact. Horizontal distance separation instead of absolute distance is adopted for simplicity and conservatism. A correction of $-20\log(\text{Dist}) - 8$ is applied to correct the SWL to sound pressure level (SPL) at the specific distance. A façade correction of +3 dB(A) is included.
- 5.5.2 For representative NSR substantially shielded by building structure (with no view line as demonstrated in **Figure 5.2**), barrier correction of -10dB(A) would apply.
- 5.5.3 Given that no tonality, intermittency or impulsiveness were perceived during the noise measurement, no corrections of the above characteristics are considered necessary.

5.6 Evaluation of Noise Impact under Unmitigated Scenario

- 5.6.1 Based on the information provided from the operational staff of the HKGCC, the operation periods of the identified fixed sources are from 7 a.m. to 11 p.m.
- 5.6.2 Given that there is no night-time operation of the identified fixed sources, the fixed noise impact assessment would only be conducted for the day and evening time period (i.e. 7 a.m. to 11 p.m.)

- 5.6.3 A summary of predicted fixed noise levels during daytime & evening (0700-2300) period at selected NSRs is tabulated as below in **Table 5.3**. Detailed calculations are shown in **Appendix 5.2**.

Table 5.3 Predicted Fixed Noise Level (Unmitigated Scenario)

Representative NSRs	Predicted Noise Level Leq(30min) (0700-2300)	Noise Criteria, dB(A)	Exceedance, dB(A)
FN3-1	69	65	4
FN3-2	56	65	0
FN4-1	69	65	4
FN4-2	56	65	0
FN5-1	69	65	4
FN5-2	56	65	0
FN6-1	69	65	4
FN6-2	56	65	0
FN7-1	69	65	4
FN7-2	56	65	0
FN9-1	66	65	1
FN9-2	68	65	3
FN9-3	68	65	3
FN9-4	67	65	2
FN9-5	66	65	1
FN9-6	54	65	0

- 5.6.4 As shown on **Table 5.3**, noise exceedances of 1 – 4 dB(A) were found out at NSRs FN3-1, FN4-1, FN5-1, FN6-1, FN7-1, FN9-1 TO FN9-5.

5.7 Mitigation Measure

- 5.7.1 At-source mitigation measure is always the most preferable option.
- 5.7.2 Based on the liaison with T.L. 60 Management Limited¹, the operator of the Hong Kong Garden Commercial Complex (HKGCC), T.L. 60 Management Limited agrees to conduct all necessary retrofitting work (e.g. partial / full enclosure, hood, silencer, acoustic louver) for the existing noisy equipment (e.g. VO1 to VO4, CT1 to CT4) at the rooftop of HKGCC to control the noise generation such that the future development at existing open ground (i.e. Application Site) to the immediate west of the HKGCC will not be subject to unacceptable noise impact as required by law due to the operation of the HKGCC. The exact retrofitting work will be determined in detailed design stage and will be implemented before OP stage of the Proposed Development. An undertaking letter from the operator of HKGCC T.L. 60 Management Limited is attached in **Appendix 5.3**.

5.8 Evaluation of Noise Impact under Mitigated Scenario

- 5.8.1 For the purpose to demonstrate the feasibility to mitigate impact to the acceptable level, it is assumed in this study that at-source noise mitigation measures (e.g. substantial shielding) would provide 10dB(A) noise reduction on the cooling towers of HKGCC (i.e. CT1 to CT4) (e.g. by using silencer, cantilevered barrier, etc.) and 5dB(A)

¹ The Applicant and operator of HKGCC are both under Chinachem Group

noise reduction on the ventilation openings of HKGCC (i.e. VO1 to VO4) (e.g. by using acoustic louver, hood to divert the opening away) such that the noise levels of the representative NSRs could comply with the relevant standards based on the Proposed Development Scheme. Detailed calculations are shown in **Appendix 5.2**.

Table 5.4 Predicted Fixed Noise Level (Mitigated Scenario)

Representative NSRs	Predicted Noise Level Leq(30min) (0700-2300)	Noise Criteria, dB(A)	Exceedance, dB(A)
FN3-1	62	65	0
FN3-2	47	65	0
FN4-1	62	65	0
FN4-2	47	65	0
FN5-1	61	65	0
FN5-2	47	65	0
FN6-1	61	65	0
FN6-2	47	65	0
FN7-1	61	65	0
FN7-2	47	65	0
FN9-1	58	65	0
FN9-2	59	65	0
FN9-3	59	65	0
FN9-4	58	65	0
FN9-5	57	65	0
FN9-6	45	65	0

5.8.2 With reference to examples and Table 2 of "Good Practices on Ventilation System Noise Control" published by EPD, the noise reduction performance of combination of partial enclosure and silencers would be 10 -20 dB(A) for cooling tower. The noise reduction of silencers would be 5-10 dB(A) for ventilation opening. It is likely that the noise reduction assumed for the mitigated scenario is practicably achievable.

5.8.3 Considering that the operator has committed to conduct required retrofitting works and it is apparent that there is practical mitigation measure to meet the targeted noise reduction, no insurmountable noise impact from the fixed sources is anticipated.

5.8.4 Given that the mitigation measures would be implemented before OP stage of the Proposed Development as agreed in the undertaking letter, no adverse impact from the fixed source would be anticipated.

5.9 Conclusion

5.9.1 The potential noise impact from fixed noise sources has been assessed based on the current proposal. The only potential fixed noise source was identified at the rooftop of Hong Kong Garden Commercial Complex (HKGCC) to the immediate east of the Application Site.

5.9.2 As the operator of HKGCC, T.L. 60 Management Limited, would conduct all necessary retrofitting work to the existing noisy equipment (e.g. VO1 to VO4, CT1 to CT4) at the rooftop of HKGCC to control the noise generation, the future residential development at existing open ground (i.e. Application Site) to the immediate west of the HKGCC will not be subject to unacceptable noise impact as required by law due to the operation of the HKGCC. Given that the mitigation measures would be implemented by the

operator of HKGCC before OP stage of the Proposed Development as agreed in the undertaking letter, no adverse impact from the fixed source would be anticipated.

6. LAND CONTAMINATION REVIEW

6.1 Legislations, Standards & Guidelines

6.1.1 The land contamination review has been conducted in accordance with the following legislation, standard and guidelines:

- EPD Guidance Note for Contaminated Land Assessment and Remediation.
- EPD Practice Guide for Investigation and Remediation of Contaminated Land.
- Guidance Manual for Use of Risk-Based Remediation Goals for Contaminated Land

6.2 Background and Site Description

6.2.1 With respect to this Land Contamination Review (LCR), a desktop review (including reviewing of historical land uses, information collected from relevant government departments) and a site visit were conducted for the EAR.

6.2.2 According to the information from the Applicant, the original use of the Application Site is an acid factory. Given that the acid factory was established long ago, the as-built drawing is not available, and no records could be found from the Building Records Access and Viewing On-line (BRAVO) of Building Departments (BD). The Application Site was found to be vacant and occupied with trees and plants when the EAR was prepared in 2021. Afterwards, there is no change of the status as confirmed by the applicant and verified in updated site survey.

6.3 Review of Historical Land Use

6.3.1 Aerial photographic records for the Site between 1963 and 2023 were reviewed to evaluate the likelihood of potential contamination associated with past uses of the Site. The historical land uses identified from the review are summarised in **Table 6.1** and selected aerial photographs are provided in **Appendix 6.1**

Table 6.1 Land Use Summary on the Application Site

Year	Land Use	Photo No.
1963	Acid Factory (suspected)	1963-6364
1964	Acid Factory (suspected)	1964-3671
1989	Acid Factory (suspected)	A18323
1990	Vacant Land	A20960
1999	Vacant Land	CN22631
2000	Open Storage Area for Construction Material	CN28040
2004	Open Storage Area for Construction Material	CW59207
2010	Open Storage Area for Construction Material	CS29341
2017	Open Storage Area for Construction Material	E027307C
2018	Vegetated Land	E050497C
2021	Vegetated Land	E129539C
2023	Vegetated Land	E194362C

6.3.2 These records revealed that the Site was occupied by building structure before 1963 and the acid factory was demolished in about the late 1980s and became vacant in 1990. Since it was learned that the site was occupied by Acid Factory, it was suspected that the building structure was Acid Factory. Open storage area for the storage of construction material were observed from 2000 to 2017. Afterwards, the Site is vacant again with vegetation until now.

6.3.3 With reference to the BRAVO, there is no building records about the Application Site. No detailed information of the unknown building structures and the open storage area can be found in the BRAVO.

6.4 Acquisition of Local Authority Records

6.4.1 The Environmental Protection Department (EPD) and the Fire Services Department (FSD) were approached to obtain the information of chemical waste and dangerous goods (DGs). As replied by EPD, there was no record of registered chemical waste producer registration or chemical spillage/ leakage incident record onsite. As replied by FSD, neither records of dangerous good license, fire incidents nor incidents of spillage / leakage of dangerous goods were found onsite. As replied by Land Department, DLO is not a position to advice the information on spillage accidents, illegal/ contaminating land uses or uncontrolled dumping uses and historical use information for the Application Site. Topographic Map available from Lands Department was reviewed. Topographic Map records generally tally with observations in aerial photos. As replied by the Planning Department, the site was zoned "R(B)" on the draft Tsuen Wan West OZP No. S/TWW/1 gazetted on 03/02/1989 and remained unchanged since then. Also, the site is currently vacant. The Consultant visited the Town Planning Board Statutory Planning Portal 3 to obtain latest records for land zoning. The website as of 19 September 2024 has confirmed the zoning was under Tsuen Wan West Outline Zoning Plan (OZP) No. S/TWW/21.

6.4.2 Details of the correspondences are shown in **Appendix 6.2**.

6.5 Site Observation

6.5.1 Site visit was conducted on 7/6/2021 for the LCR and updated survey is conducted on 3/7/2024. At present, the Site is a vacant land and occupied with trees and plants as shown in below photograph. Photo records taken from the at grade level are shown in **Appendix 6.3**.



Photo took from the roof of Hong Kong Commercial Complex (7/6/2021)



6.5.2 According to the information from the site visit, there is no stressed vegetation on site. No chemicals or noticeable odours were found. No trace of land contamination can be observed in survey.

6.6 Discussion and Observation

6.6.1 Based on the above, the desktop review of **historical** information indicates that the application site was acid factory until year 1990. The application site remained vacant since then and became open storage area for construction materials storage until 2018. The application site was abandoned and covered by trees and plants since then.

6.6.2 According to the updated site visit on conducted on 3/7/2024, the application site is mainly covered by trees and plants. No chemical spillage/ leakage was observed onsite. There are no land contamination issues identified in current land use.

6.6.3 However, the application site was previously occupied by an acid factory. There is no information on the **exact** occupation period, routine operation procedures, the layout plan, etc. Given the nature of the historical use, the application site is considered as potential land contamination area. Therefore, further site **investigation** and soil/**groundwater** sampling is recommended after site is cleared to determine whether the site is contaminated as in the **previous** approved planning application (No. A/TW/122).

6.7 Conclusion

6.7.1 The Application Site was formerly occupied as acid factory **without details** and used for open storage **of construction materials**.

6.7.2 On the other hand, there is no information suggesting the use of unknown building structure identified in aerial photo. As advised by relevant government departments, there was no chemical spillage accident record onsite. Neither records of dangerous good license, fire incidents nor incidents of spillage / leakage of dangerous goods were found onsite.

6.6.3 However, the application site was previously occupied by an acid factory. There is no information on the **exact** occupation period, routine operation procedures, the layout plan, etc. Given the nature of the historical use, the application site is considered as potential land contamination area. Therefore, further site **investigation** and soil/groundwater sampling is recommended after site is cleared to determine whether the site is contaminated as in the **previous** approved planning application (No. A/TW/122).

6.7 Conclusion

6.7.1 The Application Site was formerly occupied as acid factory **without details** and used for open storage **of construction materials**.

6.7.2 On the other hand, there is no information suggesting the use of unknown building structure identified in aerial photo. As advised by relevant government departments, there was no chemical spillage accident record onsite. Neither records of dangerous good license, fire incidents nor incidents of spillage / leakage of dangerous goods were found onsite.

6.7.3 Since there is lack of details regarding the former acid factory **before 1990** and open storage **for construction materials during 2000 to 2017**, further site **investigation** and soil/**groundwater** sampling is recommended after site is cleared to determine whether the site is contaminated, and if so, the extent of the potential contamination should be revised. The Contamination Assessment Plan (CAP) will be prepared to cover all potentially land contaminating area within the Application Site in later stage. Subsequently, Contamination Assessment Report (CAR) and Remediation Action Plan (RAP) will be prepared to identify the potential land contamination issued in the Application Site. Further land contamination assessment and/or remediation works (if necessary) shall be completed before commencement of any construction works for the Proposed Development, in accordance with relevant guidelines issues by government departments.

7. WASTE MANAGEMENT

7.1 Legislations, Standards & Guidelines

7.1.1 The principal legislation controlling waste materials in Hong Kong is the Waste Disposal Ordinance (WDO) (Cap. 354) and its subsidiary regulations including Waste Disposal (Chemical Waste) (General) Regulation (Cap. 354C) and Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N). Other relevant ordinance includes Land (Miscellaneous Provisions) Ordinance (Cap 28) and Public Health and Municipal Services Ordinance (Cap 132) - Public Cleansing and Prevention of Nuisances Regulation. Other relevant guidelines which cover how applicant and contractor should comply with the regulations are as follows:

- Waste Disposal Plan for Hong Kong (December 1989), Planning, Environment and Lands Branch Government Secretariat, Hong Kong Government;
- Environmental Guidelines for Planning In Hong Kong (2022), Hong Kong Planning Standards and Guidelines, Hong Kong Government;
- New Disposal Arrangements for Construction Waste (1992), EPD & CED, Hong Kong Government;
- Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes (2022), EPD, Hong Kong Government;
- Works Branch Technical Circular (WBTC) No. 2/93, Public Dumps, Works Branch, Hong Kong Government;
- WBTC No. 2/93B, Public Filling Facilities, Works Branch, Hong Kong Government;
- Waste Reduction Framework Plan, 1998 to 2007, Planning, Environment and Lands Bureau, Government Secretariat, 5 November 1998;
- WBTC No. 12/2000, Fill Management; Works Bureau, Hong Kong SAR Government;
- DevB TCW No. 8/2010, Enhanced Specification for Site Cleanliness and Tidiness. Development Bureau, Hong Kong SAR Government;
- WBTC No. 12/2002, Specification Facilitating the Use of Recycled Aggregates. Works Bureau, Hong Kong SAR Government;
- DEVB TC(W) No. 6/2010, Trip Ticket System for Disposal of Construction & Demolition Materials, Development Bureau, Hong Kong SAR Government;
- Practice Note for Authorized Persons and Registered Structural Engineers – Construction and Demolition Waste (PNAP ADV-19, also known as PN for AR&RSE No. 243);
- A Guide to the Chemical Waste Control Scheme; and
- Monitoring of Solid Waste in Hong Kong 2022.

7.2 Waste Generation and Mitigation Measures

Waste Generation

7.2.1 Construction activities for the Proposed Development will generate waste materials requiring appropriate management and disposal. Likely range of waste types includes:

- C&D materials due to excavation and site formation;
- General refuse generated by the workforce; and

- Chemical and oily wastes due to maintenance of equipment.

Waste Management Strategy

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

Construction Waste Disposal Measures

7.2.3 The various waste management options are categorised in terms of preference from an environmental viewpoint. The options considered to be most preferable have the least environmental impacts and are more sustainable in the long term. The hierarchy is as follows. The waste management strategy is to avoid waste generation in the first place (i.e. in descending preference of the list below).

- Avoidance and reduction;
- Reuse of materials;
- Recovery and recycling; and
- Treatment and disposal.

7.2.4 The following section describes the best management practices in construction site to avoid or further reduce the potential environmental impacts associated with the handling, collection and disposal of construction and chemical wastes arising from the construction of the Project.

7.2.5 The Contractor should prepare and submit a Waste Management Plan (WMP) to Architect/Engineer for approval before the commencement of any construction works based on the requirement of PNAP ADV-19. The WMP should include designation of areas for the segregation and temporary storage of materials for future use or recycling, the hierarchy for waste management on and off-site as well as a complete list of mitigation measures for handling excavated materials.

7.2.6 It will be the contractor's responsibility to ensure that only reputable licensed waste collectors are used and that appropriate measures to reduce adverse impacts, including windblown litter and dust from the transportation of these wastes, are employed. In addition, the contractor must ensure that all the necessary permits or licences required under the Waste Disposal Ordinance are obtained for the construction phase.

7.2.7 It can be achieved through careful planning of works method and material consumption before ordering of materials. Material should be properly stored and protected to reduce damage and contamination to reduce waste generation as well. Non-timber formwork, or used timber, instead of virgin timber, should be adopted where possible.

7.2.8 If that is unavoidable, source reduction and segregation should be exercised as far as practicable and at the same time, recycling and reuse should be adopted to salvage as much as possible all the recyclable and reusable materials.

7.2.9 On-site sorting of construction wastes will be recommended. On-site sorting can be achieved by avoiding the generation of "mixed waste" through good site control.

7.2.10 Waste generated by construction activities should be sorted into inert C&D materials and non-inert C&D materials. Adequate areas for sorting and storage of segregated materials should be provided onsite. The inert C&D materials which comprise soil, sand, clay, slurry, etc shall be reused in earth filling, reclamation or site formation works (such as backfilling). The other non-inert C&D materials which comprises metal, timber, paper, glass, junk and general garbage shall be reused or recycled and, as the

last resort, disposal of at landfills. The Applicant and its contractor will consider if any yard waste is appropriate to send to the Yard Waste Recycling Centre in Y-Park for recycling prior to disposal at the designated landfill site.

- 7.2.11 Used timber in good condition will be reused in other contract and construction site of the contractor to reduce the amount of timber wastes.
- 7.2.12 Surplus inert construction material and other non-inert C&D materials which comprises metal, timber, paper, glass, etc. shall be recycled. Recycle bins should be provided onsite and workers should be trained and encouraged to segregate recyclable and non-recyclable wastes upon disposal.
- 7.2.13 The site area of the Application Site is approximately 3306m². The level difference in Hong Kong Principal Datum (Metre) within the site is around 2.6m and assumed with a constant slope. Assuming the inert and non-inert materials produced during the site formation is 90% and 10%, 3,900m³ and 400m³ of inert and non-inert materials will be produced in this stage. On the other hand, the area and depth of the basement of the development is 2,352m² and 5.5m. It is estimated that 12,000m³ and 940m³ of inert and non-inert materials are generated from excavation, assuming 93% inert C&D materials and the remaining are non-inert C&D materials. During the building construction, appropriately 1,890m³ C&D materials will be produced. Assuming 80% are inert materials, 1,510m³ and 380m³ of inert and non-inert materials will be produced. Therefore, it is estimated that about 17,410m³ of inert C&D material and 1,720m³ of non-inert C&D material will be generated during the course of construction (including site formation, excavation and building construction). Adequate areas for sorting and storage of segregated materials should be provided onsite. Construction wastes shall be sorted, with the inert C&D materials broken up into small pieces for delivery at public fill reception facility, and the non-inert C&D materials should be disposed of at landfill.
- 7.2.14 The Applicant and its contractor will consider if "All dump trucks engaged on-site for delivery of inert and non-inert C&D material from the site to the designated disposal location, including PFRFs, landfill etc., should be equipped with GPS or equivalent system for tracking and monitoring of their travel routings and parking locations by the Contractor to prohibit illegal dumping and landfilling of materials" and "The data collected by GPS or equivalent system should be recorded properly for checking and analysis the travel routing and parking locations of dump truck engaged on site" are appropriate in the construction phase.
- 7.2.15 Any unused chemicals and those with remaining functional capacity should be recycled as far as possible. Chemical waste will be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes.
- 7.2.16 Chemical wastes such as waste lubricant and waste oil generated during maintenance and servicing of construction plant/equipment will be generated in demolition and construction phases in strict compliance with the Waste Disposal (Chemical Waste) (General) Regulations. Say, not more than 50L of chemical waste is expected to be generated per month. The amount of chemical waste to be generated shall be quantified in the Waste Management Plan (WMP) as part of the Environmental Management Plan (EMP) to be prepared by the Contractor in the subsequent construction stage. Also, the requirements to register with EPD as a chemical producer is observed and will be duly followed by the Project Proponent or its Contractor.
- 7.2.17 Waste disposal from construction site is subject to control under the Waste Disposal Ordinance.

7.2.18 For general refuse (e.g. food scraps and container, waste paper, metal can, plastic bottle) from workforce, a generation rate of 0.65 kg per worker per day is assumed. About 50 workers are assumed for this project so that daily general refuse generation rate is about 33kg/day.

7.2.19 **Table 7.1** presents the estimation of waste generated during construction phase.

Table 7.1 Estimated Quantities of Waste during Construction Phase

Waste Material	Estimated Waste Generation	Proposed Disposal Method and Destination
Inert C&D Material	~17,410 m ³	~0.5% (i.e. 90m ³) would be reused and the remaining (i.e. 99.5% or ~17,320m ³) would be delivered offsite to public fill reception facilities
Non-Inert C&D Material	~1,720 m ³	Disposal to landfill Yard waste will be delivered to the Yard Waste Recycling Centre in Y-Park
General Refuse	~33 kg per day	Recyclables to recyclers; Non-recyclables to landfill
Chemical Waste	Anticipated to be limited (not more than 50L of chemical waste)	To be collected by licensed chemical waste collectors and deliver to Chemical Waste Treatment Centre

Waste Management for Operational Phase

7.2.20 During operation of the project, there will be waste generation from residential and RCHE uses such as glass, metals, paper, plastics, food wastes, textile, wood, household hazardous wastes and others. Adequate waste collection/storage facilities will be provided for collection and storage of sorted recyclable wastes (glass, paper, metal, plastic) to enable recycling. Based on Waste Statistics for 2022, the per capita disposal rates of municipal solid waste, domestic waste, commercial & industrial waste are respectively 1.51 kg/person/day, 0.93 kg/person/day and 0.59 kg/person/day (Plate 2.7 of Waste Statistics for 2022). Among domestic and commercial waste, the recovery rate are respectively 20% and 45% respectively (Plate 3.2 of Waste Statistics for 2022). Based on the Proposed Development with around 627 residential population and 42 working population, there will be around 770kg/day of waste generation (i.e. $0.93/(1-20\%) \times 627 + 0.59/(1-45\%) \times 42$). With adequate waste collection/storage facilities provided to segregate recyclable and non-recyclable wastes, the burden of waste treatment facilities in Hong Kong will be reduced. In addition, the applicant will explore in detailed design stage to collect food waste alongside these recyclable wastes mentioned above to further reduce waste generation.

7.2.21 The removal of general refuse (including food waste, paper, plastic bottles and aluminium cans, etc.) from the site will be recommended to arrange on a daily basis or at least on every second day to minimize any potential odour impacts. Disposal of general refuse is recommended before foreseeable inclement weather such as typhoon or heavy rain.

7.3 Conclusion

- 7.3.1 Best management practice as discussed in this context will be adopted for the construction and operation of the Proposed Development so that no significant waste management implications is anticipated during the construction and operation phase.

8. OVERALL CONCLUSION

- 8.1.1 This environmental assessment has been updated with respect to the current proposal of proposed composite development to evaluate the potential environmental noise, air quality impact and risk of land contamination.
- 8.1.2 Potential air quality impact including stack and vehicular emission impact on the Proposed Development during its operation, and construction phase impact on surrounding have been discussed. Buffer separation requirement stipulated under the HKPSG has been complied with so that no adverse air quality impact on the Proposed Development is anticipated. Best management practice will be adopted to suppress air quality impact on the surrounding during its construction.
- 8.1.3 Individual environmental noise impact assessments have been included to assess the potential impact. Best management practice will be adopted to suppress noise impact on the surrounding during its construction. Road traffic noise mitigation measures, in terms of acoustic window/enhanced acoustic balcony (baffle type), will be provided to mitigate road traffic noise impact to the acceptable level for all noise sensitive uses that rely on openable window for natural ventilation. On the other hand, at-source noise mitigation measures will be implemented for the fixed noise sources identified at Hong Kong Garden Commercial Complex as confirmed by its operator so as to meet the required standard. No unacceptable noise impact is anticipated after recommended mitigation measures in place.
- 8.1.4 Regarding potential land contamination, it is known that the Application Site was occupied as acid factory before **without details** and used for open storage of **construction materials**. There is also no information suggesting the use of unknown building structure identified in aerial photo. Further site **investigation, groundwater sampling** and soil sampling is recommended after site is cleared to determine whether the site is contaminated, and if so, the extent of the potential contamination should be revised. The Contamination Assessment Plan (CAP) will be prepared to cover all potentially land contaminating area within the Application Site in later stage. Subsequently, Contamination Assessment Report (CAR) and Remediation Action Plan (RAP) will be prepared to identify the potential land contamination issued in the Application Site. Further land contamination assessment and/or remediation works (if necessary) shall be completed before commencement of any construction works for the Proposed Development, in accordance with relevant guidelines issues by government departments.
- 8.1.5 In addition, the Applicant will refer to the relevant legislation, regulations and circulars/guidelines on waste management for proper handling of waste.
- 8.1.6 Based on the finding of this environmental assessment, it is concluded that the Proposed Development would not be subject to unacceptable air quality, environmental noise impact with recommended mitigation measures in place. Potential land contamination problem will be duly addressed in later stage.

Figures

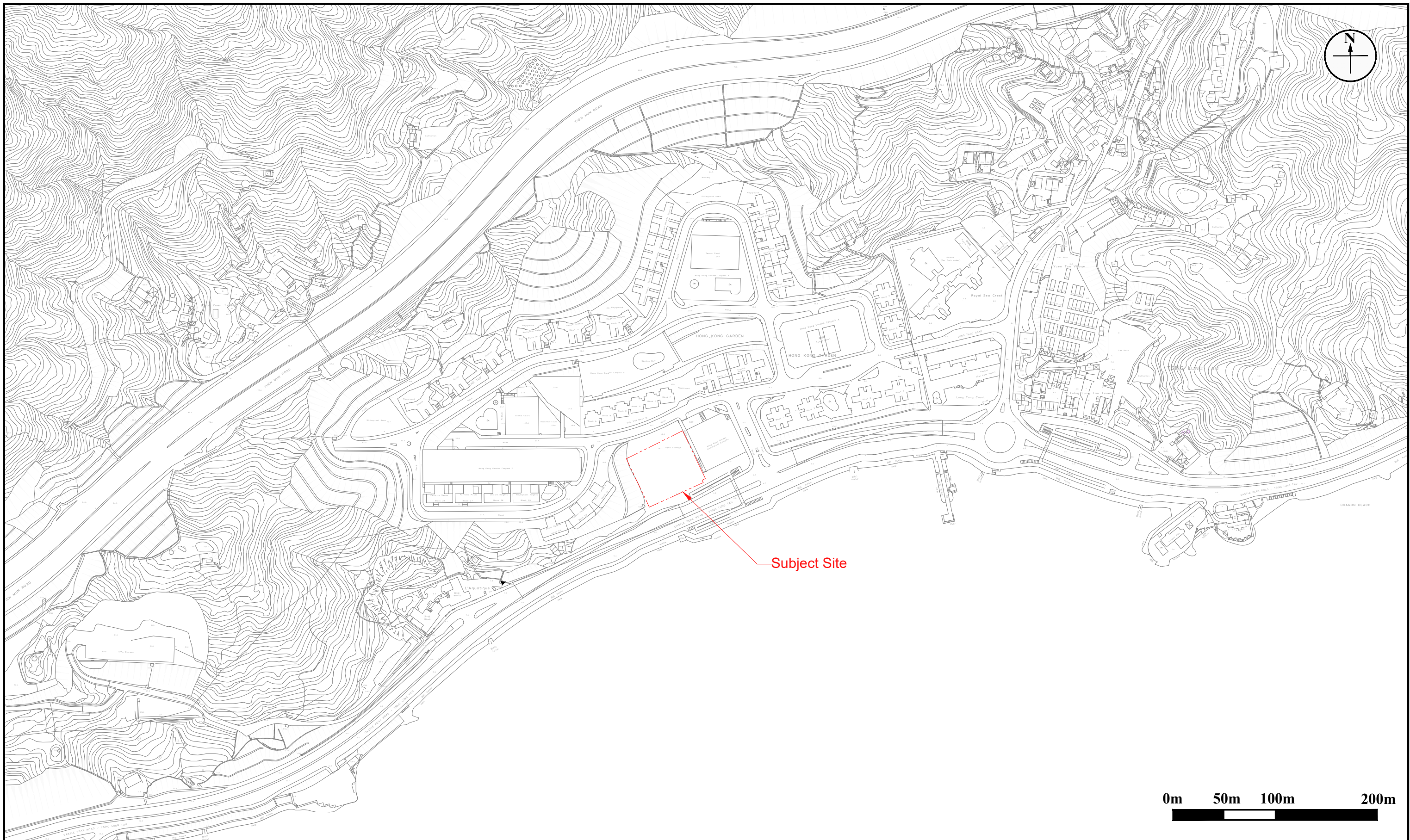


Figure: 1.1

Title: Subject Site and its Environ

RAMBOLL

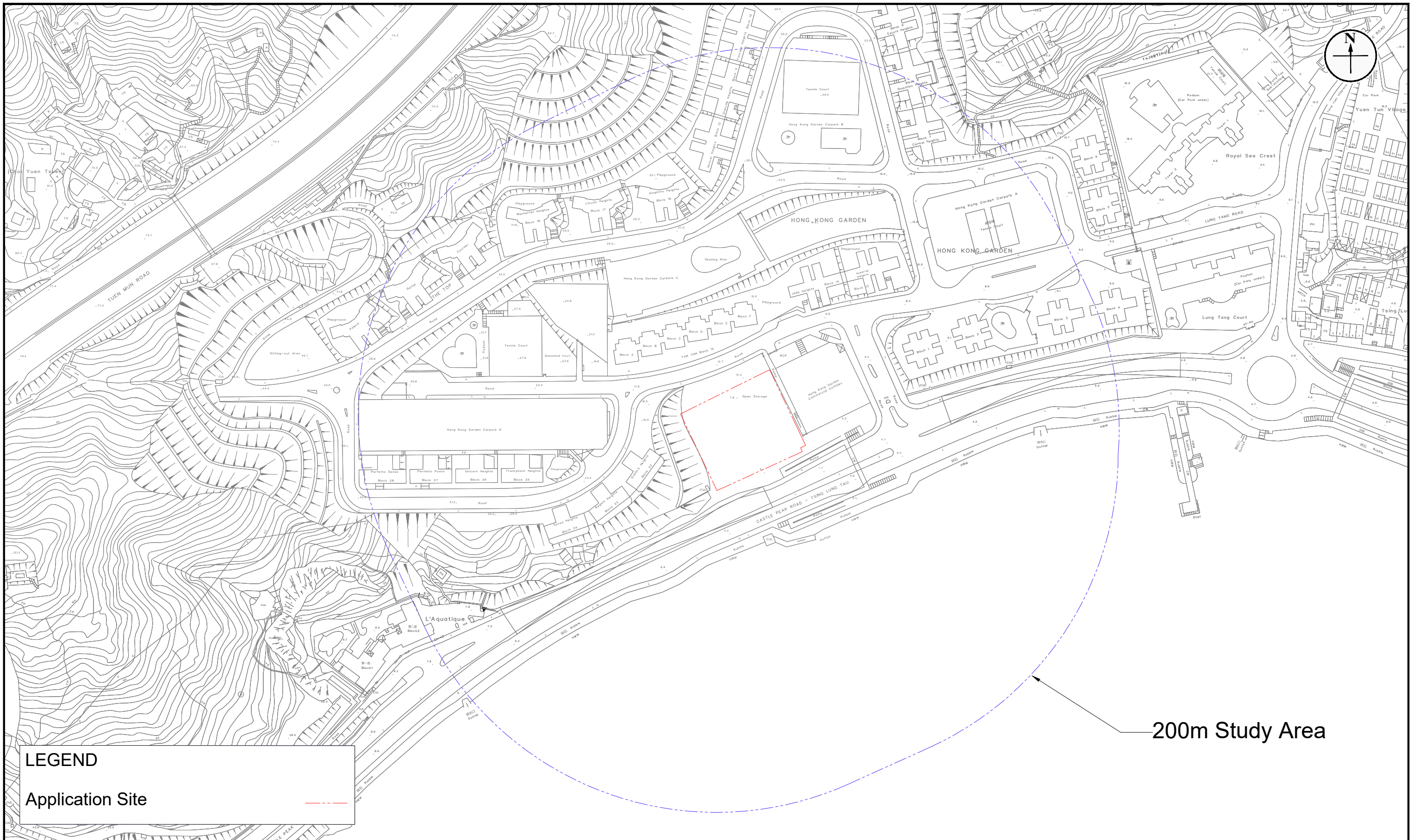
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Checked by: CC

Project: Proposed Minor Relaxation of Plot Ratio (PR) and Site Coverage (SC) for Proposed Social Welfare Facility (Residential Care Home for the Elderly) (RCHE(s)), Training Centre with Residential Institution and Permitted Residential Development (Flat) in Lot 94 in D.D. 388 and adjoining Government land, Castle Peak Road – Tsing Lung Tau, Tsuen Wan

Rev.: 1.0

Date: Apr 2022

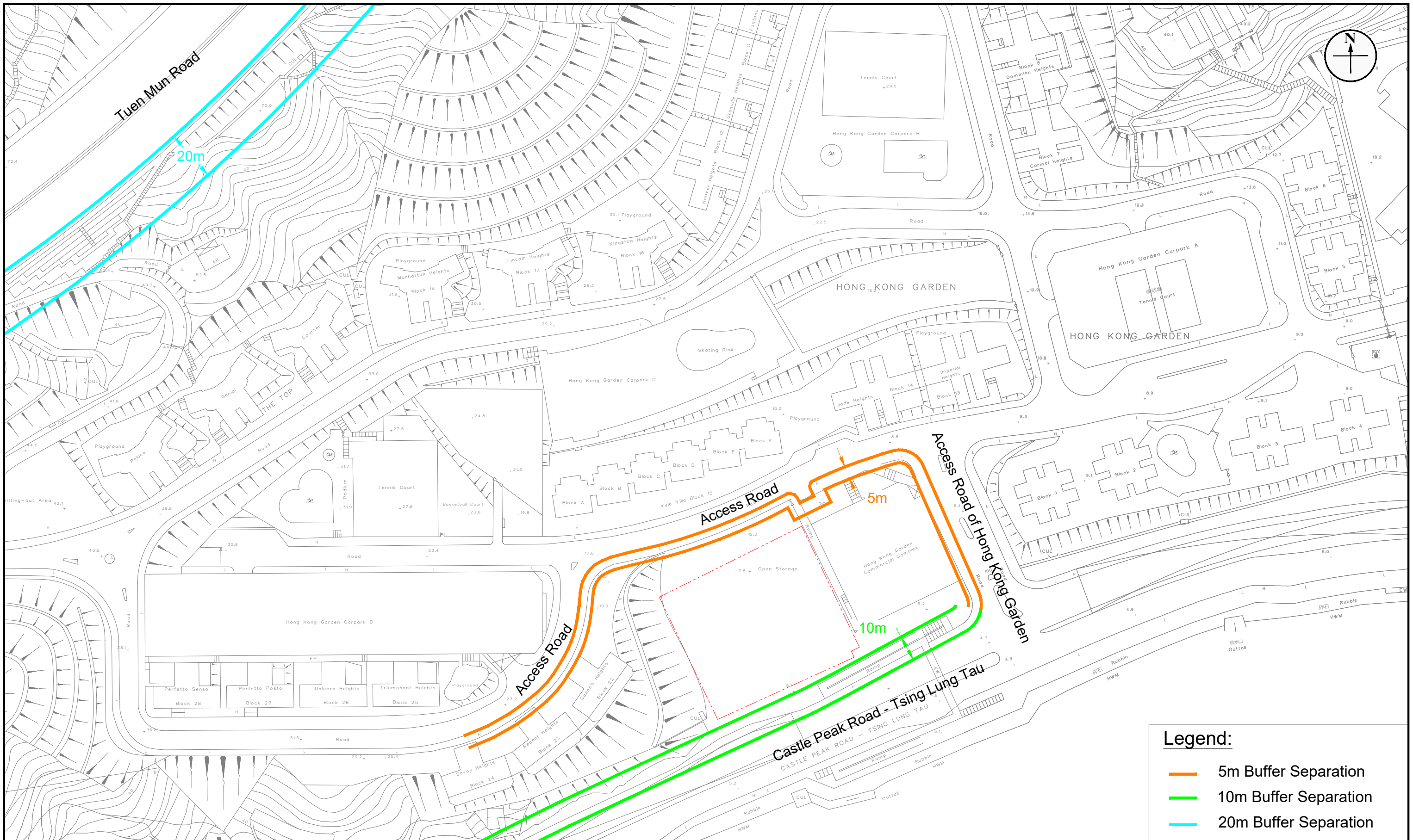


LEGEND
Application Site

Figure: 2.1
Title: 200m Study Area from the Site
Project: Proposed Minor Relaxation of Plot Ratio (PR) and Site Coverage (SC) for Proposed Social Welfare Facility (Residential Care Home for the Elderly) (RCHE(s)), Training Centre with Residential Institution and Permitted Residential Development (Flat) in Lot 94 in D.D. 388 and adjoining Government land, Castle Peak Road – Tsing Lung Tau, Tsuen Wan

RAMBOLL

Drawn by: AC
Checked by: CC
Rev.: 1.0
Date: Jun 2021



Legend:

- 5m Buffer Separation
- 10m Buffer Separation
- 20m Buffer Separation

Figure: 2.2



Title: HKPSG Vehicular Emission Buffer Distance for Nearby and Major Road Network

Drawn by: CM
Checked by: CC

Project: Proposed Minor Relaxation of Plot Ratio (PR) and Site Coverage (SC) for Proposed Social Welfare Facility (Residential Care Home for the Elderly) (RCHE(s)), Training Centre with Residential Institution and Permitted Residential Development (Flat) in Lot 94 in D.D. 388 and adjoining Government land, Castle Peak Road – Tsing Lung Tau, Tsuen Wan

Rev.: 1.1
Date: Sep 2024

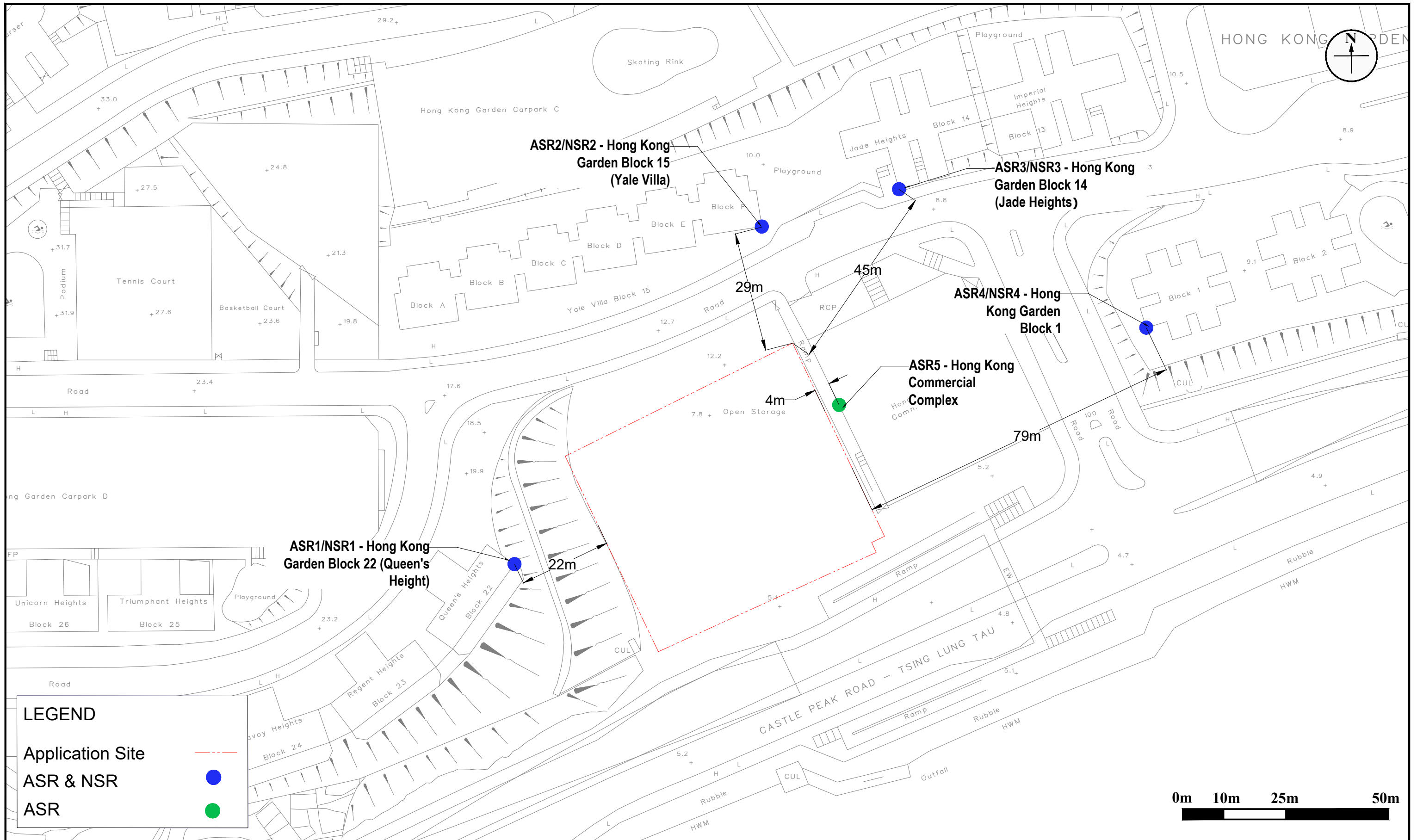


Figure: 2.3

Title: Locations of Representative Air Sensitive Receivers (ASRs) and Noise Sensitive Receivers (NSRs)

RAMBOLL

Drawn by: CM
Checked by: CC

Project: Proposed Minor Relaxation of Plot Ratio (PR) and Site Coverage (SC) for Proposed Social Welfare Facility (Residential Care Home for the Elderly) (RCHE(s)), Training Centre with Residential Institution and Permitted Residential Development (Flat) in Lot 94 in D.D. 388 and adjoining Government land, Castle Peak Road – Tsing Lung Tau, Tsuen Wan

Rev.: 1.1
Date: Sep 2024

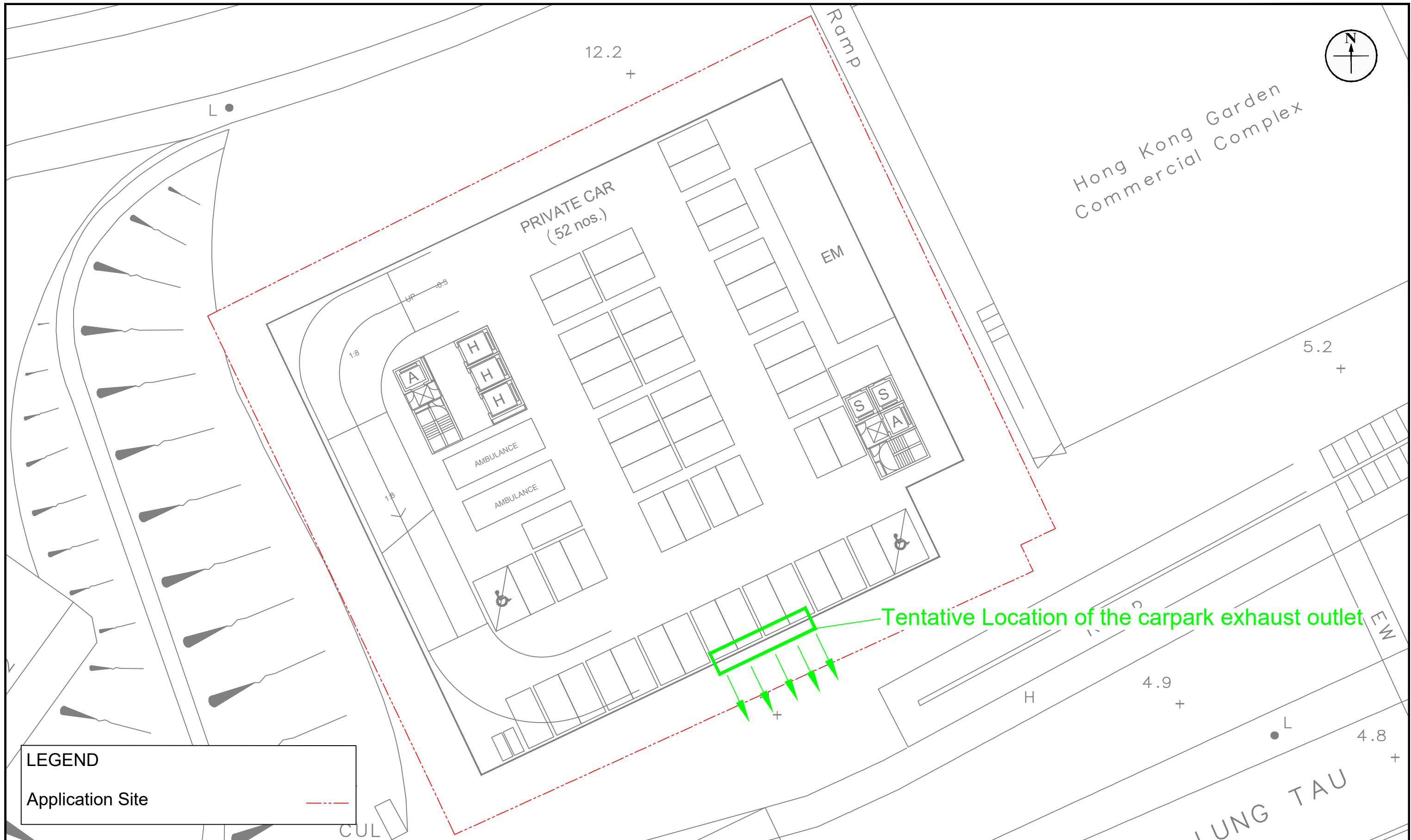


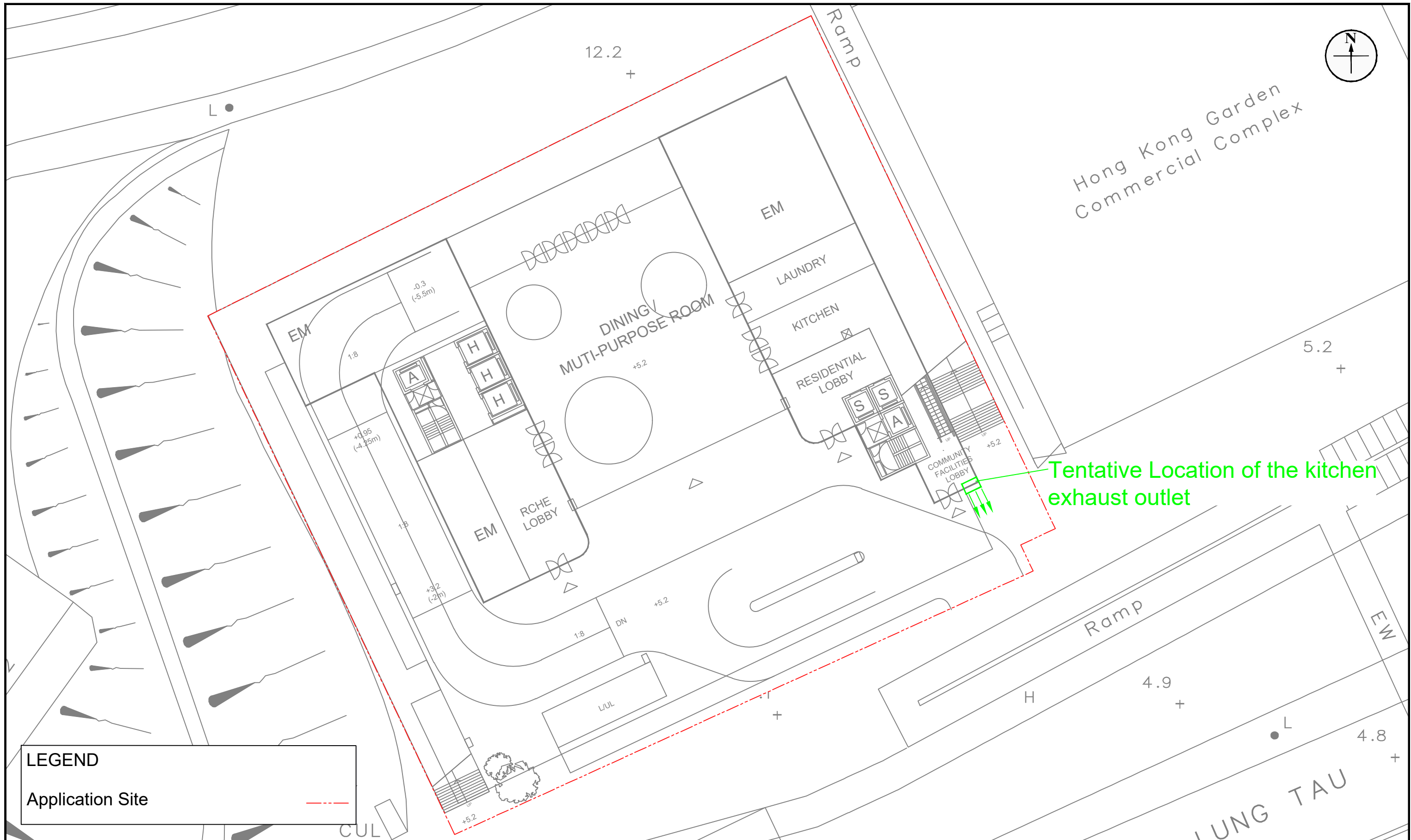
Figure: 2.4a

Title: Tentative Location of the Exhaust Outlets (B1F)

Project: Proposed Minor Relaxation of Plot Ratio Restriction for Permitted Residential Development within “Residential (Group B)” Zone at Lot 94, D.D. 388 And Adjoining Government Land, Castle Peak Road - Tsing Lung Tau, New Territories

RAMBOLL

Drawn by: CM
 Checked by: CC
 Rev.: 1.0
 Date: Sep 2024



LEGEND
Application Site

Figure: 2.4b

Title: Tentative Location of the Exhaust Outlets (GF)

Project: Proposed Minor Relaxation of Plot Ratio Restriction for Permitted Residential Development within “Residential (Group B)” Zone at Lot 94, D.D. 388 And Adjoining Government Land, Castle Peak Road - Tsing Lung Tau, New Territories

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Date: Sep 2024

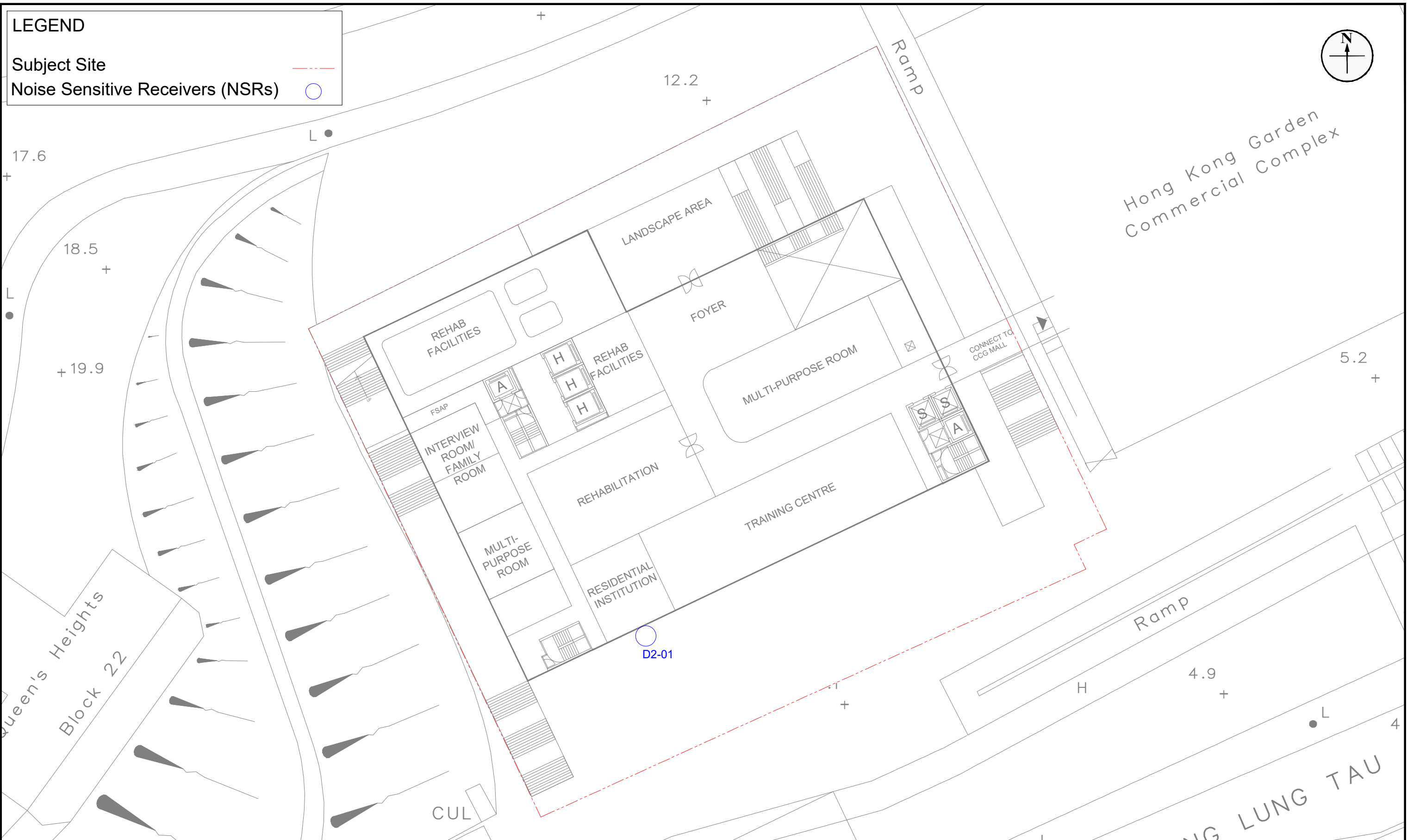


Figure: 4.1a	Title: Location of Representative Noise Sensitive Receivers for Road Traffic Noise Impact Assessment (RCHE-2/F)	Project: Proposed Minor Relaxation of Plot Ratio (PR) and Site Coverage (SC) for Proposed Social Welfare Facility (Residential Care Home for the Elderly) (RCHE(s)), Training Centre with Residential Institution and Permitted Residential Development (Flat) in Lot 94 in D.D. 388 and adjoining Government land, Castle Peak Road – Tsing Lung Tau, Tsuen Wan	RAMBOLL
			Drawn by: CM
			Checked by: CC
			Rev.: 2.0
			Date: Jul 2024





Figure: 4.1c

Title: Location of Representative Noise Sensitive Receivers for Road Traffic Noise Impact Assessment (RCHE-4/F)

Project: Proposed Minor Relaxation of Plot Ratio (PR) and Site Coverage (SC) for Proposed Social Welfare Facility (Residential Care Home for the Elderly) (RCHE(s)), Training Centre with Residential Institution and Permitted Residential Development (Flat) in Lot 94 in D.D. 388 and adjoining Government land, Castle Peak Road – Tsing Lung Tau, Tsuen Wan

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 Rev.: 2.0
 Date: Jun 2024



Figure: 4.1d	Title: Location of Representative Noise Sensitive Receivers for Road Traffic Noise Impact Assessment (RCHE-5/F)	RAMBOLL	
		Drawn by:	CM
		Checked by:	CC
		Rev.:	2.0
Project: Proposed Minor Relaxation of Plot Ratio (PR) and Site Coverage (SC) for Proposed Social Welfare Facility (Residential Care Home for the Elderly) (RCHE(s)), Training Centre with Residential Institution and Permitted Residential Development (Flat) in Lot 94 in D.D. 388 and adjoining Government land, Castle Peak Road – Tsing Lung Tau, Tsuen Wan	Date:	Jun 2024	



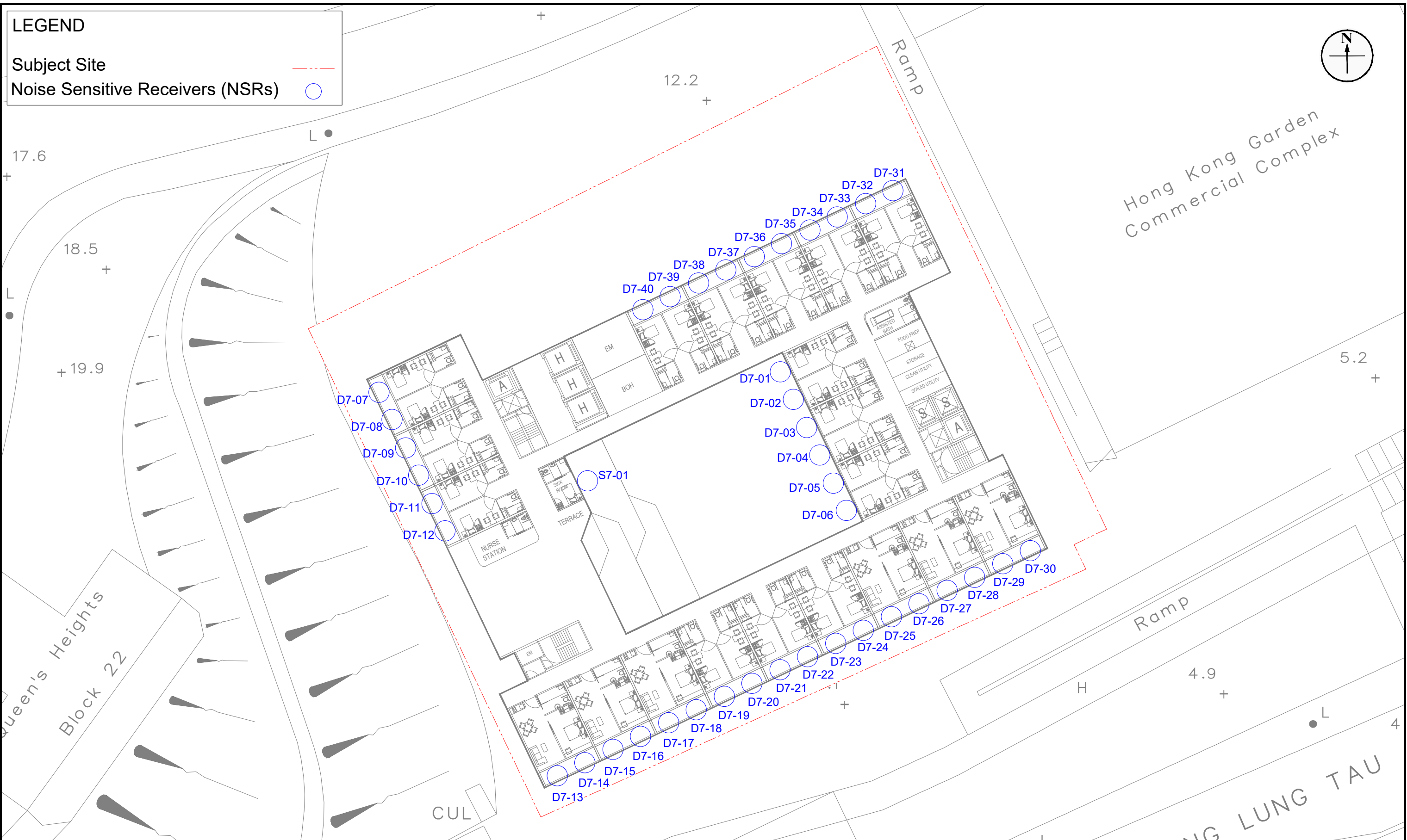




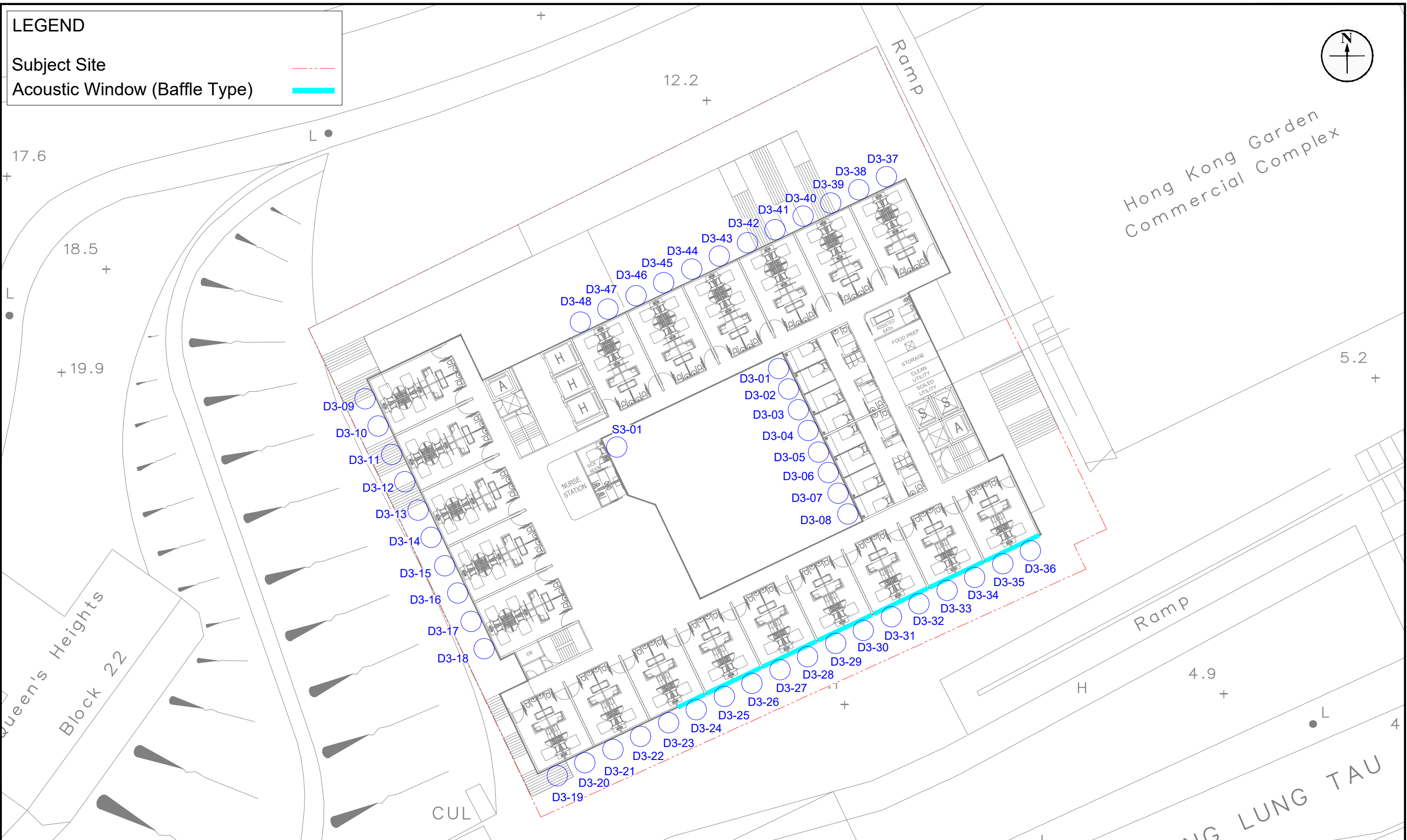
Figure: 4.1g

Title: Location of Representative Noise Sensitive Receivers for Road Traffic Noise Impact Assessment (Residential Tower)

Project: Proposed Minor Relaxation of Plot Ratio (PR) and Site Coverage (SC) for Proposed Social Welfare Facility (Residential Care Home for the Elderly) (RCHE(s)), Training Centre with Residential Institution and Permitted Residential Development (Flat) in Lot 94 in D.D. 388 and adjoining Government land, Castle Peak Road – Tsing Lung Tau, Tsuen Wan

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 Rev.: 2.0
 Date: Jun 2024



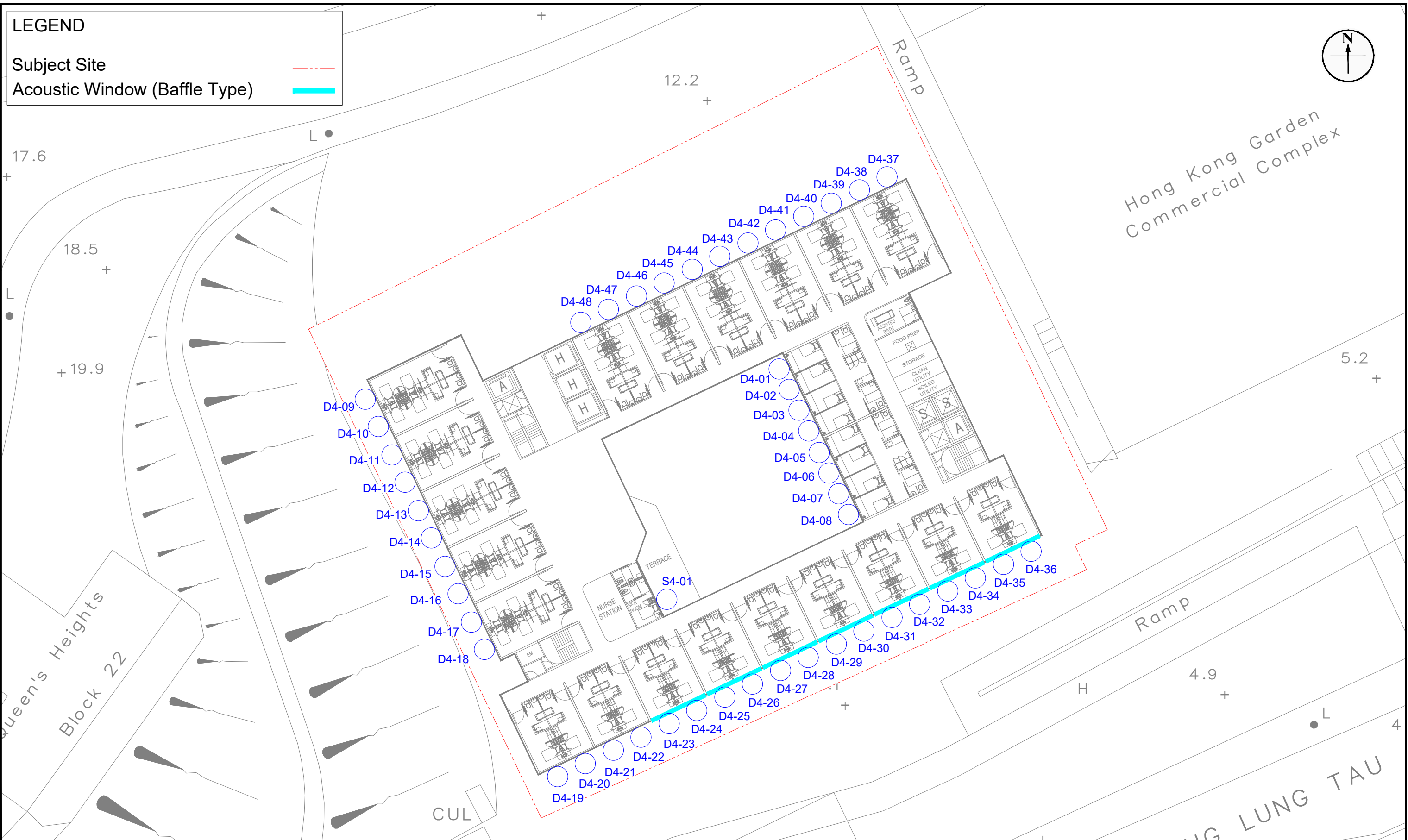
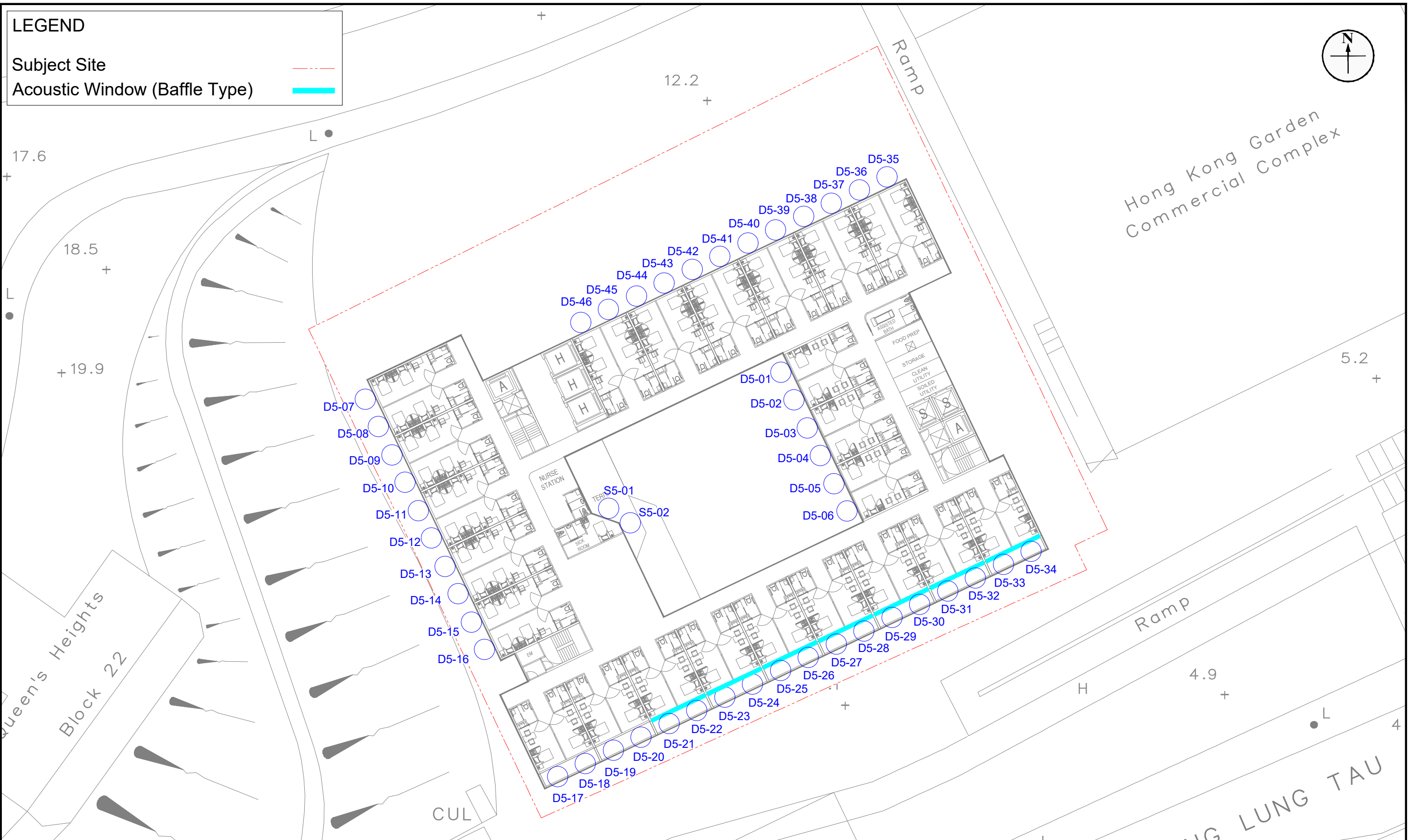


Figure: 4.2b	RAMBOLL
Title: Locations of Proposed Mitigation Measures on Traffic Noise (RCHE-4/F)	Drawn by: CM
	Checked by: CC
Project: Proposed Minor Relaxation of Plot Ratio (PR) and Site Coverage (SC) for Proposed Social Welfare Facility (Residential Care Home for the Elderly) (RCHE(s)), Training Centre with Residential Institution and Permitted Residential Development (Flat) in Lot 94 in D.D. 388 and adjoining Government land, Castle Peak Road – Tsing Lung Tau, Tsuen Wan	Rev.: 2.0
	Date: Jul 2024



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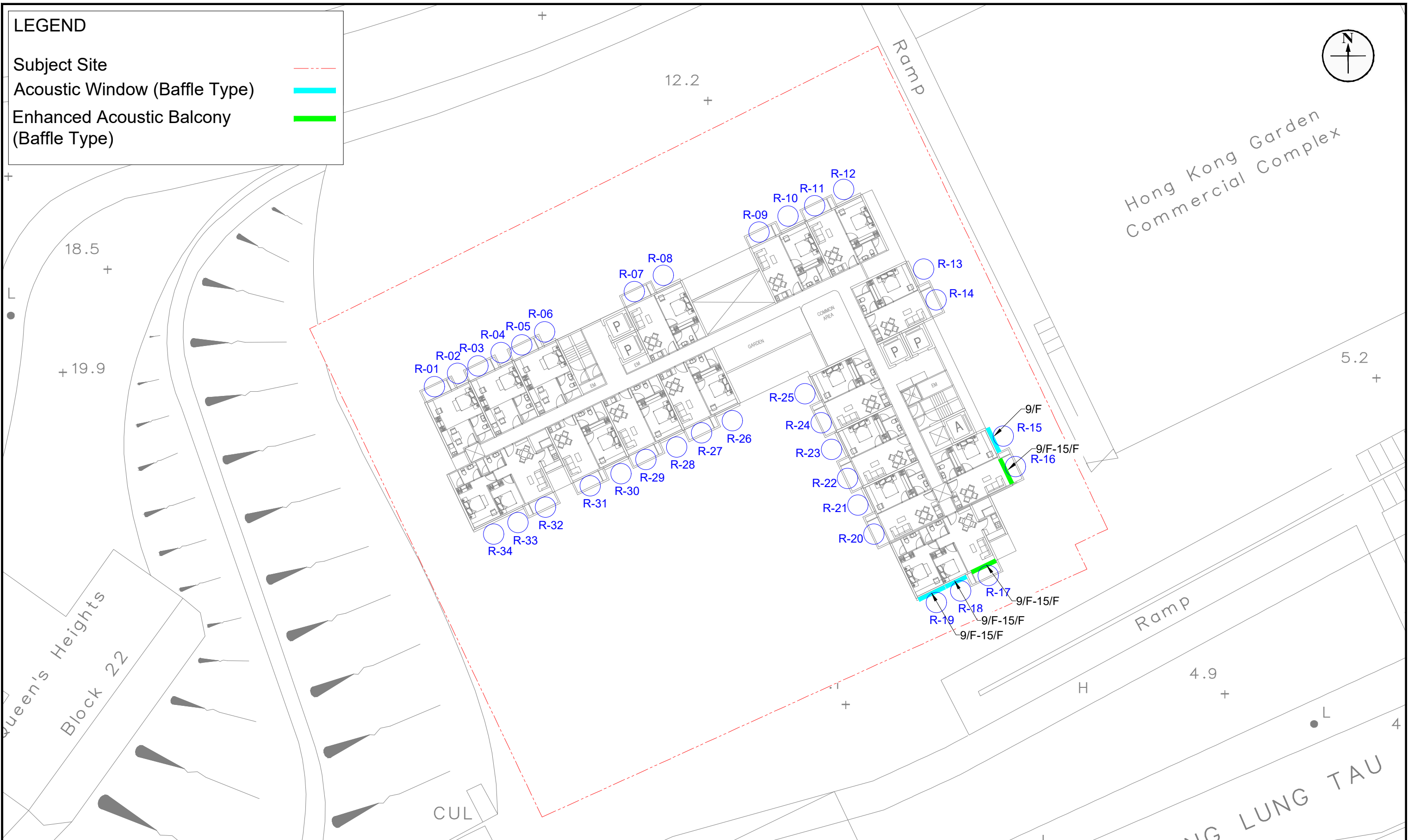
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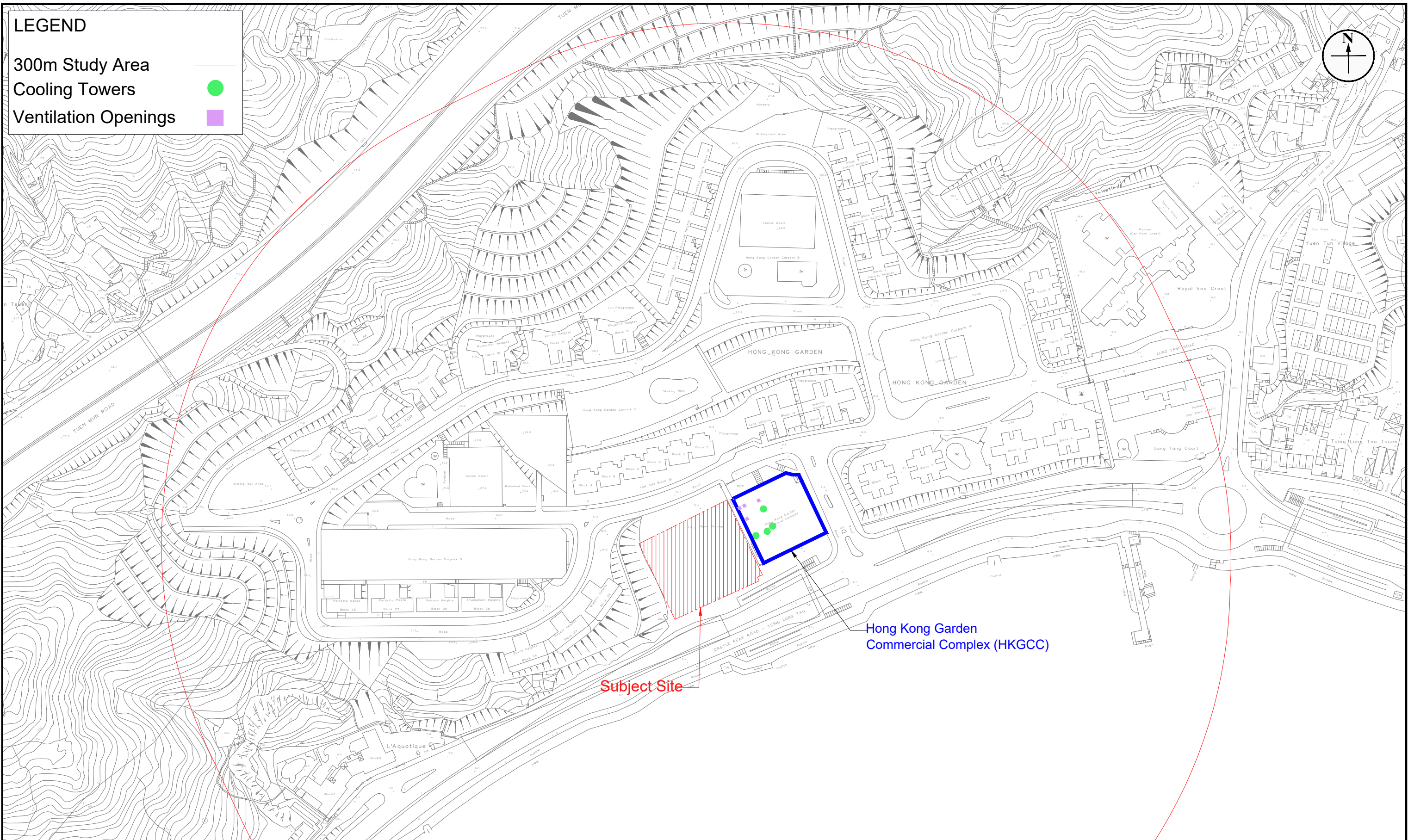


Figure: 5.1

Title: Location of the Fixed Noise Sources Identified Within 300m of the Subject Site

Project: Proposed Minor Relaxation of Plot Ratio (PR) and Site Coverage (SC) for Proposed Social Welfare Facility (Residential Care Home for the Elderly) (RCHE(s)), Training Centre with Residential Institution and Permitted Residential Development (Flat) in Lot 94 in D.D. 388 and adjoining Government land, Castle Peak Road – Tsing Lung Tau, Tsuen Wan

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Checked by:	CC
Rev.:	1.0
Date:	Jun 2021

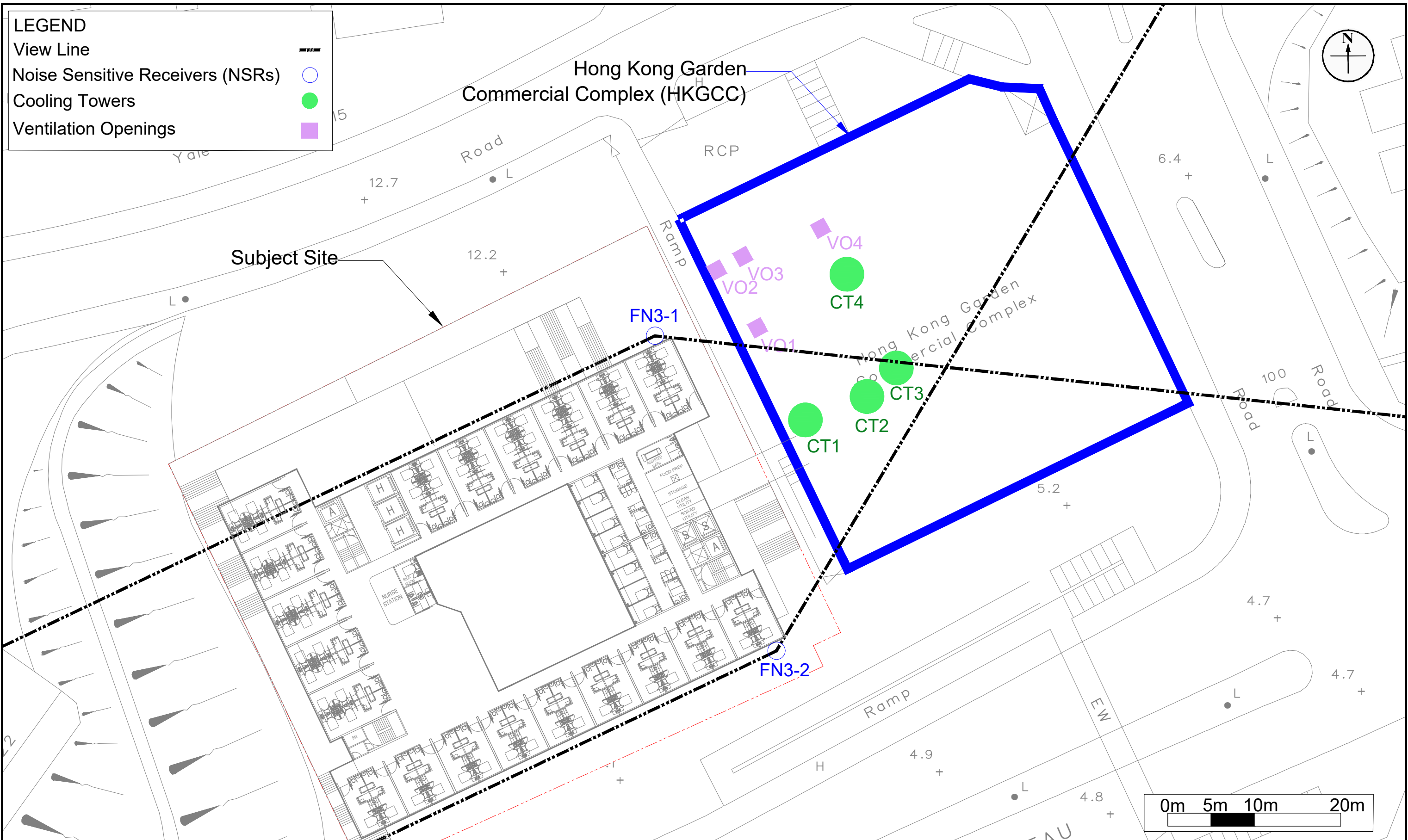


Figure: 5.2a

Title: Location of Representative Noise Sensitive Receivers for Fixed Noise Impact Assessment (RCHE-3/F)

Project: Proposed Minor Relaxation of Plot Ratio (PR) and Site Coverage (SC) for Proposed Social Welfare Facility (Residential Care Home for the Elderly) (RCHE(s)), Training Centre with Residential Institution and Permitted Residential Development (Flat) in Lot 94 in D.D. 388 and adjoining Government land, Castle Peak Road – Tsing Lung Tau, Tsuen Wan

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 Rev.: 2.0
 Date: Jun 2024



Figure: 5.2b

Title: Location of Representative Noise Sensitive Receivers for Fixed Noise Impact Assessment (RCHE-4/F)

Project: Proposed Minor Relaxation of Plot Ratio (PR) and Site Coverage (SC) for Proposed Social Welfare Facility (Residential Care Home for the Elderly) (RCHE(s)), Training Centre with Residential Institution and Permitted Residential Development (Flat) in Lot 94 in D.D. 388 and adjoining Government land, Castle Peak Road – Tsing Lung Tau, Tsuen Wan

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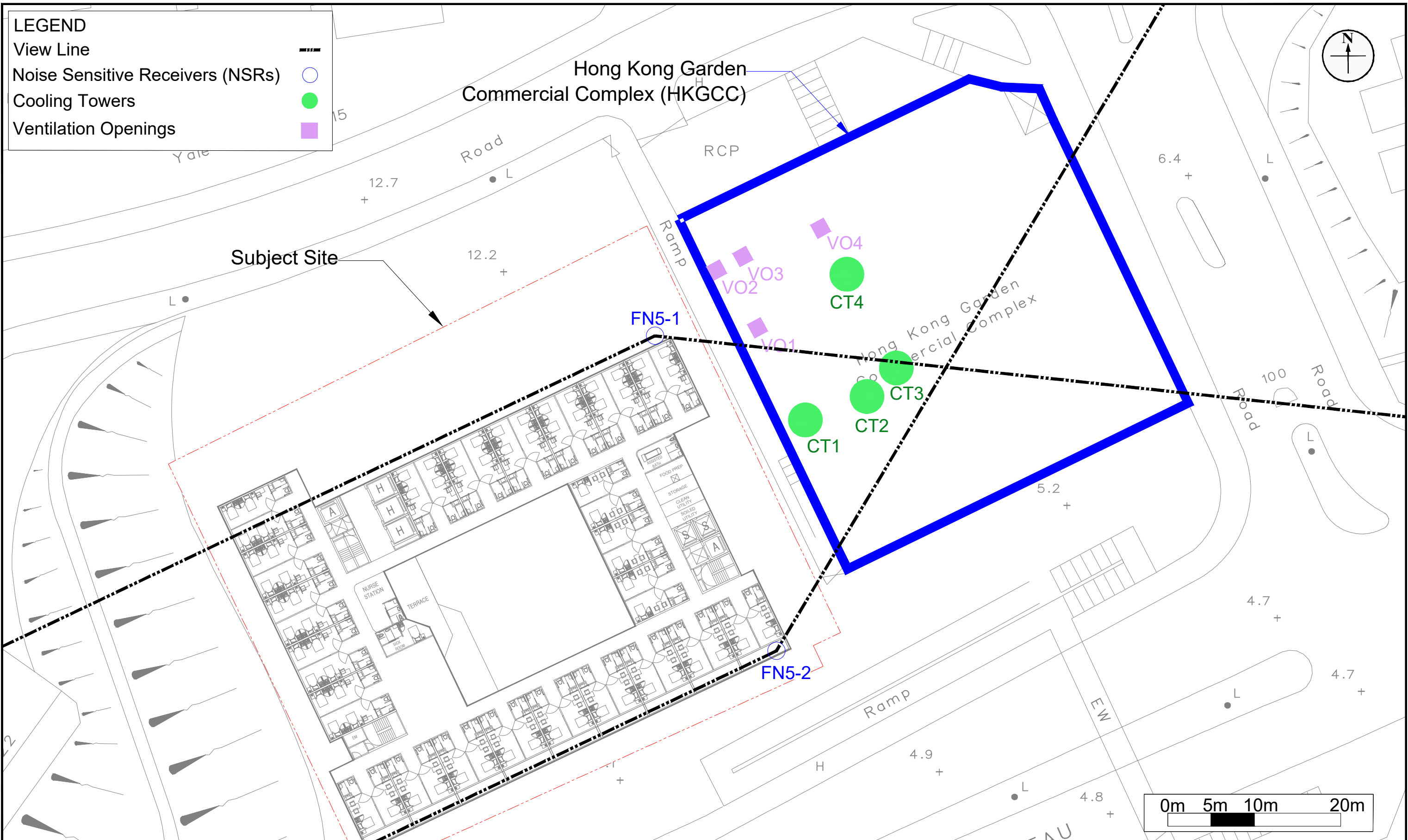


Figure: 5.2c

Title: Location of Representative Noise Sensitive Receivers for Fixed Noise Impact Assessment (RCHE-5/F)

Project: Proposed Minor Relaxation of Plot Ratio (PR) and Site Coverage (SC) for Proposed Social Welfare Facility (Residential Care Home for the Elderly) (RCHE(s)), Training Centre with Residential Institution and Permitted Residential Development (Flat) in Lot 94 in D.D. 388 and adjoining Government land, Castle Peak Road – Tsing Lung Tau, Tsuen Wan

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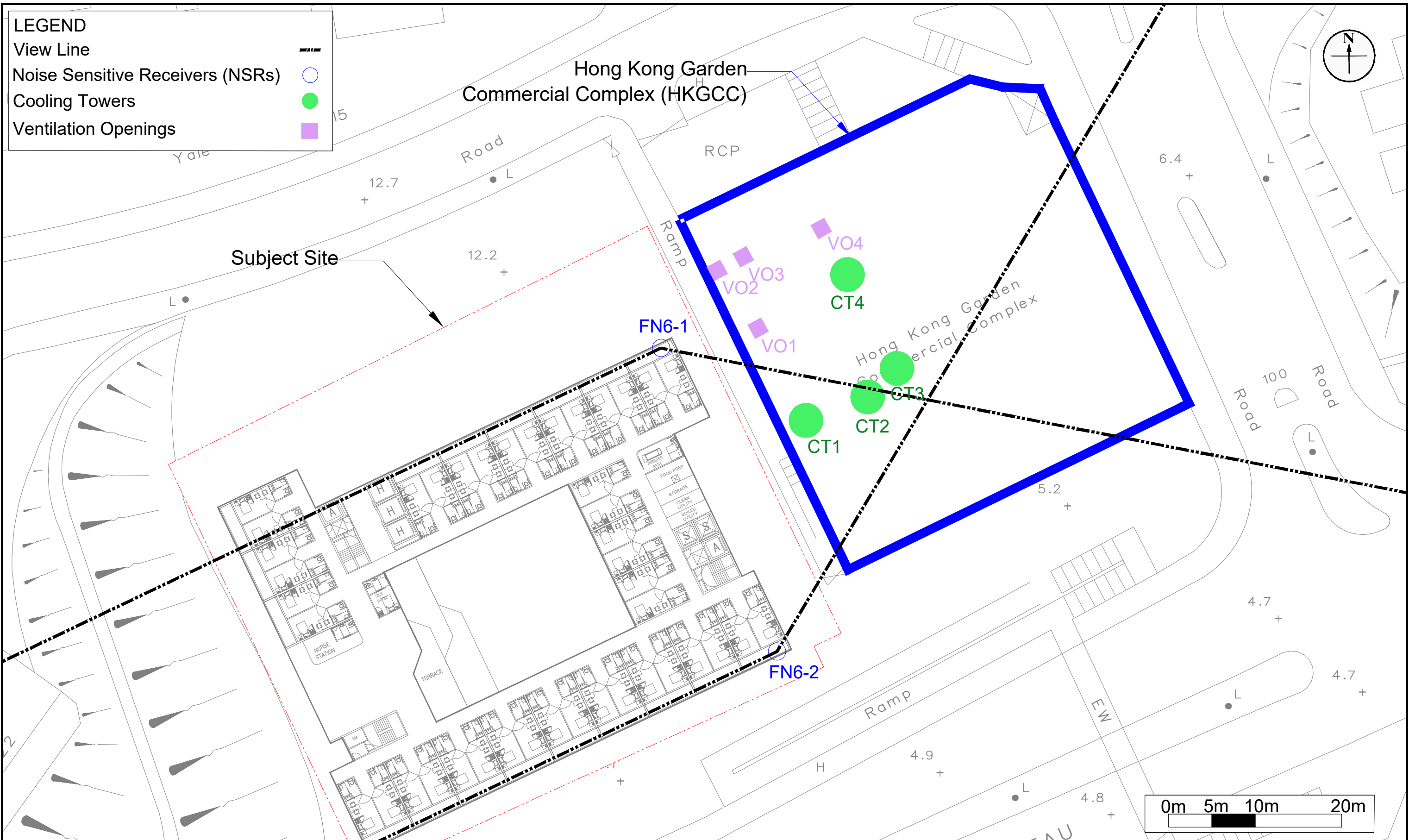


Figure: 5.2d

Title: Location of Representative Noise Sensitive Receivers for Fixed Noise Impact Assessment (RCHE-6/F)

Project: Proposed Minor Relaxation of Plot Ratio (PR) and Site Coverage (SC) for Proposed Social Welfare Facility (Residential Care Home for the Elderly) (RCHE(s)), Training Centre with Residential Institution and Permitted Residential Development (Flat) in Lot 94 in D.D. 388 and adjoining Government land, Castle Peak Road – Tsing Lung Tau, Tsuen Wan

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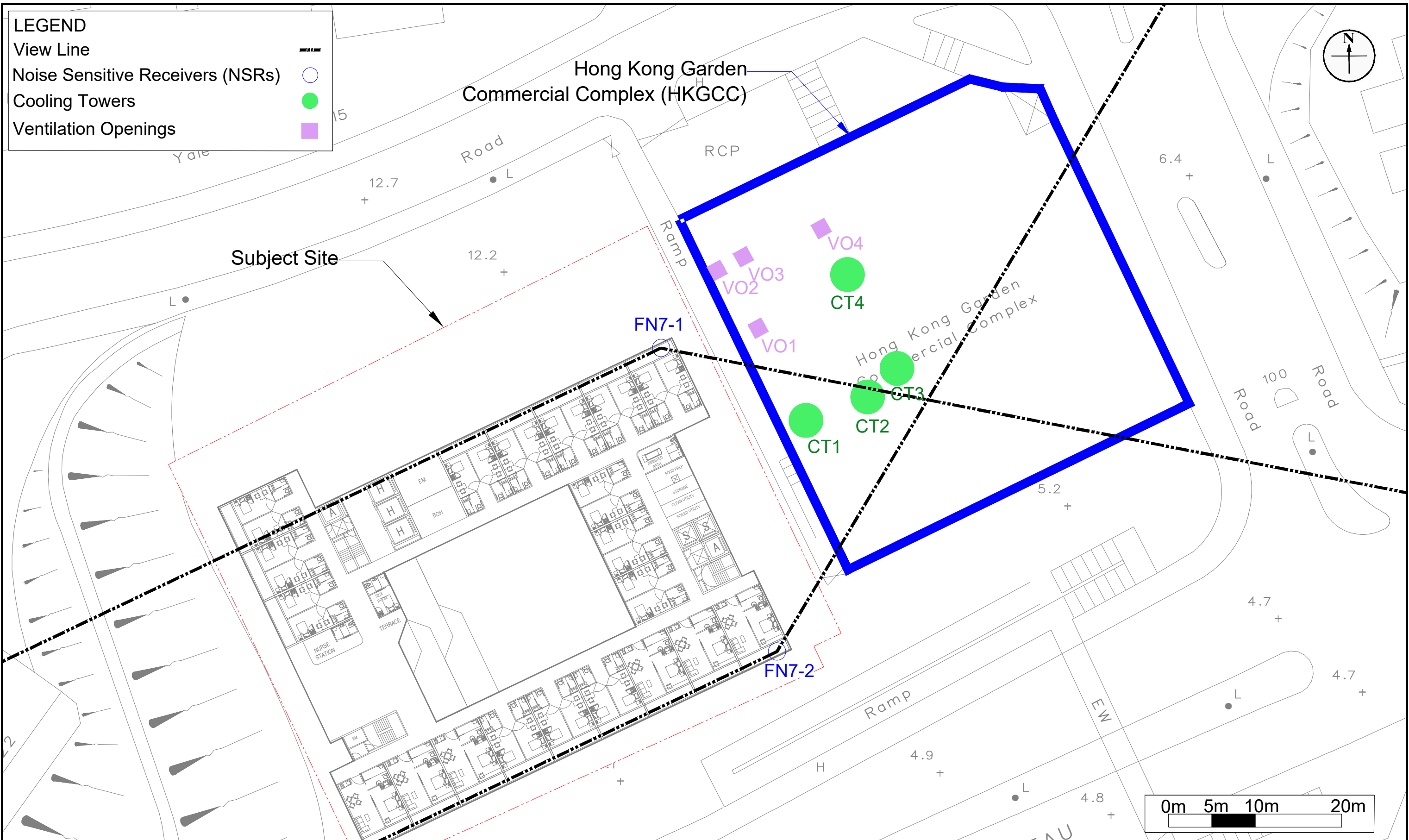


Figure: 5.2e

Title: Location of Representative Noise Sensitive Receivers for Fixed Noise Impact Assessment (RCHE-7/F)

Project: Proposed Minor Relaxation of Plot Ratio (PR) and Site Coverage (SC) for Proposed Social Welfare Facility (Residential Care Home for the Elderly) (RCHE(s)), Training Centre with Residential Institution and Permitted Residential Development (Flat) in Lot 94 in D.D. 388 and adjoining Government land, Castle Peak Road – Tsing Lung Tau, Tsuen Wan

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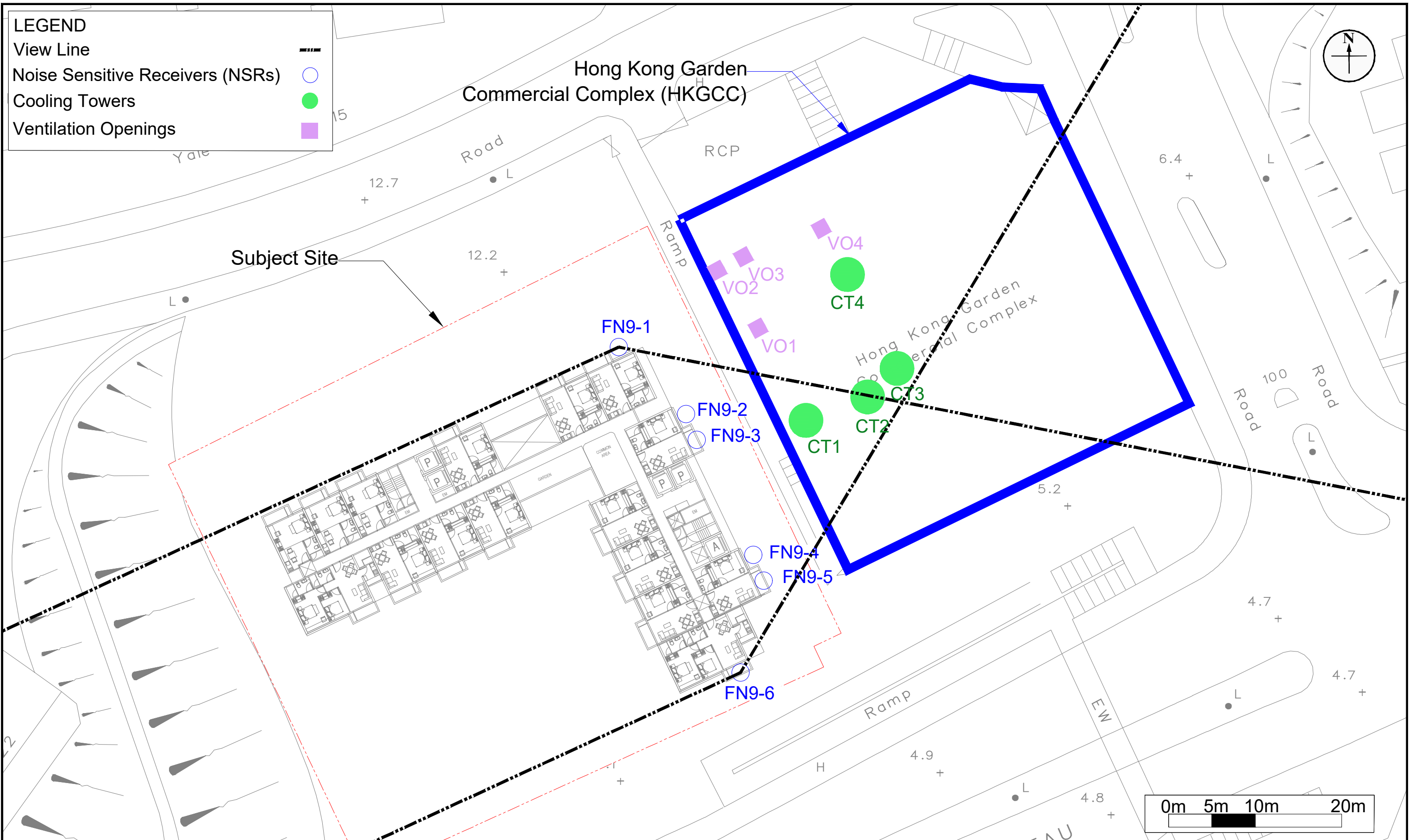


Figure: 5.2f

Title: Location of Representative Noise Sensitive Receivers for Fixed Noise Impact Assessment (Residential Tower)

Project: Proposed Minor Relaxation of Plot Ratio (PR) and Site Coverage (SC) for Proposed Social Welfare Facility (Residential Care Home for the Elderly) (RCHE(s)), Training Centre with Residential Institution and Permitted Residential Development (Flat) in Lot 94 in D.D. 388 and adjoining Government land, Castle Peak Road – Tsing Lung Tau, Tsuen Wan

RAMBOLL

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 Checked by: CC
 Rev.: 2.0
 Date: Jun 2024

Appendix 1.1 Master Layout Plan of the Proposed Development



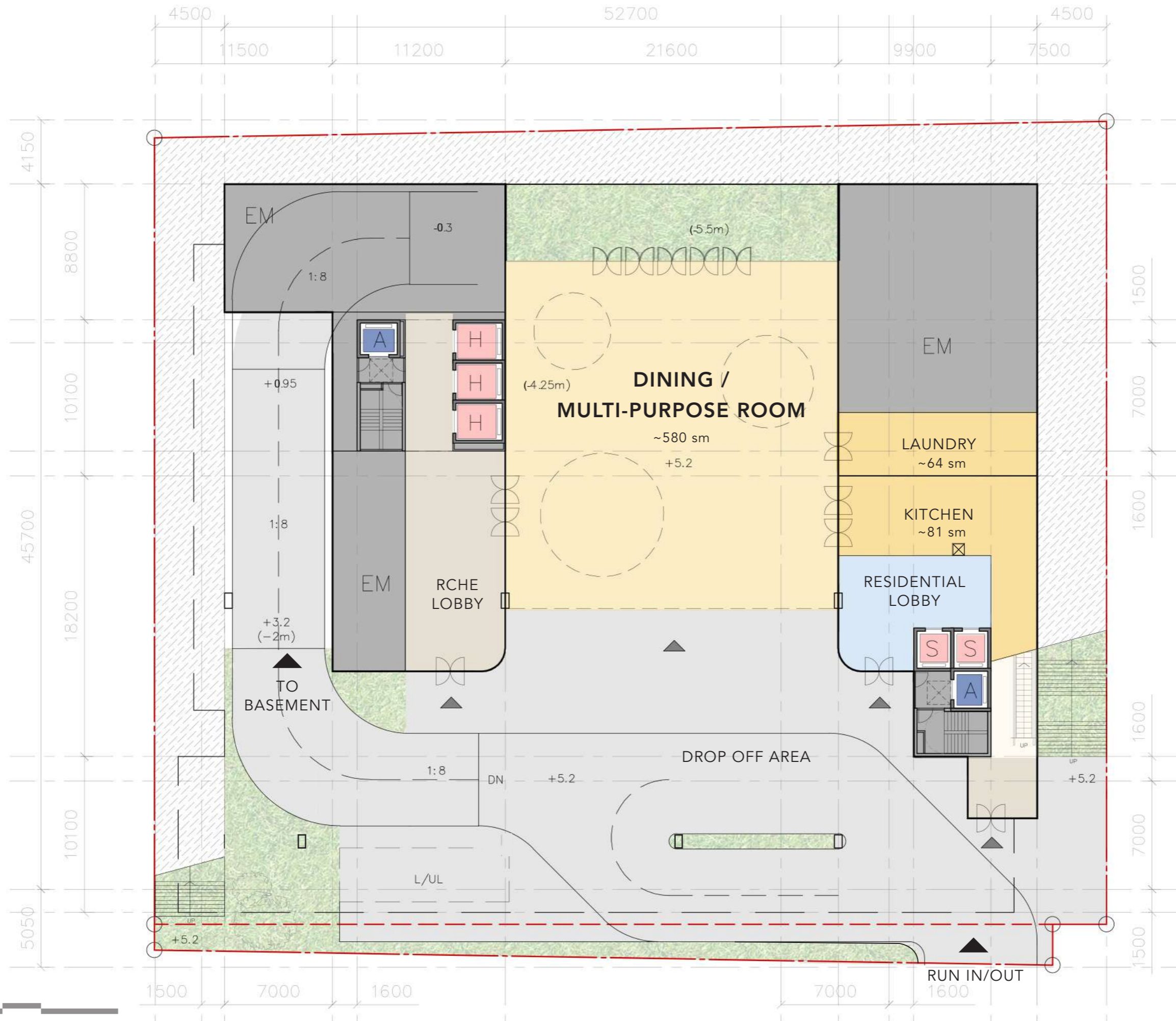
GF

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*AREAS SUBJECTED TO FURTHER STRUCTURAL AND BUILDING SERVICES CONSULTANTS' COORDINATION

— MATTER



GF

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*AREAS SUBJECT TO FURTHER STRUCTURAL AND BUILDING SERVICES CONSULTANTS' COORDINATION

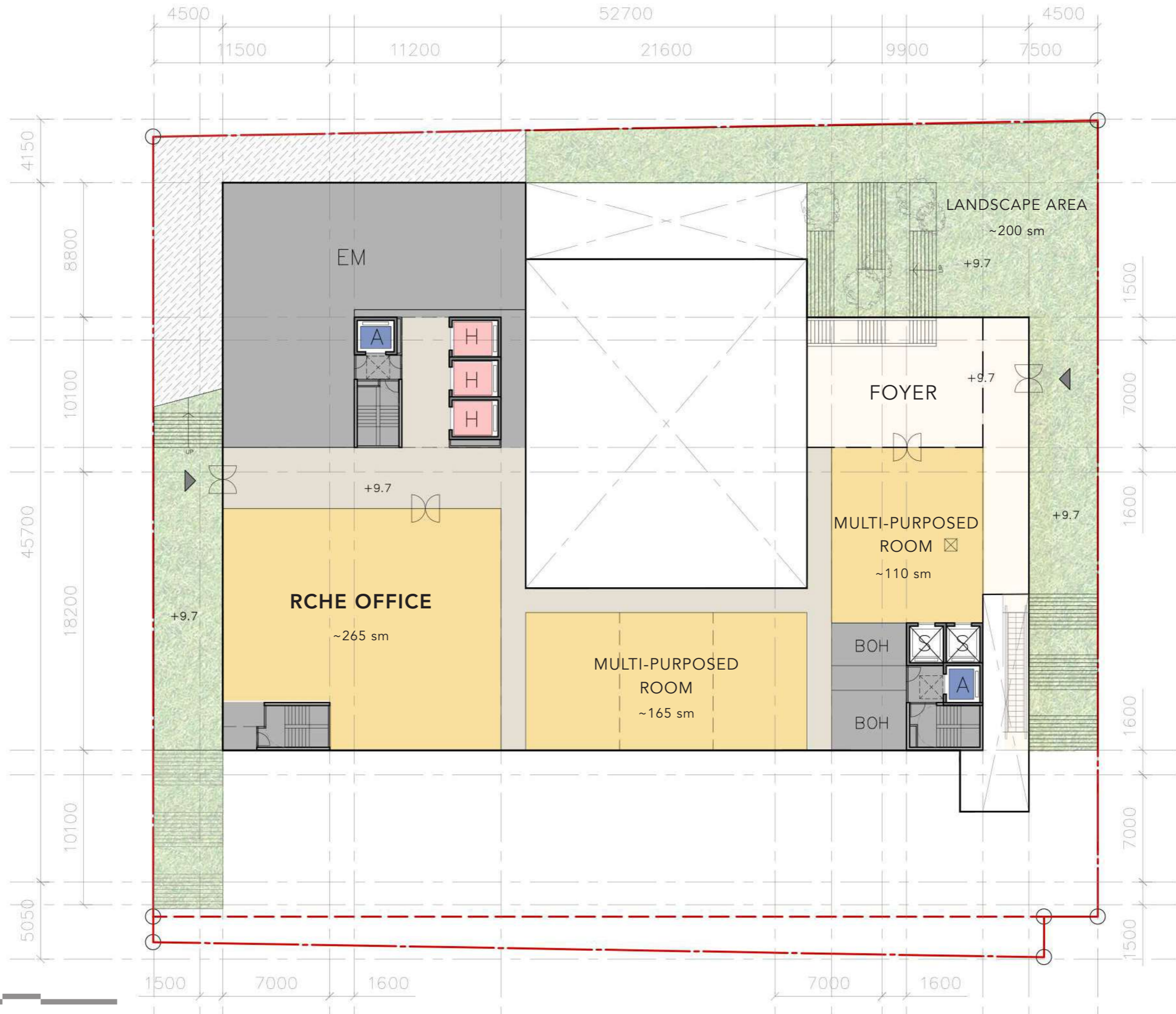
— MATTER



CAR PARK SPACE	
RESIDENTIAL	31 NOS.
VISITOR	5 NOS.
MOTORCYCLE	2 NOS.
RCHE	16 NOS.
Light Bus/Ambulance	2 NOS.

BF
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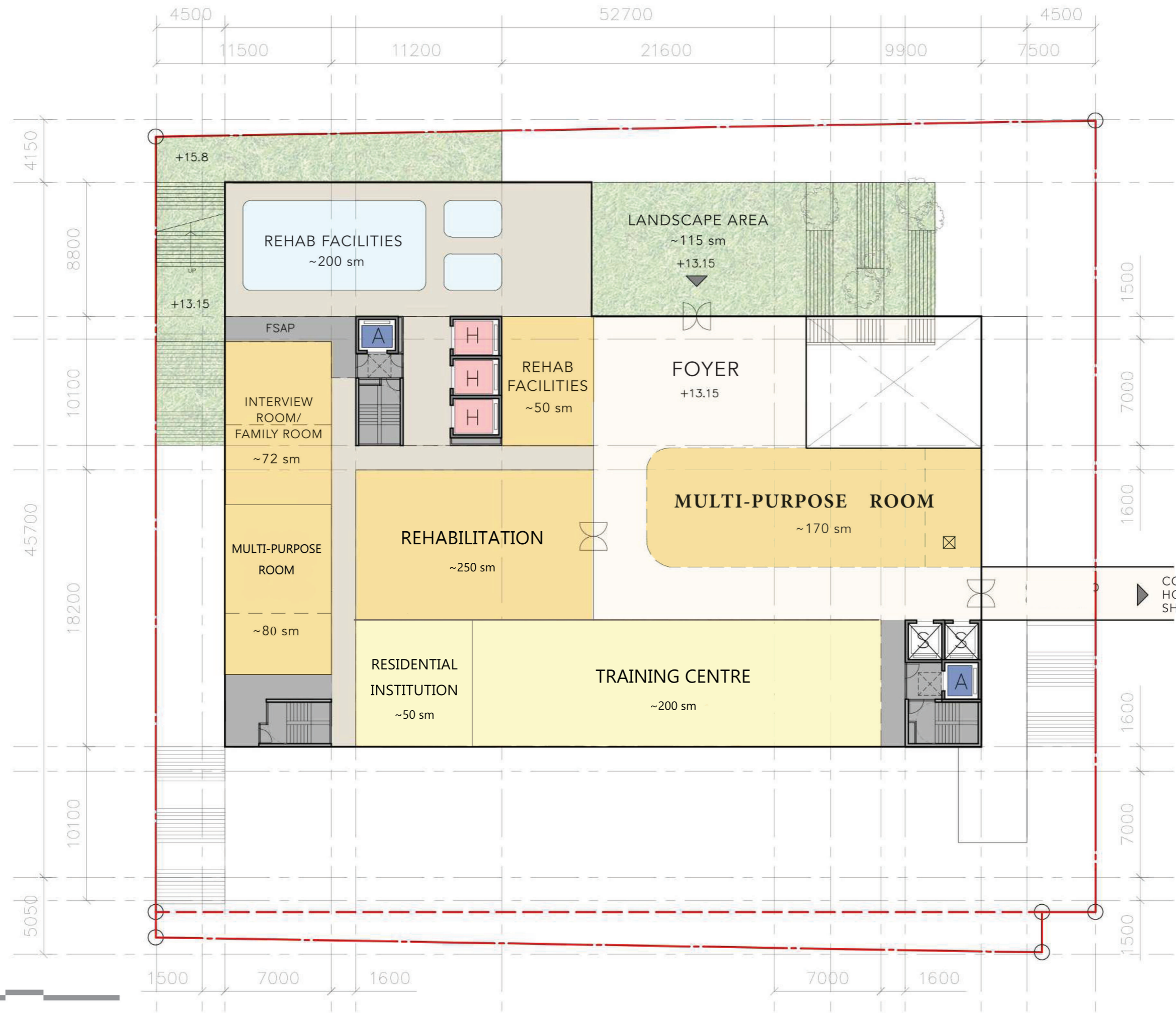


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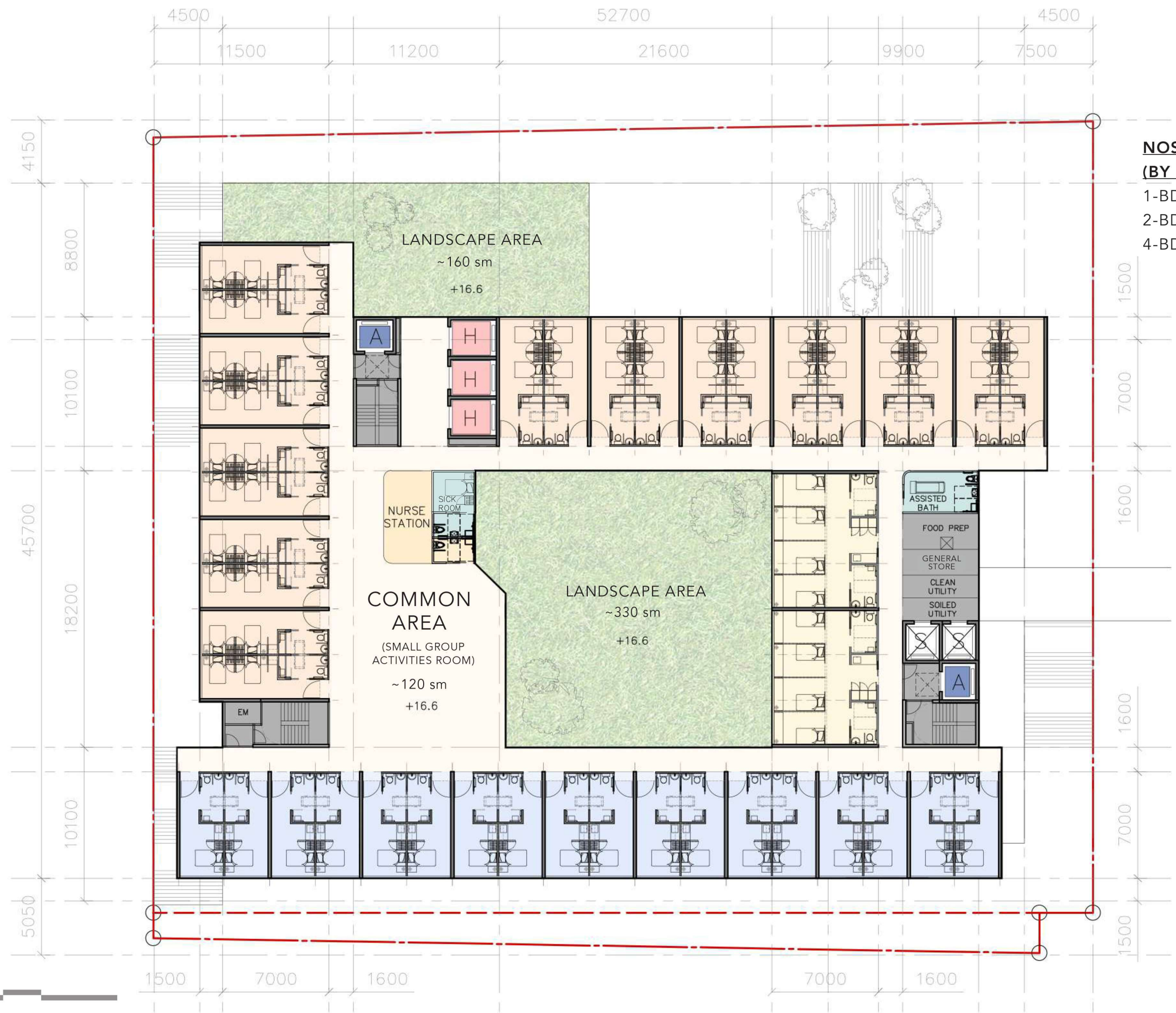


CONNECT TO HONG KONG GARDEN SHOPPING ARCADE

2F

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*AREAS SUBJECT TO FURTHER STRUCTURAL AND BUILDING SERVICES CONSULTANTS' COORDINATION



**NOS. OF BEDS
(BY FLOOR)**

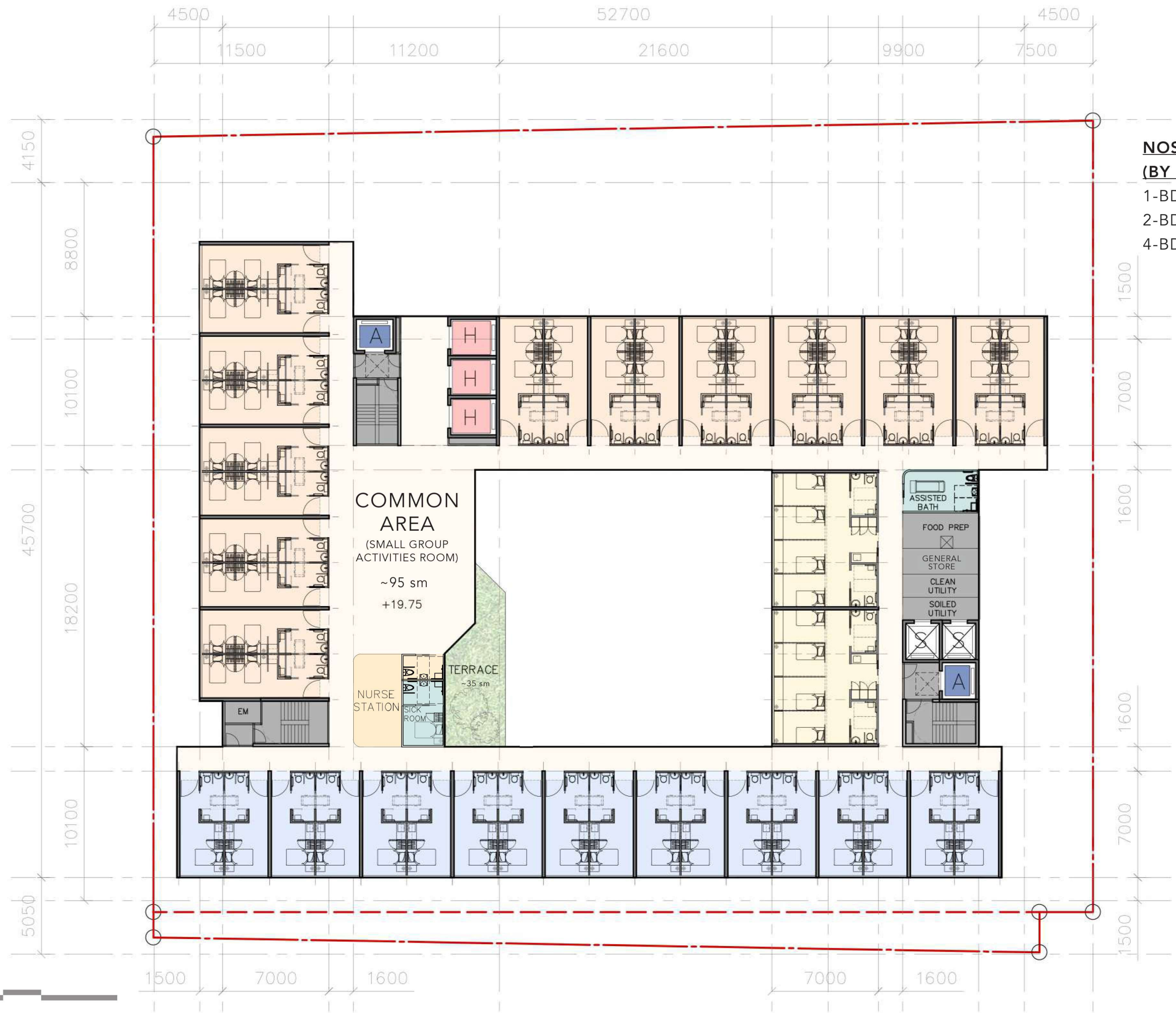
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2-BD	: 44 BEDS
4-BD	: 8 BEDS

3F

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*AREAS SUBJECT TO FURTHER STRUCTURAL AND BUILDING SERVICES CONSULTANTS' COORDINATION



**NOS. OF BEDS
(BY FLOOR)**

1-BD	: 18 BEDS
2-BD	: 44 BEDS
4-BD	: 8 BEDS

4F
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*AREAS SUBJECTED TO FURTHER STRUCTURAL AND BUILDING SERVICES CONSULTANTS' COORDINATION



**NOS. OF BEDS
(BY FLOOR)**

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2-BD	: 44 BEDS

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*AREAS SUBJECTED TO FURTHER STRUCTURAL AND BUILDING SERVICES CONSULTANTS' COORDINATION



**NOS. OF BEDS
(BY FLOOR)**
1-BD : 42 BEDS

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*AREAS SUBJECT TO FURTHER STRUCTURAL AND BUILDING SERVICES CONSULTANTS' COORDINATION



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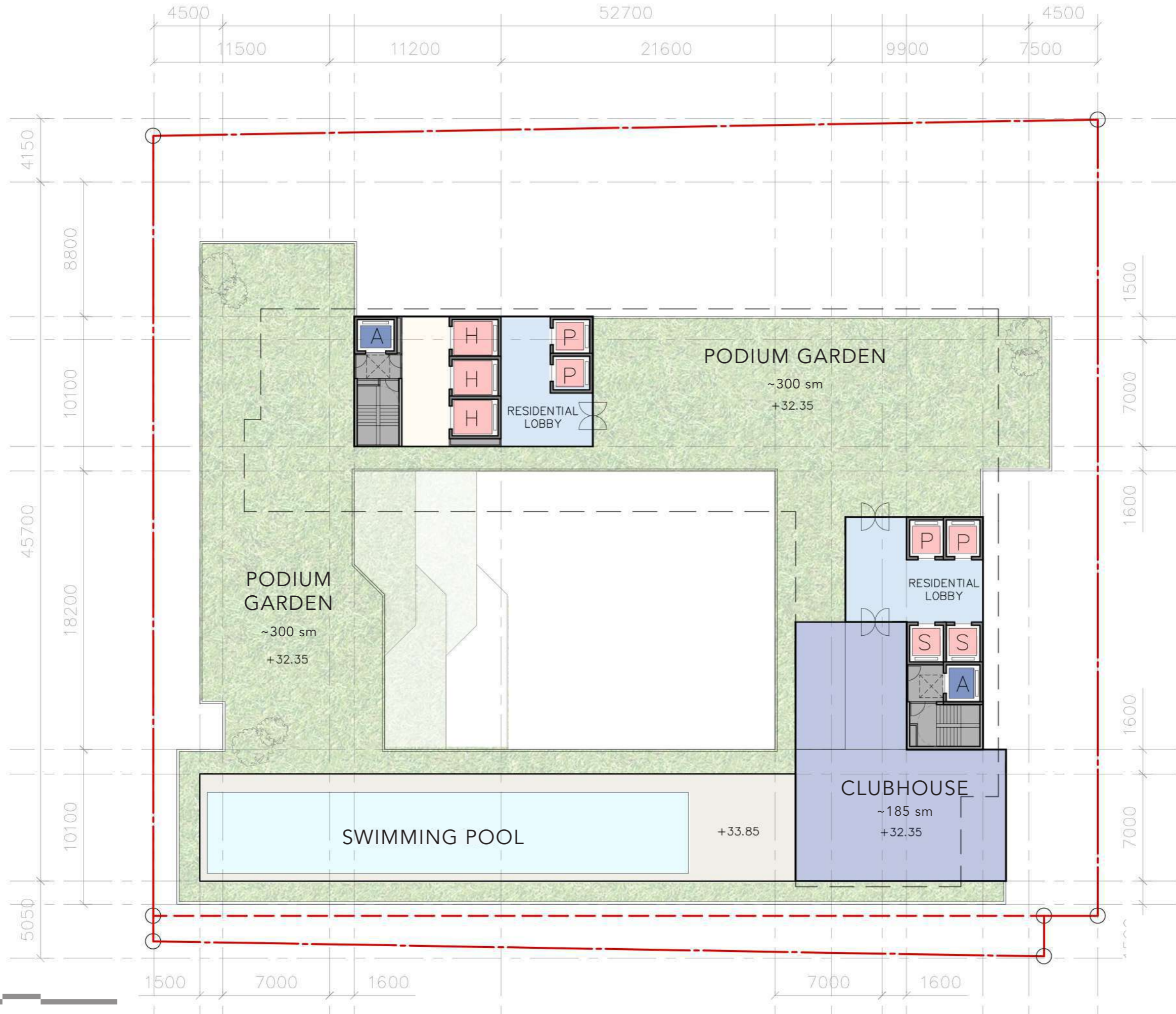
SUITE	: 6 BEDS
1-BD	: 28 BEDS

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*AREAS SUBJECTED TO FURTHER STRUCTURAL AND BUILDING SERVICES CONSULTANTS' COORDINATION

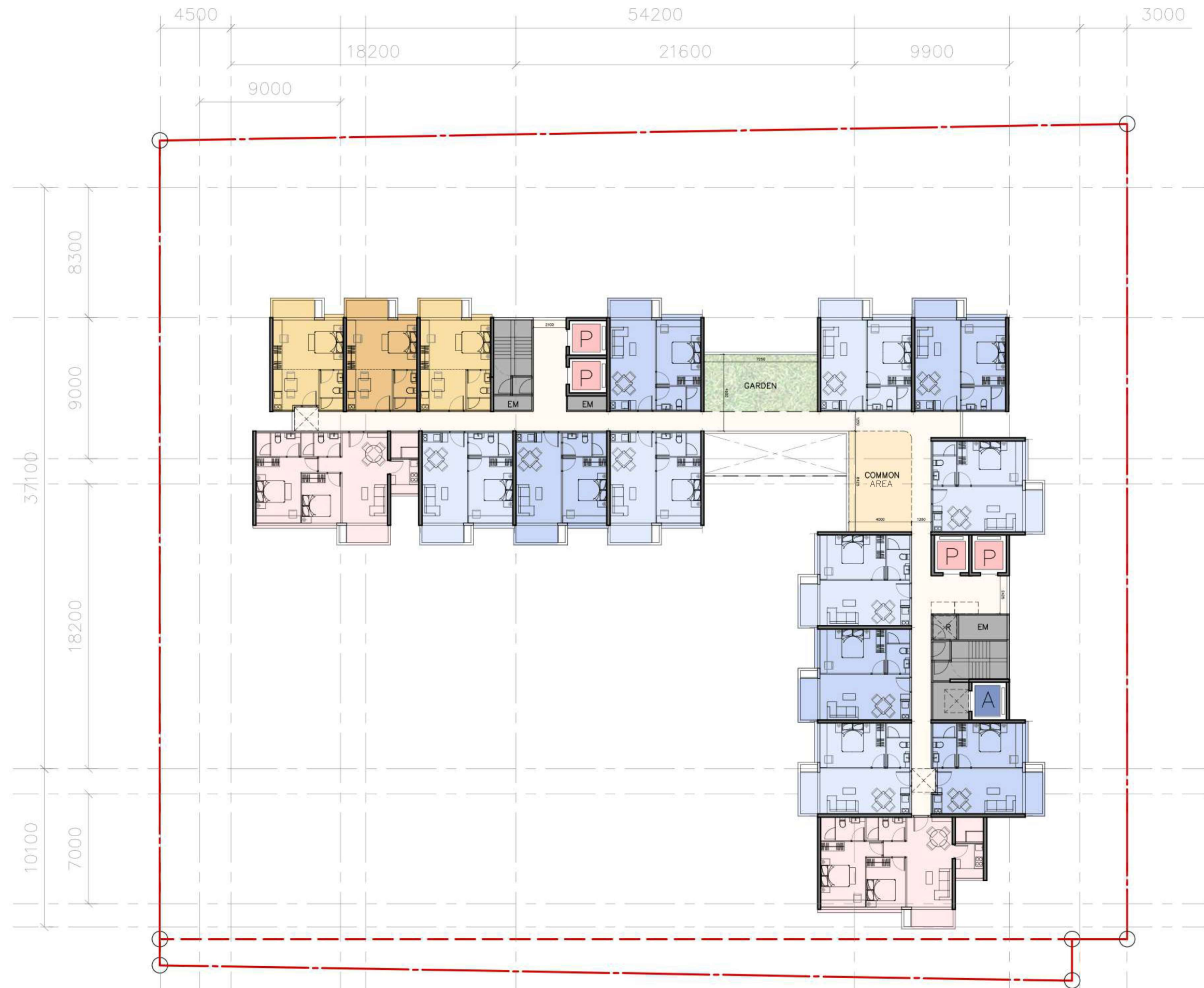


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*AREAS SUBJECT TO FURTHER STRUCTURAL AND BUILDING SERVICES CONSULTANTS' COORDINATION

— MATTER



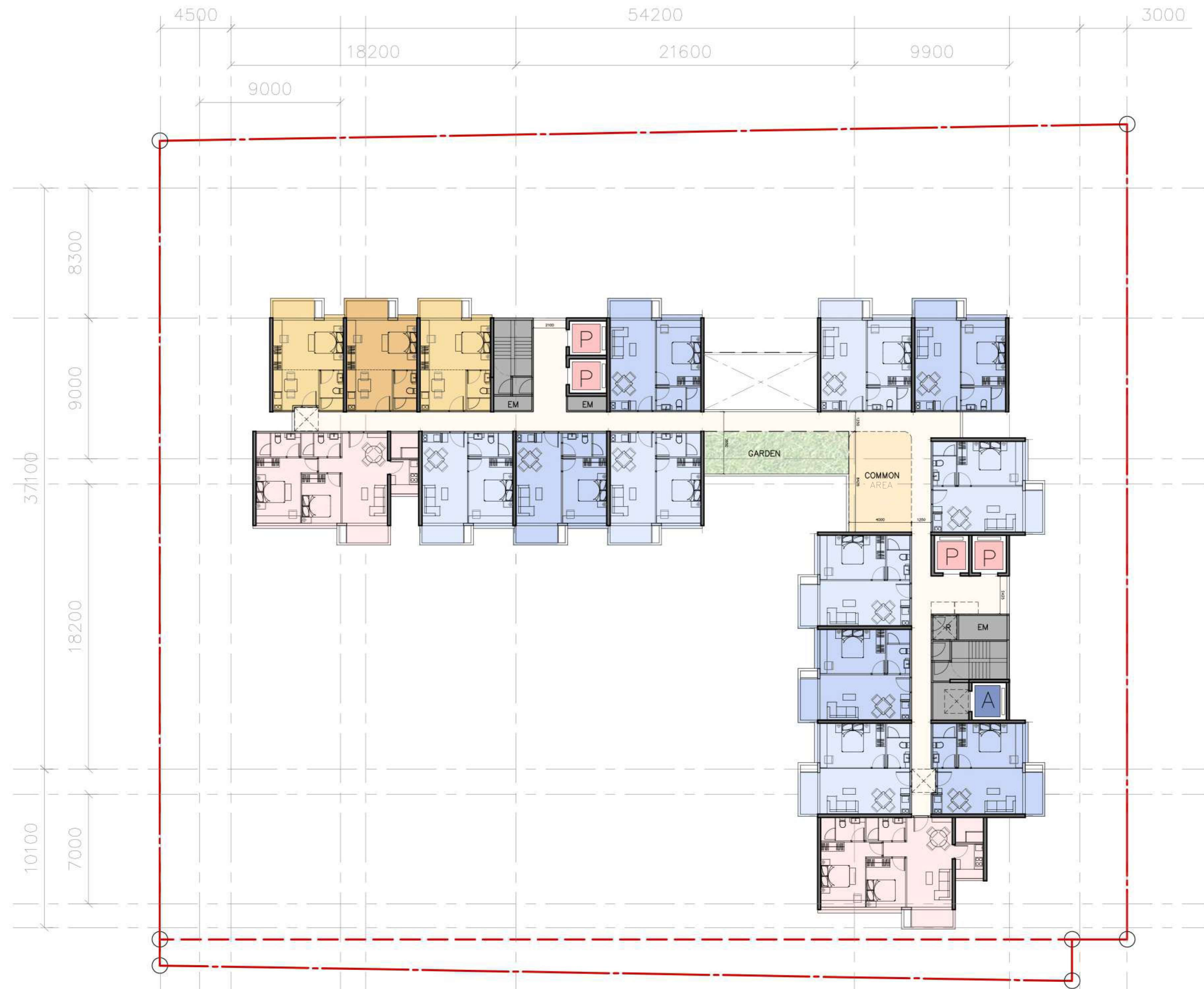
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TYPICAL FLOORS - 9,11,13,15/F

*AREAS SUBJECT TO FURTHER STRUCTURAL AND BUILDING SERVICES CONSULTANTS' COORDINATION



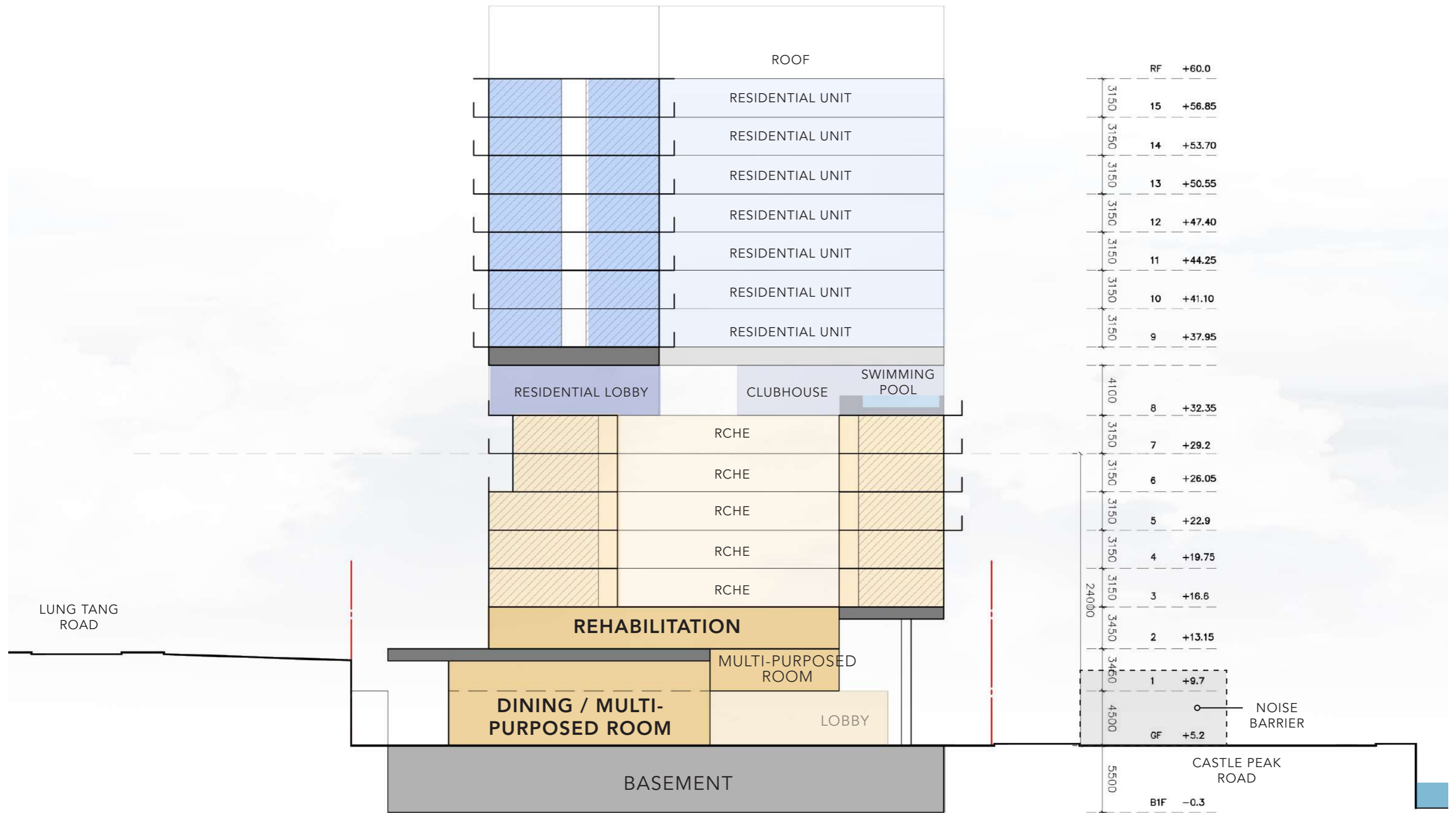
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TYPICAL FLOORS - 10,12,14/F

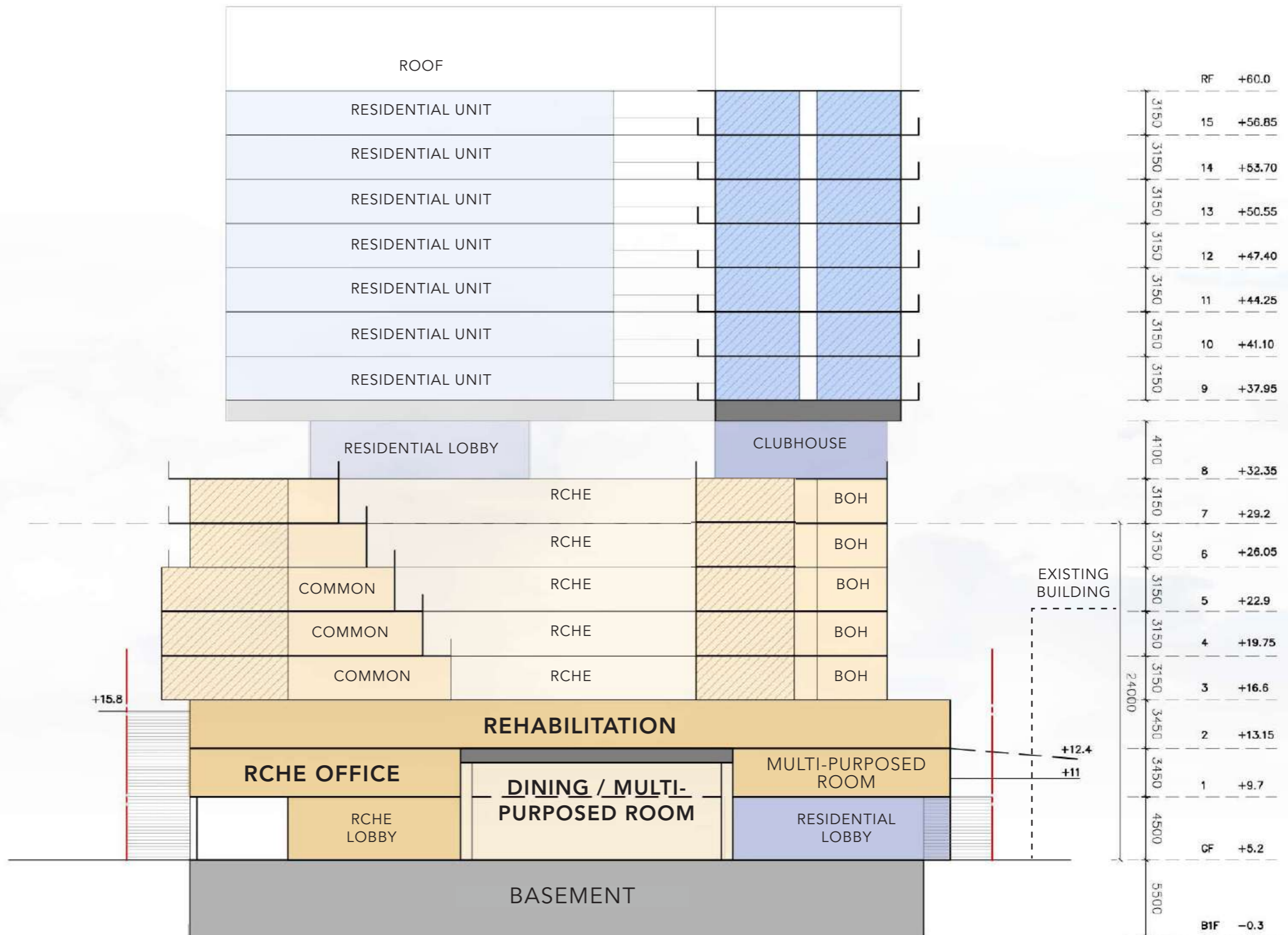
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LUNG TANG ROAD

NOISE BARRIER

CASTLE PEAK ROAD



**Appendix 1.2 Approved Environmental Assessment Report under S16
Planning Application (No. A/TW/122) – extracts of
Land Contamination Review**

1. INTRODUCTION

1.1 Background

- 1.1.1 The Subject Site is zoned "Residential (Group B)" ("R(B)") under Tsuen Wan West Outline Zoning Plan (No. S/TWW/19) with building height restriction of 60 mPD.
- 1.1.2 It is proposed to be redeveloped as residential uses comprising two residential towers and a plot ratio not more than 2.52.
- 1.1.3 Ramboll Hong Kong Limited has been appointed to conduct this Environmental Assessment to address environmental noise impact, air quality impact on the proposed development during its operational phase, potential land contamination problem and demonstrate the acceptability of the proposal.
- 1.1.4 Architectural drawings and technical information of the development are provided by the project architect (WCWP). The relevant traffic forecast is provided by the project traffic consultant (LLA).

1.2 Subject Site and its Environs

- 1.2.1 The Subject Site was formerly occupied by an Acid Factory which was already demolished. Currently, the Subject Site is for open storage purpose without building structure.
- 1.2.2 The Subject Site is bounded by Castle Peak Road (Tsing Lung Tau) on southern side. It is surrounded by Vale Villa – Hong Kong Garden to the north, Hong Kong Garden to the west and Hong Kong Garden Commercial Complex (shopping mall) to the east. Seashore is on the opposite side of Castle Peak Road at over 40m apart.
- 1.2.3 The surrounding is dominated by existing residential development and associated facilities (e.g. shopping mall of the residential development). A vacant site is located to the further north for G/IC uses. **Figure 1.1** shows the location of the Subject Site.
- 1.2.4 There is no industrial use and no I/R interface problem is not anticipated.
- 1.2.5 A section of Castle Peak Road is provided with semi-enclosure of about 175m length in front of Blocks 22 to 24 of Hong Kong Garden which is on west side of the Subject Site.

1.3 Proposed Development

- 1.3.1 The Proposed Development consists of 2 residential towers of both 15 residential storeys connected together, with a total of 165 flat units. Ancillary facilities such as clubhouse and carpark will be provided with air conditioning or mechanical ventilation system and would not rely on openable window for ventilation purpose.
- 1.3.2 The tentative completion year is 2028.
- 1.3.3 The Master Layout Plan (MLP), typical floor plan and section of the Proposed Development are shown in **Appendix 1.1**.

1.4 Environmental Appraisal of the Proposed Development

Environmental Air Quality

- 1.4.1 As discussed, there is no industrial use identified in the vicinity and no I/R interface problem anticipated. Within 200m from the boundary of the Subject Site, it is characterised by residential and associated use, as well as a retail use adjacent to the

Subject Site. There is no chimney stack emission identified within 200m from the Subject Site.

- 1.4.2 On the other hand, the Subject Site is bounded by Castle Peak Road – Tsing Lung Tau to the south and Lung Tang Road (with restricted access and considered as internal access road of Hong Kong Garden) to the north. Other carriageways are further apart.
- 1.4.3 Discussion is included in this report to demonstrate that the horizontal buffer separation requirement stipulated under Table 3.1 in Chapter 9 of the HKPSG can be fulfilled.

Environmental Noise

- 1.4.4 There is no railway system in the vicinity of the Subject Site. Railway noise is not a concern.
- 1.4.5 While there is no industrial premises and activities in the vicinity, there is a shopping mall (i.e. Hong Kong Garden Commercial Complex) to the immediate east of the Subject Site. An onsite survey is conducted to identify any potential noise source, quantify impact through direct noise measurement and assess the impact to demonstrate compliance, or to devise appropriate mitigation measures in case the fixed noise impact is found to be unacceptable under base scenario without noise mitigation measure in place.
- 1.4.6 The Subject Site is surrounded by carriageways including Castle Peak Road – Tsing Lung Tau, Lung Tang Road and Lung Yu Road further apart. Castle Peak Road – Tsing Lung Tau is considered the major carriageway that would generate considerable noise impact. Despite that a section of Castle Peak Road – Tsing Lung Tau is already provided with semi-enclosure (with south side opened) so that the residual noise contribution should be insignificant, the remaining section of Castle Peak Road – Tsing Lung Tau (mainly on east side of the Subject Site) would still impose noise impact on future noise sensitive uses of the development. An assessment of road traffic noise is therefore conducted to assess whether the traffic noise level at the Proposed Development could fulfil the criteria of HKPSG.

Land Contamination

- 1.4.7 It is noted that the Subject Site is currently vacant, unpaved and partially covered by vegetation. As given, the Subject Site was formerly used as an Acid Factory. While the site is currently vacant and there is no onsite observation of any trace of land contamination, the historic use of the Subject Site has been preliminarily checked for the purpose to evaluate any possible risk of land contamination.

6. LAND CONTAMINATION REVIEW

6.1 Legislations, Standards & Guidelines

6.1.1 The land contamination review has been conducted in accordance with the following legislation, standard and guidelines:

- EPD Guidance Note for Contaminated Land Assessment and Remediation.
- EPD Practice Guide for Investigation and Remediation of Contaminated Land.
- Guidance Manual for Use of Risk-Based Remediation Goals for Contaminated Land

6.2 Background and Site Description

6.2.1 With respect to this Land Contamination Review (LCR), a desktop review (including reviewing of historical land uses, information collected from relevant government departments) and a site visit were conducted.

6.2.2 According to the information from the Applicant, the original use of the Subject Site is an acid factory. Given that the acid factory was established long ago, the as-built drawing is not available, and no records could be found from the Building Records Access and Viewing On-line (BRAVO) of Building Departments (BD). At present, the Subject Site is vacant and occupied with trees and plants.

6.3 Review of Historical Land Use

6.3.1 Aerial photographic records for the Site between 1963 and 2021 were reviewed to evaluate the likelihood of potential contamination associated with past uses of the Site. The historical land uses identified from the review are summarised in **Table 6.1** and selected aerial photographs are provided in **Appendix 6.1**

Table 6.1 Land Use Summary on the Subject Site

Year	Land Use	Photo No.
1963	Unknow Building Structure	1963-6364
1964	Unknow Building Structure	1964-3671
1989	Unknow Building Structure	A18323
1990	Vacant Land	A20960
1999	Vacant Land	CN22631
2000	Open Storage Area for Unknown Material	CN28040
2010	Open Storage Area for Unknown Material	CS29341
2017	Open Storage Area for Unknown Material	E027307C
2018	Vacant Land	E050497C
2021	Vacant Land	E129539C

6.3.2 These records revealed that the Site is occupied by unknown building structures before 1963 and the structures was demolished in about 1990. The Site was then vacant until 1999. Open storage area for unknown material were observed from 2000 to 2017. Afterwards, the Site is vacant again until now (i.e. 2021).

6.3.3 With reference to the BRAVO, there is no building records about the Subject Site. Given that there is no detailed information of the unknown building structures and the open storage area up to the report submission date.

6.4 Acquisition of Local Authority Records

6.4.1 The Environmental Protection Department (EPD) and the Fire Services Department (FSD) were approached to obtain the information of chemical waste and dangerous goods (DGs). As replied by EPD, there was no chemical waste spillage accident record onsite. As replied by FSD, neither records of dangerous good license, fire incidents nor

incidents of spillage / leakage of dangerous goods were found onsite. Details of the correspondences are shown in **Appendix 6.2**.

6.5 Site Observation

6.5.1 Site visit was conducted on 7 June 2021 for the LCR. At present, the Site is a vacant land and occupied with trees and plants as shown in below photograph.



Photo took from the roof of Hong Kong Commercial Complex

6.5.2 According to the information from the site visit, there is no stressed vegetation on site. No chemicals or noticeable odours were found. No trace of land contamination can be observed in survey.

7. OVERALL CONCLUSION

- 7.1.1 This environmental assessment has been prepared to evaluate the potential environmental noise, air quality impact and risk of land contamination.
- 7.1.2 Potential air quality impact including stack and vehicular emission impact on the proposed development during its operation, construction phase impact on surrounding have been discussed. Buffer separation requirement stipulated under the HKPSG has been complied with so that no adverse air quality impact on the proposed development is anticipated. Best management practice will be adopted to suppress air quality impact on the surrounding during its construction.
- 7.1.3 Individual environmental noise impact assessments have been included to assess the potential impact. Best management practice will be adopted to suppress noise impact on the surrounding during its construction. Road traffic noise mitigation measures including acoustic window (baffle type) and utility platform with self-closing door will be provided to mitigate road traffic noise impact to the acceptable level to achieved full compliance. At-source noise mitigation measures will be implemented for the fixed noise sources identified at Hong Kong Garden Commercial Complex as confirmed by its operator so as to meet the required standard. No unacceptable noise impact is anticipated after recommended mitigation measures in place.
- 7.1.4 Regarding potential land contamination, it is known that the Subject Site was occupied as acid factory before and used for open storage as well without details. There is also no information suggesting the use of unknown building structure identified in aerial photo. In addition, information of chemical producer, accident records, etc. are still pending up to the report submission date. Therefore, further Land Contamination Review/ Assessment is recommended to be submitted to EPD in later stage. No construction works or development of the Subject Site shall be commenced before the approval of the Land Contamination Review / Assessment from EPD.
- 7.1.5 In addition, the Applicant will refer to the relevant legislation, regulations and circulars/guidelines on waste management for proper handling of waste.
- 7.1.6 Based on the finding of this environmental assessment, it is concluded that the Proposed Development would not be subject to unacceptable air quality and environmental noise impact with recommended mitigation measures in place. Potential land contamination problem will be duly addressed in later stage.

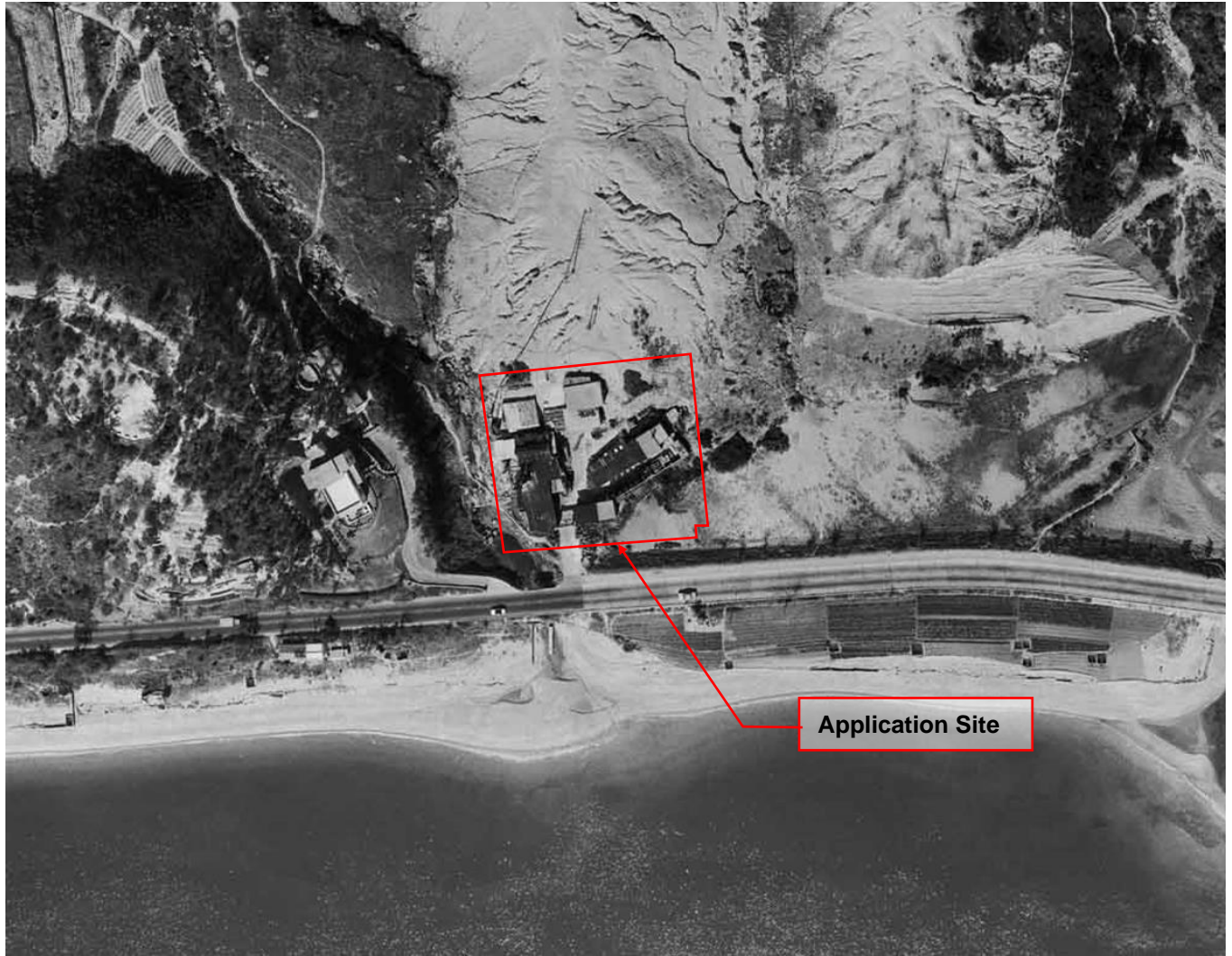
Appendix 6.1 Aerial Photographs

The Site in 1963



Site Description: Unknown Building Structure

The Site in 1964



Site Description: Unknown Building Structure

The Site in 1989



Application Site

Site Description: Unknown Building Structure

The Site in 1990



Site Description: Unknown Building Structure was demolished. The Application Site was vacant.

The Site in 1999



Site Description: Vacant Land

The Site in 2000



Site Description: Open Storage Area. Unknown material stored on the Site is observed.

The Site in 2010



Site Description: Open Storage Area. Unknown material stored on the Site is observed.

The Site in 2017



Site Description: General Storage Area. Unknown material stored on the Site is observed.

The Site in 2018



Application Site

Site Description: Vacant Land.

The Site in 2021



Site Description: Vacant Land

Appendix 6.2 Correspondence with HKSAR Government Departments

Environmental Protection Department
Environmental Compliance Division
Regional Office (West)
Tsuen Wan / North Lantau
8th floor, Tsuen Wan Government Offices,
38 Sai Lau Kok Road, Tsuen Wan, New Territories

By Fax (2411 3073) & Post

Dear Sir / Madam,

Land Contamination Assessment Study for a Proposed Residential Re-development at Lot 94, D.D. 388 And Adjoining Government Land, Castle Peak Road Tsing Lung Tau, New Territories - Enquiry for Land Contamination Information

We are conducting a Land Contamination Assessment Study for a Proposed Residential Re-development at Lot 94, D.D. 388 And Adjoining Government Land, Castle Peak Road Tsing Lung Tau, New Territories (see attached Figure 1). As required by the "Practice Guide for Investigation and Remediation of Contaminated Land" published by the Environmental Protection Department of the Government of HKSAR (EPD), information pertaining to the change of land uses/past activities/incidents/accidents at the Application Site are required as part of the vetting process.

Of particular interests is whether there are any registered chemical waste producers under your record in the Application Site, any waste disposal record, any accidental spillage record, any submission relating to land contamination assessment and any information you could provide which might be useful for our study. We enclosed herewith a site map showing the location of the Application Site for your reference.

Due to the urgency of the project, we would be much appreciated if you could provide the requested information at your earliest convenience.

Should you have any queries, please do not hesitate to contact the undersigned at 3465 2811 (email: cchiu@ramboll.com) or Ms. Lily Chow at 3465 2871 (email: lilychow@ramboll.com). We sincerely seek your feedback on this matter. Thank you in advance for any assistance you can provide.

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



Calvin Chiu
Senior Manager

Enclosure: Figure 1 - Location Plan of the Application Site

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Ramboll Hong Kong Limited 英環香港有限公司

21/F, BEA Harbour View Centre, 56 Gloucester Road, Wan Chai, Hong Kong Tel: 852.3465 2888 Fax: 852.3465 2899

www.ramboll.com

本署檔案
OUR REF: () in EP/RW/TW/General
來函檔案
YOUR REF: CCGCPRAFEI00_0_0003L21
電話
TEL NO: 2417 6086
圖文傳真
FAX NO: 2411 3073
網址
HOMEPAGE: <http://www.epd.gov.hk/>

Environmental Protection Department
Environmental Compliance Division
Regional Office (West)
8/F., Tsuen Wan Government Offices,
38 Sai Lau Kok Road,
Tsuen Wan, N.T.



環境保護署
環保法規管理科
區域辦事處(西)
荃灣西樓角路38號
荃灣政府合署八樓

11 Oct 2021

By post and fax (3465 2899)

Ramboll Hong Kong Limited
21/F, BEA Harbour View Centre,
56 Cloucester Road, Wai Chai, H.K.
(Attn: Clavin Chiu, Senior Manager)

Dear Sir/Madam,

Land Contamination Assessment Study for A Proposed Residential
Re-development at Lot 94, D.D. 388 and Adjoining Government Land,
Castle Peak Road Tsing Lung Tau, New Territories

Enquiry for Land Contamination Information

I refer to letter of the above subject received by this office on 6 Oct 2021.

There was no chemical waste spillage accident record of the subject site. For the record of Chemical Waste Producers of the subject Site, please contact the Chemical Waste and WEEE (Licensing and Control Support) Section, Mr. Andy Ma, at 28351357. For the land contamination assessment information, please contact Waste Assessment Section (fax: 2126 7531).

Yours faithfully,

(Macy Y.C. FUNG)

for Director of Environmental Protection

Fire Services Department
Fire Services Headquarters
Management Group (MG)
9th Floor, Fire Services Headquarters Building,
1 Hong Chong Road, Tsim Sha Tsui East, Kowloon

By Fax (2739 5879) & Post

Dear Sir / Madam,

Land Contamination Assessment Study for a Proposed Residential Re-development at Lot 94, D.D. 388 And Adjoining Government Land, Castle Peak Road Tsing Lung Tau, New Territories - Enquiry for Land Contamination Information

We are conducting a Land Contamination Assessment Study for a Proposed Residential Re-development at Lot 94, D.D. 388 And Adjoining Government Land, Castle Peak Road Tsing Lung Tau, New Territories (see attached Figure 1). As required by the "Practice Guide for Investigation and Remediation of Contaminated Land" published by the Environmental Protection Department of the Government of HKSAR (EPD), information pertaining to the change of land uses/past activities/incidents/accidents at the Application Site are required as part of the vetting process.

Of particular interests are spill and incident reports (including records of fire at the Application Site) that we believe your Department might have record of. Furthermore, we would also like to know whether anywhere of the Application Site had applied or possessed license for dangerous goods storage. We enclosed herewith a site map showing the location of the Application Site for your reference (see attached Figure 1).

Due to the urgency of the project, we would be much appreciated if you could provide the requested information at your earliest convenience.

Should you have any queries, please do not hesitate to contact the undersigned at 3465 2811 (email: cchiu@ramboll.com) or Ms. Lily Chow at 3465 2871 (email: lilychow@ramboll.com). We sincerely seek your feedback on this matter. Thank you in advance for any assistance you can provide.

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



Calvin Chiu
Senior Manager

Enclosure: Figure 1 - Location Plan of the Application Site

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消防處

香港九龍尖沙咀東部康莊道1號
消防處總部大廈



FIRE SERVICES DEPARTMENT
FIRE SERVICES HEADQUARTERS BUILDING,
No.1 Hong Chong Road,
Tsim Sha Tsui East, Kowloon,
Hong Kong.

本處檔號 OUR REF. : (142) in FSD GR 6-5/4 R Pt.36
來函檔號 YOUR REF. : CCGCPRAFEI00_0_0002L.21
電子郵件 E-mail : hkfsdenq@hkfsd.gov.hk
圖文傳真 FAX NO. : 2739 5879
電話 TEL NO. : 2733 7741

2 November 2021

Ramboll Hong Kong Limited
21/F, BEA Harbour View Centre,
56 Gloucester Road,
Wanchai, Hong Kong.
(Attn: Mr. Calvin CHIU, Senior Manager)

Dear Mr. CHIU,

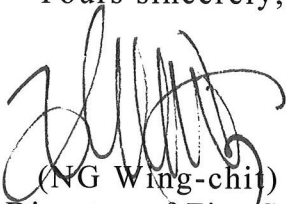
**Land Contamination Assessment Study for a Proposed Residential
Redevelopment at Lot 94, D.D. 388 and Adjoining Government
Land, Castle Peak Road, Tsing Lung Tau, New Territories
Request for Information of Dangerous Goods & Incident Records**

I refer to your letter of 5.10.2021 regarding the captioned request and reply below in response to your questions:-

Please be advised that neither records of dangerous goods license, fire incidents nor incidents of spillage / leakage of dangerous goods were found in connection with the given conditions of your request at the subject location.

If you have further questions, please feel free to contact the undersigned.

Yours sincerely,


(NG Wing-chit)
for Director of Fire Services

Appendix 1.3 Board Paper with Approval from Metro Planning Committee

APPLICATION FOR PLANNING PERMISSION
UNDER SECTION 16 OF THE TOWN PLANNING ORDINANCE

APPLICATION NO. A/TWW/122

- Applicant** : Loi Hing Investment Company Limited represented by AECOM Asia Company Limited
- Premises** : Lot 94 in D.D. 388 and adjoining Government land, Castle Peak Road - Tsing Lung Tau, Tsuen Wan
- Site Area** : About 3,306m² (including about 1,402m² Government land (i.e. about 42% of the total site area))
- Lease** : Lot 94 in D.D. 388 (with a registered area of about 1,904m²)
(a) New Grant No. 3305 dated 24.7.1953 for the purpose of building expiring on 30.6.2047;
(b) subject to General and Special Conditions of Sales in Government Notification No. 364 of 1934 as amended by Government Notification No. 50 of 1940;
(c) height of building shall not exceed 25 feet or 2 storeys in height, and no storey shall be less than 10 feet in height; and
(d) open space shall be provided at the rear of every new building and have an area at least equal to half of the roofed-over area of the building.
- Plan** : Approved Tsuen Wan West Outline Zoning Plan (OZP) No. S/TWW/19
- Zoning** : “Residential (Group B)” (“R(B)”)
(a) maximum plot ratio (PR) of 2.1 and maximum site coverage (SC) of 17.5% for building height (BH) over 33 metres; and
(b) maximum building height (BH) of 60 metres above Principal Datum (mPD).
- Application** : Proposed Minor Relaxation of PR Restriction for Permitted Residential Development (Flat)

1. The Proposal

- 1.1 The application site (the Site), located to the north of Castle Peak Road - Tsing Lung Tau and surrounded by Hong Kong Garden¹ to the north, east and west, is

¹ Hong Kong Garden (in TLTL 60 s.A RP, s.B and RP) was completed in phases between 1986 and 2008 in accordance with the master layout plan under lease.

Landscape Aspect

- (d) according to the aerial photo of 2020, the Site is situated in an area of residential urban fringe landscape character, predominated by residential buildings and vegetated woodland. The proposed development is considered not incompatible with the landscape setting in proximity; and
- (e) according to the submission, there are 20 existing trees of common species including dominant species such as *Leucaena leucocephala*, *Ficus benjamina* and *Macaranga tanarius* generally in poor to fair condition (**Drawing A-8**). All trees are proposed to be felled. New landscape treatments, including planting areas with 30 new trees (i.e. tree compensation ratio of 1 to 1.5) and swimming pool will be provided within the Site (**Drawing A-7**). Private open space of about 503m² is proposed for design population of about 462 persons. Taking into account the above, there is no objection to the application from landscape planning perspective.

Environment

8.1.6 Comments of the Director of Environmental Protection (DEP):

- (a) has no objection to the application;
- (b) according to the EA, with the implementation of noise mitigation measures (i.e. acoustic windows and utility platform with self-closing doors), noise level of all residential units would comply with the road traffic noise planning standard. The applicant has provided an undertaking letter for implementation of the EA recommended noise mitigation measures;
- (c) the EA also indicated that only potential fixed noise source was identified at the rooftop of Hong Kong Garden Commercial Complex. The EA has included a letter from the Hong Kong Garden Commercial Complex, undertaking to conduct retrofitting work at existing cooling towers or any other noisy equipment to control noise generation. As such, no adverse fixed noise source impact on the proposed development is anticipated;
- (d) on air quality, the EA found no chimney identified within 200m from the Site, and air sensitive uses in the proposed development scheme can meet air buffer requirements with respect to carriageways;
- (e) although the Site was previously occupied by an acid factory, land contamination review with site visit conducted by the applicant found no trace of land contamination. The EA has recommended further land contamination review/assessment to be submitted in

detailed design stage. No construction works or development of the Site would be commenced before approval of the land contamination review/assessment; and

- (f) a SIA has been conducted by the applicant, recommending sewers upgrading works. Should the application be approved, it is recommended to impose the following condition:
 - the submission of an updated SIA to the satisfaction of the DEP or of the Board.

8.1.7 Comments of the Chief Engineer/Mainland South, Drainage Services Department (CE/MS, DSD):

- (a) no adverse comment to the application; and
- (b) should the application be approved, it is recommended to impose the following condition:
 - the implementation of the local sewerage upgrading/sewerage connection works identified in the updated SIA to the satisfaction of the Director of Drainage Services or of the Board.

Social Welfare Aspect

8.1.8 Comments of the Director of Social Welfare (D of SW):

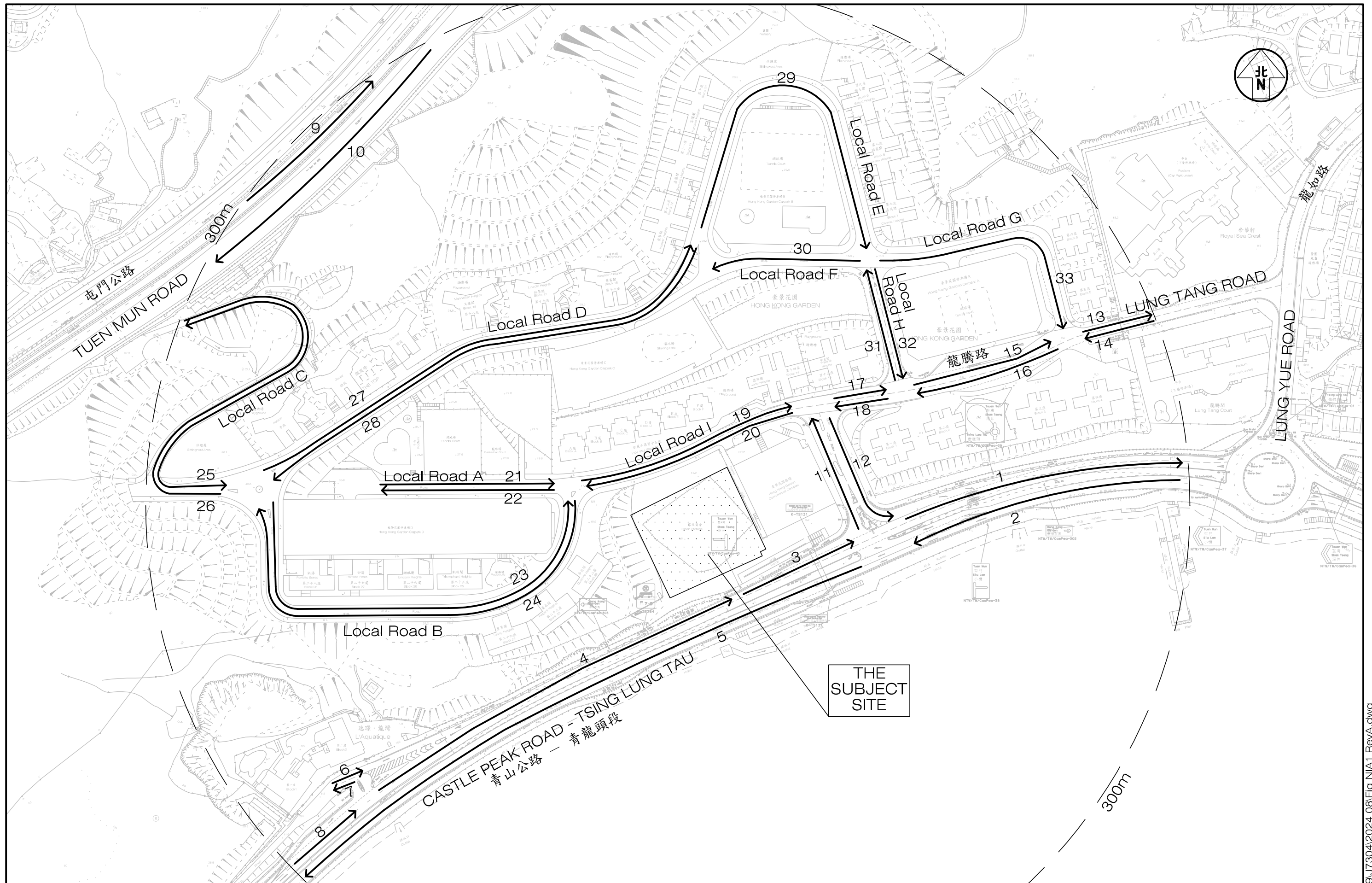
considering the overall supply and demand for social welfare facilities in the district and only a small area could be made available for social welfare facilities under the proposed development with small population in-take, D of SW is in view that there is no need to provide such facilities within the proposed development.

Building Matters

8.1.9 Comments of the Chief Building Surveyor/New Territories West, Buildings Department (CBS/NTW, BD):

- (a) has no objection to the application;
- (b) the proposed PR and SC for the whole development should not exceed the permissible limits under First Schedule of Building (Planning) Regulations (B(P)R);
- (c) if the Site does not abut on a specified street having a width of not less than 4.5m, the development intensity shall be determined under B(P)R 19(3) during plan submission stage;

Appendix 4.1 Traffic Forecast for Year 2047 and Reply from Transport Department



Project Title SECTION 16 PLANNING APPLICATION FOR PROPOSED MINOR RELAXATION OF PLOT RATIO (PR) AND SITE COVERAGE (SC) FOR PROPOSED SOCIAL WELFARE FACILITY (RESIDENTIAL CARE HOME FOR THE ELDERLY) (RCHE(S)), TRAINING CENTRE WITH RESIDENTIAL INSTITUTION AND PERMITTED RESIDENTIAL DEVELOPMENT (FLAT) IN LOT 94 IN D.D. 388 AND ADJOINING GOVERNMENT LAND, CASTLE PEAK ROAD - TSING LUNG TAU, TSUEN WAN J7304

Figure Title LOCATION OF TRAFFIC DATA WITHIN 300M STUDY AREA FROM SUBJECT SITE

Figure No.	NIA1		Revision	A	
Designed by	L C H	Drawn by	N C M	Checked by	K C
Scale in A3	1 : 2000		Date	01 AUG 2024	
CKM Asia Limited			Traffic and Transportation Planning Consultants		
21st Floor, Methodist House, 36 Hennessy Road			Wan Chai, Hong Kong		
Tel : (852) 2520 5990			Fax : (852) 2528 6343		
Email : mail@ckmasia.com.hk					

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TABLE E – PEAK HOUR TRAFFIC FLOW AND VEHICLE COMPOSITION
YEAR 2047 TRAFFIC FORECAST

Date: 2 July 2024

Job No.: J7304

Link ID	Road Section	From Road	To Road	AM Peak Hour		
				Traffic Flows (veh/hr)	Vehicle Composition	
					LV	HV
L001	Castle Peak Road - Tsing Lung Tau	Access Road of Hong Kong Garden	Lung Yue Road	2,200	84%	16%
L002	Castle Peak Road - Tsing Lung Tau	Lung Yue Road	Access Road of Hong Kong Garden	400	79%	21%
L003	Castle Peak Road - Tsing Lung Tau	Access Road of Subject Site	Access Road of Hong Kong Garden	1,850	84%	16%
L004	Castle Peak Road - Tsing Lung Tau	Access Road of L'Aquatique	Access Road of Subject Site	1,850	84%	16%
L005	Castle Peak Road - Tsing Lung Tau	Access Road of Hong Kong Garden	Access Road of Public Car Park	300	82%	18%
L006	Access Road of L'Aquatique (EB)	Cul-de-sac	Castle Peak Road - Tsing Lung Tau	50	95%	5%
L007	Access Road of L'Aquatique (WB)	Castle Peak Road - Tsing Lung Tau	Cul-de-sac	50	89%	11%
L008	Castle Peak Road - Tsing Lung Tau	Access Road of VISTACOVE	Access Road of L'Aquatique	1,850	84%	16%
L009	Tuen Mun Road (EB)	Tuen Mun Road Interchange	Sham Tseng Interchange	6,150	63%	37%
L010	Tuen Mun Road (WB)	Sham Tseng Interchange	Tuen Mun Road Interchange	4,600	60%	40%
L011	Access Road of Hong Kong Garden	Castle Peak Road - Tsing Lung Tau	Lung Tang Road	150	67%	33%
L012	Access Road of Hong Kong Garden	Lung Tang Road	Castle Peak Road - Tsing Lung Tau	400	86%	14%
L013	Lung Tang Road (EB)	Local Road H	Cul-de-sac	50	14%	86%
L014	Lung Tang Road (WB)	Cul-de-sac	Local Road H	50	15%	85%
L015	Lung Tang Road (EB)	Local Road G	Local Road H	50	14%	86%
L016	Lung Tang Road (WB)	Local Road H	Local Road G	150	80%	20%
L017	Lung Tang Road (EB)	Access Road of Hong Kong Garden	Local Road G	100	73%	27%
L018	Lung Tang Road (WB)	Local Road G	Access Road of Hong Kong Garden	300	83%	17%
L019	Local Road I (EB)	Local Road B	Access Road of Hong Kong Garden	150	90%	10%
L020	Local Road I (WB)	Access Road of Hong Kong Garden	Local Road B	100	63%	37%
L021	Local Road A (EB)	Cul-de-sac	Local Road B	100	93%	7%
L022	Local Road A (WB)	Local Road B	Cul-de-sac	100	90%	10%
L023	Local Road B (EB)	Local Road C	Local Road A	150	90%	10%
L024	Local Road B (WB)	Local Road A	Local Road C	50	59%	41%
L025	Local Road C (EB)	Cul-de-sac	Local Road D	50	81%	19%
L026	Local Road C (WB)	Local Road D	Cul-de-sac	50	80%	20%
L027	Local Road D (EB)	Local Road B	Local Road E	50	33%	67%
L028	Local Road D (WB)	Local Road E	Local Road B	50	100%	0%
L029	Local Road E (EB)	Local Road D	Local Road F	150	66%	34%
L030	Local Road F (WB)	Local Road E	Local Road D	50	68%	32%
L031	Local Road G (NB)	Lung Tang Road	Local Road F	100	97%	3%
L032	Local Road G (SB)	Local Road F	Lung Tang Road	150	87%	13%
L033	Local Road H (EB)	Local Road E	Lung Tang Road	150	95%	5%

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

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

TABLE E – PEAK HOUR TRAFFIC FLOW AND VEHICLE COMPOSITION
YEAR 2047 TRAFFIC FORECAST

Date: 2 July 2024

Job No.: J7304

Link ID	Road Section	From Road	To Road	PM Peak Hour		
				Traffic Flows (veh/hr)	Vehicle Composition	
					LV	HV
L001	Castle Peak Road - Tsing Lung Tau	Access Road of Hong Kong Garden	Lung Yue Road	400	80%	20%
L002	Castle Peak Road - Tsing Lung Tau	Lung Yue Road	Access Road of Hong Kong Garden	600	83%	17%
L003	Castle Peak Road - Tsing Lung Tau	Access Road of Subject Site	Access Road of Hong Kong Garden	300	86%	14%
L004	Castle Peak Road - Tsing Lung Tau	Access Road of L'Aquatique	Access Road of Subject Site	250	86%	14%
L005	Castle Peak Road - Tsing Lung Tau	Access Road of Hong Kong Garden	Access Road of Public Car Park	350	79%	21%
L006	Access Road of L'Aquatique (EB)	Cul-de-sac	Castle Peak Road - Tsing Lung Tau	50	78%	22%
L007	Access Road of L'Aquatique (WB)	Castle Peak Road - Tsing Lung Tau	Cul-de-sac	50	87%	13%
L008	Castle Peak Road - Tsing Lung Tau	Access Road of VISTACOVE	Access Road of L'Aquatique	300	87%	13%
L009	Tuen Mun Road (EB)	Tuen Mun Road Interchange	Sham Tseng Interchange	4,700	69%	31%
L010	Tuen Mun Road (WB)	Sham Tseng Interchange	Tuen Mun Road Interchange	5,650	73%	27%
L011	Access Road of Hong Kong Garden	Castle Peak Road - Tsing Lung Tau	Lung Tang Road	350	89%	11%
L012	Access Road of Hong Kong Garden	Lung Tang Road	Castle Peak Road - Tsing Lung Tau	200	76%	24%
L013	Lung Tang Road (EB)	Local Road H	Cul-de-sac	50	0%	100%
L014	Lung Tang Road (WB)	Cul-de-sac	Local Road H	50	0%	100%
L015	Lung Tang Road (EB)	Local Road G	Local Road H	50	0%	100%
L016	Lung Tang Road (WB)	Local Road H	Local Road G	100	52%	48%
L017	Lung Tang Road (EB)	Access Road of Hong Kong Garden	Local Road G	200	89%	11%
L018	Lung Tang Road (WB)	Local Road G	Access Road of Hong Kong Garden	200	73%	27%
L019	Local Road I (EB)	Local Road B	Access Road of Hong Kong Garden	50	91%	9%
L020	Local Road I (WB)	Access Road of Hong Kong Garden	Local Road B	150	89%	11%
L021	Local Road A (EB)	Cul-de-sac	Local Road B	50	100%	0%
L022	Local Road A (WB)	Local Road B	Cul-de-sac	100	98%	2%
L023	Local Road B (EB)	Local Road C	Local Road A	50	85%	15%
L024	Local Road B (WB)	Local Road A	Local Road C	100	85%	15%
L025	Local Road C (EB)	Cul-de-sac	Local Road D	50	92%	8%
L026	Local Road C (WB)	Local Road D	Cul-de-sac	50	90%	10%
L027	Local Road D (EB)	Local Road B	Local Road E	100	82%	18%
L028	Local Road D (WB)	Local Road E	Local Road B	100	96%	4%
L029	Local Road E (EB)	Local Road D	Local Road F	150	81%	19%
L030	Local Road F (WB)	Local Road E	Local Road D	150	86%	14%
L031	Local Road G (NB)	Lung Tang Road	Local Road F	200	91%	9%
L032	Local Road G (SB)	Local Road F	Lung Tang Road	100	72%	28%
L033	Local Road H (EB)	Local Road E	Lung Tang Road	50	92%	8%

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

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

Speed Limit of Road Section

Link ID	Road Section	From Road	To Road	Speed Limit (km/h)
L001	Castle Peak Road - Tsing Lung Tau (EB)	Access Road of Hong Kong Garden	Lung Yue Road	50
L002	Castle Peak Road - Tsing Lung Tau (WB)	Lung Yue Road	Access Road of Hong Kong Garden	50
L003	Castle Peak Road - Tsing Lung Tau (EB)	Access Road of Subject Site	Access Road of Hong Kong Garden	50
L004	Castle Peak Road - Tsing Lung Tau (EB)	Access Road of L'Aquatique	Access Road of Subject Site	50
L005	Castle Peak Road - Tsing Lung Tau (WB)	Access Road of Hong Kong Garden	Access Road of Public Car Park	50
L006	Access Road of L'Aquatique (EB)	Cul-de-sac	Castle Peak Road - Tsing Lung Tau	50
L007	Access Road of L'Aquatique (WB)	Castle Peak Road - Tsing Lung Tau	Cul-de-sac	50
L008	Castle Peak Road - Tsing Lung Tau (EB)	Access Road of VISTACOVE	Access Road of L'Aquatique	70
L009	Tuen Mun Road (EB)	Tuen Mun Road Interchange	Sham Tseng Interchange	80
L010	Tuen Mun Road (WB)	Sham Tseng Interchange	Tuen Mun Road Interchange	80
L011	Access Road of Hong Kong Garden (NB)	Castle Peak Road - Tsing Lung Tau	Lung Tang Road	50
L012	Access Road of Hong Kong Garden (SB)	Lung Tang Road	Castle Peak Road - Tsing Lung Tau	50
L013	Lung Tang Road (EB)	Local Road H	Cul-de-sac	50
L014	Lung Tang Road (WB)	Cul-de-sac	Local Road H	50
L015	Lung Tang Road (EB)	Local Road G	Local Road H	50
L016	Lung Tang Road (WB)	Local Road H	Local Road G	50
L017	Lung Tang Road (EB)	Access Road of Hong Kong Garden	Local Road G	50
L018	Lung Tang Road (WB)	Local Road G	Access Road of Hong Kong Garden	50
L019	Local Road I (EB)	Local Road B	Access Road of Hong Kong Garden	50
L020	Local Road I (WB)	Access Road of Hong Kong Garden	Local Road B	50
L021	Local Road A (EB)	Cul-de-sac	Local Road B	50
L022	Local Road A (WB)	Local Road B	Cul-de-sac	50
L023	Local Road B (EB)	Local Road C	Local Road A	50
L024	Local Road B (WB)	Local Road A	Local Road C	50
L025	Local Road C (EB)	Cul-de-sac	Local Road D	50
L026	Local Road C (WB)	Local Road D	Cul-de-sac	50
L027	Local Road D (EB)	Local Road B	Local Road E	50
L028	Local Road D (WB)	Local Road E	Local Road B	50
L029	Local Road E (EB)	Local Road D	Local Road F	50
L030	Local Road F (WB)	Local Road E	Local Road D	50
L031	Local Road G (NB)	Lung Tang Road	Local Road F	50
L032	Local Road G (SB)	Local Road F	Lung Tang Road	50
L033	Local Road H (EB)	Local Road E	Lung Tang Road	50



Our Ref: J7304/3

3 September 2024

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

Attn: Mr CHIU Ka Fai, Calvin

Dear Mr Chiu,

**Proposed Minor Relaxation of Plot Ratio (PR) and Site Coverage (SC) for
Proposed Social Welfare Facility (Residential Care Home for the Elderly) (RCHE(s)),
Training Centre with Residential Institution and Permitted Residential Development
(Flat) in Lot 94 in D.D. 388 and adjoining Government land
Castle Peak Road, Tsing Lung Tau, Tsuen Wan**

Traffic Forecast for Noise Impact Assessment (NIA)

We refer to the following correspondences pertaining to the traffic forecast in support of NIA for the captioned project:

- i. Letter dated 23th August 2024 to Transport Department with the traffic forecasting methodology and traffic forecast; and
- ii. Email record dated 27th August 2024 from Transport Department with ***“no in-principle objection”*** to the methodology of the traffic forecast for NIA.

We would like to confirm that the traffic forecast for NIA enclosed in our Letters [CKM ref.: J7304/2] is produced strictly in accordance to the traffic forecasting methodology agreed by Transport Department.

Thank you for your attention.

Yours sincerely



Tommy Law
Senior Traffic Engineer

Encl. 2 attachments

KIMLCH



Our Ref: J7304/2

23 August 2024

Transport Department
NT Regional Office
Traffic Survey & Support Division
Tsuen Wan Section
9/F, Mongkok Government Offices
30 Luen Wan Street
Mongkok, Kowloon

Attn: Mr. SIN Ho Pong, Stanley (Engr/Tsuen Wan 2)

(BY POST & EMAIL: hpsin@td.gov.hk)

Dear Mr. Sin,

**Section 16 Planning Application for the Proposed Minor Relaxation of Plot Ratio (PR)
and Site Coverage (SC) for Proposed Social Welfare Facility
(Residential Care Home for the Elderly) (RCHE(s)) and Permitted Residential
Development (Flat) in Lot 94 in D.D. 388 and adjoining Government land,
Castle Peak Road – Tsing Lung Tau, Tsuen Wan (Application No. A/TWW/129)**

Traffic Forecast for Traffic Noise Impact Assessment

CKM Asia Limited, a traffic and transportation planning consultancy firm, is engaged by the Owner of the captioned lot to produce the year 2047 traffic data for the purpose of conducting the Traffic Noise Impact Assessment ("TNIA") by the project Environmental Consultant.

In connection, we write to submit attached Technical Note on Traffic Forecast Methodology for your office review and comment. It is highly appreciated if you can provide your feedback on the traffic forecast methodology to produce year 2047 traffic data, which are solely used for the TNIA at your earliest convenience.

Should you have any queries, please do not hesitate to contact the undersigned.

Thank you for your attention.

Yours sincerely,


Tommy Law
Senior Traffic Engineer

Encl.

KIMLCH

From: Ho Pong SIN <hpsin@td.gov.hk>
Sent: Tuesday, 27 August 2024 6:38 pm
To: CKM Asia
Subject: Re: Section 16 Planning Application for the Proposed Development) in Lot 94 in D.D. 388 and adjoining Government land, Castle Peak Road – Tsing Lung Tau, Tsuen Wan (Application No. A/TWW/129) - Traffic Forecast for TNIA
Attachments: J7304_2.pdf

To : CKM Asia
(Attn: Tommy Law)

I refer to the enclosed letter dated 23 Aug 2024 for the captioned Subject.

It is noted that the Traffic Forecast will be used for Traffic Noise Impact Assessment only and I have no in-principle objection on the Traffic Forecast Methodology to produce year 2047 traffic data for the submission.

Regards,
Stanley SIN
E/TW2, TD
Tel: 2399 2233

From: CKM Asia <mail@ckmasia.com.hk>
To: "hpsin@td.gov.hk" <hpsin@td.gov.hk>
Date: 2024/08/23 下午 02:15
Subject: Section 16 Planning Application for the Proposed Development) in Lot 94 in D.D. 388 and adjoining Government land Castle Peak Road – Tsing Lung Tau, Tsuen Wan (Application No. A/TWW/129) - Traffic Forecast for TNIA

Dear Mr. Sin,

We write to submit the enclosed letter (CKM ref.: J7304/2) for the captioned project. The original document is sent to you by post.

Should you have any queries, please do not hesitate to contact the undersigned.

Thank you for your attention.

Regards,
Tommy Law
CKM Asia Limited
Traffic and Transportation Planning Consultant
21st Floor, Methodist House
36 Hennessy Road
Wan Chai, Hong Kong

Appendix 4.2 On-site Laser Distance Measurements for the Semi-Enclosures at Castle Peak Road – Tsing Lung Tau

Locations of the Semi Enclosure of Castle Peak Road – Tsing Lung Tau



View Point 2 – Semi Enclosure B



View Point 1 – Semi Enclosure A

Photo Records – Semi Enclosure A



- The height of the semi enclosure was measured by laser distance sensor at the lower side. The measured height is about 6.2m.

Photo Records – Semi Enclosure B



- The height of the semi enclosure was measured by laser distance sensor at the lower side. The measured height is about 7.1m.

Appendix 4.3 Predicted Road Traffic Noise [L10(1hr) dB(A)] at Selected Noise Sensitive Receivers for Unmitigated Scenario and Mitigated Scenario

Results of Road Traffic Noise Impact Assessment (Unmitigated Scenario) - RCHE (AM Peak Flow)

RCHE-2/F

GBP Floor	mPD,m	D2-01
2/F	13.2	70
Max Noise Level, dB(A)		70

Noted:

56	Exceeded Hong Kong Planning Standard Guidelines' Standard of 55 dB(A) - Diagnostic Rooms
71	Exceeded Hong Kong Planning Standard Guidelines' Standard of 70 dB(A) - Domestic Premises

Max. Noise Level:	70
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Results of Road Traffic Noise Impact Assessment (Unmitigated Scenario) - RCHE (PM Peak Flow)

RCHE-2/F

GBP Floor	mPD,m	D2-01
2/F	13.2	66
Max Noise Level, dB(A)		66

Noted:

56	Exceeded Hong Kong Planning Standard Guidelines' Standard of 55 dB(A) - Diagnostic Rooms
71	Exceeded Hong Kong Planning Standard Guidelines' Standard of 70 dB(A) - Domestic Premises

Max. Noise Level:	66
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Results of Road Traffic Noise Impact Assessment (Mitigated Scenario) - RCHE (AM Peak Flow-Worst Case)

RCHE-2/F

GBP Floor	mPD,m	D2-01
2/F	13.2	70
Max Noise Level, dB(A)		70

Noted:

	Acoustic Window (Baffle Type)
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Max. Noise Level:	70
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Results of Road Traffic Noise Impact Assessment (Unmitigated Scenario) - RCHE (AM Peak Flow)

RCHE-4/F

GBP Floor	mPD,m	S4-01	D4-01	D4-02	D4-03	D4-04	D4-05	D4-06	D4-07	D4-08	D4-09	D4-10	D4-11	D4-12	D4-13	D4-14
4/F	19.8	49	49	49	50	50	50	51	51	50	67	66	66	65	64	64
Max Noise Level, dB(A)		49	49	49	50	50	50	51	51	50	67	66	66	65	64	64

GBP Floor	mPD,m	D4-15	D4-16	D4-17	D4-18	D4-19	D4-20	D4-21	D4-22	D4-23	D4-24	D4-25	D4-26	D4-27	D4-28
4/F	19.8	64	64	63	63	69	69	70	70	71	71	72	72	73	73
Max Noise Level, dB(A)		64	64	63	63	69	69	70	70	71	71	72	72	73	73

GBP Floor	mPD,m	D4-29	D4-30	D4-31	D4-32	D4-33	D4-34	D4-35	D4-36	D4-37	D4-38	D4-39	D4-40	D4-41	D4-42
4/F	19.8	73	74	74	74	74	74	74	75	67	67	67	68	68	68
Max Noise Level, dB(A)		73	74	74	74	74	74	74	75	67	67	67	68	68	68

GBP Floor	mPD,m	D4-43	D4-44	D4-45	D4-46	D4-47	D4-48
4/F	19.8	68	68	68	68	68	68
Max Noise Level, dB(A)		68	68	68	68	68	68

Noted:

56	Exceeded Hong Kong Planning Standard Guidelines' Standard of 55 dB(A) - Diagnostic Rooms
71	Exceeded Hong Kong Planning Standard Guidelines' Standard of 70 dB(A) - Domestic Premises

Max. Noise Level (Diagnostic Rooms):	49
Max. Noise Level (Residential Portion and Dormitories):	75

Results of Road Traffic Noise Impact Assessment (Unmitigated Scenario) - RCHE (PM Peak Flow)

RCHE-4/F

GBP Floor	mPD,m	S4-01	D4-01	D4-02	D4-03	D4-04	D4-05	D4-06	D4-07	D4-08	D4-09	D4-10	D4-11	D4-12	D4-13	D4-14
4/F	19.8	48	47	47	48	48	48	49	49	48	65	64	64	64	63	63
Max Noise Level, dB(A)		48	47	47	48	48	48	49	49	48	65	64	64	64	63	63

GBP Floor	mPD,m	D4-15	D4-16	D4-17	D4-18	D4-19	D4-20	D4-21	D4-22	D4-23	D4-24	D4-25	D4-26	D4-27	D4-28
4/F	19.8	62	62	62	61	67	67	68	68	68	68	69	69	69	69
Max Noise Level, dB(A)		62	62	62	61	67	67	68	68	68	68	69	69	69	69

GBP Floor	mPD,m	D4-29	D4-30	D4-31	D4-32	D4-33	D4-34	D4-35	D4-36	D4-37	D4-38	D4-39	D4-40	D4-41	D4-42
4/F	19.8	70	70	70	70	70	70	70	70	65	65	65	65	66	66
Max Noise Level, dB(A)		70	70	70	70	70	70	70	70	65	65	65	65	66	66

GBP Floor	mPD,m	D4-43	D4-44	D4-45	D4-46	D4-47	D4-48
4/F	19.8	66	66	66	66	66	66
Max Noise Level, dB(A)		66	66	66	66	66	66

Noted:

56	Exceeded Hong Kong Planning Standard Guidelines' Standard of 55 dB(A) - Diagnostic Rooms
71	Exceeded Hong Kong Planning Standard Guidelines' Standard of 70 dB(A) - Domestic Premises

Max. Noise Level (Diagnostic Rooms):	48
Max. Noise Level (Residential Portion and Dormitories):	70

Results of Road Traffic Noise Impact Assessment (Mitigated Scenario) - RCHE (AM Peak Flow-Worst Case)

RCHE-4/F

GBP Floor	mPD,m	S4-01	D4-01	D4-02	D4-03	D4-04	D4-05	D4-06	D4-07	D4-08	D4-09	D4-10	D4-11	D4-12	D4-13	D4-14
4/F	19.8	49	49	49	50	50	50	51	51	50	67	66	66	65	64	64
Max Noise Level, dB(A)		49	49	49	50	50	50	51	51	50	67	66	66	65	64	64

GBP Floor	mPD,m	D4-15	D4-16	D4-17	D4-18	D4-19	D4-20	D4-21	D4-22	D4-23	D4-24	D4-25	D4-26	D4-27	D4-28
4/F	19.8	64	64	63	63	69	69	70	70	70	70	70	70	70	70
Max Noise Level, dB(A)		0	64	63	63	69	69	70	70	70	70	70	70	70	70

GBP Floor	mPD,m	D4-29	D4-30	D4-31	D4-32	D4-33	D4-34	D4-35	D4-36	D4-37	D4-38	D4-39	D4-40	D4-41	D4-42
4/F	19.8	70	70	70	70	70	70	70	70	67	67	67	68	68	68
Max Noise Level, dB(A)		0	70	70	70	70	70	70	70	67	67	67	68	68	68

GBP Floor	mPD,m	D4-43	D4-44	D4-45	D4-46	D4-47	D4-48
4/F	19.8	68	68	68	68	68	68
Max Noise Level, dB(A)		68	68	68	68	68	68

Noted:

Acoustic Window (Baffle Type)

Max. Noise Level (Diagnostic Rooms):	49
Max. Noise Level (Residential Portion and Dormitories):	70

Results of Road Traffic Noise Impact Assessment (Unmitigated Scenario) - RCHE (AM Peak Flow)

RCHE-5/F

GBP Floor	mPD,m	S5-01	S5-02	D5-01	D5-02	D5-03	D5-04	D5-05	D5-06	D5-07	D5-08	D5-09	D5-10	D5-11	D5-12
5/F	22.9	53	53	53	54	54	54	55	54	67	66	66	65	65	64
Max Noise Level, dB(A)		53	53	53	54	54	54	55	54	67	66	66	65	65	64

GBP Floor	mPD,m	D5-13	D5-14	D5-15	D5-16	D5-17	D5-18	D5-19	D5-20	D5-21	D5-22	D5-23	D5-24	D5-25	D5-26
5/F	22.9	64	64	64	63	69	69	70	70	71	71	72	72	73	73
Max Noise Level, dB(A)		64	64	64	63	69	69	70	70	71	71	72	72	73	73

GBP Floor	mPD,m	D5-27	D5-28	D5-29	D5-30	D5-31	D5-32	D5-33	D5-34	D5-35	D5-36	D5-37	D5-38	D5-39	D5-40
5/F	22.9	73	73	74	74	74	74	74	74	68	68	68	68	68	68
Max Noise Level, dB(A)		73	73	74	74	74	74	74	74	68	68	68	68	68	68

GBP Floor	mPD,m	D5-41	D5-42	D5-43	D5-44	D5-45	D5-46
5/F	22.9	68	68	68	68	68	68
Max Noise Level, dB(A)		68	68	68	68	68	68

Noted:

56 Exceeded Hong Kong Planning Standard Guidelines' Standard of 55 dB(A) - Diagnostic Rooms
71 Exceeded Hong Kong Planning Standard Guidelines' Standard of 70 dB(A) - Domestic Premises

Max. Noise Level (Diagnostic Rooms):	53
Max. Noise Level (Residential Portion and Dormitories):	74

Results of Road Traffic Noise Impact Assessment (Unmitigated Scenario) - RCHE (PM Peak Flow)

RCHE-5/F

GBP Floor	mPD,m	S5-01	S5-02	D5-01	D5-02	D5-03	D5-04	D5-05	D5-06	D5-07	D5-08	D5-09	D5-10	D5-11	D5-12
5/F	22.9	52	52	51	52	52	53	53	52	65	64	64	64	63	63
Max Noise Level, dB(A)		52	52	51	52	52	53	53	52	65	64	64	64	63	63

GBP Floor	mPD,m	D5-13	D5-14	D5-15	D5-16	D5-17	D5-18	D5-19	D5-20	D5-21	D5-22	D5-23	D5-24	D5-25	D5-26
5/F	22.9	62	62	62	61	67	67	68	68	68	68	69	69	69	69
Max Noise Level, dB(A)		62	62	62	61	67	67	68	68	68	68	69	69	69	69

GBP Floor	mPD,m	D5-27	D5-28	D5-29	D5-30	D5-31	D5-32	D5-33	D5-34	D5-35	D5-36	D5-37	D5-38	D5-39	D5-40
5/F	22.9	69	69	70	70	70	70	70	70	66	65	66	66	66	66
Max Noise Level, dB(A)		69	69	70	70	70	70	70	70	66	65	66	66	66	66

GBP Floor	mPD,m	D5-41	D5-42	D5-43	D5-44	D5-45	D5-46
5/F	22.9	66	66	66	66	66	66
Max Noise Level, dB(A)		66	66	66	66	66	66

Noted:

56 Exceeded Hong Kong Planning Standard Guidelines' Standard of 55 dB(A) - Diagnostic Rooms
71 Exceeded Hong Kong Planning Standard Guidelines' Standard of 70 dB(A) - Domestic Premises

Max. Noise Level (Diagnostic Rooms):	52
Max. Noise Level (Residential Portion and Dormitories):	70

Results of Road Traffic Noise Impact Assessment (Mitigated Scenario) - RCHE (AM Peak Flow-Worst Case)

RCHE-5/F

GBP Floor	mPD,m	S5-01	S5-02	D5-02	D5-03	D5-04	D5-05	D5-06	D5-07	D5-08	D5-09	D5-10	D5-11	D5-12	D5-13
5/F	22.9	53	53	53	54	54	54	55	54	67	66	66	65	65	64
Max Noise Level, dB(A)		53	53	53	54	54	54	55	54	67	66	66	65	65	64

GBP Floor	mPD,m	D5-13	D5-14	D5-15	D5-16	D5-17	D5-18	D5-19	D5-20	D5-21	D5-22	D5-23	D5-24	D5-25	D5-26
5/F	22.9	64	64	64	63	69	69	70	70	70	70	70	70	70	70
Max Noise Level, dB(A)		0	64	64	63	69	69	70	70	70	70	70	70	70	70

GBP Floor	mPD,m	D5-27	D5-28	D5-29	D5-30	D5-31	D5-32	D5-33	D5-34	D5-35	D5-36	D5-37	D5-38	D5-39	D5-40
5/F	22.9	70	70	70	70	70	70	70	70	68	68	68	68	68	68
Max Noise Level, dB(A)		0	70	70	70	70	70	70	70	68	68	68	68	68	68

GBP Floor	mPD,m	D5-41	D5-42	D5-43	D5-44	D5-45	D5-46
5/F	22.9	68	68	68	68	68	68
Max Noise Level, dB(A)		0	68	68	68	68	68

Noted:

Acoustic Window (Baffle Type)

Max. Noise Level (Diagnostic Rooms):	53
Max. Noise Level (Residential Portion and Dormitories):	70

Results of Road Traffic Noise Impact Assessment (Unmitigated Scenario) - RCHE (AM Peak Flow)

RCHE-6/F																
GBP Floor	mPD,m	S6-01	D6-01	D6-02	D6-03	D6-04	D6-05	D6-06	D6-07	D6-08	D6-09	D6-10	D6-11	D6-12	D6-13	D6-14
6/F	26.1	53	52	53	53	54	54	54	67	65	65	65	64	64	69	70
	Max Noise Level, dB(A)	53	52	53	53	54	54	54	67	65	65	65	64	64	69	70
GBP Floor	mPD,m	D6-15	D6-16	D6-17	D6-18	D6-19	D6-20	D6-21	D6-22	D6-23	D6-24	D6-25	D6-26	D6-27	D6-28	
6/F	26.1	70	70	71	71	72	72	72	73	73	73	73	74	74	74	
	Max Noise Level, dB(A)	70	70	71	71	72	72	72	73	73	73	73	74	74	74	
GBP Floor	mPD,m	D6-29	D6-30	D6-31	D6-32	D6-33	D6-34	D6-35	D6-36	D6-37	D6-38	D6-39	D6-40	D6-41	D6-42	
6/F	26.1	74	74	68	67	67	68	68	68	68	68	68	68	68	68	
	Max Noise Level, dB(A)	74	74	68	67	67	68	68	68	68	68	68	68	68	68	

Noted:

56 Exceeded Hong Kong Planning Standard Guidelines' Standard of 55 dB(A) - Diagnostic Rooms
71 Exceeded Hong Kong Planning Standard Guidelines' Standard of 70 dB(A) - Domestic Premises

Max. Noise Level (Diagnostic Rooms):	53
Max. Noise Level (Residential Portion and Dormitories):	74

Results of Road Traffic Noise Impact Assessment (Unmitigated Scenario) - RCHE (PM Peak Flow)

RCHE-6/F																
GBP Floor	mPD,m	S6-01	D6-01	D6-02	D6-03	D6-04	D6-05	D6-06	D6-07	D6-08	D6-09	D6-10	D6-11	D6-12	D6-13	D6-14
6/F	26.1	51	51	51	52	52	53	52	65	64	63	63	62	62	67	67
	Max Noise Level, dB(A)	51	51	51	52	52	53	52	65	64	63	63	62	62	67	67
GBP Floor	mPD,m	D6-15	D6-16	D6-17	D6-18	D6-19	D6-20	D6-21	D6-22	D6-23	D6-24	D6-25	D6-26	D6-27	D6-28	
6/F	26.1	68	68	68	68	68	69	69	69	69	69	69	70	70	70	
	Max Noise Level, dB(A)	68	68	68	68	68	69	69	69	69	69	69	70	70	70	
GBP Floor	mPD,m	D6-29	D6-30	D6-31	D6-32	D6-33	D6-34	D6-35	D6-36	D6-37	D6-38	D6-39	D6-40	D6-41	D6-42	
6/F	26.1	70	70	66	65	65	66	66	66	66	66	66	66	66	66	
	Max Noise Level, dB(A)	70	70	66	65	65	66	66	66	66	66	66	66	66	66	

Noted:

56 Exceeded Hong Kong Planning Standard Guidelines' Standard of 55 dB(A) - Diagnostic Rooms
71 Exceeded Hong Kong Planning Standard Guidelines' Standard of 70 dB(A) - Domestic Premises

Max. Noise Level (Diagnostic Rooms):	51
Max. Noise Level (Residential Portion and Dormitories):	70

Results of Road Traffic Noise Impact Assessment (Mitigated Scenario) - RCHE (AM Peak Flow-Worst Case)

RCHE-6/F																
GBP Floor	mPD,m	S6-01	D6-01	D6-02	D6-03	D6-04	D6-05	D6-06	D6-07	D6-08	D6-09	D6-10	D6-11	D6-12	D6-13	D6-14
6/F	26.1	53	52	53	53	54	54	54	67	65	65	65	64	64	69	70
	Max Noise Level, dB(A)	53	52	53	53	54	54	54	67	65	65	65	64	64	69	70
GBP Floor	mPD,m	D6-15	D6-16	D6-17	D6-18	D6-19	D6-20	D6-21	D6-22	D6-23	D6-24	D6-25	D6-26	D6-27	D6-28	
6/F	26.1	70	70	70	70	70	70	70	70	70	70	70	70	70	70	
	Max Noise Level, dB(A)	0	70	70	70	70	70	70	70	70	70	70	70	70	70	
GBP Floor	mPD,m	D6-29	D6-30	D6-31	D6-32	D6-33	D6-34	D6-35	D6-36	D6-37	D6-38	D6-39	D6-40	D6-41	D6-42	
6/F	26.1	70	70	68	67	67	68	68	68	68	68	68	68	68	68	
	Max Noise Level, dB(A)	0	70	68	67	67	68	68	68	68	68	68	68	68	68	

Noted:

Acoustic Window (Baffle Type)

Max. Noise Level (Diagnostic Rooms):	53
Max. Noise Level (Residential Portion and Dormitories):	70

Results of Road Traffic Noise Impact Assessment (Unmitigated Scenario) - RCHE (AM Peak Flow)

RCHE-7/F

GBP Floor	mPD,m	S7-01	D7-01	D7-02	D7-03	D7-04	D7-05	D7-06	D7-07	D7-08	D7-09	D7-10	D7-11	D7-12	D7-13	D7-14
7/F	29.2	52	52	52	53	53	53	53	67	66	66	65	64	64	69	69
Max Noise Level, dB(A)		52	52	52	53	53	53	53	67	66	66	65	64	64	69	69

GBP Floor	mPD,m	D7-15	D7-16	D7-17	D7-18	D7-19	D7-20	D7-21	D7-22	D7-23	D7-24	D7-25	D7-26	D7-27	D7-28
7/F	29.2	70	70	71	71	71	72	72	72	73	73	73	73	73	74
Max Noise Level, dB(A)		70	70	71	71	71	72	72	72	73	73	73	73	73	74

GBP Floor	mPD,m	D7-29	D7-30	D7-31	D7-32	D7-33	D7-34	D7-35	D7-36	D7-37	D7-38	D7-39	D7-40
7/F	29.2	74	74	68	68	68	68	68	68	68	68	68	68
Max Noise Level, dB(A)		74	74	68	68	68	68	68	68	68	68	68	68

Noted:

56	Exceeded Hong Kong Planning Standard Guidelines' Standard of 55 dB(A) - Diagnostic Rooms
71	Exceeded Hong Kong Planning Standard Guidelines' Standard of 70 dB(A) - Domestic Premises

Max. Noise Level (Diagnostic Rooms):	52
Max. Noise Level (Residential Portion and Dormitories):	74

Results of Road Traffic Noise Impact Assessment (Unmitigated Scenario) - RCHE (PM Peak Flow)

RCHE-7/F

GBP Floor	mPD,m	S7-01	D7-01	D7-02	D7-03	D7-04	D7-05	D7-06	D7-07	D7-08	D7-09	D7-10	D7-11	D7-12	D7-13	D7-14
7/F	29.2	50	50	51	51	52	52	51	65	64	64	64	63	63	67	67
Max Noise Level, dB(A)		50	50	51	51	52	52	51	65	64	64	64	63	63	67	67

GBP Floor	mPD,m	D7-15	D7-16	D7-17	D7-18	D7-19	D7-20	D7-21	D7-22	D7-23	D7-24	D7-25	D7-26	D7-27	D7-28
7/F	29.2	67	68	68	68	68	68	69	69	69	69	69	69	69	70
Max Noise Level, dB(A)		67	68	68	68	68	68	69	69	69	69	69	69	69	70

GBP Floor	mPD,m	D7-29	D7-30	D7-31	D7-32	D7-33	D7-34	D7-35	D7-36	D7-37	D7-38	D7-39	D7-40
7/F	29.2	70	70	66	66	66	66	66	66	66	66	66	66
Max Noise Level, dB(A)		70	70	66	66	66	66	66	66	66	66	66	66

Noted:

56	Exceeded Hong Kong Planning Standard Guidelines' Standard of 55 dB(A) - Diagnostic Rooms
71	Exceeded Hong Kong Planning Standard Guidelines' Standard of 70 dB(A) - Domestic Premises

Max. Noise Level (Diagnostic Rooms):	50
Max. Noise Level (Residential Portion and Dormitories):	70

Results of Road Traffic Noise Impact Assessment (Mitigated Scenario) - RCHE (AM Peak Flow-Worst Case)

RCHE-7/F

GBP Floor	mPD,m	S7-01	D7-01	D7-02	D7-03	D7-04	D7-05	D7-06	D7-07	D7-08	D7-09	D7-10	D7-11	D7-12	D7-13	D7-14
7/F	29.2	52	52	52	53	53	53	53	67	66	66	65	64	64	69	69
Max Noise Level, dB(A)		52	52	52	53	53	53	53	67	66	66	65	64	64	69	69

GBP Floor	mPD,m	D7-15	D7-16	D7-17	D7-18	D7-19	D7-20	D7-21	D7-22	D7-23	D7-24	D7-25	D7-26	D7-27	D7-28
7/F	29.2	70	70	70	70	70	70	70	70	70	70	70	70	70	70
Max Noise Level, dB(A)		0	70	70	70	70	70	70	70	70	70	70	70	70	70

GBP Floor	mPD,m	D7-29	D7-30	D7-31	D7-32	D7-33	D7-34	D7-35	D7-36	D7-37	D7-38	D7-39	D7-40
7/F	29.2	70	70	68	68	68	68	68	68	68	68	68	68
Max Noise Level, dB(A)		0	70	68	68	68	68	68	68	68	68	68	68

Noted:

Acoustic Window (Baffle Type)

Max. Noise Level (Diagnostic Rooms):	52
Max. Noise Level (Residential Portion and Dormitories):	70

Results of Road Traffic Noise Impact Assessment (Unmitigated Scenario) - Residential Tower (AM Peak Flow)

Residential Tower

GBP Floor	mPD,m	R-01	R-02	R-03	R-04	R-05	R-06	R-07	R-08	R-09	R-10	R-11	R-12	R-13	R-14
9/F	38.0	68	68	68	68	68	68	68	68	68	68	68	68	70	70
10/F	41.1	68	68	68	68	68	68	68	68	68	68	68	68	70	70
11/F	44.3	68	68	68	68	68	68	68	68	68	68	67	68	70	70
12/F	47.4	68	68	68	68	68	68	68	68	67	67	67	68	69	70
13/F	50.6	68	68	68	68	68	68	68	67	67	67	67	68	69	69
14/F	53.7	68	68	67	68	67	68	67	67	67	67	67	68	69	69
15/F	56.9	67	67	67	67	67	67	67	67	67	67	67	68	69	69
Max Noise Level, dB(A)		68	68	68	68	68	68	68	68	68	68	68	68	70	70
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0	0	0

GBP Floor	mPD,m	R-15	R-16	R-17	R-18	R-19	R-20	R-21	R-22	R-23	R-24	R-25	R-26	R-27
9/F	38.0	71	71	73	73	73	62	58	57	56	56	55	55	55
10/F	41.1	70	71	73	73	72	65	61	59	57	57	56	56	56
11/F	44.3	70	71	72	72	72	66	64	61	59	57	56	56	56
12/F	47.4	70	71	72	72	72	66	65	63	61	59	57	57	57
13/F	50.6	70	71	72	72	72	66	65	64	62	61	59	59	59
14/F	53.7	70	71	72	72	71	66	65	65	63	62	60	61	61
15/F	56.9	70	71	72	71	71	66	65	65	64	63	61	62	62
Max Noise Level, dB(A)		71	71	73	73	73	66	65	65	64	63	61	62	62
Exceedance		7	7	0	0	0	0	0	0	0	0	0	0	0

GBP Floor	mPD,m	R-28	R-29	R-30	R-31	R-32	R-33	R-34
9/F	38.0	55	55	55	55	55	55	57
10/F	41.1	56	55	56	55	55	56	58
11/F	44.3	57	56	57	56	56	56	58
12/F	47.4	58	57	58	58	57	58	59
13/F	50.6	59	59	59	59	59	59	60
14/F	53.7	61	61	61	61	61	61	62
15/F	56.9	62	62	62	62	62	62	63
Max Noise Level, dB(A)		62	62	62	62	62	62	63
Exceedance		0	0	0	0	0	0	0

Noted:

71 Exceeded Hong Kong Planning Standard Guidelines' Standard of 70 dB(A) - Domestic Premises

Total no. of Flats:	112
Total no. of Exceedance:	14
Compliance Level:	88%
Max. Noise Level:	73

Results of Road Traffic Noise Impact Assessment (Unmitigated Scenario) - Residential Tower (PM Peak Flow)

Residential Tower

GBP Floor	mPD,m	R-01	R-02	R-03	R-04	R-05	R-06	R-07	R-08	R-09	R-10	R-11	R-12	R-13	R-14
9/F	38.0	66	66	66	66	66	66	66	66	66	66	66	67	67	67
10/F	41.1	66	66	66	66	66	66	66	66	66	66	66	67	67	67
11/F	44.3	66	66	66	66	66	66	66	66	66	66	66	66	67	67
12/F	47.4	66	66	66	66	66	66	66	66	66	66	66	66	67	67
13/F	50.6	66	66	66	66	66	66	66	66	66	66	65	66	67	67
14/F	53.7	66	66	66	66	66	66	66	66	66	65	65	66	67	67
15/F	56.9	66	66	66	66	66	66	66	66	65	65	65	66	67	67
Max Noise Level, dB(A)		66	66	66	66	66	66	66	66	66	66	66	67	67	67
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0	0	0

GBP Floor	mPD,m	R-15	R-16	R-17	R-18	R-19	R-20	R-21	R-22	R-23	R-24	R-25	R-26	R-27
9/F	38.0	67	68	69	69	69	60	56	54	53	52	51	51	51
10/F	41.1	67	67	69	69	69	63	60	57	54	53	52	52	52
11/F	44.3	67	68	69	68	68	63	62	60	57	55	53	53	54
12/F	47.4	67	68	69	68	68	63	62	61	60	57	55	55	55
13/F	50.6	67	68	68	68	68	63	63	62	61	60	57	57	57
14/F	53.7	67	68	68	68	68	63	62	62	61	60	59	60	60
15/F	56.9	67	68	68	68	68	63	62	62	61	61	60	61	61
Max Noise Level, dB(A)		67	68	69	69	69	63	63	62	61	61	60	61	61
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0	0

GBP Floor	mPD,m	R-28	R-29	R-30	R-31	R-32	R-33	R-34
9/F	38.0	52	52	52	52	52	52	55
10/F	41.1	53	53	53	53	53	53	56
11/F	44.3	54	54	54	54	54	54	56
12/F	47.4	55	55	56	56	56	56	57
13/F	50.6	58	58	58	58	58	58	59
14/F	53.7	60	60	61	60	61	61	61
15/F	56.9	61	61	61	61	61	62	62
Max Noise Level, dB(A)		61	61	61	61	61	62	62
Exceedance		0	0	0	0	0	0	0

Noted:

71 Exceeded Hong Kong Planning Standard Guidelines' Standard of 70 dB(A) - Domestic Premises

Total no. of Flats:	112
Total no. of Exceedance:	0
Compliance Level:	100%
Max. Noise Level:	69

Results of Road Traffic Noise Impact Assessment (Mitigated Scenario) - Residential Tower (AM Peak Flow-Worst case)

Residential Tower

GBP Floor	mPD,m	R-01	R-02	R-03	R-04	R-05	R-06	R-07	R-08	R-09	R-10	R-11	R-12	R-13	R-14
9/F	38.0	68	68	68	68	68	68	68	68	68	68	68	68	70	70
10/F	41.1	68	68	68	68	68	68	68	68	68	68	68	68	70	70
11/F	44.3	68	68	68	68	68	68	68	68	68	68	67	68	70	70
12/F	47.4	68	68	68	68	68	68	68	68	67	67	67	68	69	70
13/F	50.6	68	68	68	68	68	68	68	67	67	67	67	68	69	69
14/F	53.7	68	68	67	68	67	68	67	67	67	67	67	68	69	69
15/F	56.9	67	67	67	67	67	67	67	67	67	67	67	68	69	69
Max Noise Level, dB(A)		68	68	68	68	68	68	68	68	68	68	68	68	70	70
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0	0	0

GBP Floor	mPD,m	R-15	R-16	R-17	R-18	R-19	R-20	R-21	R-22	R-23	R-24	R-25	R-26	R-27
9/F	38.0	70	70	70	70	70	62	58	57	56	56	55	55	55
10/F	41.1	70	70	70	70	70	65	61	59	57	57	56	56	56
11/F	44.3	70	70	70	70	70	66	64	61	59	57	56	56	56
12/F	47.4	70	70	70	70	70	66	65	63	61	59	57	57	57
13/F	50.6	70	70	70	70	70	66	65	64	62	61	59	59	59
14/F	53.7	70	70	70	70	70	66	65	65	63	62	60	61	61
15/F	56.9	70	70	70	70	70	66	65	65	64	63	61	62	62
Max Noise Level, dB(A)		70	70	70	70	70	66	65	65	64	63	61	62	62
Exceedance		0	0	0	0	0	0	0	0	0	0	0	0	0

GBP Floor	mPD,m	R-28	R-29	R-30	R-31	R-32	R-33	R-34
9/F	38.0	55	55	55	55	55	55	57
10/F	41.1	56	55	56	55	55	56	58
11/F	44.3	57	56	57	56	56	56	58
12/F	47.4	58	57	58	58	57	58	59
13/F	50.6	59	59	59	59	59	59	60
14/F	53.7	61	61	61	61	61	61	62
15/F	56.9	62	62	62	62	62	62	63
Max Noise Level, dB(A)		62	62	62	62	62	62	63
Exceedance		0	0	0	0	0	0	0

Noted:

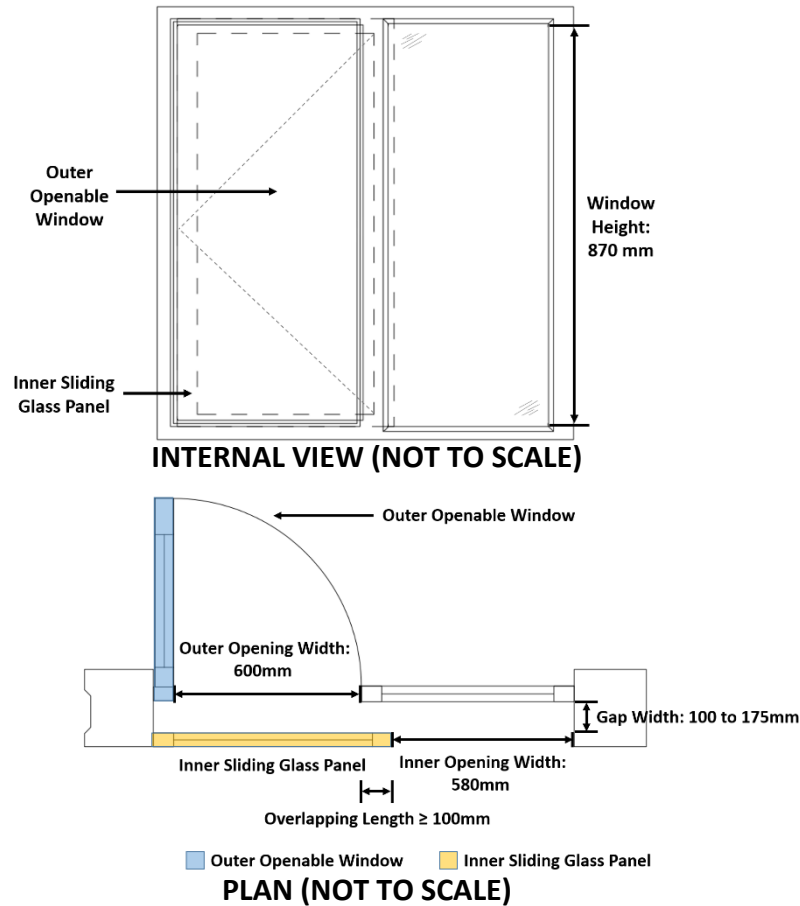
	Acoustic Window (Baffle Type)
	Enhanced Acoustic Balcony (Baffle Type)

Total no. of Flats:	112
Total no. of Exceedance:	0
Compliance Level:	100%
Max. Noise Level:	70

Appendix 4.4 Reference Figures of Acoustic Window/Enhanced Acoustic Balcony (Baffle Type)

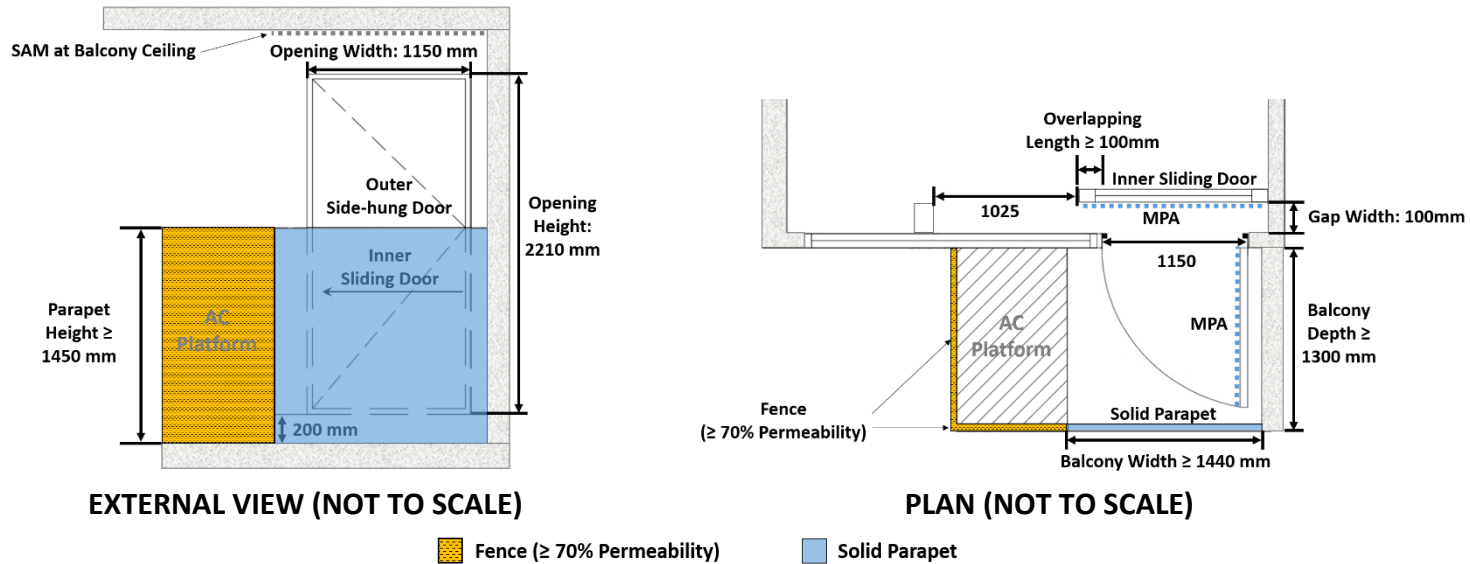
Annex A

(I) A possible design of “Acoustic Window (Baffle Type)” for 8m² habitable room (i.e. dining room, living room or bedroom)



A Possible Design of “Acoustic Window (Baffle Type)” for 8m ² room				
Room Dimensions (mm ³)	Inner Window Opening (mm ²)	Outer Window Opening (mm ²)	Window Overlapping Length (mm)	Gap Width between Window Panels (mm)
3200 (W) x 2500 (D) x 3400 (H)	580 (W) x 870 (H)	600 (W) x 870 (H)	≥ 100	100 to 175
<p><i>* This is one of feasible designs of AW(BT) for 8m² room. The key points of designs include:</i></p> <ul style="list-style-type: none"> - <i>The resultant opening after aligning the inner sliding glass panel with the outer openable window will be taken as its openable window area for the purpose of regulations 30 and 31 of the Building (Planning) Regulations (B(P)R) and Part III of Appendix A of PNAP APP-130;</i> - <i>For optimum performance, the air gap should have a pane-to-pane overlapping length of ≥ 100mm and a width between 100mm and 175mm, with the inner sliding glass panel in a closed position as required in PNAP APP-130. The window pane shall be ≥ 6mm in thickness.</i> 				

(III) A possible design of “Enhanced Acoustic Balcony (Baffle Type)” in 14m² habitable room (i.e. dining room, living room or bedroom)



A Possible Design of “Enhanced Acoustic Balcony (Baffle Type)” for 14m ² room							
Room Dimensions (mm ³)	Balcony Width (mm)	Balcony Depth (mm)	Parapet Height (mm)	Inner Opening (mm ²)	Outer Opening (mm ²)	Overlapping Length (mm)	Gap Width between Panels (mm)
3400 (W) x 4100 (D) x 3100 (H)	≥ 1440	≥ 1300	≥ 1450	1025 (W) x 2210 (H)	1150 (W) x 2210 (H)	≥ 100	100
<p>* This is one of feasible designs of EAB for 14m² room. The room with EAB should meet the natural lighting and ventilation requirements in regulations 30 & 31 of the Building (Planning) Regulations (B(P)R). The EAB door with MPA may not be accountable for complying with the natural lighting requirements in regulation 30(2)(a)(i) of B(P)R. The AC platform should comply with the requirements under Appendix B of Code of Practice on Access for External Maintenance 2021 (AfEM Code), and balconies for residential buildings should comply with the criteria and conditions set out in Joint Practice Note (JPN) 1 for application of exemption from gross floor area and/or site coverage under the B(P)R.</p> <p>* MPA refers to micro-perforated absorber of noise reduction coefficient ≥ 0.45; SAM refers to sound absorptive material of noise reduction coefficient ≥ 0.7.</p> <p>* Comparable noise performance is anticipated should the AC platform be replaced by balcony with solid parapet.</p>							

Table 1: Summary on RNR of Acoustic Window (Baffle Type)

(for use in NIA)

*Plan not to scale

Correction
dB(A) L10(1hr)

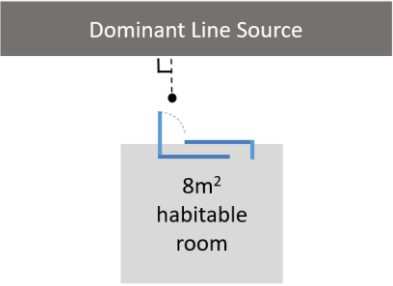
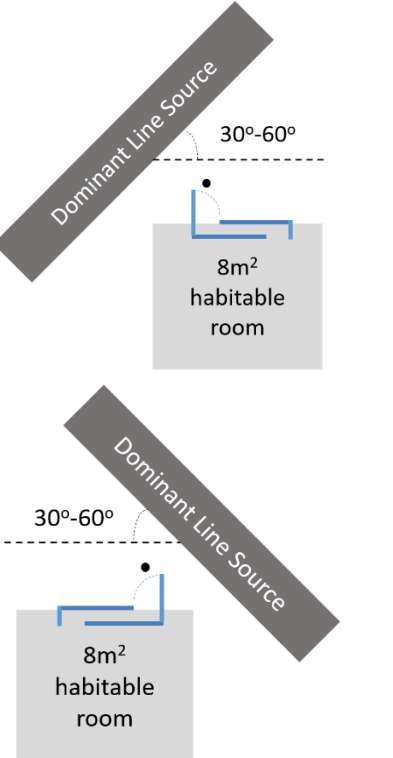
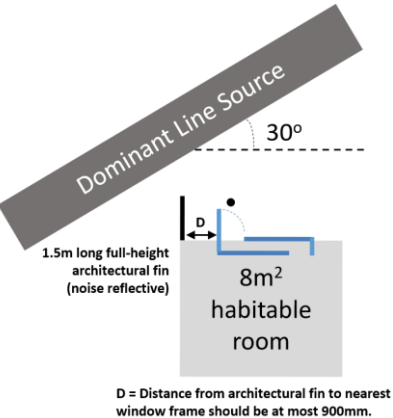
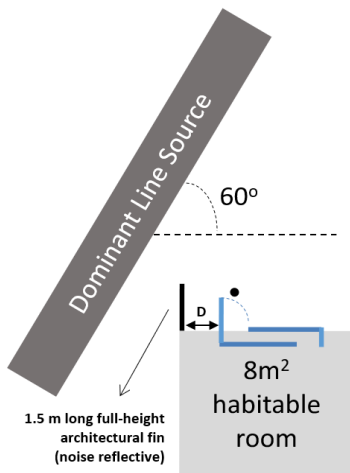
	<p>(a) Provision of AW(BT) parallel to dominant line source (whichever side the outer side-hung window is)</p>	<p>- 6.0</p>
	<p>(b) Tilting the AW(BT) in (a) above to 30°-60° horizontal incident angle to dominant line source (whichever side the outer side-hung window is)</p>	<p>Additional - 1.0 to (a)</p>
 <p>D = Distance from architectural fin to nearest window frame should be at most 900mm.</p>	<p>(b1) If tilted AW(BT) is at <u>30° horizontal incident angle</u> to dominant line source</p> <p>+ 1.5m long full-height architectural fin (noise reflective) ^{Note1}</p> <p>* AW(BT) + fin should be considered as ONE package of noise mitigation measures. Outer side-hung window of AW(BT) and fin should be installed at the side nearer to dominant line source.</p>	<p>Additional - 1.0 to (b)</p>

Table 1: Summary on RNR of Acoustic Window (Baffle Type)
(for use in NIA)

Correction
dB(A) L10(1hr)

*Plan not to scale



D = Distance from architectural fin to nearest window frame should be at most 900mm.

(b2) If tilted AW(BT) is at 60° horizontal incident angle to dominant line source

+ 1.5m long full-height architectural fin (noise reflective) ^{Note1}

* AW(BT) + fin should be considered as ONE package of noise mitigation measures. Outer side-hung window of AW(BT) and fin should be installed at the side nearer to dominant line source.

Additional
- 2.0
to (b)

Note 1: The 1.5m long full-height architectural fin (noise reflective) may be subject to the requirements for natural lighting and ventilation, gross floor area and site coverage under the B(P)R.

Note 2: For case (a), (b), (b1) and (b2), addition of Sound Absorptive Material (SAM) of Noise Reduction Coefficient ≥ 0.7 at top and both side of window frame can offer an additional 1.5 dB(A) reduction. The material of SAM is subject to the requirements of section 3 of Building (Construction) Regulation. The examples below may serve as reference.

Example 1

Predicted Noise Level at Noise Sensitive Receiver (Base Case)	: 77.9	dB(A)
RNR of prescribed AW in (a) + SAM	: 6.0 + 1.5	dB(A)
Predicted Noise Level at Noise Sensitive Receiver (Mitigated Case)	: 70.4	dB(A)
	= 70 dB(A) [rounded to the nearest whole number]	
	[complied with the HKPSG]	

Example 2

Predicted Noise Level at Noise Sensitive Receiver (Base Case)	: 78.9	dB(A)
RNR of prescribed AW in (b) + SAM	: 6.0 + 1.0 + 1.5	dB(A)
Predicted Noise Level at Noise Sensitive Receiver (Mitigated Case)	: 70.4	dB(A)
	= 70 dB(A) [rounded to the nearest whole number]	
	[complied with the HKPSG]	

Table 1: Summary on RNR of Acoustic Window (Baffle Type)

(for use in NIA)

*Plan not to scale

**Correction
dB(A) L10(1hr)**

Example 3

Predicted Noise Level at Noise Sensitive Receiver (Base Case)	: 79.9	dB(A)
RNR of prescribed AW in (b1) + SAM	: 6.0 + 1.0 + 1.0 + 1.5	dB(A)
Predicted Noise Level at Noise Sensitive Receiver (Mitigated Case)	: 70.4	dB(A)
	= 70 dB(A) [rounded to the nearest whole number]	
	[complied with the HKPSG]	

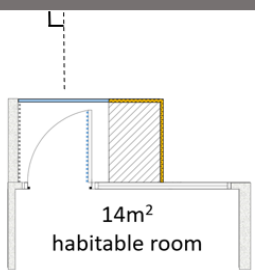
Example 4

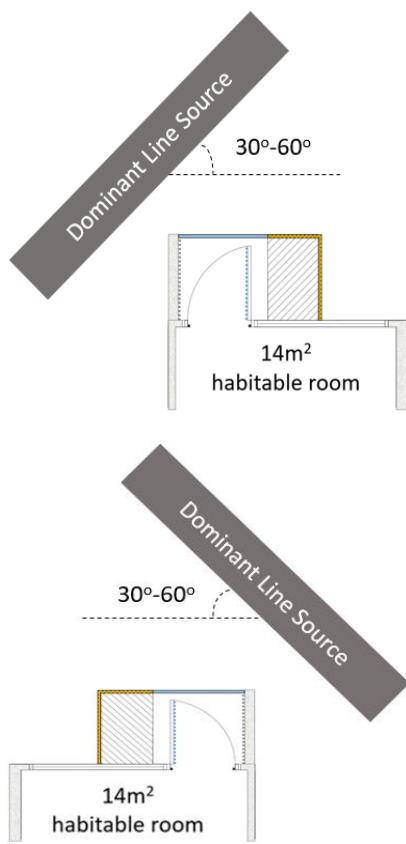
Predicted Noise Level at Noise Sensitive Receiver (Base Case)	: 80.9	dB(A)
RNR of prescribed AW in (b2) + SAM	: 6.0 + 1.0 + 2.0 + 1.5	dB(A)
Predicted Noise Level at Noise Sensitive Receiver (Mitigated Case)	: 70.4	dB(A)
	= 70 dB(A) [rounded to the nearest whole number]	
	[complied with the HKPSG]	

Table 2: Summary on RNR of Enhanced Acoustic Balconies
(for use in NIA)

Correction
dB(A) L10(1hr)

*Plan not to scale

<p>Dominant Line Source</p>  <p>14m² habitable room</p>	<p>(a) Provision of EAB(ST) parallel to dominant line source</p>	<p>- 2.0</p>
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 <p>14m² habitable room</p> <p>14m² habitable room</p>	<p>(b) Tilting the EAB in (a) above to 30°-60° horizontal incident angle to dominant line source</p>	<p>Additional - 1.0 to (a)</p>
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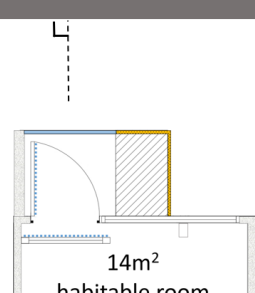
<p>Dominant Line Source</p>  <p>14m² habitable room</p>	<p>(c) Provision of EAB(BT) parallel to dominant line source</p>	<p>- 8.0</p>
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Table 2: Summary on RNR of Enhanced Acoustic Balconies

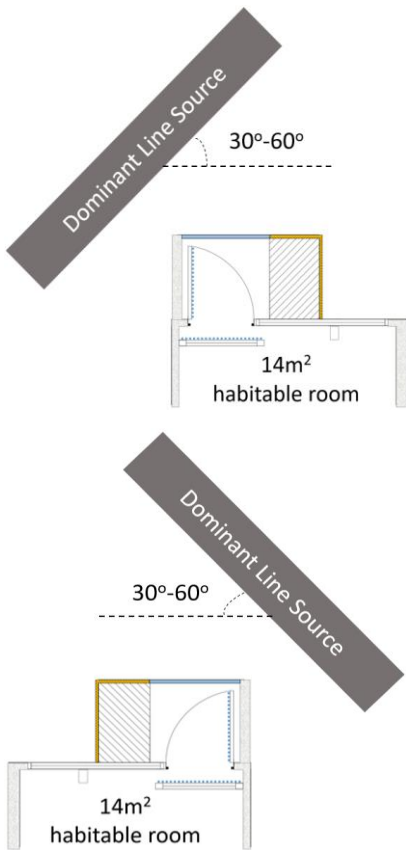
(for use in NIA)

*Plan not to scale

Correction
dB(A) L10(1hr)

(d) Tilting the EAB in (c) above to 30°-60° horizontal incident angle to dominant line source

Additional
- 3.0
to (c)



Note: For cases (c) and (d), addition of Sound Absorptive Material (SAM) of Noise Reduction Coefficient ≥ 0.7 at top and both side of the mullion can offer an additional 1.5 dB(A) reduction. The material of SAM is subject to the requirements of section 3 of Building (Construction) Regulation. The examples below may serve as reference.

Example 1

Predicted Noise Level at Noise Sensitive Receiver (Base Case)	: 72.4	dB(A)
RNR of prescribed EAB in (a)	: 2.0	dB(A)
Predicted Noise Level at Noise Sensitive Receiver (Mitigated Case)	: 70.4	dB(A)
	= 70 dB(A) [rounded to the nearest whole number]	
	[complied with the HKPSG]	

Table 2: Summary on RNR of Enhanced Acoustic Balconies (for use in NIA) *Plan not to scale		Correction dB(A) L10(1hr)
Example 2		
Predicted Noise Level at Noise Sensitive Receiver (Base Case)	: 73.4	dB(A)
RNR of prescribed EAB in (b)	: 2.0 + 1.0	dB(A)
Predicted Noise Level at Noise Sensitive Receiver (Mitigated Case)	: 70.4	dB(A)
	= 70 dB(A) [rounded to the nearest whole number]	
	[complied with the HKPSG]	
Example 3		
Predicted Noise Level at Noise Sensitive Receiver (Base Case)	: 79.9	dB(A)
RNR of prescribed EAB in (c) + SAM	: 8.0 + 1.5	dB(A)
Predicted Noise Level at Noise Sensitive Receiver (Mitigated Case)	: 70.4	dB(A)
	= 70 dB(A) [rounded to the nearest whole number]	
	[complied with the HKPSG]	
Example 4		
Predicted Noise Level at Noise Sensitive Receiver (Base Case)	: 82.9	dB(A)
RNR of prescribed EAB in (d) + SAM	: 8.0 + 3.0 + 1.5	dB(A)
Predicted Noise Level at Noise Sensitive Receiver (Mitigated Case)	: 70.4	dB(A)
	= 70 dB(A) [rounded to the nearest whole number]	
	[complied with the HKPSG]	

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

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

Appendix 4.5 Schedule of Noise Mitigation Measures on Traffic Noise

Schedule of Noise Mitigation Measures

RCHE-3/F

Ref. Figure	Noise Mitigation Measures	NSR	Location
Figure 4.2a	Acoustic Window (Baffle Type)	D3-24	Dormitory: 3/F
	Acoustic Window (Baffle Type)	D3-25	Dormitory: 3/F
	Acoustic Window (Baffle Type)	D3-26	Dormitory: 3/F
	Acoustic Window (Baffle Type)	D3-27	Dormitory: 3/F
	Acoustic Window (Baffle Type)	D3-28	Dormitory: 3/F
	Acoustic Window (Baffle Type)	D3-29	Dormitory: 3/F
	Acoustic Window (Baffle Type)	D3-30	Dormitory: 3/F
	Acoustic Window (Baffle Type)	D3-31	Dormitory: 3/F
	Acoustic Window (Baffle Type)	D3-32	Dormitory: 3/F
	Acoustic Window (Baffle Type)	D3-33	Dormitory: 3/F
	Acoustic Window (Baffle Type)	D3-34	Dormitory: 3/F
	Acoustic Window (Baffle Type)	D3-35	Dormitory: 3/F
	Acoustic Window (Baffle Type)	D3-36	Dormitory: 3/F

RCHE-4/F

Ref. Figure	Noise Mitigation Measures	NSR	Location
Figure 4.2b	Acoustic Window (Baffle Type)	D4-23	Dormitory: 4/F
	Acoustic Window (Baffle Type)	D4-24	Dormitory: 4/F
	Acoustic Window (Baffle Type)	D4-25	Dormitory: 4/F
	Acoustic Window (Baffle Type)	D4-26	Dormitory: 4/F
	Acoustic Window (Baffle Type)	D4-27	Dormitory: 4/F
	Acoustic Window (Baffle Type)	D4-28	Dormitory: 4/F
	Acoustic Window (Baffle Type)	D4-29	Dormitory: 4/F
	Acoustic Window (Baffle Type)	D4-30	Dormitory: 4/F
	Acoustic Window (Baffle Type)	D4-31	Dormitory: 4/F
	Acoustic Window (Baffle Type)	D4-32	Dormitory: 4/F
	Acoustic Window (Baffle Type)	D4-33	Dormitory: 4/F
	Acoustic Window (Baffle Type)	D4-34	Dormitory: 4/F
	Acoustic Window (Baffle Type)	D4-35	Dormitory: 4/F
	Acoustic Window (Baffle Type)	D4-36	Dormitory: 4/F

RCHE-5/F

Ref. Figure	Noise Mitigation Measures	NSR	Location
Figure 4.2c	Acoustic Window (Baffle Type)	D5-21	Dormitory: 5/F
	Acoustic Window (Baffle Type)	D5-22	Dormitory: 5/F
	Acoustic Window (Baffle Type)	D5-23	Dormitory: 5/F
	Acoustic Window (Baffle Type)	D5-24	Dormitory: 5/F
	Acoustic Window (Baffle Type)	D5-25	Dormitory: 5/F
	Acoustic Window (Baffle Type)	D5-26	Dormitory: 5/F
	Acoustic Window (Baffle Type)	D5-27	Dormitory: 5/F
	Acoustic Window (Baffle Type)	D5-28	Dormitory: 5/F
	Acoustic Window (Baffle Type)	D5-29	Dormitory: 5/F
	Acoustic Window (Baffle Type)	D5-30	Dormitory: 5/F
	Acoustic Window (Baffle Type)	D5-31	Dormitory: 5/F
	Acoustic Window (Baffle Type)	D5-32	Dormitory: 5/F
	Acoustic Window (Baffle Type)	D5-33	Dormitory: 5/F
	Acoustic Window (Baffle Type)	D5-34	Dormitory: 5/F

RCHE-6/F

Ref. Figure	Noise Mitigation Measures	NSR	Location
Figure 4.2d	Acoustic Window (Baffle Type)	D6-17	Dormitory: 6/F
	Acoustic Window (Baffle Type)	D6-18	Dormitory: 6/F
	Acoustic Window (Baffle Type)	D6-19	Dormitory: 6/F
	Acoustic Window (Baffle Type)	D6-20	Dormitory: 6/F
	Acoustic Window (Baffle Type)	D6-21	Dormitory: 6/F
	Acoustic Window (Baffle Type)	D6-22	Dormitory: 6/F
	Acoustic Window (Baffle Type)	D6-23	Dormitory: 6/F
	Acoustic Window (Baffle Type)	D6-24	Dormitory: 6/F
	Acoustic Window (Baffle Type)	D6-25	Dormitory: 6/F
	Acoustic Window (Baffle Type)	D6-26	Dormitory: 6/F
	Acoustic Window (Baffle Type)	D6-27	Dormitory: 6/F
	Acoustic Window (Baffle Type)	D6-28	Dormitory: 6/F
	Acoustic Window (Baffle Type)	D6-29	Dormitory: 6/F
	Acoustic Window (Baffle Type)	D6-30	Dormitory: 6/F

RCHE-7/F

Ref. Figure	Noise Mitigation Measures	NSR	Location
Figure 4.2e	Acoustic Window (Baffle Type)	D7-17	Living/Dining Room: 7/F
	Acoustic Window (Baffle Type)	D7-18	Bedroom: 7/F
	Acoustic Window (Baffle Type)	D7-19	Dormitory: 7/F
	Acoustic Window (Baffle Type)	D7-20	Dormitory: 7/F
	Acoustic Window (Baffle Type)	D7-21	Dormitory: 7/F
	Acoustic Window (Baffle Type)	D7-22	Dormitory: 7/F
	Acoustic Window (Baffle Type)	D7-23	Dormitory: 7/F
	Acoustic Window (Baffle Type)	D7-24	Dormitory: 7/F
	Acoustic Window (Baffle Type)	D7-25	Living/Dining Room: 7/F
	Acoustic Window (Baffle Type)	D7-26	Bedroom: 7/F
	Acoustic Window (Baffle Type)	D7-27	Living/Dining Room: 7/F
	Acoustic Window (Baffle Type)	D7-28	Bedroom: 7/F
	Acoustic Window (Baffle Type)	D7-29	Living/Dining Room: 7/F
	Acoustic Window (Baffle Type)	D7-30	Bedroom: 7/F

Residential Tower

Ref. Figure	Noise Mitigation Measures	NSR	Location
Figure 4.2f	Acoustic Window (Baffle Type)	R-15	Bedroom: 9/F
	Enhanced Acoustic Balcony (Baffle Type)	R-16	Living/Dining Room: 9/F-15/F
	Enhanced Acoustic Balcony (Baffle Type)	R-17	Living/Dining Room: 9/F-15/F
	Acoustic Window (Baffle Type)	R-18	Bedroom: 9/F-15/F
	Acoustic Window (Baffle Type)	R-19	Master Bedroom: 9/F-15/F

Appendix 4.6 Draft Undertaking Letter of Noise Mitigation Measures on Traffic Noise

DRAFT

Our Ref :
23 July 2024

Environmental Protection Department
27th floor, Southorn Centre,
130 Hennessy Road,
Wan Chai, Hong Kong.

Attention: Mr. S. W. Tsang [Assistant Director (Environmental Assessment)]

Dear Sir,

Re: Proposed Minor Relaxation of Plot Ratio (PR) and Site Coverage (SC) for Proposed Social Welfare Facility (Residential Care Home for the Elderly) (RCHE(s)) and Permitted Residential Development (Flat) in Lot 94 in D.D. 388 and adjoining Government land, Castle Peak Road – Tsing Lung Tau, Tsuen Wan
Undertaking for the Implementation of Noise Mitigation Measures

We, Lo Hing Investment Company Limited, being the owner of the above lot, hereby undertake the followings for implementation of the proposed noise mitigation measures as shown in the Environmental Assessment Report (the EAR) named 'Proposed Minor Relaxation of Plot Ratio (PR) and Site Coverage (SC) for Proposed Social Welfare Facility (Residential Care Home for the Elderly) (RCHE(s)) and Permitted Residential Development (Flat) in Lot 94 in D.D. 388 and adjoining Government land, Castle Peak Road – Tsing Lung Tau, Tsuen Wan – Environmental Assessment' (Ref no.: R8126_V2.0 dated July 2024), submitted to Town Planning Board by Ramboll Hong Kong Limited:-

1. All the noise mitigation measures proposed in the EAR shall be incorporated into the General Building Plans for the approval by the Building Authority.
2. To appoint an independent Authorized Person ("IAP") to certify and inform the Director of Environmental Protection that all noise mitigation measures identified in the EAR are duly implemented before the date of issue of Certificate of Compliances by Lands Department.
3. To be responsible for implementation and modification/ rectification of all deviations from the noise mitigation measures identified in the EAR before the date of issue of Certificate of Compliances by Lands Department, and be responsible for all the associated costs.
4. All noise mitigation measures proposed in the EAR shall be designated as Noise Mitigation Measures ("NMM") in the Deed of Mutual Covenant (DMC) with details of use and locations clearly indicated. Such DMC should contain binding and enforceable conditions for the control, operation, financial support and maintenance for such measures.
5. To agree that Environmental Protection Department ("EPD") could disclose the content of the EAR and this undertaking when required.
6. In case when changes to the building plans that would affect the noise performance, we will seek prior agreement with EPD and propose alternative measures with equivalent noise mitigation performance. The IAP will then check and certify implementation of these measures accordingly before the date of issue of Certificate of Compliances by Lands Department.
7. To allow access for the EPD to conduct on-site inspection / noise measurement before the full occupation of the development.

Thank you for your attention.

Yours faithfully,
For and on behalf of
Lo Hing Investment Company Limited

Authorized Signature(s)

Appendix 5.1 Site Visit and Fixed Noise Sources surveys

NOISE SURVEY FOR EXISTING FIXED NOISE SOURCES

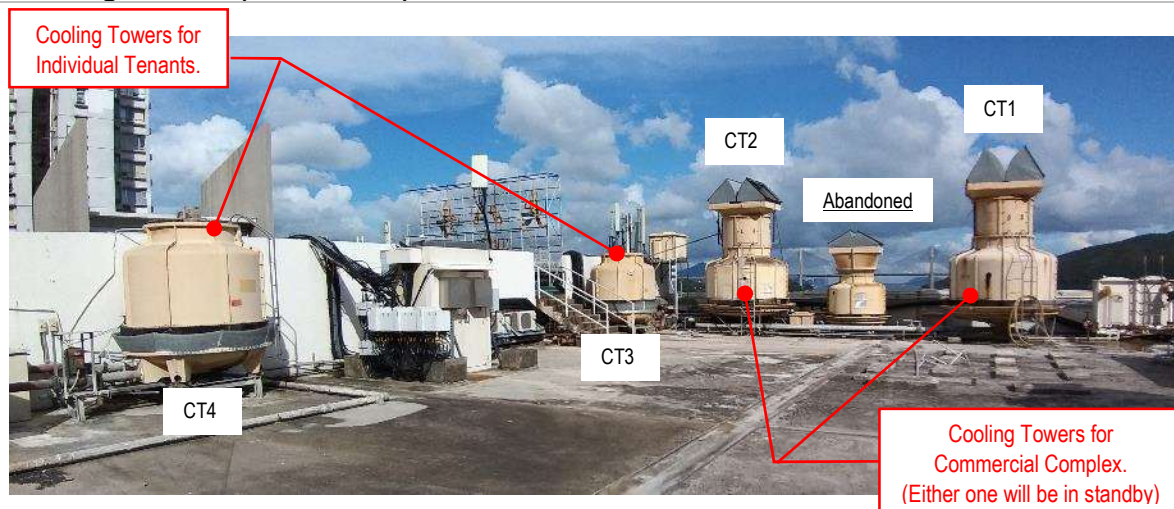
Introduction

The environs of the Subject Site are dominated by residential uses. The only potential fixed noise source was identified at the rooftop of Hong Kong Garden Commercial Complex (HKGCC) to the immediate east of the Subject Site. Therefore, noise survey was conducted at HKGCC.

Hong Kong Garden Commercial Complex (HKGCC)

According to the on-site observations, there are 5 numbers of cooling towers (one of them is abandoned) and 4 numbers of ventilation openings at the rooftop of HKGCC. Details of the observations and noise measurements are summarized below –

Cooling Towers (CT1 to CT4)



Information / Observations (7 June 2021):

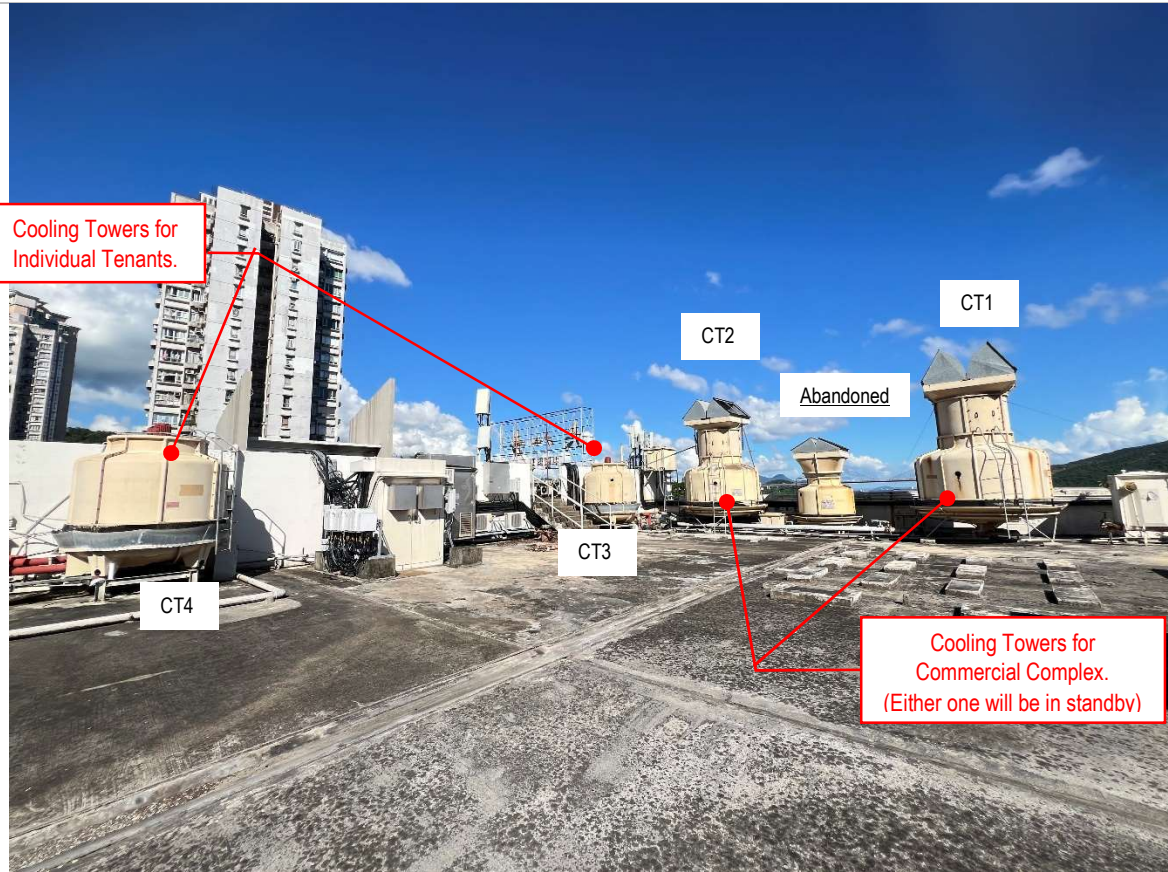
According to the information provided from the operational staff of the HKGCC, the cooling tower between CT1 and CT2 is abandoned. CT1 and CT2 are for the Commercial Complex. CT3 and CT4 are for Individual Tenants. In addition, either one of CT1 and CT2 will be in standby mode. The operation periods of the cooling towers (i.e. CT1 to CT4) are from 7 a.m. to 11 p.m.

No acoustic lining was observed at the vent coil of CT1 and CT2. Given that no catalog could be provided from the operational staff of the HKGCC, the dimensions of the cooling towers are measured on-site -

CT1 and CT2: 2.9m Ø x 4.8 (H)

CT3 and CT4: 2.1m Ø x 2.0 (H)

CT1 and CT2 are the same module. CT3 and CT4 are the same module.



Information / Observations (3 July 2024):

Based on the updated survey and the confirmation from the operational staff from HKGCC, the location, status and the operation period of the cooling towers (i.e. CT1 to CT4) unchanged.

Noise Measurement (Methodology and Condition)

During the noise survey, only cooling tower CT1 is in operation. Therefore, noise measurement is only conducted for CT1.

The measurements were conducted in accordance with the international standard ISO 3746:2010 of following equation –

$$SWL = \text{Mean A-weighted SPL} - K_{1A} - K_{2A} + AC$$

where

- AC = Area Correction (i.e. $10\log(S/S_0)$)
- S = Surface area of the measurement box (m^2)
- S_0 = Reference area of the measurement box (i.e. $1m^2$)
- K_{1A} = Background Noise Correction, dB(A)
- K_{2A} = Environmental Correction for sound absorption and reflection, dB(A)

Measurement Condition

Date of Measurement	7 June 2021
Location of Measurement	Roof of HKGCC
Weather Condition	Sunny
Measurement Start / End Time	2:00 PM / 3:00 PM

Measurement Equipment

Sound Level Meter	Norsonic 139 (S/N: 1392834)
Calibrator Model	Norsonic Nor1256 (S/N: 125626667)

Calibration (@1k Hz) Start / Finish

94.0 dB(A) / 94.0 dB(A)

Measurement Result

The locations of the measurement points are shown in **Ref. A** below. Noise measurement results and the estimated SWL for the CT1 are presented in **Table 1 and 2**. No tonality, intermittency or impulsiveness were perceived during the noise measurement.

Table 1 – Noise Measurement Result for the Cooling Tower CT1

Measurement Item	Dimension of Reference Box	Measurement Distance	Measurement Point	Measurement Noise Level, $L_{eq(30s)}$, dB(A)
CT1 – Cooling Towers for Commercial Complex	2.9m(L) x 2.9 (W) x 4.8 (H)	1m	P1	73.9
			P2	74.6
			P3	74.8
			P4	75.1
			P5	72.7
			P6	74.2
			P7	75.6
			P8	75.3
			P9	74.2
			P10	75.1
			P11	76.5
			P12	76.5
			P13	76.3
			P14	76.4
			P15	76.4
			P16	76.4
Mean SPL, dB(A)	75.5			

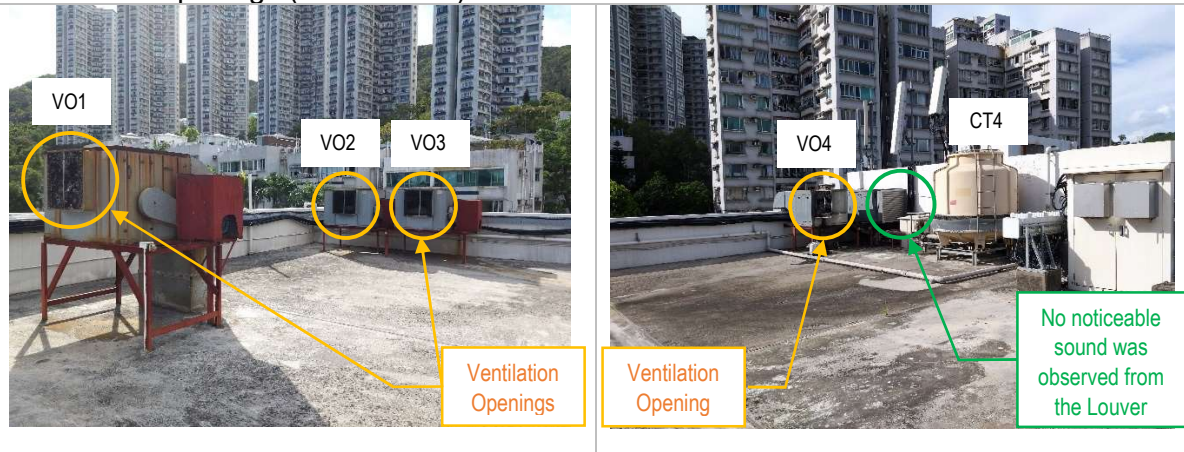
Table 2 – Estimated SWL for the Cooling Tower CT1

Item	Mean SPL, dB(A)	Measurement Box				Area Correction, dB(A)	K_{1A} , dB(A) [1]	K_{2A} , dB(A) [2]	Overall SWL, dB(A)
		L	W	H	Surface Area				
CT1	75.5	4.9m	4.9m	5.8m	138m ³	21.4	0	0	96.9

Remark [1] – No background noise correction is applied (e.g. $K_{1A} = 0$) as for conservative purpose.

Remark [2] – No environmental correction is applied (e.g. $K_{2A} = 0$) as the measurement was conducted at free-field.

Ventilation Openings (VO1 to VO4)



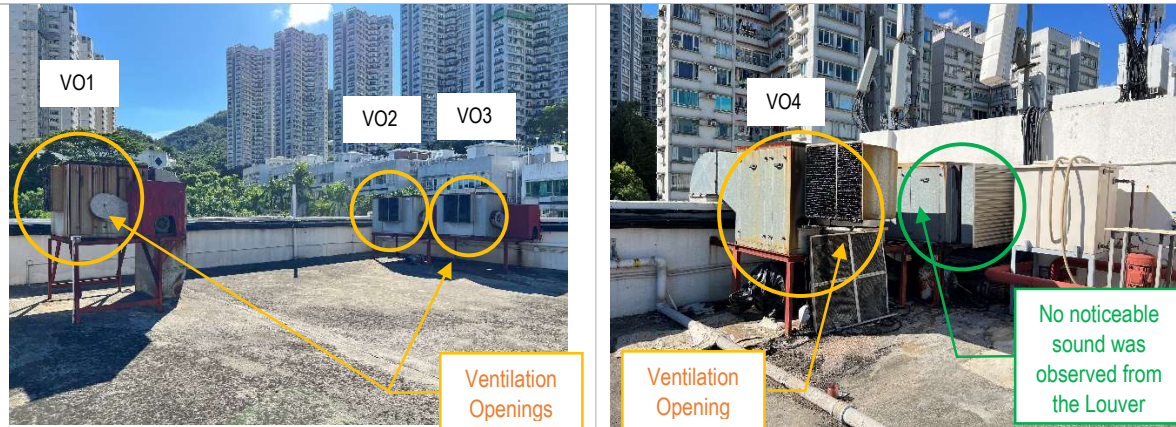
Information / Observations (7 June 2021):

According to the information provided from the operational staff of the HKGCC, the operation periods of the ventilation openings (i.e. VO1 to VO4) are from 7 a.m. to 11 p.m.

No noticeable sound was observed from the louver located next to VO4. Thus, the louver is not considered as fixed noise source. The dimensions of ventilation openings are measured on-site –

VO1 to VO3: 0.7m (W) x 0.65m (H)

VO4: 0.6m (W) x 0.5m (H)



Information / Observations (3 July 2024):

Based on the updated survey and the confirmation from the operational staff from HKGCC, the location, status and the operation period of the ventilation openings (i.e. VO1 to VO4) unchanged.

Noise Measurement (Methodology and Condition)

The measurements were conducted in accordance with the standard acoustical principle on a near field area source -

$$SWL = SPL + AC$$

where

- AC = Area Correction (i.e. $10\log(S)$)
- S = Surface Area of the source (m^2)

The measurement points will be assigned as close as possible to the ventilation openings. The distance from the ventilation opening to the microphone position must be less than 1m.

Measurement Condition

Date of Measurement	7 June 2021
Location of Measurement	Roof of HKGCC
Weather Condition	Sunny
Measurement Start / End Time	3:00 PM / 4:00 PM

Measurement Equipment

Sound Level Meter	Norsonic 139 (S/N: 1392834)
Calibrator Model	Norsonic Nor1256 (S/N: 125626667)
Calibration (@1k Hz) Start / Finish	94.0 dB(A) / 94.0 dB(A)

Measurement Result

The locations of the measurement points are shown in **Ref. B** below.

Noise measurement results and the estimated SWLs for the ventilation openings (i.e. VO1 to VO4) are presented in **Table 3**. No tonality, intermittency or impulsiveness were perceived during the noise measurement.

Table 3 – Summary of SWL for the Ventilation Openings VO1 to VO4

Item	SPL at Ventilation Opening, dB(A) [1]	Measurement Surface			Area Correction, dB(A)	Overall SWL, dB(A)
		W	H	Surface Area		
VO1	85.6	0.7m	0.65m	0.46m ²	-3.4	82.2
VO2	91.5	0.7m	0.65m	0.46m ²	-3.4	88.1
VO3	88.6	0.7m	0.65m	0.46m ²	-3.4	85.2
VO4	92.7	0.6m	0.5m	0.30m ²	-5.2	87.5

Remark [1] – No background noise correction is applied as for conservative purpose.

Summary

Noise measurements were conducted for CT1 and VO1 to VO4. No tonality, intermittency or impulsiveness were perceived during the noise measurement.

Generally, a larger cooling tower would have a higher capacities of water flow rate and air flow rate. Moreover, the powers of motor and fan would also be greater. As such, a larger cooling tower would generally generate a higher noise level. Given that the largest cooling tower CT1 was measured, the SWLs of the CT2 and CT4 are reference to the SWL of CT1.

Based on the updated site survey on 3 July 2024, the observation during the pervious survey on 7 June 2021 is still valid.

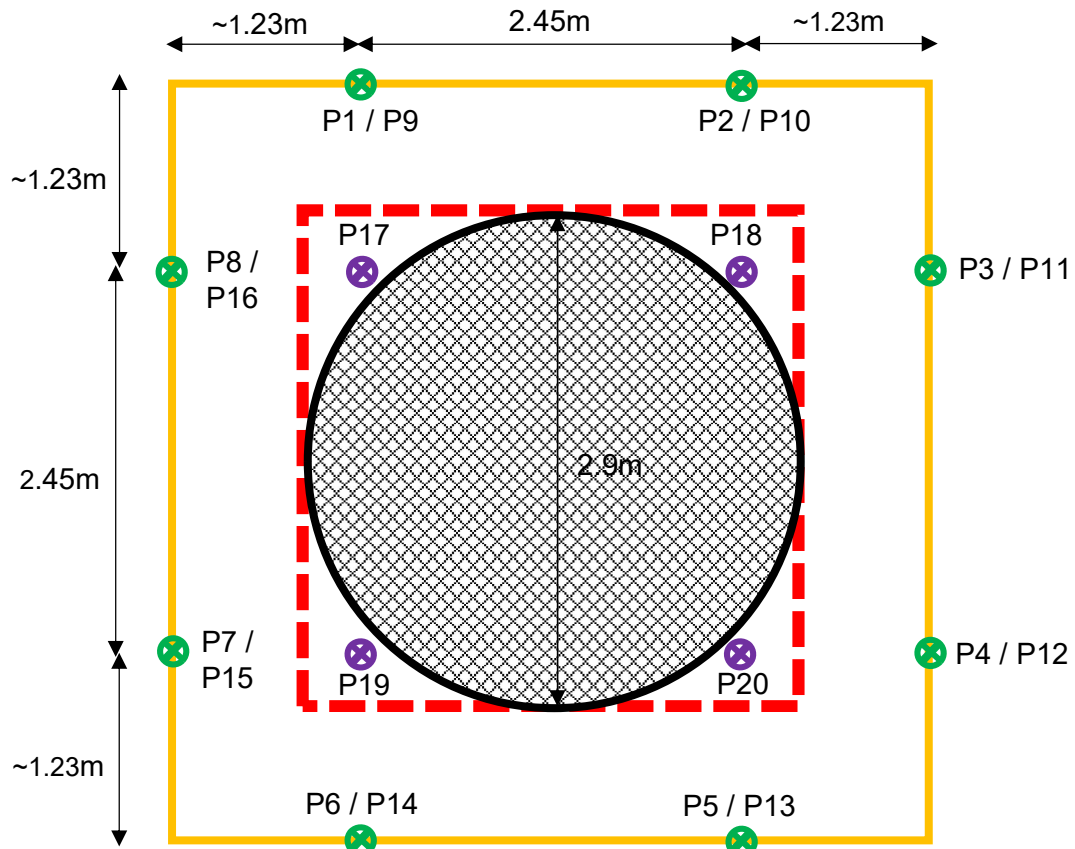
Table 4 summarised the adopted SWL of this assessment.

Table 4 – Summary of the SWL of Fixed Noise Sources at HKGCC

Item	Dimension	SWL, dB(A)	Ref. Source	Remark
CT1	2.9m Ø x 4.8 (H)	96.9	From on-site measurement.	Either one in standby mode
CT2	2.9m Ø x 4.8 (H)	96.9	Reference to the SWL of CT1.	
CT3	2.1m Ø x 2.0 (H)	96.9	Reference to the SWL of CT1.	--
CT4	2.1m Ø x 2.0 (H)	96.9	Reference to the SWL of CT1.	--
VO1	0.7m (W) x 0.65m (H)	82.2	From on-site measurement.	--
VO2	0.7m (W) x 0.65m (H)	88.1	From on-site measurement.	--
VO3	0.7m (W) x 0.65m (H)	85.2	From on-site measurement.	--
VO4	0.6m (W) x 0.5m (H)	87.5	From on-site measurement.	--






Reference A – Indicative Measurement Points for the Cooling Towers CT1

Top View



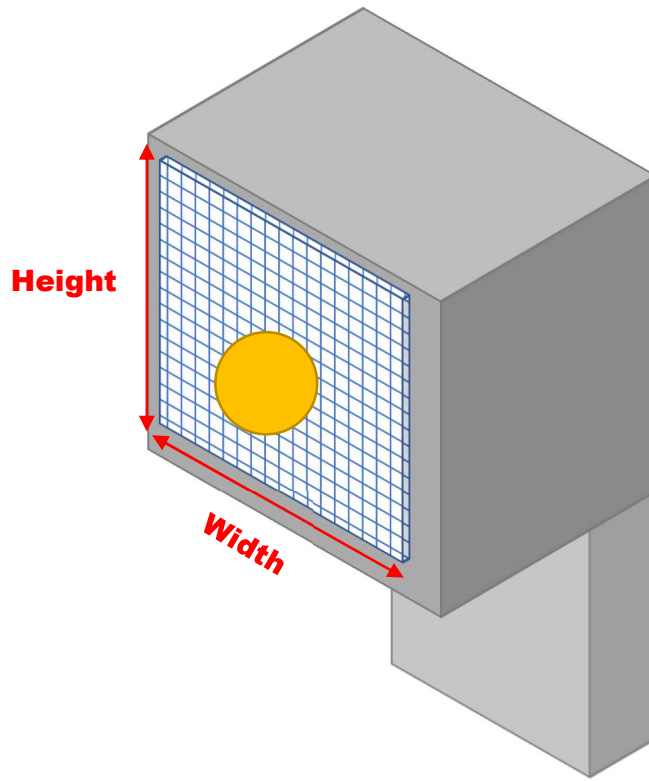
P1 – P8 is at 1.45mAG
 P9 – P16 is at 4.35mAG

Legend

Water Chillers	
Reference Box	
Measurement Box	
Measurement Point (1.45 and 4.35 mAG)	
Measurement Point (5.8m mAG)	

Reference B – Indicative Measurement Point for the Ventilation Openings VO1 to VO4

Side View



Legend

- Ventilation Duct
- Ventilation Opening
- Measurement Point



Appendix 5.2 Detailed Calculations of Fixed Noise Impact Assessment

Calculation of Fixed Noise Impact Assessment (Unmitigated Scenario)

NSR	Fixed Source ID	Description	Operation Mode [1]	Location	SWL, dB(A)	Distance from Fixed Noise Source to Receiver, m	Correction Factors			Predicted Noise Level, dB(A)	Predicted Noise Level, dB(A)	Noise Criteria, dB(A)
							Distance Correction, dB(A)	Barrier Correction, dB(A) [2]	Façade Correction, dB(A)			
FN3-1	CT1	Cooling Tower 1	In Operate	Roof	96.9	20	-34.0	-10.0	3	55.9	69	65
	CT2	Cooling Tower 2	Standby	Roof	0.0	26	-36.1	-10.0	3	0.0		
	CT3	Cooling Tower 3	In Operate	Roof	96.9	28	-37.0	0.0	3	62.9		
	CT4	Cooling Tower 4	In Operate	Roof	96.9	23	-35.4	0.0	3	64.5		
	VO1	Ventilation Opening 1	In Operate	Roof	82.2	12	-29.6	0.0	3	55.6		
	VO2	Ventilation Opening 2	In Operate	Roof	88.1	11	-28.4	0.0	3	62.6		
	VO3	Ventilation Opening 3	In Operate	Roof	85.2	12	-29.8	0.0	3	58.4		
VO4	Ventilation Opening 4	In Operate	Roof	87.5	23	-35.2	0.0	3	55.3			

NSR	Fixed Source ID	Description	Operation Mode [1]	Location	SWL, dB(A)	Distance from Fixed Noise Source to Receiver, m	Correction Factors			Predicted Noise Level, dB(A)	Predicted Noise Level, dB(A)	Noise Criteria, dB(A)
							Distance Correction, dB(A)	Barrier Correction, dB(A) [2]	Façade Correction, dB(A)			
FN3-2	CT1	Cooling Tower 1	In Operate	Roof	96.9	27	-36.6	-10.0	3	53.3	56	65
	CT2	Cooling Tower 2	Standby	Roof	0.0	31	-37.9	-10.0	3	0.0		
	CT3	Cooling Tower 3	In Operate	Roof	96.9	36	-39.0	-10.0	3	50.9		
	CT4	Cooling Tower 4	In Operate	Roof	96.9	44	-40.9	-10.0	3	48.9		
	VO1	Ventilation Opening 1	In Operate	Roof	82.2	37	-39.5	-10.0	3	35.7		
	VO2	Ventilation Opening 2	In Operate	Roof	88.1	45	-41.0	-10.0	3	40.1		
	VO3	Ventilation Opening 3	In Operate	Roof	85.2	45	-41.1	-10.0	3	37.1		
VO4	Ventilation Opening 4	In Operate	Roof	87.5	49	-41.8	-10.0	3	38.7			

NSR	Fixed Source ID	Description	Operation Mode [1]	Location	SWL, dB(A)	Distance from Fixed Noise Source to Receiver, m	Correction Factors			Predicted Noise Level, dB(A)	Predicted Noise Level, dB(A)	Noise Criteria, dB(A)
							Distance Correction, dB(A)	Barrier Correction, dB(A) [2]	Façade Correction, dB(A)			
FN4-1	CT1	Cooling Tower 1	In Operate	Roof	96.9	20	-34.0	-10.0	3	55.9	69	65
	CT2	Cooling Tower 2	Standby	Roof	0.0	26	-36.1	-10.0	3	0.0		
	CT3	Cooling Tower 3	In Operate	Roof	96.9	28	-37.0	0.0	3	62.9		
	CT4	Cooling Tower 4	In Operate	Roof	96.9	23	-35.4	0.0	3	64.5		
	VO1	Ventilation Opening 1	In Operate	Roof	82.2	12	-29.6	0.0	3	55.6		
	VO2	Ventilation Opening 2	In Operate	Roof	88.1	11	-28.5	0.0	3	62.6		
	VO3	Ventilation Opening 3	In Operate	Roof	85.2	12	-29.8	0.0	3	58.3		
VO4	Ventilation Opening 4	In Operate	Roof	87.5	23	-35.2	0.0	3	55.3			

NSR	Fixed Source ID	Description	Operation Mode [1]	Location	SWL, dB(A)	Distance from Fixed Noise Source to Receiver, m	Correction Factors			Predicted Noise Level, dB(A)	Predicted Noise Level, dB(A)	Noise Criteria, dB(A)
							Distance Correction, dB(A)	Barrier Correction, dB(A) [2]	Façade Correction, dB(A)			
FN4-2	CT1	Cooling Tower 1	In Operate	Roof	96.9	27	-36.6	-10.0	3	53.3	56	65
	CT2	Cooling Tower 2	Standby	Roof	0.0	31	-37.9	-10.0	3	0.0		
	CT3	Cooling Tower 3	In Operate	Roof	96.9	36	-39.0	-10.0	3	50.9		
	CT4	Cooling Tower 4	In Operate	Roof	96.9	44	-40.9	-10.0	3	48.9		
	VO1	Ventilation Opening 1	In Operate	Roof	82.2	37	-39.5	-10.0	3	35.7		
	VO2	Ventilation Opening 2	In Operate	Roof	88.1	45	-41.0	-10.0	3	40.1		
	VO3	Ventilation Opening 3	In Operate	Roof	85.2	45	-41.1	-10.0	3	37.1		
VO4	Ventilation Opening 4	In Operate	Roof	87.5	49	-41.8	-10.0	3	38.7			

Calculation of Fixed Noise Impact Assessment (Unmitigated Scenario)

NSR	Fixed Source ID	Description	Operation Mode [1]	Location	SWL, dB(A)	Distance from Fixed Noise Source to Receiver, m	Correction Factors			Predicted Noise Level, dB(A)	Predicted Noise Level, dB(A)	Noise Criteria, dB(A)
							Distance Correction, dB(A)	Barrier Correction, dB(A) [2]	Façade Correction, dB(A)			
FN5-1	CT1	Cooling Tower 1	In Operate	Roof	96.9	20	-34.2	-10.0	3	55.6	69	65
	CT2	Cooling Tower 2	Standby	Roof	0.0	26	-36.3	-10.0	3	0.0		
	CT3	Cooling Tower 3	In Operate	Roof	96.9	29	-37.1	0.0	3	62.8		
	CT4	Cooling Tower 4	In Operate	Roof	96.9	24	-35.5	0.0	3	64.3		
	VO1	Ventilation Opening 1	In Operate	Roof	82.2	13	-30.2	0.0	3	55.0		
	VO2	Ventilation Opening 2	In Operate	Roof	88.1	12	-29.2	0.0	3	61.8		
	VO3	Ventilation Opening 3	In Operate	Roof	85.2	13	-30.4	0.0	3	57.8		
VO4	Ventilation Opening 4	In Operate	Roof	87.5	23	-35.4	0.0	3	55.1			

NSR	Fixed Source ID	Description	Operation Mode [1]	Location	SWL, dB(A)	Distance from Fixed Noise Source to Receiver, m	Correction Factors			Predicted Noise Level, dB(A)	Predicted Noise Level, dB(A)	Noise Criteria, dB(A)
							Distance Correction, dB(A)	Barrier Correction, dB(A) [2]	Façade Correction, dB(A)			
FN5-2	CT1	Cooling Tower 1	In Operate	Roof	96.9	27	-36.7	-10.0	3	53.1	56	65
	CT2	Cooling Tower 2	Standby	Roof	0.0	32	-38.0	-10.0	3	0.0		
	CT3	Cooling Tower 3	In Operate	Roof	96.9	36	-39.1	-10.0	3	50.8		
	CT4	Cooling Tower 4	In Operate	Roof	96.9	45	-41.0	-10.0	3	48.9		
	VO1	Ventilation Opening 1	In Operate	Roof	82.2	38	-39.5	-10.0	3	35.6		
	VO2	Ventilation Opening 2	In Operate	Roof	88.1	45	-41.0	-10.0	3	40.0		
	VO3	Ventilation Opening 3	In Operate	Roof	85.2	45	-41.1	-10.0	3	37.0		
VO4	Ventilation Opening 4	In Operate	Roof	87.5	49	-41.9	-10.0	3	38.6			

Note [2] - A barrier correction of -	Fixed Source ID	Description	Operation Mode [1]	Location	SWL, dB(A)	Distance from Fixed Noise Source to Receiver, m	Correction Factors			Predicted Noise Level, dB(A)	Predicted Noise Level, dB(A)	Noise Criteria, dB(A)
							Distance Correction, dB(A)	Barrier Correction, dB(A) [2]	Façade Correction, dB(A)			
FN6-1	CT1	Cooling Tower 1	Standby	Roof	0.0	20	-34.2	-10.0	3	0.0	69	65
	CT2	Cooling Tower 2	In Operate	Roof	96.9	26	-36.2	0.0	3	63.6		
	CT3	Cooling Tower 3	In Operate	Roof	96.9	29	-37.1	0.0	3	62.8		
	CT4	Cooling Tower 4	In Operate	Roof	96.9	24	-35.8	0.0	3	64.1		
	VO1	Ventilation Opening 1	In Operate	Roof	82.2	14	-30.9	0.0	3	54.3		
	VO2	Ventilation Opening 2	In Operate	Roof	88.1	14	-30.7	0.0	3	60.4		
	VO3	Ventilation Opening 3	In Operate	Roof	85.2	15	-31.6	0.0	3	56.6		
VO4	Ventilation Opening 4	In Operate	Roof	87.5	24	-35.8	0.0	3	54.7			

NSR	Fixed Source ID	Description	Operation Mode [1]	Location	SWL, dB(A)	Distance from Fixed Noise Source to Receiver, m	Correction Factors			Predicted Noise Level, dB(A)	Predicted Noise Level, dB(A)	Noise Criteria, dB(A)
							Distance Correction, dB(A)	Barrier Correction, dB(A) [2]	Façade Correction, dB(A)			
FN6-2	CT1	Cooling Tower 1	In Operate	Roof	96.9	28	-37.0	-10.0	3	52.9	56	65
	CT2	Cooling Tower 2	Standby	Roof	0.0	32	-38.2	-10.0	3	0.0		
	CT3	Cooling Tower 3	In Operate	Roof	96.9	36	-39.2	-10.0	3	50.6		
	CT4	Cooling Tower 4	In Operate	Roof	96.9	45	-41.1	-10.0	3	48.8		
	VO1	Ventilation Opening 1	In Operate	Roof	82.2	38	-39.7	-10.0	3	35.5		
	VO2	Ventilation Opening 2	In Operate	Roof	88.1	45	-41.1	-10.0	3	40.0		
	VO3	Ventilation Opening 3	In Operate	Roof	85.2	46	-41.2	-10.0	3	37.0		
VO4	Ventilation Opening 4	In Operate	Roof	87.5	50	-41.9	-10.0	3	38.5			

Calculation of Fixed Noise Impact Assessment (Unmitigated Scenario)

NSR	Fixed Source ID	Description	Operation Mode [1]	Location	SWL, dB(A)	Distance from Fixed Noise Source to Receiver, m	Correction Factors			Predicted Noise Level, dB(A)	Predicted Noise Level, dB(A)	Noise Criteria, dB(A)
							Distance Correction, dB(A)	Barrier Correction, dB(A) [2]	Façade Correction, dB(A)			
FN7-1	CT1	Cooling Tower 1	Standby	Roof	0.0	22	-34.8	-10.0	3	0.0	69	65
	CT2	Cooling Tower 2	In Operate	Roof	96.9	27	-36.6	0.0	3	63.3		
	CT3	Cooling Tower 3	In Operate	Roof	96.9	30	-37.4	0.0	3	62.5		
	CT4	Cooling Tower 4	In Operate	Roof	96.9	26	-36.2	0.0	3	63.7		
	VO1	Ventilation Opening 1	In Operate	Roof	82.2	16	-32.1	0.0	3	53.1		
	VO2	Ventilation Opening 2	In Operate	Roof	88.1	16	-31.9	0.0	3	59.1		
	VO3	Ventilation Opening 3	In Operate	Roof	85.2	17	-32.6	0.0	3	55.6		
	VO4	Ventilation Opening 4	In Operate	Roof	87.5	26	-36.2	0.0	3	54.3		

NSR	Fixed Source ID	Description	Operation Mode [1]	Location	SWL, dB(A)	Distance from Fixed Noise Source to Receiver, m	Correction Factors			Predicted Noise Level, dB(A)	Predicted Noise Level, dB(A)	Noise Criteria, dB(A)
							Distance Correction, dB(A)	Barrier Correction, dB(A) [2]	Façade Correction, dB(A)			
FN7-2	CT1	Cooling Tower 1	In Operate	Roof	96.9	29	-37.3	-10.0	3	52.6	56	65
	CT2	Cooling Tower 2	Standby	Roof	0.0	33	-38.4	-10.0	3	0.0		
	CT3	Cooling Tower 3	In Operate	Roof	96.9	37	-39.4	-10.0	3	50.4		
	CT4	Cooling Tower 4	In Operate	Roof	96.9	46	-41.2	-10.0	3	48.7		
	VO1	Ventilation Opening 1	In Operate	Roof	82.2	39	-39.8	-10.0	3	35.3		
	VO2	Ventilation Opening 2	In Operate	Roof	88.1	46	-41.2	-10.0	3	39.8		
	VO3	Ventilation Opening 3	In Operate	Roof	85.2	46	-41.3	-10.0	3	36.8		
	VO4	Ventilation Opening 4	In Operate	Roof	87.5	50	-42.0	-10.0	3	38.4		

Note [1] - According to the given information from the operation staff from HKGCC, either CT1 or CT2 will be in standby mode. Given that CT1 is closer to the NSRs, CT2 is assigned in "standby" whereas CT1 is assigned "in operate", unless CT1 is shielded.

Note [2] - A barrier correction of -10dB(A) will be provided to the fixed noise source when the direct line of sight is substantially shielded.

Calculation of Fixed Noise Impact Assessment (Mitigated Scenario)

NSR	Fixed Source ID	Description	Operation Mode [1]	Location	SWL, dB(A)	Required Noise Reduction from At-Source Mitigation Measure, dB(A)	Mitigated SWL, dB(A)	Distance from Fixed Noise Source to Receiver, m	Correction Factors			Predicted Noise Level, dB(A)	Predicted Noise Level, dB(A)	Noise Criteria, dB(A)
									Distance Correction, dB(A)	Barrier Correction, dB(A) [2]	Façade Correction, dB(A)			
FN3-1	CT1	Cooling Tower 1	In Operate	Roof	96.9	-10	86.9	20	-34.0	-10.0	3	45.9	62	65
	CT2	Cooling Tower 2	Standby	Roof	0.0	-10	0.0	26	-36.1	-10.0	3	0.0		
	CT3	Cooling Tower 3	In Operate	Roof	96.9	-10	86.9	28	-37.0	0.0	3	52.9		
	CT4	Cooling Tower 4	In Operate	Roof	96.9	-10	86.9	23	-35.4	0.0	3	54.5		
	VO1	Ventilation Opening 1	In Operate	Roof	82.2	-5	77.2	12	-29.6	0.0	3	50.6		
	VO2	Ventilation Opening 2	In Operate	Roof	88.1	-5	83.1	11	-28.4	0.0	3	57.6		
	VO3	Ventilation Opening 3	In Operate	Roof	85.2	-5	80.2	12	-29.8	0.0	3	53.4		
	VO4	Ventilation Opening 4	In Operate	Roof	87.5	-5	82.5	23	-35.2	0.0	3	50.3		

NSR	Fixed Source ID	Description	Operation Mode [1]	Location	SWL, dB(A)	Required Noise Reduction from At-Source Mitigation Measure, dB(A)	Mitigated SWL, dB(A)	Distance from Fixed Noise Source to Receiver, m	Correction Factors			Predicted Noise Level, dB(A)	Predicted Noise Level, dB(A)	Noise Criteria, dB(A)
									Distance Correction, dB(A)	Barrier Correction, dB(A) [2]	Façade Correction, dB(A)			
FN3-2	CT1	Cooling Tower 1	In Operate	Roof	96.9	-10	86.9	27	-36.6	-10.0	3	43.3	47	65
	CT2	Cooling Tower 2	Standby	Roof	0.0	-10	0.0	31	-37.9	-10.0	3	0.0		
	CT3	Cooling Tower 3	In Operate	Roof	96.9	-10	86.9	36	-39.0	-10.0	3	40.9		
	CT4	Cooling Tower 4	In Operate	Roof	96.9	-10	86.9	44	-40.9	-10.0	3	38.9		
	VO1	Ventilation Opening 1	In Operate	Roof	82.2	-5	77.2	37	-39.5	-10.0	3	30.7		
	VO2	Ventilation Opening 2	In Operate	Roof	88.1	-5	83.1	45	-41.0	-10.0	3	35.1		
	VO3	Ventilation Opening 3	In Operate	Roof	85.2	-5	80.2	45	-41.1	-10.0	3	32.1		
	VO4	Ventilation Opening 4	In Operate	Roof	87.5	-5	82.5	49	-41.8	-10.0	3	33.7		

NSR	Fixed Source ID	Description	Operation Mode [1]	Location	SWL, dB(A)	Required Noise Reduction from At-Source Mitigation Measure, dB(A)	Mitigated SWL, dB(A)	Distance from Fixed Noise Source to Receiver, m	Correction Factors			Predicted Noise Level, dB(A)	Predicted Noise Level, dB(A)	Noise Criteria, dB(A)
									Distance Correction, dB(A)	Barrier Correction, dB(A) [2]	Façade Correction, dB(A)			
FN4-1	CT1	Cooling Tower 1	In Operate	Roof	96.9	-10	86.9	20	-34.0	-10.0	3	45.9	62	65
	CT2	Cooling Tower 2	Standby	Roof	0.0	-10	0.0	26	-36.1	-10.0	3	0.0		
	CT3	Cooling Tower 3	In Operate	Roof	96.9	-10	86.9	28	-37.0	0.0	3	52.9		
	CT4	Cooling Tower 4	In Operate	Roof	96.9	-10	86.9	23	-35.4	0.0	3	54.5		
	VO1	Ventilation Opening 1	In Operate	Roof	82.2	-5	77.2	12	-29.6	0.0	3	50.6		
	VO2	Ventilation Opening 2	In Operate	Roof	88.1	-5	83.1	11	-28.5	0.0	3	57.6		
	VO3	Ventilation Opening 3	In Operate	Roof	85.2	-5	80.2	12	-29.8	0.0	3	53.3		
	VO4	Ventilation Opening 4	In Operate	Roof	87.5	-5	82.5	23	-35.2	0.0	3	50.3		

NSR	Fixed Source ID	Description	Operation Mode [1]	Location	SWL, dB(A)	Required Noise Reduction from At-Source Mitigation Measure, dB(A)	Mitigated SWL, dB(A)	Distance from Fixed Noise Source to Receiver, m	Correction Factors			Predicted Noise Level, dB(A)	Predicted Noise Level, dB(A)	Noise Criteria, dB(A)
									Distance Correction, dB(A)	Barrier Correction, dB(A) [2]	Façade Correction, dB(A)			
FN4-2	CT1	Cooling Tower 1	In Operate	Roof	96.9	-10	86.9	27	-36.6	-10.0	3	43.3	47	65
	CT2	Cooling Tower 2	Standby	Roof	0.0	-10	0.0	31	-37.9	-10.0	3	0.0		
	CT3	Cooling Tower 3	In Operate	Roof	96.9	-10	86.9	36	-39.0	-10.0	3	40.9		
	CT4	Cooling Tower 4	In Operate	Roof	96.9	-10	86.9	44	-40.9	-10.0	3	38.9		
	VO1	Ventilation Opening 1	In Operate	Roof	82.2	-5	77.2	37	-39.5	-10.0	3	30.7		
	VO2	Ventilation Opening 2	In Operate	Roof	88.1	-5	83.1	45	-41.0	-10.0	3	35.1		
	VO3	Ventilation Opening 3	In Operate	Roof	85.2	-5	80.2	45	-41.1	-10.0	3	32.1		
	VO4	Ventilation Opening 4	In Operate	Roof	87.5	-5	82.5	49	-41.8	-10.0	3	33.7		

Calculation of Fixed Noise Impact Assessment (Mitigated Scenario)

NSR	Fixed Source ID	Description	Operation Mode [1]	Location	SWL, dB(A)	Required Noise Reduction from At-Source Mitigation Measure, dB(A)	Mitigated SWL, dB(A)	Distance from Fixed Noise Source to Receiver, m	Correction Factors			Predicted Noise Level, dB(A)	Predicted Noise Level, dB(A)	Noise Criteria, dB(A)
									Distance Correction, dB(A)	Barrier Correction, dB(A) [2]	Façade Correction, dB(A)			
FNS-1	CT1	Cooling Tower 1	In Operate	Roof	96.9	-10	86.9	20	-34.2	-10.0	3	45.6	61	65
	CT2	Cooling Tower 2	Standby	Roof	0.0	-10	0.0	26	-36.3	-10.0	3	0.0		
	CT3	Cooling Tower 3	In Operate	Roof	96.9	-10	86.9	29	-37.1	0.0	3	52.8		
	CT4	Cooling Tower 4	In Operate	Roof	96.9	-10	86.9	24	-35.5	0.0	3	54.3		
	VO1	Ventilation Opening 1	In Operate	Roof	82.2	-5	77.2	13	-30.2	0.0	3	50.0		
	VO2	Ventilation Opening 2	In Operate	Roof	88.1	-5	83.1	12	-29.2	0.0	3	56.8		
	VO3	Ventilation Opening 3	In Operate	Roof	85.2	-5	80.2	13	-30.4	0.0	3	52.8		
	VO4	Ventilation Opening 4	In Operate	Roof	87.5	-5	82.5	23	-35.4	0.0	3	50.1		

NSR	Fixed Source ID	Description	Operation Mode [1]	Location	SWL, dB(A)	Required Noise Reduction from At-Source Mitigation Measure, dB(A)	Mitigated SWL, dB(A)	Distance from Fixed Noise Source to Receiver, m	Correction Factors			Predicted Noise Level, dB(A)	Predicted Noise Level, dB(A)	Noise Criteria, dB(A)
									Distance Correction, dB(A)	Barrier Correction, dB(A) [2]	Façade Correction, dB(A)			
FNS-2	CT1	Cooling Tower 1	In Operate	Roof	96.9	-10	86.9	27	-36.7	-10.0	3	43.1	47	65
	CT2	Cooling Tower 2	Standby	Roof	0.0	-10	0.0	32	-38.0	-10.0	3	0.0		
	CT3	Cooling Tower 3	In Operate	Roof	96.9	-10	86.9	36	-39.1	-10.0	3	40.8		
	CT4	Cooling Tower 4	In Operate	Roof	96.9	-10	86.9	45	-41.0	-10.0	3	38.9		
	VO1	Ventilation Opening 1	In Operate	Roof	82.2	-5	77.2	38	-39.5	-10.0	3	30.6		
	VO2	Ventilation Opening 2	In Operate	Roof	88.1	-5	83.1	45	-41.0	-10.0	3	35.0		
	VO3	Ventilation Opening 3	In Operate	Roof	85.2	-5	80.2	45	-41.1	-10.0	3	32.0		
	VO4	Ventilation Opening 4	In Operate	Roof	87.5	-5	82.5	49	-41.9	-10.0	3	33.6		

NSR	Fixed Source ID	Description	Operation Mode [1]	Location	SWL, dB(A)	Required Noise Reduction from At-Source Mitigation Measure, dB(A)	Mitigated SWL, dB(A)	Distance from Fixed Noise Source to Receiver, m	Correction Factors			Predicted Noise Level, dB(A)	Predicted Noise Level, dB(A)	Noise Criteria, dB(A)
									Distance Correction, dB(A)	Barrier Correction, dB(A) [2]	Façade Correction, dB(A)			
FNS-1	CT1	Cooling Tower 1	Standby	Roof	0.0	-10	0.0	20	-34.2	-10.0	3	0.0	61	65
	CT2	Cooling Tower 2	In Operate	Roof	96.9	-10	86.9	26	-36.2	0.0	3	53.6		
	CT3	Cooling Tower 3	In Operate	Roof	96.9	-10	86.9	29	-37.1	0.0	3	52.8		
	CT4	Cooling Tower 4	In Operate	Roof	96.9	-10	86.9	24	-35.8	0.0	3	54.1		
	VO1	Ventilation Opening 1	In Operate	Roof	82.2	-5	77.2	14	-30.9	0.0	3	49.3		
	VO2	Ventilation Opening 2	In Operate	Roof	88.1	-5	83.1	14	-30.7	0.0	3	55.4		
	VO3	Ventilation Opening 3	In Operate	Roof	85.2	-5	80.2	15	-31.6	0.0	3	51.6		
	VO4	Ventilation Opening 4	In Operate	Roof	87.5	-5	82.5	24	-35.8	0.0	3	49.7		

NSR	Fixed Source ID	Description	Operation Mode [1]	Location	SWL, dB(A)	Required Noise Reduction from At-Source Mitigation Measure, dB(A)	Mitigated SWL, dB(A)	Distance from Fixed Noise Source to Receiver, m	Correction Factors			Predicted Noise Level, dB(A)	Predicted Noise Level, dB(A)	Noise Criteria, dB(A)
									Distance Correction, dB(A)	Barrier Correction, dB(A) [2]	Façade Correction, dB(A)			
FNS-2	CT1	Cooling Tower 1	In Operate	Roof	96.9	-10	86.9	28	-37.0	-10.0	3	42.9	47	65
	CT2	Cooling Tower 2	Standby	Roof	0.0	-10	0.0	32	-38.2	-10.0	3	0.0		
	CT3	Cooling Tower 3	In Operate	Roof	96.9	-10	86.9	36	-39.2	-10.0	3	40.6		
	CT4	Cooling Tower 4	In Operate	Roof	96.9	-10	86.9	45	-41.1	-10.0	3	38.8		
	VO1	Ventilation Opening 1	In Operate	Roof	82.2	-5	77.2	38	-39.7	-10.0	3	30.5		
	VO2	Ventilation Opening 2	In Operate	Roof	88.1	-5	83.1	45	-41.1	-10.0	3	35.0		
	VO3	Ventilation Opening 3	In Operate	Roof	85.2	-5	80.2	46	-41.2	-10.0	3	32.0		
	VO4	Ventilation Opening 4	In Operate	Roof	87.5	-5	82.5	50	-41.9	-10.0	3	33.5		

Calculation of Fixed Noise Impact Assessment (Mitigated Scenario)

NSR	Fixed Source ID	Description	Operation Mode [1]	Location	SWL, dB(A)	Required Noise Reduction from At-Source Mitigation Measure, dB(A)	Mitigated SWL, dB(A)	Distance from Fixed Noise Source to Receiver, m	Correction Factors			Predicted Noise Level, dB(A)	Predicted Noise Level, dB(A)	Noise Criteria, dB(A)
									Distance Correction, dB(A)	Barrier Correction, dB(A) [2]	Façade Correction, dB(A)			
FN7-1	CT1	Cooling Tower 1	Standby	Roof	0.0	-10	0.0	22	-34.8	-10.0	3	0.0	61	65
	CT2	Cooling Tower 2	In Operate	Roof	96.9	-10	86.9	27	-36.6	0.0	3	53.3		
	CT3	Cooling Tower 3	In Operate	Roof	96.9	-10	86.9	30	-37.4	0.0	3	52.5		
	CT4	Cooling Tower 4	In Operate	Roof	96.9	-10	86.9	26	-36.2	0.0	3	53.7		
	VO1	Ventilation Opening 1	In Operate	Roof	82.2	-5	77.2	16	-32.1	0.0	3	48.1		
	VO2	Ventilation Opening 2	In Operate	Roof	88.1	-5	83.1	16	-31.9	0.0	3	54.1		
	VO3	Ventilation Opening 3	In Operate	Roof	85.2	-5	80.2	17	-32.6	0.0	3	50.6		
	VO4	Ventilation Opening 4	In Operate	Roof	87.5	-5	82.5	26	-36.2	0.0	3	49.3		

NSR	Fixed Source ID	Description	Operation Mode [1]	Location	SWL, dB(A)	Required Noise Reduction from At-Source Mitigation Measure, dB(A)	Mitigated SWL, dB(A)	Distance from Fixed Noise Source to Receiver, m	Correction Factors			Predicted Noise Level, dB(A)	Predicted Noise Level, dB(A)	Noise Criteria, dB(A)
									Distance Correction, dB(A)	Barrier Correction, dB(A) [2]	Façade Correction, dB(A)			
FN7-2	CT1	Cooling Tower 1	In Operate	Roof	96.9	-10	86.9	29	-37.3	-10.0	3	42.6	46	65
	CT2	Cooling Tower 2	Standby	Roof	0.0	-10	0.0	33	-38.4	-10.0	3	0.0		
	CT3	Cooling Tower 3	In Operate	Roof	96.9	-10	86.9	37	-39.4	-10.0	3	40.4		
	CT4	Cooling Tower 4	In Operate	Roof	96.9	-10	86.9	46	-41.2	-10.0	3	38.7		
	VO1	Ventilation Opening 1	In Operate	Roof	82.2	-5	77.2	39	-39.8	-10.0	3	30.3		
	VO2	Ventilation Opening 2	In Operate	Roof	88.1	-5	83.1	46	-41.2	-10.0	3	34.8		
	VO3	Ventilation Opening 3	In Operate	Roof	85.2	-5	80.2	46	-41.3	-10.0	3	31.8		
	VO4	Ventilation Opening 4	In Operate	Roof	87.5	-5	82.5	50	-42.0	-10.0	3	33.4		

Note [1] - According to the given information from the operation staff from HKGCC, either CT1 or CT2 will be in standby mode. Given that CT1 is closer to the NSRs, CT2 is assigned in "standby" whereas CT1 is assigned "in operate", unless CT1 is shielded.

Note [2] - A barrier correction of -10dB(A) will be provided to the fixed noise source when the direct line of sight is substantially shielded.

Calculation of Fixed Noise Impact Assessment (Unmitigated Scenario)

NSR	Fixed Source ID	Description	Operation Mode [1]	Location	SWL, dB(A)	Distance from Fixed Noise Source to Receiver, m	Correction Factors			Predicted Noise Level, dB(A)	Predicted Noise Level, dB(A)	Noise Criteria, dB(A)
							Distance Correction, dB(A)	Barrier Correction, dB(A) [2]	Façade Correction, dB(A)			
FN9-1	CT1	Cooling Tower 1	Standby	Roof	0.0	31	-37.7	-10.0	3	0.0	<u>66</u>	65
	CT2	Cooling Tower 2	In Operate	Roof	96.9	35	-39.0	0.0	3	60.9		
	CT3	Cooling Tower 3	In Operate	Roof	96.9	38	-39.6	0.0	3	60.3		
	CT4	Cooling Tower 4	In Operate	Roof	96.9	34	-38.7	0.0	3	61.2		
	VO1	Ventilation Opening 1	In Operate	Roof	82.2	26	-36.2	0.0	3	49.0		
	VO2	Ventilation Opening 2	In Operate	Roof	88.1	25	-35.8	0.0	3	55.3		
	VO3	Ventilation Opening 3	In Operate	Roof	85.2	26	-36.2	0.0	3	52.0		
	VO4	Ventilation Opening 4	In Operate	Roof	87.5	34	-38.5	0.0	3	51.9		

NSR	Fixed Source ID	Description	Operation Mode [1]	Location	SWL, dB(A)	Distance from Fixed Noise Source to Receiver, m	Correction Factors			Predicted Noise Level, dB(A)	Predicted Noise Level, dB(A)	Noise Criteria, dB(A)
							Distance Correction, dB(A)	Barrier Correction, dB(A) [2]	Façade Correction, dB(A)			
FN9-2	CT1	Cooling Tower 1	In Operate	Roof	96.9	24	-35.7	0.0	3	64.2	<u>68</u>	65
	CT2	Cooling Tower 2	Standby	Roof	0.0	29	-37.2	0.0	3	0.0		
	CT3	Cooling Tower 3	In Operate	Roof	96.9	32	-38.1	0.0	3	61.8		
	CT4	Cooling Tower 4	In Operate	Roof	96.9	32	-38.0	0.0	3	61.9		
	VO1	Ventilation Opening 1	In Operate	Roof	82.2	24	-35.5	0.0	3	49.6		
	VO2	Ventilation Opening 2	In Operate	Roof	88.1	26	-36.4	0.0	3	54.7		
	VO3	Ventilation Opening 3	In Operate	Roof	85.2	27	-36.6	0.0	3	51.6		
	VO4	Ventilation Opening 4	In Operate	Roof	87.5	33	-38.4	0.0	3	52.1		

NSR	Fixed Source ID	Description	Operation Mode [1]	Location	SWL, dB(A)	Distance from Fixed Noise Source to Receiver, m	Correction Factors			Predicted Noise Level, dB(A)	Predicted Noise Level, dB(A)	Noise Criteria, dB(A)
							Distance Correction, dB(A)	Barrier Correction, dB(A) [2]	Façade Correction, dB(A)			
FN9-3	CT1	Cooling Tower 1	In Operate	Roof	96.9	24	-35.5	0.0	3	64.4	<u>68</u>	65
	CT2	Cooling Tower 2	Standby	Roof	0.0	29	-37.1	0.0	3	0.0		
	CT3	Cooling Tower 3	In Operate	Roof	96.9	32	-38.0	0.0	3	61.9		
	CT4	Cooling Tower 4	In Operate	Roof	96.9	33	-38.3	0.0	3	61.6		
	VO1	Ventilation Opening 1	In Operate	Roof	82.2	25	-35.9	0.0	3	49.3		
	VO2	Ventilation Opening 2	In Operate	Roof	88.1	28	-37.0	0.0	3	54.1		
	VO3	Ventilation Opening 3	In Operate	Roof	85.2	29	-37.2	0.0	3	51.0		
	VO4	Ventilation Opening 4	In Operate	Roof	87.5	35	-38.8	0.0	3	51.7		

NSR	Fixed Source ID	Description	Operation Mode [1]	Location	SWL, dB(A)	Distance from Fixed Noise Source to Receiver, m	Correction Factors			Predicted Noise Level, dB(A)	Predicted Noise Level, dB(A)	Noise Criteria, dB(A)
							Distance Correction, dB(A)	Barrier Correction, dB(A) [2]	Façade Correction, dB(A)			
FN9-4	CT1	Cooling Tower 1	In Operate	Roof	96.9	26	-36.3	0.0	3	63.6	<u>67</u>	65
	CT2	Cooling Tower 2	Standby	Roof	0.0	30	-37.6	0.0	3	0.0		
	CT3	Cooling Tower 3	In Operate	Roof	96.9	34	-38.6	0.0	3	61.3		
	CT4	Cooling Tower 4	In Operate	Roof	96.9	40	-39.9	0.0	3	59.9		
	VO1	Ventilation Opening 1	In Operate	Roof	82.2	33	-38.4	0.0	3	46.8		
	VO2	Ventilation Opening 2	In Operate	Roof	88.1	39	-39.7	0.0	3	51.3		
	VO3	Ventilation Opening 3	In Operate	Roof	85.2	39	-39.9	0.0	3	48.3		
	VO4	Ventilation Opening 4	In Operate	Roof	87.5	43	-40.7	0.0	3	49.7		

Calculation of Fixed Noise Impact Assessment (Unmitigated Scenario)

NSR	Fixed Source ID	Description	Operation Mode [1]	Location	SWL, dB(A)	Distance from Fixed Noise Source to Receiver, m	Correction Factors			Predicted Noise Level, dB(A)	Predicted Noise Level, dB(A)	Noise Criteria, dB(A)
							Distance Correction, dB(A)	Barrier Correction, dB(A) [2]	Façade Correction, dB(A)			
FN9-5	CT1	Cooling Tower 1	In Operate	Roof	96.9	28	-36.8	0.0	3	63.0	66	65
	CT2	Cooling Tower 2	Standby	Roof	0.0	32	-38.0	0.0	3	0.0		
	CT3	Cooling Tower 3	In Operate	Roof	96.9	35	-38.9	0.0	3	60.9		
	CT4	Cooling Tower 4	In Operate	Roof	96.9	42	-40.4	0.0	3	59.5		
	VO1	Ventilation Opening 1	In Operate	Roof	82.2	35	-39.0	0.0	3	46.2		
	VO2	Ventilation Opening 2	In Operate	Roof	88.1	41	-40.3	0.0	3	50.7		
	VO3	Ventilation Opening 3	In Operate	Roof	85.2	42	-40.4	0.0	3	47.7		
	VO4	Ventilation Opening 4	In Operate	Roof	87.5	46	-41.2	0.0	3	49.3		

NSR	Fixed Source ID	Description	Operation Mode [1]	Location	SWL, dB(A)	Distance from Fixed Noise Source to Receiver, m	Correction Factors			Predicted Noise Level, dB(A)	Predicted Noise Level, dB(A)	Noise Criteria, dB(A)
							Distance Correction, dB(A)	Barrier Correction, dB(A) [2]	Façade Correction, dB(A)			
FN9-6	CT1	Cooling Tower 1	In Operate	Roof	96.9	36	-39.1	-10.0	3	50.7	54	65
	CT2	Cooling Tower 2	Standby	Roof	0.0	40	-40.1	-10.0	3	0.0		
	CT3	Cooling Tower 3	In Operate	Roof	96.9	44	-40.9	-10.0	3	49.0		
	CT4	Cooling Tower 4	In Operate	Roof	96.9	52	-42.2	-10.0	3	47.6		
	VO1	Ventilation Opening 1	In Operate	Roof	82.2	45	-41.0	-10.0	3	34.2		
	VO2	Ventilation Opening 2	In Operate	Roof	88.1	51	-42.1	-10.0	3	39.0		
	VO3	Ventilation Opening 3	In Operate	Roof	85.2	51	-42.2	-10.0	3	36.0		
	VO4	Ventilation Opening 4	In Operate	Roof	87.5	56	-42.9	-10.0	3	37.5		

Note [1] - According to the given information from the operation staff from HKGCC, either CT1 or CT2 will be in standby mode. Given that CT1 is closer to the NSRs, CT2 is assigned in "standby" whereas CT1 is assigned "in operate", unless CT1 is shielded.

Note [2] - A barrier correction of -10dB(A) will be provided to the fixed noise source when the direct line of sight is substantially shielded.

Calculation of Fixed Noise Impact Assessment (Mitigated Scenario)

NSR	Fixed Source ID	Description	Operation Mode [1]	Location	SWL, dB(A)	Required Noise Reduction from At-Source Mitigation Measure, dB(A)	Mitigated SWL, dB(A)	Distance from Fixed Noise Source to Receiver, m	Correction Factors			Predicted Noise Level, dB(A)	Predicted Noise Level, dB(A)	Noise Criteria, dB(A)
									Distance Correction, dB(A)	Barrier Correction, dB(A) [2]	Façade Correction, dB(A)			
FN9-1	CT1	Cooling Tower 1	Standby	Roof	0.0	-10	0.0	31	-37.7	-10.0	3	0.0	58	65
	CT2	Cooling Tower 2	In Operate	Roof	96.9	-10	86.9	35	-39.0	0.0	3	50.9		
	CT3	Cooling Tower 3	In Operate	Roof	96.9	-10	86.9	38	-39.6	0.0	3	50.3		
	CT4	Cooling Tower 4	In Operate	Roof	96.9	-10	86.9	34	-38.7	0.0	3	51.2		
	VO1	Ventilation Opening 1	In Operate	Roof	82.2	-5	77.2	26	-36.2	0.0	3	44.0		
	VO2	Ventilation Opening 2	In Operate	Roof	88.1	-5	83.1	25	-35.8	0.0	3	50.3		
	VO3	Ventilation Opening 3	In Operate	Roof	85.2	-5	80.2	26	-36.2	0.0	3	47.0		
	VO4	Ventilation Opening 4	In Operate	Roof	87.5	-5	82.5	34	-38.5	0.0	3	46.9		

NSR	Fixed Source ID	Description	Operation Mode [1]	Location	SWL, dB(A)	Required Noise Reduction from At-Source Mitigation Measure, dB(A)	Mitigated SWL, dB(A)	Distance from Fixed Noise Source to Receiver, m	Correction Factors			Predicted Noise Level, dB(A)	Predicted Noise Level, dB(A)	Noise Criteria, dB(A)
									Distance Correction, dB(A)	Barrier Correction, dB(A) [2]	Façade Correction, dB(A)			
FN9-2	CT1	Cooling Tower 1	In Operate	Roof	96.9	-10	86.9	24	-35.7	0.0	3	54.2	59	65
	CT2	Cooling Tower 2	Standby	Roof	0.0	-10	0.0	29	-37.2	0.0	3	0.0		
	CT3	Cooling Tower 3	In Operate	Roof	96.9	-10	86.9	32	-38.1	0.0	3	51.8		
	CT4	Cooling Tower 4	In Operate	Roof	96.9	-10	86.9	32	-38.0	0.0	3	51.9		
	VO1	Ventilation Opening 1	In Operate	Roof	82.2	-5	77.2	24	-35.5	0.0	3	44.6		
	VO2	Ventilation Opening 2	In Operate	Roof	88.1	-5	83.1	26	-36.4	0.0	3	49.7		
	VO3	Ventilation Opening 3	In Operate	Roof	85.2	-5	80.2	27	-36.6	0.0	3	46.6		
	VO4	Ventilation Opening 4	In Operate	Roof	87.5	-5	82.5	33	-38.4	0.0	3	47.1		

NSR	Fixed Source ID	Description	Operation Mode [1]	Location	SWL, dB(A)	Required Noise Reduction from At-Source Mitigation Measure, dB(A)	Mitigated SWL, dB(A)	Distance from Fixed Noise Source to Receiver, m	Correction Factors			Predicted Noise Level, dB(A)	Predicted Noise Level, dB(A)	Noise Criteria, dB(A)
									Distance Correction, dB(A)	Barrier Correction, dB(A) [2]	Façade Correction, dB(A)			
FN9-3	CT1	Cooling Tower 1	In Operate	Roof	96.9	-10	86.9	24	-35.5	0.0	3	54.4	59	65
	CT2	Cooling Tower 2	Standby	Roof	0.0	-10	0.0	29	-37.1	0.0	3	0.0		
	CT3	Cooling Tower 3	In Operate	Roof	96.9	-10	86.9	32	-38.0	0.0	3	51.9		
	CT4	Cooling Tower 4	In Operate	Roof	96.9	-10	86.9	33	-38.3	0.0	3	51.6		
	VO1	Ventilation Opening 1	In Operate	Roof	82.2	-5	77.2	25	-35.9	0.0	3	44.3		
	VO2	Ventilation Opening 2	In Operate	Roof	88.1	-5	83.1	28	-37.0	0.0	3	49.1		
	VO3	Ventilation Opening 3	In Operate	Roof	85.2	-5	80.2	29	-37.2	0.0	3	46.0		
	VO4	Ventilation Opening 4	In Operate	Roof	87.5	-5	82.5	35	-38.8	0.0	3	46.7		

NSR	Fixed Source ID	Description	Operation Mode [1]	Location	SWL, dB(A)	Required Noise Reduction from At-Source Mitigation Measure, dB(A)	Mitigated SWL, dB(A)	Distance from Fixed Noise Source to Receiver, m	Correction Factors			Predicted Noise Level, dB(A)	Predicted Noise Level, dB(A)	Noise Criteria, dB(A)
									Distance Correction, dB(A)	Barrier Correction, dB(A) [2]	Façade Correction, dB(A)			
FN9-4	CT1	Cooling Tower 1	In Operate	Roof	96.9	-10	86.9	26	-36.3	0.0	3	53.6	58	65
	CT2	Cooling Tower 2	Standby	Roof	0.0	-10	0.0	30	-37.6	0.0	3	0.0		
	CT3	Cooling Tower 3	In Operate	Roof	96.9	-10	86.9	34	-38.6	0.0	3	51.3		
	CT4	Cooling Tower 4	In Operate	Roof	96.9	-10	86.9	40	-39.9	0.0	3	49.9		
	VO1	Ventilation Opening 1	In Operate	Roof	82.2	-5	77.2	33	-38.4	0.0	3	41.8		
	VO2	Ventilation Opening 2	In Operate	Roof	88.1	-5	83.1	39	-39.7	0.0	3	46.3		
	VO3	Ventilation Opening 3	In Operate	Roof	85.2	-5	80.2	39	-39.9	0.0	3	43.3		
	VO4	Ventilation Opening 4	In Operate	Roof	87.5	-5	82.5	43	-40.7	0.0	3	44.7		

Calculation of Fixed Noise Impact Assessment (Mitigated Scenario)

NSR	Fixed Source ID	Description	Operation Mode [1]	Location	SWL, dB(A)	Required Noise Reduction from At-Source Mitigation Measure, dB(A)	Mitigated SWL, dB(A)	Distance from Fixed Noise Source to Receiver, m	Correction Factors			Predicted Noise Level, dB(A)	Predicted Noise Level, dB(A)	Noise Criteria, dB(A)
									Distance Correction, dB(A)	Barrier Correction, dB(A) [2]	Façade Correction, dB(A)			
FN9-5	CT1	Cooling Tower 1	In Operate	Roof	96.9	-10	86.9	28	-36.8	0.0	3	53.0	57	65
	CT2	Cooling Tower 2	Standby	Roof	0.0	-10	0.0	32	-38.0	0.0	3	0.0		
	CT3	Cooling Tower 3	In Operate	Roof	96.9	-10	86.9	35	-38.9	0.0	3	50.9		
	CT4	Cooling Tower 4	In Operate	Roof	96.9	-10	86.9	42	-40.4	0.0	3	49.5		
	VO1	Ventilation Opening 1	In Operate	Roof	82.2	-5	77.2	35	-39.0	0.0	3	41.2		
	VO2	Ventilation Opening 2	In Operate	Roof	88.1	-5	83.1	41	-40.3	0.0	3	45.7		
	VO3	Ventilation Opening 3	In Operate	Roof	85.2	-5	80.2	42	-40.4	0.0	3	42.7		
	VO4	Ventilation Opening 4	In Operate	Roof	87.5	-5	82.5	46	-41.2	0.0	3	44.3		

NSR	Fixed Source ID	Description	Operation Mode [1]	Location	SWL, dB(A)	Required Noise Reduction from At-Source Mitigation Measure, dB(A)	Mitigated SWL, dB(A)	Distance from Fixed Noise Source to Receiver, m	Correction Factors			Predicted Noise Level, dB(A)	Predicted Noise Level, dB(A)	Noise Criteria, dB(A)
									Distance Correction, dB(A)	Barrier Correction, dB(A) [2]	Façade Correction, dB(A)			
FN9-6	CT1	Cooling Tower 1	In Operate	Roof	96.9	-10	86.9	36	-39.1	-10.0	3	40.7	45	65
	CT2	Cooling Tower 2	Standby	Roof	0.0	-10	0.0	40	-40.1	-10.0	3	0.0		
	CT3	Cooling Tower 3	In Operate	Roof	96.9	-10	86.9	44	-40.9	-10.0	3	39.0		
	CT4	Cooling Tower 4	In Operate	Roof	96.9	-10	86.9	52	-42.2	-10.0	3	37.6		
	VO1	Ventilation Opening 1	In Operate	Roof	82.2	-5	77.2	45	-41.0	-10.0	3	29.2		
	VO2	Ventilation Opening 2	In Operate	Roof	88.1	-5	83.1	51	-42.1	-10.0	3	34.0		
	VO3	Ventilation Opening 3	In Operate	Roof	85.2	-5	80.2	51	-42.2	-10.0	3	31.0		
	VO4	Ventilation Opening 4	In Operate	Roof	87.5	-5	82.5	56	-42.9	-10.0	3	32.5		

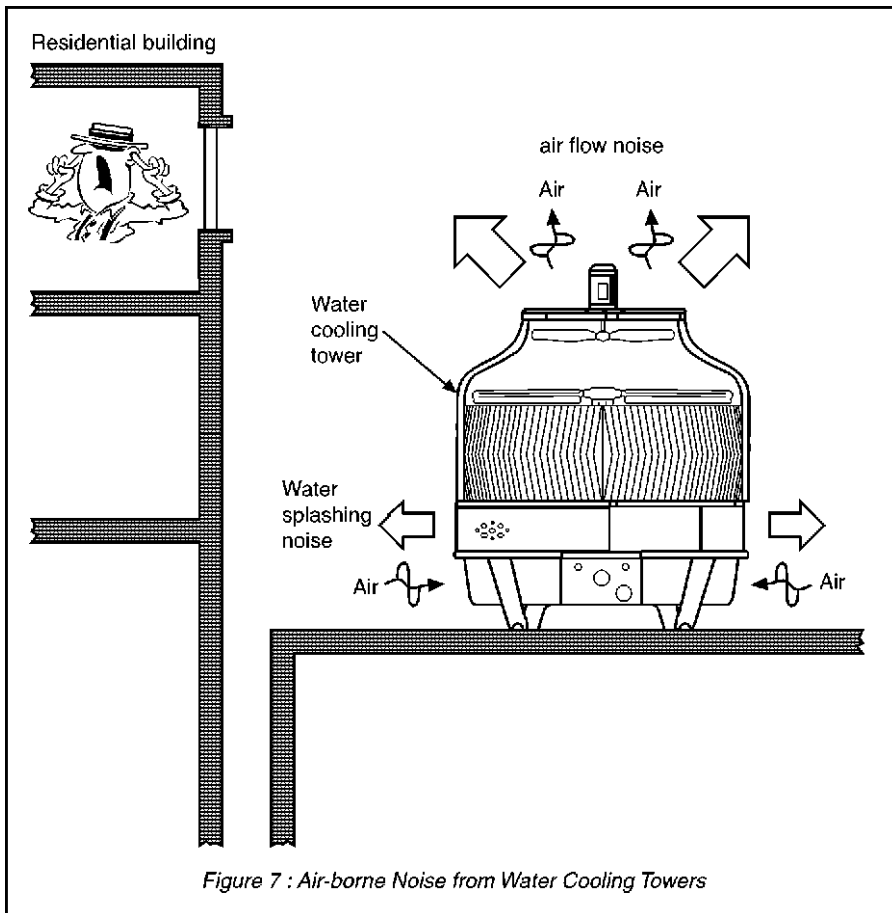
Note [1] - According to the given information from the operation staff from HKGCC, either CT1 or CT2 will be in standby mode. Given that CT1 is closer to the NSRs, CT2 is assigned in "standby" whereas CT1 is assigned "in operate", unless CT1 is shielded.

Note [2] - A barrier correction of -10dB(A) will be provided to the fixed noise source when the direct line of sight is substantially shielded.

4.3 Air-borne Noise from Water Cooling Towers

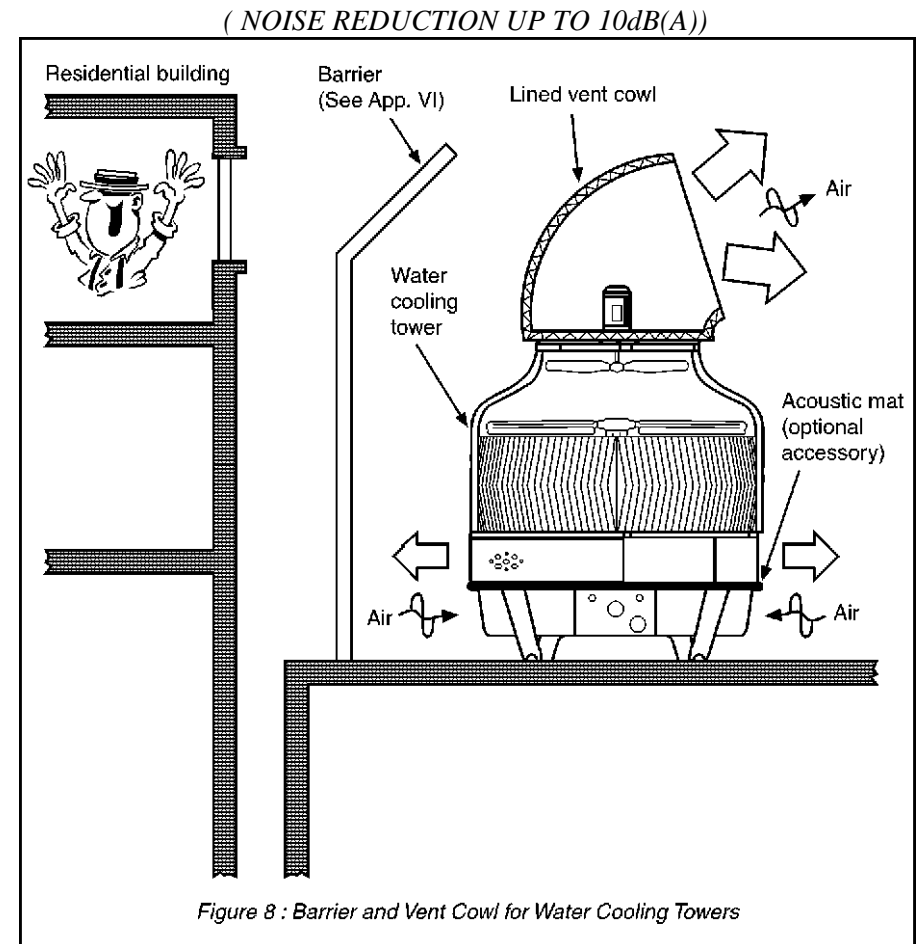
(A) Problems

Noise generated from water cooling towers may cause disturbance to nearby residents (see Fig. 7). It mainly comes from the air flow noise resulting from air turbulence at condenser fans and water splashing noise due to water flowing through the tower into the collection basin.



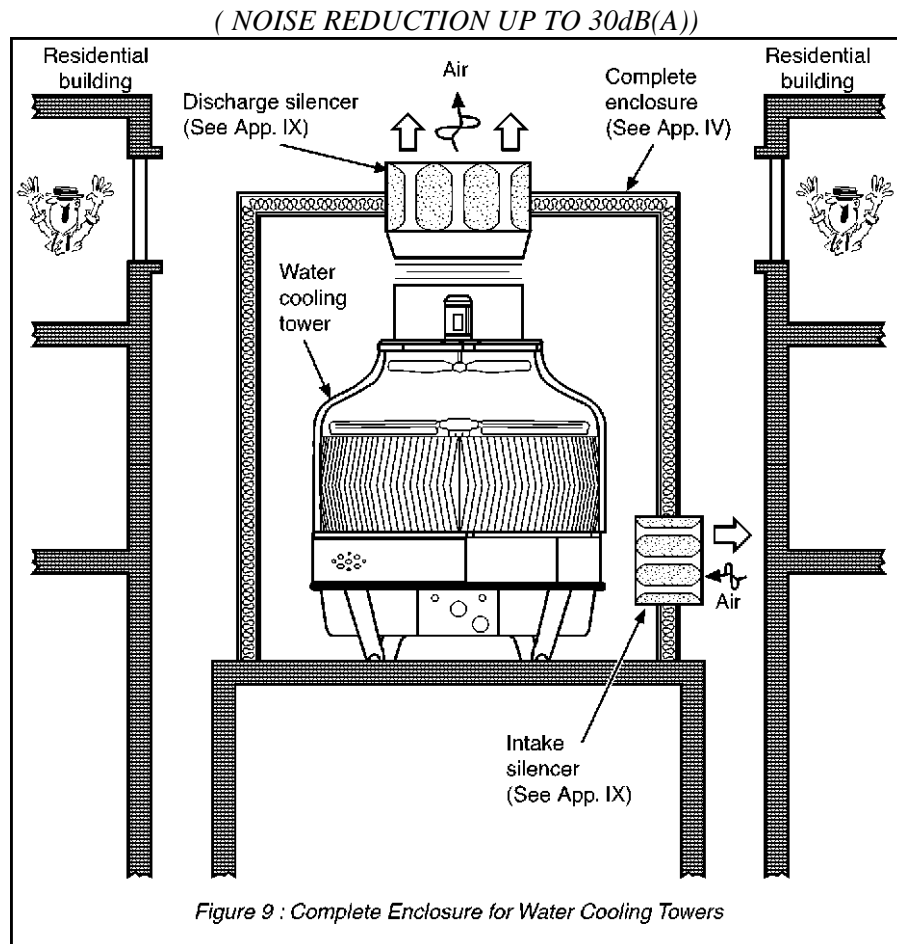
(B) Practical Remedies

- Erect a barrier or partial enclosure between the plant and nearby residential buildings so as to block the noise propagation path (see App. VI and V), provide acoustic mat on the water surface so as to reduce the water splashing noise, and install acoustically lined vent cowl at fan discharge outlet (see Fig. 8), if not much noise reduction is required.



(B) Practical Remedies (Cont'd)

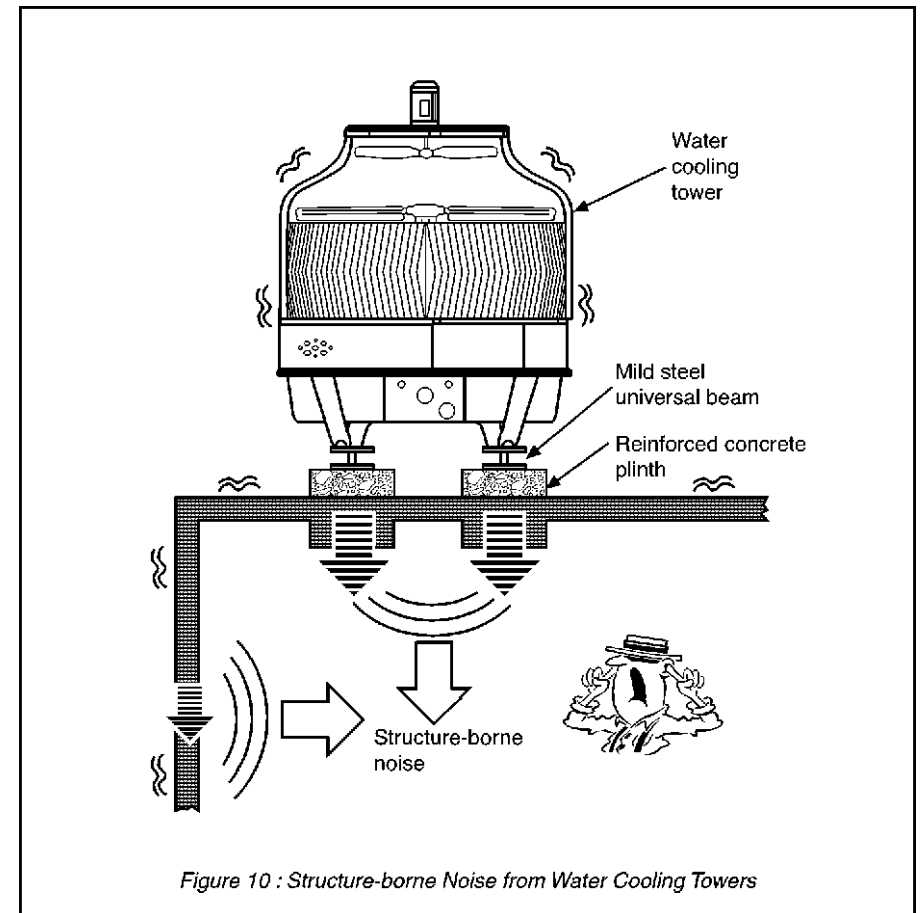
- Fabricate a complete enclosure with silencers at condenser fan outlets and at air inlets of the enclosure (see Fig. 9) so as to contain and absorb the noise from the water cooling tower (see App. IV) when there are noise sensitive receivers all around.



4.4 Structure-borne Noise from Water Cooling Towers

(A) Problems

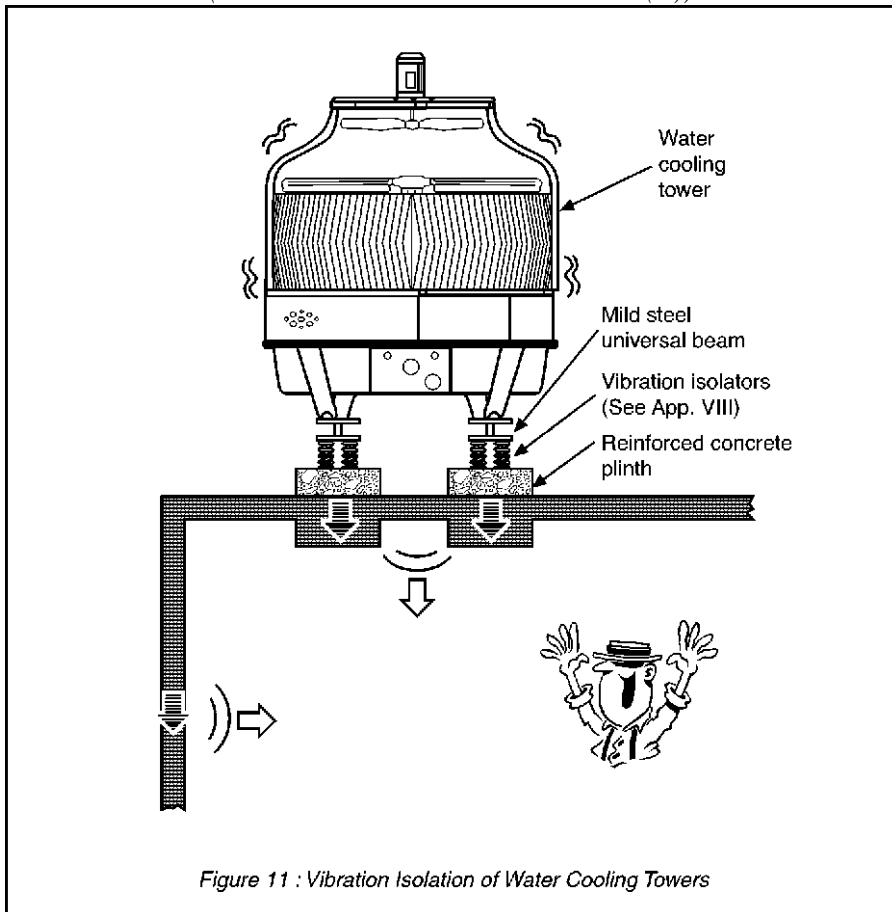
Vibration from a water cooling tower's operation may be transmitted indoors through building structure at points where the cooling tower is rigidly fixed to the structure without proper isolation (see Fig. 10). The vibration transmitted may activate the building structure to generate noise which causes noise disturbance to residents inside the building.



(B) Practical Remedies

- Provide vibration isolators to support a water cooling tower (see Fig. 11), thereby isolating it from the building structure (see App. VIII).

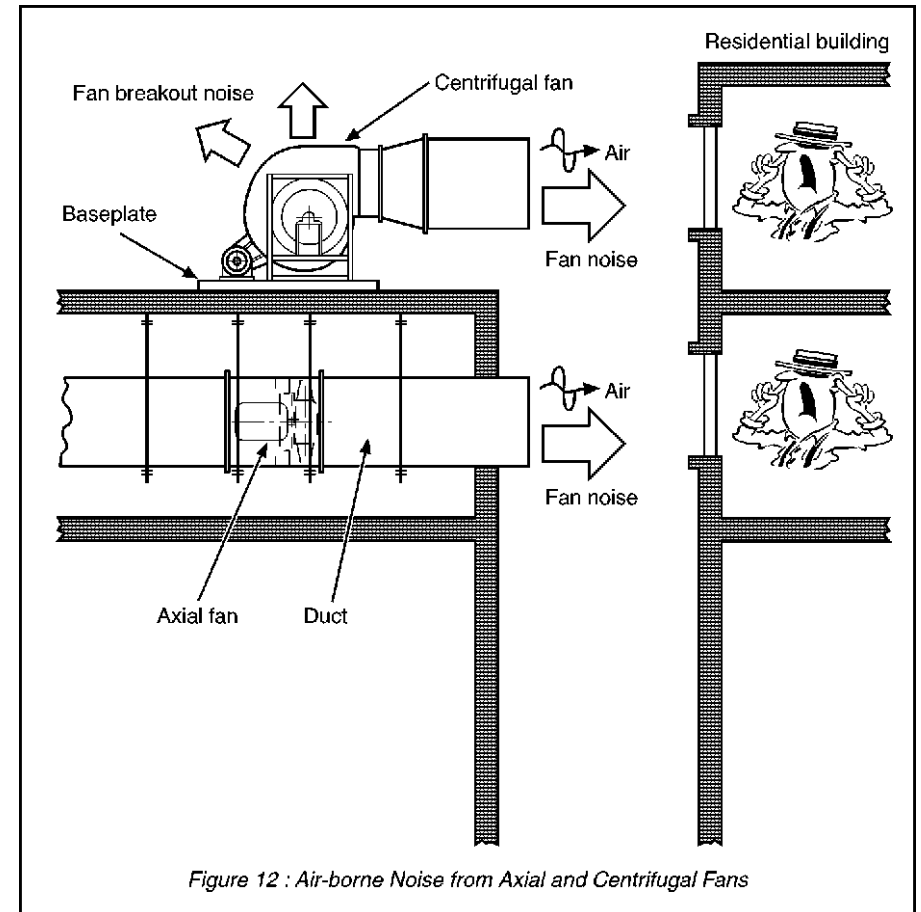
(NOISE REDUCTION UP TO 20dB(A))



4.5 Air-borne Noise from Fans

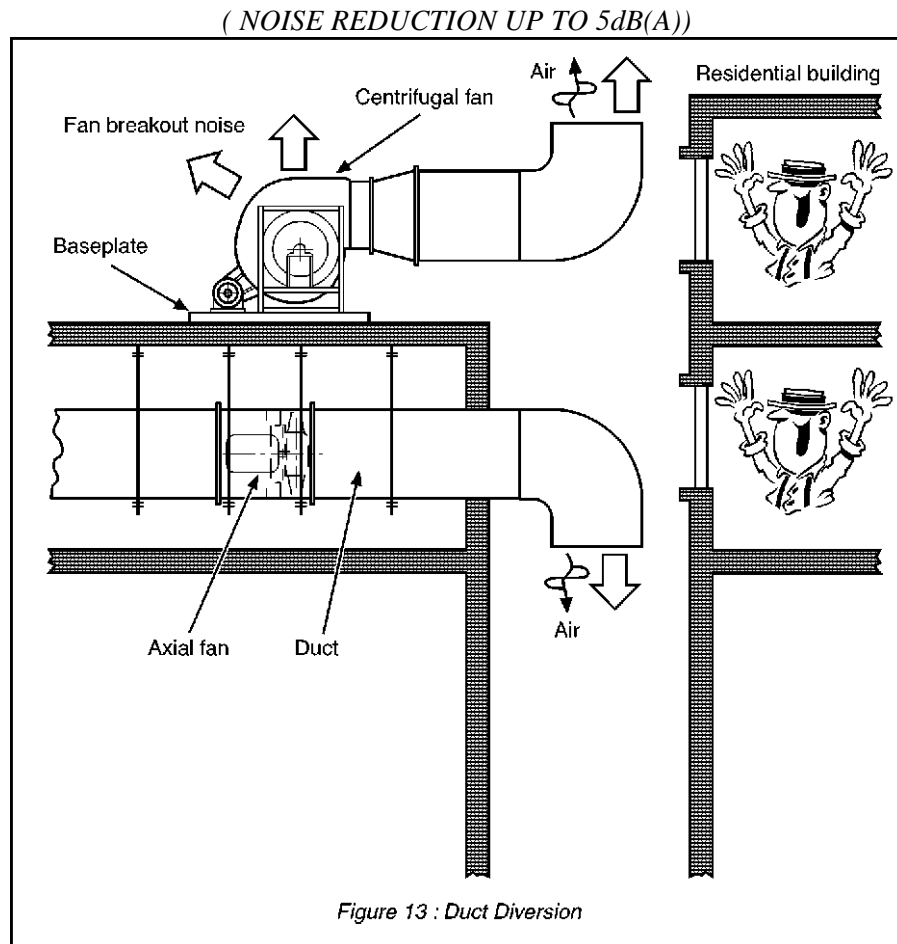
(A) Problems

The noise problem associated with fans may cause noise disturbance to nearby residents (see Fig.12). It mainly comes from the interaction of flow turbulence and solid surface of fan blades, and blade / fan vibration. The noise is transmitted upstream and downstream in the connecting ducts or to the atmosphere through the fan case.



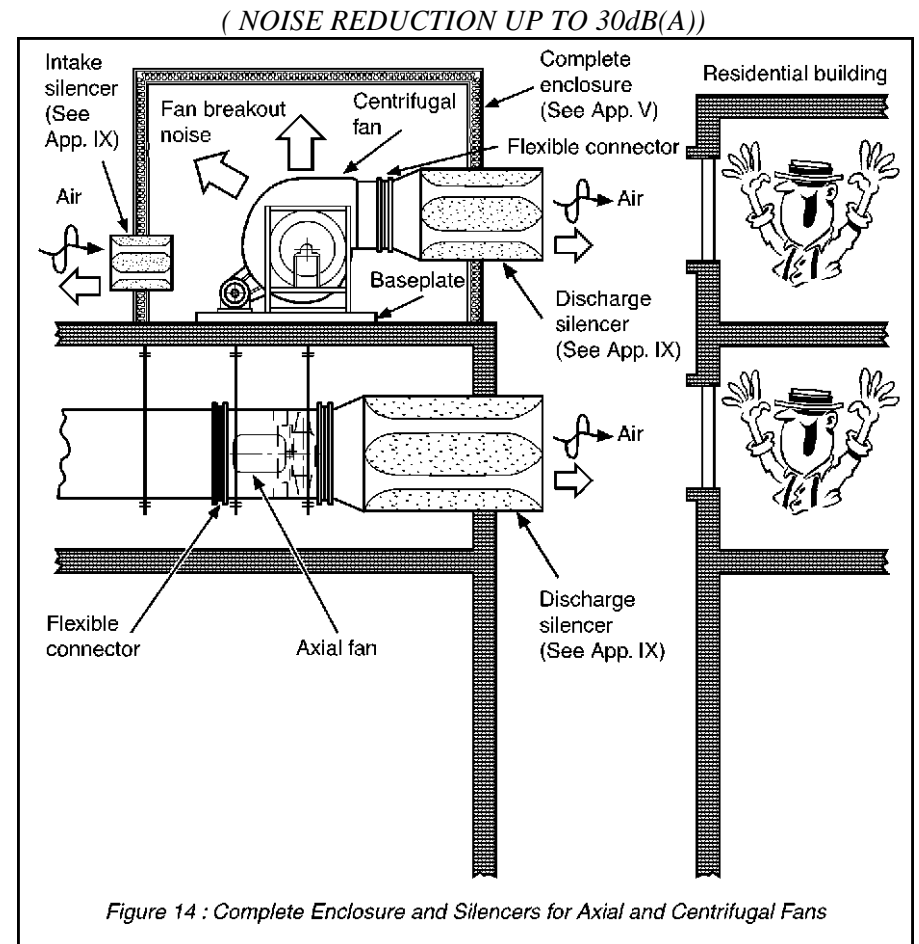
(B) Practical Remedies

- Reduce the speed of fans at non-rushed hours.
- Divert duct openings away from receivers (see Fig. 13).



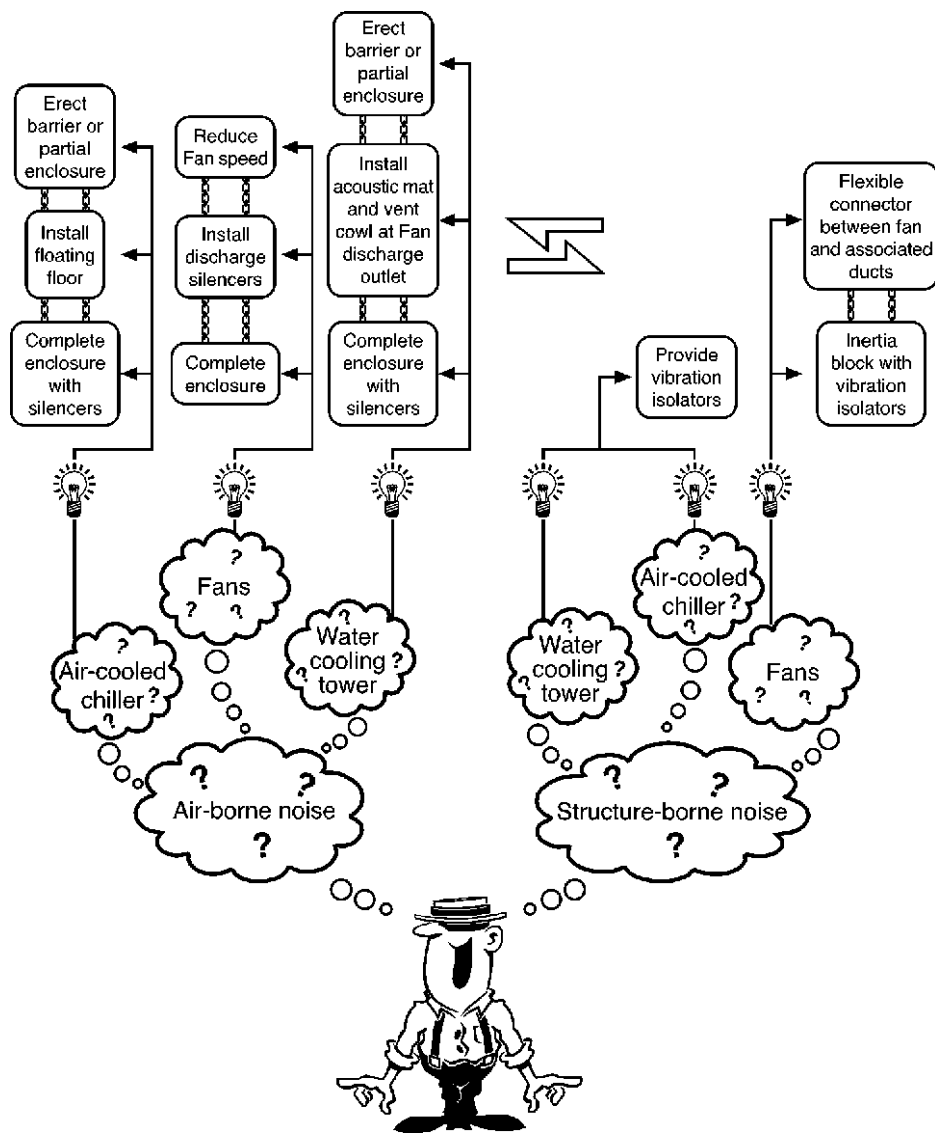
(B) Practical Remedies (Cont'd)

- Install a silencer at air discharge point of a fan (see Fig. 14) so as to absorb noise generated from the fan (see App IX).
- Fabricate a complete enclosure (see Fig. 14) to contain and absorb the noise energy radiated by the source (see App IV).



4.8 Important Note

The above only suggests solutions for a particular noise problem. In real life, the noise may be caused by more than one source. In those cases, several remedies may be required simultaneously to solve the problem.



5. RECOMMENDED PRACTICAL REMEDIES FOR DIFFERENT EXCEEDANCE LEVELS

The following recommended practical remedies for different noise exceedance levels are for reference purpose only. No guarantee is given to the performance of the application of the recommended remedies. The reader is advised to seek professional advice from independent experts in case of doubts or complicated problems.

Table 2 : Recommended Practical Remedies

Cause of Problem	Noise Exceedance Level (dB(A))	Recommended Practical Remedies
Air-borne Noise from Chillers	<10	- Barrier and/or silencers
	10 to 20	- Partial enclosure and silencers
	> 20	- Complete enclosure and silencers - Floating floor
Structure-borne Noise from Chillers	< 20	- Vibration isolators
	> 20	- Relocation
Air-borne Noise from Water Cooling Towers	< 10	- Acoustic mat, barrier and lined vent cowl
	10 to 20	- Partial enclosure and silencers
	> 20	- Complete enclosure and silencers
Structure-borne Noise from Water Cooling Towers	< 20	- Vibration isolators
	> 20	- Relocation
Fan Noise in Ductwork	< 5	- Duct opening away from receiver - Fan speed reduction
	5 to 10	- Silencers
	> 10	- Duct opening away from receiver - Silencers
Structure-borne Noise from Fans	< 20	- Inertia block and vibration isolators
	> 20	- Relocation
Rumbling Duct Noise	< 5	- Stiffening of the vibrating duct surface
	> 5	- Damping materials or composite lagging

Appendix 5.3 Undertaking Letter from the Operator of Hong Kong Garden Commercial Complex (HKGCC)

豪景花園管理有限公司

T.L. 60 MANAGEMENT LIMITED

(牌照號碼：C-642565)

新界青山公路100號青龍頭豪景花園商場1樓22號舖

Shop 22, 1/F, Commercial Complex, Hong Kong Garden, No.100 Castle Peak Road, Tsing Lung Tau, N.T.

Tel : 2491 7234 Fax : 2496 1998

Our. Ref. : HKG-2024-L0570 , HKG-2021-L0637

25th July 2024

To whom it may concern

Dear Sirs

Noise Abatement Measures for Cooling Towers in Hong Kong Garden

We, TL60 Management Limited, being the managers of Hong Kong Garden Commercial Complex (the Complex), hereby undertake to conduct appropriate retrofitting work with respect to existing noisy equipment installed at the roof top of the Complex (e.g. installation of partial/full enclosure, hood, silencer at existing cooling towers or any other noisy equipment) to control noise generation so that the future composite development at existing open ground to the immediate west of the Complex will not be subject to unacceptable noise impact as required by law due to operation of the Complex.

The exact retrofitting work will be determined in detailed design stage of this future composite development and will be implemented before OP stage of the development.

Yours Sincerely

For and on behalf of

TL60 Management Limited



Ming Chan

Property Manager

/ja

Appendix 6.1 Aerial Photographs

The Site in 1963



Site Description: Acid Factory

The Site in 1964



Site Description: Acid Factory

The Site in 1989



Site Description: Acid Factory

The Site in 1990



Site Description: Acid Factory was demolished. The Application Site was vacant.

The Site in 1999



Application Site

Site Description: Vacant Land

The Site in 2000



Site Description: Open Storage Area. Construction material stored on the Site is observed.

The Site in 2004



Site Description: Open Storage Area. Construction material stored on the Site is observed.

The Site in 2010



Site Description: Open Storage Area. Construction material stored on the Site is observed.

The Site in 2017



Site Description: Open Storage Area. Construction material stored on the Site is observed.

The Site in 2018



Site Description: Vegetated Land.

The Site in 2021



Site Description: Vegetated Land

The Site in 2023



Site Description: Vegetated Land

Appendix 6.2 Previous Correspondence with HKSAR Government Departments

Fire Services Department
Corporate Strategy Command,
Corporate Services Division,
9th Floor, Fire Services Headquarters Building,
1 Hong Chong Road, Tsim Sha Tsui East, Kowloon

By Fax (2739 5879) & Post

Dear Sir / Madam,

Land Contamination Assessment Study for a Proposed Social Welfare Facility and Permitted Residential Development at Lot 94, D.D. 388 And Adjoining Government Land, Castle Peak Road Tsing Lung Tau, New Territories - Enquiry for Land Contamination Information

We are conducting a Land Contamination Assessment Study for a Proposed Social Welfare Facility and Permitted Residential Development at Lot 94, D.D. 388 And Adjoining Government Land, Castle Peak Road Tsing Lung Tau, New Territories (see attached Figure 1). As required by the "Practice Guide for Investigation and Remediation of Contaminated Land" published by the Environmental Protection Department of the Government of HKSAR (EPD), information pertaining to the change of land uses/past activities/incidents/accidents at the Application Site are required as part of the vetting process.

Of particular interests are spill and incident reports (including records of fire at the Application Site) that we believe your Department might have record of. Furthermore, we would also like to know whether anywhere of the Application Site had applied or possessed license for dangerous goods storage. We enclosed herewith a site map showing the location of the Application Site for your reference (see attached Figure 1).

Due to the urgency of the project, we would be much appreciated if you could provide the requested information by **17 July 2024**.

Should you have any queries, please do not hesitate to contact the undersigned at 3465 2811 (email: cchiu@ramboll.com) or Ms. Coco Ma at 3465 2807 (email: cocoma@ramboll.com). We sincerely seek your feedback on this matter. Thank you in advance for any assistance you can provide.

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

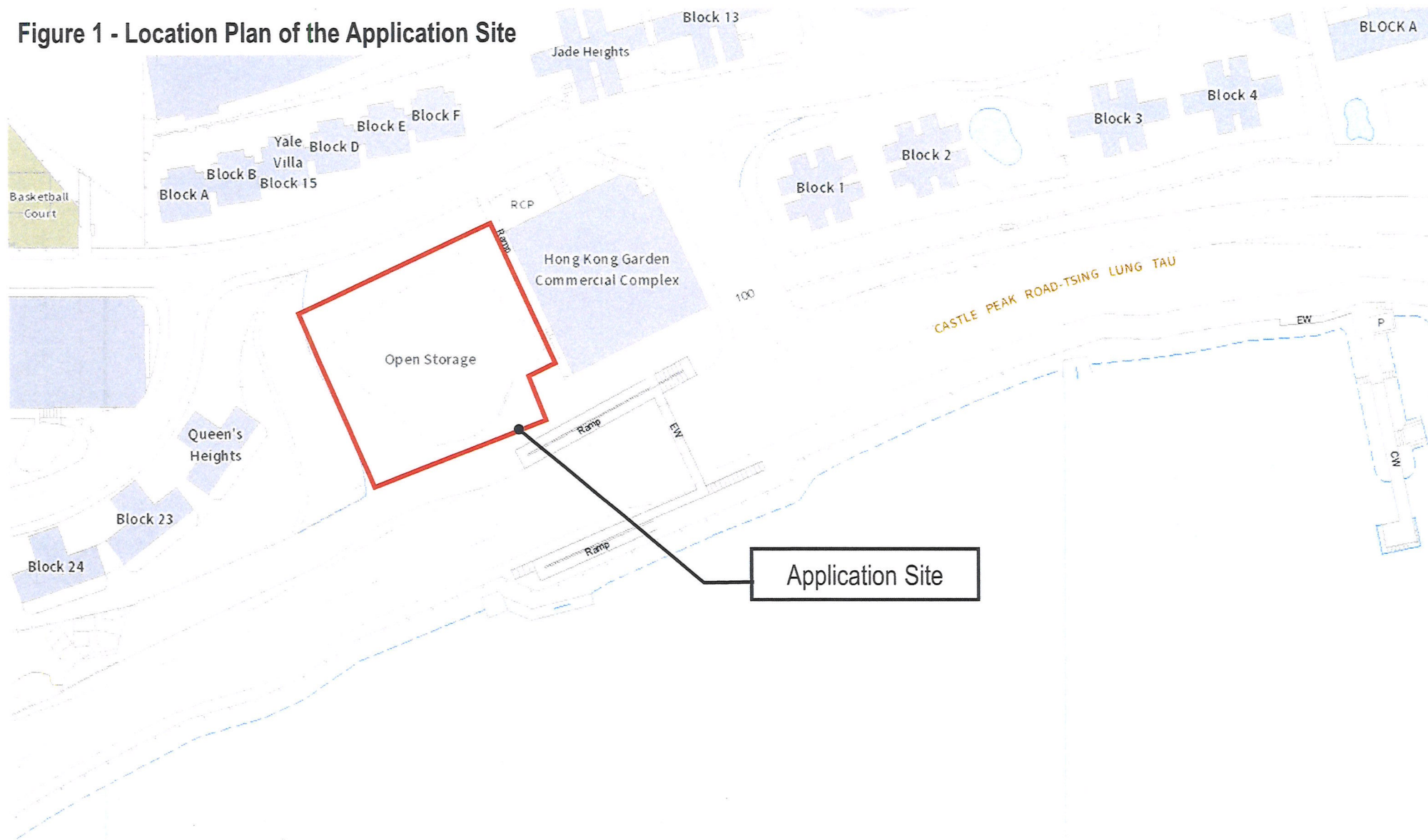


Calvin Chiu
Technical Director

Enclosure: Figure 1 - Location Plan of the Application Site

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Figure 1 - Location Plan of the Application Site



消防處
香港九龍尖沙咀東部康莊道1號
消防處總部大廈



FIRE SERVICES DEPARTMENT
FIRE SERVICES HEADQUARTERS BUILDING,
No.1 Hong Chong Road,
Tsim Sha Tsui East, Kowloon,
Hong Kong.

本處檔號 OUR REF. : (33) in FSD GR 6-5/4 R Pt. 54
來函檔號 YOUR REF. : CCGCPRAFEI00_0_0017L.24.docx
電子郵件 E-mail : hkfsdenq@hkfsd.gov.hk
圖文傳真 FAX NO. : 2988 1196
電話 TEL NO. : 2733 5848

RECEIVED
16 JUL 2024

BY:.....

12 July 2024

Ramboll Hong Kong Limited
21/F, BEA Harbour View Centre,
56 Gloucester Road,
Wanchai, Hong Kong.
(Attn: Mr. Calvin CHIU, Technical Director)

Dear Mr. CHIU,

**Land Contamination Assessment Study for a Proposed Social Welfare Facility and Permitted Residential Development at Lot 94, D.D. 388 And Adjoining Government Land, Castle Peak Road Tsing Lung Tau, New Territories
- Enquiry for Land Contamination Information
Request for Information of Dangerous Goods & Incident Records**

I refer to your letter of 26.6.2024 regarding the captioned request and reply below in response to your questions:-

Please be advised that neither records of dangerous goods license, fire incidents nor incidents of spillage / leakage of dangerous goods were found in connection with the given conditions of your request at the subject location.

If you have further questions, please feel free to contact the undersigned.

Yours sincerely,

Ramboll Hong Kong Ltd.

Project:	CCGCPRAFEI00_0_0024L.24		
Maconomy no.:	308001326		
Circulation:	Read	Action	
CC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MIC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Document Scan	<input type="checkbox"/>	Yes	No
Keep Hard Copy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(TSANG Chun-hei)
for Director of Fire Services

Environmental Protection Department
Environmental Compliance Division
Regional Office (West)
Tsuen Wan / North Lantau
8th floor, Tsuen Wan Government Offices,
38 Sai Lau Kok Road, Tsuen Wan, New Territories

By Fax (2411 3073) & Post

Dear Sir / Madam,

Land Contamination Assessment Study for a Proposed Social Welfare Facility and Permitted Residential Development at Lot 94, D.D. 388 And Adjoining Government Land, Castle Peak Road Tsing Lung Tau, New Territories - Enquiry for Land Contamination Information

We are conducting a Land Contamination Assessment Study for a Proposed Social Welfare Facility and Permitted Residential Development at Lot 94, D.D. 388 And Adjoining Government Land, Castle Peak Road Tsing Lung Tau, New Territories (see attached Figure 1). As required by the "Practice Guide for Investigation and Remediation of Contaminated Land" published by the Environmental Protection Department of the Government of HKSAR (EPD), information pertaining to the change of land uses/past activities/incidents/accidents at the Application Site are required as part of the vetting process.

Of particular interests is whether there are any registered chemical waste producers under your record in the Application Site, any waste disposal record, any accidental spillage record, any submission relating to land contamination assessment and any information you could provide which might be useful for our study. We enclosed herewith a site map showing the location of the Application Site for your reference.

Due to the urgency of the project, we would be much appreciated if you could provide the requested information by **17 July 2024**.

Should you have any queries, please do not hesitate to contact the undersigned at 3465 2811 (email: cchiu@ramboll.com) or Ms. Coco Ma at 3465 2807 (email: cocoma@ramboll.com). We sincerely seek your feedback on this matter. Thank you in advance for any assistance you can provide.

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

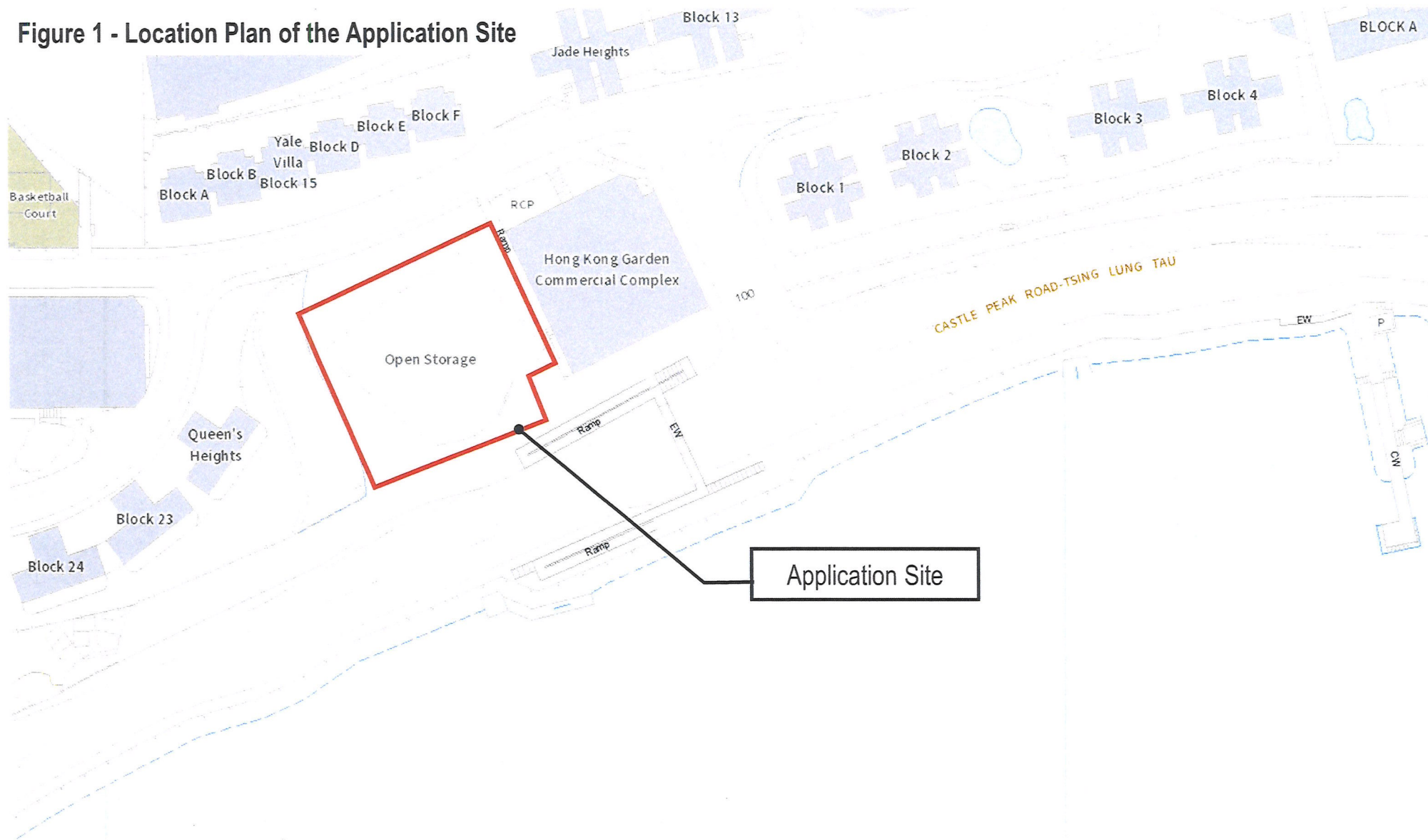


Calvin Chiu
Technical Director

Enclosure: Figure 1 - Location Plan of the Application Site

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Figure 1 - Location Plan of the Application Site



Mike Kwan

From: MIKEKWAN@ramboll.com
To: Calvin Chiu
Subject: RE: Request for Land Contamination Info - Proposed Social Welfare Facility in Castle Peak Road Tsing Lung Tau

From: wendywshung@epd.gov.hk <wendywshung@epd.gov.hk> On Behalf Of
WS_HUNG/EEB/HKSARG@Not_For_Reply_From_Internet.hksarg.hk
Sent: Tuesday, July 2, 2024 4:28 PM
To: Calvin Chiu <cchiu@ramboll.com>
Cc: tomlau@epd.gov.hk; Coco Ma <cocoma@ramboll.com>
Subject: Fw: Request for Land Contamination Info - Proposed Social Welfare Facility in Castle Peak Road Tsing Lung Tau

Some people who received this message don't often get email from ws_hung/eeb/hksarg@not_for_reply_from_internet.hksarg.hk.
[Learn why this is important](#)

Dear Calvin,

Please note there is no record of registered chemical waste producer registration or chemical spillage/leakage incident was found for the application site.

Regards,
Wendy Hung
RWG/EPD
2417 6123

Lands Department
Land Administration Office
District Lands Office, Tsuen Wan and Kwai Tsing
10th and 11th floors, Tsuen Wan Multi-storey Carpark Building,
174-208 Castle Peak Road, Tsuen Wan, New Territories

By Fax (2415 0703) & Post

Dear Sir / Madam,

Land Contamination Assessment Study for a Proposed Social Welfare Facility and Permitted Residential Development at Lot 94, D.D. 388 And Adjoining Government Land, Castle Peak Road Tsing Lung Tau, New Territories - Enquiry for Land Contamination Information

We are conducting a Land Contamination Assessment Study for a Proposed Social Welfare Facility and Permitted Residential Development at Lot 94, D.D. 388 And Adjoining Government Land, Castle Peak Road Tsing Lung Tau, New Territories (see attached Figure 1). As required by the "Practice Guide for Investigation and Remediation of Contaminated Land" published by the Environmental Protection Department of the Government of HKSAR (EPD), information pertaining to the change of land uses/past activities/incidents/accidents at the Application Site are required as part of the vetting process.

Of particular interests are information on spillage accidents, illegal/contaminating land uses or uncontrolled dumping uses, current and historical land use information, and any information relating to land contamination issues of the Application Site. We enclosed herewith a site map showing the location of the Application Site for your reference (see attached Figure 1).

Due to the urgency of the project, we would be much appreciated if you could provide the requested information by **17 July 2024**.

Should you have any queries, please do not hesitate to contact the undersigned at 3465 2811 (email: cchiu@ramboll.com) or Ms. Coco Ma at 3465 2807 (email: cocoma@ramboll.com). We sincerely seek your feedback on this matter. Thank you in advance for any assistance you can provide.

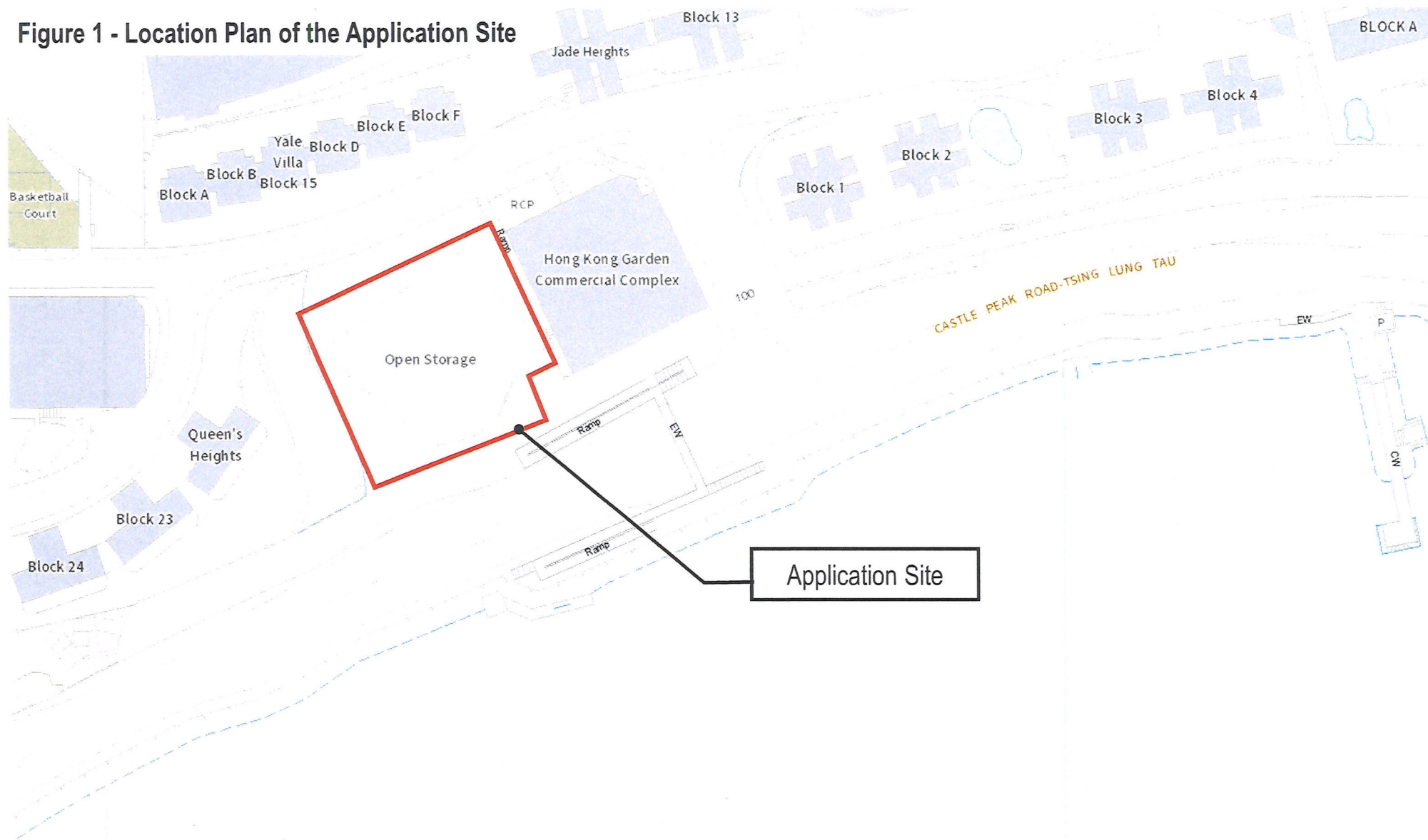
Yours faithfully,
For and on behalf of
Ramboll Hong Kong Limited



Calvin Chiu
Technical Director

Enclosure: Figure 1 - Location Plan of the Application Site
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Figure 1 - Location Plan of the Application Site



電話 Tel: 2402 1064
圖文傳真 Fax: 2415 0703 / 2412 0505
電郵地址 Email:
本署檔號 Our Ref: (49) in DLO/TWKT/TW 66/WLT/82 V
來函檔號 Your Ref: CCGCPRAFEI00_0_00019L.24

來函請註明本署檔號

Please quote our reference in your reply



地政總署
荃灣葵青地政處
DISTRICT LANDS OFFICE/
TSUEN WAN AND KWAI TSING
LANDS DEPARTMENT

我們矢志努力不懈，提供盡善盡美的土地行政服務。
We strive to achieve excellence in land administration.

新界荃灣青山公路 174-208 號荃灣多層停車場大廈 10 樓及 11 樓
10/F. & 11/F., Tsuen Wan Multi-storey Carpark Building,
174-208 Castle Peak Road, Tsuen Wan, New Territories.

網址 Website : www.landsd.gov.hk

Ramboll Hong Kong Limited
c/o 21/F, BEA Harbour View Centre,
56 Gloucester Road,
Wan Chai, Hong Kong
(Attn.: Mr. Calvin CHIU)

By Fax (3465 2899) and Post

5 July 2024

Dear Sirs,

**Land Contamination Assessment Study for a Proposed Residential Redevelopment
at Lot No. 94 in Demarcation District No. 388 and Adjoining Government Land,
Castle Peak Road – Tsing Lung Tau, New Territories
Enquiry for Land Contamination Information**

I refer to your letter dated 26 June 2024.

2. I am not in a position to provide the information you requested. You are advised to approach the lot owner for the information.

Yours faithfully,

(K H CHAN)

for District Lands Officer,
Tsuen Wan and Kwai Tsing

Planning Department
District Planning Branch
Metro District Planning Division
Tsuen Wan and West Kowloon District Planning Office
27/F, Tsuen Wan Government Offices,
38 Sai Lau Kok Road, Tsuen Wan, New Territories

By Fax (2412 5435) & Post

Dear Sir / Madam,

Land Contamination Assessment Study for a Proposed Social Welfare Facility and Permitted Residential Development at Lot 94, D.D. 388 And Adjoining Government Land, Castle Peak Road Tsing Lung Tau, New Territories - Enquiry for Land Contamination Information

We are conducting a Land Contamination Assessment Study for a Proposed Social Welfare Facility and Permitted Residential Development at Lot 94, D.D. 388 And Adjoining Government Land, Castle Peak Road Tsing Lung Tau, New Territories (see attached Figure 1). As required by the "Practice Guide for Investigation and Remediation of Contaminated Land" published by the Environmental Protection Department of the Government of HKSAR (EPD), information pertaining to the change of land uses/past activities/incidents/accidents at the Application Site are required as part of the vetting process.

Of particular interests are current and historical site information, any change on the land use, future land use and any information relating to land contamination issues of the Application Site. We enclosed herewith a site map showing the location of the Application Site for your reference (see attached Figure 1).

Due to the urgency of the project, we would be much appreciated if you could provide the requested information by **17 July 2024**.

Should you have any queries, please do not hesitate to contact the undersigned at 3465 2811 (email: cchiu@ramboll.com) or Ms. Coco Ma at 3465 2807 (email: cocoma@ramboll.com). We sincerely seek your feedback on this matter. Thank you in advance for any assistance you can provide.

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

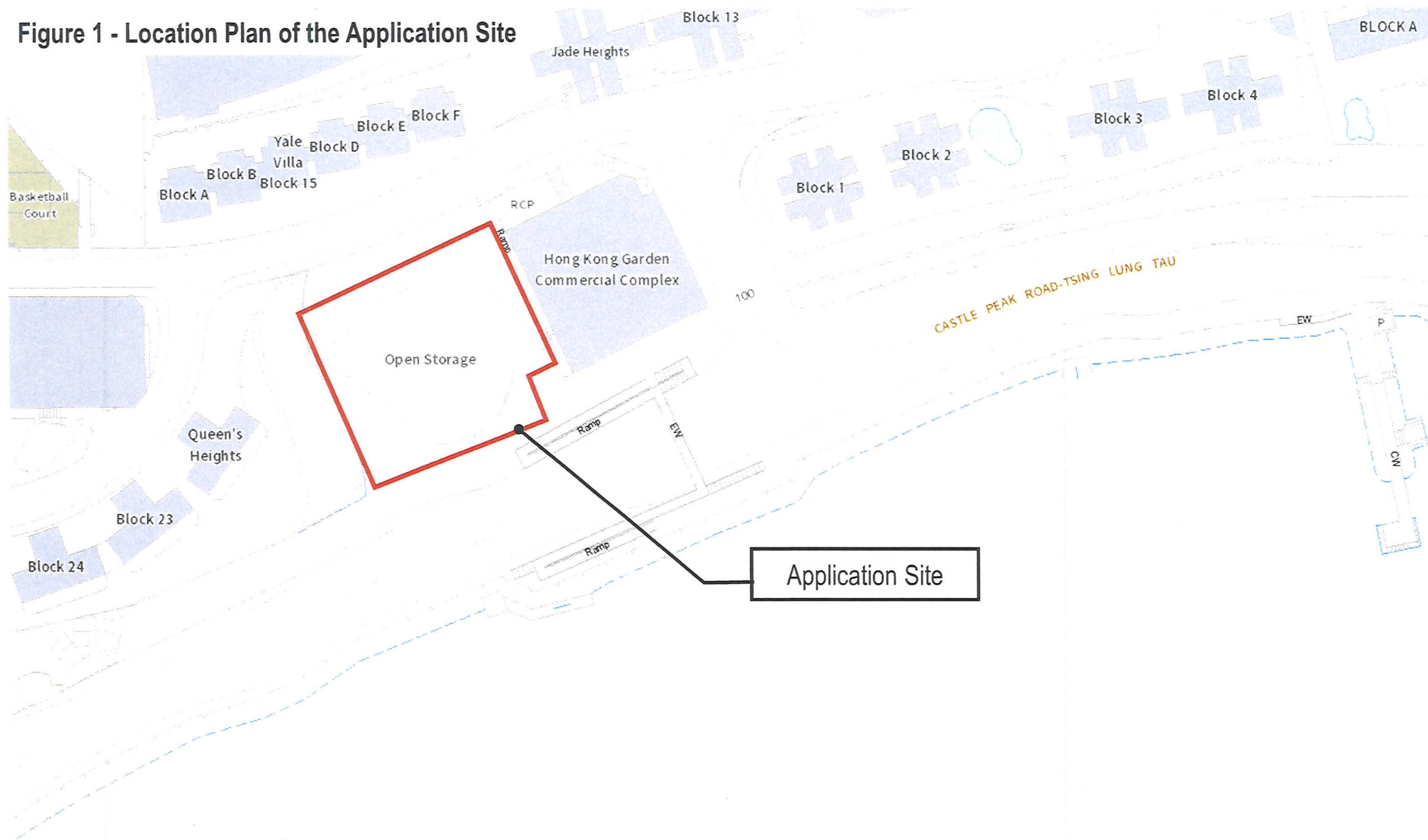


Calvin Chiu
Technical Director

Enclosure: Figure 1 - Location Plan of the Application Site

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Figure 1 - Location Plan of the Application Site



規 劃 署

荃灣及西九龍規劃處
新界荃灣西樓角路38號
荃灣政府合署27樓



Planning Department

Tsuen Wan & West Kowloon
District Planning Office
27/F, Tsuen Wan Government Offices,
38 Sai Lau Kok Road,
Tsuen Wan, N.T.

本函檔號 Your Reference CCGCPRAFEI00_0_0020L.24.docx
本署檔號 Our Reference D/TWW/641
電話號碼 Tel. No. : 2417 6686
傳真機號碼 Fax No. : 2412 5435

By Post and Fax (3465 2899)

Ramboll Hong Kong Limited
21/F, BEA Harbour View Centre, 56 Gloucester Road,
Wan Chai, Hong Kong
(Attn.: Mr. Calvin Chiu)

17 July 2024

Dear Sir/Madam,

**Land Contamination Assessment Study for a Proposed Social Welfare Facility
and Permitted Residential Development at Lot 94, D.D. 388 and
Adjoining Government Land, Castle Peak Road, Tsing Lung Tau, New Territories –
Enquiry for Land Contamination Information**

Reference is made to your letter dated 26.6.2024 on the subject matter.

The subject site (the Site) falls within an area zoned “Residential (Group B)” (“R(B)”) on the approved Tsuen Wan West Outline Zoning Plan (OZP) No. S/TWW/21. According to the Notes of the OZP for the “R(B)” zone, ‘Flat’ is always permitted while ‘Social Welfare Facility (not elsewhere specified)’ requires planning permission from the Town Planning Board (the Board).

The Site is the subject of a planning application (No. A/TWW/122) for proposed minor relaxation of plot ratio restriction for permitted residential development (flat), which was approved by the Metro Planning Committee of the Board on 12.8.2022. The Site was zoned “R(B)” on the draft Tsuen Wan West OZP No. S/TWW/1 gazetted on 3.2.1989 and the zoning of the Site has remained unchanged since then. According to our record, the Site is currently vacant.

For history of land contamination and land record of the Site, you may wish to contact the Environmental Protection Department and the Lands Department for further information.

Yours faithfully,

(Jacqueline CHAN)
for District Planning Officer/
Tsuen Wan and West Kowloon,
Planning Department

透過規劃工作，使香港成為一個宜居、具競爭力利可持續發展的亞洲國際都會
We plan to make Hong Kong a Liveable • Competitive • Sustainable ASIA'S WORLD CITY

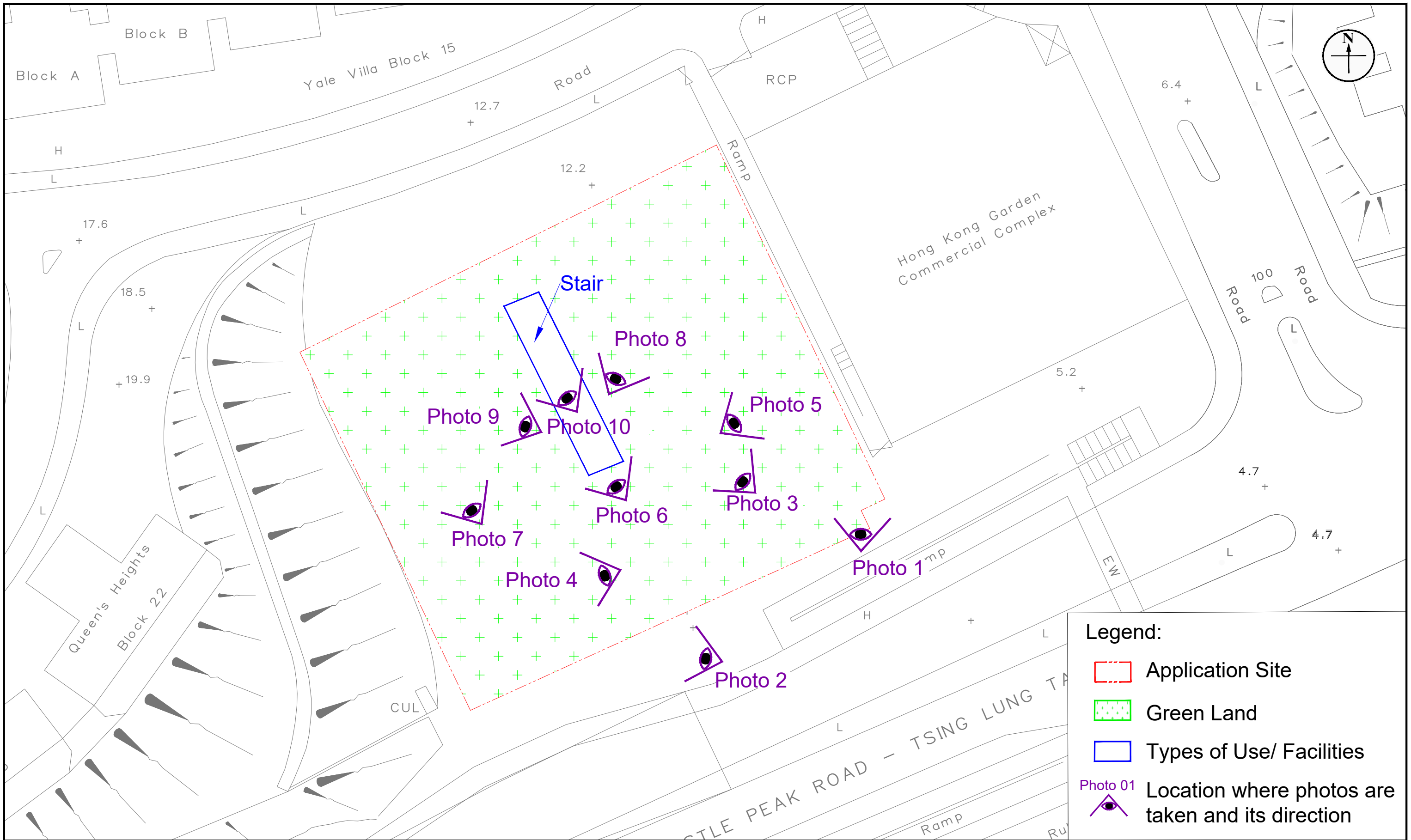
c.c.
DLO/TW&KT, LandsD
DEP

(Attn.: Mr. Koby KO)
(Attn.: Mr. Keith LAM)

(Fax. No.: 2415 0703)
(Fax. No.: 2591 0558)

MC/JC/jc

Appendix 6.3 Photo Records



Legend:

- Application Site
- Green Land
- Types of Use/ Facilities
- 👁 Photo 01 Location where photos are taken and its direction

Appendix: 6.3

Title: Site Survey Record Plan

Project: Proposed Minor Relaxation of Plot Ratio Restriction for Permitted Residential Development within “Residential (Group B)” Zone at Lot 94, D.D. 388 And Adjoining Government Land, Castle Peak Road - Tsing Lung Tau, New Territories



Drawn by: CM
 Checked by: CC
 Rev.: 1.0
 Date: Sep 2024

Photo Records



Photo 1: Vegetated Land

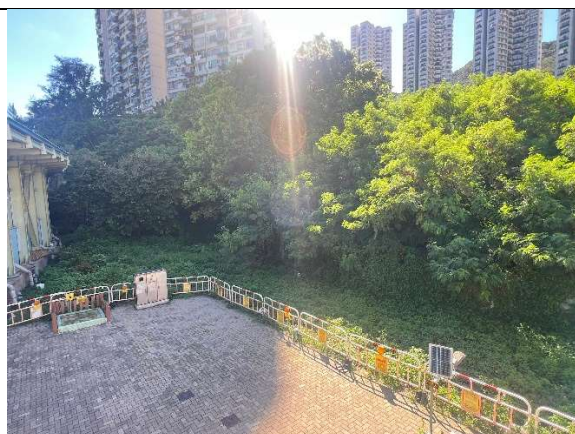


Photo 2: Vegetated Land



Photo 3: Vegetated Land



Photo 4: Vegetated Land



Photo 5: Vegetated Land



Photo 6: Vegetated Land



Photo 7: Vegetated Land



Photo 8: Vegetated Land



Photo 9: Vegetated Land



Photo 10: Vegetated Land