Appendix D:

Environmental Assessment (EA)

Prepared for

Urban Renewal Authority

Prepared by

Ramboll Hong Kong Limited

PROPOSED MINOR RELAXATION OF DOMESTIC PLOT RATIO AND BUILDING HEIGHT RESTRICTIONS FOR THE PERMITTED RESIDENTIAL DEVELOPMENT WITH COMMERCIAL / RETAIL USES OF THE URA MA TAU WAI ROAD/ LOK SHAN ROAD DEVELOPMENT PROJECT (KC-020), AND PROPOSED PUBLIC VEHICLE PARK

ENVIRONMENTAL ASSESSMENT REPORT

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1. INTRODUCTION

1.1 Background and Objectives

1.1.1 The Ma Tau Wai Road/ Lok Shan Road Development Project (KC-020) (the Project) was commenced by the Urban Renewal Authority (URA) on 9 August 2024 by way of a development project in accordance to Section 26 of the Urban Renewal Authority Ordinance (URAO). The Secretary for Development (SDEV) has authorised the URA to proceed with the Project without any amendment on 26 August 2025, the decision was subsequently gazetted on 5 September 2025.

1.1.2 Under the district-based planning approach, the Project was intended to be holistically planned and designed with the adjoining approved URA Kau Pui Lung Road / Chi Kiang Street Development Scheme (CBS-2:KC) to multiply the planning gains. The two projects may be submitted under the same land grant(s), with possibility of under different phases, for implementation.

1.1.3 To tally with the permissible domestic plot ratio (DPR) and building height restriction (BHR) of CBS:2-KC for holistic design and implementation, a Planning Application in accordance to Section 16 of the Town Planning Ordinance (S16 Planning Application) is required to seek Town Planning Board (TPB)'s approval on **minor relaxation of DPR restriction from 7.5 to 8.0** and **BHR from 120 mPD to 140 mPD** for the Application Site (i.e. the area zoned "R(A)" on the OZP within the Project boundary). It is also proposed to **include Public Vehicle Park (PVP) use** to facilitate design flexibility for accommodating the PVP parking spaces required by CBS-2KC[1] in the future combined development, if necessary.

1.1.4 The proposed relaxation in the S16 Planning Application can facilitate a more flexible layout across the two sites (i.e. the Application Site and CBS-2:KC) which are under same permissible BHR and PR controls upon this S16 approval. Nevertheless, despite that a combined development will be proposed, the URA undertakes that the portion of the future combined development within the Application Site would not exceed maximum DPR of 8.0 and total PR of 9.0.

1.1.5 This S16 Planning Application is a non-scheme-based submission. The notional design and indicative development parameters provided in the application are solely for illustration purpose and for conducting necessary technical assessments. Except for any planning condition(s) to be imposed, the design of the future development will not be bounded by the notional design submitted in the S16 Planning Application.

1.1.6 To support the S16 Planning Application, Ramboll Hong Kong Limited has been appointed by Urban Renewal Authority to prepare this Environmental Assessment (EA).

1.2 Application Site and its Environs

1.2.1 The Project is broadly bounded by Ma Tau Wai Road to the east, a back lane to the south, URA's Kau Pui Lung Road / Chi Kiang Street Development Scheme (CBS-2:KC) to the west and Lok Shan Road to the north。 The application site of the subject S16 Planning Application comprises only the area zoned "Residential (Group A)" ("R(A)")

[1] The inclusion of PVP does not necessarily mean there must be certain amount of PVP provision in the Project, but to avoid further S16 planning permission to be sought in case some PVP spaces as required in CBS-2:KC might need to be provided within the Project area due to site constraints and/or integrated design consideration under the combined site development. In any case, the total number of PVP spaces required by Transport Department (TD) in CBS-2:KC would be provided within the combined site of the Project and CBS-2:KC.

within the Project boundary, excluding the adjoining area shown as "Road" on the Draft Ma Tau Kok Outline Zoning Plan No. S/K10/31 (the Application Site) (**Figure 1** refers).

1.2.2 The Application Site, with anarea of about 1.566 sq.m. It comprises a row of private buildings at Nos. 324 – 354 Ma Tau Wai Road (even nos. only) and part of a government lane at the western boundary. Subject to site survey and detailed design, the Application Site with and area of about 1,566 sq.m. will be the net site area for Plot Ratio (PR) calculation. Please refer to **Figure 2** for the location of the Application Site and its environs.

1.3 Comparison of OZP Compliant Proposal and the Current S.16 Planning Proposal

1.3.1 A comparison between the OZP Compliant Proposal authorized by SDEV in August 2025 (OZP Compliant Proposal) and the Current Indicative Proposal of the S16 Planning Application (Current s16 Planning Proposal) is provided in **Table 1.1** below.

Table 1.1 Comparison of Development Parameters of the OZP Compliant Proposal and Current S16 Planning Proposal

Development Parameters	OZP Compliant Proposal (1) [A]	Current S16 Planning Proposal [B]	Difference [B]-[A] (% change)
Zoning (Under Approved Ma Tau Kok Outline Zoning Plan No. S/K10/30)	R(A)	R(A)	N/A
Site Area - Application Site Area (for PR Calculation) (m^2)	About 1,578	**About 1,566 (2)**	-12 (-0.8%)
Maximum Plot Ratio (PR) - Total PR - Domestic PR	9.0 7.5	**9.0** **8.0(3)**	No change +0.5 (+6.7%)
GFA Total GFA (m^2) Domestic GFA (m^2)	About 14,202 About 11,835	About 14,094(2) About 12,528 (2) (3)	-108 (-0.8%) +693 (+5.9%)
Max. BH (mPD)	120	**140**	+20 (+16.7%)

Remarks

(1) As per the notional design under the URA Ma Tau Wai Road/ Lok Shan Road Development Project (KC-020) authorized by SDEV in August 2025.

(2) According to the latest land boundary survey, the net site area is 1,566m^2 resulting to corresponding adjustment in total GFA, subject to agreement with LandsD in the land grant application stage.

(3) The domestic and non-domestic PR/GFA are for illustrative purpose only. To allow flexibility and optimum use of development potential, development at the Application Site is subject to a maximum domestic PR and total PR. The actual domestic and non-domestic PRs and GFAs would be worked out at detailed design stage.

1.4 Notional Design of the Project

1.4.1 This EA is prepared based on the Indicative Development Parameters provided in **Table 1.2** and the notional design of the Project provided in **Appendix 1** (the Notional Design).

1.4.2 The Project is tentatively scheduled for completion by year 2033/34.

Table 1.2 Indicative Development Parameters under Notional Design

Zoning (Under Approved Ma Tau Kok Outline Zoning Plan No. S/K10/30)	R(A)
Application Area (for PR Calculation) (m^2)	~1,566
Number of Residential Tower*	1
Number of Residential Units*	About 279
Number of Storeys*	About 31
Number of Podium Storeys*	About 3
Number of Basement Levels*	About 3
Height of Notional Design (mPD)	140
Tentative Completion Year	Year 2033 / 2034

*Remarks: * Notional Design subject to detailed design and changes.*

1.5 Appraisal of Environmental Impact

Noise

1.5.1 There is no aboveground railway system in the vicinity (i.e. 300m) of the Application Site. Therefore, no railway noise impact is anticipated on the Project.

1.5.2 Assessment of potential noise impact from major carriageways such as East Kowloon Corridor, To Kwa Wan Road and Ma Tau Wai Road on the Project were conducted. Practical noise mitigation measures would be recommended where required and discussed in **Section 2**.

1.5.3 A desktop review and site survey were conducted to identify whether there are any industrial activities in the vicinity (i.e. 300m) of the Application Site, and this will be discussed in **Section 3**.

1.5.4 Recommended Pollution Control Clause for Construction Contracts published by Environmental Protection Department (i.e. Technical Memorandum on Noise from Construction Work other than Percussive Pilling (GW-TM) and Practice Note for Professional Persons on Minimizing Noise from Construction Activities (ProPECC PN 1/24)) would be implemented during the construction phase of the Project. Good site practices should be adopted as far as practicable to minimize the noise impact of construction activities. It is expected that there would not be any adverse construction phase environmental impact upon the nearby sensitive uses.

Waste

1.5.5 The potential waste management practices in connection with the construction and operation of the Project will be discussed in **Section 4**. Waste management practices

and mitigation measures will be recommended in order to alleviate the impacts, where necessary.

Water Supply

1.5.6 The water supply impact including fresh water and flushing water to existing supply facilities will be discussed in **Section 5**. Mitigation measures to alleviate the adverse water supply impact (if any), where necessary.

2. ROAD TRAFFIC NOISE IMPACT ASSESSMENT

2.1 Introduction

2.1.1 This section is prepared to address road traffic noise impact on the noise sensitive uses based on the Notional Design for the subject S16 Planning Application and to recommend mitigation measures where practicable to attenuate the impact.

2.2 Environmental Legislation, Policies, Standards and Criteria and other Relevant Guideline

2.2.1 The following practice notes and guidelines provide the standards and guidelines for mitigation of traffic noise impacts:

- Hong Kong Planning Standard and Guidelines (HKPSG)
- ProPECC PN4/23 Practice Note for the Planning of Residential Developments against Road Traffic Noise
- ProPECC PN5/23 Application of Innovative Noise Mitigation Designs in Planning Private Residential Developments against Road Traffic Noise Impact

Hong Kong Planning Standard and Guidelines (HKPSG)

2.2.2 Noise standards are recommended in the Hong Kong Planning Standards and Guidelines (HKPSG) for planning against noise impact from sources such as road traffic, railway, and aircraft etc.

2.2.3 The Project includes domestic dwellings at the proposed residential tower, as well as clubhouse and retail uses housed in podium. The podium will be provided with centralised air conditioning system so that the used inside would not rely on opened window for ventilation purpose. Glazing of at least 8mm thickness will be provided for insulation purpose.

2.2.4 Domestic dwellings will rely on opened window for ventilation. According to the guidelines, the maximum noise level from road traffic, measured in terms of $L_{10\ (1\text{-}hr)}$ is recommended to be 70 dB(A) at typical facades of new dwellings.

ProPECC PN4/23 Practice Note for the Planning of Residential Developments against Road Traffic Noise

2.2.5 ProPECC PN4/23 issued by the Environmental Protection Department, focuses on the planning of residential developments in relation to road traffic noise. The practice note provides guidance and standards for assessing compliance with road traffic noise standards and the Hong Kong Planning Standards and Guidelines (HKPSG). It emphasizes the importance of conducting a Noise Impact Assessment (RTNIA) to ensure compliance with these standards. The note also outlines various mitigation measures that can be incorporated into the design of residential developments to address road traffic noise impacts.

ProPECC PN5/23 Application of Innovative Noise Mitigation Designs in Planning Private Residential Developments against Road Traffic Noise Impact

2.2.6 ProPECC PN5/23 issued by the Environmental Protection Department, aims to evaluate the noise reduction performance of Innovative Noise Mitigation Designs (INMDs). The purpose of this practice note is to provide technical information for designing and implementing Acoustic Windows and Enhanced Acoustic Balconies to mitigate road traffic noise impacts in private residential developments in Hong Kong.

2.2.7 The practice note emphasizes the importance of evaluating the effectiveness of these INMDs in reducing noise levels and ensuring a more comfortable living environment for residents. It provides guidelines and standards for assessing the noise reduction performance of Acoustic Windows and Enhanced Acoustic Balconies, as well as recommendations for their proper design and application.

2.2.8 INMDs are considered as one of the mitigation measures for addressing road traffic noise in the Project. Detailed discussions are provided in **Section 2.7.**

2.3 Assessment Methodology

2.3.1 The methodology involves the prediction of future noise impacts on Noise Sensitive Receivers (NSRs) arising from traffic flows on existing and future road carriageways in the vicinity of the Application Site.

2.3.2 The U.K. Department of Transport's procedure "Calculation of Road Traffic Noise" was applied to predict the hourly L_{10} noise level generated from road traffic at selected representative facades (NSRs) of the Notional Design. The predicted noise levels were then compared with the HKPSG noise criterion for assessing the impact.

2.3.3 Based on the tentative completion year of the development (Year 2033), traffic forecast for the Year 2048 on the road carriageways in the vicinity of the Project, which has the maximum traffic projection within 15 years from the completion of the Project, was provided by Aurecon Hong Kong Limited (the project traffic consultant) for prediction of the worst-case traffic noise impact. The projected traffic flows, vehicle composition of the road carriageways provided by the project traffic consultant and endorsement from Transport Department (TD) are shown in **Appendix 2.**

2.3.4 As shown in **Appendix 2,** the traffic flow and / or % of heavy vehicle of some roads is higher in PM peak flow (i.e., Road 12, 15, 16, 17, 19, 20, 21, 25, 30, 31, 32, 33, 36, 37, 44, 47, 50, 84, 86, 88, 89, 90, 91, 93, 109, 112, 130, 131, 132, 133, 140, 141, 142, 143, 146, 147, 148, 149, 150, 151, 152, 155 ,156, 157, 165, 166, 167, 168, 170, 176, 178, 181, 185, 236, 237, 240). Therefore, both AM and PM peak scenarios are assessed in this study.

2.4 Road Characteristics

2.4.1 As checked with the project traffic consultant, all roads excepted East Kowloon Corridor are with speed limit of 50km/hr, while East Kowloon Corridor are with speed limit of 70km/hr. The speed limit of road links is shown in **Appendix 2**.

2.4.2 Existing low noise road surface information was obtained from Highways Department. In this assessment, part of East Kowloon Corridor (section bisecting San Lau Street and Ma Hang Chung Road) are classified as low noise road surface, while other roads are impervious as shown in **Appendix 3**.

2.5 Noise Sensitive Receivers

2.5.1 Residential dwellings with openable windows / doors for prescribed ventilation purposed, are selected as noise sensitive receivers (NSRs). The assessment points of NSRs are taken 1.2m above the floors and 1m away from the facades of openable windows (which would be used for ventilation purpose). Locations of Planned NSRs for the road traffic noise impact assessment are shown in **Figure 3**.

2.6 Assessment Results under Base-case Scenario

2.6.1 According to the results in **Appendix 4**, noise exceedances are found at residential units under the base-case scenario. An overall compliance rate of 44% resulted with 155 flats with traffic noise exceedance in AM base-case scenario. Maximum predicted noise level is 79 dB(A), which exceeds the 70 dB(A) noise criterion as listed in HKPSG for residential units. The summary for base-case scenario assessment result is shown in **Table 2.1**. Result in base-case scenario indicated that AM case is a worst-case scenario.

2.6.2 Hence, noise mitigation measures are proposed to further mitigate the adverse noise nuisances to an acceptable noise level.

Table 2.1 Road Traffic Noise Impact Assessment Results of Residential Blocks in Base Scenario

Total Number of Flat Units	279
Total Number of Exceedances	155
Predicted Maximum Noise Level, dB(A)	79
Percentage of Compliance	44%

2.7 Consideration of Noise Mitigation Measures for Project

2.7.1 In consideration of the above, noise mitigation measures for domestic uses are duly considered below.

a) Use of Noise Canopies

2.7.2 As the residential unit facing Ma Tau Wai Road is heavily affected by road traffic noise from Ma Tau Wai Road, one noise canopy is proposed on edge of podium to mitigate road traffic noise at low zone due to Ma Tau Wai Road. Location of noise canopies is shown in **Figure 4.**

b) Acoustic Window (Baffle Type)

2.7.3 Innovative noise mitigation measures are being explored in recent years. According to EPD's website regarding innovative noise mitigation design and measures (http://www.epd.gov.hk/epd/Innovative/greeny/eng/index.html), different balconies and special design window systems have been implemented in public rental housing, private residential and hostel developments.

2.7.4 The baffle type acoustic window refers to the type of window that has a sliding glass panel behind an outer window, both readily openable, for creating an air gap for the supply of fresh air with noise mitigation effect. It comprises two glazing, including the outer window system with side hung openable window and the inner sliding panel.

2.7.5 The design can enable natural ventilation through the gap between the outer façade and inner sliding panel on one hand (although extent of natural ventilation may not be inferior to the case without the sliding panel behind) and prevent most noise from entering indoor environment on the other hand. To comply with the relevant natural ventilation requirement under the Building (Planning) Regulations (B(P)Rs) and its sub-regulations, the inner sliding glass panel needs to be slide behind the opened outer

window/ door for creating an air gap for the supply of fresh air with noise mitigation effect. According to the Practice Note on Lighting and Ventilation Requirements – Performance-based Approach (App-130) issued by Buildings Department, for optimum performance with the inner sliding panel in a closed position, the length of overlapping ("the length of overlapping" interprets as "the length of air gap" in APP-130) should not be less than 100mm and the width should be between 100mm to 175mm. The length and width of the air gap of the proposed Acoustic Window (Baffle Type) meet these conditions.

2.7.6 According to ProPECC PN 5/23, there are configuration of AW(BT) with opening of around 0.522 m^2 (600mm x 870mm) with the referenced room area of 8m^2 and with opening of around 1.125 m^2 (750mm x 1500mm) with the referenced room area of 18m^2, inner sliding door with gap width of 100mm to 175mm and overlapping length of at least 100mm. Noise reduction of 6 dB(A) (for 8m^2 room) and 7 dB(A) (for 18m^2 room) are achievable. 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). Moreover, additional 1 dB(A) reduction can offer for tilting the AW(BT) with not less than 30° horizontal incident angles to the dominant line source. Altogether, 7.5 dB(A) (for 8m^2 room) and 8.5 dB(A) (for 18m^2 room) are assumed as the maximum noise reduction for habitable room using AW(BT) in ProPECC 5/23.

2.7.7 In this study, the design of the Acoustic Window (Baffle Type) would make reference to the enhanced acoustic windows (baffle type) adopted in ProPECC 5/23 with referenced room area of 8m^2 and with addition of SAM.

2.7.8 The design parameter adopted for the Acoustic Window (Baffle Type) for the Notional Design and the associated acoustic reduction are presented in **Table 2.2** below.

2.7.9 The indicative design of Enhanced Acoustic Window (Baffle Type) is shown in **Appendix 5**.

Table 2.2 Design Parameters of Enhanced Acoustic Window (Baffle Type)

Design Parameters	**Enhanced Acoustic Window (Baffle Type)**		
Room Type	Bedroom		
No. of Outer Opening	1		
Outer Window Opening Area (sqm)	0.522		
Air gap width (mm)	100		
Overlapping length (mm)	100		
SAM at window frame	Yes		
Degree to dominant noise source (dg)	0		
Minimum room area (sqm)	6.8 (For 3/F to 11/F)	5.8 (For 12/F to 22/F)	4.2 (For 23/F to 33/F)
Sound Attenuation (dB(A))	6.7 - 7.5	5.5 - 7.5	4.7 - 7.5

2.7.10 Furthermore, based on consultant's experience of other projects, the performance of sound attenuation is affected by the various design parameters including the air gap width, overlapping area and the area of outer window opening. It is understood that the room size will affect the sound attenuation performance of the proposed acoustic window (baffle type), therefore, further adjustment is needed by using the equation "10 x log (R_{ref}/R_{design})", where R_{ref} and R_{design} refer to the area of the room of the reference case and the Notional Design respectively. Room area adjustment is shown in **Appendix 6**.

2.7.11 With increase of window outer opening area, the sound energy entering the room via the outer opening is increased. The drop in sound attenuation (relative noise reduction (RNR)) due to increment of sound entering the room is evaluated using the equation "10 x log (S_{ref}/S_{design})", where S_{ref} and S_{design} refer to the area of the window outer opening area (OOA) of the reference case of acoustic window and the Notional Design respectively. As the proposed window outer opening area in Notional Design are same as / smaller than that of reference smaller than that of the reference case, it is expected that the sound energy entering the room via the outer opening is decreased, no OOA adjustment are required.

2.7.12 In addition, for conservative approach, the corrected noise level would not be greater than the reference case even the room size of the Notional Design is larger than the reference case or / and the window outer opening area is smaller than the reference case. The room size comparison between the Notional Design and the reference case is shown in **Appendix 6**.

c) Enhanced Acoustic Balcony (Baffle Type)

2.7.13 The design concept and mechanism are basically similar to the acoustic window (Baffle type) as mentioned above, i.e. there is a baffle panel sitting behind the balcony door. The baffle type acoustic balcony refers to the type of door that has an inner sliding glass panel behind an outer window, both readily openable, for creating an air gap for the supply of fresh air with noise mitigation effect. It comprises two glazing, including the outer window system with openable door and the inner sliding panel.

2.7.14 "Application of Innovative Noise Mitigation Designs in Planning Private Residential Developments against Road Traffic Noise Impact" (ProPECC PN 5/23) issued by EPD is referred in this planning application. For EAB(BT) with solid parapet at the front (and 70% permeability fence on the side), sound absorptive material (SAM) applied at balcony ceiling, and inner sliding door with gap width of 100mm and overlapping length of at least 100mm, a noise reduction of 8 dB(A) and 9 dB(A) are achievable with the referenced room area of 14m^2 and 18 m^2 respectively. 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) reduction. Moreover, additional 3 dB(A) reduction can offer for tilting the EAB(BT) with not less than 30° horizontal incident angle to the dominant line source. Altogether, 12.5 dB(A) is assumed as the maximum noise reduction and adopted in this study for habitable room using EAB(BT).

2.7.15 In this study, the design of the Enhanced Acoustic Balcony (Baffle Type) would make reference to the enhanced acoustic balcony (baffle type) adopted in ProPECC 5/23 with referenced room area of 14m^2.

2.7.16 The design parameter adopted for the Enhanced Acoustic Balcony (Baffle Type) for the Notional Design and the associated acoustic reduction are presented in **Table 2.3** below.

Table 2.3 Design Parameters of Enhanced Acoustic Balcony (Baffle Type)

Design Parameters	Enhanced Acoustic Balcony (Baffle Type)
Room Type	Living / Dining Room
No. of Outer Opening	1
Outer Window Opening Area (sqm)	2.54
Air gap width (mm)	100
Overlapping length (mm)	100

SAM at window frame	No		
Degree to dominant noise source (dg)	0		
Minimum room area(sqm)	10.5 (For 3/F to 11/F)	9.5 (For 12/F to 22/F)	9 (For 23/F to 33/F)
Sound Attenuation (dB(A))	6.8 - 8	6.3 - 8	6.1 - 8

2.7.17 With increase of balcony outer opening area, the sound energy entering the room via the outer opening is increased. The drop in sound attenuation (relative noise reduction (RNR)) due to increment of sound entering the room is evaluated using the equation "10 x log (S_{ref}/S_{design})", where S_{ref} and S_{design} refer to the area of the outer opening area (OOA) of the reference case of acoustic balcony and OOA of balcony in the Notional Design respectively. As the proposed balcony outer opening area in Notional Design is same as / smaller than that of the reference case, it is expected that the sound energy entering the room via the outer opening is decreased, no OOA adjustment are required.

2.7.18 Indicative design of the acoustic balcony is shown in **Appendix 5**.

2.8 Schedule of Noise Mitigation Measures for Notional Design

2.8.1 In consideration of the above, noise mitigation measures for domestic uses are duly considered below.

2.8.2 Schedules of noise mitigation measures is respectively tabulated below for reference. Locations of the proposed noise mitigation measures are shown in **Figure 4** and **Appendix 7**.

Table 2.4 Schedule of Noise Mitigation Measures

Tower	NSR ID	Room	Floor (/F)	Proposed Noise Mitigation Measures
Tower 1	B1-01	BR	3-33	Enhanced Acoustic Window (Baffle Type), noise canopy
	B1-02	BR	3-33	Enhanced Acoustic Window (Baffle Type), noise canopy
	B1-03	Liv	4-33	Enhanced Acoustic Balcony (Baffle Type), noise canopy
	B1-04	Liv	4-33	Enhanced Acoustic Balcony (Baffle Type), noise canopy
	B1-05	BR	4-33	Enhanced Acoustic Window (Baffle Type), noise canopy
	B1-06	BR	4-33	Enhanced Acoustic Window (Baffle Type), noise canopy
	B1-07	BR	4-33	Enhanced Acoustic Window (Baffle Type), noise canopy
	B1-08	Liv	4-33	Enhanced Acoustic Balcony (Baffle Type), noise canopy
	B1-09	BR	4-33	Enhanced Acoustic Window (Baffle Type), noise canopy
	B1-10	Liv	4-33	Enhanced Acoustic Balcony (Baffle Type), noise canopy
	B1-11	BR	4-33	Enhanced Acoustic Window (Baffle Type), noise canopy

	B1-12	BR	3-33	Enhanced Acoustic Window (Baffle Type), noise canopy

BR – Bedroom
Liv – Living / Dining Room
Residential floor starts from 3/F

2.9 Assessment Results under Mitigated Scenario

2.9.1 The predicted traffic noise impacts on the selected NSRs based on the noise mitigation measures discussed above were quantified.

2.9.2 The result in **Appendix 7** showed the road traffic noise compliance is estimated to be 96%, with maximum traffic noise level of 71dB(A) as compared to the maximum noise criteria of 70dB(A) stipulated in Table 4.1 of the Chapter 9 of the HKPSG road traffic noise standard. Hence, it is concluded that the subject S16 Planning Application will not be subjected to adverse traffic noise impact.

3. FIXED NOISE SOURCE IMPACT ASSESSMENT

3.1 Introduction

3.1.1 The aim of this study is to assess potential noise impacts arising from nearby fixed noise source of the industrial buildings and activities on the Project. Practicable noise mitigation measures would be recommended, where necessary.

3.2 Environmental Legislation, Policies, Standards and Criteria and other Relevant Guideline

3.2.1 The following practice notes and guidelines provide the standards:

- Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites
- ProPECC PN 3/23 Application of Sound Insulation in Residential Buildings to Reduce Noise Transmission Between Units

Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites

3.2.2 In accordance with the Technical Memorandum for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites (herein referred as TM), the area sensitive rating (ASR) depends on the location of NSR (e.g. whether within urban or rural area) and the degree of impact that the Influencing Factors (IFs) have on the NSRs. Any industrial area, major road or the area within the boundary of Hong Kong International Airport shall be considered to be IFs.

3.2.3 The Project is situated at an area of diverse development including a mixture of greenery area, industrial activities and residential premises. As extracted in fixed plant noise audit report (Batch 1 – To Kwa Wan Station (TKW)) under Shatin to Central Link – Tai Wai to Hung Hom Section [SCL (TAW – HUH)] and Stabling Sidings at Hung Hom Freight Yard [SCL (HHS)], ASR of C is assigned to 352-354 Ma Tau Wai Road which is now the northern part of Project as extracted in **Appendix 9**. The type of the area where the Project located is considered to be "Type (iii) Urban area" due to its area nature. With the reference to the traffic census of Year 2023 published by Transport Department (TD), the Ma Tau Kok Road (from Ma Tau Kok Road & Ma Tau Chung Road to Farm Road) is 30870 vehicles per day (Station 4016), which is over 30,000 vehicles per day. Although the Ma Tau Kok Road (Station 4016) is considered as IF, it is located far away from the NSRs, thus, the dominant feature of the noise climate at the Application Site appears to be the traffic noise from Ma Tau Wai Road (from Chi Kiang Street and Tin Kwong Road) and East Kowloon Corridor. Under Type of Area (iii), NSRs which are indirectly affected from the IF (i.e. Ma Tau Wai Road), an ASR of C is therefore assigned.

3.2.4 The Acceptable Noise Levels (ANLs), in L_{eq}(30mins) dB(A), regarding to the ASR for both daytime and night-time are shown in **Table 3.1**.

Table 3.1 Acceptable Noise Level (ANL), dB(A)

Area Sensitivity Rating (ASR) In Relevant Time Periods	Acceptable Noise Level (ANL), L_{eq}(30mins) dB(A)
	ASR C
Day (0700 to 1900 hours)	70
Evening (1900 to 2300 hours)	

Night (2300 to 0700 hours)	60

ProPECC PN 3/23 Application of Sound Insulation in Residential Buildings to Reduce Noise Transmission Between Units

ProPECC PN3/23 depicts sound insulation performance of building partition elements in and between all types of residential units and offers technical details on how to design and implement sound insulation measures for partition walls and floors in residential buildings. The purpose is to enhance privacy protection, improve the indoor sound environment, and reduce noise transmission between units.

3.3 Representative Noise Sensitive Receivers

3.3.1 Representative NSRs of residential towers nearest to the identified industrial noise sources have been selected for the assessment. The NSRs are located at 1m away from the façade of openable window for ventilation. **Figure 5** shown the locations of the representative NSRs for this assessment.

3.4 Fixed Noise Sources

3.4.1 According to the desktop study and site survey conducted in June 2025, potential fixed noise sources in vicinity of the Project are summarized in **Table 3.2** below and locations indicated in **Figure 5**. Some of the identified fixed noise sources located at roof or inaccessible location, direct noise measurement is not possible and relevant details of the identified noise sources are not available at this stage. Since direct measurement is not practicable possible, the noise strength of the identified noise sources has been assumed based on reference equipment catalogue model of similar scale or from reference report. Tonality correction of 3 dB(A) is adopted if SWL from reference catalogue is adopted. The reference catalogue is shown in **Appendix 10**. The reference reports are extracted in **Appendix 12**.

Table 3.2 Potential Fixed Noise Sources

ID	Location	Potential Noise Source	Sound Emission Data for Assessment	Remark
V01 to V19	BMW House	VRV Outdoor Units (19 nos on Eastern roof)	Reference from EA-CBS02 Report[1] to typical VRV outdoor unit Daikin RUXYQ14BA and RUXYQ22BA. Tonality correction of 3 dB(A) is adopted. SWL adopted in this assessment are as follows. V01 to V08, V13 to V16: 68 + 3 = **71.0 dB(A)** V09 to V12: 64 + 3 = **67.0 dB(A)**	No night-time operation (23:00 – 07:00) during site visit.

ID	Location	Potential Noise Source	Sound Emission Data for Assessment	Remark
G01	Gainfall Centre	Car Washing	Reference from EA-HSK Report[2] , relevant SPL of similar car washing calculated on the on-site measurement is 69.9 dB(A) at 5m measurement distance. Tonality correction of 3 dB(A) is adopted. SWL adopted in this assessment are as follows. 91.9 = 3 = **94.9 dB(A)**	24-hours operation for all day.
C01 to C05	To Kwa Wan Complex and Government Offices	Chiller and VRV Outdoor Units	Reference from EA-CBS02 Report[1] to noise measurement and typical VRV outdoor unit Daikin RHXYQ16QY1 Tonality correction of 3 dB(A) is adopted for C05 with reference to equipment catalogue. SWL adopted in this assessment are as follows. C01 to C04: **87.9 dB(A)** C05: 68 + 3 = **71.0 dB(A)**	No night-time operation (23:00 – 07:00) during site visit.
A01 to A07	To Kwa Wan Market	Chiller and VRV Outdoor Units	Reference from EA-CBS02 Report[1] to noise measurement and typical VRV outdoor unit Daikin RJZQ8AAY and RXQ12ARY6 and Chiller Airedale UCUR100 and Carrier 30RBS045. Tonality correction of 3 dB(A) is adopted for A01, A02, A03, A06 and A07 with reference to equipment catalogue. SWL adopted in this assessment are as follows. A01, A02, A06 and A07: 81 + 3 = **84.0 dB(A)** A03: 68 + 3 = **71.0 dB(A)** A04: **73.4 dB(A)** A05: **74.4 dB(A)**	No night-time operation (23:00 – 07:00).

ID	Location	Potential Noise Source	Sound Emission Data for Assessment	Remark
B01 to B04	O' Hotel	VRV Outdoor Units (6 nos on Southern upper roof and 10 nos on lower roof)	Reference to typical VRV outdoor unit Daikin RUXYQ14BA. Tonality correction of 3 dB(A) is adopted. SWL adopted in this assessment are as follows. B01: 6 nos of VRV 64 + 3 + 10 x log (6) = **71.8 dB(A)**	24-hours operation for all day. Line of sight of B02 to B04 (10 nos VRV Outdoor Units) on lower roof are blocked by O' Hotel (building itself). So B02 to B04 is not calculated in fixed noise source impact assessment.
D01 to D02	iClub To Kwa Wan Hotel	Cooling Tower (2 nos on roof)	SWL information was made reference to cooling tower Ryowo FC-250 of 86.7 dB(A). Tonality correction of 3 dB(A) is adopted. SWL adopted in this assessment are as follows. D01, D02: 86.7 + 3 = **89.7 dB(A)**	24-hours operation for all day.
E01 to E17	To Kwa Wan MTR Station Exit D	Ventilation Louvre and Cooling Tower	Reference from FNSAR–TKW [3], maximum allowable SWLs for fixed plant noise at the location at both daytime & evening time and night time are adopted and extracted in **Appendix 9**.	Operation follows service hour of MTR. Both day & evening time and night time operation is adopted in fixed noise sources impact assessment.
F01 to F14	Ventilation Shaft (next to To Kwa Wan Market)	Ventilation Louvre	Reference from FNSAR–TKW [3], maximum allowable SWLs for fixed plant noise at the location at both daytime & evening time and night time are adopted and extracted in **Appendix 9**.	Operation follows service hour of MTR. Both day & evening time and night time operation is adopted in fixed noise sources impact assessment.
H01 to H06	To Kwa Wan MTR Station Exit A	Ventilation Louvre	Reference from FNSAR–TKW [3], maximum allowable SWLs for fixed plant noise at the location at both daytime & evening time and night time are adopted and extracted in **Appendix 9**.	Operation follows service hour of MTR. Both day & evening time and night time operation is adopted in fixed noise sources impact assessment.
J01 to J03	Full Moon (Ming Yuet) Building	VRV Outdoor Units (13 nos on Northern lower roof)	No line of sight to the Application Site. Thus, this noise source is not calculated in the fixed noise source impact assessment.	No night-time operation (23:00 – 07:00). Line of sight of J01 to J03 (13 nos VRV Outdoor Units) on lower roof are blocked by Cheung Wah Building which located between noise source and Application Site and adjacent to the noise source. So J01 to J03 is not calculated in fixed noise source impact assessment.

Notes:

[1] SWL information are derived from noise measurement and reference catalogue of fixed noise sources in Environmental Assessment for CBS-2:KC Development Scheme and the study area of the reference project is near to the study area of the Application Site (ref: **Appendix 12**).

[2] SWL information of car washing are reference in Environment Assessment Report for PRH Sites in Planning Areas 8 (Part) and 10 of Hung Shui Kiu / Ha Tsuen New Development Area (HSK/HT NDA). (ref.: **Appendix 12**).

[3] SWL information of tunnel / station ventilation lourve (SVL / TVL) and cooling tower are reference to maximum allowable SWL as stated in Fixed Plant Noise Audit Report for (Batch 1 – To Kwa Wan Station (TKW)) under Shatin to Central Link – Tai Wai to Hung Hom Section [SCL (TAW – HUH)] and Stabling Sidings at Hung Hom Freight Yard [SCL (HHS)] (ref.: **Appendix 9**).

3.4.2 For facilities related to MTR station (E01 to E17, F01 to F14 and H01 to H09), no reference SWL can be found in catalogue and no on-site measurement available. With reference to Fixed Plant Noise Audit Report for (Batch 1 – To Kwa Wan Station (TKW)) under Shatin to Central Link – Tai Wai to Hung Hom Section [SCL (TAW – HUH)] and Stabling Sidings at Hung Hom Freight Yard [SCL (HHS)] extratced in **Appendix 9,** the location and maximum allowable SWL infotmation of fixed noise sources in To Kwa Wan Station are shown and adopted in the fixed noise source impact for the Project. The operation for fixed noise sources related to MTR are followed operation hour for MTR service. Thus both daytime & evening time and night time operation are both assessed in **Appendix 11**.

3.4.3 Night time operation are found in O' Hotel (B01 to B04), iClub To Kwa Wan Hotel (D01 to D02) and facilities related to MTR station (E01 to E17, F01 to F14 and H01 to H09), fixed noise source impact for night time is assessed in **Appendix 11.**

3.5 Assessment Approach and Methodology

3.5.1 The predicted noise levels at representative NSRs were calculated by applying appropriate corrections to the sound power level (SWL) of the noisy activities as indicated in the following formula:

$$PNL = SWL + C_{dist} + C_{fac} + C_{bar} + C_{char} + C_{freq}$$

Where

PNL is the predicted noise level at the Noise Sensitive Receiver in dB(A)

SWL is the sound power level of the noisy industrial activities in dB(A);

C_{dist} is the distance correction in dB(A) = 20 x log (Distance) + 8, where is distance is measured form the noise source to noise sensitive receiver (NSR). The assessment only account for the shortest distance between noise source and NSR to present the worst case scenario.

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

C_{bar} is the barrier correction in dB(A), -10dB(A) can be applied when noise source is no direct line of sight. No barrier correction is adopted in the fixed noise source impact assessment as conservative.

C_{char} is the correction for noise source characteristic including tonality, impulsiveness, intermittency in accordance with the IND-TM as applicable. No tonality, impulsiveness and intermittency were noticeable on site. However, tonality correction of 3 dB(A) is

given to fixed noise source SWL reference to catalogue and tonality characteristic observed in noise measurement from reference report.

C_{freq} is the correction for operation duration of noise sources, i.e. the maximum operation duration within any 30 minutes. It is conservatively taken as zero in this assessment.

Air absorption was not accounted in the exercise.

3.5.2 The equation for calculating the correction for slant distance makes reference to general acoustic principles.

3.6 Assessment Result

3.6.1 The detailed fixed noise result is presented in **Appendix 11** and **Table 3.3**.

Table 3.3 Predicted Fixed Noise Level at Representative NSR (Daytime and Evening Scenario)

Representative NSR	Noise Criteria in Current Assessment, Leq (30mins), dB(A)	Predicted Noise Level (Daytime and Evening-time), Leq (30mins), dB(A)	Compliance
N01	70	63	Yes
N02	70	64	Yes
N03	70	64	Yes

Table 3.4 Predicted Fixed Noise Level at Representative NSR (Night time scenario)

Representative NSR	Noise Criteria in Current Assessment, Leq (30mins), dB(A)	Predicted Noise Level (Nighttime), Leq (30mins), dB(A)	Compliance
N01	60	57	Yes
N02	60	58	Yes
N03	60	58	Yes

3.6.2 Due to the sufficient setback distance from the major fixed noise sources, all NSRs will comply with the relevant fixed noise standard, i.e. the noise level at NSRs are not higher than 70 dB(A) in daytime and evening; and 60 dB(A) in night time.

3.7 Impact of Fixed Noise Sources from the Project

3.7.1 The Project will inevitably contain noisy facilities such as ventilation system for podium. The requirement under HKPSG is fully observed (i.e. ANL – 5dB(A)). In future detailed design of the Project, same requirement will be imposed so that the relevant noise standard will be met by various means such as selection of quiet equipment, use of shielding device, acoustic louvers, silencers, semi/ full enclosure. With abundance of direct noise mitigation measures to control and suppressed the generated noise level, no adverse noise impact due to operation of potentially noisy facilities of the Project is anticipated.

3.8 Discussion and Conclusion

3.8.1 The potential fixed noise impact has been assessed for the Notional Design. The results confirm that the predicted fixed noise level at all NSRs comply with the requirement of relevant technical memorandum under Noise Control Ordinance.

4. WASTE MANAGEMENT STUDY

4.1 Introduction

4.1.1 This section presents the management and disposal strategy of the wastes generated from the construction work and operation phase. The options for waste minimization, reuse, recycling, collection, transportation and disposal of wastes arising from the construction, demolition work and operation phase have been examined. Where appropriate, procedures for waste reduction and management are considered and environmental control measures for avoiding and minimising the potential impacts are recommended.

4.2 Legislation

4.2.1 The following legislations and guidelines are relevant to the handling, treatment and disposal of waste in HKSAR and references were made in assessing the potential impacts and their avoidance or mitigation:

- *Waste Disposal Ordinance (Cap. 354);*
- *Waste Disposal (Chemical Waste) (General) Regulation (Cap. 354C);*
- *Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N);*
- *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);*
- *Public Health and Municipal Services Ordinance (Cap 132);*
- *Land (Miscellaneous Provisions) Ordinance (Cap 28);*
- *Dumping at Sea Ordinance (Cap.466);*
- *Monitoring of Solid Waste in Hong Kong 2024; and*
- *Project Administration Handbook (PAH) for Civil Engineering Works, Section 4.1.3 of Chapter 4.*
- *The following guidelines also relate to waste management and disposal:*
- *Waste Disposal Plan for Hong Kong (1989);*
- *Hong Kong Planning Standards and Guidelines (HKPSG), Chapter 9 – Environment;*
- *WBTC No. 2/93, Public Dumps;*
- *WBTC No. 2/93B, Public Filling Facilities;*
- *WBTC No. 12/2000, Fill Management, Hong Kong SAR Government;*
- *WBTC No. 12/2002, Specification Facilitating the Use of Recycled Aggregates, Works Bureau, Hong Kong SAR Government;*
- *WBTC No. 32/92, The Use of Tropical Hard Wood on Construction Site;*
- *ETWB TC(W) No. 19/2005 Environmental Management on Construction Sites;*
- *DEVB TC(W) No. 2/2011, Encouraging the Use of Recycled and other Green Materials in Public Works Projects;*

- *DEVB TC(W) No. 6/2010, Trip Ticket System for Disposal of Construction & Demolition Materials, Development Bureau, Hong Kong SAR Government;*
- *DEVB TC(W) No. 8/2010, Enhanced Specification for Site Cleanliness and Tidiness, Works Bureau, Hong Kong SAR Government;*
- *CEDD TC No. 11/2019, Management of Construction and Demolition Materials;*
- *Code of Practice on the Handling, Transportation and Disposal of Asbestos Waste (1993) Environmental Protection Department;*
- *Code of Practice on Asbestos Control: Preparation of Asbestos Investigation Report, Asbestos Management Plan and Asbestos Abatement Plan (1997) Environmental Protection Department;*
- *ProPECC PN2/97, Handling of Asbestos Containing Materials in Buildings;*
- *PNAP No. 252 (ADV-21), Management Framework for Disposal of Dredged / Excavated Sediment*
- *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes, EPD (1992); and*
- *Guidance Note. No. 1/2024" under Dumping at Sea Ordinance, Cap. 466"*

4.3 Assessment Methodology

4.3.1 The assessment of the potential waste management implications during the construction and operation phases of the Application Site has been conducted in accordance with Annexes 7 and 15 of the EIAO-TM, including the following tasks:

- Estimation of the types and quantities of the wastes generated;
- Evaluation of opportunities for waste reduction and re-use;
- Identification of disposal options for each type of wastes;
- Assessment of potential environmental impacts arising from the wastes management with respect of potential hazards, air and odour emissions, noise, wastewater discharge, and public transport; and
- Assessment of the impacts caused by handling, collection, transportation and re-use /disposal of wastes.

4.3.2 Prior to considering the disposal options for various types of waste, opportunities for reducing waste generation, on-site or off-site reuse and recycling have been evaluated. Measures which can be taken in the planning and design phases (e.g. by modifying the design approach) and construction phase for maximizing waste reduction have been separately considered. Practices to promote segregation of waste materials are additionally considered for advancing the waste management efficiency.

4.3.3 After considering the opportunities for reducing waste generation and maximizing reuse, the types and quantities of the waste required to be disposed of have been estimated and the disposal options for each type of waste have been described. The disposal method recommended for each type of waste has been taken into account the result of the assessment. The impacts caused by handling (including stockpiling, labelling, packaging and storage), collection and reuse / disposal of waste have been addressed, and appropriate mitigation measures have been proposed.

4.4 Identification and Evaluation of Potential Impact during Construction Phase

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

- Construction and Demolition (C&D) materials due to excavation and site formation;
- General refuse generated by the workforce;
- Chemical and oily wastes due to maintenance of equipment; and
- Asbestos Containing Materials (ACM)

Key sources of C&D materials

4.4.2 It is anticipated that the majority of C&D materials will be generated from the following key construction activities:

- Demolition existing industrial buildings;
- Site Clearance.
- Site formation;
- Excavation of ground for basement of the Notional Design; and
- Building construction.

C&D Materials

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

- Inert C&D materials (also known as public fill, including soil, rock debris, rubble earth, concrete, etc.) do not decompose and are suitable to reuse as filling materials for land reclamation and site formation. Inert C&D materials could be reused on-site as filling materials. For those inert C&D materials that cannot be reused should be delivered to CEDD designated public fill reception facilities.
- Non-inert C&D materials (also known as C&D waste, including bamboo, timber, paper, metal, glass, plastic, packaging wastes, etc.). Non-inert C&D materials should be reused or recycled as far as possible. For those non-inert C&D materials that cannot be reused or recycled, they should be disposed of at designated landfill sites as last resort.

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

4.4.5 According to ETWB TC(W) 19/2005 on "Environmental Management on Construction Sites", waste management plan (WMP) becomes part of Environmental Management Plan (EMP) to be submitted to Architect/ Engineer for approval before construction works. The Project team will require the Contractor(s) to submit WMPs for approval. The WMPs will include appropriate mitigation measures to avoid, reduce, reuse and recycle C&D materials. It will ensure that the day-to-day operations on site comply with the approved WMPs. It will control the delivery of inert C&D materials and non-

inert C&D materials to public fill reception facilities and landfills, respectively, through a trip-ticket system. It will require the Contractor(s) to separate public fill from C&D materials for delivery at appropriate facilities. It will record the delivery, reuse and recycling of C&D materials for monitoring purposes.

4.4.6 For assessment purpose, the net site area of the Application Site is roundup to approximately 1,570 m^2 with 15 existing building blocks of three to nine storeys high, it is assumed with 3m height for each storey. Assuming the inert and non-inert C&D materials produced during the demolition is 90% and 10%, 21,600m^3 and 2,400m^3 of inert and non-inert C&D materials will be produced in this stage[2]. Assuming 1m depth would be excavated for site formation, it is estimated that 1,410 m^3 of inert C&D materials and 160 m^3 of non-inert C&D materials would be generated respectively[3]. Three basement levels are proposed in the Notional Design with 5m high for each level. By assuming the area of each basement level is 1570m^2, the total of 23,550m^3 of inert C&D materials are generated from the excavation[4]. During the building construction, with total GFA round-up to appropriately 14,100m^2 and assuming 10% of C&D material will be produced, the quantity of inert and non-inert C&D materials would be 1270m^3 and 130m^3, respectively[5]. Therefore, it is estimated that about 47,830m^3 of inert C&D material and 2,690m^3 of non-inert C&D material will be generated during the course of construction including demolition, site formation, basement excavation and building construction[6].

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

4.4.8 Prior to disposal of non-inert C&D materials, it is recommended that wood, steel, glass and other metals will be collected separately for re-use and/or recycling and inert C&D materials utilized as fill materials to minimize the quantity of waste to be delivered to the Public Fill Reception Facilities and landfill. The details are shown in **Table 4.2**.

4.4.9 All the soil generated from the underground work should be refill on site to form the site to the required level. Other C&D materials should be used on-site as far as practicable.

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[2] C&D material from Demolition of Existing Buildings
- Assumed occupied site area (net site area x 0.8) = 1256 m^2
- Total C&D material generated
  = 1256 m^2 x 3 m (assumed 3m high of each storeys) x 6.3 (average storeys of existing buildings)
  = 24000 m^3 (rounded up)
- Assumed C&D materials produced during the demolition:
  inert C&D materials (24000 m^3 x 90%) = 21600 m^3;
  non-inert C&D materials (24000 m^3 x 10%) = 2400 m^3

[3] C&D material from Site Formation
- Total C&D material generated (net site area x excavated depth) = 1570 m^2
- Assumed C&D materials produced during the site formation:
  inert C&D materials (1570 m^3 x 90%) = 1410 m^3;
  non-inert C&D materials (1570 m^3 x 10%) = 160 m^3

[4] Inert C&D material from Basement Excavation
- Total inert C&D material generated (assumed 100 % of C&D material)
  = 1570 m^2 (net site area) x 3 (no. of basement level) x 5 m (excavated depth) = 23550 m^2

[5] C&D material from Building Construction
- Assumed C&D materials produced = 14100 m^2 (total GFA) x 10% = 1410 m^2
  inert C&D materials (1410 m^3 x 90%) = 1270 m^3;
  non-inert C&D materials (1410 m^3 x 10%) = 130 m^3

[6] Total inert C&D material generated = 21600 m^3 + 1410 m^3 + 23550 m^2 + 1270 m^3 = 47830 m^3
Total non-inert C&D material generated = 2400 m^3 + 160 m^3 + 130 m^3 = 2690 m^3

4.4.10 Project Administration Handbook for Civil Engineering Works, Section 4.1.3 Management of Construction and Demolition Material Including Rock published by CEDD to enhance the management of C&D materials and to minimise their generation at source. The enhancement measures include drawing up a Construction and Demolition Material Management Plan (C&DMMP) at an early design stage to minimise C&D materials generation and encourage proper management of such materials.

4.4.11 Under DEVB TCW No. 6/2010 Trip Ticket System for Disposal of Construction and Demolition Materials, for all contracts that are expected to generate inert C&D materials requiring disposal from site, the project office should write to the Public Fill Committee (PFC) through Secretary of the PFC to request a designated disposal ground for incorporation into the tender documents. For contracts where the estimated amount of non-inert C&D materials to be generated from the contract is less than 50,000 m^3, the project office is not required to apply to DEP for designated landfill facilities, but it should still specify in the tender documents of the appropriate landfill facilities for disposal.

4.4.12 **Table 4.1** summarised the estimation of C&D materials generated during construction phase.

Table 4.1 Summary Table of Estimated C&D Materials during Construction Phase

Construction activities	Estimated Quantities C&D Materials Generated	
	Inert C&D Materials [d]	**Non-Inert C&D Materials [e]**
Demolition of Existing Building	21600 m^3	2400m^3
Site formation	1410 m^3	160 m^3
Excavation of Basements	23550 m^3[a]	-
Buildings Construction	1270 m^3	130m^3
Total	47830 m^3	2690 m^3
Required Dump Truck	Less than 12 trucks/day [b]	Less than 1 trucks/day [c]

Note:

(a) The assumption of the Inert C&D Materials generated from excavation may have double-counting with the land-based sediment, The actual volume is subject to the detail design stage.

(b) Assuming the density of inert C&D materials is 1.8 tones/m^3. With total of ~47,830 tones inert C&D material, the number of dump truck is anticipated to be less than 12 trucks/day (assuming each truck can carry 15 tones and there is around 270 working day per year) (reference Approved Planning Application Y/H5/8)

(c) Assuming the density of non-inert C&D materials is 1.0 tones/m^3. With total of ~2,690 tones non-inert C&D material, the number of dump truck is anticipated to be less than 1 trucks/day (assuming each truck can carry 15 tones and there is around 270 working day per year) (reference Approved Planning Application Y/H5/8)

(d) The destination of inert C&D materials is subject to the designation by the Public Fill Committee according to DEVB TC(W) No.6/2010

(e) The disposal of non- inert C&D materials is subject to agreement with relevant section of the EPD

(f) The above estimated quantities are subject to detailed design.

Chemical Waste

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

4.4.14 It is difficult to quantify the amount of chemical wastes as it will solely depend on the contractor's on-site maintenance practice and the quantities of plant and vehicles utilized at the construction site. Nevertheless, it is anticipated that the quantity of chemical waste such as lubrication oil and solvent produced from equipment maintenance would be small and less than hundred litres per month.

4.4.15 The contractor is required to register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes. 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.

4.4.16 Storage, handling, transportation and disposal of chemical waste should be arranged in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Waste published by the EPD. Chemical wastes such as wasted solvents, lubrication oil and fuel, etc. will need special handling and storage arrangements and should be collected by licensed chemical waste collectors for subsequent disposal and appropriate treatment at licensed waste disposal facilities, for example the Chemical Waste Treatment Facility Centre (CWTC) in Tsing Yi. Mitigation and control requirements for chemical waste are provided in the "Recommended Pollution Control Clauses for Construction Contracts" available in EPD website mentioned the handling, storage and disposal of chemical wastes. With good management and site particles, adverse environmental impacts should not result.

Asbestos Containing Materials (ACM)

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

4.4.18 As the Project involve the demolition of buildings/ structures that were built before 1980s, ACM may be present in the buildings within the Application Site. It requires that all asbestos wastes must be disposed of at designated or licensed facilities. In Hong Kong, the only proven method of disposing of asbestos is by secure burial in a landfill site, so as to avoid the release of harmful asbestos fibres to environment and minimise potential hazard.

4.4.19 All ACM if confirmed to be present within the existing premises must be removed and disposed of in accordance with the Air Pollution Control Ordinance (APCO) and WDO prior to the demolition works. A Registered Asbestos Consultant and Registered Asbestos Laboratory shall be engaged to conduct investigation for the presence of ACM. An Asbestos Investigation Report, an Asbestos Abatement Plan (AAP) (if

required) and a notification of commencement of asbestos abatement works commences. Also, the removal of ACMs should be carried out by a Registered Asbestos Contractor according to the approved AAP under the supervision of a Registered Asbestos Consultant. The asbestos waste generated shall be disposed of by a licensed chemical waste collectors in compliance with the WDO.

General Refuse

4.4.20 Throughout the construction stage, the workforce would generate general refuse comprising food scraps, wastepaper, empty containers, etc. 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 33 kg/day. Release of general refuse into the nearby storm drain should not be permitted as introduction of these wastes is likely to have detrimental effects on water quality in the area. Effective collection of site wastes would be required to prevent waste materials being blown around by wind, flushed or leached into the surrounding environment, and odour nuisance. The work site may also attract pests and vermin if the waste storage area is not well maintained and cleaned regularly.

4.4.21 Recyclable materials (i.e., food scraps and container, paper, plastic bottles and aluminium cans) will be separated for recycling, in order to reduce the amount of general refuse to be disposed of at landfill. Adequate number of enclosed waste containers will be provided to avoid over-spillage of waste. The non-recyclable refuse will be placed in bags and stored in enclosed containers and disposed of on a daily basis to designated landfill.

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

4.4.23 **Table 4.2** summarised the estimation of waste generated during construction phase.

Table 4.2 Estimated Quantities of Waste during Construction Phase

Waste Material	Estimated Waste Generation	Proposed Disposal Method and Destination
Inert C&D Material	~47830 m^3	Assumed 0.5% of inert C&D material generated from site formation and basement excavation would be reused and the remaining 99.5% would be delivered offsite to public fill reception facilities. - Quantity of reuse inert C&D material = 47830 m^3 x 0.5% = ~240 m^3 - Quantity of reuse inert C&D material generated from basement excavation = 47830 m^3 x 99.5% = ~47590 m^3 *Ratio of reuse inert C&D material (i.e. 0.5%) is reference from approved planning application A/TWW/122.*
Non-Inert C&D Material	~2,700 m^3	To be reused or recycled as far as possible, disposed of at designated landfill sites as last resort.

Waste Material	Estimated Waste Generation	Proposed Disposal Method and Destination
General Refuse	50 workers x 0.65 (kg/ worker/ day) generation rate ~33 kg/day	Recyclables to recyclers; Non-recyclables to landfill
Chemical Waste	Anticipated to be limited (not more than 100L of chemical waste) ACM: TBP	To be collected by licensed chemical waste collectors and deliver to Chemical Waste Treatment Centre For ACM, the only proven method for disposing of asbestos in Hong Kong is by secure burial in a landfill site

4.5 Mitigation Measures During Construction Phase

4.5.1 The mitigation measures for construction phase are recommended based on the waste management hierarchy principles. Recommendations of good site practices, waste reduction measures as well as the waste transportation, storage and collection are described in following sub-sections.

Good Site Practices

4.5.2 Appropriate waste handling, transportation and disposal methods for all waste arisings generated during the construction phase should be implemented to ensure that construction waste do not enter the nearby sensitive receivers.

4.5.3 It is expected that adverse impacts from waste management would not arise, provided that good site practices are strictly followed. Recommendations for good site practices during construction include:

- Nomination of approved personnel, such as a site manager, to be responsible for good site practices, and making arrangements for collection of all wastes generated at the site and effective disposal to appropriate facilities;
- Training of site personnel in proper waste management and chemical waste handling procedures;
- Provision of sufficient waste disposal points and regular collection for disposal;
- Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers;
- Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors.

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

Waste Reduction Measures

4.5.5 Good management and control can prevent the generation of significant amounts of waste. Waste reduction is best achieved at the planning and design stage, as well as

by ensuring the implementation of good site practices. Recommendations to achieve waste reduction include:

- Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal;
- Separate labelled bins shall be provided to segregate aluminium cans from other general refuse generated by the work force, and to encourage collection of by individual collectors;
- Any unused chemicals or those with remaining functional capacity shall be recycled;
- Maximising the use of reusable steel formwork to reduce the amount of c&d material;
- Prior to disposal of non-inert C&D material, it is recommended that wood, steel and other metals shall be separated for re-use and / or recycling to minimise the quantity of waste to be disposed of to landfill;
- Proper storage and site practices to minimise the potential for damage or contamination of construction materials;
- Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste; and
- Minimize over ordering of concrete, mortars and cement grout by doing careful check before ordering.

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

General Refuse

4.5.7 Recycle bins will be provided onsite to collect recyclable wastes such as paper, metal (e.g. cans), plastic and glass. Recyclable wastes will be segregated from non-recyclable waste to be stored in enclosed bins or compaction units. A reputable waste collector should be employed by the contractor to remove general refuse from the site on a daily basis. Recyclable waste will be collected in appropriate frequency to ensure no over stacking of recyclable wastes. An enclosed and covered area is preferred to reduce the occurrence of 'wind-blown' light material.

4.5.8 For the food waste, it is recommended an adequate number of enclosed waste containers will be provided to avoid over-spillage of waste. Also, food waste will be placed in bags and stored in enclosed containers. The containers should be placed in prominent places to promote wate separation at the source. The food waste should be collected by daily basis to minimize any potential odour and environmental hygiene impacts.

Construction and Demolition Material

4.5.9 The C&D material generated from excavation should be sorted on-site into inert C&D material (that is, public fill) and non-inert C&D material. In order to minimise the impact resulting from collection and transportation of C&D materials for off-site disposal, the excavated material comprising fill material should be reused on-site as far as practicable. Non-inert C&D material, such as wood, plastic, steel and other metals should be reused or recycled and, as a last resort, disposed of to landfill.

4.5.10 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. Disposal and transportation of C&D materials are recommended before foreseeable inclement weather such as typhoon or heavy rain.

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

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

Chemical Wastes

4.5.12 For those processes which would generate chemical waste, it may be possible to find alternatives to eliminate the use of chemicals, to reduce the generation quantities or to select a chemical type of less impact on environment, health and safety as far as possible.

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

Asbestos Containing Materials

4.5.14 Due to the potential presence of ACM during the site clearance stage, asbestos investigation is required. An asbestos specialist shall be employed during the design and construction stage to investigate this issue.

4.5.15 Sufficient and reasonable lead time shall be allowed for the preparation, vetting and implementation of asbestos investigation report and asbestos abatement plan in accordance with APCO before commencement of any demolition or site clearance work.

4.5.16 Asbestos waste will be handled in accordance with the Code of practice on the Handling, Transportation and Disposal of Asbestos Waste issued by the EPD.

4.5.17 Some key precautionary measures related to the handling and disposal of asbestos based on Handling of Asbestos Containing Materials in Buildings (ProPECC PN 2/97) are listed as following:

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

4.6 Identification and Evaluation of Potential Impact during Operation Phase

4.6.1 During operation of the project, there will be waste generation from residential and recreational uses such as glass, metals, paper, plastics, food wastes, textile, wood, household hazardous wastes and others. Instead, general refuse is anticipated to be the major type of waste generated during the operation of the Project. With reference to the latest data from "Monitoring of Solid Waste in Hong Kong 2024" by EPD, the per capita disposal rates of domestic waste, commercial & industrial waste are respectively 0.86 kg/person/day and 0.53 kg/person/day (Plate 2.7 of Waste Statistics for 2024). Among domestic and commercial waste, the recovery rate is 22% and 48% respectively (Plate 3.2 of Waste Statistics for 2023). Based on the Notional Design with around 754 residential population and 102 working population, there will be around 702 kg/day (i.e., 648 kg/day and 54 kg/day for domestic and C&I respectively) of waste generation (i.e. 0.86/ (1-22%) x 754 + 0.53/ (1-48%) x 102), in which approximately 935 kg/ day (i.e., 831 kg/day and 104 kg/day for domestic and C&I respectively) of waste, approximately 702 kg/ day (i.e. 0.86x 754 + 0.53x 102) would be disposed and approximately 233 kg/ day (i.e., 183 kg/day and 50 kg/day for domestic and C&I respectively) of waste (i.e. (831-648)+ (104-54))would be recovered.

4.6.2 By providing adequate waste collection and storage facilities to segregate waste, the burden on waste treatment facilities in Hong Kong will be reduced. Additionally, the applicant will explore options during the detailed design stage to collect recyclable waste, further minimizing waste generation.

Table 4.3 Estimated Quantities of General Refuse during Potential Phase

	Domestic (kg/day)		
	Waste Generated	Disposed	Recycled
	~831	~648	~183
	Commercial sector (kg/day)		
	Waste Generated	Disposed	Recycled
	~104	~54	~50
Total (kg/day)	~935	~702	~233

4.6.3 The refuse shall be properly managed by suitable waste collectors so that intentional or accidental release to the surrounding environment will not occur. Storage of general refuse would generate odour nuisance and visual impact if they are not managed in a proper manner. Vermin and pests may also be attracted if the waste containers are not cleaned or maintained properly and frequently. Therefore, general refuse should be temporarily stored in proper containers with covers to avoid adverse impact to the surroundings. To reduce waste and improve recycling, sufficient properly labelled recycling bins for paper, plastic and aluminium should be provided at appropriate locations of the site to collect recyclables for off-site recycling. Regular (e.g., daily) waste removal and recyclables collecting should be arranged to avoid odour nuisance or pest/vermin problem. These waste management practices and good site practises should be properly implemented to ensure adverse environmental impacts from handling and disposal of general refuse would not arise.

4.6.4 For the food wastes such as leftovers, it is recommended an adequate number of enclosed waste containers will be provided to avoid over-spillage of waste. Also, leftovers will be placed in bags and stored in enclosed containers. Rather than disposing of the food waste to the designated landfill directly, the project proponent is recommended to deliver the food waste to the Organic Resources Recovery Centre (ORRC) to reduce the pressure on the existing landfill. Therefore, the chances of odour nuisance and hygiene issues are reduced.

Chemical Waste

4.6.5 Chemical waste will be generated from various routine maintenance and servicing activities for air conditioning systems, and other electrical and mechanical equipment. Chemical waste such as waste lubricating oil, contaminated rags, waste paint, used solvents and spent chemicals are expected to be generated from these activities. It is difficult to quantify the amount of chemical waste that will arise from those activities at this stage since it will be dependent on the equipment maintenance requirements and the amount of equipment utilised.

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

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

4.6.7 Similar to the construction phase, as described in Section 3.5, occupants who would regularly produce chemical waste, if any, shall register with EPD as a Chemical Waste Producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Good quality containers compatible with the chemical wastes should be used. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosives, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The operator shall use a licensed chemical waste collector to transport and dispose of the chemical wastes generated at the Chemical Waste Treatment Centre at Tsing Yi, or other licenced facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.

4.7 Conclusion

4.7.1 Waste generated during construction and operation phases of the project have been qualitatively evaluated. With the implementation of the mitigation measures, no significant impact on waste management is anticipated. The implementation of the mitigation measures shall form part of the works contracts.

5. WATER SUPPLY IMPACT ASSESSMENT

5.1 Scope of Work

5.1.1 The aim of this study is to assess the water supply arrangements in the vicinity of the Application Site and demonstrate that the Notional Design for the S16 Planning Application will not impose insurmountable water supply impact.

5.2 Assessment Criteria and Methodology

5.2.1 The unit water demands for the various population categories is made reference to Departmental Instruction 1309 (DI) issued by WSD and Guidelines. Assumptions are made for the daily unit fresh and flushing water demands for various uses for this assessment. The Notional Design would be a R2 type residential development with 279 units, estimated to house 754 people assuming an average of 2.7 people occupying each unit. The unit demand for service trade (per head of residential population) is in accordance with the DI corresponding to the supply zones, i.e. Homantin. The assumed area for retail is about 1570m^2. The number of workers is estimated based on Table 8 of Commercial and Industrial Floor Space Utilization Survey (CIFSUS) conducted by the Planning Department. For estimation of water demands of non-domestic nature, "EPD/TP1/05 Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning Version 1.0" (GESF) published by EPD has been used as reference. For the irrigation, minimum 20% greenery coverage is required on the Application Site according to the Sustainable Building Design Guidelines, which about 314 m^2 (i.e. 1,570 x 20%). Irrigation water demand is referenced to the Technical Information Paper (TIP) (No.10/05) published by Architectural Services Department (ArchSD). A summary of the flow factors used for different development types is shown in **Table 5.1** below (**Appendix 15** refers).

Table 5.1 Unit Demands

Type of Use	Fresh Water		Flushing Water	
	Daily Unit Demand (m^3/head/day)	**Daily Unit Demand (m^3/m^2/day)**	**Daily Unit Demand (m^3/head/day)**	**Daily Unit Demand (m^3/m^2/day)**
Residential (R2)	0.40 [1][2]	-	0.07 [1]	-
Retail	-	0.02 [3]	-	0.007 [3]
Irrigation	-	0.07 [4]	-	-

Note:

[1] Refer to Table 1 of WSD Departmental Instruction 1309 (WSD DI 1309) - Residential (R2), i.e. daily unit demand of 0.3 m^3/head/day for freshwater and 0.07 m^3/head/day for flushing water.

[2] Service trade of 0.1 m^3/head/day (Homantin) adopted. The service trade demand already covers the demand from clubhouse and its daily unit demand for fresh water has been subsumed under Residential (R2), i.e. 0.3 (freshwater daily unit demand for R2) + 0.1 (freshwater daily unit demand for service trades = 0.4m^3/head/day.

[3] Based on WSD information, the unit demand for Commercial - retail/ restaurant are 0.02 and 0.007 m^3/GFA m^2/day for freshwater and saltwater, respectively.

[4] Based on ArchSD's Technical Information Paper (TIP) (No.10/05), the recommended daily water consumption in irrigation is 7 litres/m^2/day (i.e. 0.07 m^3/m^2/day).

5.3 Existing Water Supplies

5.3.1 According to the record plan from Water Supplies Department (WSD) in **Appendix 13**, there are existing fresh water and salt water mains connected to the Application Site.

5.3.2 Based on the information for WSD shown in **Appendix 14**, the Application Site is served by the supply zone of Ho Man Tin East Fresh Water Service reservoir (152,411m^3) and Ho Man Tin West Fresh Water Service Reservoir (67,434m^3) and daily inflow of 127.5 megaliters (ML) and 16.6 ML, respectively.

5.3.3 Flushing water is served by the supply zone of Tai Wan Salt Water Pumping Station (with daily delivery of 80.6 MLD), Lok Fu Salt Water Service Reservoir and Diamond Hill Salt Water Service and Lok Fu Salt Water Service Reservoir with capacity of 8,597m^3 and 21,836m^3, respectively.

5.3.4 The existing consumption and reservoir capacity of the freshwater and saltwater serving the Site are summarized in **Table 5.2** below.

Table 5.2 Reservoir Capacity and Existing Consumption

	Freshwater (m^3/day)	**Saltwater (m^3/day)**
Existing Consumption	127,500	80,600 (pumping capacity)
Capacity of Reservoir	219,845	30,433

5.4 Water Demands based on the Notional Design

5.4.1 The freshwater and flushing water demands based on the Notional Design will be primarily originated from the residential population. There will be some commercial use such as clubhouse and retails and a small demand for irrigation.

5.4.2 To estimate water demand for each type of uses, the following equations are adopted:

Water Demand for Domestic Use = Number of Residents x Unit Demand

Water Demand for Commercial Use/ Irrigation = Area x Unit Demand

5.4.3 Using the aforementioned equations, a summary of the water demands is shown in **Table 5.3** below while detailed calculations are included in **Appendix 15**.

Table 5.3 Water Demand Summary

Type of Use	Unit Demand on Fresh Water (m^3/day)	Unit Demand on Flushing Water (m^3/day)
Residential	302	53
Retail	31	11
Irrigation	22	-
Total	**355**	**64**

5.5 Discussion

5.5.1 Based on the data given by WSD as shown in **Table 5.2**, the freshwater demand from the Application Site (355 m^3/day) accounts for 0.2% of the total capacity of Fresh Water Service Reservoirs. Even with the existing daily consumption of 127.5 ML, the abovementioned Fresh Water Service Reservoirs are considered sufficient to meet the demand. At the same time, the flushing water demand from the Application Site (64 m^3/day) accounts for 0.2% of the pumping capacity of the Tai Wan Salt Water Pumping Station. There is substantial spare capacity in both the pumping station and service reservoir serving the Application Site. Therefore, the expected increase in freshwater and saltwater demand can be accommodated by the existing water supply facilities.

5.5.2 The detailed connection arrangements for the Site and the local watermains will be reviewed in later stages of project implementation. Local upgrading and/or realignment will be implemented as required.

Construction and Maintenance

5.5.3 The Project Proponent will be responsible for the design, construction, repair and maintenance of the internal water supply facilities and connection to the main water system(s) to the satisfaction of relevant Government departments. The cost of any diversion of the existing watermains within the Application Site boundary should be borne by the developer.

6. CONCLUSION

6.1.1 The Environmental Assessment report has been prepared to identify the following potential environmental impacts arise by the Notional Design for the subject S16 Planning Application.

Noise Impact Assessment

6.1.2 A road traffic noise impact assessment has been carried out for the Notional Design for the S16 Planning Application. All practicable noise mitigation measures have been adopted to achieve 96% compliance of road traffic noise standard (i.e. L_{10}(1-hr) of 70 dB(A)). With the implementation of all the practical noise mitigation measures, the future residents would not be subject to adverse road traffic noise impact.

6.1.3 The potential noise impact from fixed noise sources has been assessed. According to the assessment results, the subject S16 planning application would not be subject to adverse noise impact from fixed noise sources.

Waste Management Study

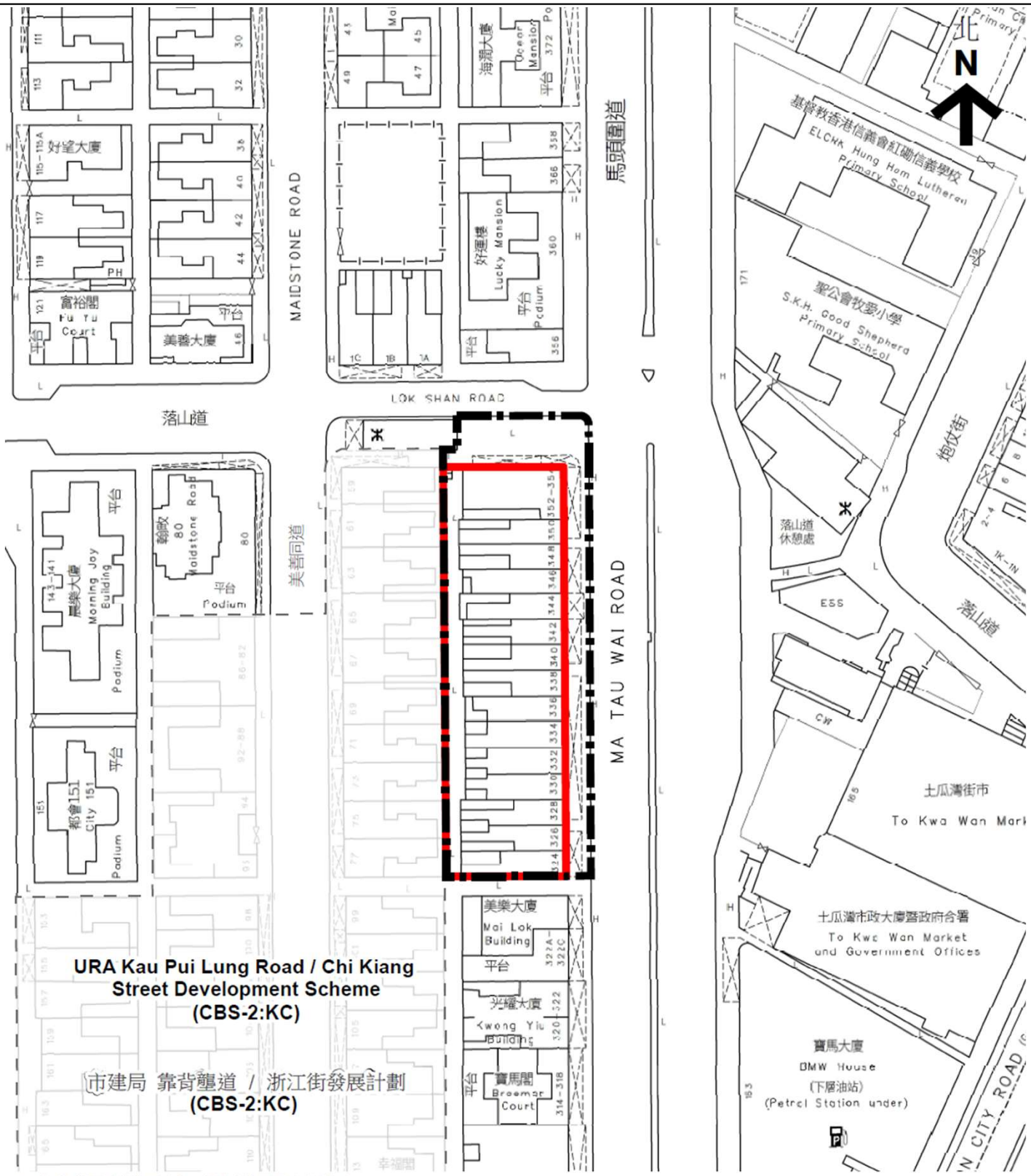
6.1.4 Waste generated during construction and operation phases of the project have been qualitatively evaluated. With the implementation of the mitigation measures, no significant impact on waste management is anticipated. The implementation of the mitigation measures shall form part of the works contracts.

Water Supply Impact Assessment

6.1.5 There will be new demand for both freshwater and flushing water from the development. Based on assessment results, the demand from the Application Site account for a small fraction of the capacity of the reservoirs and therefore, can be accommodated from the existing supply facilities. No adverse water supply impact is anticipated.

6.1.6 In conclusion, the assessments in this EA report reveal overall acceptability of the subject S16 planning application from air, noise and waste management and water supply perspectives.

Figure



DP Boundary

Application Site
(i.e. Area zoned “R(A)”)

EXTRACT PLAN PREPARED ON 12/06/2024
BASED ON SURVEY SHEET No.
11-NW-20B & 11-NW-20D

SITE PLAN

MA TAU WAI ROAD /
LOK SHAN ROAD
DEVELOPMENT PROJECT
(KC-020)

市區重建局
URBAN RENEWAL AUTHORITY

Figure 1

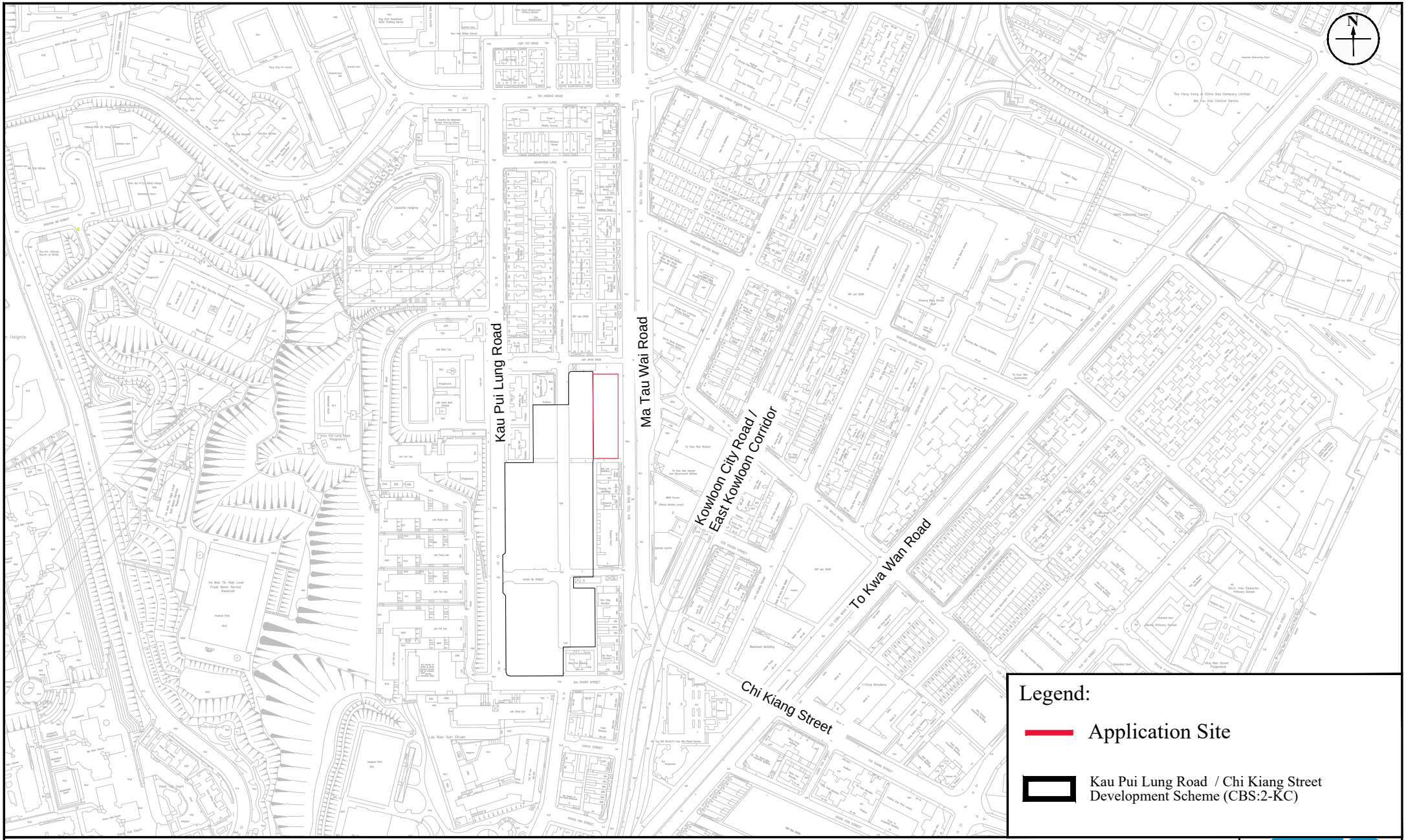


Figure: 2

Title: Location of Application Site and Its Environ

Project: Proposed Minor Relaxation of Domestic Plot Ratio and Building Height Restrictions for the Permitted Residential Development with Commercial / Retail uses of the URA Ma Tau Wai Road / Lok Shan Road Development Project (KC-020), and Proposed Public Vehicle Park

RAMBOLL

Drawn by:	CL
Checked by:	TC
Rev.:	1.0
Date:	May 2026

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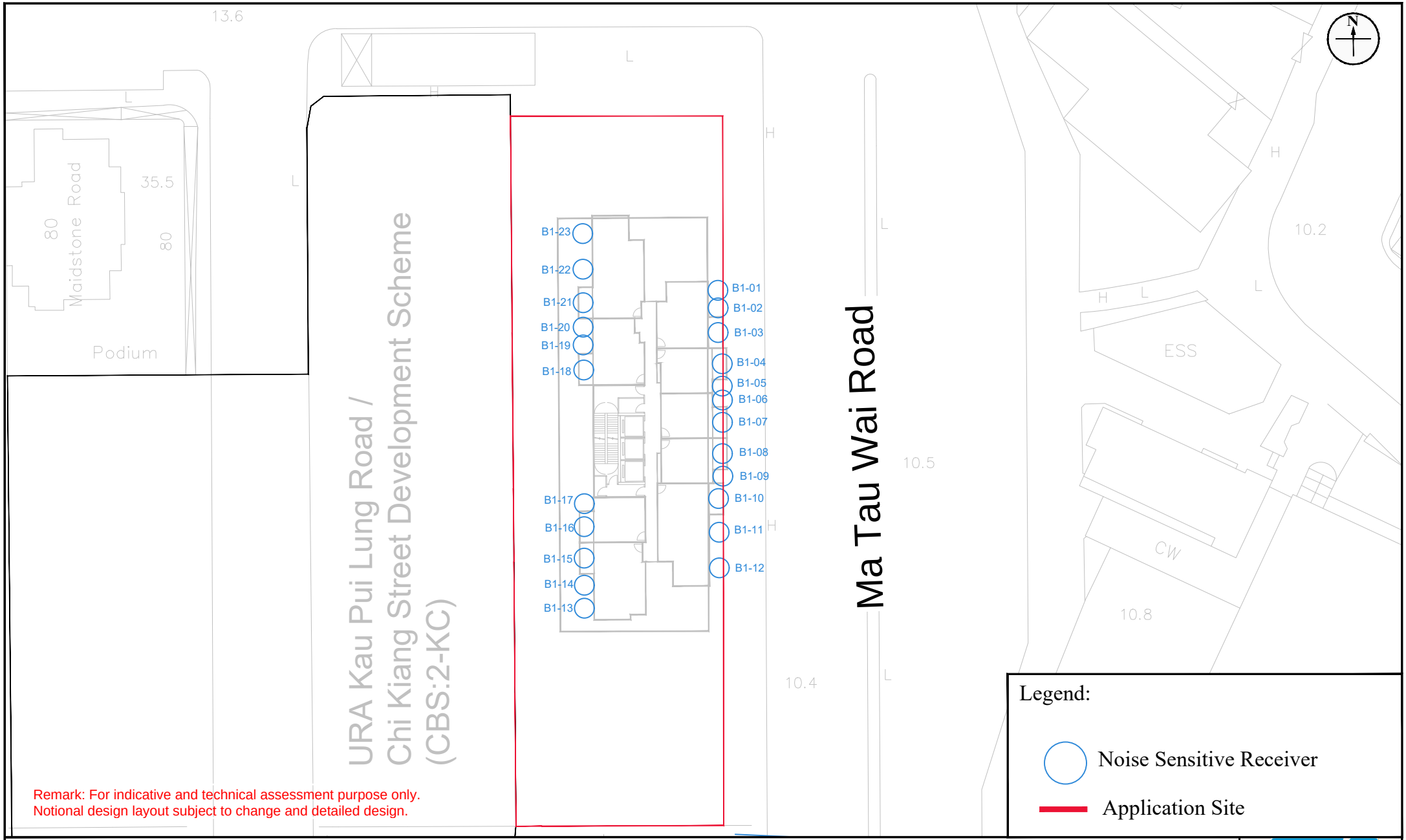

Figure: 3

Title: Location of Representative Noise Sensitive Receiver for Road Traffic Noise Impact Assessment

Project: Proposed Minor Relaxation of Domestic Plot Ratio and Building Height Restrictions for the Permitted Residential Development with Commercial / Retail uses of the URA Ma Tau Wai Road / Lok Shan Road Development Project (KC-020), and Proposed Public Vehicle Park

RAMBOLL

Drawn by:	CL
Checked by:	TC
Rev.:	1.0
Date:	May 2026

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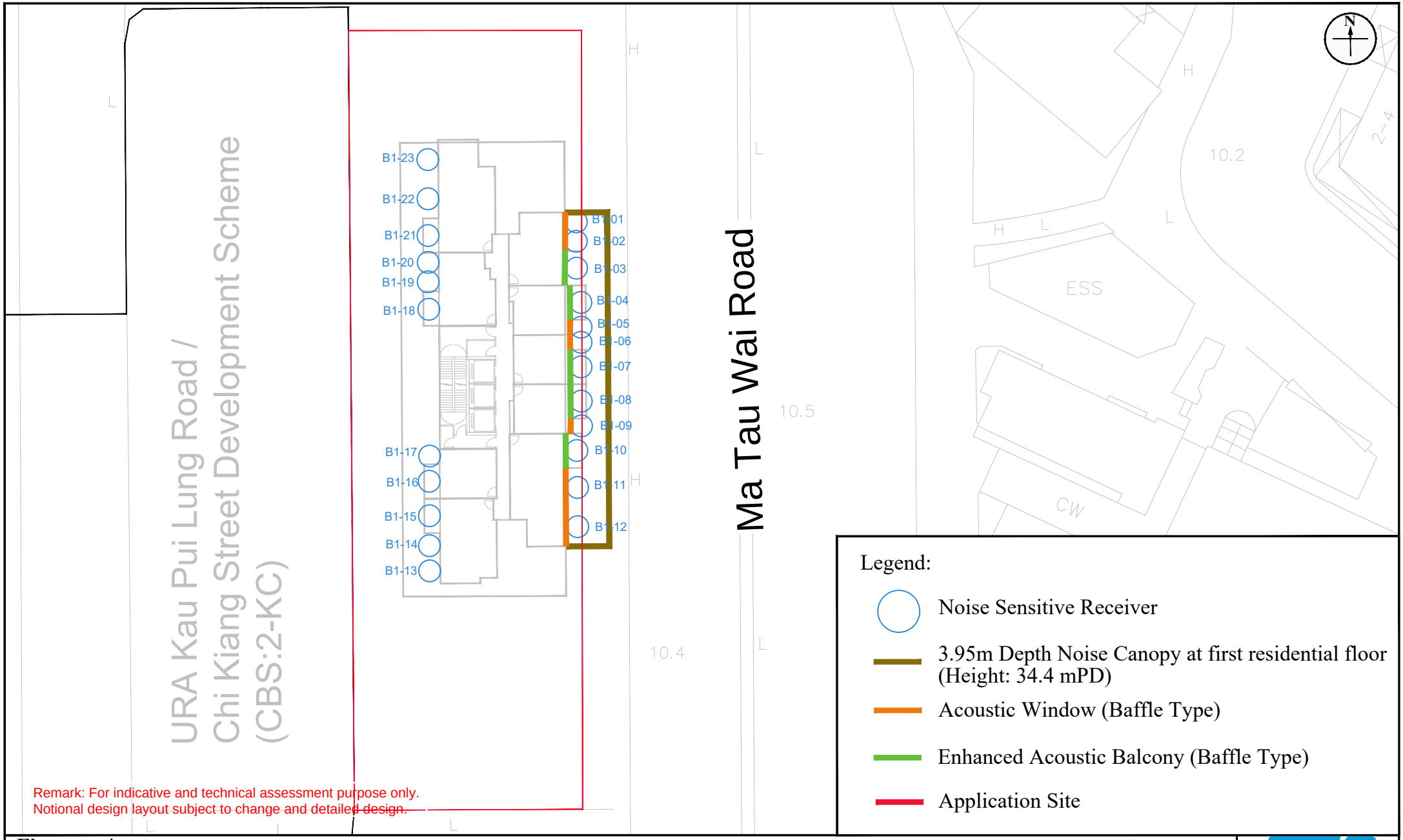

Figure: 4

Title: Proposed Noise Mitigation Measures for Road Traffic Noise Impact Assessment

Project: Proposed Minor Relaxation of Domestic Plot Ratio and Building Height Restrictions for the Permitted Residential Development with Commercial / Retail uses of the URA Ma Tau Wai Road / Lok Shan Road Development Project (KC-020), and Proposed Public Vehicle Park

RAMBOLL

Drawn by:	CL
Checked by:	TC
Rev.:	1.0
Date:	May 2026

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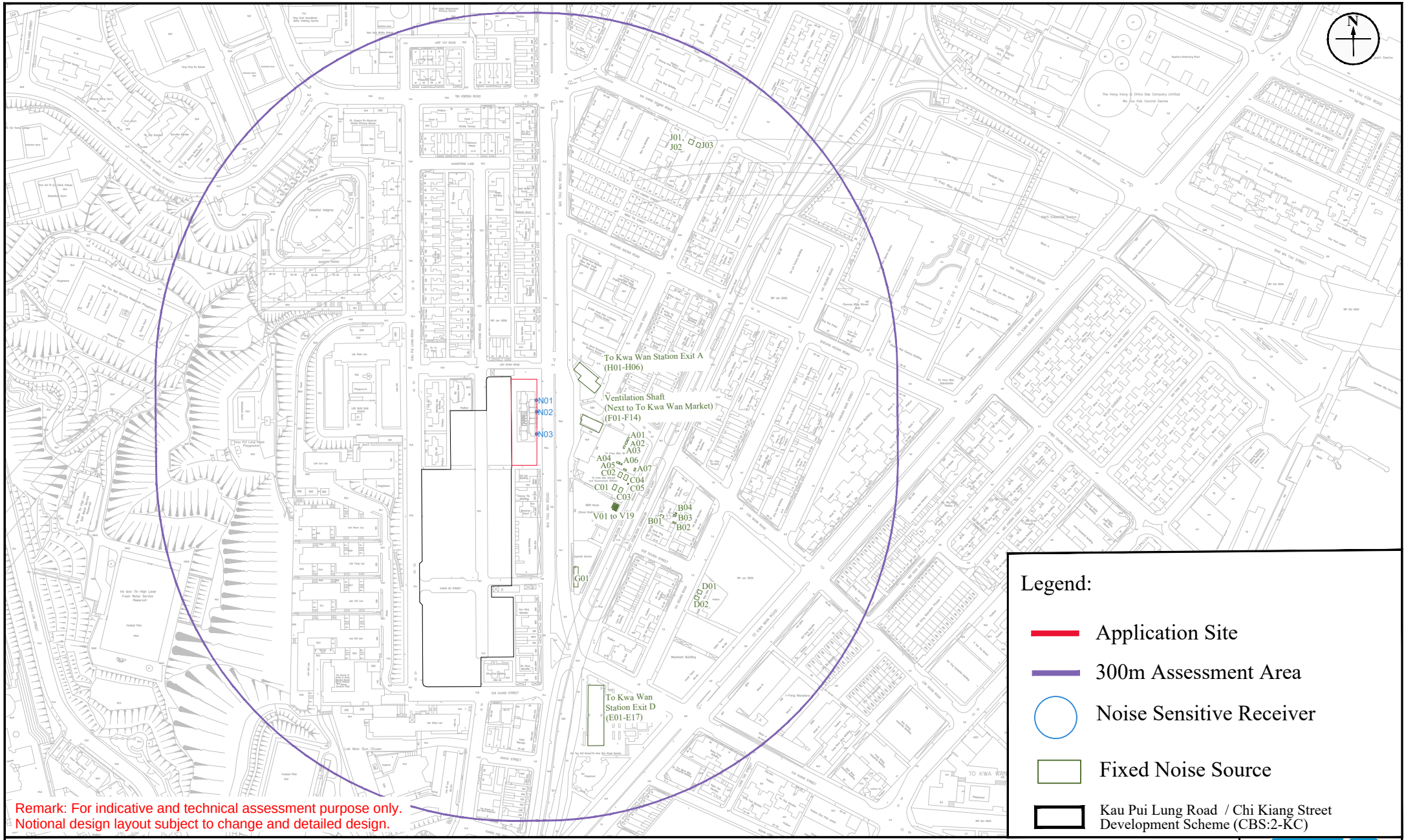

Figure: 5

Title: Location of Fixed Noise Sources and Representative Noise Sensitive Receivers for Fixed Noise Source Impact Assessment

Project: Proposed Minor Relaxation of Domestic Plot Ratio and Building Height Restrictions for the Permitted Residential Development with Commercial / Retail uses of the URA Ma Tau Wai Road / Lok Shan Road Development Project (KC-020), and Proposed Public Vehicle Park

RAMBOLL

Drawn by:	CL
Checked by:	TC
Rev.:	1.0
Date:	May 2026

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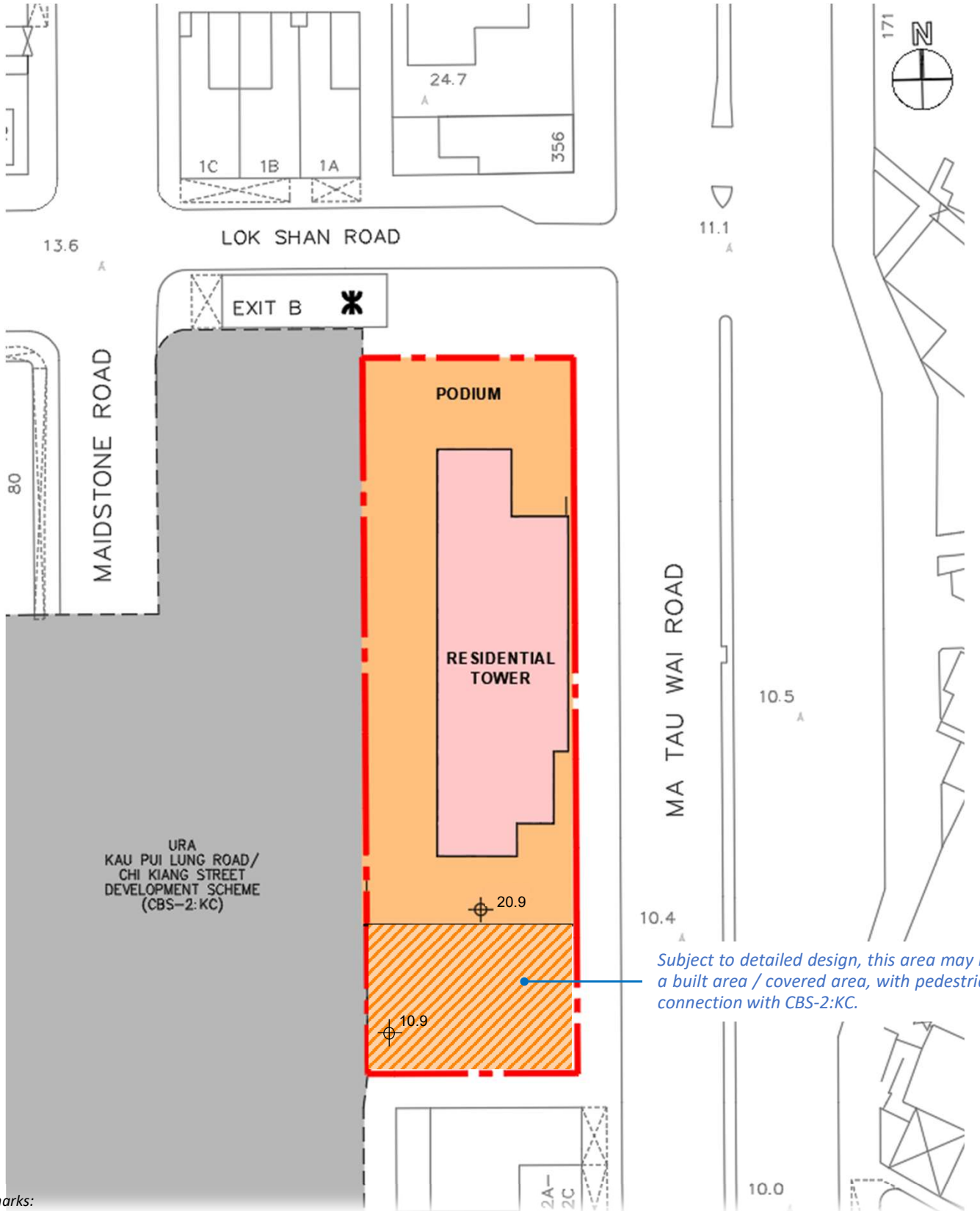
Appendix 1 Notional Design of the KC-020 Project (Ma Tau Wai Road / Lok Shan Road Development Project)



Remarks:
This S16 Planning Application is a "non-scheme-based" submission. This notional design layout is solely for illustration purpose and for conducting necessary technical assessments. Except for any planning condition(s) to be imposed, the design of the future development will not be bounded by the notional design submitted in the S16 Planning Application.

URA undertakes that the portion of the future combined development within the Application Site would not exceed maximum DPR of 8.0 and total PR of 9.0.

Application Site Boundary

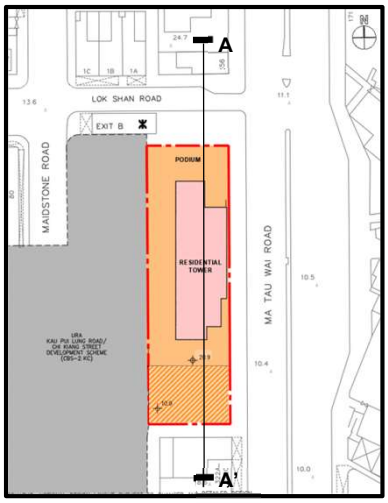
NOTIONAL BLOCK PLAN

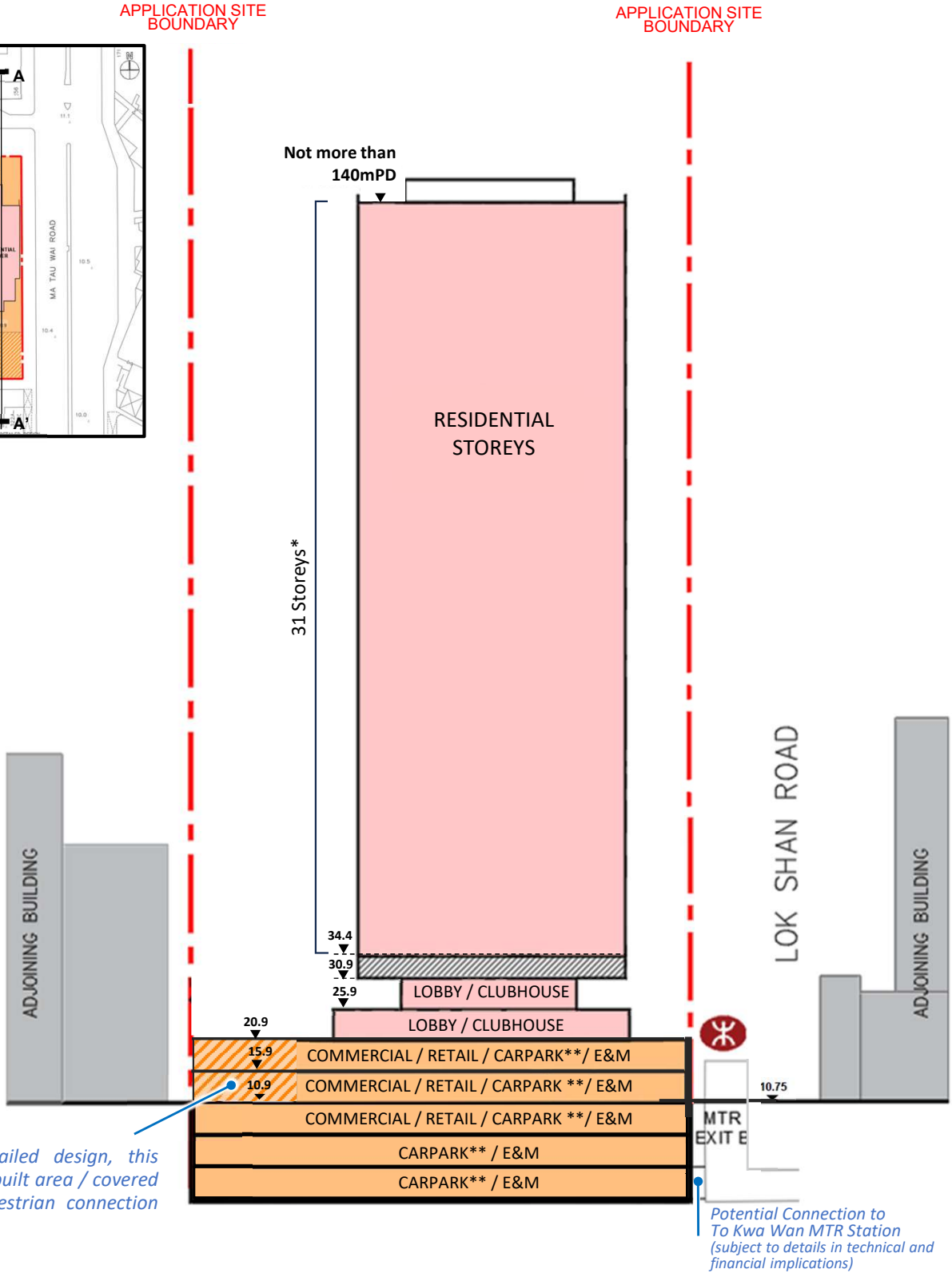
MA TAU WAI ROAD /
LOK SHAN ROAD
DEVELOPMENT PROJECT
(KC-020)

市區重建局
URBAN RENEWAL AUTHORITY

Figure 3.1

Key Plan





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URA undertakes that the portion of the future combined development within the Application Site would not exceed maximum DPR of 8.0 and total PR of 9.0.

* *Reference to typical floor-to-floor height of 3.3m to 3.5m adopted in Hong Kong's private residential development.*

** *The proposed location of the carpark may reference to the latest PNAP APP-2, which permits full GFA exemption for up to two levels of above-ground carparks. Details will be worked out at detailed design stage.*

Application Site Boundary

NOTIONAL SECTION PLAN

MA TAU WAI ROAD / LOK SHAN ROAD DEVELOPMENT PROJECT (KC-020)

市區重建局 URBAN RENEWAL AUTHORITY

Figure 3.2

Appendix 2 Traffic Forecast data for Year 2048

Carman Lee

From: Eddy Wai Chi CHEUNG [redacted]
Sent: 01 September 2025 14:06
To: Dickens Lo
Cc: Hugo Li; Wang, Iris; Leon Ting
Subject: Re: Technical Note on Traffic Forecast for Environmental Assessment of Urban Renewal Authority Kau Pui Lung Road / Chi Kiang Street Development Scheme (CBS-2:KC) and Ma Tau Wai Road / Lok Shan Road Development Project (KC-020)

Dear Dickens,

We refer to your submission (your ref: 523348/SO018/OC003/DL, dated 18 Jul 2025) and our telephone discussions, we have no comment on the methodology of the traffic forecast from traffic engineering point of view provided that the traffic volume estimated in the forecast will only be used for conducting Air Quality Impact Assessment and Noise Impact Assessment.

Regards,

Eddy CHEUNG
EK/HM, TE/K
Transport Department
Tel: [redacted]

From: "Dickens Lo" [redacted]
To: [redacted]
Cc: "Wan... Iris" [redacted], "Hugo Li" [redacted], "Leon Ting" [redacted]
Date: 21/07/2025 09:51 AM
Subject: Technical Note on Traffic Forecast for Environmental Assessment of Urban Renewal Authority Kau Pui Lung Road / Chi Kiang Street Development Scheme (CBS-2:KC) and Ma Tau Wai Road / Lok Shan Road Development Project (KC-020)

Dear Mr. CHEUNG,

We have been appointed by Urban Renewal Authority to carry out the captioned Study. Please find the enclosed Technical Note of the captioned study for your review and comment. Due to the large file size, the soft copy of the Technical Note can be accessed via the link below. The hard copy will be delivered to TD within the next few days

20250718 AQIA & NIA TN (To TD)

It should be grateful if you could provide your comments by **01 August 2025**.

Should you have any queries, please contact the Mr. Dickens Lo on tel: 3664 6718 or via email: Dickens.Lo@aurecongroup.com

Best Regards,

Dickens Lo
Traffic Engineer, Aurecon
[redacted]

At Aurecon, we encourage flexible working. If you receive an email from us outside your work hours, we don't expect you to read it, act on it, or reply until you return.

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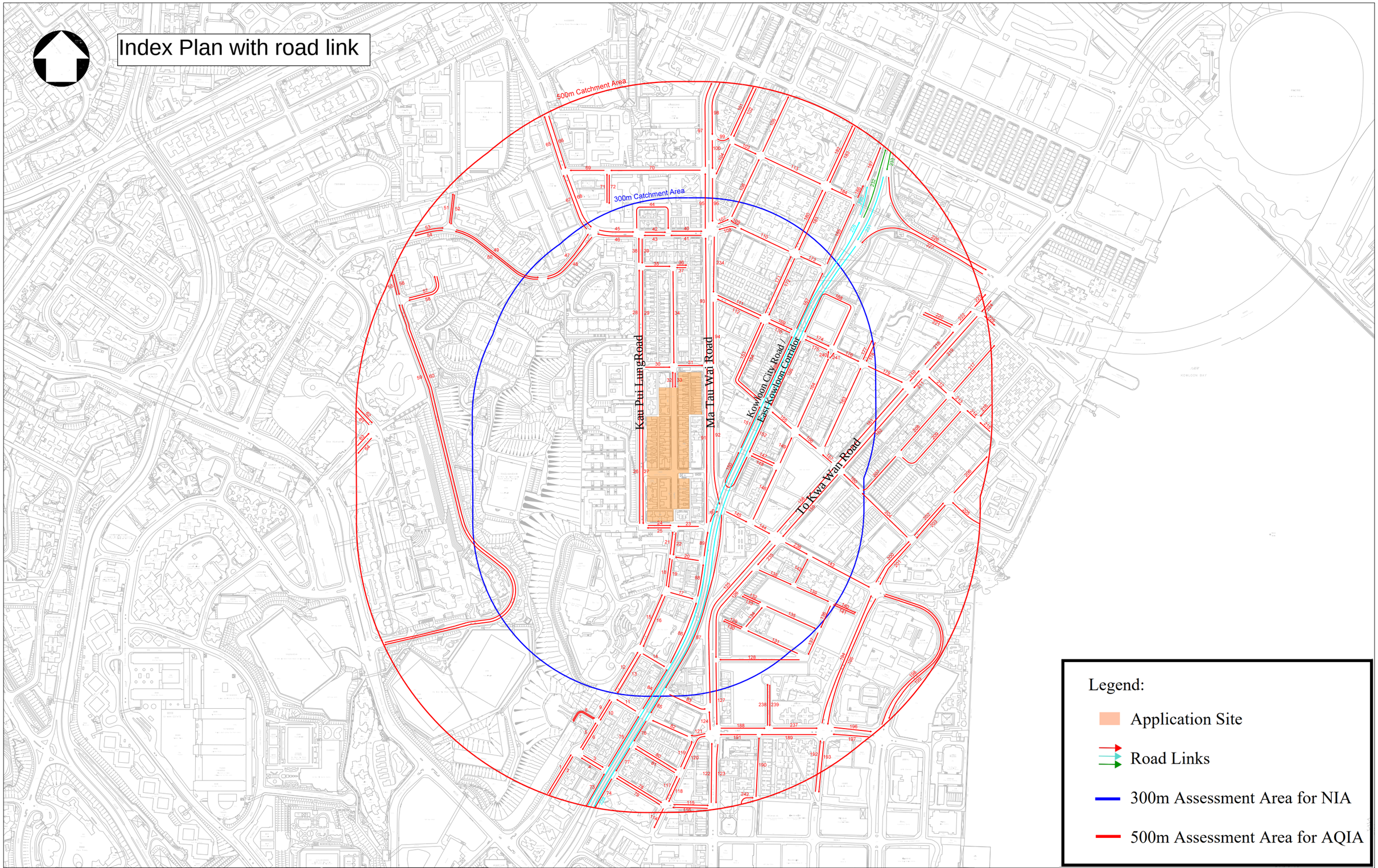
DISCLAIMER

Index Plan with road link



Legend:

- Application Site
- Road Links
- 300m Assessment Area for NIA
- 500m Assessment Area for AQIA

Client: 市區重建局 URBAN RENEWAL AUTHORITY	Consultant: aurecon www.aurecongroup.com	Project Title: URBAN RENEWAL AUTHORITY KAU PUI LUNG ROAD / CHI KIANG STREET DEVELOPMENT SCHEME AND MA TAU WAI ROAD / LOK SHAN ROAD DEVELOPMENT	Drawing Title: **INDEX PLAN**			
			Designed: HL	Checked: JY	Scale: 1:6000(A3)	Date: MAY 2025
			Figure No.: **A1**		Rev.: -	

Original Size : A3

2048 NIA Traffic Flows AM Peak

2048 NIA Traffic Flows AM Peak					
Road No.	**Road Name**	**Bound**	**Speed (km/hr)**	**Total (veh/hr)**	**HV%**
12	Ko Shan Road	NB	50	700	20%
13	Ko Shan Road	SB	50	100	33%
14	Shansi Street	EB	50	450	20%
15	Ko Shan Road	NB	50	300	21%
16	Ko Shan Road	SB	50	250	20%
17	Kiang Hsi Street	EB	50	100	14%
18	Ko Shan Road	NB	50	150	34%
19	Ko Shan Road	SB	50	300	18%
20	Anhui Street	WB	50	150	11%
21	Ko Shan Road	NB	50	250	20%
22	Ko Shan Road	SB	50	250	20%
23	Chi Kiang Street	WB	50	150	23%
24	Chi Kiang Street	EB	50	250	20%
25	Chi Kiang Street	WB	50	350	21%
26	Kau Pui Lung Road	NB	50	500	18%
27	Kau Pui Lung Road	SB	50	350	16%
28	Kau Pui Lung Road	NB	50	400	14%
29	Kau Pui Lung Road	SB	50	300	16%
30	Lok Shan Road	EB	50	250	21%
31	Lok Shan Road	EB	50	350	23%
32	Maidstone Road	NB	50	50	11%
33	Maidstone Road	SB	50	50	11%
34	Maidstone Road	SB	50	150	28%
35	Maidstone Lane	EB	50	150	29%
36	Maidstone Lane	EB	50	50	11%
37	Maidstone Lane	WB	50	50	11%
38	Kau Pui Lung Road	NB	50	400	14%
39	Kau Pui Lung Road	SB	50	300	16%
40	Tin Kwong Road	EB	50	1150	22%
41	Tin Kwong Road	WB	50	650	21%
42	Tin Kwong Road	EB	50	1150	22%
43	Tin Kwong Road	WB	50	650	21%
44	Hop Yat Road	SB	50	50	11%
45	Tin Kwong Road	EB	50	1200	23%
46	Tin Kwong Road	WB	50	800	19%
47	Sheung Shing Street	NB	50	600	15%
48	Sheung Shing Street	SB	50	400	22%
49	Sheung Shing Street	EB	50	350	25%
50	Sheung Shing Street	WB	50	550	15%
67	Tin Kwong Road	NB	50	800	12%
68	Tin Kwong Road	SB	50	900	23%
84	Chatham Road North	NB	50	1350	32%
85	Chatham Road North	SB	50	1250	35%
86	Chatham Road North	NB	50	1750	29%
87	Chatham Road North	SB	50	1300	34%
88	Ma Tau Wai Road	NB	50	1850	28%
89	Ma Tau Wai Road	NB	50	1700	30%
90	Chi Kiang Street	EB	50	550	24%
91	Ma Tau Wai Road	NB	50	1100	34%
92	Ma Tau Wai Road	SB	50	1800	32%
93	Ma Tau Wai Road	NB	50	900	38%
94	Ma Tau Wai Road	SB	50	1400	36%
95	Ma Tau Wai Road	NB	50	1950	29%
96	Ma Tau Wai Road	SB	50	1900	36%
106	Pak Tai Street	NB	50	300	13%
107	Ma Hang Chung Road	EB	50	150	13%
108	Ma Hang Chung Road	WB	50	350	17%
109	Ma Hang Chung Road	WB	50	150	9%
110	Ma Hang Chung Road	WB	50	300	18%
111	Sheung Heung Road	EB	50	400	45%
112	Sheung Heung Road	WB	50	100	15%

2048 NIA Traffic Flows AM Peak

2048 NIA Traffic Flows AM Peak					
Road No.	**Road Name**	**Bound**	**Speed (km/hr)**	**Total (veh/hr)**	**HV%**
125	To Kwa Wan Road	NB	50	450	64%
126	To Kwa Wan Road	SB	50	900	48%
127	Ma Tau Wai Road	SB	50	1400	38%
128	Wing Kwong Street	WB	50	450	18%
129	Kai Ming Street	EB	50	100	17%
130	Kai Ming Street	WB	50	100	16%
131	Kai Ming Street	WB	50	150	16%
132	Hung Fook Street	EB	50	50	11%
133	Hung Fook Street	WB	50	50	11%
134	Yuk Shing Street	NB	50	150	16%
135	Hung Fook Street	EB	50	150	16%
136	Wing Kwong Street	SB	50	350	22%
138	Ngan Hon Street	EB	50	350	22%
139	Ngan Hon Street	EB	50	350	22%
140	Ngan Hon Street	EB	50	50	11%
141	Ngan Hon Street	WB	50	50	11%
142	Lung Tak Street	NB	50	50	11%
143	Chi Kiang Street	EB	50	100	27%
144	Chi Kiang Street	EB	50	1000	25%
145	Chi Kiang Street	EB	50	1050	25%
146	Ha Heung Road	NB	50	100	25%
147	Sze Chuen Street	EB	50	50	11%
148	Sze Chuen Street	WB	50	50	11%
149	Ha Heung Road	NB	50	100	25%
150	Kowloon City Road	NB	50	50	15%
151	Kowloon City Road	NB	50	50	15%
152	Kowloon City Road	SB	50	50	15%
153	Pau Chung Street	NB	50	150	44%
154	Pau Chung Street	SB	50	50	11%
155	Lok Shan Road	WB	50	250	36%
156	Lok Shan Road	WB	50	550	21%
157	Lok Shan Road	WB	50	650	27%
158	To Kwa Wan Road	NB	50	450	63%
159	To Kwa Wan Road	SB	50	850	49%
160	Lok Shan Road	WB	50	500	19%
161	To Kwa Wan Road	NB	50	250	27%
162	To Kwa Wan Road	SB	50	650	45%
163	Cheung Ning Street	NB	50	200	36%
164	Ha Heung Road	NB	50	400	13%
165	Kowloon City Road	NB	50	150	18%
166	Kowloon City Road	SB	50	50	15%
167	Kowloon City Road	NB	50	550	15%
168	Kowloon City Road	SB	50	100	16%
169	Sheung Heung Road	EB	50	400	41%
170	Sheung Heung Road	WB	50	100	14%
171	Pau Chung Street	NB	50	200	29%
172	Pau Chung Street	SB	50	100	13%
173	Ma Hang Chung Road	WB	50	50	23%
174	Sheung Heung Road	EB	50	300	48%
175	Sheung Heung Road	WB	50	400	13%
176	Sheung Heung Road	EB	50	300	49%
177	Cheung Ning Street	NB	50	50	35%
178	Cheung Ning Street	SB	50	50	15%
179	Sheung Heung Road	EB	50	500	42%
180	Pau Chung Street	NB	50	200	44%
181	Pau Chung Street	SB	50	100	21%
185	Kowloon City Road	NB	50	550	15%
228	East Kowloon Corridor	NB	70	3050	27%
229	East Kowloon Corridor	SB	70	2550	22%
234	Ma Tau Wai Road	SB	50	1700	39%
235	To Kwa Wan Road	SB	50	1700	36%
236	Chi Kiang Street	EB	50	100	30%
237	Bailey Street	EB	50	50	63%
238	Wan On Street	NB	50	100	15%
239	Wan On Street	SB	50	100	16%
240	Ha Heung Road	NB	50	50	12%
241	Ha Heung Road	NB	50	400	13%

2048 NIA Traffic Flows PM Peak

2048 NIA Traffic Flows PM Peak					
Road No.	**Road Name**	**Bound**	**Speed (km/hr)**	**Total (veh/hr)**	**HV%**
12	Ko Shan Road	NB	50	500	29%
13	Ko Shan Road	SB	50	100	31%
14	Shansi Street	EB	50	200	34%
15	Ko Shan Road	NB	50	350	26%
16	Ko Shan Road	SB	50	250	25%
17	Kiang Hsi Street	EB	50	250	17%
18	Ko Shan Road	NB	50	150	33%
19	Ko Shan Road	SB	50	300	22%
20	Anhui Street	WB	50	150	21%
21	Ko Shan Road	NB	50	200	30%
22	Ko Shan Road	SB	50	200	23%
23	Chi Kiang Street	WB	50	150	18%
24	Chi Kiang Street	EB	50	200	23%
25	Chi Kiang Street	WB	50	350	24%
26	Kau Pui Lung Road	NB	50	450	19%
27	Kau Pui Lung Road	SB	50	250	18%
28	Kau Pui Lung Road	NB	50	300	15%
29	Kau Pui Lung Road	SB	50	300	14%
30	Lok Shan Road	EB	50	250	23%
31	Lok Shan Road	EB	50	350	24%
32	Maidstone Road	NB	50	50	11%
33	Maidstone Road	SB	50	50	11%
34	Maidstone Road	SB	50	150	26%
35	Maidstone Lane	EB	50	150	26%
36	Maidstone Lane	EB	50	50	11%
37	Maidstone Lane	WB	50	50	11%
38	Kau Pui Lung Road	NB	50	300	15%
39	Kau Pui Lung Road	SB	50	300	14%
40	Tin Kwong Road	EB	50	600	27%
41	Tin Kwong Road	WB	50	500	21%
42	Tin Kwong Road	EB	50	600	27%
43	Tin Kwong Road	WB	50	500	21%
44	Hop Yat Road	SB	50	50	11%
45	Tin Kwong Road	EB	50	750	24%
46	Tin Kwong Road	WB	50	600	21%
47	Sheung Shing Street	NB	50	500	20%
48	Sheung Shing Street	SB	50	350	23%
49	Sheung Shing Street	EB	50	300	25%
50	Sheung Shing Street	WB	50	450	22%
67	Tin Kwong Road	NB	50	550	13%
68	Tin Kwong Road	SB	50	500	21%
84	Chatham Road North	NB	50	1700	28%
85	Chatham Road North	SB	50	1000	33%
86	Chatham Road North	NB	50	1850	28%
87	Chatham Road North	SB	50	1050	33%
88	Ma Tau Wai Road	NB	50	2100	27%
89	Ma Tau Wai Road	NB	50	1950	28%
90	Chi Kiang Street	EB	50	650	21%
91	Ma Tau Wai Road	NB	50	1200	33%
92	Ma Tau Wai Road	SB	50	1450	30%
93	Ma Tau Wai Road	NB	50	1000	36%
94	Ma Tau Wai Road	SB	50	1050	32%
95	Ma Tau Wai Road	NB	50	1350	33%
96	Ma Tau Wai Road	SB	50	1450	35%
106	Pak Tai Street	NB	50	250	15%
107	Ma Hang Chung Road	EB	50	50	17%
108	Ma Hang Chung Road	WB	50	250	16%
109	Ma Hang Chung Road	WB	50	150	11%
110	Ma Hang Chung Road	WB	50	350	15%
111	Sheung Heung Road	EB	50	300	57%
112	Sheung Heung Road	WB	50	100	23%

2048 NIA Traffic Flows PM Peak

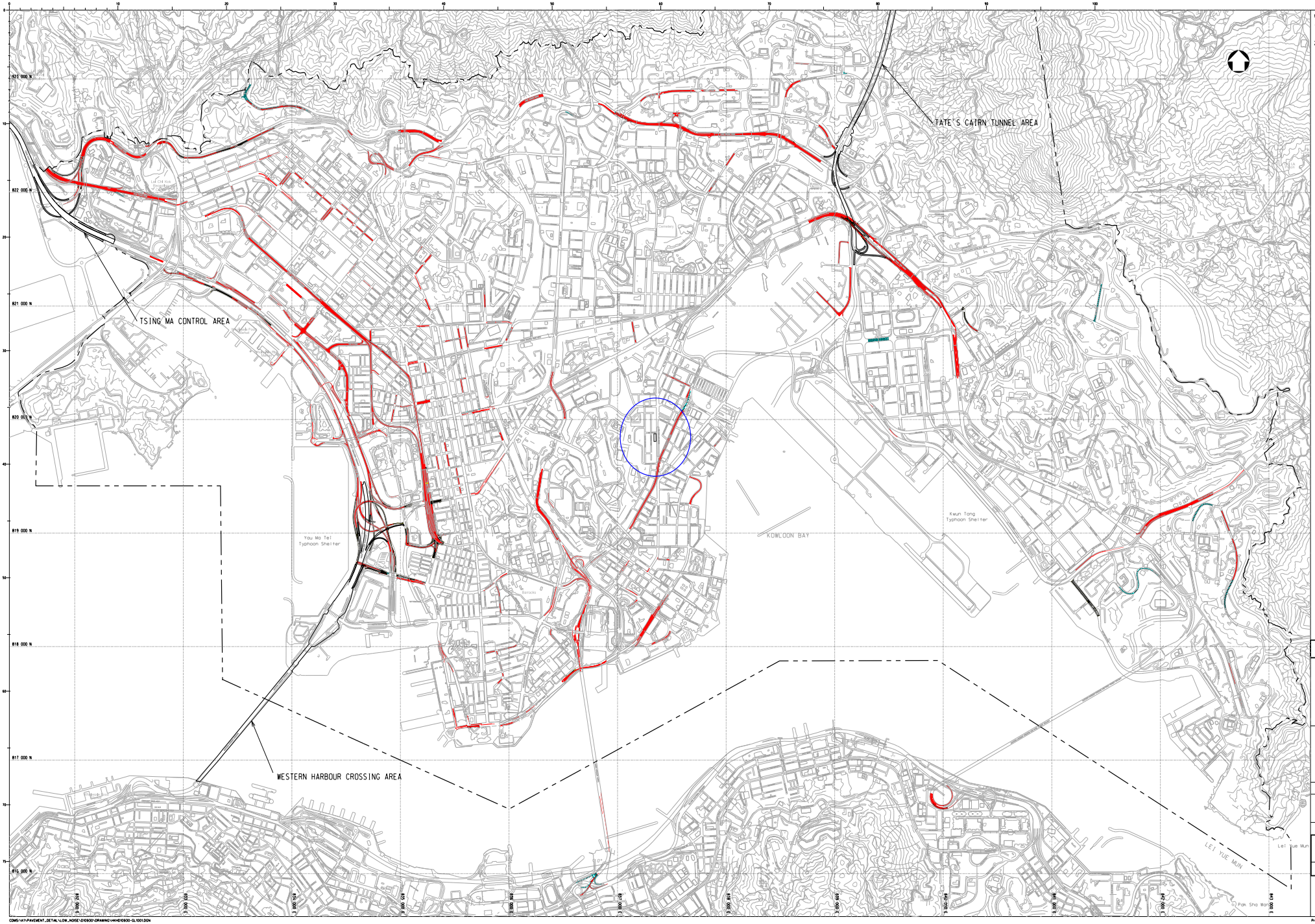
2048 NIA Traffic Flows PM Peak					
Road No.	**Road Name**	**Bound**	**Speed (km/hr)**	**Total (veh/hr)**	**HV%**
125	To Kwa Wan Road	NB	50	400	61%
126	To Kwa Wan Road	SB	50	650	50%
127	Ma Tau Wai Road	SB	50	1000	39%
128	Wing Kwong Street	WB	50	250	19%
129	Kai Ming Street	EB	50	100	16%
130	Kai Ming Street	WB	50	100	16%
131	Kai Ming Street	WB	50	150	16%
132	Hung Fook Street	EB	50	50	11%
133	Hung Fook Street	WB	50	50	11%
134	Yuk Shing Street	NB	50	150	16%
135	Hung Fook Street	EB	50	100	16%
136	Wing Kwong Street	SB	50	300	19%
138	Ngan Hon Street	EB	50	300	19%
139	Ngan Hon Street	EB	50	300	19%
140	Ngan Hon Street	EB	50	50	11%
141	Ngan Hon Street	WB	50	50	11%
142	Lung Tak Street	NB	50	50	11%
143	Chi Kiang Street	EB	50	150	35%
144	Chi Kiang Street	EB	50	1000	21%
145	Chi Kiang Street	EB	50	1050	22%
146	Ha Heung Road	NB	50	100	32%
147	Sze Chuen Street	EB	50	50	11%
148	Sze Chuen Street	WB	50	50	11%
149	Ha Heung Road	NB	50	100	32%
150	Kowloon City Road	NB	50	50	22%
151	Kowloon City Road	NB	50	50	22%
152	Kowloon City Road	SB	50	50	22%
153	Pau Chung Street	NB	50	150	39%
154	Pau Chung Street	SB	50	50	10%
155	Lok Shan Road	WB	50	350	38%
156	Lok Shan Road	WB	50	850	18%
157	Lok Shan Road	WB	50	950	23%
158	To Kwa Wan Road	NB	50	500	53%
159	To Kwa Wan Road	SB	50	600	51%
160	Lok Shan Road	WB	50	600	14%
161	To Kwa Wan Road	NB	50	100	29%
162	To Kwa Wan Road	SB	50	500	48%
163	Cheung Ning Street	NB	50	200	35%
164	Ha Heung Road	NB	50	600	9%
165	Kowloon City Road	NB	50	250	32%
166	Kowloon City Road	SB	50	50	22%
167	Kowloon City Road	NB	50	750	15%
168	Kowloon City Road	SB	50	100	21%
169	Sheung Heung Road	EB	50	250	58%
170	Sheung Heung Road	WB	50	100	16%
171	Pau Chung Street	NB	50	200	24%
172	Pau Chung Street	SB	50	50	10%
173	Ma Hang Chung Road	WB	50	50	23%
174	Sheung Heung Road	EB	50	200	62%
175	Sheung Heung Road	WB	50	550	6%
176	Sheung Heung Road	EB	50	250	63%
177	Cheung Ning Street	NB	50	50	25%
178	Cheung Ning Street	SB	50	50	16%
179	Sheung Heung Road	EB	50	400	47%
180	Pau Chung Street	NB	50	150	50%
181	Pau Chung Street	SB	50	100	27%
185	Kowloon City Road	NB	50	750	15%
228	East Kowloon Corridor	NB	70	3750	17%
229	East Kowloon Corridor	SB	70	1750	18%
234	Ma Tau Wai Road	SB	50	1300	38%
235	To Kwa Wan Road	SB	50	1400	31%
236	Chi Kiang Street	EB	50	150	38%
237	Bailey Street	EB	50	50	72%
238	Wan On Street	NB	50	100	15%
239	Wan On Street	SB	50	50	15%
240	Ha Heung Road	NB	50	550	7%
241	Ha Heung Road	NB	50	50	37%

Comparison of AM and PM peak flow in Year 2048					
Road No.	**Road Name**	**Bound**	**HV of AM Peak (Flow * % of**	**HV of PM Peak (Flow * % of heavies)**	**Higher Peak Flow (AM/PM)**
12	Ko Shan Road	NB	141	143	PM
13	Ko Shan Road	SB	33	31	AM
14	Shansi Street	EB	88	69	AM
15	Ko Shan Road	NB	63	90	PM
16	Ko Shan Road	SB	51	61	PM
17	Kiang Hsi Street	EB	14	43	PM
18	Ko Shan Road	NB	51	50	AM
19	Ko Shan Road	SB	55	67	PM
20	Anhui Street	WB	17	31	PM
21	Ko Shan Road	NB	50	60	PM
22	Ko Shan Road	SB	49	46	AM
23	Chi Kiang Street	WB	35	27	AM
24	Chi Kiang Street	EB	49	46	AM
25	Chi Kiang Street	WB	75	86	PM
26	Kau Pui Lung Road	NB	89	87	AM
27	Kau Pui Lung Road	SB	57	44	AM
28	Kau Pui Lung Road	NB	57	46	AM
29	Kau Pui Lung Road	SB	49	43	AM
30	Lok Shan Road	EB	52	58	PM
31	Lok Shan Road	EB	81	85	PM
32	Maidstone Road	NB	5	6	PM
33	Maidstone Road	SB	5	6	PM
34	Maidstone Road	SB	43	39	AM
35	Maidstone Lane	EB	44	39	AM
36	Maidstone Lane	EB	5	6	PM
37	Maidstone Lane	WB	5	6	PM
38	Kau Pui Lung Road	NB	57	46	AM
39	Kau Pui Lung Road	SB	49	43	AM
40	Tin Kwong Road	EB	255	160	AM
41	Tin Kwong Road	WB	137	106	AM
42	Tin Kwong Road	EB	255	160	AM
43	Tin Kwong Road	WB	137	106	AM
44	Hop Yat Road	SB	5	6	PM
45	Tin Kwong Road	EB	276	178	AM
46	Tin Kwong Road	WB	154	123	AM
47	Sheung Shing Street	NB	88	100	PM
48	Sheung Shing Street	SB	88	81	AM
49	Sheung Shing Street	EB	89	74	AM
50	Sheung Shing Street	WB	83	97	PM
67	Tin Kwong Road	NB	99	74	AM
68	Tin Kwong Road	SB	207	103	AM
84	Chatham Road North	NB	431	469	PM
85	Chatham Road North	SB	436	326	AM
86	Chatham Road North	NB	510	525	PM
87	Chatham Road North	SB	448	344	AM
88	Ma Tau Wai Road	NB	525	572	PM
89	Ma Tau Wai Road	NB	503	539	PM
90	Chi Kiang Street	EB	132	139	PM
91	Ma Tau Wai Road	NB	369	393	PM
92	Ma Tau Wai Road	SB	581	435	AM
93	Ma Tau Wai Road	NB	338	355	PM
94	Ma Tau Wai Road	SB	499	333	AM
95	Ma Tau Wai Road	NB	568	441	AM
96	Ma Tau Wai Road	SB	688	508	AM
106	Pak Tai Street	NB	40	39	AM
107	Ma Hang Chung Road	EB	19	8	AM
108	Ma Hang Chung Road	WB	61	40	AM
109	Ma Hang Chung Road	WB	14	16	PM
110	Ma Hang Chung Road	WB	53	52	AM
111	Sheung Heung Road	EB	179	171	AM
112	Sheung Heung Road	WB	15	23	PM

Comparison of AM and PM peak flow in Year 2048

Road No.	Road Name	Bound	HV of AM Peak (Flow * % of	HV of PM Peak (Flow * % of heavies)	Higher Peak Flow (AM/PM)
125	To Kwa Wan Road	NB	288	243	AM
126	To Kwa Wan Road	SB	435	326	AM
127	Ma Tau Wai Road	SB	525	390	AM
128	Wing Kwong Street	WB	81	47	AM
129	Kai Ming Street	EB	17	16	AM
130	Kai Ming Street	WB	16	16	PM
131	Kai Ming Street	WB	24	24	PM
132	Hung Fook Street	EB	5	6	PM
133	Hung Fook Street	WB	5	6	PM
134	Yuk Shing Street	NB	24	24	AM
135	Hung Fook Street	EB	25	16	AM
136	Wing Kwong Street	SB	76	58	AM
138	Ngan Hon Street	EB	77	58	AM
139	Ngan Hon Street	EB	76	58	AM
140	Ngan Hon Street	EB	5	6	PM
141	Ngan Hon Street	WB	5	6	PM
142	Lung Tak Street	NB	5	6	PM
143	Chi Kiang Street	EB	27	53	PM
144	Chi Kiang Street	EB	254	212	AM
145	Chi Kiang Street	EB	267	231	AM
146	Ha Heung Road	NB	25	32	PM
147	Sze Chuen Street	EB	5	6	PM
148	Sze Chuen Street	WB	5	6	PM
149	Ha Heung Road	NB	25	32	PM
150	Kowloon City Road	NB	7	11	PM
151	Kowloon City Road	NB	7	11	PM
152	Kowloon City Road	SB	7	11	PM
153	Pau Chung Street	NB	66	58	AM
154	Pau Chung Street	SB	6	5	AM
155	Lok Shan Road	WB	91	134	PM
156	Lok Shan Road	WB	117	157	PM
157	Lok Shan Road	WB	172	217	PM
158	To Kwa Wan Road	NB	283	267	AM
159	To Kwa Wan Road	SB	420	304	AM
160	Lok Shan Road	WB	97	84	AM
161	To Kwa Wan Road	NB	69	29	AM
162	To Kwa Wan Road	SB	295	239	AM
163	Cheung Ning Street	NB	73	70	AM
164	Ha Heung Road	NB	53	52	AM
165	Kowloon City Road	NB	27	81	PM
166	Kowloon City Road	SB	7	11	PM
167	Kowloon City Road	NB	85	114	PM
168	Kowloon City Road	SB	16	21	PM
169	Sheung Heung Road	EB	166	144	AM
170	Sheung Heung Road	WB	14	16	PM
171	Pau Chung Street	NB	57	48	AM
172	Pau Chung Street	SB	13	5	AM
173	Ma Hang Chung Road	WB	12	11	AM
174	Sheung Heung Road	EB	143	124	AM
175	Sheung Heung Road	WB	51	35	AM
176	Sheung Heung Road	EB	146	158	PM
177	Cheung Ning Street	NB	18	12	AM
178	Cheung Ning Street	SB	8	8	PM
179	Sheung Heung Road	EB	208	189	AM
180	Pau Chung Street	NB	87	75	AM
181	Pau Chung Street	SB	21	27	PM
185	Kowloon City Road	NB	83	112	PM
228	East Kowloon Corridor	NB	832	640	AM
229	East Kowloon Corridor	SB	561	323	AM
234	Ma Tau Wai Road	SB	659	492	AM
235	To Kwa Wan Road	SB	616	440	AM
236	Chi Kiang Street	EB	30	56	PM
237	Bailey Street	EB	31	36	PM
238	Wan On Street	NB	15	15	AM
239	Wan On Street	SB	16	8	AM
240	Ha Heung Road	NB	6	36	PM
241	Ha Heung Road	NB	51	19	AM

Appendix 3 Extent of Low-Noise-Road-Surfacing extracted from Highway Department



NOTES:

1. THIS DRAWING SUPERSEDES DRAWING NUMBER KHD10126-GL0001.
2. THIS DRAWING SHOWS THE N.R.H.S IN THE AREA UNDER HyD/URBAN REGION (KOWLOON)'S JURISDICTION.

LEGEND : -

- CARRIAGEWAY WITH N. R. H. S. USING POLYMER MODIFIED FRICTION COURSE
- CARRIAGEWAY WITH N. R. H. S. USING POROUS FRICTION COURSE
- CARRIAGEWAY WITH N. R. H. S. USING SMA SURFACING

FOR INFORMATION ONLY
as at December 2023

project

drawing title

NOISE REDUCING HIGHWAY SURFACING(NRHS) IN URBAN REGION (KOWLOON)

map reference

drawing no.

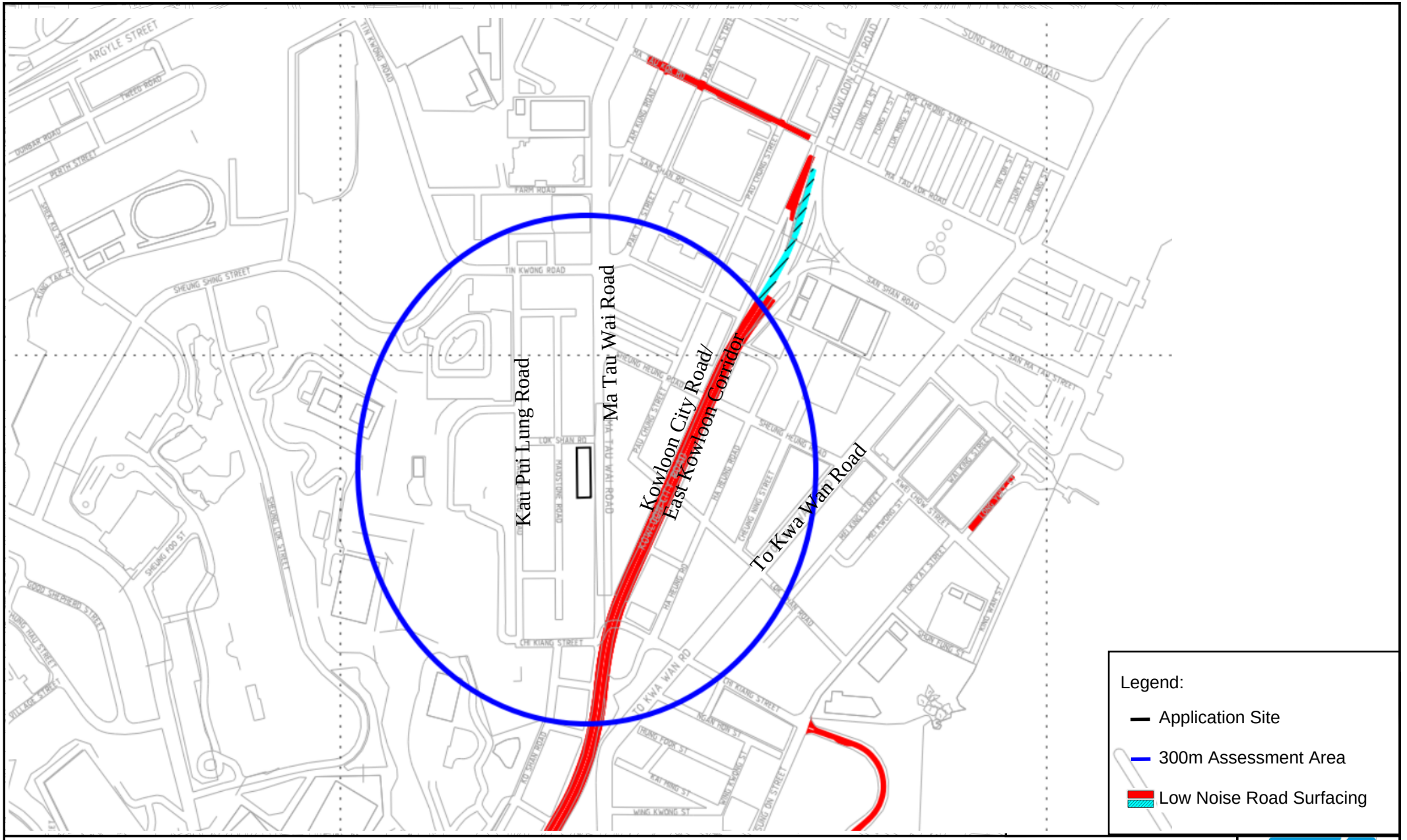
HKHD10930-GL1001

scale 1 : 10000

office

URBAN REGION (KOWLOON)

HIGHWAYS DEPARTMENT HONG KONG



Appendix: 3

Title: Location of Low Noise Road Surfacing within 300m Assessment Area of the Application Site

Project: Proposed Minor Relaxation of Domestic Plot Ratio and Building Height Restrictions for the Permitted Residential Development with Commercial / Retail uses of the URA Ma Tau Wai Road / Lok Shan Road Development Project (KC-020), and Proposed Public Vehicle Park

RAMBOLL

Drawn by:	CL
Checked by:	TC
Rev.:	1.0
Date:	Sep 2025

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Appendix 4 Results of Traffic Noise Impact Assessment (Base Case Scenario)

Traffic Noise Impact Assessment Results, Base Case Scenario (AM)

Predicted Road Traffic Noise Level (L 10 (1-hour)) at Selected Noise Sensitive Receivers (Based on Year 2048 Traffic Forecast)

Residential

Tower 1

Floor	mPD	B1-01	B1-02	B1-03	B1-04	B1-05	B1-06	B1-07	B1-08	B1-09	B1-10	B1-11	B1-12	B1-13	B1-14	B1-15	B1-16	B1-17	B1-18	B1-19	B1-20	B1-21	B1-22	B1-23
3/F	32.9	79	79	79	79	79	79	79	79	79	79	79	79	68	64	64	64	64	65	65	65	66	67	69
4/F	36.4	79	79	79	79	79	79	79	79	79	79	79	79	68	64	64	64	64	65	65	65	66	67	69
5/F	39.8	79	78	78	78	78	78	78	78	78	78	78	78	68	64	64	64	64	65	65	65	66	67	69
6/F	43.3	78	78	78	78	78	78	78	78	78	78	78	78	68	64	64	64	64	65	65	65	66	67	70
7/F	46.7	78	78	78	78	78	78	78	78	78	78	78	78	68	64	64	64	64	65	65	65	66	67	70
8/F	50.2	78	78	78	78	78	78	78	78	78	78	78	78	68	64	64	64	64	65	65	65	66	67	69
9/F	53.6	77	77	77	77	77	77	77	77	77	77	77	77	68	64	64	64	64	65	65	65	65	67	69
10/F	57.1	77	77	77	77	77	77	77	77	77	77	77	77	68	64	64	64	64	65	65	65	65	67	69
11/F	60.5	77	77	77	77	77	77	77	77	77	77	77	77	68	64	64	64	64	65	65	65	65	66	69
12/F	64.0	77	77	77	77	77	77	77	77	77	77	77	77	68	64	64	64	64	65	65	65	65	66	69
13/F	67.4	77	76	76	76	76	77	77	77	77	77	77	77	68	64	64	64	64	65	65	65	65	66	69
14/F	70.9	76	76	76	76	76	76	76	76	76	76	76	76	68	64	64	64	64	65	65	65	65	66	69
15/F	74.3	76	76	76	76	76	76	76	76	76	76	76	76	68	64	64	64	64	65	65	65	65	66	69
16/F	77.8	76	76	76	76	76	76	76	76	76	76	76	76	68	64	64	64	64	65	65	65	65	66	69
17/F	81.2	76	76	76	76	76	76	76	76	76	76	76	76	69	64	64	64	64	64	65	65	65	66	69
18/F	84.7	76	76	76	76	76	76	76	76	76	76	76	76	69	65	64	64	64	64	65	65	65	66	69
19/F	88.1	76	76	76	76	76	76	76	76	76	76	76	76	69	65	64	64	64	64	64	65	65	66	68
20/F	91.6	76	75	75	75	75	75	75	75	75	75	75	75	69	65	64	64	64	64	64	64	65	66	68
21/F	95.0	75	75	75	75	75	75	75	75	75	75	75	75	69	65	64	64	64	64	64	64	65	66	68
22/F	98.5	75	75	75	75	75	75	75	75	75	75	75	75	69	65	64	64	64	64	64	64	65	66	68
23/F	101.9	75	75	75	75	75	75	75	75	75	75	75	75	69	65	64	64	64	64	64	64	65	65	68
24/F	105.4	75	75	75	75	75	75	75	75	75	75	75	75	69	66	64	64	64	64	64	64	65	65	68
25/F	108.8	75	75	75	75	75	75	75	75	75	75	75	75	69	66	64	64	64	64	64	64	65	65	68
26/F	112.3	75	75	75	75	75	75	75	75	75	75	75	75	69	66	65	64	64	64	64	64	64	65	68
27/F	115.7	75	75	75	75	75	75	75	75	75	75	75	75	69	66	65	64	64	64	64	64	64	65	68
28/F	119.2	75	75	75	75	75	75	75	75	75	75	75	75	69	66	65	64	64	64	64	64	64	65	67
29/F	122.6	75	75	75	75	75	75	75	75	75	75	75	75	69	66	65	64	64	64	64	64	64	65	67
30/F	126.1	75	74	74	75	75	75	75	75	75	75	75	75	69	66	65	64	64	64	64	64	64	65	67
31/F	129.5	74	74	74	74	74	74	74	74	74	74	75	75	69	66	65	64	64	64	64	64	64	65	67
32/F	133.0	74	74	74	74	74	74	74	74	74	74	74	74	69	66	65	64	64	64	64	64	64	65	67
33/F	136.4	74	74	74	74	74	74	74	74	74	74	74	74	69	66	65	64	64	64	64	64	64	65	67
Exceedance		31	31	31	31	31	31	31	31	31	31	31	31	0	0	0	0	0	0	0	0	0	0	0
No. of flats with exceedance		31			31		31		31		31			0			0			0			0	
Max. Noise Level		79	79	79	79	79	79	79	79	79	79	79	79	69	66	65	64	64	65	65	65	66	67	70

Noise level that will exceed limit of 70dB(A)

Max Noise Level (dB(A)) =	79
Total no. of Exceedance =	372
Total no. of flat Exceedance =	155
Total no. of Premises =	279
% Compliance =	44%

Traffic Noise Impact Assessment Results, Base Case Scenario (PM)

Predicted Road Traffic Noise Level (L 10 (1-hour)) at Selected Noise Sensitive Receivers (Based on Year 2048 Traffic Forecast)

Residential

Tower 1

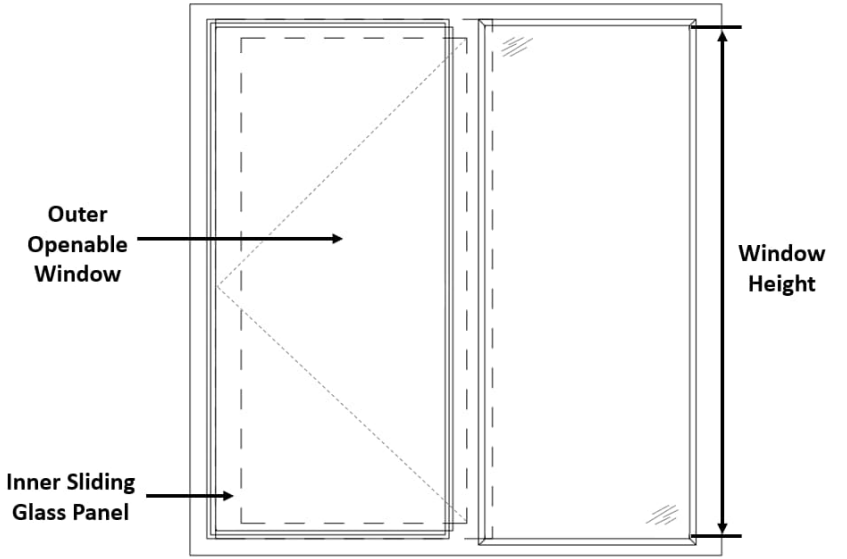
Floor	mPD	B1-01	B1-02	B1-03	B1-04	B1-05	B1-06	B1-07	B1-08	B1-09	B1-10	B1-11	B1-12	B1-13	B1-14	B1-15	B1-16	B1-17	B1-18	B1-19	B1-20	B1-21	B1-22	B1-23
3/F	32.9	79	79	79	79	79	79	79	79	79	79	79	79	68	64	64	64	64	65	65	65	66	67	69
4/F	36.4	78	78	78	78	78	78	78	78	78	78	78	78	68	64	64	64	64	65	65	65	66	67	69
5/F	39.8	78	78	78	78	78	78	78	78	78	78	78	78	67	64	64	64	64	65	65	65	66	67	69
6/F	43.3	78	78	78	78	78	78	78	78	78	78	78	78	67	64	64	64	64	65	65	65	66	67	69
7/F	46.7	77	77	77	77	77	77	77	77	77	77	77	77	67	64	64	64	64	65	65	65	66	67	69
8/F	50.2	77	77	77	77	77	77	77	77	77	77	77	77	67	64	64	64	64	65	65	65	66	67	69
9/F	53.6	77	77	77	77	77	77	77	77	77	77	77	77	67	64	64	64	64	65	65	65	65	66	69
10/F	57.1	77	76	76	76	76	76	76	77	77	77	77	76	67	64	64	64	64	65	65	65	65	66	69
11/F	60.5	76	76	76	76	76	76	76	76	76	76	76	76	67	64	64	64	64	65	65	65	65	66	69
12/F	64.0	76	76	76	76	76	76	76	76	76	76	76	76	67	64	64	64	64	65	65	65	65	66	69
13/F	67.4	76	76	76	76	76	76	76	76	76	76	76	76	67	64	64	64	64	65	65	65	65	66	69
14/F	70.9	76	76	76	76	76	76	76	76	76	76	76	76	67	64	64	64	64	65	65	65	65	66	69
15/F	74.3	76	75	75	75	75	75	75	76	76	76	75	75	68	64	64	64	64	64	65	65	65	66	68
16/F	77.8	75	75	75	75	75	75	75	75	75	75	75	75	68	64	64	64	64	64	65	65	65	66	68
17/F	81.2	75	75	75	75	75	75	75	75	75	75	75	75	68	64	64	64	64	64	64	65	65	66	68
18/F	84.7	75	75	75	75	75	75	75	75	75	75	75	75	68	64	64	64	64	64	64	64	65	66	68
19/F	88.1	75	75	75	75	75	75	75	75	75	75	75	75	68	65	64	64	64	64	64	64	65	66	68
20/F	91.6	75	75	75	75	75	75	75	75	75	75	75	75	68	65	64	64	64	64	64	64	65	65	68
21/F	95.0	75	75	75	75	75	75	75	75	75	75	75	75	68	65	64	64	64	64	64	64	65	65	68
22/F	98.5	75	74	74	75	75	75	75	75	75	75	75	75	68	65	64	64	64	64	64	64	64	65	68
23/F	101.9	74	74	74	74	74	74	74	74	74	74	74	74	68	65	64	64	64	64	64	64	64	65	68
24/F	105.4	74	74	74	74	74	74	74	74	74	74	74	74	68	65	64	64	64	64	64	64	64	65	67
25/F	108.8	74	74	74	74	74	74	74	74	74	74	74	74	68	65	64	64	63	64	64	64	64	65	67
26/F	112.3	74	74	74	74	74	74	74	74	74	74	74	74	68	65	64	64	63	64	64	64	64	65	67
27/F	115.7	74	74	74	74	74	74	74	74	74	74	74	74	69	65	64	64	63	64	64	64	64	65	67
28/F	119.2	74	74	74	74	74	74	74	74	74	74	74	74	69	66	64	64	63	64	64	64	64	65	67
29/F	122.6	74	74	74	74	74	74	74	74	74	74	74	74	69	66	64	64	63	63	64	64	64	65	67
30/F	126.1	74	74	74	74	74	74	74	74	74	74	74	74	69	66	64	64	63	63	64	64	64	65	67
31/F	129.5	74	74	74	74	74	74	74	74	74	74	74	74	69	66	64	64	63	63	63	64	64	65	67
32/F	133.0	74	74	74	74	74	74	74	74	74	74	74	74	69	66	64	64	63	63	63	64	64	65	67
33/F	136.4	74	74	73	73	73	74	74	74	74	74	74	74	69	66	64	64	63	63	64	64	64	65	67
Exceedance		31	31	31	31	31	31	31	31	31	31	31	31	0	0	0	0	0	0	0	0	0	0	0
No. of flats with exceedance		31			31		31		31		31			0			0			0		0		
Max. Noise Level		79	79	79	79	79	79	79	79	79	79	79	79	69	66	64	64	64	65	65	65	66	67	69

Noise level that will exceed limit of 70dB(A)

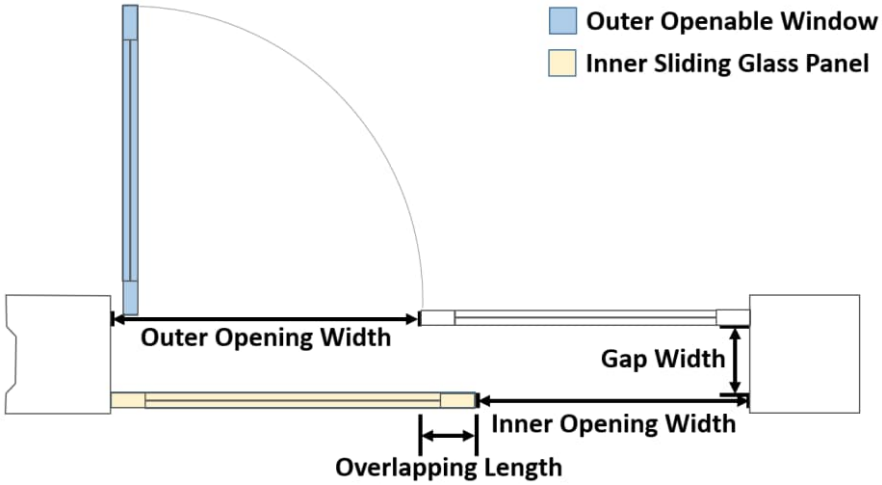
Max Noise Level (dB(A)) =	79
Total no. of Exceedance =	372
Total no. of flat Exceedance =	155
Total no. of Premises =	279
% Compliance =	44%

Appendix 5 **Indicative Design of Acoustic Window (Baffle Type) and Enhanced Acoustic Balcony (Baffle Type) – EPD ProPECC PN 5/23**

(I) Possible design of "Acoustic Window (Baffle Type)" for 8m² and 18m² habitable rooms (i.e. dining room, living room or bedroom)



INTERNAL VIEW (NOT TO SCALE)



PLAN (NOT TO SCALE)

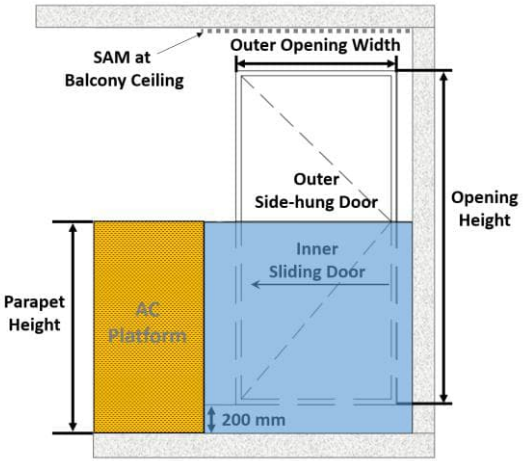
Possible Designs of "Acoustic Window (Baffle Type)" for 8m² and 18m² rooms					
Room Size (m^2)	**Room Dimensions (mm^3)**	**Inner Window Opening (mm^2)**	**Outer Window Opening (mm^2)**	**Overlapping Length (mm)**	**Gap Width (mm)**
8	**3200 (W) x 2500 (D) x 3400 (H)**	**580 (W) x 870 (H)**	**600 (W) x 870 (H)**	**≥ 100**	**100 to 175**
18	**5300 (W) x 3390 (D) x 3400 (H)**	**750 (W) x 1500 (H)**	**750 (W) x 1500 (H)**	**≥ 100**	**100 to 175**

Notes:

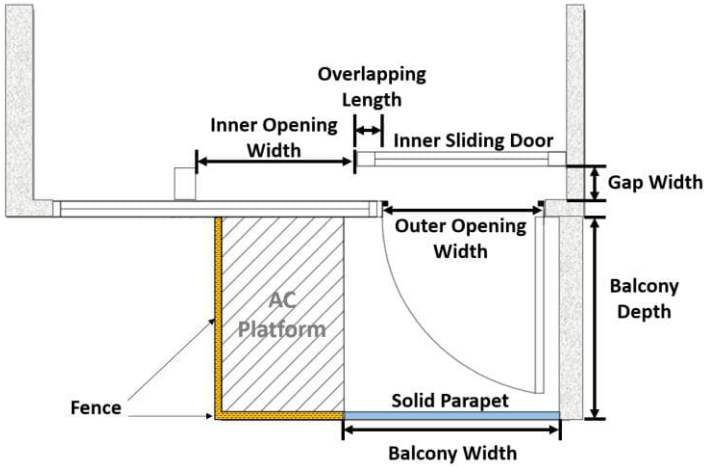
a. These are feasible designs of AW(BT) for 8m² and 18m² rooms.

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

(II) Possible designs of "Enhanced Acoustic Balcony (Baffle Type)" in 14m^2 and 18m^2 habitable rooms (i.e. dining room, living room or bedroom)



EXTERNAL VIEW (NOT TO SCALE)



PLAN (NOT TO SCALE)

Fence (≥ 70% Permeability) Solid Parapet

Possible Designs of "Enhanced Acoustic Balcony (Baffle Type)" for 14m^2 and 18m^2 rooms								
Room size (m^2)	**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 (mm)**
14	**3400 (W) x 4100 (D) x 3100 (H)**	**≥ 1440**	**≥ 1300**	**≥ 1450**	**1025 (W) x 2210 (H)**	**1150 (W) x 2210 (H)**	**≥ 100**	**100**
18	**5300 (W) x 3390 (D) x 3400 (H)**	**≥ 2055**	**≥ 1300**	**≥ 1450**	**1150 (W) x 2210 (H)**	**1150 (W) x 2210 (H)**	**≥ 100**	**100**

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

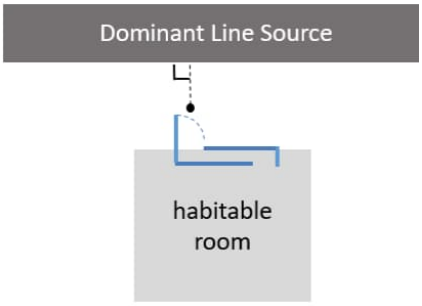
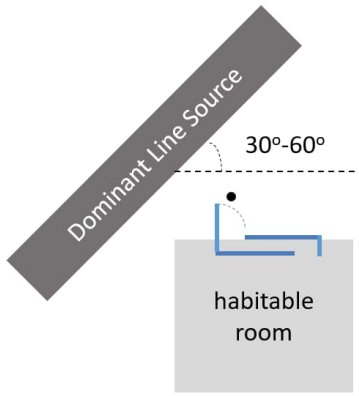
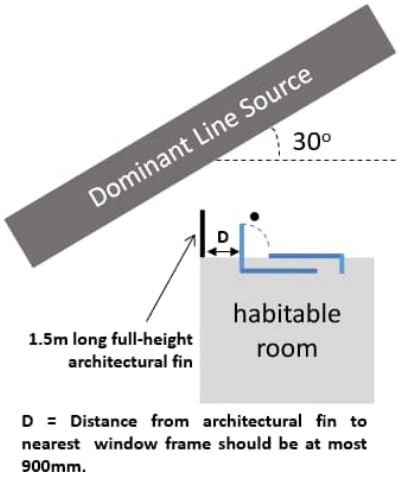
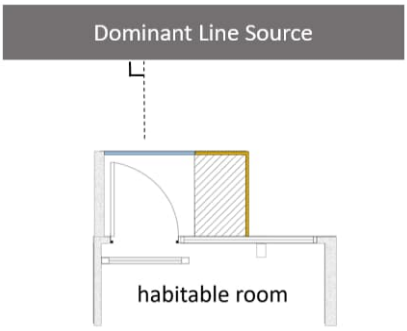
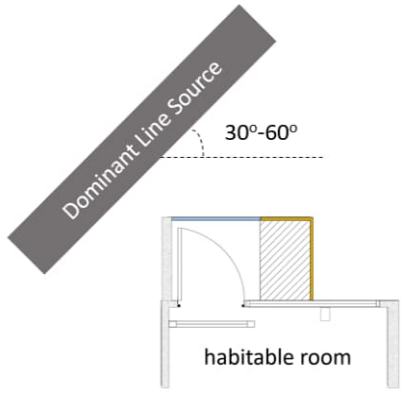
Table 1: Summary on RNR of Acoustic Window (Baffle Type) (for use in NIA) *Plan not to scale		Correction dB(A) L10(1hr)	
		8m²	18m²
	**(a) Provision of AW(BT) parallel to dominant line source** (whichever side the outer side-hung window is)	- **6.0** - **7.5 (added SAM[1])**	- **7.0** - **8.5 (added SAM[1])**
	**(b) Tilting the AW(BT) in (a) above to 30° - 60° horizontal incident angle to dominant line source** (whichever side the outer side-hung window is)	- **7.0** - **8.5 (added SAM[1])**	- **8.0** - **9.5 (added SAM[1])**
 D = Distance from architectural fin to nearest window frame should be at most 900mm.	**(b1) If tilted AW(BT) is at 30° horizontal incident angle to dominant line source** **+ 1.5m long full-height architectural fin[2]** *** AW(BT) + architectural fin should be considered as ONE package of noise mitigation measures. Outer side-hung window of AW(BT) and architectural fin should be installed at the side nearer to dominant line source.**	- **8.0** - **9.5 (added SAM[1])**	- **9.0** - **10.5 (added SAM[1])**

Table 2: Summary on RNR of Enhanced Acoustic Balcony (Baffle Type) (for use in NIA) *Plan not to scale		Correction dB(A) L10(1hr)	
		14m²	18m²
	**(a) Provision of EAB(BT) parallel to dominant line source**	- **8.0** - **9.5 (added SAM[1])**	- **9.0** - **10.5 (added SAM[1])**
	**(b) Tilting the EAB(BT) in (a) above to 30° - 60° horizontal incident angle to dominant line source**	- **11.0** - **12.5 (added SAM[1])**	- **11.0** - **12.5 (added SAM[1])**
Note 1: The additional Sound Absorptive Material (SAM) shall be of Noise Reduction Coefficient ≥ 0.7 and applied at top and outer opening side of the mullion. The material of SAM is subject to the requirements of section 3 of Building (Construction) Regulation.			

[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 the EPD for further details. As RNR varies with room size, practitioners and professionals may like to propose the preferred RNR to the EPD for consideration if different room size is encountered in the NIA study. Having said that, information indicates that for* ***Tables 1 and 2****:*

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

Appendix 6 **Table of Major Parameters and Room Size of Proposed Case and Corresponding Reference Case, and Sound Attenuation by Acoustic Systems**

Ref Code	Ref	FLAT	MPA /SAM	RA (m²)	PARAMETERS OF ACOUSTIC WINDOW (mm)			TNIA Sound Attenuation, dB(A)
					OOA (sqm)	G (mm)	O (mm)	
PN_8sqm_0_Enh	PN 5/23	BR2 (1 outer opening)	SAM, no MPA	8.0	0.52	100	100	7.5
PN_14_EAB_0		Living Room (Door)	no MPA / SAM	14.0	2.54	100	100	8

Abbreviations:

G	Gap Width between interior sliding panel and exterior glazing, or between exterior glazing and MPA on interior sliding panel
O	Overlapping Length
OOA	Outer Opening Area
RA	Room Area

Project Case							Reference Reduction			
NSR	Room	RA	Maximum Predicted Noise Level	Noise Exceedance Level	Overlap / Gap Width	OOA	Config	OOA	Room Size Adjustment	SA
		sqm	L10,peak hr, dB(A)	L10,peak hr, dB(A)	mm/mm	sqm		sqm	dB(A)	dB(A)
3/F - 11/F										
B1-01	BR	6.6	77.4	7.0	100 / 100	0.52	PN_8sqm_0_Enh	0.52	-0.84	6.7
B1-02	BR	6.6	77.1	6.7	100 / 100	0.52	PN_8sqm_0_Enh	0.52	-0.84	6.7
B1-03	Liv	10.5	77.0	6.6	100 / 100	2.54	PN_14_EAB_0	2.54	-1.25	6.8
B1-04	Liv	10.5	77.1	6.7	100 / 100	2.54	PN_14_EAB_0	2.54	-1.25	6.8
B1-05	BR	6.6	77.1	6.7	100 / 100	0.52	PN_8sqm_0_Enh	0.52	-0.84	6.7
B1-06	BR	6.6	77.1	6.7	100 / 100	0.52	PN_8sqm_0_Enh	0.52	-0.84	6.7
B1-07	BR	6.6	77.1	6.7	100 / 100	0.52	PN_8sqm_0_Enh	0.52	-0.84	6.7
B1-08	Liv	10.5	77.0	6.6	100 / 100	2.54	PN_14_EAB_0	2.54	-1.25	6.8
B1-09	BR	6.6	77.0	6.6	100 / 100	0.52	PN_8sqm_0_Enh	0.52	-0.84	6.7
B1-10	Liv	10.5	76.9	6.5	100 / 100	2.54	PN_14_EAB_0	2.54	-1.25	6.8
B1-11	BR	6.6	76.9	6.5	100 / 100	0.52	PN_8sqm_0_Enh	0.52	-0.84	6.7
B1-12	BR	6.6	77.2	6.8	100 / 100	0.52	PN_8sqm_0_Enh	0.52	-0.84	6.7
12/F - 22/F										
B1-01	BR	5.5	76.6	6.2	100 / 100	0.52	PN_8sqm_0_Enh	0.52	-1.63	5.9
B1-02	BR	5.5	76.4	6.0	100 / 100	0.52	PN_8sqm_0_Enh	0.52	-1.63	5.9
B1-03	Liv	9.5	76.4	6.0	100 / 100	2.54	PN_14_EAB_0	2.54	-1.68	6.3
B1-04	Liv	9.5	76.4	6.0	100 / 100	2.54	PN_14_EAB_0	2.54	-1.68	6.3
B1-05	BR	5.5	76.4	6.0	100 / 100	0.52	PN_8sqm_0_Enh	0.52	-1.63	5.9
B1-06	BR	5.5	76.5	6.1	100 / 100	0.52	PN_8sqm_0_Enh	0.52	-1.63	5.9
B1-07	BR	5.5	76.5	6.1	100 / 100	0.52	PN_8sqm_0_Enh	0.52	-1.63	5.9
B1-08	Liv	9.5	76.5	6.1	100 / 100	2.54	PN_14_EAB_0	2.54	-1.68	6.3
B1-09	BR	5.5	76.5	6.1	100 / 100	0.52	PN_8sqm_0_Enh	0.52	-1.63	5.9
B1-10	Liv	9.5	76.4	6.0	100 / 100	2.54	PN_14_EAB_0	2.54	-1.68	6.3
B1-11	BR	5.5	76.4	6.0	100 / 100	0.52	PN_8sqm_0_Enh	0.52	-1.63	5.9
B1-12	BR	5.5	76.5	6.1	100 / 100	0.52	PN_8sqm_0_Enh	0.52	-1.63	5.9
23/F - 33/F										
B1-01	BR	4.2	75.0	4.6	100 / 100	0.52	PN_8sqm_0_Enh	0.52	-2.80	4.7
B1-02	BR	4.2	74.9	4.5	100 / 100	0.52	PN_8sqm_0_Enh	0.52	-2.80	4.7
B1-03	Liv	9.0	74.9	4.5	100 / 100	2.54	PN_14_EAB_0	2.54	-1.92	6.1
B1-04	Liv	9.0	74.9	4.5	100 / 100	2.54	PN_14_EAB_0	2.54	-1.92	6.1
B1-05	BR	4.2	74.9	4.5	100 / 100	0.52	PN_8sqm_0_Enh	0.52	-2.80	4.7
B1-06	BR	4.2	74.9	4.5	100 / 100	0.52	PN_8sqm_0_Enh	0.52	-2.80	4.7
B1-07	BR	4.2	74.9	4.5	100 / 100	0.52	PN_8sqm_0_Enh	0.52	-2.80	4.7
B1-08	Liv	9.0	74.9	4.5	100 / 100	2.54	PN_14_EAB_0	2.54	-1.92	6.1
B1-09	BR	4.2	75.0	4.6	100 / 100	0.52	PN_8sqm_0_Enh	0.52	-2.80	4.7
B1-10	Liv	9.0	75.0	4.6	100 / 100	2.54	PN_14_EAB_0	2.54	-1.92	6.1
B1-11	BR	4.2	75.0	4.6	100 / 100	0.52	PN_8sqm_0_Enh	0.52	-2.80	4.7
B1-12	BR	4.2	75.1	4.7	100 / 100	0.52	PN_8sqm_0_Enh	0.52	-2.80	4.7

BR /Liv Bedroom / Living Dining Room
RA Room area
OOA Outer Opening Area
SA Sound Attenuation of noise mitigation measures adopted after correction

Note:
*: For NSRs proposed with Noise Mitigation Measures (NMM), the presented noise level is not the actual noise level at the external façade after the application of NMM, and these noise level are only the equivalent noise level at 1m from the external facade after accounting the reduction in noise levels inside the flat offered by propsoed NMM.

Appendix 7 Use of Acoustic Systems and Results of Traffic Noise Impact Assessment (Mitigated Scenario)

Traffic Noise Impact Assessment Results, Mitigated Scenario with Noise Canopy (AM)

Predicted Road Traffic Noise Level (L 10 (1-hour)) at Selected Noise Sensitive Receivers (Based on Year 2048 Traffic Forecast)

Residential

Tower 1

Floor	mPD	B1-01	B1-02	B1-03	B1-04	B1-05	B1-06	B1-07	B1-08	B1-09	B1-10	B1-11	B1-12	B1-13	B1-14	B1-15	B1-16	B1-17	B1-18	B1-19	B1-20	B1-21	B1-22	B1-23
3/F	32.9	73	70	70	70	69	69	69	70	70	69	70	72	68	64	64	64	64	65	65	65	66	67	69
4/F	36.4	77	76	76	76	76	76	76	76	76	76	76	76	68	64	64	64	64	65	65	65	66	67	69
5/F	39.8	77	77	77	77	77	77	77	77	77	77	77	77	68	64	64	64	64	65	65	65	66	67	69
6/F	43.3	77	77	77	77	77	77	77	77	77	77	77	77	68	64	64	64	64	65	65	65	66	67	70
7/F	46.7	77	77	77	77	77	77	77	77	77	77	77	77	68	64	64	64	64	65	65	65	66	67	70
8/F	50.2	77	77	77	77	77	77	77	77	77	77	77	77	68	64	64	64	64	65	65	65	66	67	69
9/F	53.6	77	77	77	77	77	77	77	77	77	77	77	77	68	64	64	64	64	65	65	65	65	67	69
10/F	57.1	77	77	77	77	77	77	77	77	77	77	77	77	68	64	64	64	64	65	65	65	65	67	69
11/F	60.5	77	77	77	77	77	77	77	77	77	77	77	77	68	64	64	64	64	65	65	65	65	66	69
12/F	64.0	77	76	76	76	76	77	77	77	77	76	76	77	68	64	64	64	64	65	65	65	65	66	69
13/F	67.4	76	76	76	76	76	76	76	76	76	76	76	76	68	64	64	64	64	65	65	65	65	66	69
14/F	70.9	76	76	76	76	76	76	76	76	76	76	76	76	68	64	64	64	64	65	65	65	65	66	69
15/F	74.3	76	76	76	76	76	76	76	76	76	76	76	76	68	64	64	64	64	65	65	65	65	66	69
16/F	77.8	76	76	76	76	76	76	76	76	76	76	76	76	68	64	64	64	64	65	65	65	65	66	69
17/F	81.2	76	76	76	76	76	76	76	76	76	76	76	76	69	64	64	64	64	64	65	65	65	66	69
18/F	84.7	76	76	76	76	76	76	76	76	76	76	76	76	69	65	64	64	64	64	65	65	65	66	69
19/F	88.1	76	75	75	75	75	75	75	75	75	75	75	75	69	65	64	64	64	64	64	65	65	66	68
20/F	91.6	75	75	75	75	75	75	75	75	75	75	75	75	69	65	64	64	64	64	64	64	65	66	68
21/F	95.0	75	75	75	75	75	75	75	75	75	75	75	75	69	65	64	64	64	64	64	64	65	66	68
22/F	98.5	75	75	75	75	75	75	75	75	75	75	75	75	69	65	64	64	64	64	64	64	65	66	68
23/F	101.9	75	75	75	75	75	75	75	75	75	75	75	75	69	65	64	64	64	64	64	64	65	65	68
24/F	105.4	75	75	75	75	75	75	75	75	75	75	75	75	69	66	64	64	64	64	64	64	65	65	68
25/F	108.8	75	75	75	75	75	75	75	75	75	75	75	75	69	66	64	64	64	64	64	64	65	65	68
26/F	112.3	75	75	75	75	75	75	75	75	75	75	75	75	69	66	65	64	64	64	64	64	64	65	68
27/F	115.7	75	75	75	75	75	75	75	75	75	75	75	75	69	66	65	64	64	64	64	64	64	65	68
28/F	119.2	75	75	75	75	75	75	75	75	75	75	75	75	69	66	65	64	64	64	64	64	64	65	67
29/F	122.6	75	74	74	75	75	75	75	75	75	75	75	75	69	66	65	64	64	64	64	64	64	65	67
30/F	126.1	74	74	74	74	74	74	74	74	75	75	75	75	69	66	65	64	64	64	64	64	64	65	67
31/F	129.5	74	74	74	74	74	74	74	74	74	74	74	74	69	66	65	64	64	64	64	64	64	65	67
32/F	133.0	74	74	74	74	74	74	74	74	74	74	74	74	69	66	65	64	64	64	64	64	64	65	67
33/F	136.4	74	74	74	74	74	74	74	74	74	74	74	74	69	66	65	64	64	64	64	64	64	65	67
Exceedance		31	30	30	30	30	30	30	30	30	30	30	31	0	0	0	0	0	0	0	0	0	0	0
No. of flats with exceedance		31			30		30		30		31			0			0			0			0	
Max. Noise Level		77	77	77	77	77	77	77	77	77	77	77	77	69	66	65	64	64	65	65	65	66	67	70

Noise level that will exceed limit of 70dB(A)

Max Noise Level (dB(A)) =	77
Total no. of Exceedance =	362
Total no. of flat Exceedance =	152
Total no. of Premises =	279
% Compliance =	46%

Schedule of Enhanced Acoustic Window and Enhanced Acoustic Balcony - Mitigated Scenario (AM)

Residential
Tower 1

Floor	mPD	B1-01	B1-02	B1-03	B1-04	B1-05	B1-06	B1-07	B1-08	B1-09	B1-10	B1-11	B1-12	B1-13	B1-14	B1-15	B1-16	B1-17	B1-18	B1-19	B1-20	B1-21	B1-22	B1-23
3/F	32.9	PN_8sqm_0_Enh	PN_8sqm_0_Enh	-	-	-	-	-	-	-	-	-	PN_8sqm_0_Enh	-	-	-	-	-	-	-	-	-	-	-
4/F	36.4	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	-	-	-	-	-	-	-	-	-	-	-
5/F	39.8	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	-	-	-	-	-	-	-	-	-	-	-
6/F	43.3	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	-	-	-	-	-	-	-	-	-	-	-
7/F	46.7	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	-	-	-	-	-	-	-	-	-	-	-
8/F	50.2	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	-	-	-	-	-	-	-	-	-	-	-
9/F	53.6	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	-	-	-	-	-	-	-	-	-	-	-
10/F	57.1	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	-	-	-	-	-	-	-	-	-	-	-
11/F	60.5	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	-	-	-	-	-	-	-	-	-	-	-
12/F	64.0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	-	-	-	-	-	-	-	-	-	-	-
13/F	67.4	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	-	-	-	-	-	-	-	-	-	-	-
14/F	70.9	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	-	-	-	-	-	-	-	-	-	-	-
15/F	74.3	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	-	-	-	-	-	-	-	-	-	-	-
16/F	77.8	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	-	-	-	-	-	-	-	-	-	-	-
17/F	81.2	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	-	-	-	-	-	-	-	-	-	-	-
18/F	84.7	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	-	-	-	-	-	-	-	-	-	-	-
19/F	88.1	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	-	-	-	-	-	-	-	-	-	-	-
20/F	91.6	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	-	-	-	-	-	-	-	-	-	-	-
21/F	95.0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	-	-	-	-	-	-	-	-	-	-	-
22/F	98.5	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	-	-	-	-	-	-	-	-	-	-	-
23/F	101.9	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	-	-	-	-	-	-	-	-	-	-	-
24/F	105.4	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	-	-	-	-	-	-	-	-	-	-	-
25/F	108.8	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	-	-	-	-	-	-	-	-	-	-	-
26/F	112.3	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	-	-	-	-	-	-	-	-	-	-	-
27/F	115.7	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	-	-	-	-	-	-	-	-	-	-	-
28/F	119.2	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	-	-	-	-	-	-	-	-	-	-	-
29/F	122.6	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	-	-	-	-	-	-	-	-	-	-	-
30/F	126.1	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	-	-	-	-	-	-	-	-	-	-	-
31/F	129.5	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	-	-	-	-	-	-	-	-	-	-	-
32/F	133.0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	-	-	-	-	-	-	-	-	-	-	-
33/F	136.4	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_14_EAB_0	PN_8sqm_0_Enh	PN_8sqm_0_Enh	-	-	-	-	-	-	-	-	-	-	-

Enhanced Acoustic Window (Baffle Type) adopted, reference from EPD PN 5/23
Enhanced Acoustic Balcony (Baffle Type) adopted, reference from EPD PN 5/23

Traffic Noise Impact Assessment Results, Mitigated Scenario with Noise Canopy, Enhanced Acoustic Window and Enhanced Acoustic Balcony (AM)

Predicted Road Traffic Noise Level (L 10 (1-hour)) at Selected Noise Sensitive Receivers (Based on Year 2048 Traffic Forecast)

Residential

Tower 1

Floor	mPD	B1-01	B1-02	B1-03	B1-04	B1-05	B1-06	B1-07	B1-08	B1-09	B1-10	B1-11	B1-12	B1-13	B1-14	B1-15	B1-16	B1-17	B1-18	B1-19	B1-20	B1-21	B1-22	B1-23
3/F	32.9	66	70	70	70	69	69	69	70	70	69	70	65	68	64	64	64	64	65	65	65	66	67	69
4/F	36.4	70	69	69	69	70	69	70	69	69	69	69	70	68	64	64	64	64	65	65	65	66	67	69
5/F	39.8	71	70	70	70	70	70	70	70	70	70	70	70	68	64	64	64	64	65	65	65	66	67	69
6/F	43.3	71	70	70	70	70	70	70	70	70	70	70	71	68	64	64	64	64	65	65	65	66	67	70
7/F	46.7	71	70	70	70	70	70	70	70	70	70	70	70	68	64	64	64	64	65	65	65	66	67	70
8/F	50.2	71	70	70	70	70	70	70	70	70	70	70	70	68	64	64	64	64	65	65	65	66	67	69
9/F	53.6	70	70	70	70	70	70	70	70	70	70	70	70	68	64	64	64	64	65	65	65	65	67	69
10/F	57.1	70	70	70	70	70	70	70	70	70	70	70	70	68	64	64	64	64	65	65	65	65	67	69
11/F	60.5	70	70	70	70	70	70	70	70	70	70	70	70	68	64	64	64	64	65	65	65	65	66	69
12/F	64.0	71	71	70	70	71	71	71	70	71	70	71	71	68	64	64	64	64	65	65	65	65	66	69
13/F	67.4	71	70	70	70	70	70	70	70	70	70	70	70	68	64	64	64	64	65	65	65	65	66	69
14/F	70.9	70	70	70	70	70	70	70	70	70	70	70	70	68	64	64	64	64	65	65	65	65	66	69
15/F	74.3	70	70	70	70	70	70	70	70	70	70	70	70	68	64	64	64	64	65	65	65	65	66	69
16/F	77.8	70	70	70	70	70	70	70	70	70	70	70	70	68	64	64	64	64	65	65	65	65	66	69
17/F	81.2	70	70	69	69	70	70	70	69	70	69	70	70	69	64	64	64	64	64	65	65	65	66	69
18/F	84.7	70	70	69	69	70	70	70	69	70	69	70	70	69	65	64	64	64	64	65	65	65	66	69
19/F	88.1	70	70	69	69	70	70	70	69	70	69	70	70	69	65	64	64	64	64	64	65	65	66	68
20/F	91.6	70	69	69	69	69	69	69	69	69	69	69	69	69	65	64	64	64	64	64	64	65	66	68
21/F	95.0	69	69	69	69	69	69	69	69	69	69	69	69	69	65	64	64	64	64	64	64	65	66	68
22/F	98.5	69	69	69	69	69	69	69	69	69	69	69	69	69	65	64	64	64	64	64	64	65	66	68
23/F	101.9	70	70	69	69	70	70	70	69	70	69	70	70	69	65	64	64	64	64	64	64	65	65	68
24/F	105.4	70	70	69	69	70	70	70	69	70	69	70	70	69	66	64	64	64	64	64	64	65	65	68
25/F	108.8	70	70	69	69	70	70	70	69	70	69	70	70	69	66	64	64	64	64	64	64	65	65	68
26/F	112.3	70	70	69	69	70	70	70	69	70	69	70	70	69	66	65	64	64	64	64	64	64	65	68
27/F	115.7	70	70	68	69	70	70	70	69	70	69	70	70	69	66	65	64	64	64	64	64	64	65	68
28/F	119.2	70	70	68	68	70	70	70	69	70	69	70	70	69	66	65	64	64	64	64	64	64	65	67
29/F	122.6	70	70	68	68	70	70	70	68	70	68	70	70	69	66	65	64	64	64	64	64	64	65	67
30/F	126.1	70	70	68	68	70	70	70	68	70	68	70	70	69	66	65	64	64	64	64	64	64	65	67
31/F	129.5	70	70	68	68	70	70	70	68	70	68	70	70	69	66	65	64	64	64	64	64	64	65	67
32/F	133.0	70	70	68	68	70	70	70	68	70	68	70	70	69	66	65	64	64	64	64	64	64	65	67
33/F	136.4	70	70	68	68	70	70	70	68	70	68	70	70	69	66	65	64	64	64	64	64	64	65	67
Exceedance		6	1	0	0	1	1	1	0	1	0	1	2	0	0	0	0	0	0	0	0	0	0	0
No. of flats with exceedance		6			1		1		1		2			0			0			0			0	
Max. Noise Level		71	71	70	70	71	71	71	70	71	70	71	71	69	66	65	64	64	65	65	65	66	67	70

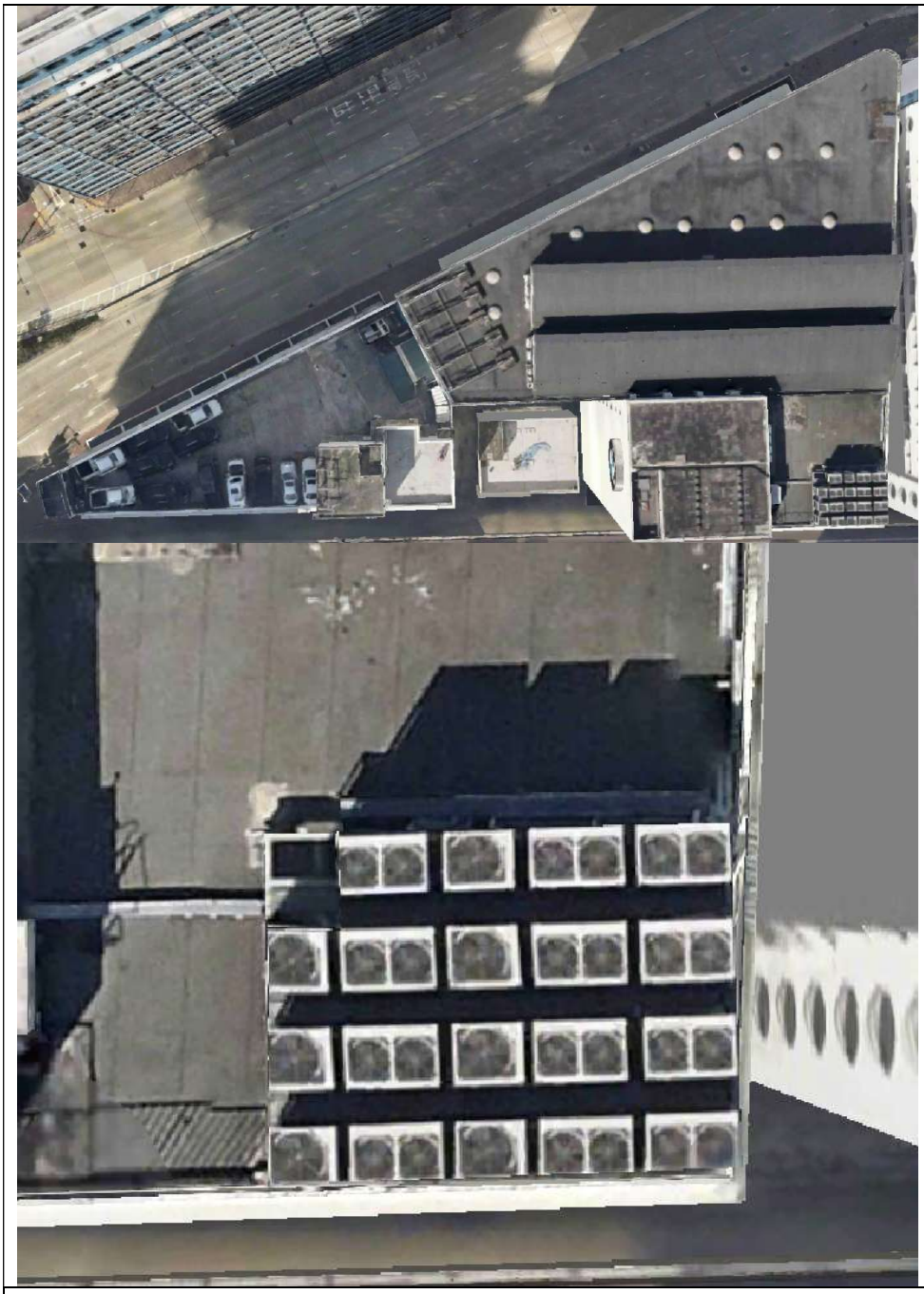
Enhanced Acoustic Window (Baffle Type) adopted, reference from EPD PN 5/23

Enhanced Acoustic Balcony (Baffle Type) adopted, reference from EPD PN 5/23

Noise level that will exceed limit of 70dB(A)

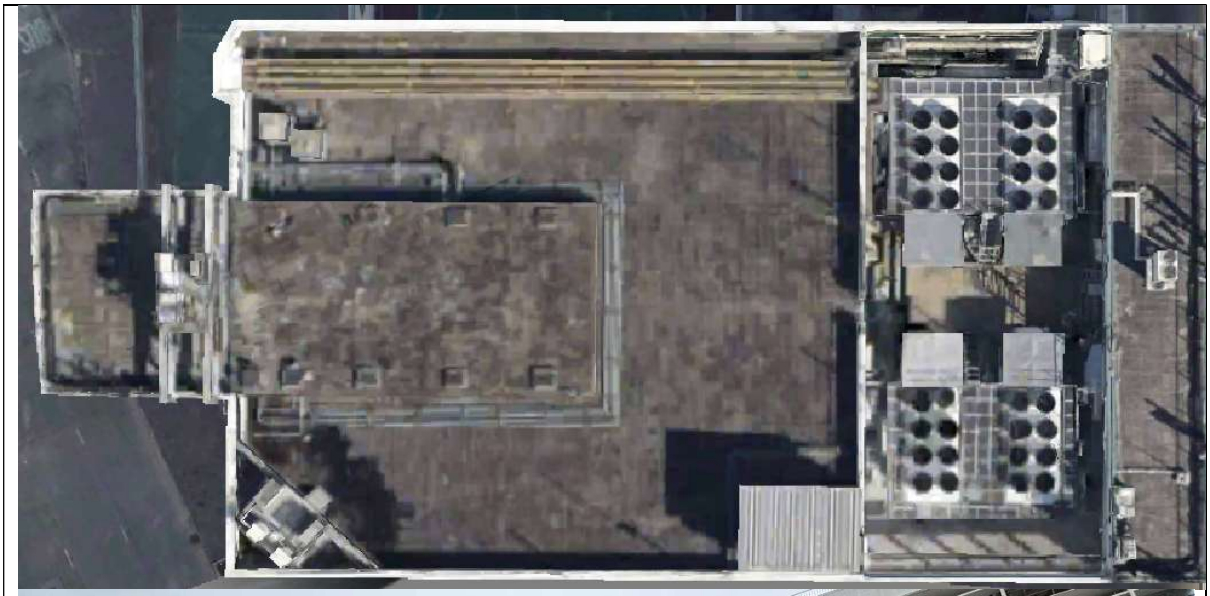
Max Noise Level (dB(A)) =	71
Total no. of Exceedance =	14
Total no. of flat Exceedance =	11
Total no. of Premises =	279
% Compliance =	96%

Appendix 8 Photo Records of Site Survey and Desktop Review



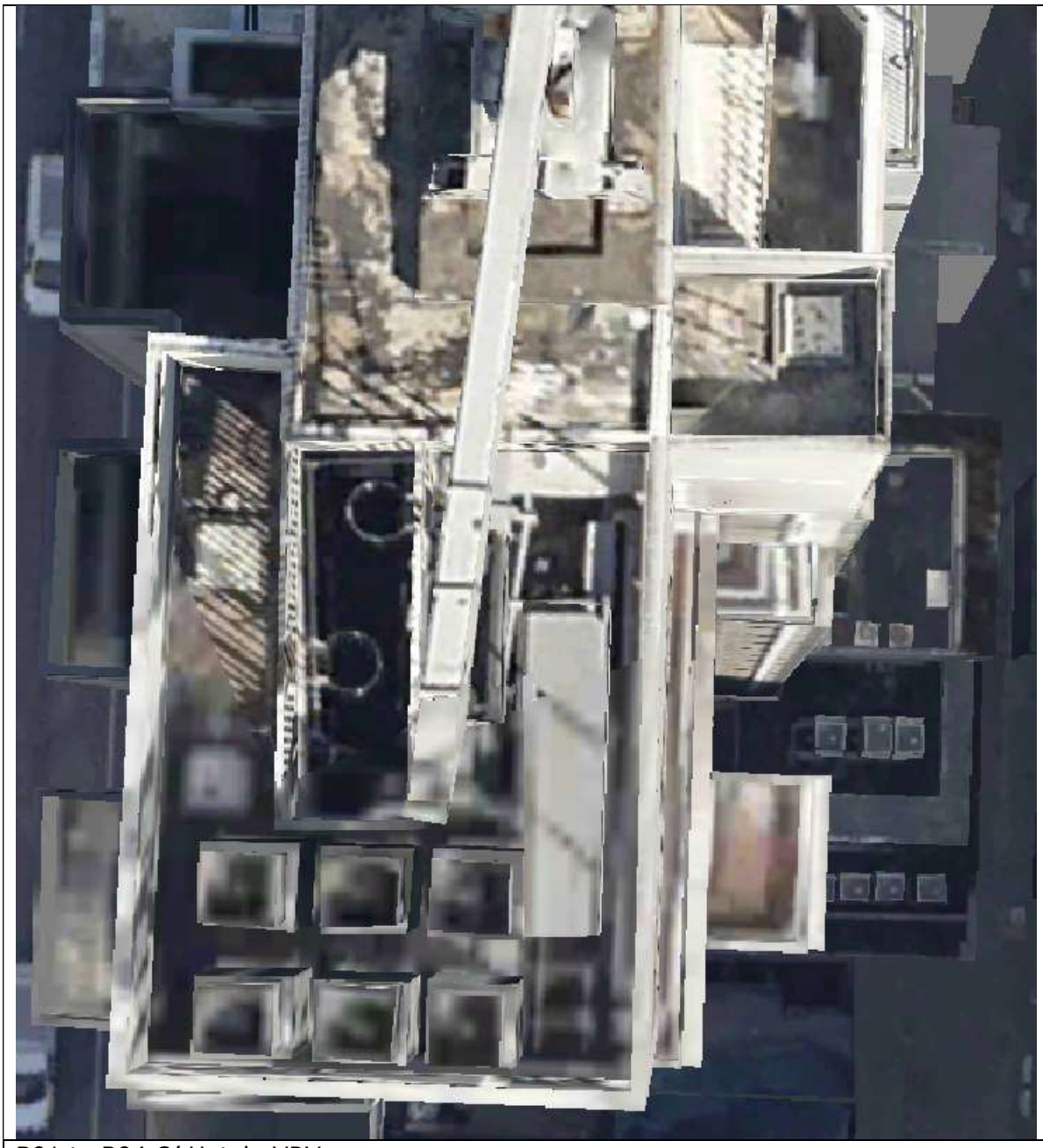
V01 to V19 BMW House - VRVs
No nighttime operation (23:00 – 07:00)
SWL reference from EA report of CBS:2-KC

G01 Gainfall Centre – Car Washing
24-hour operation
SWL reference from EA report of HSK/HT NDA

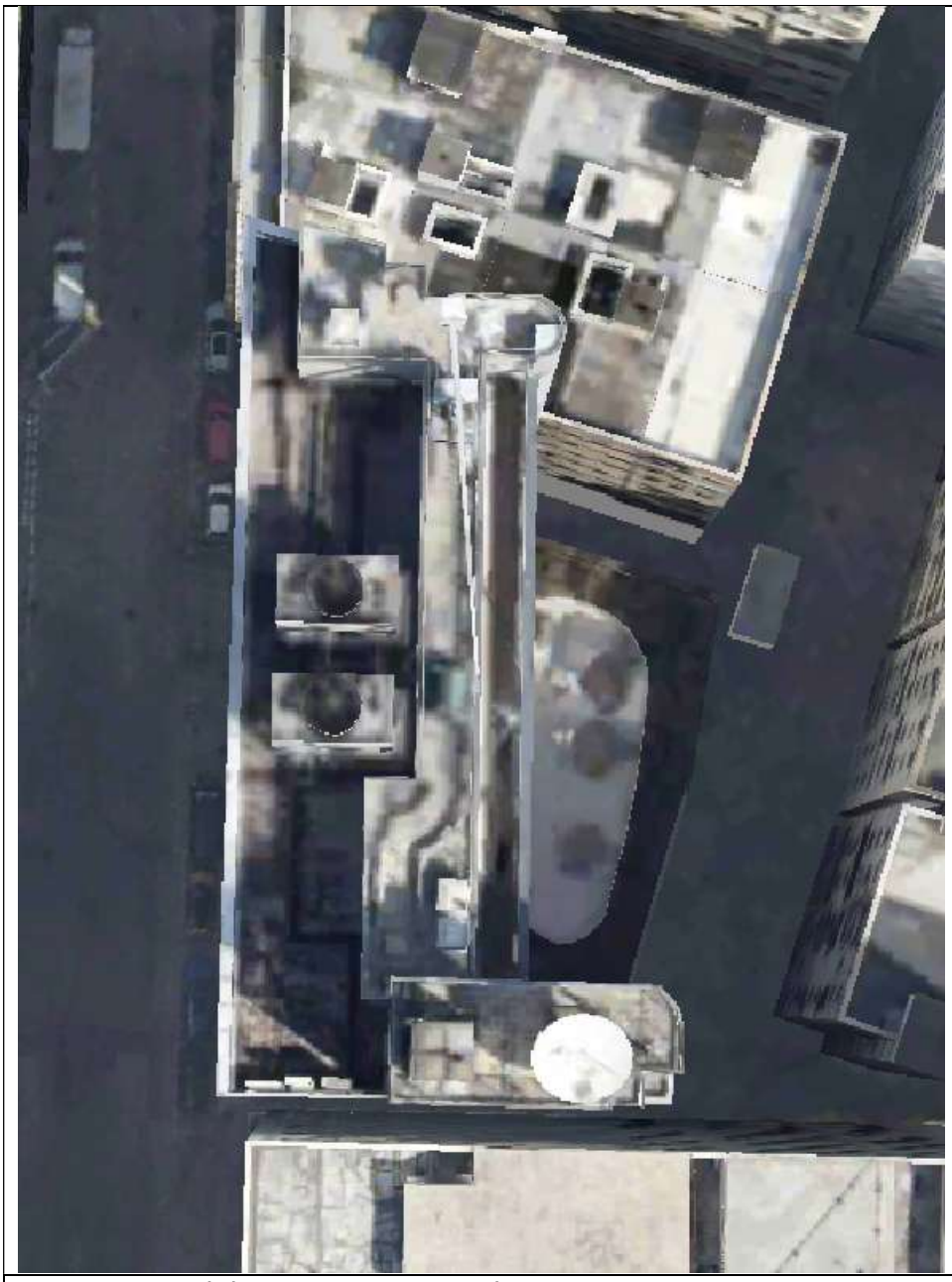


C01 to C05 To Kwa Wan Complex and Government Offices – Chillers and VRVs
No nighttime operation (23:00 – 07:00)
SWL reference from EA report of CBS:2-KC

A01 to A07 To Kwa Wan Market – Chillers and VRVs
No nighttime operation (23:00 – 07:00)
SWL reference from reference EA report of CBS:2-KC



B01 to B04 O' Hotel –VRVs
24-hour operation
Line of sight of VRVs at lower roof blocked by building itself, not calculated in fixed noise source impact assessment
SWL reference from catalogue

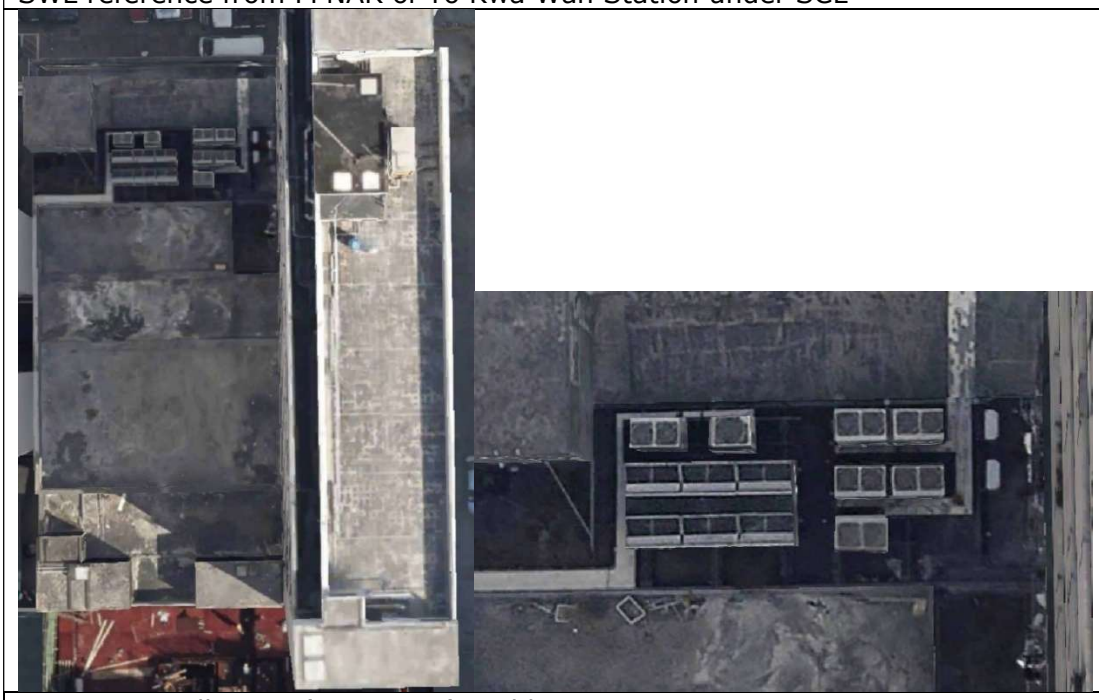


D01 to D02 iClub To Kwa Wan Hotel
24-hour operation
SWL reference from catalogue

E01 to E17 To Kwa Wan MTR Station Exit D – Ventilation Louvre and Cooling Tower
Operation follow MTR operation hour
(Both daytime & evening time and night-time operation)
SWL reference from FPNAR of To Kwa Wan Station under SCL

F01 to F14 Ventilation Shaft (next to To Kwa Wan Market) – Ventilation Louvre
Operation follow MTR operation hour
(Both daytime & evening time and night-time operation)
SWL reference from FPNAR of To Kwa Wan Station under SCL

H01 to H06 To Kwa Wan MTR Station Exit A (next to To Kwa Wan Market) – Ventilation Louvre
Operation follow MTR operation hour
(Both daytime & evening time and night-time operation)
SWL reference from FPNAR of To Kwa Wan Station under SCL



J01 to J03 Full Moon (Ming Yuet) Building – VRVs
Line of sight of VRVs at lower roof blocked by adjacent building (Cheung Wah Building), not calculated in fixed noise source impact assessment
No nighttime operation (23:00 – 07:00)

Appendix 9 **Extracted Pages from Fixed Plant Noise Audit Report and Proposal for Updating Maximum Allowable SWL of Fixed Plant Sources (Batch 1 – To Kwa Wan Station (TKW)) under Shatin to Central Link – Tai Wai to Hung Hom Section [SCL (TAW – HUH)] and Stabling Sidings at Hung Hom Freight Yard [SCL (HHS)]**

AECOM

MTR Corporation Limited

Consultancy Agreement No. C11033

Shatin to Central Link - Tai Wai to Hung Hom Section [SCL(TAW – HUH)] and Stabling Sidings at Hung Hom Freight Yard [SCL(HHS)]

Fixed Plant Noise Audit Report (Batch 1 – To Kwa Wan Station (TKW))

March 2019

	Name	Signature
Prepared & Checked:	Isaac Chu	
Reviewed & Approved:	Josh Lam	

Version:	A	Date: 14 March 2019

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1 INTRODUCTION

1.1 Background

1.1.1 The Shatin to Central Link (SCL) is a 17km extension of the existing Ma On Shan Line (MOL) and East Rail Line (EAL) comprising (i) The East-West Corridor which extends the MOL from Tai Wai to Hung Hom via East Kowloon to connect with the West Rail Line (WRL) at Hung Hom Station (HUH) and Stabling Sidings at Hung Hom Freight Yard (HHS); and (ii) The North-South Corridor which is an extension of the EAL at Hung Hom across the harbour to Admiralty Station (ADM).

1.1.2 Environmental Impact Assessment (EIA) Reports for SCL – Tai Wai to Hung Hom Section [SCL (TAW-HUH)] (Register No. AEIAR-167/2012) and SCL Stabling Sidings at Hung Hom Freight Yard [SCL (HHS)] (Register No. AEIAR-164/2012) (hereinafter referred to as "the EIA Reports") were approved on 17 February 2012 under the Environmental Impact Assessment Ordinance (EIAO). Following the approval of the EIA Reports, the Environmental Permit (EP) (EP No: EP-438/2012), covering the construction of both SCL (TAW-HUH) and SCL (HHS) (hereinafter referred to as "the Project"), was granted on 22 March 2012. Variations of Environmental Permit (VEP) were subsequently applied for EP-438/2012 and the latest Environmental Permit (EP No: EP-438/2012/K) was issued by Director of Environmental Protection (DEP) on 4 October 2016.

1.1.3 Pursuant to EP Condition 2.32, at least one month before commencement of operation of the Project, the Permit Holder, MTR Corporation Ltd (MTR), shall carry out fixed plant noise audit and deposit with the Director four hardcopies and one electronic copy of an audit report showing the design of the fixed plant noise sources associated with the Project complies with the maximum sound power levels determined in the approved SCL(TAW-HUH) EIA Report (Register No. AEIAR-167/2012) and SCL(HHS) EIA Report (Register No. AEIAR-164/2012) and all relevant documents in the Register, or otherwise approved by the Director in compliance with the requirements in Technical Memorandum on Environmental Impact Assessment Process having due regard to the characteristics of tonality, impulsiveness and intermittency.

1.1.4 Since the installation of fixed plant along the SCL (TAW-HUH) and SCL (HHS) would be completed in stages, the fixed plant noise audit will be conducted in stages according to the testing and commissioning programmes in each area.

1.1.5 AECOM Asia Co. Ltd was commissioned by the MTR to prepare the fixed plant noise audit report to check the compliance of the maximum sound power levels (SWLs) and to undertake noise measurement at the representative Noise Sensitive Receivers (NSRs) for investigation of any characteristics of tonality, impulsiveness and intermittency from the fixed plant noise sources associated with the Project.

1.1.6 Based on the latest design information, the maximum allowable SWLs of fixed plant items has been updated to reflect the latest design of the Project, and therefore Proposals were prepared to present the updated maximum allowable sound power levels (SWLs) of the fixed plant items at different stations of the Project. The Proposal for Updating Maximum Allowable Sound Power Levels of Louvers (Batch 1 – To Kwa Wan Station (TKW)) (hereinafter referred to as "the Proposal (Batch 1 – TKW)") (**Appendix A** refers) was approved by DEP on 13 March 2019.

1.1.7 This Fixed Plant Noise Audit Report (Batch 1 – To Kwa Wan Station (TKW)) (hereinafter referred to as "the FPNAR (Batch 1 - TKW") presents the noise measurement methodology and measurement results at the fixed plant noise sources of TKW and at the representative NSRs near TKW, for checking compliance with the maximum allowable sound power levels (SWLs) determined in the Proposal (Batch 1 – TKW).

2 UPDATED SOUND POWER LEVELS OF FIXED PLANT NOISE SOURCES

2.1.1 The updated maximum allowable SWL of fixed plant noise sources at TKW are extracted from the Proposal (Batch 1 – TKW) and are summarised in **Table 2.1**. The updated fixed plant noise sources locations at TKW are shown in **Figure No. C1103/C/SCL/ACM/M52/041**. The measured noise level of fixed plant noise sources during the commissioning test shall comply with the maximum allowable SWLs as summarised in **Table 2.1**. Appropriate corrections in tonal, impulsive or intermittent characteristics should be applied, where applicable, in accordance with the IND-TM during the commissioning test conducted at the representative NSRs.

Table 2.1 Summary of Updated Maximum Allowable SWLs for Fixed Plant Noise Sources at TKW

Location	Fixed Plant ID. (1)	Fixed Plant Source	Maximum Allowable SWL, dB(A)	
			Daytime/Evening (2)	Night-time (2)
TKW	VS-TKW-1	Tunnel Ventilation Louver	87	77
	VS-TKW-2	Tunnel Ventilation Louver	90	80
	VS-TKW-3	Tunnel Ventilation Louver	87	77
	VS-TKW-4	Station Ventilation Louver	81	71
	VS-TKW-5	Station Ventilation Louver	85	75
	VS-TKW-6	Station Ventilation Louver	81	71
	VS-TKW-7	Tunnel Ventilation Louver	91	81
	VS-TKW-8	Tunnel Ventilation Louver	85	75
	VS-TKW-9	Station Ventilation Louver	80	70
	VS-TKW-22	Station Ventilation Louver	95	85
	VS-TKW-27-L	Station Ventilation Louver	78	68
	VS-TKW-27-R	Station Ventilation Louver	82	72
	VS-TKW-27A-L	Station Ventilation Louver	82	72
	VS-TKW-27A-R	Station Ventilation Louver	89	79
	VS-TKW-28	Station Ventilation Louver	85	75
	VS-TKW-48	Tunnel Ventilation Louver	87	81
	VS-TKW-49	Station Ventilation Louver	82	76
	VS-TKW-50	Tunnel Ventilation Louver	96	88
	VS-TKW-51	Tunnel Ventilation Louver	94	88
	VS-TKW-52	Tunnel Ventilation Louver	88	82
	VS-TKW-53	Tunnel Ventilation Louver	81	74
	VS-TKW-54	Station Ventilation Louver	84	78
	VS-TKW-55	Station Ventilation Louver	87	81
	VS-TKW-56	Station Ventilation Louver	92	86
	VS-TKW-57	Station Ventilation Louver	81	75
	VS-TKW-57A	Station Ventilation Louver	90	84
	VS-TKW-58	Station Ventilation Louver	90	84
	VS-TKW-59	Tunnel Ventilation Louver	84	78
	VS-TKW-60	Tunnel Ventilation Louver	85	79
	VS-TKW-61	Station Ventilation Louver	77	76
	VS-TKW-64	Station Ventilation Louver	79	73
	VS-TKW-65	Station Ventilation Louver	80	79
	VS-TKW-67	Station Ventilation Louver	88	87

Location	Fixed Plant ID. (1)	Fixed Plant Source	Maximum Allowable SWL, dB(A)	
			Daytime/Evening (2)	Night-time (2)
	VS-TKW-68	Station Ventilation Louver	79	77
	VS-TKW-71	Station Ventilation Louver	79	73
	CT-TKW-001	Cooling Tower	97	87
	CT-TKW-002	Cooling Tower	97	87

Notes:
(1) Ma Tau Wai Station as named in the EIA Reports have been recently renamed as To Kwa Wan Station (TKW). The fixed plant ID. are therefore updated from VS-MTW-XX to VS-TKW-XX to match with existing naming.
(2) Day: 0700 to 1900 hours, Evening: 1900 to 2300 hours, Night: 2300 to 0700 hours.

LEGEND:

- REPRESENTATIVE NOISE SENSITIVE RECEIVERS (NSRs)
- ASSESSMENT POINT FOR FIXED PLANT NOISE CALCULATION
- APPROXIMATE NOISE SOURCE LOCATION (FACADE)
- APPROXIMATE NOISE SOURCE LOACTION (TOP)

TKW-12-3
TKW-12-4
TKW-12-10B
TKW-12-10A
TKW-12-5
TKW-17-1
TKW-18-1
VS-TKW-65
TKW-16-1
VS-TKW-61,
VS-TKW-68
VS-TKW-71
VS-TKW-67
VS-TKW-64
VS-TKW-28
VS-TKW-27-L
VS-TKW-27A-L
VS-TKW-27-R
VS-TKW-8
VS-TKW-1
VS-TKW-5
VS-TKW-4
CT-TKW-002
CT-TKW-001
VS-TKW-27A-R
VS-TKW-7
VS-TKW-22
VS-TKW-2
VS-TKW-3
VS-TKW-6,
VS-TKW-9
DETAIL '1'
TKW
KAU PUI LUNG ROAD
MAIDSTONE ROAD
KOWLOON CITY ROAD (Ground Level) (RCP under)
CHI KIANG STREET
ANHUI STREET
SZE CHUEN STREET
HA HEUNG ROAD
CHEUNG NING STREET
SHEUNG HEUNG ROAD
TAU WAI ROAD
HUNG KWONG STREET
WING YU STREET
CHUNG ROAD
MA HANG CHUNG ROAD
SHAN ROAD
Elevated Road
TO KWA WAN ROAD
819600 N
819800 N
820000 N
820200 N
837200 E
837400 E
837600 E

0 7.5 15 22.5 30 37.5
METRES
1 : 1500 (A3)

DETAIL '1'
SCALE A3 1 : 500

VS-TKW-48
VS-TKW-58
VS-TKW-49
VS-TKW-60
VS-TKW-59
VS-TKW-50
VS-TKW-51
VS-TKW-54
VS-TKW-52
VS-TKW-53
VS-TKW-57,
VS-TKW-57A
VS-TKW-55,
VS-TKW-56
819850 N
819800 N
837400 E

REV	DESCRIPTION	BY	DATE	APPROVED

DRAWN	XH
DESIGNED	GL
CHECKED	ST
APPROVED	ST
DATE	09/JAN/2019

MTR

SHATIN TO CENTRAL LINK

ORIGINATOR

AECOM

CADD REF. C11033_C_SCL_ACM_M52_041.dgn

TITLE

C11033
SCL (TAW-HUH)
LOCATIONS OF NSRs AND FIXED PLANT NOISE SOURCES AT TKW

SCALE 1 : 1500 (A3)

FIGURE NO. C11033/C/SCL/ACM/M52/041

REV. -

PLOT DRV: V:\customer\MTR\PLOTDRIVER\WINDOWS\A3_COLOUR.pltr
MODEL: PRINTED BY: ZENGFA 2019/1/11 14:49:2
FILENAME: P:\PROJECTS\60273491\DRAWING\REPORT\C11033\C11033_C_SCL_ACM_M52_041.dgn

Table 2.4 Review of ASRs

Area (NSR No.) (1)	Type of Area (2)	Influencing Factor (IF)	Degree to which NSR is affected by IF	ASR	Time Period(3)	Prevailing Background Noise Levels, dB(A) (4)	ANL-5, dB(A) (5)	Criteria, dB(A) (6)
To Kwa Wan								
Lucky Mansion (TKW-12-3)	Urban Area	Ma Tau Wai Road	Directly Affected	C	Day & evening	69	65	65
					Night	56	55	55
352-354 Ma Tau Wai Rd (TKW-12-4)	Urban Area	Ma Tau Wai Road	Directly Affected	C	Day & evening	69	65	65
					Night	56	55	55
Lucky Building (TKW-12-10)	Urban Area	Ma Tau Wai Road	Directly Affected	C	Day & evening	69	65	65
					Night	56	55	55
SKH Good Shepherd Primary School (TKW-16-1)	Urban Area	Ma Tau Wai Road	Directly Affected	C	Day & evening	69	65	65
					Night	56	55	N/A (7)
Seng Cheong Building (TKW-12-5)	Urban Area	Chatham Road North & Ma Tau Wai Road, East Kowloon Corridor <Flyover>	Directly Affected	C	Day & evening	70	65	65
					Night	65	55	55
Loyal Mansion (TKW-17-1)	Urban Area	Chatham Road North & Ma Tau Wai Road, East Kowloon Corridor <Flyover>	Directly Affected	C	Day & evening	70	65	65
					Night	65	55	55
Residential premises along Chi Kiang Street (City Hub) (TKW-18-1)	Urban Area	Chatham Road North & Ma Tau Wai Road, East Kowloon Corridor <Flyover>	Directly Affected	C	Day & evening	70	65	65
					Night	65	55	55

Notes:
(1) Ma Tau Wai Station as named in the EIA Reports has been recently renamed as To Kwa Wan Station (TKW). The NSR Nos. are therefore updated from MTW-XX-X to TKW-XX-X to match with existing naming of both stations.
(2) Reference is made from Appendix 8.2 of the approved SCL(TAW-HUH) EIA report.
(3) Day: 0700 to 1900 hours, Evening: 1900 to 2300 hours, Night: 2300 to 0700 hours.
(4) Prevailing background noise levels are extracted from Table 8.8 of approved EIA Reports.
(5) A 5 dB(A) has been deducted from ANL as specified in requirement of TM-EIAO.
(6) The minimum of prevailing background noise level & ANL-5 is adopted.
(7) No sensitive use during night-time period is assumed.

Appendix 10 Reference catalogue of typical cooling tower

菱和
RYOWO™

FRP CROSS FLOW FC SERIES

COOLING TOWER

SPECIFICATION

ITEM	MODER			ONE CELL							TWO CELLS					THREE CELLS			FOUR CELLS		
				FC-100	FC-125	FC-150	FC-175	FC-200	FC-225	FC-250	FC-300	FC-350	FC-400	FC-450	FC-500	FC-600	FC-675	FC-750	FC-800	FC-900	FC-1000
CAPACITY	27°C WB	circulating water flow rate	m^3/hr	78.0	97.5	117.0	136.5	156.0	175.5	195.0	234.0	273.0	312.0	351.0	390.0	468.0	526.5	585.0	624.0	702.0	780.0
		make-up water(approx.)	m^3/hr	1.1	1.4	1.7	2.0	2.2	2.5	2.8	3.3	3.9	4.5	5.0	5.6	6.7	7.5	8.4	8.9	10.0	11.2
	28°C WB	circulating water flow rate	m^3/hr	70	88	105	123	140	158	175	210	245	280	315	350	420	473	525	560	630	700
		make-up water(approx.)	m^3/hr	1.0	1.3	1.5	1.8	2.0	2.3	2.5	3.0	3.5	4.0	4.5	5.0	6.0	6.8	7.5	8.0	9.0	10.0
	Air flow rate(Approx.)		m^3/min	630	800	960	1135	1285	1460	1660	1920	2270	2570	2920	3320	3855	4380	4950	5140	5840	6640
	Hot water temperature		℃	37																	
	Cold water temperature		℃	32																	
OVERALL DIMENSION	Width		mm	1650		2000		2300	2600		4000		4600	5200		6900		7800	9200		10400
	Length		mm	3650		4000		4300	4400		4000		4300	4400		4300		4400	4300		4400
	Height		mm	3400																	
MATERIAL	Casing			FRP																	
	Steel structure			Steel (hot-dip galvanized)																	
	Filler			PVC																	
	Distribution tray			FRP																	
	Cold water basin			FRP																	
	Sump tank			FRP																	
	Fan			Blade : FRP , Hub : Aluminum Cast alloy																	
	Fan stack			FRP																	
FAN ASSEMBLY	Fan	TYPE		Axial-flow																	
		Diameter X Nos.	∅ mm	1400 x 1		1600 x 1		1800 X1	2000 x 1		1600 x 2	1800 X1	2000 x 2	1800 X3	2000 x 3	1800 X4		2000 x 4			
		Number of blades		4																	
		Fan speed(Approx.)	rpm	470	540	375	420	420	335	370	375	420	420	335	370	420	335	370	420	335	370
		Drive system		V-belt drive																	
	Motor	TYPE		Totally enclosed fan cooled outdoor 3 phase induction motor 4 poles																	
		Power source		380V / 3 / 50Hz																	
		Rated output	Kw	2.2 x 1	3.7 x 1		5.5 x 1		7.5 x		3.7 x 2	5.5 x 2		7.5 x 2		5.5 x 3	7.5 x 3		5.5 x 4	7.5 x 4	
		Quantity		1							2					3			4		
DISTRIBUTION SYSTEM				Open gravity + redistribution layer																	
PIPING DIMENSION	Hot water inlet pipe		mm	∅100 x 2			∅125 x 2				∅100 x 4		∅125 x 4			∅125 x 6			∅125 x 8		
	Cold water outlet pipe		mm	∅125 x 1		∅150 x 1			∅200 x 1			∅250 x 1				∅200 x 2			∅250 x 2		
	Drain pipe		mm	∅50 x 1		∅ 50 x 1			∅ 50 x 1							∅50 x 2					
	Overflow pipe		mm	∅50 x 1		∅ 50 x 1			∅80 x 1							∅80 x 2					
	Float valve		mm	∅25 x 1					∅40 x 1			∅ 40 x 1				∅40 x 2			∅ 40 x 2		
	Manual make-up		mm	∅25 x 1					∅40 x 1			∅ 40 x 1				∅40 x 2			∅ 40 x 2		
MAKE-UP	Evaporation loss(Approx.)		%	Approx 0.83																	
	Drift loss		%	Less than 0.005																	
WEIGHT	Net weight		kg	970	985	1160	1205	1345	1390	1450	2270	2360	2640	2730	2850	3985	4120	4300	5280	5460	5700
	Operating weight		kg	2475	2490	2975	3020	3450	3750	3810	5455	5545	6400	7000	7120	9850	10755	10935	12800	14005	14245
NOISE LEVEL	Measuring point D=1.13√LxW		dBA	64	65	65	66	66	66	67	67	68	68	69	70	70	71	71	72	73	73

ITEM	MODER			ONE CELL					TWO CELLS							THREE CELLS						FOUR CELLS			FIVE CELLS	
				FC/LN-100	FC/LN-125	FC/LN-150	FC/LN-175	FC/LN-200	FC/LN-250	FC/LN-300	FC/LN-350	FC/LN-400	FC/LN-450	FC/LN-500	FC/LN-600	FC/LN-700	FC/LN-800	FC/LN-900	FC/LN-1000
CAPACITY	27°C WB	circulating water flow rate	m^3/hr	78.0	97.5	117.0	136.5	156.0	195.0	234.0	273.0	312.0	351.0	390.0	468.0	546.0	624.0	702.0	780.0
		make-up water(approx.)	m^3/hr	1.1	1.4	1.7	2.0	2.2	2.8	3.3	3.9	4.5	5.0	5.6	6.7	7.8	8.9	10.0	11.2
	28°C WB	circulating water flow rate	m^3/hr	70	88	105	123	140	175	210	245	280	315	350	420	490	560	630	700
		make-up water(approx.)	m^3/hr	1.0	1.3	1.5	1.8	2.0	2.5	3.0	3.5	4.0	4.5	5.0	6.0	7.0	8.0	9.0	10.0
	Air flow rate(Approx.)		m^3/min	530	680	830	980	1100	1360	1660	1960	2200	2490	2940	3300	3920	4400	4900	5500
	Hot water temperature		℃	37															
	Cold water temperature		℃	32															
OVERALL DIMENSION	Width		mm	2000		2300		2600	4000		4600	5200		6900		7800	9200	10400	11500	13000
	Length		mm	4000		4300		4400	4000		4300	4400		4300		4400	4300	4400	4300	4400
	Height		mm	3700																
MATERIAL	Casing			FRP																
	Steel structure			Steel (hot-dip galvanized)																
	Filler			PVC																
	Distribution tray			FRP																
	Cold water basin			FRP																
	Sump tank			FRP																
	Fan			Blade : FRP , Hub : Aluminum Cast alloy																
	Fan stack			FRP																
FAN ASSEMBLY	Fan	TYPE		Axial-flow																
		Diameter X Nos.	∅ mm	1600 x 1		1800 x 1		2000 x 1	1600 x 2		1800 x 2	2000 x 2		1800 x 3	2000 x 3	1800 x 4	2000 x 4	1800 x 5	2000 x 5
		Number of blades		4															
		Fan speed(Approx.)	rpm	270	340	300	360	310	340	300	360	310	300	360	310	360	310	360	310
		Drive system		V-belt drive															
	Motor	TYPE		Totally enclosed fan cooled outdoor 3 phase induction motor 4 poles															
		Power source		380V / 3 / 50Hz															
		Rated output	Kw	1.5 x 1	2.2 x 1		3.7 x 1		2.2 x 2		3.7 x 2		2.2 x 3		3.7 x 3		3.7 x 4		3.7 x 5
		Quantity		1					2				3			4			5
DISTRIBUTION SYSTEM				Open gravity + redistribution layer															
PIPING DIMENSION	Hot water inlet pipe		mm	∅100 x 2				∅125 x 2	∅100 x 4			∅125 x 4	∅100 x 6		∅125 x 6	∅100 x 8	∅125 x 8		∅125 x 10
	Cold water outlet pipe		mm	∅125 x 1		∅150 x 1			∅200 x 1			∅250 x 1	∅200 x 2				∅250 x 2		∅200 x 3
	Drain pipe		mm	∅50 x 1		∅ 50 x 1			∅50 x 1				∅50 x 2						
	Overflow pipe		mm	∅50 x 1		∅ 50 x 1			∅80 x 1				∅80 x 2						
	Float valve		mm	∅25 x 1					∅40 x 1				∅40 x 2					∅ 40 x 2	
	Manual make-up		mm	∅25 x 1					∅40 x 1				∅40 x 2					∅ 40 x 2	
MAKE-UP	Evaporation loss(Approx.)		%	Approx 0.83															
	Drift loss		%	Less than 0.005															
WEIGHT	Net weight		kg	1080	1120	1240	1260	1530	2230	2450	2470	2880	3700	3800	4550	5000	6050	6100	7550
	Operating weight		kg	2250	2340	2640	2730	3170	4340	4920	5090	5910	7560	7820	9080	10180	11820	12910	14990
NOISE LEVEL	Measuring point D=1.13√LxW		dBA	60	61	62	63	64	65	65	66	66	67	68	68	69	70	71	71

Note: Nominal cooling capacity is based on 131 / min/ RT(1RT=3,900 Kcal /hr) at 37 ℃ hot water in, 32℃ cold water out 27℃ ambient wet bulb. The SPLs are measured 1.13.√WxL horizontally away from air intake side of the tower at 1.5m above the foundation level. Pump head of the cooling tower is approximate equal to the height of tower(H). Dimension shown in this catalogue is metric sized and specifications are subject to change without further notice for technical improvement of our products.

GUARANTEE:

All components are guaranteed against defective material for a period of one(1) year. When return to RYOWO with transportation prepaid, all parts found by factory inspection to be defective will be repaired or replaced without charge, FOB Hong Kong or FOB ShenZhen, PRC. No liability will be assumed for loss or damage resulting form misuse of our products.

Appendix 11 Results of Fixed Noise Source Impact Assessment

Table 1 Industrial Noise Inventory

Noise Source ID	Coordinates		Equipment	Location	Operation		Day Reference SPL / SWL	Night Reference SPL /SWL	No. of Equipment	Measurement Distance	Day Total SWL	Night Total SWL	Tonality Correction	Remarks	Name in Other Reference
	x	y			Day	Night	dB(A)	dB(A)	no	m	dB(A)	dB(A)	dB(A)		
V01	837421	819770.7	VRV	BMW House	Yes	No	60	-	1	1	68.0	-	3	Reference is made to Approved EA Report for Kau Pui Lung Road / Chi Kiang Street Development Scheme (CBS-2:KC) extracted in Appendix 12. 3 dB(A) tonality correction is given to SWL referenced from equipment catalogue.	V01
V02	837422	819770.2	VRV		Yes	No	60	-	1	1	68.0	-	3		V02
V03	837423	819769.6	VRV		Yes	No	60	-	1	1	68.0	-	3		V03
V04	837424	819768.9	VRV		Yes	No	60	-	1	1	68.0	-	3		V04
V05	837420	819769.5	VRV		Yes	No	60	-	1	1	68.0	-	3		V05
V06	837421	819768.9	VRV		Yes	No	60	-	1	1	68.0	-	3		V06
V07	837423	819768.4	VRV		Yes	No	60	-	1	1	68.0	-	3		V07
V08	837424	819767.7	VRV		Yes	No	60	-	1	1	68.0	-	3		V08
V09	837420	819768.5	VRV		Yes	No	56	-	1	1	64.0	-	3		V09
V10	837421	819767.9	VRV		Yes	No	56	-	1	1	64.0	-	3		V10
V11	837422	819767.3	VRV		Yes	No	56	-	1	1	64.0	-	3		V11
V12	837423	819766.7	VRV		Yes	No	56	-	1	1	64.0	-	3		V12
V13	837419	819767.5	VRV		Yes	No	60	-	1	1	68.0	-	3		V13
V14	837420	819766.9	VRV		Yes	No	60	-	1	1	68.0	-	3		V14
V15	837422	819766.3	VRV		Yes	No	60	-	1	1	68.0	-	3		V15
V16	837423	819765.7	VRV		Yes	No	60	-	1	1	68.0	-	3		V16
V17	837420	819765.8	VRV		Yes	No	56	-	1	1	64.0	-	3		V17
V18	837421	819765.2	VRV		Yes	No	56	-	1	1	64.0	-	3		V18
V19	837422	819764.6	VRV		Yes	No	56	-	1	1	64.0	-	3		V19
G01	837388	819709	Car washing	Gainfall Centre	Yes	Yes	69.9	69.9	1	5.0	91.9	91.9	3	Reference from NIA-HSK Report (extracted in Appendix 12), relevant SWL of similar car washing facilities calculated based on the on-site measurement is 69.9 dB(A) measured at 5m. 3 dB(A) tonality correction is given to this noise source.	-
C01	837421	819784.4	Chiller	To Kwa Wan Complex and Government Offices	Yes	No	87.9	-	1	-	87.9	-	0	Reference is made to Approved EA Report for Kau Pui Lung Road / Chi Kiang Street Development Scheme (CBS-2:KC) extracted in Appendix 12. 3 dB(A) tonality correction is given to SWL referenced from equipment catalogue.	C01
C02	837426	819794.9	Chiller		Yes	No	87.9	-	1	-	87.9	-	0		C02
C03	837426	819782	Chiller		Yes	No	87.9	-	1	-	87.9	-	0		C03
C04	837431	819792.7	Chiller		Yes	No	87.9	-	1	-	87.9	-	0		C04
C05	837433	819787.2	VRV		Yes	No	60	-	1	1	68.0	-	3		C05
A01	837433	819825.3	Chiller	To Kwa Wan Market	Yes	No	53	-	1	10	81.0	-	3	Reference is made to Approved EA Report for Kau Pui Lung Road / Chi Kiang Street Development Scheme (CBS-2:KC) extracted in Appendix 12. 3 dB(A) tonality correction is given to SWL referenced from equipment catalogue.	A01
A02	837431	819821.8	Chiller		Yes	No	53	-	1	10	81.0	-	3		A02
A03	837429	819818.3	VRV		Yes	No	60	-	1	1	68.0	-	3		A03
A04	837425	819807.3	VRV		Yes	No	73.4	-	1	-	73.4	-	0		A04
A05	837428	819806	VRV		Yes	No	74.4	-	1	-	74.4	-	0		A05
A06	837430	819799.3	Chiller		Yes	No	81	-	1	-	81.0	-	3		A06
A07	837433	819797.8	Chiller		Yes	No	81	-	1	-	81.0	-	3		A07
B01	837461	819760.2	VRV	O' Hotel	Yes	Yes	56	56	6	1	71.8	71.8	3	Reference is made to Product Catalogue of Daikin RUXYQ14BA in Approved EA Report for Kau Pui Lung Road / Chi Kiang Street Development Scheme (CBS-2:KC) extracted in Appendix 12 for similar dimension. 3 dB(A) tonality correction is given to this noise source.	-
B02	837472	819754.4	VRV		Yes	Yes	-	-	5	-	-	-	-	As the location of fixed noise sources are at lower roof of the building and line of sight being blocked by O' Hotel. Thus this fixed noise source is not calculated in Fixed Noise Sources Impact Assessment.	-
B03	837472	819760.8	VRV		Yes	Yes	-	-	3	-	-	-	-		-
B04	837473	819762.4	VRV		Yes	Yes	-	-	2	-	-	-	-		-
D01	837495	819696.7	Cooling Tower	iClub To Kwa Wan Hotel	Yes	Yes	67	67	1	3.8	86.7	86.7	3	Reference is made to Product Catalogue in Appendix 10: Ryowo FC-250 for similar dimension. 3 dB(A) tonality correction is given to this noise source.	-
D02	837493	819692.7	Cooling Tower		Yes	Yes	67	67	1	3.8	86.7	86.7	3		-
E01	837399	819579.5	TVL	To Kwa Wan MTR Station Exit D	Yes	Yes	87	77	1	-	87.0	77.0	0	Reference is made to Fixed Plant Noise Audit Report (Batch 1 - To Kwa Wan Station), pursuant to Condition 2.32 of the Environmental Permit (EP-438/2012/K) as extracted in Appendix 9.	VS-TKW-1
E02	837408	819581.6	TVL		Yes	Yes	90	80	1	-	90.0	80.0	0		VS-TKW-2
E03	837405	819572.2	TVL		Yes	Yes	87	77	1	-	87.0	77.0	0		VS-TKW-3
E04	837402	819571.9	SVL		Yes	Yes	81	71	1	-	81.0	71.0	0		VS-TKW-4
E05	837400	819571.9	SVL		Yes	Yes	85	75	1	-	85.0	75.0	0		VS-TKW-5
E06	837399	819586	SVL		Yes	Yes	81	71	1	-	81.0	71.0	0		VS-TKW-6
E07	837405	819590.1	TVL		Yes	Yes	91	81	1	-	91.0	81.0	0		VS-TKW-7
E08	837399	819579.6	TVL		Yes	Yes	85	75	1	-	85.0	75.0	0		VS-TKW-8
E09	837399	819585.9	SVL		Yes	Yes	80	70	1	-	80.0	70.0	0		VS-TKW-9
E10	837412	819582.8	SVL		Yes	Yes	95	85	1	-	95.0	85.0	0		VS-TKW-22
E11	837398	819608.5	SVL		Yes	Yes	78	68	1	-	78.0	68.0	0		VS-TKW-27-L
E12	837398	819598.8	SVL		Yes	Yes	82	72	1	-	82.0	72.0	0		VS-TKW-27-R
E13	837398	819601.3	SVL		Yes	Yes	82	72	1	-	82.0	72.0	0		VS-TKW-27A-L
E14	837398	819599.7	SVL		Yes	Yes	89	79	1	-	89.0	79.0	0		VS-TKW-27A-R
E15	837405	819617.1	SVL		Yes	Yes	85	75	1	-	85.0	75.0	0		VS-TKW-28
E16	837402	819600.7	Cooling Tower		Yes	Yes	97	87	1	-	97.0	87.0	0		CT-TKW-001
E17	837401	819609.5	Cooling Tower		Yes	Yes	97	87	1	-	97.0	87.0	0		CT-TKW-002
F01	837394	819842.1	TVL	Ventilation Shaft (Next to To Kwa Wan Market)	Yes	Yes	87	81	1	-	87.0	81.0	0	Reference is made to Fixed Plant Noise Audit Report (Batch 1 - To Kwa Wan Station), pursuant to Condition 2.32 of the Environmental Permit (EP-438/2012/K) as extracted in Appendix 9.	VS-TKW-48
F02	837395	819844.2	SVL		Yes	Yes	82	76	1	-	82.0	76.0	0		VS-TKW-49
F03	837401	819842.1	TVL		Yes	Yes	96	88	1	-	96.0	88.0	0		VS-TKW-50
F04	837399	819835.6	TVL		Yes	Yes	94	88	1	-	94.0	88.0	0		VS-TKW-51
F05	837408	819839.1	TVL		Yes	Yes	88	82	1	-	88.0	82.0	0		VS-TKW-52
F06	837405	819838.7	TVL		Yes	Yes	81	74	1	-	81.0	74.0	0		VS-TKW-53
F07	837407	819835.3	SVL		Yes	Yes	84	78	1	-	84.0	78.0	0		VS-TKW-54
F08	837407	819833.7	SVL		Yes	Yes	87	81	1	-	87.0	81.0	0		VS-TKW-55
F09	837407	819833.7	SVL		Yes	Yes	92	86	1	-	92.0	86.0	0		VS-TKW-56
F10	837406	819832.7	SVL		Yes	Yes	81	75	1	-	81.0	75.0	0		VS-TKW-57
F11	837406	819832.5	SVL		Yes	Yes	90	84	1	-	90.0	84.0	0		VS-TKW-57A
F12	837394	819839.2	SVL		Yes	Yes	90	84	1	-	90.0	84.0	0		VS-TKW-58
F13	837395	819840.5	TVL		Yes	Yes	84	78	1	-	84.0	78.0	0		VS-TKW-59
F14	837394	819841.3	TVL		Yes	Yes	85	79	1	-	85.0	79.0	0		VS-TKW-60
H01	837387	819884.8	SVL	To Kwa Wan MTR Station Exit A	Yes	Yes	77	76	1	-	77.0	76.0	0	Reference is made to Fixed Plant Noise Audit Report (Batch 1 - To Kwa Wan Station), pursuant to Condition 2.32 of the Environmental Permit (EP-438/2012/K) as extracted in Appendix 9.	VS-TKW-61
H02	837404	819872.3	SVL		Yes	Yes	79	73	1	-	79.0	73.0	0		VS-TKW-64
H03	837393	819888.1	SVL		Yes	Yes	80	79	1	-	80.0	79.0	0		VS-TKW-65
H04	837397	819875.2	SVL		Yes	Yes	88	87	1	-	88.0	87.0	0		VS-TKW-67
H05	837387	819884.5	SVL		Yes	Yes	79	77	1	-	79.0	77.0	0		VS-TKW-68
H06	837404	819879.1	SVL		Yes	Yes	79	73	1	-	79.0	73.0	0		VS-TKW-71
J01	837486	820075.8	VRV	Full Moon (Ming Yuet) Building	Yes	No	-	-	7	-	-	-	-	As the location of fixed noise sources are at lower roof of the building and line of sight being blocked by Cheung Wah Building. Thus this fixed noise source is not calculated in Fixed Noise Sources Impact Assessment.	-
J02	837486	820075.8	VRV		Yes	No	-	-	1	-	-	-	-		-
J03	837492	820073.1	VRV		Yes	No	-	-	5	-	-	-	-		-

Remark:

1 For column of reference SPL /SWL, measurement distance is shown if reference SPL is adopted while measurement distance is not shown if reference SWL is adopted.

2 For column of Name in other Reference refers to naming in Approved EA Report for Kau Pui Lung Road / Chi Kiang Street Development Scheme (CBS-2:KC) and Fixed Plant Noise Audit Report (Batch 1 - To Kwa Wan Station), pursuant to Condition 2.32 of the Environmental Permit (EP-438/2012/K).

Table 2 Representative Noise Sensitive Receivers for Fixed Noise Source Impact Assessment

NSR	Area Sensitivity Ratings	Coordinates		Predicted Noise Level		Acceptable Noise Level	
		x-	y-	Day	Night	Day	Night
	A/B/C			Leq (30 min) dB(A)	Leq (30 min) dB(A)	Leq (30 min) dB(A)	Leq (30 min) dB(A)
N01	C	837355	819857.7	63	57	70	60
N02	C	837355.5	819846.5	64	58	70	60
N03	C	837355.2	819829.3	64	58	70	60

NSR N01
Coordinates 837355.0 819857.7

Noise Source ID	Coordinates		Operation		Day Total SWL	Night Total SWL	Tonality Correction	Barrier Correction	Distance with NSR	Distance Attenuation	Façade Correction	Day SPL	Night SPL
	x	y	Day	Night	dB(A)	dB(A)	dB(A)	dB(A)	m	dB(A)	dB(A)	dB(A)	dB(A)
V01	837420.6	819770.7	Yes	No	68	-	3	0	109	-49	3	25.3	0
V02	837421.8	819770.2	Yes	No	68	-	3	0	110	-49	3	25.2	0
V03	837423.1	819769.6	Yes	No	68	-	3	0	111	-49	3	25.1	0
V04	837424.3	819768.9	Yes	No	68	-	3	0	113	-49	3	25.0	0
V05	837420.1	819769.5	Yes	No	68	-	3	0	110	-49	3	25.2	0
V06	837421.3	819768.9	Yes	No	68	-	3	0	111	-49	3	25.1	0
V07	837422.5	819768.4	Yes	No	68	-	3	0	112	-49	3	25.0	0
V08	837423.8	819767.7	Yes	No	68	-	3	0	113	-49	3	24.9	0
V09	837419.6	819768.5	Yes	No	64	-	3	0	110	-49	3	21.2	0
V10	837420.8	819767.9	Yes	No	64	-	3	0	111	-49	3	21.1	0
V11	837422.0	819767.3	Yes	No	64	-	3	0	113	-49	3	21.0	0
V12	837423.3	819766.7	Yes	No	64	-	3	0	114	-49	3	20.9	0
V13	837419.1	819767.5	Yes	No	68	-	3	0	111	-49	3	25.1	0
V14	837420.3	819766.9	Yes	No	68	-	3	0	112	-49	3	25.0	0
V15	837421.5	819766.3	Yes	No	68	-	3	0	113	-49	3	24.9	0
V16	837422.8	819765.7	Yes	No	68	-	3	0	114	-49	3	24.8	0
V17	837419.8	819765.8	Yes	No	64	-	3	0	112	-49	3	21.0	0
V18	837421.0	819765.2	Yes	No	64	-	3	0	114	-49	3	20.9	0
V19	837422.3	819764.6	Yes	No	64	-	3	0	115	-49	3	20.8	0
G01	837388.2	819709.0	Yes	Yes	92	92	3	0	152	-52	3	46.2	46.2
C01	837421.2	819784.4	Yes	No	88	-	0	0	99	-48	3	43.0	0
C02	837425.9	819794.9	Yes	No	88	-	0	0	95	-48	3	43.4	0
C03	837426.2	819782.0	Yes	No	88	-	0	0	104	-48	3	42.6	0
C04	837430.8	819792.7	Yes	No	88	-	0	0	100	-48	3	42.9	0
C05	837432.5	819787.2	Yes	No	68	-	3	0	105	-48	3	25.6	0
A01	837432.6	819825.3	Yes	No	81	-	3	0	84	-46	3	40.5	0
A02	837430.9	819821.8	Yes	No	81	-	3	0	84	-46	3	40.5	0
A03	837429.3	819818.3	Yes	No	68	-	3	0	84	-46	3	27.5	0
A04	837424.9	819807.3	Yes	No	73	-	0	0	86	-47	3	29.7	0
A05	837427.7	819806.0	Yes	No	74	-	0	0	89	-47	3	30.4	0
A06	837429.9	819799.3	Yes	No	81	-	3	0	95	-48	3	39.4	0
A07	837433.3	819797.8	Yes	No	81	-	3	0	99	-48	3	39.1	0
B01	837461.2	819760.2	Yes	Yes	72	72	3	0	144	-51	3	26.6	26.6
D01	837494.5	819696.7	Yes	Yes	87	87	3	0	213	-55	3	38.1	38.1
D02	837492.6	819692.7	Yes	Yes	87	87	3	0	215	-55	3	38.0	38.0
E01	837398.7	819579.5	Yes	Yes	87	77	0	0	282	-57	3	33.0	23.0
E02	837407.9	819581.6	Yes	Yes	90	80	0	0	281	-57	3	36.0	26.0
E03	837405.5	819572.2	Yes	Yes	87	77	0	0	290	-57	3	32.8	22.8
E04	837401.9	819571.9	Yes	Yes	81	71	0	0	290	-57	3	26.8	16.8
E05	837399.6	819571.9	Yes	Yes	85	75	0	0	289	-57	3	30.8	20.8
E06	837398.7	819586.0	Yes	Yes	81	71	0	0	275	-57	3	27.2	17.2
E07	837404.9	819590.1	Yes	Yes	91	81	0	0	272	-57	3	37.3	27.3
E08	837398.9	819579.6	Yes	Yes	85	75	0	0	282	-57	3	31.0	21.0
E09	837398.7	819585.9	Yes	Yes	80	70	0	0	275	-57	3	26.2	16.2
E10	837411.5	819582.8	Yes	Yes	95	85	0	0	281	-57	3	41.0	31.0
E11	837398.0	819608.5	Yes	Yes	78	68	0	0	253	-56	3	24.9	14.9
E12	837397.8	819598.8	Yes	Yes	82	72	0	0	262	-56	3	28.6	18.6
E13	837397.9	819601.3	Yes	Yes	82	72	0	0	260	-56	3	28.7	18.7
E14	837397.8	819599.7	Yes	Yes	89	79	0	0	262	-56	3	35.6	25.6
E15	837404.7	819617.1	Yes	Yes	85	75	0	0	246	-56	3	32.2	22.2
E16	837401.6	819600.7	Yes	Yes	97	87	0	0	261	-56	3	43.7	33.7
E17	837401.3	819609.5	Yes	Yes	97	87	0	0	252	-56	3	44.0	34.0
F01	837394.1	819842.1	Yes	Yes	87	81	0	0	42	-40	3	49.5	43.5
F02	837394.9	819844.2	Yes	Yes	82	76	0	0	42	-40	3	44.5	38.5
F03	837400.7	819842.1	Yes	Yes	96	88	0	0	48	-42	3	57.3	49.3
F04	837399.2	819835.6	Yes	Yes	94	88	0	0	49	-42	3	55.1	49.1
F05	837407.8	819839.1	Yes	Yes	88	82	0	0	56	-43	3	48.0	42.0
F06	837404.6	819838.7	Yes	Yes	81	74	0	0	53	-43	3	41.5	34.5
F07	837407.3	819835.3	Yes	Yes	84	78	0	0	57	-43	3	43.9	37.9
F08	837407.3	819833.7	Yes	Yes	87	81	0	0	57	-43	3	46.8	40.8
F09	837407.4	819833.7	Yes	Yes	92	86	0	0	58	-43	3	51.8	45.8
F10	837406.3	819832.7	Yes	Yes	81	75	0	0	57	-43	3	40.9	34.9
F11	837406.3	819832.5	Yes	Yes	90	84	0	0	57	-43	3	49.9	43.9
F12	837393.9	819839.2	Yes	Yes	90	84	0	0	43	-41	3	52.3	46.3
F13	837394.6	819840.5	Yes	Yes	84	78	0	0	43	-41	3	46.3	40.3
F14	837394.3	819841.3	Yes	Yes	85	79	0	0	43	-41	3	47.4	41.4
H01	837387.4	819884.8	Yes	Yes	77	76	0	0	42	-41	3	39.5	38.5
H02	837403.8	819872.3	Yes	Yes	79	73	0	0	51	-42	3	39.9	33.9
H03	837393.3	819888.1	Yes	Yes	80	79	0	0	49	-42	3	41.2	40.2
H04	837397.3	819875.2	Yes	Yes	88	87	0	0	46	-41	3	49.8	48.8
H05	837387.1	819884.5	Yes	Yes	79	77	0	0	42	-40	3	41.6	39.6
H06	837404.0	819879.1	Yes	Yes	79	73	0	0	53	-43	3	39.4	33.4
										Cumulative Noise Level		63.2	57.3

NSR N02
Coordinates 837355.5 819846.5

Noise Source ID	Coordinates		Operation		Day Total SWL	Night Total SWL	Tonality Correction	Barrier Correction	Distance with NSR	Distance Attenuation	Façade Correction	Day SPL	Night SPL
	x	y	Day	Night	dB(A)	dB(A)	dB(A)	dB(A)	m	dB(A)	dB(A)	dB(A)	dB(A)
V01	837420.6	819770.7	Yes	No	68	-	3	0	100	-48	3	26.0	0
V02	837421.8	819770.2	Yes	No	68	-	3	0	101	-48	3	25.9	0
V03	837423.1	819769.6	Yes	No	68	-	3	0	102	-48	3	25.8	0
V04	837424.3	819768.9	Yes	No	68	-	3	0	104	-48	3	25.7	0
V05	837420.1	819769.5	Yes	No	68	-	3	0	100	-48	3	26.0	0
V06	837421.3	819768.9	Yes	No	68	-	3	0	102	-48	3	25.9	0
V07	837422.5	819768.4	Yes	No	68	-	3	0	103	-48	3	25.7	0
V08	837423.8	819767.7	Yes	No	68	-	3	0	104	-48	3	25.6	0
V09	837419.6	819768.5	Yes	No	64	-	3	0	101	-48	3	21.9	0
V10	837420.8	819767.9	Yes	No	64	-	3	0	102	-48	3	21.8	0
V11	837422.0	819767.3	Yes	No	64	-	3	0	103	-48	3	21.7	0
V12	837423.3	819766.7	Yes	No	64	-	3	0	105	-48	3	21.6	0
V13	837419.1	819767.5	Yes	No	68	-	3	0	101	-48	3	25.9	0
V14	837420.3	819766.9	Yes	No	68	-	3	0	103	-48	3	25.8	0
V15	837421.5	819766.3	Yes	No	68	-	3	0	104	-48	3	25.7	0
V16	837422.8	819765.7	Yes	No	68	-	3	0	105	-48	3	25.6	0
V17	837419.8	819765.8	Yes	No	64	-	3	0	103	-48	3	21.7	0
V18	837421.0	819765.2	Yes	No	64	-	3	0	104	-48	3	21.6	0
V19	837422.3	819764.6	Yes	No	64	-	3	0	106	-48	3	21.5	0
G01	837388.2	819709.0	Yes	Yes	92	92	3	0	141	-51	3	46.9	46.9
C01	837421.2	819784.4	Yes	No	88	-	0	0	90	-47	3	43.8	0
C02	837425.9	819794.9	Yes	No	88	-	0	0	87	-47	3	44.1	0
C03	837426.2	819782.0	Yes	No	88	-	0	0	96	-48	3	43.3	0
C04	837430.8	819792.7	Yes	No	88	-	0	0	93	-47	3	43.6	0
C05	837432.5	819787.2	Yes	No	68	-	3	0	97	-48	3	26.2	0
A01	837432.6	819825.3	Yes	No	81	-	3	0	80	-46	3	40.9	0
A02	837430.9	819821.8	Yes	No	81	-	3	0	79	-46	3	41.0	0
A03	837429.3	819818.3	Yes	No	68	-	3	0	79	-46	3	28.0	0
A04	837424.9	819807.3	Yes	No	73	-	0	0	80	-46	3	30.4	0
A05	837427.7	819806.0	Yes	No	74	-	0	0	83	-46	3	31.0	0
A06	837429.9	819799.3	Yes	No	81	-	3	0	88	-47	3	40.1	0
A07	837433.3	819797.8	Yes	No	81	-	3	0	92	-47	3	39.7	0
B01	837461.2	819760.2	Yes	Yes	72	72	3	0	136	-51	3	27.1	27.1
D01	837494.5	819696.7	Yes	Yes	87	87	3	0	204	-54	3	38.4	38.4
D02	837492.6	819692.7	Yes	Yes	87	87	3	0	206	-54	3	38.4	38.4
E01	837398.7	819579.5	Yes	Yes	87	77	0	0	270	-57	3	33.4	23.4
E02	837407.9	819581.6	Yes	Yes	90	80	0	0	270	-57	3	36.4	26.4
E03	837405.5	819572.2	Yes	Yes	87	77	0	0	279	-57	3	33.1	23.1
E04	837401.9	819571.9	Yes	Yes	81	71	0	0	279	-57	3	27.1	17.1
E05	837399.6	819571.9	Yes	Yes	85	75	0	0	278	-57	3	31.1	21.1
E06	837398.7	819586.0	Yes	Yes	81	71	0	0	264	-56	3	27.6	17.6
E07	837404.9	819590.1	Yes	Yes	91	81	0	0	261	-56	3	37.7	27.7
E08	837398.9	819579.6	Yes	Yes	85	75	0	0	270	-57	3	31.4	21.4
E09	837398.7	819585.9	Yes	Yes	80	70	0	0	264	-56	3	26.6	16.6
E10	837411.5	819582.8	Yes	Yes	95	85	0	0	270	-57	3	41.4	31.4
E11	837398.0	819608.5	Yes	Yes	78	68	0	0	242	-56	3	25.3	15.3
E12	837397.8	819598.8	Yes	Yes	82	72	0	0	251	-56	3	29.0	19.0
E13	837397.9	819601.3	Yes	Yes	82	72	0	0	249	-56	3	29.1	19.1
E14	837397.8	819599.7	Yes	Yes	89	79	0	0	250	-56	3	36.0	26.0
E15	837404.7	819617.1	Yes	Yes	85	75	0	0	235	-55	3	32.6	22.6
E16	837401.6	819600.7	Yes	Yes	97	87	0	0	250	-56	3	44.0	34.0
E17	837401.3	819609.5	Yes	Yes	97	87	0	0	241	-56	3	44.3	34.3
F01	837394.1	819842.1	Yes	Yes	87	81	0	0	39	-40	3	50.2	44.2
F02	837394.9	819844.2	Yes	Yes	82	76	0	0	39	-40	3	45.1	39.1
F03	837400.7	819842.1	Yes	Yes	96	88	0	0	45	-41	3	57.8	49.8
F04	837399.2	819835.6	Yes	Yes	94	88	0	0	45	-41	3	55.9	49.9
F05	837407.8	819839.1	Yes	Yes	88	82	0	0	53	-42	3	48.5	42.5
F06	837404.6	819838.7	Yes	Yes	81	74	0	0	50	-42	3	42.1	35.1
F07	837407.3	819835.3	Yes	Yes	84	78	0	0	53	-42	3	44.5	38.5
F08	837407.3	819833.7	Yes	Yes	87	81	0	0	53	-43	3	47.5	41.5
F09	837407.4	819833.7	Yes	Yes	92	86	0	0	53	-43	3	52.4	46.4
F10	837406.3	819832.7	Yes	Yes	81	75	0	0	53	-42	3	41.6	35.6
F11	837406.3	819832.5	Yes	Yes	90	84	0	0	53	-42	3	50.6	44.6
F12	837393.9	819839.2	Yes	Yes	90	84	0	0	39	-40	3	53.2	47.2
F13	837394.6	819840.5	Yes	Yes	84	78	0	0	40	-40	3	47.0	41.0
F14	837394.3	819841.3	Yes	Yes	85	79	0	0	39	-40	3	48.1	42.1
H01	837387.4	819884.8	Yes	Yes	77	76	0	0	50	-42	3	38.0	37.0
H02	837403.8	819872.3	Yes	Yes	79	73	0	0	55	-43	3	39.2	33.2
H03	837393.3	819888.1	Yes	Yes	80	79	0	0	56	-43	3	40.0	39.0
H04	837397.3	819875.2	Yes	Yes	88	87	0	0	51	-42	3	48.9	47.9
H05	837387.1	819884.5	Yes	Yes	79	77	0	0	49	-42	3	40.1	38.1
H06	837404.0	819879.1	Yes	Yes	79	73	0	0	58	-43	3	38.7	32.7
										Cumulative Noise Level		63.7	57.7

NSR N03
Coordinates 837355.2 819829.3

Noise Source ID	Coordinates		Operation		Day Total SWL	Night Total SWL	Tonality Correction	Barrier Correction	Distance with NSR	Distance Attenuation	Façade Correction	Day SPL	Night SPL
	x	y	Day	Night	dB(A)	dB(A)	dB(A)	dB(A)	m	dB(A)	dB(A)	dB(A)	dB(A)
V01	837420.6	819770.7	Yes	No	68	-	3	0	88	-47	3	27.1	0
V02	837421.8	819770.2	Yes	No	68	-	3	0	89	-47	3	27.0	0
V03	837423.1	819769.6	Yes	No	68	-	3	0	90	-47	3	26.9	0
V04	837424.3	819768.9	Yes	No	68	-	3	0	92	-47	3	26.7	0
V05	837420.1	819769.5	Yes	No	68	-	3	0	88	-47	3	27.1	0
V06	837421.3	819768.9	Yes	No	68	-	3	0	90	-47	3	27.0	0
V07	837422.5	819768.4	Yes	No	68	-	3	0	91	-47	3	26.8	0
V08	837423.8	819767.7	Yes	No	68	-	3	0	92	-47	3	26.7	0
V09	837419.6	819768.5	Yes	No	64	-	3	0	89	-47	3	23.1	0
V10	837420.8	819767.9	Yes	No	64	-	3	0	90	-47	3	22.9	0
V11	837422.0	819767.3	Yes	No	64	-	3	0	91	-47	3	22.8	0
V12	837423.3	819766.7	Yes	No	64	-	3	0	93	-47	3	22.7	0
V13	837419.1	819767.5	Yes	No	68	-	3	0	89	-47	3	27.0	0
V14	837420.3	819766.9	Yes	No	68	-	3	0	90	-47	3	26.9	0
V15	837421.5	819766.3	Yes	No	68	-	3	0	92	-47	3	26.8	0
V16	837422.8	819765.7	Yes	No	68	-	3	0	93	-47	3	26.6	0
V17	837419.8	819765.8	Yes	No	64	-	3	0	91	-47	3	22.9	0
V18	837421.0	819765.2	Yes	No	64	-	3	0	92	-47	3	22.7	0
V19	837422.3	819764.6	Yes	No	64	-	3	0	93	-47	3	22.6	0
G01	837388.2	819709.0	Yes	Yes	92	92	3	0	125	-50	3	48.0	48.0
C01	837421.2	819784.4	Yes	No	88	-	0	0	80	-46	3	44.8	0
C02	837425.9	819794.9	Yes	No	88	-	0	0	79	-46	3	45.0	0
C03	837426.2	819782.0	Yes	No	88	-	0	0	85	-47	3	44.3	0
C04	837430.8	819792.7	Yes	No	88	-	0	0	84	-46	3	44.4	0
C05	837432.5	819787.2	Yes	No	68	-	3	0	88	-47	3	27.1	0
A01	837432.6	819825.3	Yes	No	81	-	3	0	78	-46	3	41.2	0
A02	837430.9	819821.8	Yes	No	81	-	3	0	76	-46	3	41.4	0
A03	837429.3	819818.3	Yes	No	68	-	3	0	75	-45	3	28.5	0
A04	837424.9	819807.3	Yes	No	73	-	0	0	73	-45	3	31.1	0
A05	837427.7	819806.0	Yes	No	74	-	0	0	76	-46	3	31.8	0
A06	837429.9	819799.3	Yes	No	81	-	3	0	81	-46	3	40.9	0
A07	837433.3	819797.8	Yes	No	81	-	3	0	84	-47	3	40.5	0
B01	837461.2	819760.2	Yes	Yes	72	72	3	0	127	-50	3	27.7	27.7
D01	837494.5	819696.7	Yes	Yes	87	87	3	0	192	-54	3	39.0	39.0
D02	837492.6	819692.7	Yes	Yes	87	87	3	0	194	-54	3	38.9	38.9
E01	837398.7	819579.5	Yes	Yes	87	77	0	0	254	-56	3	33.9	23.9
E02	837407.9	819581.6	Yes	Yes	90	80	0	0	253	-56	3	36.9	26.9
E03	837405.5	819572.2	Yes	Yes	87	77	0	0	262	-56	3	33.6	23.6
E04	837401.9	819571.9	Yes	Yes	81	71	0	0	262	-56	3	27.6	17.6
E05	837399.6	819571.9	Yes	Yes	85	75	0	0	261	-56	3	31.7	21.7
E06	837398.7	819586.0	Yes	Yes	81	71	0	0	247	-56	3	28.1	18.1
E07	837404.9	819590.1	Yes	Yes	91	81	0	0	244	-56	3	38.2	28.2
E08	837398.9	819579.6	Yes	Yes	85	75	0	0	254	-56	3	31.9	21.9
E09	837398.7	819585.9	Yes	Yes	80	70	0	0	247	-56	3	27.1	17.1
E10	837411.5	819582.8	Yes	Yes	95	85	0	0	253	-56	3	41.9	31.9
E11	837398.0	819608.5	Yes	Yes	78	68	0	0	225	-55	3	26.0	16.0
E12	837397.8	819598.8	Yes	Yes	82	72	0	0	234	-55	3	29.6	19.6
E13	837397.9	819601.3	Yes	Yes	82	72	0	0	232	-55	3	29.7	19.7
E14	837397.8	819599.7	Yes	Yes	89	79	0	0	234	-55	3	36.6	26.6
E15	837404.7	819617.1	Yes	Yes	85	75	0	0	218	-55	3	33.2	23.2
E16	837401.6	819600.7	Yes	Yes	97	87	0	0	233	-55	3	44.6	34.6
E17	837401.3	819609.5	Yes	Yes	97	87	0	0	225	-55	3	45.0	35.0
F01	837394.1	819842.1	Yes	Yes	87	81	0	0	41	-40	3	49.8	43.8
F02	837394.9	819844.2	Yes	Yes	82	76	0	0	42	-41	3	44.5	38.5
F03	837400.7	819842.1	Yes	Yes	96	88	0	0	47	-41	3	57.5	49.5
F04	837399.2	819835.6	Yes	Yes	94	88	0	0	44	-41	3	56.0	50.0
F05	837407.8	819839.1	Yes	Yes	88	82	0	0	54	-43	3	48.4	42.4
F06	837404.6	819838.7	Yes	Yes	81	74	0	0	50	-42	3	42.0	35.0
F07	837407.3	819835.3	Yes	Yes	84	78	0	0	52	-42	3	44.6	38.6
F08	837407.3	819833.7	Yes	Yes	87	81	0	0	52	-42	3	47.6	41.6
F09	837407.4	819833.7	Yes	Yes	92	86	0	0	52	-42	3	52.6	46.6
F10	837406.3	819832.7	Yes	Yes	81	75	0	0	51	-42	3	41.8	35.8
F11	837406.3	819832.5	Yes	Yes	90	84	0	0	51	-42	3	50.8	44.8
F12	837393.9	819839.2	Yes	Yes	90	84	0	0	40	-40	3	53.0	47.0
F13	837394.6	819840.5	Yes	Yes	84	78	0	0	41	-40	3	46.7	40.7
F14	837394.3	819841.3	Yes	Yes	85	79	0	0	41	-40	3	47.8	41.8
H01	837387.4	819884.8	Yes	Yes	77	76	0	0	64	-44	3	35.9	34.9
H02	837403.8	819872.3	Yes	Yes	79	73	0	0	65	-44	3	37.8	31.8
H03	837393.3	819888.1	Yes	Yes	80	79	0	0	70	-45	3	38.1	37.1
H04	837397.3	819875.2	Yes	Yes	88	87	0	0	62	-44	3	47.1	46.1
H05	837387.1	819884.5	Yes	Yes	79	77	0	0	64	-44	3	37.9	35.9
H06	837404.0	819879.1	Yes	Yes	79	73	0	0	70	-45	3	37.1	31.1
										Cumulative Noise Level		63.7	57.5

Appendix 12 **Extracted Pages from Environmental Assessment Report for Planning Areas 8 (Part) and 10 of HSK /HT NDA and Environmental Assessment Report for CBS:2-KC**

Extracted Pages from Environmental Assessment Report for Planning Areas 8 (Part) and 10 of HSK /HT NDA

Potential existing fixed noise sources were identified based on the desktop review and site survey conducted on 19 June 2020. Details for the location and type of identified major existing fixed noise sources are summarized in **Table 4-9** and indicated in **Figure 4.1**. Details for the site surveys of identified existing fixed noise sources are summarized in **Appendix 4.4**.

Table 4-9: Location and Type of Identified Existing Fixed Noise Sources

	Identified Potential Fixed Noise Sources		Day-time / Evening Operation	Night-time Operation
Shop Name (ID)	Type	Location		
Tak Fook Seafood Restaurant (ENS1)	Exhaust Air Fan	2/F	✓	✓
JB Motor Service (ENS2)	Car Repair and Maintenance	G/F	✓	
Wo Hing Hardware Store (ENS3)	Cutting Machine / Drilling Machine	G/F	✓	
Perfect Auto Beauty House (ENS4)	Car Washing	G/F	✓	
Wai Ming Maintenance Engineering Company Limited (ENS5)	Car Repair and Maintenance	G/F	✓	
Master Tuning Asia (ENS6)	Car Repair and Maintenance	G/F	✓	
Alignment Formula (ENS7)	Car Repair and Maintenance	G/F	✓	
Crystal Logistics (ENS8)	Loading and Unloading Activity	G/F	✓	

Tak Fook Seafood Restaurant

Tak Fook Seafood Restaurant is located at south of the Site. Exhaust Air Fan (EAF) for extracting the cooking fume are installed in the kitchen. Louvre openings of EAF were identified facing toward to the south of Site 5-26 during the site survey dated 19 June 2020. Also, noticeable noise, which was mainly contributed by the EAF in the kitchen. As confirmed with a manager who is in charge in the kitchen, the operating period of the EAF is from 0230 to 2230 hours (i.e. including night-time operation). A noise measurement for the EAF has been conducted at a location 10m away from the louvre openings of the EAF, the measured noise level ($L_{eq\ (5mins)}$) of the EAF is 64.7 dB(A) and no tonal correction is applied based on the noise measurement results.

Wai Ming Maintenance Engineering Company Limited

Wai Ming Maintenance Engineering Company Limited is located at west of the Project site. Noticeable noise from the air pumping machine was identified during the site survey dated 19 June 2020.

Based on the interview with two employees of the company, the store operates from 0900 to 1800 hours on Monday to Saturday. The major noise activity of the car repair and maintenance is ties pumping. The maximum measured noise level during the ties pumping process (i.e 80.7 dB(A)) at 3m apart from the noise sources have been adopted for the similar car repair and maintenance workshops in this assessment for conservative approach. Tonal correction (+3 dB(A)) is applied based on the noise measurement results.

Based on the best available information in approved HSK NDA EIA, the shop is located within HSK NDA Site 5-36 and would be expected to be terminated before the first population intake (i.e. before 2025). Therefore, no adverse cumulative noise impacts due to the operation of the workshop are not anticipated.

JB Motor Service

The JB Motor Service which is for car repair and maintenance, is located at south west of the Project site. The shop was closed during the site survey on 28 May 2020 and 19 June 2020. The measured noise result at a similar car repair and maintenance workshop (i.e. Wai Ming Maintenance Engineering Company Limited) is adopted in the study and assumed four ties pumps working at the same period for conservative approach due to the uncertainty of type and quantity of equipment at workshop.

Wo Hing Hardware Store

Wo Hing Hardware Store is located at south of the Project site. Based on the interview with the owner on 19 June 2020, the major activities which will generate noise include steel cutting and drilling during day-time and evening only. The store operates from 1000 to 1700 hours on Monday to Saturday. Noise measurements for the cutting machine and drilling machine have been conducted at a location 3m away from the cutting machine and drilling machine on 19 June 2020. The maximum measured noise levels during the cutting and drilling process (i.e 87.2 dB(A) and 76.3 dB(A)) at 3m apart from the noise sources for cutting and drilling process respectively) have been adopted in this assessment for conservative approach. Tonal correction (+3 dB(A)) is applied based on the noise measurement results.

Perfect Auto Beauty House

Perfect Auto Beauty House is located at southwest of the Project site. Noticeable noise from washing spray gun was identified during the site survey dated 19 June 2020.

Based on the interview with the employees on 19 June 2020, the major activity is car washing. The operation hour of the shop is from 1000 to 1900 hours every day except Thursday. A high pressure car washing spray gun was identified to generate noise during the site survey. Noise measurement has been conducted on 19 June 2020 to measure the noise level ($L_{eq\ (1\ min)}$) (69.9 dB(A) at 5m apart from the noise sources) generated by the washing spray gun. Tonal correction (+3 dB(A)) is applied based on the noise measurement results.

Crystal Logistics

Crystal Logistics is located at southwest of the Project site. No noticeable noise from the facilities was identified during the site survey dated 19 June 2020.

Based on the interview with the site management officer and the observation, the major activity is loading and unloading for goods by truck during day-time and evening only. The direct line-of-sight between the proposed development and the major activity is blocked by the warehouse. Due to large separation distance (i.e. loading and unloading area more than 250m from project site boundary) and no direct line-of-sight from the proposed development, adverse cumulative noise impacts due to the operation of the open storage are not anticipated.

Master Tuning Asia

Alignment Formula is located at north west of the Project site. Based on the interview with the employees of company, the operation of shop is from 1030 to 1900 hours on Monday to Saturday. The measured noise result at a similar car repair and maintenance workshop (i.e. Wai Ming Maintenance Engineering Company Limited) is adopted in the study.

Alignment Formula

Alignment Formula is located at north west of the Project site. Based on the interview with the employees of company, the operation of shop is from 1030 to 1900 hours on Monday to Saturday. The measured noise result at a similar car repair and maintenance workshop (i.e. Wai Ming Maintenance Engineering Company Limited) is adopted in the study.

4.6.1 Identification of Representative Noise Sensitive Receivers

The identified representative NSRs include existing, planned / committed noise sensitive developments and relevant uses earmarked on the relevant Outline Zoning Plans, Development Permission Area

Appendix 4.4 – Summary of Site Surveys of Identified Fixed Noise Sources

Identified Existing Fixed Noise Sources

ENS 4 Perfect Auto Beauty House – Car Washing

Extracted Pages from
Environmental Assessment Report for CBS:2-KC

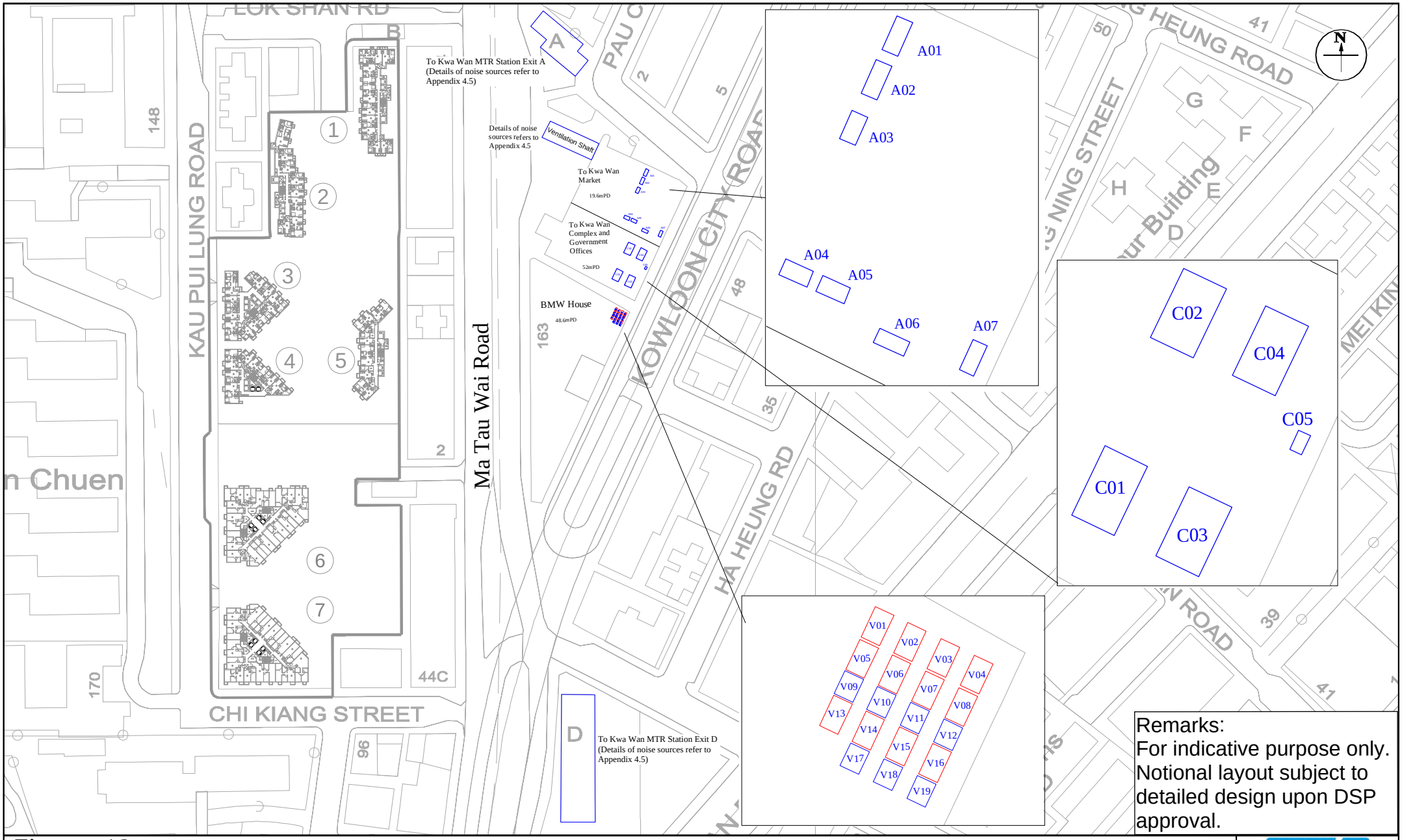


Figure: 4.2	RAMBOLL
Title: Location of Potential Fixed Noise Sources on the Roof of BMW House, To Kwa Wan Complex and Government Offices, To Kwa Wan Market and To Kwa Wan MTR Station	Drawn by: KW Checked by: TC
Project: Kau Pui Lung Road / Chi Kiang Street Development Scheme (CBS-2:KC)	Rev.: 2.0 Date: Aug 2022

Q:\Projects\URACBS02EI00\05 Assessments\02 Noise\01 Industrial\202208 v2.0\Fig 4 300m from Site (Noise).dwg

Appendix 4.1

Details of the VRVs (V01 to V19) on the roof of BMW House and

Catalogue of Daikin

The VRVs (V01 to V19) on the roof of BMW House

The VRVs belong to Daikin Series X7.

There are in total 19 nos. of VRVs on the roof of BMW house.
12 nos. of VRVs have double top fan, 7 nos. of them have single top fan.
Their location is indicated in **Figure 4.2**.

Source ID	Brand	VRV Series	Number of Fan on the top	Model Number adopted *	Horse Power	Cooling Capacity (KW)	Dimension			Sound Power Level, dB(A) ^
							H (m)	L (m)	W (m)	
V09 to V12, V17 to V19	Daikin	Series X7	1	RUXYQ14BA	14	40	1.66	0.93	0.77	64
V01 to V08, V13 to V16	Daikin	Series X7	2	RUXYQ22BA	22	61.5	1.66	1.24	0.77	68

* Since the model number is unknown, the model with the largest sound power level is selected as worst case study.

^ Refer to the catalogue of Daikin, which is attached in this Appendix 4.1.

VRV X7 智能化中央冷氣系統

V09 to V12, V17 to V19

返回

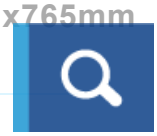
8匹	10匹	12匹	14匹	16匹	18匹	20匹	22匹	24匹	26匹	28匹	30匹	32匹
34匹	36匹	38匹	40匹	42匹	44匹	46匹	48匹	50匹	52匹	54匹	56匹	58匹
60匹	62匹	64匹	66匹									

室外機 - RUXYQ14BA

V09 to V12, V17 to V19

Sound power level is 64dB(A) when the measurement distance is 1m

型號		室外機	
室外機	RUXYQ14BA	運轉音量 (高/低)	56dB(A)
製冷量	40kW kW	尺寸 (高x闊x深)	1657x1240x765mm
供暖量	45kW kW	機身重量	250kg
電源	3Ø, 380V, 50Hz	配管直徑(液態)	Ø12.7mm
		配管直徑(氣態)	Ø25.4mm



製冷量以室內溫度27°CDB，19°CWB及室外溫度35°CDB為基本量度環境

供暖量以室內溫度20°CDB 及室外溫度7°CDB，6°CWB為基本量度環境

運轉音量值為無反響房間轉換數值，以機身前1m量度，在一般實際運行情況下，室外機運轉音量值可能受環境影響

VRV X7 智能化中央冷氣系統

V01 to V08, V13 to V16

返回

8匹	10匹	12匹	14匹	16匹	18匹	20匹	22匹	24匹	26匹	28匹	30匹	32匹
34匹	36匹	38匹	40匹	42匹	44匹	46匹	48匹	50匹	52匹	54匹	56匹	58匹
60匹	62匹	64匹	66匹									

室外機 - RUXYQ22BA

V01 to V08, V13 to V16

Sound power level is 68dB(A) when the measurement distance is 1m

型號		室外機	
室外機	RUXYQ22BA	運轉音量 (高/低)	60dB(A)
製冷量	61.5kW kW	尺寸 (高x闊x深)	1657x1240x765mm
供暖量	69.0kW kW	機身重量	300kg
電源	3Ø, 380V, 50Hz	配管直徑(液態)	Ø15.9mm
		配管直徑(氣態)	Ø28.6mm

製冷量以室內溫度27°CDB，19°CWB及室外溫度35°CDB為基本量度環境

供暖量以室內溫度20°CDB 及室外溫度7°CDB，6°CWB為基本量度環境

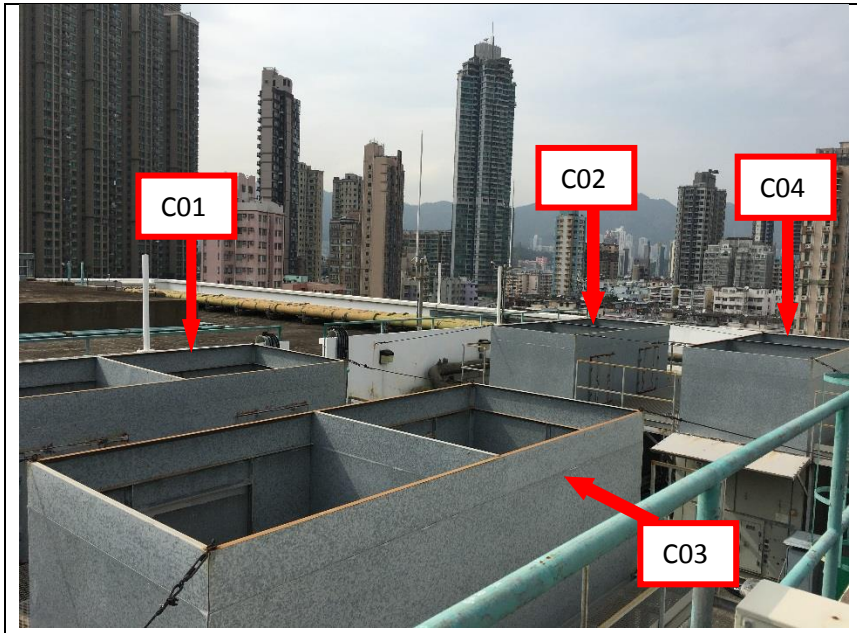
運轉音量值為無反響房間轉換數值，以機身前1m量度，在一般實際運行情況下，室外機運轉音量值可能受環境影響

TOP

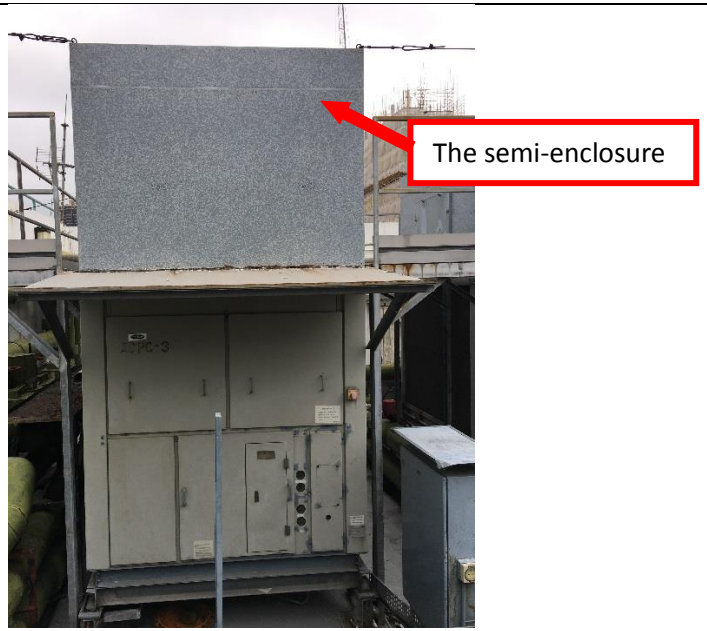
Appendix 4.2

Details of the Chillers (C01 to C04) and VRV (C05) on the Roof of To Kwa Wan Complex and Government Offices

The chillers (C01 to C04) and VRV (C05) on the roof of To Kwa Wan Complex and Government Offices



Top view, the four 8 fans-air cooled chillers (C01 to C04) are semi-enclosed.



Side view, the brand of chiller is Carrier.


Side view


Side view

C05, the VRV

ID	Type	Brand	Number of Fans on the top	Model Number	In operation during the measurement?	Dimension			Sound Power Level, dB(A)
						H (m)	L (m)	W (m)	
C01	Chiller	Carrier	8	Unknown	Yes	4.1 *	4.5	2	87.9 ^
C02		Carrier	8	Unknown	No	4.1 *	4.5	2	87.9 ^
C03		Carrier	8	Unknown	No	4.1 *	4.5	2	87.9 ^
C04		Carrier	8	Unknown	Yes	4.1 *	4.5	2	87.9 ^
C05	VRV	Daikin	2	RHXYQ16QY1	No	1.68	1.24	0.77	68 #

* With semi-enclosure

^ Refer to the calculation, which is attached in this Appendix 4.2.

Refer to the catalogue, which is attached in this Appendix 4.2.

C01 to C04

Sound Power Measurement Calculation Sheet

To: ISO 3746 (Survey Method)

Project	**To Kwa Wan**
Measurement Date & Time:	**2019-May-22**
Type of Sound Source:	**Chillers and VRVs**
Opeartion Conditions:	**Stable**

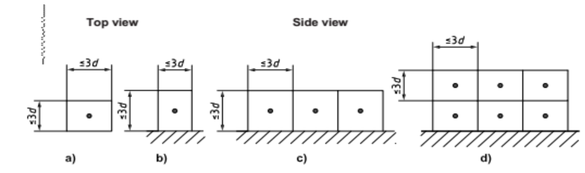
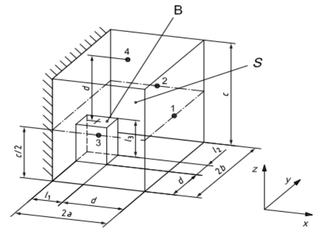
Overall, dB(A)			**C01 (Chiller)**			
Raw Data	$\overline{L'_{pA(ST)}} = 10 \lg\left[\frac{1}{N_M}\sum_{i=1}^{N_M} 10^{0,1L'_{pA\,i(ST)}}\right]$ dB	**Averaged $L'_{pA(ST)}$**	68.6			
		Averaged $L_{pA(BG)}$	63.1			

Surface Area	**No. of reflecting plane:**	1			
	Parallaed Measurement Surface, d (m):	1			
	Surface Area of Measurement (m^2):	133.1			

K_{1A} Correction	$\Delta L_{pA} = \overline{L'_{pA(ST)}} - \overline{L_{pA(B)}}$	**ΔL_{pA}=L'$_{pA(ST)}$ - $L_{pA(BG)}$**	5.5			
	$\Delta L_{pA} > 10$ dB, K_{1A} is assumed equal to zero.	**ΔL_{pA}>10**				
	3 dB $\leqslant \Delta L_{pA} \leqslant$ 10 dB $K_{1A} = -10 \lg\left(1-10^{-0,1\Delta L_{pA}}\right)$ dB	**3=<ΔL_{pA}<=10**	1.4			
	$\Delta L_{pA} <$ 3 dB, K_{1A} to be applied in this case is 3 dB	**ΔL_{pA}<3**				
		K_{1A}	1.4			

K_{2A} Correction	$K_{2A} = 10 \lg\left[1+4\frac{S}{A}\right]$ dB	**A= α S_V**	Outdoor Env.			
		K_{2A}	0			

Results	$\overline{L_{pA}} = \overline{L'_{pA(ST)}} - K_{1A} - K_{2A}$	**Corrected L_{pA}**	67.2			
	$L_{WA} = \overline{L_{pA}} + 10 \lg\frac{S}{S_0}$ dB	**Sound Power Level: L_{WA}**	**88.4**			

Determination of Microphone Arrays on Parallelepiped Measurement Surface	**Parallelepiped Measurement Surface for Floor-standing Noise Sources Adjacent to Two Reflecting Plans**
	

Key
- ● microphone positions
- *d* measurement distance

Figure C.1 — Microphone positions on a parallelepiped measurement surface

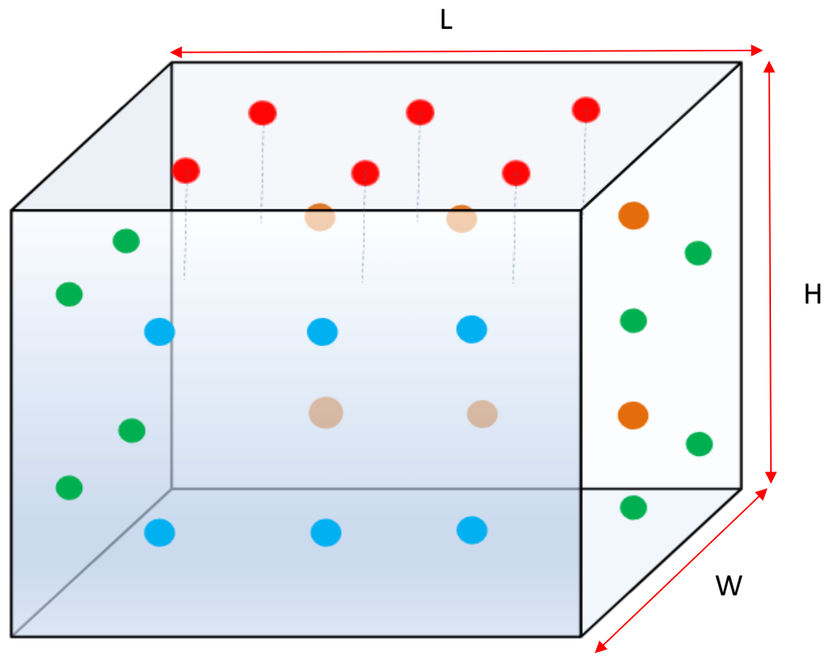
Key
- ● microphone positions (1, 2, 3, 4)
- B reference box
- $2a$ measurement surface length
- $2b$ measurement surface width
- c measurement surface height
- d measurement distance
- l_1 reference box length
- l_2 reference box width
- l_3 reference box height
- S measurement surface

$S = 2(2ab + bc + 2ca)$

C01 to C04

Sound Pressure Level of C01 (Chiller):

Sound Source	Overall, dB(A)	$10^{li/10}$
Side	68.1	6456542.3
	67.3	5370318.0
	68.3	6760829.8
	68.5	7079457.8
	66.9	4897788.2
	67.6	5754399.4
	67.7	5888436.6
	67.2	5248074.6
	68.0	6309573.4
	67.5	5623413.3
	66.9	4897788.2
	68.1	6456542.3
	68.3	6760829.8
	67.7	5888436.6
	67.6	5754399.4
	67.6	5754399.4
	66.8	4786300.9
	67.7	5888436.6
	68.5	7079457.8
	67.4	5495408.7
Top	70.4	10964782.0
	69.5	8912509.4
	71.3	13489628.8
	71.2	13182567.4
	70.8	12022644.3
	70.8	12022644.3
$L'_{pA(ST)}$ = Average SPL	68.6	



Microphone Position over the noise source

Microphone Position aside the noise source

Measurement Distance = 1m

Dimension of measurement Surface

	H (m)	L (m)	W (m)
=	4.1+1	4.5+1+1	2+1+1
=	5.1	6.5	4

Total Measurement Surface

= 6.5*4 + 2*6.5*5.1 + 2*5.1*4

= **133.1** m2

C05

VRV 更新用Q 智能化中央冷氣系統

返回

8匹 | 10匹 | 12匹 | 14匹 | **16匹** | 18匹 | 20匹 | 22匹 | 24匹 | 26匹 | 28匹 | 30匹 | 32匹

34匹 | 36匹 | 38匹 | 40匹 | 42匹 | 44匹 | 46匹 | 48匹

室外機 - RHXYQ16QY1

C05

Sound power level is 68dB(A) when the measurement distance is 1m

型號		室外機	
室外機	RHXYQ16QY1	運轉音量 (高/低)	60dB(A)
製冷量	45.0kW kW	尺寸 (高x闊x深)	1,680x1,240x765mm
供暖量	50.0kW kW	機身重量	393kg
電源	3Ø, 380V, 50Hz	配管直徑(液態)	Ø12.7mm
		配管直徑(氣態)	Ø28.6mm

製冷量以室內溫度27°CDB，19°CWB及室外溫度35°CDB為基本量度環境

供暖量以室內溫度20°CDB 及室外溫度7°CDB，6°CWB為基本量度環境

TOP

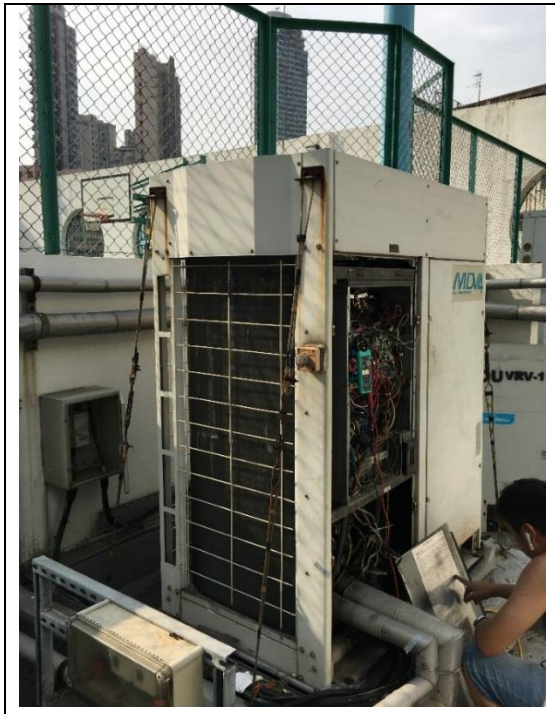
Appendix 4.3

Details of the Chillers (A01, A02, A06 & A07) and VRVs (A03 to A05) on the Roof of To Kwa Wan Market

The VRVs and chillers (A01 to A07) on the roof of To Kwa Wan Market

A01

A02



A03

A04

A05

A06 & A07

Noise Source ID	Type	Brand	Model Number	Dimension of 1 nos. of chiller / VRV			In Operation during Site Visit?	Sound Power Level dB(A)		
				H (m)	L (m)	W (m)		Shown in Catalogue *	Measured by ISO3746:2010 Methodology ^	Adopted in Industrial Noise Impact Assessment
A01	Chiller	Airedale	UCUR100	2.0	2.8	1.3	No	81	-	**81**
A02							No	81	-	**81**
A03	VRV	Midea	MDV-450W	1.8	1.3	0.8	No	68	-	**68**
A04	VRV	Daikin	RJZQ8AAY	1.43	0.94	0.32	Yes	64	73.4	**73.4**
A05	VRV	Daikin	RXQ12ARY6	1.66	0.93	0.77	Yes	67	74.4	**74.4**
A06	Chiller	Carrier	30RBS045	1.33	2.05	1.06	Yes	81	79.1	**81**
A07							No	81	-	**81**

* Refer to the catalogue, which is attached in this Appendix 4.3.

^ Refer to the calculation, which is attached in this Appendix 4.3.

A04 to A06

Sound Power Measurement Calculation Sheet

To: ISO 3746 (Survey Method)

Project	**To Kwa Wan**
Measurement Date & Time:	**2019-May-22**
Type of Sound Source:	**Chillers and VRVs**
Opeartion Conditions:	**Stable**

Overall, dB(A)			**A04 (VRV)**	**A05 (VRV)**	**A06 (Chiller)**	
Raw Data	$\overline{L'_{pA(ST)}} = 10 \lg\left[\frac{1}{N_M}\sum_{i=1}^{N_M} 10^{0,1L'_{pA\,i(ST)}}\right]$ dB	**Averaged $L'_{pA(ST)}$**	63.1	63.4	67.2	
		Averaged $L_{pA(BG)}$	63.1	63.1	63.1	

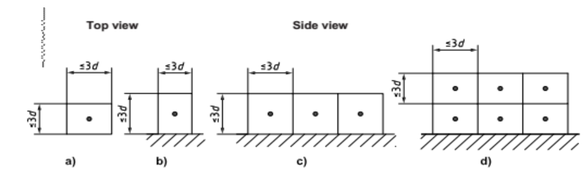
Surface Area	**No. of reflecting plane:**		2	2	1	
	Parallaed Measurement Surface, d (m):		1	1	1	
	Surface Area of Measurement (m^2):		21.4	25.2	45.5	

K_{1A} Correction	$\Delta L_{pA} = \overline{L'_{pA(ST)}} - \overline{L_{pA(B)}}$	**ΔL_{pA}=L'$_{pA(ST)}$ - $L_{pA(BG)}$**	0.0	0.3	4.1	
	$\Delta L_{pA} > 10$ dB, K_{1A} is assumed equal to zero.	**ΔL_{pA}>10**				
	3 dB $\leqslant \Delta L_{pA} \leqslant$ 10 dB $K_{1A} = -10 \lg\left(1-10^{-0,1\Delta L_{pA}}\right)$ dB	**3=<ΔL_{pA}<=10**			2.1	
	$\Delta L_{pA} <$ 3 dB, K_{1A} to be applied in this case is 3 dB	**ΔL_{pA}<3**	3	3		
		K_{1A}	3.0	3.0	2.1	

K_{2A} Correction	$K_{2A} = 10 \lg\left[1 + 4\frac{S}{A}\right]$ dB	**A= α S_V**	Outdoor Env.			
		K_{2A}	0			

Results	$\overline{L_{pA}} = \overline{L'_{pA(ST)}} - K_{1A} - K_{2A}$	**Corrected L_{pA}**	60.1	60.4	65.1	
	$L_{WA} = \overline{L_{pA}} + 10 \lg\frac{S}{S_0}$ dB	**Sound Power Level: L_{WA}**	**73.4**	**74.4**	**79.1**	

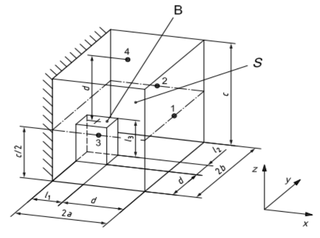
Determination of Microphone Arrays on Parallelepiped Measurement Surface



Key
● microphone positions
d measurement distance

Figure C.1 — Microphone positions on a parallelepiped measurement surface

Parallelepiped Measurement Surface for Floor-standing Noise Sources Adjacent to Two Reflecting Plans

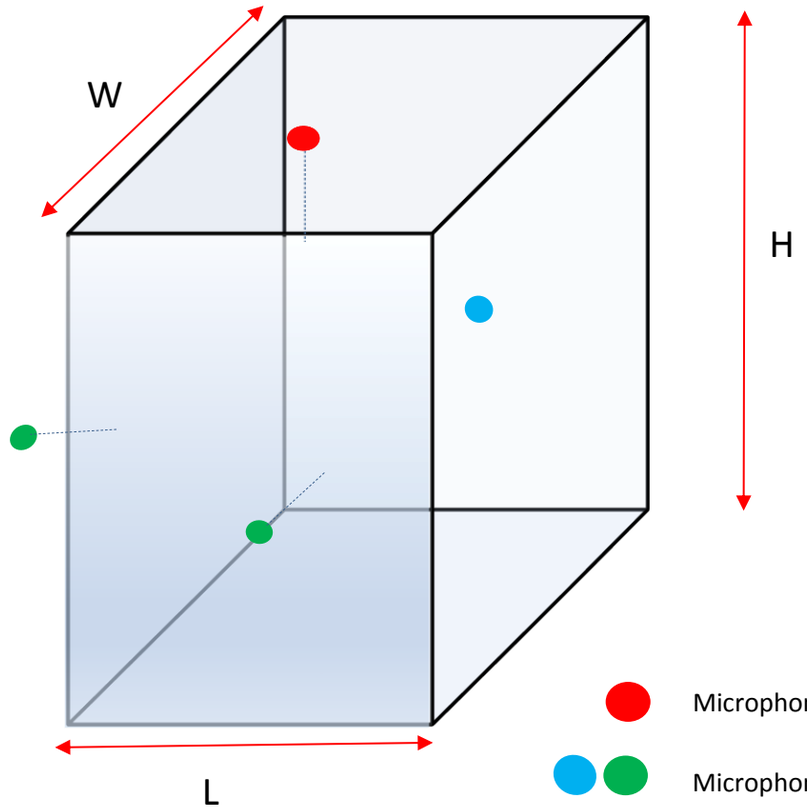


Key
● microphone positions (1, 2, 3, 4)
B reference box
$2a$ measurement surface length
$2b$ measurement surface width
c measurement surface height
d measurement distance
l_1 reference box length
l_2 reference box width
l_3 reference box height
S measurement surface
$S = 2(2ab + bc + 2ca)$

A04 to A06

Sound Pressure Level of A04:

Sound Source	Overall, dB(A)	$10^{li/10}$
Side	63.4	2187761.6
	63.8	2398832.9
	62.6	1819700.9
Top	62.6	1819700.9
$L'_{pA(ST)}$ = Average SPL	63.1	



Microphone Position over the noise source

Microphone Position aside the noise source

Measurement Distance = 1m

Dimension of measurement Surface

	H (m)	L (m)	W (m)
=	1.43+1	0.94+1+1	0.32+1
=	2.43	2.94	1.32

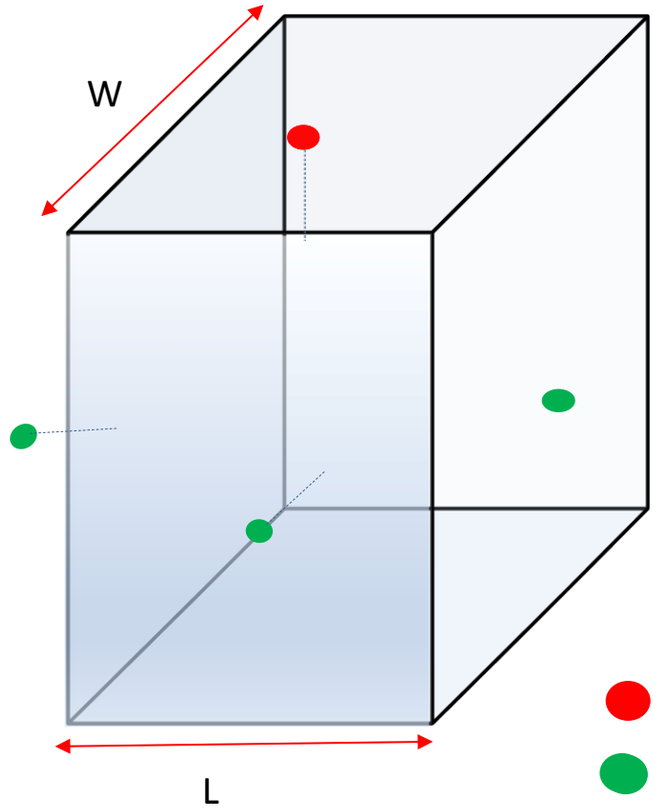
Total Measurement Surface

= 2.94*1.32 + 2*2.43*2.94 + 2.43*1.32

= **21.4** m2

Sound Pressure Level of A05:

Sound Source	Overall, dB(A)	$10^{li/10}$
Side	64.1	2570395.8
	63.4	2187761.6
	63.0	1995262.3
Top	63.1	2041737.9
$L'_{pA(ST)}$ = Average SPL	63.4	



Microphone Position over the noise source

Microphone Position aside the noise source

Measurement Distance = 1m

Dimension of measurement Surface

	H (m)	L (m)	W (m)
=	1.66+1	0.93+1	0.77+1+1
=	2.66	1.93	2.77

Total Measurement Surface

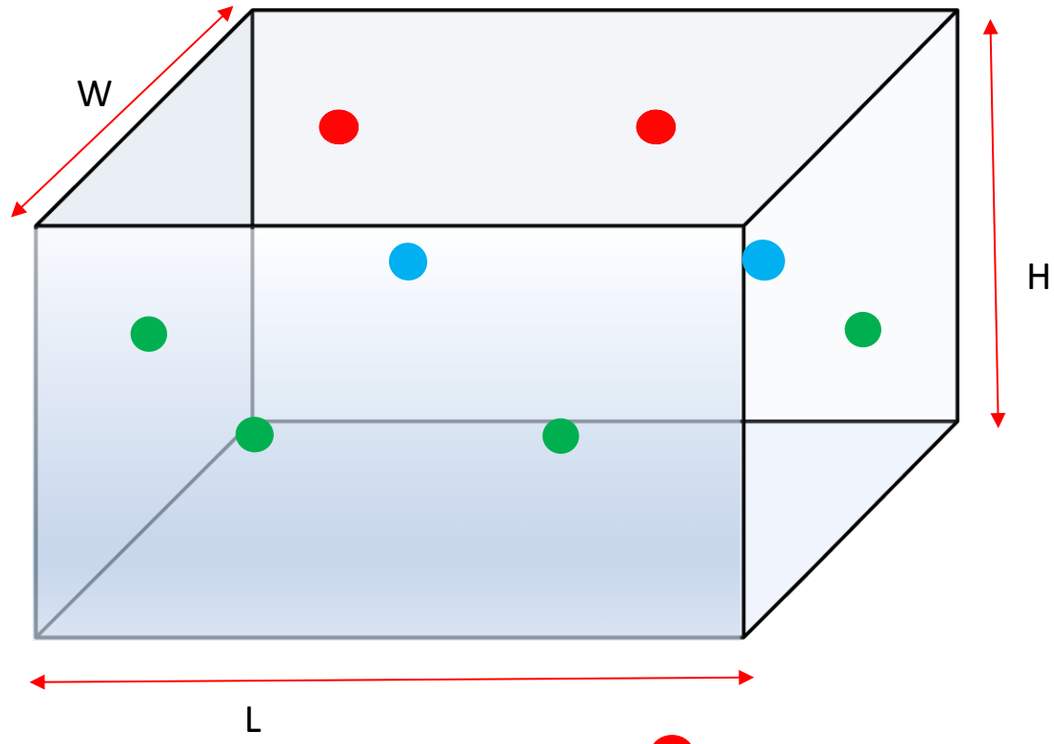
= 2.77*1.93 + 2.66*1.93 + 2*2.66*2.77

= **25.2** m2

A04 to A06

Sound Pressure Level of A06:

Sound Source	Overall, dB(A)	$10^{li/10}$
Side	67.1	5128613.8
	66.4	4385307.0
	66.0	3981071.7
	67.0	5011872.3
	67.8	6025595.9
	68.2	6606934.5
Top	67.1	5128613.8
	67.8	6025595.9
$L'_{pA(ST)}$ = Average SPL	67.2	



Microphone Position over the noise source

Microphone Position aside the noise source

Measurement Distance = 1m

Dimension of measurement Surface

	H (m)	L (m)	W (m)
=	1.33+1	2.05+1+1	1.06+1+1
=	2.33	4.05	3.06

Total Measurement Surface

= 3.06*4.05 + 2*2.33*4.05 + 2*2.33*3.06

= **45.5** m2

A01 & A02

Unparalleled efficiency

Ultimate in advanced condenser technology

The Ultima Compact Condenser is a high efficiency, compact, air-cooled single/ dual circuit condensing unit, which offers exceptional Energy Efficiency Ratios (EER) of up to 3.39 .

With DSH scroll compressors and optimised for R410A refrigerant, the Ultima Compact Condensing range has been engineered using the very best condenser technology and components to increase efficiency and deliver improved performance.

Developed with low sound levels as a key factor in its design, the Ultima Compact Condenser is ideally applicable to a variety of environments including including offices, retail, healthcare, leisure and data centres.

Key technical data

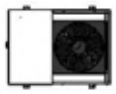
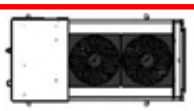
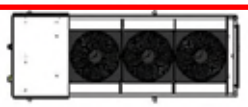
- 30 – 150kW nominal cooling capacity
- 30 models
- 5 case sizes
- Single and dual circuit variants
- Regular quiet and extra quiet sound variants
- 1-4 stages of cooling
- Designed and optimised for R410A refrigerant

EER* of up to 3.42

Part load efficiencies are enhanced by sequenced scroll compressors and EC fans.

*Energy Efficiency Ratio

5 case sizes available

	H x W x L	Nominal Cooling*
	**1450 x 1310 x 1650mm** Single and Dual Circuit	**30 - 40kW**
	**1450 x 1310 x 2500mm** Single and Dual Circuit	**30 - 75kW**
	**2000 x 1300 x 2800mm** Dual Circuit Only	**85 - 100kW**
	**2000 x 1300 x 3650mm** Dual Circuit Only	**100 - 150kW**
	**2000 x 1300 x 4500mm** Dual Circuit Only	**125 - 150kW**

* 6°C evaporating temperature, 35°C ambient

A01 & A02

Specifications at a glance

Nomenclature explained U CUR 075 D R- 2

U	Ultima
CUR	CUR = Condensing Unit R410A
xxx	Nominal Capacity (kW)
S D	Number of Circuits Single Circuit Dual Circuit
R- X-	Noise Variant Regular Quiet Extra Quiet
1-4	Number of Fans/Case size

Nominal capacity @ 6°C evaporating, 35°C ambient

EU F-Gas Regulations

This product range contains R410A fluorinated greenhouse gas with a GWP of 2088, weight range of 8.5 - 45.5kg, representing 17.7 - 95.0 equivalent tonnes of CO_2.

5 case sizes available

Model No.	Number of Circuits	Nom. Cooling Capacity (kW)[1]	Input (kW)[1]	EER[2]	Sound Pressure @ 10m dB(A)	Dimensions (HxWxD) mm	Operating Weight (kg)
Regular quiet							
UCUR030SR-10E0	1	31.6	10.1	3.13	44	1450 x 1310 x 1650	
UCUR040SR-10H0	1	39.4	14.5	2.72	44	1450 x 1310 x 1650	
UCUR040DR-10CC	2	39.4	14.5	2.72	44	1450 x 1310 x 1650	
UCUR050SR-20K0	1	57.2	17.6	3.25	47	1450 x 1310 x 2500	833
UCUR050DR-20DD	2	57.2	17.6	3.25	47	1450 x 1310 x 2500	804
UCUR060SR-20L0	1	63.6	20.1	3.16	47	1450 x 1310 x 2500	839
UCUR060DR-20EE	2	63.6	20.1	3.16	47	1450 x 1310 x 2500	812
UCUR070SR-20M0	1	71.1	23.6	3.01	47	1450 x 1310 x 2500	843
UCUR070DR-20FF	2	71.1	23.6	3.01	47	1450 x 1310 x 2500	816
UCUR075SR-20N0	1	78.1	27.3	2.86	48	1450 x 1310 x 2500	850
UCUR075DR-20GG	2	78.1	27.3	2.86	48	1450 x 1310 x 2500	823
UCUR085DR-20HJ	2	88.2	30.3	2.91	49	2000 x 1300 x 2800	1160
UCUR100DR-20JK	2	105.7	34.4	3.07	53	2000 x 1300 x 2800	1206
UCUR125DR-30LL	2	130.1	40.4	3.22	53	2000 x 1300 x 3650	1511
UCUR150DR-30NN	2	161.6	53.8	3.00	54	2000 x 1300 x 3650	1536
Extra quiet							
UCUR030SX-10E0	1	31.8	10.0	3.18	42	1450 x 1310 x 1650	560
UCUR040SX-10H0	1	39.7	14.4	2.76	42	1450 x 1310 x 1650	616
UCUR040DX-10CC	2	39.7	14.4	2.76	42	1450 x 1310 x 1650	650
UCUR050SX-20K0	1	57.4	17.4	3.30	45	1450 x 1310 x 2500	833
UCUR050DX-20DD	2	57.4	17.4	3.30	45	1450 x 1310 x 2500	804
UCUR060SX-20L0	1	63.9	19.9	3.21	45	1450 x 1310 x 2500	839
UCUR060DX-20EE	2	63.9	19.9	3.21	45	1450 x 1310 x 2500	812
UCUR070SX-20M0	1	71.5	23.3	3.07	45	1450 x 1310 x 2500	843
UCUR070DX-20FF	2	71.5	23.3	3.07	45	1450 x 1310 x 2500	816
UCUR075SX-20N0	1	78.6	26.9	2.92	46	1450 x 1310 x 2500	850
UCUR075DX-20GG	2	78.6	26.9	2.92	46	1450 x 1310 x 2500	823
UCUR085DX-20HJ	2	89.3	29.7	3.01	47	2000 x 1300 x 2800	1160
UCUR100DX-30JK	2	106.6	33.0	3.23	48	2000 x 1300 x 3650	1498
UCUR125DX-40LL	2	130.7	38.5	3.39	48	2000 x 1300 x 4500	1679
UCUR150DX-40NN	2	162.1	51.7	3.14	48	2000 x 1300 x 4500	1704

Sound power level is 81dB(A) when the measurement distance is 10m

1) Nominal cooling capacity at 6°C evaporating temperature, 35°C ambient temperature, EC fans

2) EER at 6°C evaporating temperature, 35°C ambient temperature, based on TOTAL input power of compressors and fans

A03

Technical Service Manual

V4 Plus

Individual Series VRF

Top Discharge Version

Model:

3 phase, 380-415V, 50Hz

MDV-252W/DRN1-i(B)
MDV-280W/DRN1-i(B)
MDV-335W/DRN1-i(B)
MDV-400W/DRN1-i(B)
MDV-450W/DRN1-i(B)
MDV-560W/DRN1-i(B)
MDV-615W/DRN1-i(B)
MDV-670W/DRN1-i(B)
MDV-730W/DRN1-i(B)
MDV-785W/DRN1-i(B)
MDV-850W/DRN1-i(B)
MDV-900W/DRN1-i(B)

A03

Model			MDV-400W/ DRN1-i(B)	MDV-450W/ DRN1-i(B)
Power supply		V-Ph-Hz	380-415/3/50	
Cooling	Capacity	kW	40.0	45.0
	Power input	kW	12.3	14.0
	EER		3.25	3.21
Heating	Capacity	kW	45.0	50.0
	Power input	kW	11.2	12.8
	COP		4.02	3.91
DC inverter compressor	Model		E405DHD-36D2YG	E405DHD-36D2YG
	Type		DC inverter	DC inverter
	Brand		HITACHI	HITACHI
	Quantity		1	1
	Capacity	kW	11.8	11.8
	Input	kW	3.665	3.665
	Crankcase heater	W	27.6	27.6
	Refrigerant oil type		FVC68D	FVC68D
	Refrigerant oil charge	ml	500	500
Fixed inverter compressor	Model		E605DH-59D2YG	E655DH-65D2YG(GC)
	Type		Scroll	Scroll
	Brand		HITACHI	HITACHI
	Quantity		2	2
	Capacity	kW	15.39	17.1
	Input	kW	5.13	5.74
	Crankcase heater	W	27.6	27.6
	Refrigerant oil type		FVC68D	FVC68D
	Refrigerant oil charge	ml	500	500
Outdoor fan motor	Model		WZDK450-38G	WZDK450-38G
	Type		DC	DC
	Quantity		2	2
	Brand		PANASONIC	PANASONIC
	Insulation class		IPX4	IPX4
	Safe class		E	E
	Input	W	505×2	505×2
	Output	W	450×2	450×2
	Rated current	A	3.28×2	3.28×2
Outdoor fan	Material		ASG20	ASG20
	Type		Axial fan	Axial fan
	Quantity		2	2
	Diameter	mm	560	560
	Height	mm	189	189
	ESP	Pa	0-20 (default)	0-20 (default)
		Pa	20-40 (customized)	20-40 (customized)

Outdoor coil	Number of rows		2	2
	Tube pitch(a)× row pitch(b)	mm	22×19	22×19
	Fin spacing	mm	1.6	1.6
	Fin type		Hydrophilic aluminium	Hydrophilic aluminium
	Tube outside diameter	mm	Φ7.94	Φ7.94
	Tube type		innergroove tube	innergroove tube
	Coil dimension (W×H×D)	mm	2270×38×1232	2270×38×1232
	Number of circuits		inlet:22; outlet:20	inlet:22; outlet:20
Outdoor air flow		m^3/h	15000	15000
Sound pressure level		dB(A)	60	60
Connectable indoor unit	Total capacity	%	50-130	50-130
	Max. quantity		16	20
Outdoor unit	Net dimension (W×H×D)	mm	1250×1615×765	1250×1615×765
	Packing (W×H×D)	mm	1305×1790×820	1305×1790×820
	Net/Gross weight	mm	325/345	325/345
Refrigerant	Type		R410A	R410A
	Factory charged	kg	15	15
Throttle type			EXV	EXV
Design pressure (Hi/Lo)		MPa	4.4/2.6	4.4/2.6
Refrigerant piping	Liquid pipe	mm	15.9	15.9
	Gas pipe	mm	31.8	31.8
Ambient temp. range	Cooling	°C	-5~48	-5~48
	Heating	°C	-15~24	-15~24

Notes:

Capacities are based on the following conditions:

Cooling: Indoor temperature 27 °C DB/19 °C WB; Outdoor temperature 35 °C DB/24 °C WB.

Heating: Indoor temperature 20 °C DB/15 °C WB; Outdoor temperature 7 °C DB/6 °C WB.

Piping length: Interconnecting piping length 7.5m, level difference of zero.

Sound values are measured in a semi-anechoic room, at a position 1m in front of the unit and 1.3m above the floor.

The above data may be changed without notice for future improvement on quality and performance.

A04

VRV S 三管道智能化中央冷氣系統

返回

3匹 | 4匹 | 4匹 | 5匹 | 6匹 | 7匹 | 8匹 | 9匹 | 10匹 | 11匹 | 12匹 | 14匹 | 16匹

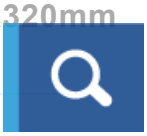
室外機 - RJZQ8AAY

A04

Sound power level is 64dB(A) when the measurement distance is 1m

型號	
室外機	RJZQ8AAY
製冷量	22.4kW kW
供暖量	25.0kW kW
電源	Y: 3Ø, 380V, 50Hz

室外機	
運轉音量 (高/低)	56dB(A)
尺寸 (高x闊x深)	1,430x940x320mm
機身重量	140kg
配管直徑(液態)	Ø9.5mm
配管直徑(氣態)	Ø19.1mm



描述

製冷量以室內溫度27°CDB，19°CWB及室外溫度35°CDB為基本量度環境

供暖量以室內溫度20°CDB 及室外溫度7°CDB，6°CWB為基本量度環境

TOP

A05

Outdoor Units

VRV X (Cooling Only)

MODEL			RXQ6ARY6	RXQ8ARY6	RXQ10ARY6	RXQ12ARY6	RXQ14ARY6	RXQ16ARY6
Combination units			-	—	—	—	—	—
Power supply			3-phase, 380-415 V, 50 Hz					
Cooling capacity		Btu/h	54,600	76,400	95,500	1,14,000	1,36,000	1,54,000
		kW	16.0	22.4	28.0	33.5	40.0	45.0
Capacity control		%	25~100	20~100	13~100	12~100	11~100	10~100
Casing colour			Ivory white (5Y7.5/1)					
Compressor	Type		Hermetically Sealed Scroll Type					
	No. of compressor		1	1	1	1	1	2
Airflow rate		m^3/min	119	178		191	257	
Dimensions (HxWxD)		mm	1,657X930X765				1,657X1,240X765	
Machine weight		kg	165		175		220	260
Sound level		dB(A)	56	56	57	59	60	60
Operation range	Cooling	°CDB	10 ~ 49					
Refrigerant	Type		R410A					
	Charge	kg	5.9		6.7	6.8	7.4	8.2
Piping connections	Liquid	mm	ø 9.5				ø 12.7	
	Gas	mm	ø 19.1		ø 22.2		ø 28.6	

Note: Specifications are based on the following conditions:

- Cooling: Indoor temp.: 27°CDB, 19°CWB, Outdoor temp.: 35°CDB, Equivalent piping length: 7.5 m, Level difference: 0
- Sound level: Anechoic chamber conversion value, measured at a point 1 m in front of the unit at a height of 1.5 m. During actual operation, these values are normally somewhat higher as a result of ambient conditions.

Physical data, 30RBS

A06 & A07

30RBS				039	045	050	060	070	080	090	100	120	140	160
Cooling														
Standard unit	C1	Nominal capacity	kW	40	44	51	58	67	79	87	97	114	135	156
Full load performances*	C1	EER	kW/kW	2.87	2.76	2.67	2.66	2.72	2.70	2.73	2.73	2.67	2.70	2.65
	C1	Eurovent class cooling		C	C	D	D	C	C	C	C	D	C	D
	C2	Nominal capacity	kW	53	59	69	81	85	98	114	126	151	171	194
	C2	EER	kW/kW	3.44	3.32	3.12	3.31	2.97	3.06	3.18	3.09	3.10	2.99	3.01
Full load performances**	C1	Gross nominal capacity	kW	40	44	52	59	68	80	87	98	115	136	157
	C1	Gross EER	kW/kW	2.95	2.84	2.75	2.74	2.80	2.78	2.79	2.79	2.73	2.77	2.72
	C2	Gross nominal capacity	kW	54	59	69	82	86	99	115	127	152	173	196
	C2	Gross EER	kW/kW	3.59	3.47	3.26	3.47	3.08	3.19	3.28	3.19	3.21	3.09	3.12
Seasonal efficiency*	C1	ESEER	kW/kW	3.75	3.88	3.95	3.80	3.62	3.67	3.91	3.94	3.83	3.68	3.87
Seasonal efficiency**	C1	Gross ESEER	kW/kW	3.97	4.14	4.22	4.06	3.84	3.90	4.16	4.18	4.08	3.94	4.16
IPLV			kW/kW	4.54	4.71	4.81	4.58	4.26	4.39	4.55	4.53	4.55	4.29	4.64
Sound levels														
Standard unit														
Sound power level(1)			dB(A)	80	81	81	81	87	87	84	84	84	90	90
Sound pressure level at 10 m(2)			dB(A)	49	49	49	49	55	55	52	52	52	58	58
Unit with option 15LS														
Sound power level(1)			dB(A)	79	80	80	80	80	80	83	83	83	83	83
Sound pressure level at 10 m(2)			dB(A)	48	48	48	48	48	48	51	51	51	51	51
Dimensions														
Length			mm	1061	1061	1061	1061	1061	1061	2258	2258	2258	2258	2258
Width			mm	2050	2050	2050	2050	2050	2050	2050	2050	2050	2050	2050
Height			mm	1330	1330	1330	1330	1330	1330	1330	1330	1330	1330	1330
Operating weight with MCHE coil (3)														
Standard unit without hydronic module			kg	429	436	442	454	454	471	766	776	789	896	928
Standard unit with hydronic module														
Single high-pressure pump			kg	459	466	472	484	484	501	798	808	825	935	967
Dual high-pressure pump			kg	484	492	497	510	510	527	843	853	873	972	1004
Compressors				Hermetic scroll compressors, 48.3 r/s										
Circuit A				2	2	2	2	2	2	3	3	3	2	2
Circuit B				-	-	-	-	-	-	-	-	-	2	2
No of control stages				2	2	2	2	2	2	3	3	3	4	4
Refrigerant charge with MCHE coil(3)				R-410A										
Circuit A			kg	4.7	5.3	5.9	6.7	6.2	7.3	10.7	10.8	11.4	6.5	7.4
			$teqCO_2$	9.8	11.1	12.3	14.0	12.9	15.2	22.3	22.6	23.8	13.6	15.5
Circuit B			kg	-	-	-	-	-	-	-	-	-	6.5	7.4
			$teqCO_2$	-	-	-	-	-	-	-	-	-	13.6	15.5
Capacity control				Touch Pilot Junior										
Minimum capacity			%	50	50	50	50	50	50	33	33	33	25	25
Condensers				All-aluminium microchannel heat exchanger (MCHE)										
Fans				Axial Flying Bird IV with rotating shroud										
Quantity				1	1	1	1	1	1	2	2	2	2	2
Maximum total air flow			l/s	3885	3883	3687	3908	5013	5278	6940	6936	7370	10026	10556
Maximum rotation speed			r/s	12	12	12	12	16	16	12	12	12	16	16
Evaporator				Direct expansion. plate heat exchanger										
Water volume			l	2.6	3.0	3.3	4.0	4.8	5.6	8.7	9.9	11.3	12.4	14.7
Without hydronic module (option)														
Max. water-side operating pressure			kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
With hydronic module (option)														
Single or dual pump (as selected)				Pump, Victaulic screen filter, relief valve, expansion tank, purge valves (water + air), pressure sensors										
Expansion tank volume			l	12	12	12	12	12	12	35	35	35	35	35
Expansion tank pressure (4)			bar	1	1	1	1	1	1	1.5	1.5	1.5	1.5	1.5
Max. water-side operating pressure			kPa	400	400	400	400	400	400	400	400	400	400	400
Water connections with/without hydronic module				Victaulic										
Diameter			in	2	2	2	2	2	2	2	2	2	2	2
Outside tube diameter			mm	60.3	60.3	60.3	60.3	60.3	60.3	60.3	60.3	60.3	60.3	60.3
Chassis paint colour				Colour code: RAL7035										

* In accordance with standard EN14511-3:2013

** Not in accordance with standard EN14511-3:2013.These performances do not take into account the correction for the proportionnal heating capacity and power input generated by the water pump to overcome the internal pressure drop in the heat exchanger.

C1 Cooling mode conditions: evaporator water entering/leaving temperature 12°C/7°C, outside air temperature 35°C, evaporator fooling factor 0 $m^2.K/W$

C2 Cooling mode conditions: evaporator water entering/leaving temperature 23°C/18°C, outside air temperature 35°C, evaporator fooling factor 0 $m^2.K/W$

IPLV Calculations according to standard performances (in accordance with AHRI 550-590)

(1) In dB ref=10-12 W, (A) weighting. Declared dualnumber noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3dB(A)). Measured in accordance with ISO 9614-1 and certified by Eurovent.

(2) In dB ref 20µPa, (A) weighting. Declared dualnumber noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3dB(A)). For information, calculated from the sound power level Lw(A).

(3) Values shown are a guideline only. Please refer to the unit nameplate

(4) When delivered, the standard pre-inflation of the tank is not necessarily the optimal value for the system. To permit changing the water volume, change the inflation pressure to a pressure that is close to the static head of the system. Fill the system with water (purging the air) to a pressure value that is 10 to 20 kPa higher than the pressure in the tank

Eurovent certified values

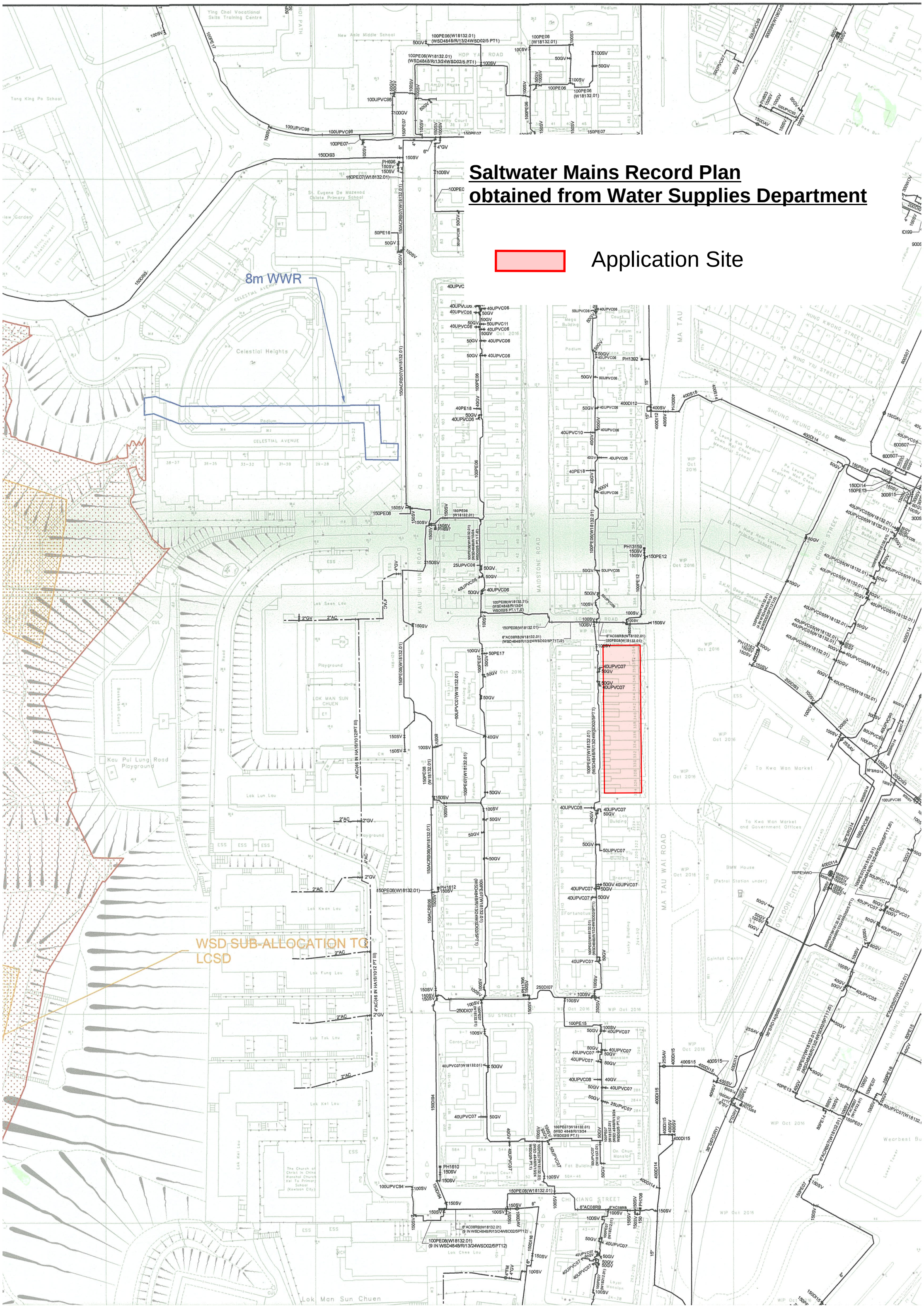
Appendix 13 Freshwater and Flushing Water Mains Record Plan From Water Supplies Department

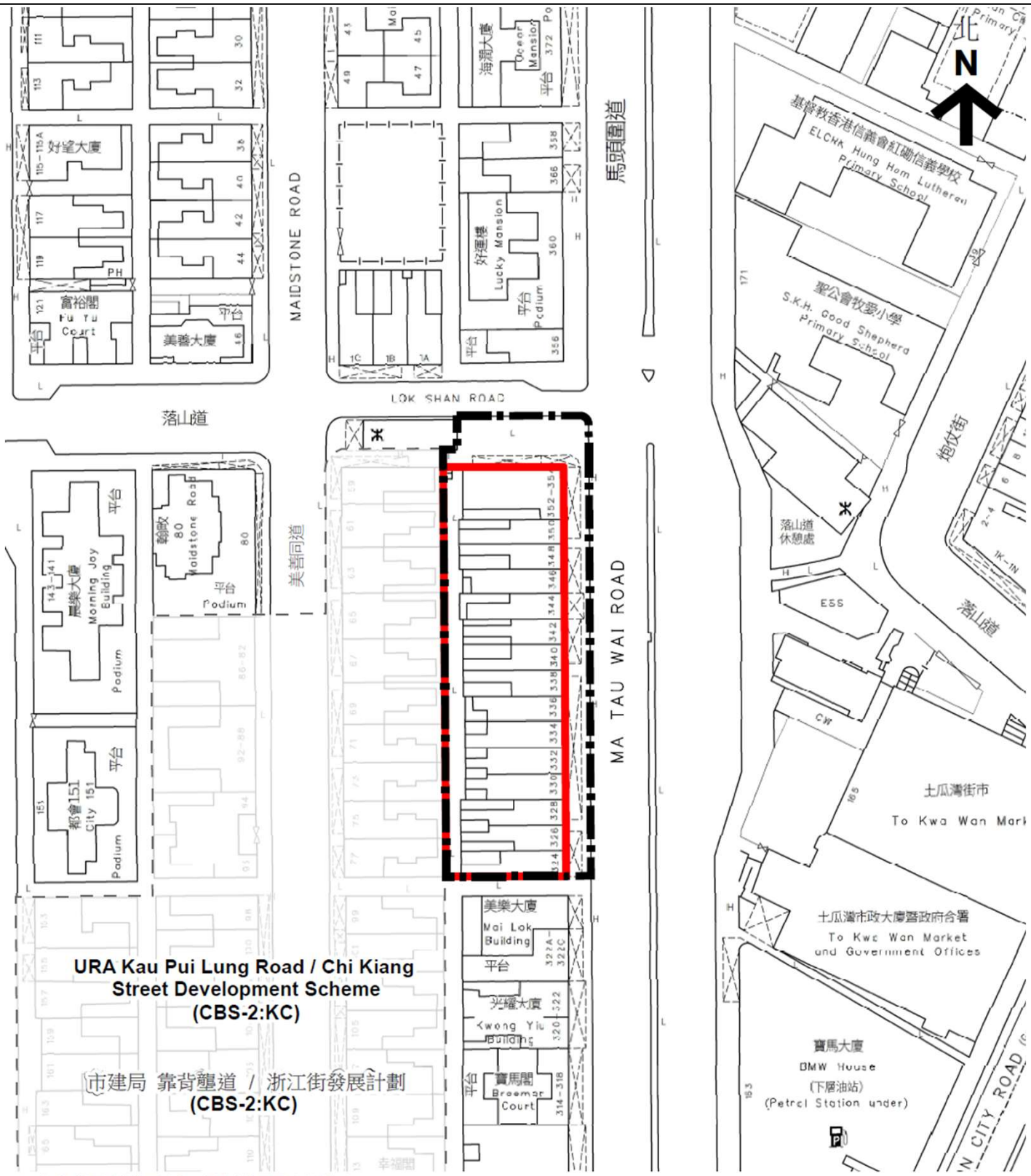
Freshwater Mains Record Plan obtained from Water Supplies Department

Application Site

8m WWR

WSD SUB-ALLOCATION TO LCSD


Saltwater Mains Record Plan
obtained from Water Supplies Department
Application Site
8m WWR
WSD SUB-ALLOCATION TO LCSD
HOP YAT ROAD
MAIDSTONE ROAD
KAU PUI LUNG ROAD
MA TAU WAI ROAD
SHEUNG HEUNG ROAD
PAU CHUNG STREET
OLD CITY ROAD
CHI KIANG STREET
CELESTIAL AVENUE
HUNG KWONG STREET
WING YIU STREET
Ying Chai Vocational Skills Training Centre
New Asia Middle School
Tang King Po School
St. Eugene De Mazenod Oblate Primary School
Celestial Heights
Kau Pui Lung Road Playground
Lok Man Sun Chuen
To Kwa Wan Market
To Kwa Wan Market and Government Offices
WIP Oct 2016



DP Boundary

Application Site
(i.e. Area zoned “R(A)”)

EXTRACT PLAN PREPARED ON 12/06/2024
BASED ON SURVEY SHEET No.
11-NW-20B & 11-NW-20D

SITE PLAN

MA TAU WAI ROAD /
LOK SHAN ROAD
DEVELOPMENT PROJECT
(KC-020)

市區重建局
URBAN RENEWAL AUTHORITY

Figure 1.1

Appendix 14 Capacity of Freshwater and Flushing Water Service Reservoir

Outlook

Re: Enquiry for Existing Water Supply Network for Ma Tau Wai Road/ Lok Shan Road Development Project (KC-020)

From WC LEE/WSD <wc_lee@wsd.gov.hk>
Date Fri 9/26/2025 09:52
To Wendy Tin [redacted]
Cc Tony Cheng [redacted] Ophelia SM CHAN/WSD [redacted] CH LOK/WSD [redacted]

1 attachment (632 KB)
SitePlan.pdf;

Dear Wendy,

Referring to your request for information dated 19.9.2025, please find the consolidated reply of Headworks and Distribution Section of Kowloon Region.

1. Freshwater & Saltwater Service Reservoirs serving the Application Site
2. Supply zone of Freshwater & Saltwater Service Reservoirs serving the Application Site
   The fresh water supply of the application site is served by the supply zone of Ho Man Tin East Fresh Water Service and Ho Man Tin West Fresh Water Service Reservoir. The salt water supply of the application site is served by the supply zone of Tai Wan Salt Water Pumping Station, Lok Fu Salt Water Service Reservoir and Diamond Hill Salt Water Service.

3. Designed capacity, average water demand (daily consumption) and the spare capacity of the Freshwater & Saltwater Service Reservoirs
   Daily Consumption of Tai Wan SWPS (Averaged from 9/2024 to 8/2025): 80.58 MLD
   Daily inflow (Averaged from 9/2024 to 8/2025): Ho Man Tin East FWSR (127.5 ML), Ho Man Tin West FWSR (16.6ML)
   Design Capacity: Ho Man Tin East FWSR (152,411m3); Ho Man Tin West FWSR (67,434m3), Lok Fu SWSR (8,597m3) and Diamond Hill SWSR (21,836m3)

Regards,
Wayne WC LEE
E/K(D1), WSD
Tel.:[redacted]

From: Wendy Tin <WENDYTIN@ramboll.com>
Sent: Friday, September 19, 2025 3:07 PM
To: WC LEE/WSD [redacted]
Cc: Tony Cheng [redacted]
Subject: Enquiry for Existing Water Supply Network for Ma Tau Wai Road/ Lok Shan Road Development Project (KC-020)

Dear Mr. Lee,

We are the environmental consultant employed by URA of the captioned site. We are writing to request for the following information to facilitate the water supply impact assessment. The location plan of the captioned site is attached for your easy reference.

The enquiries are as follow:

1. Freshwater & Saltwater Service Reservoirs serving the Application Site
2. Supply zone of Freshwater & Saltwater Service Reservoirs serving the Application Site
3. Designed capacity, average water demand (daily consumption) and the spare capacity of the Freshwater & Saltwater Service Reservoirs

Should you have any queries, please do not hesitate the undersigned. We thank you in anticipation of your help in the matter.

Thank you for your kind attention.

Kind regards

Wendy Tin

Senior Consultant

[redacted]

Connect with us

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Appendix 15 Calculation of Freshwater and Flushing Water Demands

Table 1 - Future Water Demands of the Application Site

					Freshwater			Flushing Water		
	Type of Use	**Unit**	**Population (Head)**	**GFA Area (m^2)**	**Daily Unit Demand (m^3/head/day)**	**Daily Unit Demand (m^3/GFA m^2/day)**	**Daily Demand (m^3/day)**	**Daily Unit Demand (m^3/head/day)**	**Daily Unit Demand (m^3/GFA m^2/day)**	**Daily Demand (m^3/day)**
Application Site	Residential Development (R2)	279	754 [1]	-	0.40 [2][3]	-	301.6	0.07 [2]	-	52.8
	Retail	-		1570	-	0.02 [4]	31.4	-	0.007 [4]	11.0
	Irrigation	-	-	314 [5]	-	0.07 [6]	22.0	-	-	-
						Total:	**355**		**Total:**	**64**

Note:

[1] Derived by assuming 2.7 occupants as per the average domestic household size in Kowloon City District based on Population Census 2021.

[2] Refer to Table 1 of WSD Departmental Instruction 1309 (WSD DI 1309) - Residential (R2), i.e. daily unit demand of 0.3 m^3/head/day for freshwater and 0.07 m^3/head/day for flushing water.

[3] SThe unit demand for service trades (per head of residential population) is in accordance with the DI corresponding to the supply zones. Service trade of 0.1 m^3/head/day (Homantin) adopted.

[4] Based on WSD imformation, the unit demand for Commerical - retail/ restaurant are 0.02 and 0.007 m^3/GFA m^2/day for freshwater and saltwater, respectively.

[5] According to the Sustainable Building Design Guidelines, minimum 20% greenery coverage is required on the Application Site, i.e. 1,570 x 20% = 314 m^2

[6] Based on ArchSD's Technical Information Paper (TIP) (No.10/05), the recommended daily water consumption in irrigation is 7 litres/m^2/day (i.e. 0.07 m^3/m^2/day).