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Agreement No. CB20180686 Term Traffic and Environmental Consultancy Services 2019 – 2021 for Kowloon Central and West and Islands Region

Instruction No. K02
Proposed Public Housing Development
at To Kwa Wan Road
Environmental Assessment Study (EAS)

Draft Report (Revision 2)

Hong Kong Housing Authority

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Executive Summary

An Environmental Assessment Study (EAS) has been carried out to evaluate the environmental feasibility for the proposed Public Housing Development at To Kwa Wan Road, with respect to Chapter 9 of the Hong Kong Planning Standards and Guidelines (HKPSG).

The proposed development is a single public housing domestic block at 4/F – 40/F with carpark at G/F to 1/F, and non-domestic block (welfare facilities) at 2/F to 3/F. The proposed development site is located at To Kwa Wan Road and Sung Wong Toi Road in Kowloon City. Road traffic noise impact, fixed noise impact from vehicle workshops, the industrial chimney emission at the Ma Tau Kok Gas Works and odour emissions at the sewage pumping station are the key environmental issues to be addressed for the proposed development.

Road traffic noise assessment results for the public housing domestic block indicated that the base-case scenario would achieve a noise compliance rate of 78% at the AM peak scenario with a total of 172 out of 777 residential flats exposed to traffic noise levels exceeding $L_{10(1\text{hour})}$ 70 dB(A) criterion. The maximum predicted peak hour L_{10} noise level is 74 dB(A).

Possible noise mitigation measures, such as the use of fixed glazing and acoustic windows, are recommended for the affected NSRs to mitigate the road traffic impact. With the implementation of the proposed mitigation measures, the overall compliance rate for the public housing blocks is 100% and the maximum predicted peak hourly $L_{10(1\text{hour})}$ noise level is 70 dB(A).

Based on the results of the base-case scenario, no road traffic noise exceedance has been predicted at all noise sensitive uses in the welfare facilities at 2/F to 3/F.

Fixed plant noise impact assessment was conducted to evaluate the potential noise impact arising from fixed plant operation in the vicinity of the proposed development. The results showed that the predicted noise levels at the worst affected NSR in the proposed development would comply with the relevant noise criteria. Adverse fixed plant noise impacts on the proposed public housing development are not anticipated.

Industrial emissions, vehicular emissions and odour emissions on the proposed development have been assessed. No adverse impact on air quality is anticipated for the proposed development.



行政摘要

是次環境評估研究根據《香港規劃標準與準則》第九章的規定評估了擬議的土瓜灣道公營房屋興建項目的環境可行性。

是次擬議的興建項目包括一座樓高三十七層的公營住宅樓宇，地面層及一樓為停車場，基層底座二至三樓為社會福利設施。是次興建項目位於土瓜灣道及宋皇臺道交界。道路交通噪音、由附近車輛維修作業的固定噪音、馬頭角燃煤設施所產生的廢氣以及源自污水泵房的氣味為對是次擬議的興建項目的主要環境問題。

在基本方案下，道路交通噪音評估結果顯示，有 78% 的單位將在最差交通情況下(上午高鋒時間)符合噪音標準，即 777 個單位中有 172 個住宅單位將受到交通噪音超過標準 70 分貝(A) 的影響。預測最高噪音聲級為 74 分貝(A)。

對於超過交通噪音標準的「噪音感應強的地方」，報告建議實施相應緩解措施，例如減音窗及固定玻璃，以減輕道路交通影響。在實施緩解措施後的情況下，預測最高的噪音聲級為 70 分貝(A) 而且 100% 的住宅單位將會符合噪音標準。

根據基本方案下的結果顯示，在二至三樓所有「噪音感應強的」福利設施均沒有道路交通噪音超標。

是次環境評估研究亦評估在興建發展項目附近潛在的固定噪音源所產生的影響。結果顯示，在擬議的興建項目中受影響最嚴重的「噪音感應強的地方」將符合相關的噪音標準。預計固定噪音源對擬議的興建項目不會引致不良的噪音影響。

是次環境評估研究亦審查了來自車輛排放、工業排放及氣味排放對是次擬議興建項目在空氣質素方面的影響。預計該興建發展項目不會受到任何不良空氣質素影響。



1. Introduction

1.1. Project Background

- 1.1.1. The Hong Kong Housing Authority (HKHA) has identified a potential site for a public housing development with provision of social welfare facilities and retail at To Kwa Wan Road (hereafter referred as “the proposed development”).
- 1.1.2. Atkins China Limited was commissioned by HKHA to undertake an Environmental Assessment Study (EAS) for the proposed development.

1.2. Scope

- 1.2.1. The scope of this EAS is outlined as follow:
 - Assess the road traffic noise impacts upon the proposed re-development with reference to the Hong Kong Planning Standards and Guidelines (HKPSG);
 - Assess the potential noise impacts of other fixed type noise sources upon the proposed development with reference to HKPSG;
 - Assess the potential air quality impacts due to vehicular emissions from the surroundings road network upon the proposed re-development with reference to HKPSG;
 - Assess the potential air quality impacts due to chimney emissions from the nearby industrial premises with reference to HKPSG; and
 - Recommend appropriate environmental mitigation measures as required.

1.3. Site Location

- 1.3.1. The Site is located at To Kwa Wan Road in Kowloon City. It is bounded by Sung Wong Toi Road, To Kwa Wan Road and Mok Cheong Street. According to the Outline Zoning Plan S/K10/30 – Ma Tau Kok, the site is located in an area zoned as "Residential (Group A)"("R(A)"). The proposed development comprises of one building block, with a total area of approximately 0.28 hectares. Location of the proposed development is shown in **Figure 1.1**.



1.4. Development Layout Details

1.4.1. The proposed development layout under this EAS comprises one residential block. Social welfare facilities, recreational facilities and carparks will also be provided at podium levels. Details of the proposed facilities are summarised in **Table 1.1** below and the layout plan is attached in **Appendix 1.1**.

Table 1.1 Summary of the Proposed Facilities for the Development

Location		Name of the Proposed Facility	Type of Noise Sensitive Uses
Floor	Floor Level, mPD		
G/F	+4.20	Carpark and Plantrooms	Carpark / Plantrooms
1/F	+10.70	Carpark	Carpark
2/F	+14.90	Estate Management Office	Office
		HKHA's Office	Office
		Child Care Centre (CCC)	Activity Room / Dormitory / Office
3/F	+19.70	Neighbourhood Elderly Centre (NEC)	Activity Room / Office
		Integrated Family Services Centre (IFSC)	Activity Room / Office
4/F to 40/F	+26.70 to +130.00	Domestic	Residential

1.4.2. The key development parameters of the proposed development are summarised in **Table 1.2** below.

Table 1.2 Key Development Parameter for the Proposed Development

Parameter	Development Details
Domestic Floor	4/F to 40/F
No. of Domestic Storey	37
No. of Flats per Floor	21
Total No. of Flats	777
Tentative Population Intake Year	Year 2029
Typical Floor to Floor Height – Domestic	2.75 m
First Domestic Floor Level	26.70 mPD



2. Road Traffic Noise Impacts

2.1. Assessment Criteria

- 2.1.1. According to the HKPSG, the road traffic noise criterion of $L_{10 (peak\ hour)}$ 70 dB(A) is applicable to the domestic premises in the proposed development.
- 2.1.2. The following guidelines are considered to assess and mitigate the noise impact from possible noise sources within the assessment area.
- Hong Kong Planning Standards and Guidelines (HKPSG)
 - ProPECC PN3/23 Application of Sound Insulation in Residential Buildings to Reduce Noise Transmission Between Units
 - ProPECC PN5/23 Application of Innovative Noise Mitigation Designs in Planning Private Residential Developments against Road Traffic Noise Impact
- 2.1.3. The domestic premises within the proposed development shall rely on openable window for ventilation. Locations of the noise assessment points at domestic floors are illustrated in **Figure 2.1**.
- 2.1.4. Apart from domestic premises, office spaces and social welfare facilities will be provided on 2/F and 3/F as detailed in **Table 1.1**. Other remaining rooms do not rely on openable window for ventilation, i.e. fixed glazing coupled with mechanical ventilation will be provided, or are not considered to be noise sensitive. The use of non-domestic premises will exhibit similar nature to the residential/ office use thus the noise criterion $L_{10 (peak\ hour)}$ 70 dB(A) will be adopted as well. Noise assessment points in the proposed welfare facilities and office are identified and summarised in **Table 2.1** below. The locations of the noise assessment points at the social welfare facilities are illustrated in **Figure 2.2** and **Figure 2.3**.

Table 2.1 Summary of Traffic Noise Assessment Criteria

Floor	Type of Facility	Name of the Proposed Welfare Facility ^[1] / Area	Noise Criterion $L_{10 (1-hr)}$ in dB(A)	Noise Assessment Point ID
2/F	CCC	Daytime Dormitory	70 ^[2]	CCC-01
		Playroom / Music Room	70 ^[2]	CCC-02
		Play Cum Dining Area	70 ^[2]	CCC-03
3/F	NEC	Common Room	70 ^[2]	NEC-01 & NEC-02
		Activity Room	70 ^[2]	NEC-03 & NEC-04
		Interview Room	70 ^[2]	NEC-05
		Volunteer Room	70 ^[2]	NEC-06
		Office	70 ^[2]	NEC-07
	ISFC	Exhibition Area	70 ^[2]	ISFC-01
		Information & Resource Corner	70 ^[2]	ISFC-02
		Play Room	70 ^[2]	ISFC-03
		Small Group Room	70 ^[2]	ISFC-04



Floor	Type of Facility	Name of the Proposed Welfare Facility ^[1] / Area	Noise Criterion L ₁₀ (1-hr) in dB(A)	Noise Assessment Point ID
		Office	70 ^[2]	ISFC-05 & ISFC-06
4/F to 35/F	Domestic	Residential	70	T1-01A to T1-21C

Note:

[1] Noise standards in HKPSG Chapter 9 Table 4.1 apply to uses which rely on opened window for ventilation. As detailed internal layout is yet to be determined, it is assumed that all windows to be provided is openable for ventilation and will be included in detailed traffic noise assessment.

[2] For other facilities with noise sensitivity similar to that of domestic premises and offices which no training/ education/ medical consultation activities would be taken place in these areas, the noise planning standards of 70 dB(A) as stipulated in Table 4.1 of the HKPSG is selected.

2.2. Assessment Methodology

- 2.2.1. Road traffic noise level prediction has been carried out using the NoiseMap model, which is a computerized model developed on the basis of the UK Department of Transport's Calculation of Road Traffic Noise (CRTN) procedures, which is a method accepted by Environmental Protection Department (EPD) for use in Hong Kong.
- 2.2.2. Existing roads within 300m from the sites of the proposed development have been included in the assessment.
- 2.2.3. All openable windows for ventilation at all noise sensitive rooms at domestic floors of the proposed development are assigned with noise assessment points and included for the assessment. For other facilities on podium levels where detailed internal layout is yet to be determined, all possible locations of openable windows for ventilation of potential noise assessment points have been selected for the assessment. The noise assessment points, building structures with noise screening effects, topographical contours and road segments with traffic flow data have been input into the NoiseMap model in predicting the potential traffic noise impacts.
- 2.2.4. The assessment has been undertaken based on the projected peak hourly traffic flows in year 2044, which corresponds to the maximum projected traffic conditions within 15 years upon occupancy of the proposed development, i.e., year 2029. A Technical Note on the traffic forecast methodology for year 2044 is submitted to Transport Department for review and approval. The adopted traffic forecast data including traffic flow and percentage of heavy vehicles are provided in **Appendix 2.1**.

2.3. Design Consideration for the Base-case Scenario

- 2.3.1. The proposed layout scheme of the public housing blocks studied in this EAS has implemented the following design consideration in order to minimize the road traffic noise impacts as much as practicable and with an aim to achieve a high compliance rate.



Provision of Podium

- 2.3.2. For the base-case scenario, podiums have been adopted as building features for residential building blocks. Podiums at 3/F are to be provided at +19.59 mPD for the proposed development. The provision of such building feature is to reduce the noise impact to the lower floor levels.

Internal Layout Design

- 2.3.3. In general, standard modular flat design is adopted in public housing design including those with acoustic windows. Revision of internal layout to the affected floors would not be feasible.

Further Setback

- 2.3.4. The Project Site is abutting nearby roads, slopes and existing buildings, further setback is considered not feasible for the proposed development.

Fixed Glazing with Maintenance Window (Openable for Maintenance Purpose) for Public Housing Units

- 2.3.5. Fixed glazing with maintenance window has been adopted in some flats of the proposed development as most of the side windows of end dwellings at the façade facing Sung Wong Toi Road and some side windows of the end dwellings in the west facing façade. These maintenance windows have been designed to be installed with fixed glazing with 6mm thick of window pane with reference to the Appendix 4.4 in Ch9 of HKPSG. The fixed glazing with maintenance window reduces the noise entering the flat when closed and adverse road traffic noise impact to the indoor environment of the concerned flats is therefore not anticipated.
- 2.3.6. These windows should be normally closed for noise reduction and need not be opened for ventilation. It can only be opened for cleaning and maintenance purposes by a specific type of key e.g. Allen key. Thus, they are not considered as noise sensitive facades for this assessment. The purpose of provision of fixed glazing with maintenance window would be incorporated in the tenant handbook and handover to the future tenants to ensure the future occupants aware of this. The location of fixed glazing with maintenance window is illustrated in **Appendix 2.2**.

2.4. Traffic Noise Impact Assessment

Predicted Road Traffic Noise Impacts on Public Housing Units (Base-case Scenario)

- 2.4.1. The noise assessment points have been assigned to each openable windows for ventilation at the proposed development are shown in **Figure 2.1**. The predicted peak hourly road traffic noise levels are summarized in **Table 2.2** and the predicted road traffic noise levels at the representative NSRs under base-case scenario are detailed in **Appendix 2.3**.

Table 2.2 Summary of Predicted Peak Hourly Road Traffic Noise for the Public Housing Units (Base-case Scenario)

Parameter	Overall	
Total No. of Flats	777	
Traffic scenario	AM Peak	PM Peak
Predicted Maximum L ₁₀ (peak hour), dB(A)	74	73



No. of Flats with Noise Exceedance	172	110
Compliance Rate, %	78%	86%

Notes: Noise Criterion $L_{10}(\text{peak hour}) = 70 \text{ dB(A)}$

- 2.4.2. The predicted maximum road traffic noise level for the public housing units of the proposed development is 74 dB(A). The worst-case noise compliance rate for the proposed development is 78% at AM peak scenario.

Predicted Road Traffic Noise Impacts on Non-domestic Uses (Base-case Scenario)

- 2.4.3. The noise assessment points have been assigned to locations with openable windows for ventilation at the noise sensitive rooms on 2/F and 3/F. Locations of noise assessment points are indicated in **Figure 2.2** and **Figure 2.3**. The predicted maximum peak hourly road traffic noise levels at the proposed development for non-domestic uses are shown in **Table 2.3** and detailed in **Appendix 2.3**.

Table 2.3 Summary of Predicted Peak Hourly Road Traffic Noise Results for the Non-Domestic Block (Welfare Facilities) - Base-case Scenario

Noise Assessment Point	Floor	Proposed Use	Noise Criteria, dB(A) ^[2]	Range of Predicted Maximum Predicted $L_{10}(\text{peak hour})$, dB(A)
CCC-01	2/F	Daytime Dormitory	70	51
CCC-02		Playroom / Music Room	70	69
CCC-03		Play Cum Dining Area	70	70
NEC-01	3/F	Common Room	70	50
NEC-02		Common Room	70	66
NEC-03		Activity Room	70	69
NEC-04		Activity Room	70	70
NEC-05		Interview Room	70	69
NEC-06		Volunteer Room	70	68
NEC-07		Office	70	60
ISFC-01		Exhibition Area	70	57
ISFC-02		Information & Resource Corner	70	57
ISFC-03		Play Room	70	57
ISFC-04		Small Group Room	70	58
ISFC-05		Office	70	54
ISFC-06		Office	70	56

Notes:

[1] According to Appendix 4.1 of Ch.9 of the HKPSG, noise criterion $L_{10}(\text{peak hour}) = 70 \text{ dB(A)}$ is applicable to all domestic premises, hotels and hostels and offices.

[2] The facility is identified as community uses which is noise-tolerant uses in accordance with Appendix 4.1 of Ch.9 of the HKPSG. However, facilities or rooms with noise sensitivity similar to domestic premise and offices are regarded as noise sensitive uses which shall follow the noise planning standard of 70 dB(A).

- 2.4.4. Based on the results of base-case scenario, no road traffic noise exceedance has been predicted at the proposed development for non-domestic uses on 2/F and 3/F.



Mitigation Measures for Domestic Uses

Provision of Acoustic Windows

- 2.4.5. According to results of the traffic noise impact assessment under the base-case scenario, noise exceedances are anticipated at some noise sensitive uses that are directly overlooking Sung Wong Toi Road and To Kwa Wan Road. Acoustic windows have been proposed for the flats with noise exceedances to mitigate road traffic noise impact. Modular Flat Design (MFD) has been adopted for those flats proposed with acoustic windows.
- 2.4.6. With reference to HD's Technical Note on "Noise Attenuation for Modular Flat Design (MFD) with Acoustic Windows" as extracted in **Appendix 2.4**, sound attenuations ranging from 2.7 dB(A) and 3.9 dB(A) can be achieved for acoustic window system without or and with sound absorptive lining at bedroom, respectively. And 5.5 dB(A) to 5.8 dB(A) can be achieved for acoustic window system without sound absorptive lining at living room. Those flats with provision of the acoustic window and the corresponding sound attenuation performance are MFD (i) Type A-3 – 5.8 dB(A), (ii) Type B-5 – 5.5 dB(A), (iii) Type C-8 (Living Room) – 5.5 dB(A), (iv) Type D-6 (Living Room) – 5.6 dB(A), (v) Type D-6 (Bedroom 2, with absorptive lining) – 3.9 dB(A), and (vi) Type D-6 (Bedroom 2, without absorptive lining) – 2.7 dB(A).
- 2.4.7. It should be noted that the sound attenuation performance is subjected to actual design and configurations of the acoustic window as well as setting and orientation of the acoustic window. Sound attenuation performance and configurations of the acoustic window for typical public housing units are listed in **Appendix 2.4**.
- 2.4.8. To achieve the sound attenuation performance, the setting and orientation of the acoustic window shall follow the Final Report of Acoustic Design and Performance Evaluation of the Acoustic Window (ADPEAW).
- 2.4.9. Acoustic windows are recommended to be provided to the affected flats. The windows specified for use of acoustic windows and their locations are presented in **Figure 2.4**.

Acoustic Window Configuration

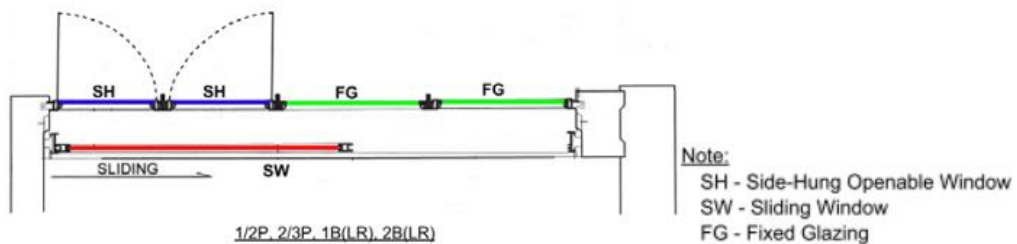
- 2.4.10. The sound attenuation of the acoustic window system is dependent on the window configuration. Summary of acoustic window configurations (Retrieved from HD's Technical Note on "Noise Attenuation for Modular Flat Design (MFD) with Acoustic Windows") of the proposed acoustic window system and the corresponding window type adopted in this proposed development is presented in Table 2.4.



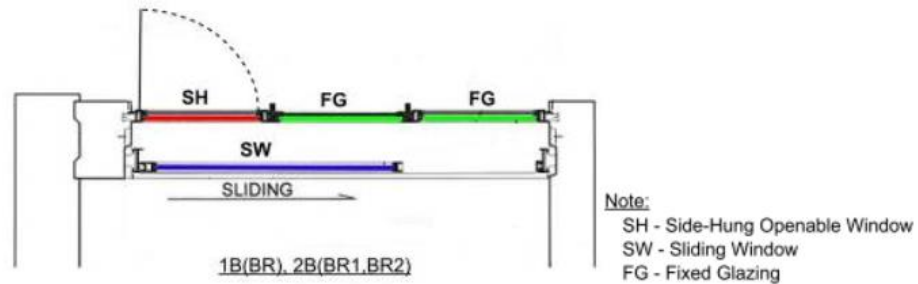
Table 2.4 Summary of Acoustic Window Configuration (Retrieved from HD’s Technical Note on “Noise Attenuation for Modular Flat Design (MFD) with Acoustic Windows”) and the Corresponding Window Type of the Residential Units in the Proposed Development

NAP	Floors	Flat Type	Room Type	Acoustic Windows Dimensions					W/WO Sound Absorption Material	Favourable/ Unfavourable Setting	Noise Reduction, dB(A)
				Gap Width, mm	Window Height, mm	Inner Window Width, mm	Outer Window Width, mm	Over-lapping Length, mm			
T1-03D	5/F-25/F	D-6	Living Room	175	1383	980	1040	100	Without	Favourable	5.5
T1-03E	5/F-25/F		Bedroom 1	175	1383	675	600	525	Without	Favourable	5.5
T1-04B	5/F-25/F	B-5	Living Room	175	1383	940	1010	200	Without	Favourable	5.5
T1-05A	6/F-24/F	C-8	Living Room	175	1383	1060	1050	330	Without	Favourable	5.6
T1-05B	5/F-25/F		Bedroom 1	175	1383	675	600	525	Without	Favourable	5.6
T1-06B	5/F-25/F	B-5	Living Room	175	1383	940	1010	200	Without	Favourable	5.5
T1-07A	6/F-14/F	A-3	Living Room	175	1383	840	870	340	Without	Favourable	5.8
T1-08B	5/F-20/F	A-3	Living Room	175	1383	840	870	340	Without	Favourable	5.8
T1-09A	5/F-22/F	B-5	Living Room	175	1383	940	1010	200	Without	Favourable	5.5
T1-10B	4/F-25/F	D-6	Bedroom 1	175	1383	675	600	525	Without	Favourable	5.5
T1-10C	4/F-26/F		Living Room	175	1383	980	1040	100	Without	Favourable	5.5
T1-10E	6/F-21/F		Bedroom 2	175	1383	550	550	500	Without	Favourable	2.7
T1-11B	5/F-17/F		Bedroom 2	175	1383	550	550	500	Without	Favourable	2.7
T1-11D	5/F-18/F	D-6	Living Room	175	1383	980	1040	100	Without	Favourable	5.5
T1-11E	5/F-17/F		Bedroom 1	175	1383	675	600	525	Without	Unfavourable	4.5
T1-12B	6/F-13/F	B-5	Living Room	175	1383	940	1010	200	Without	Favourable	5.5

2.4.11. Based on the acoustic window system design, the outer layer of the window system shall consist of fixed glazing and side-hung openable gasketed window, and the inner layer shall consist of one sliding window. The basic configurations of the acoustic window for Flat Type A, Type B, Type C and Type D for the proposed development is shown below:



Acoustic Window Configuration for Flat Type A, Type B and Living Room of Type C and Type D

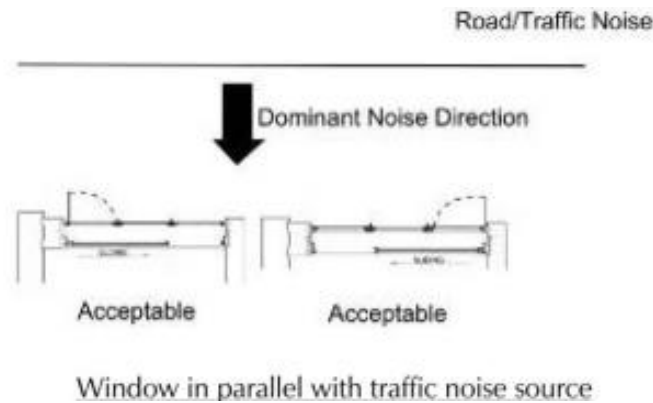


Acoustic Window Configuration for Bedroom of Type C and Type D

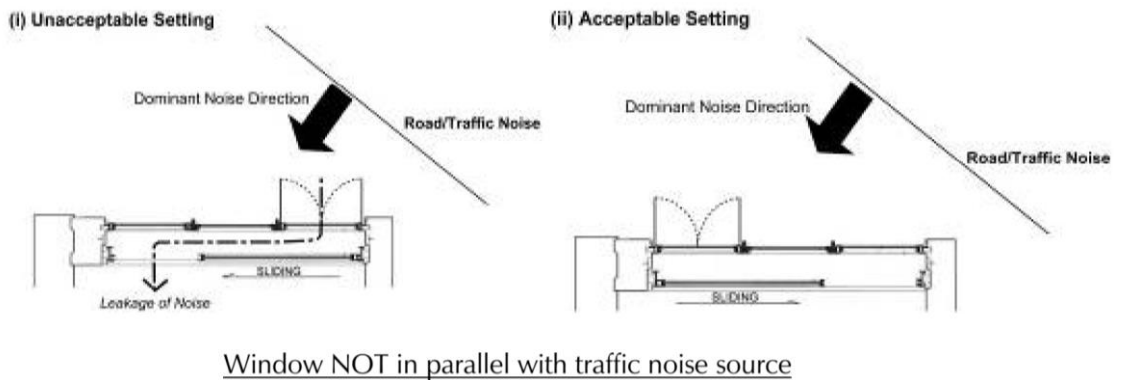
- 2.4.12. For fixed glazing equipped with side-hung openable window, the provision of special window opening device like Allen Key should be provided in order to keep the side-hung window normally closed. However, as advised by the ADPEAW, the future residents shall be advised of the caution that such window should be closed to achieve the intended sound attenuation and that opening of the windows for purpose of other operation, maintenance or additional ventilation would compromise the indoor noise level in the flat.
- 2.4.13. The design of the proposed acoustic window meets the relevant natural ventilation requirement under the Building (Planning) Regulations. The inner sliding glass panel need to be slid behind the opened outer window 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 glass panel in a closed position, the air gap should have a length of not less than 100mm and a width between 100mm and 175mm. The length and width of the air gap of the proposed acoustic window also meet these conditions.

Acoustic Window Settings

- 2.4.14. For achieving the sound attenuation assessed in the study, the acoustic window should be set at the intended orientation as described in the Final Report of ADPEAW. The setting and orientation are summarized and described below:
- 2.4.15. In case a flat is fronting a major noisy road running in parallel with the façade, the left or right settings of the openings of its acoustic window are only mutual images; both of which could achieve the intended sound attenuation.



2.4.16. In case the road is located at one side of the flat, the traffic noise would propagate to the façade more from the side of the road rather than right in front of it. The staggered openings of the acoustic window should be set to intercept direct propagation of noise through the openings and the gap between outer and inner panes. In general, the opening of the outer layer of window should be sited further away from the road, as illustrated below:



Advice to Future Residents for the Use of Acoustic Window

- 2.4.17. The sound attenuation achieved by the acoustic window refers to the designated setting of window. Hence the future residents in the flats equipped with acoustic windows should be advised of such settings stated in **Sections 2.4.14 to 2.4.16** for achieving the intended attenuation. Deviation from the recommended setting might affect the noise level in the flat.
- 2.4.18. The noise reduction purpose of the acoustic window and its setting to achieve the noise reduction effect would be incorporated in the Decoration Handbook to inform the future occupants.

Predicted Road Traffic Noise Impacts on Public Housing Units (Mitigated Scenario)

- 2.4.19. The predicted peak hourly road traffic noise levels of the mitigated scenario with incorporation of fixed glazing with maintenance window and acoustic window are summarised in **Table 2.4** and the predicted road traffic noise levels at the representative NSRs under the mitigated scenario are detailed in **Appendix 2.5**.



Table 2.4 Summary of Predicted Peak Hourly Road Traffic Noise Results for the Public Housing Units (Mitigated Scenario)

Parameter	Overall
Total No. of Flats	777
Predicted Maximum L_{10} (peak hour), dB(A)	70
No. of Dwellings with Noise Exceedance	0
Compliance Rate, %	100.0

Notes: Noise Criterion L_{10} (peak hour) = 70 dB(A)

- 2.4.20. With incorporation of fixed glazing with maintenance window and acoustic window, the predicted maximum road traffic noise level of the domestic units of the proposed developments is 70 dB(A) and the noise compliance rate is 100.0%. No traffic noise exceedance has been predicted.

Predicted Road Traffic Noise Impacts on Non-domestic Uses (Mitigated Scenario)

- 2.4.21. With proper layout design and room arrangement, adverse road traffic noise impacts on the noise sensitive room for non-domestic uses of the proposed development at podium level is not anticipated.

2.5. Summary

- 2.5.1. The predicted maximum road traffic noise level under the base-case scenario for the public housing units of the proposed development is 74 dB(A) which exceeds the noise criterion by 4 dB(A). The noise compliance rate under the base-case scenario is 78%.
- 2.5.2. With the provisions of fixed glazing with maintenance window and acoustic window as mitigation measures for the public housing units, the compliance rate for the proposed development is 100%, and the predicted maximum peak hourly road traffic noise level is 70 dB(A).
- 2.5.3. Based on the results of base-case scenario, no traffic noise exceedance has been predicted at all noise sensitive room for non-domestic uses of the proposed development at 2/F to 3/F.



3. Fixed Plant Noise Impacts

3.1. Assessment Criteria

- 3.1.1. According to the HKPSG, noise assessments for fixed noise sources would normally be conducted in accordance with the Technical Memorandum for the Assessment of Noise from Places Other Than Domestic Premises, Public Places Or Construction Sites (IND-TM), published under the Noise Control Ordinance. IND-TM lays down statutory Acceptable Noise Levels (ANL). The HKPSG also stated that in order to plan for a better environment, all planned fixed noise sources should be located and designed that when assessed in accordance with IND-TM, the level of the intruding noise at the facade of the nearest sensitive use should be at least 5 dB(A) below the appropriate ANL shown in Table 2 of IND-TM or, in the case of the background being 5 dB(A) lower than the ANL, should not be higher than the background. As there are no planned noise sources at the proposed re-development, ANL is adopted in the fixed noise assessment. The ANLs provided in the IND-TM is detailed in **Table 3.1**.

Table 3.1 Acceptable Noise Level in IND-TM

Time Period	Acceptable Noise Level, $L_{eq\ 30\ min}$, dB(A)		
	ASR "A"	ASR "B"	ASR "C"
Day time (0700 – 1900 hours)	60	65	70
Evening (1900 – 2300 hours)			
Night-time (2300 – 0700 hours)	50	55	60

Notes: ASR = Area Sensitivity Rating

- 3.1.2. The Acceptable Noise Levels (ANLs) are dependent on the Area Sensitivity Rating (ASR) defined and the time period of the day. The ASR of the NSR is determined by the type of area containing it and the presence of any influencing factors (IF) such as industrial areas, major roads, etc.
- 3.1.3. The proposed development is located in To Kwa Wan, Kowloon City. The area is a well-developed area mainly comprises of low-rise residential developments with industrial development (including Towgas Ma Tau Kok Gas Works and industrial building on Mok Cheong Street), construction activities (mainly at Kai Tak Development Area) and limited commercial elements nearby. Therefore, the type of area is taken as "Urban area" based on IND-TM.
- 3.1.4. According to the Annual Traffic Census 2022, Sung Wong Toi Road and To Kwa Wan Road that runs along the northern and eastern boundary of the proposed development with annual average daily traffic flows (AADT) of 12,460 and 18,910, respectively. As the AADT for both roads are less than 30,000, they are not considered as an IF. Therefore, ASR of "B" is adopted in the assessment.



3.2. Identified Fixed Plant Noise Sources

3.2.1. Fixed noise sources within a study area of 300m from the proposed development site boundary have been identified. Fixed plant noise sources were identified based on the desktop study and the site visits conducted on 21 October 2022 and 19 January 2024. The identified fixed plant noise sources are summarised in **Table 3.2** and their locations are shown in **Figure 3.1**. Photograph records of site survey and identified fixed plant noise sources, and fixed plant noise source inventory detailed in **Appendix 3.1**.

Table 3.2 Identified Fixed Plant Noise Sources

Location	Source ID	Source Type	Approximate distance from Site Boundary, m	Remarks
<i>Planned Noise Sources</i>				
Planned Kai Tak Sports Park	NA	<ul style="list-style-type: none"> - Sport events at Main Stadium and Public Sports Ground, - Noise from building services system, and - Musical performance events 	100 – 250m	Information extracted from the approved EIA report for Kai Tak Multi-purpose Sports Complex
<i>Existing Noise Sources</i>				
Vehicle Workshops/ Recycle Workshops at 13 Street/ Mok Cheong Street	HLS_7 to HLS27, TTS_4 to TTS_27, YOS_5 to YOS_28, SLS_27 to SLS_28, HWS_28, PCS_28, LCS_28, FYS_27 to FYS_28, KCR_28, MCS3_7 to MCS_9, MCS9_4, MCS11_1	Vehicle Workshops/ recycle workshops	50 – 250m	Daytime operation only
Rooftop equipment at nearby factory buildings New Port Center	MCS3_1 to MCS_6	Cooling Towers	180m	Daytime operation only
	MCS5_1	Cooling Tower	150m	Daytime operation only
	MCS11_2	Cooling Tower	60m	Daytime operation only
	MCS9_1 to MCS9_3	Chillers	80 – 85m	Out of order during site visit
	MCS13_1 to MCS13_2	Chillers	50m	Out of order during site visit
	NP_1 to NP_18	Chillers and Cooling Towers	100 – 180m	To be redeveloped by URA



Location	Source ID	Source Type	Approximate distance from Site Boundary, m	Remarks
To Kwa Wan Road Sewage Pumping Station	SPS	Façade louver with noise emission	40m	Assume 24hr operation
Harbour Plaza 8 Degrees	HP_1 to HP_2	Chillers	290m	Assume 24hr operation
Towngas Ma Tau Kok Gas Works	TG_1 to TG_16	Chillers	150 – 280m	Assume 24hr operation

Planned Fixed Plant Noise Sources

Planned Fixed Noise Sources at Kai Tak Multi-purpose Sports Complex Development

- 3.2.2. As the Kai Tak Multi-purpose Sports Complex is under construction, information from the approved Kai Tak Multi-purpose Sports Complex EIA Report (AEIAR-204/2017) is reference for assessment propose.
- 3.2.3. In the AEIAR-204/2017, types of noise sources within the Sports Complex include sport events at Main Stadium and Public Sports Ground, noise from building services system and musical performance events. It is also mentioned that events would not be conducted simultaneously in the Main Stadium and the Public Sports Ground.
- 3.2.4. The proposed development was identified as a noise assessment point in the AEIAR-204/2017 and relevant information is extracted in **Appendix 3.2**. AEIAR-204/2017 stated that the mitigated cumulative noise levels due to sports events in the Main Stadium and all the fixed plant, and the mitigated cumulative noise levels due to sports events in the Public Sports Ground and all the fixed plant would comply with the noise criteria at all NSRs. The predicted maximum fixed plant noise level was 60dB(A) for daytime and evening period, and no nighttime sport event will be held in the Main Stadium or the Public Sports Ground.
- 3.2.5. For musical events at the Main Stadium, it is mentioned that the potential noise impact arising from the musical events at the Main Stadium during daytime/evening period (i.e. 7 a.m. to 11 p.m.) would comply with the noise criteria as stipulated under the Noise Control Guidelines for Music, Singing and Instrument Performing Activities. Should the future operator plan to implement any musical events at the Main Stadium during night-time period (i.e. 11 p.m. to 7 a.m.), the operator is obliged to ensure that the noise impacts arising from the said night-time musical events will comply with the noise requirements under the NCO.
- 3.2.6. The assessment in this report will be based on above findings in the AEIAR-204/2017.

Existing Fixed Plant Noise Sources

Vehicle Workshops/ Recycle Workshops at 13 Street and Mok Cheong Street

- 3.2.7. Vehicle workshops/ recycle workshops at the 13 Streets (the area bounded by Kowloon City Road at the west, To Kwa Wan Road at the east, Mok Cheong Street at the north and Ma Tau Kok Road at the south) scattered to the south and southwest of the site with separation distance of around 50 – 250m (ID: HLS_7 to HLS_27, TTS_4 to TTS_27, YOS_5 to YOS_28, SLS_27 to SLS_28, HWS_28, PCS_28, LCS_28, FYS_27 to 28, KCR_28, MCS3_7 to MCS_9, MCS9_4, MCS11_1).



- 3.2.8. The vehicle workshops/ recycle workshops are located at ground level of the 13 Streets and along Mok Cheong Street. Major activities undertaken inside the workshops are mainly for vehicle repair services/ loading and unloading of recycle materials. Major noisy activities identified include operation of pneumatic screwdriver, hammering, metal loading/ unloading and metal grinding. The nature of these noise sources is sporadic in nature and only sustained for short time periods. It was only occasionally encountered during the site visit while most of the workshops were inactive during the site visit.
- 3.2.9. Typically, the noisy activities are conducted within the workshops which is a semi-enclosed space. For the workshops along Mok Cheong Street with opening towards the Subject Site (KCR_28, FYS_27 to FYS_28, LCS_28, PCS_28, HWS_28, SLS_27 to SLS_28, YOS_27 to YOS_28, TTS27, HLS_26 to HLS_27), the workshop openings are directly facing the Subject Site and it is considered that shielding due to building structure is minimal. For the workshops within the 13 Streets which the shop front openings are not facing the Subject Site (YOS_5 to YOS_26, TTS_4 to TTS_26, HLS_7 to HLS_25), it is considered building structure can partially shield the noisy activities within the workshops and a -5 dB correction is applied to account for the noise shielding. For the remaining workshops on Mok Cheong Street with opening towards the 13 Streets (MCS3_7 to MCS3_9, MCS9_4 and MCS11_1), there are no direct line of sight towards the Subject Site and excluded in the assessment.
- 3.2.10. Among these activities, it is considered that the noise level due to operation of pneumatic screwdriver is the loudest. For assessment purpose, a SWL of 98dB(A) is adopted with reference to the noise source data for similar pneumatic screw drives, tyre pumping and hammering activities in AEIAR 263/2020 as extracted in **Appendix 3.3**.
- 3.2.11. The workshops operate in daytime only. From site observation, the workshops are inactive for most of the time and only with sporadic activities. For a conservative assessment, it is assumed that noisy activities would only be conducted for maximum 50% during operation hours. A time correction of -3dB is therefore applied in the assessment.

Rooftop Equipment in nearby Factory Buildings

No. 11 Mok Cheong Street

- 3.2.12. No. 11 Mok Cheong Street is located to the west of the site with separation distance of approximately 60m. A cooling tower is identified at the rooftop of building (ID: MCS11_2) and it is in operation during site visit. Noise measurement was conducted for the cooling tower as shown in **Appendix 3.4**. The projected sound power level (SWL) is 92dB(A) which is calculated from sound pressure level measured on site. It is assumed that it is 100% in operation during daytime & evening and no operation during nighttime.

Freder Center

- 3.2.13. Freder Center locates at west of the site with separation distance of around 180m. There are 6 cooling towers identified within the area/ building (ID: MCS3_1 to MCS3_6).
- 3.2.14. The cooling towers are located at the side of the building with direct line of sight from the Subject Site. During the site visits, the cooling towers were not assessable. Based on site observation, the cooling towers MCS3_1 to MCS3_6 are of similar model as the cooling tower MCS11_2 at No. 11 Mok Cheong Street. It is considered that similar SWL will be emitted by these cooling towers, i.e. 92dB(A). It is also assumed that all cooling towers will be in operation during daytime and evening and there will be no operation during nighttime period which is outside normal working hours.



KK Industrial Building

- 3.2.15. KK Industrial Building is located to the west of the site with separation distance of approximately 150m. A cooling tower is identified at the rooftop (ID: MCS5_1).
- 3.2.16. The cooling towers were not assessable during the site visit. Based on observation, the cooling towers MCS5_1 is also of similar model as the cooling tower MCS11_2 at No. 11 Mok Cheong Street. It is considered that similar SWL will be emitted by these cooling towers, i.e. 92dB(A). It is also assumed that all cooling towers will be in operation during daytime and evening and there will be no operation during nighttime period which is outside normal working hours.

No. 9 and No. 13 Mok Cheong Street

- 3.2.17. Multiple rooftop chillers were identified at the roof of No .9 and No. 13 Mok Cheong Street (ID: MCS9_1 to MCS9_3, MCS13_1 to MCS13_2). During the site visits, these chillers were inactive and was obvious in poor condition such that the chillers were apparently no longer functional. These chillers are excluded from the assessment.

Newport Centre Phase 1 and Phase 2

- 3.2.18. New Port Centre Phase 1 and Phase 2 locates at the southeast of the site with separation distance of around 100 – 180m. There are various chillers and cooling towers identified within the building (ID: NP_1 to NP_18).
- 3.2.19. According to the latest announcement from the Urban Renewal Authority (URA), the concerned buildings are under the redevelopment project of Ming Lun Street/Ma Tau Kok Road Development Scheme and To Kwa Wan Road/Ma Tau Kok Road Development Scheme. Details of URA's announcement are extracted in **Appendix 3.5** and their estimated year of completion is 2033. The entire Newport Centre Phase 1 and 2 will be demolished in the future for the redevelopment. It is anticipated that fixed plants on the rooftop will be dismantled, and no adverse fixed plant noise impact would be generated after the redevelopment.

Towngas Ma Tau Kok Gas Works

- 3.2.20. Towngas Ma Tau Kok Gas Works, operated by The Hong Kong and China Gas Company, is located to the southwest of the site with separation distance of approximately 150m. Chillers and cooling towers were identified within the gas works site (ID: TG_1 to TG_16).
- 3.2.21. The chillers and cooling towers are located at rooftop/ground level. Among the identified fixed plant noise sources, only TG_1 to TG_6, TG_15 to TG_16 have direct line of sight towards the Subject Site while the other sources are blocked by the gas works site's office building. Cross section drawings between the noise sources and the receivers are drawn in **Appendix 3.6** to show the sightline blockage to the noise sources of concern.
- 3.2.22. Request for information was issued to The Hong Kong and China Gas Company regarding the noise source operation details within the gas works site and response is pending at the time of this report. For assessment purpose, the SWL of the chillers and cooling towers are based on manufacturer catalogues of similar models as extracted in **Appendix 3.7**. For worst case assessment, it is assumed that the fixed plant noise sources in the plant will be operated on a 24-hour basis.



To Kwa Wan Road Sewage Pumping Station

- 3.2.23. To Kwa Wan Road Sewage Pumping Station (SPS) locates at east of the site with separation distance of around 40m. There is a noise emitting façade louver identified along the façade of the pumping station (ID: SPS).
- 3.2.24. The façade louver is located at façade facing To Kwa Wan Road. The shutter gates for the SPS entrance are normally closed and closed such that the only noise source from the SPS is due to the identified façade louver.
- 3.2.25. From the information provided by Drainage Service Department (DSD), as extracted in **Appendix 3.8**, total 4 (four) sets of main pumps are installed at basement which three sets are on duty and one set is on standby mode in daily operation. These pumps are operated by auto mode subject to water level at wet well so that no operation schedule is expected to be provided.
- 3.2.26. An on-site measurement was conducted for the façade louver during site visit and a noise level of 68 dB was recorded at 3m from the louver as shown in **Appendix 3.8**. The equivalent SWL is 86dB(A). For conservative assessment, it is assumed the SPS operates 24 hours per day.

Harbour Plaza 8 Degree

- 3.2.27. Harbour Plaza 8 Degrees is located approximately 290m to the west of the Project site boundary. There are 2 chillers identified at the roof of the building (ID: HP_1 to HP_2). Given the large separation between the noise sources and the proposed development, no significant fixed plant noise sources due to the chillers are envisaged.

3.3. Impact Assessment

Assessment Methodology

Planned Fixed Plant Noise Sources

- 3.3.1. As mentioned in **Section 3.2.2. to 3.2.6.**, the proposed development Site was assessed under the AEIAR-204/2017. Predicted maximum fixed plant noise level was 60dB(A) for daytime and evening period, and there will be no nighttime sport event in both Main Stadium and Public Sports Ground.
- 3.3.2. The above finding will be adopted for NSRs with direct line of sight towards the Multi-purpose Kai Tak Sports Complex.

Existing Fixed Plant Noise Sources

- 3.3.3. The assessment of the fixed noise sources was undertaken in accordance with the following standard acoustic principle:

$$\text{SPL} = \text{SWL} - \text{DC} + \text{FC} + \text{BC}$$

Where SPL = Predicted façade noise level, dB(A)

SWL = Sound Power Level, dB(A)

DC = Distance attenuation correction, $20 \log_{10} D_i + 8$ in dB(A)

D_i = Distance in m between the source and the receiver

FC = Façade correction of 3 dB(A)

BC = Barrier correction



- 3.3.4. As the noise sources in this assessment are mostly origin from building services equipment (i.e. air-cooled chillers), the operation and noise levels of such equipment are typically fairly constant, i.e. intermittency nor impulsiveness of the noise levels are insignificant. Neither corrections for intermittency nor impulsiveness are adopted. Furthermore, based on findings in site observation, the concerned buidlign equipment noise source are in good conditions and tonal characteristics were not observed. Therefore, no tonal correction is adopted.
- 3.3.5. The total predicted façade noise level (SPL) contributed from adjacent identified fixed noise sources at representative NSR is then calculated by the following formula:

$$\text{Total SPL} = 10 \log_{10} \sum 10^{\text{SPL}_i / 10}$$

Where Total SPL = Total Predicted façade noise level from all noise sources in the calculations, dB(A)

SPL_i = Predicted façade noise level at receiver by individual noise source, dB(A)

Selection of Representative Noise Sensitive Receivers

- 3.3.6. Five representative NSRs, namely T1-03A, T1-10E, T1-11B, T1-18B and T1-19A at the public housing units have been selected for the noise assessment. This representative assessment points are located closest to the identified fixed plant, it is considered as the worst-case scenario. The shortest horizontal separation distance between representative NSRs and the fixed noise sources have been used for the assessment.

Cumulative Fixed Plant Noise Impact Assessment

- 3.3.7. The cumulative noise impact assessment results for the identified fixed noise sources are summarized in **Table 3.3**. The detailed fixed plant noise assessment results are provided in **Appendix 3.10**.

Table 3.3 Summary of Fixed Plant Noise Impact Assessment Results

NSR ID	Area Sensitivity Rating	Noise Criteria, dB(A)	Predicted Façade Noise Levels, dB(A)		
			Planned Noise Sources	Existing Noise Sources	Overall
Day-time/ Evening Scenario					
T1-03A	B	65	-	63	63
T1-10E	B	65	60	55	61
T1-11B	B	65	-	60	60
T1-18B	B	65	-	64	64
T1-19A	B	65	-	64	64
Night-time Scenario					
T1-03A	B	55	-	51	51
T1-10E	B	55	-	45	45
T1-11B	B	55	-	51	51
T1-18B	B	55	-	52	52
T1-19A	B	55	-	51	51



- 3.3.8. Based on the results in **Table 3.3**, the predicted noise level at the selected NSRs due to the operation of the identified fixed plant will comply with the relevant daytime and evening time as well as night-time criteria.

3.4. Fixed Plant Noise Impacts from Proposed Development

- 3.4.1. To ensure the fixed plant noise generated by the proposed development would not cause excessive impact to neighbouring noise sensitive uses, potential noise sources from the proposed development (e.g., pump rooms, transformer rooms, lift machine rooms, emergency generator rooms, etc.) should be designed to meet the relevant noise criteria as stipulated in the HKPSG.
- 3.4.2. Provisions shall be made to control the noise sources by suitable at source noise control measures such as silencers and acoustic linings when necessary. As such, it is anticipated that the fixed plant noise impact on the surrounding NSRs due to the operation of the proposed development will not exceed the relevant noise criteria of the HKPSG and NCO.

3.5. Summary

- 3.5.1. Based on the fixed plant noise impact assessment results, the predicted cumulative noise levels at NSRs from the identified fixed plant noise sources will comply with the daytime and evening and night-time noise criteria. Adverse fixed plant noise impacts on the proposed development are not anticipated.



4. Air Quality Impacts

4.1. Assessment Criteria

The Hong Kong Planning Standards and Guidelines

4.1.1. The HKPSG recommends a buffer distance on usage of “open space” site for active and passive recreational from roads and industrial areas. Evaluation of potential air quality impacts on the proposed public housing development due to roads and industrial chimney emissions has made reference to the HKPSG guidelines. **Table 4.1** provides the HKPSG recommended buffer distances for recreational uses in open space.

Table 4.1 HKPSG Recommended Buffer Distance for Open Space

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

Remarks (*):

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



4.2. Industrial Emissions

4.2.1. According to HKPSG chapter 9 Table 1.3, the recommended buffer distance between industrial chimneys and high-rise buildings should be at least 200m. Initial desktop study was first conducted to review the nature of all buildings within the study area based on latest street maps and statutory plans. Followed by the desktop review, chimneys within study area were then identified by site walks, with focus on the industrial buildings identified from the desktop study. Chimney surveys were undertaken on 22 October 2022 and 19 January 2024 to confirm the chimney details.

Chimney 1 to Chimney 7: The Hong Kong & China Gas Company Limited – Ma Tau Kok Gas Works

4.2.2. Towngas Ma Tau Kok Gas Works operated by the Hong Kong & China Gas Company Limited is located within the 500m study area of the proposed development. With referent to the approved EIA for Kai Tak Multi-purpose Sports Complex (Sport Complex EIA) (AEIAR- 204/2017), a total of 5 chimneys were identified at Towngas Ma Tau Kok Gas Works and relevant information is extracted in **Appendix 4.1**. During the site visit, 2 more chimneys were further identified at Towngas Ma Tau Kok Gas Works. A total of 7 chimneys were therefore identified at Towngas Ma Tau Kok Gas Works as shown in **Figure 4.1**. 6 out of the 7 chimneys are location within 200m from the Site Boundary as shown in **Figure 4.1**. Emissions from these 6 chimneys were observed during the site visits which indicates that they are actively being used. Photo showing the 6 chimneys are contained in **Figure 4.1**. Request for operation details of the chimneys was issued to the operator of Towngas Ma Tau Kok Gas Works and the operator’s reply is still pending at the time of this report.

4.2.3. In the current layout design, there will be no window opening/ fresh air intake within 200m from the chimneys as shown in **Figure 4.1**, **Figure 4.2** and **Figure 4.3**. The proposed development complies with the HKPSG recommended buffer distances and therefore would meet the HKPSG standard with regards to vehicular emissions from open roads. **No planned Air Sensitive Uses with openable windows and fresh air intake would be located within the recommended buffer zone. For the recreation used on 3/F, air sensitive uses at the podium area within the 200m buffer distance from the chimney will not be provided (i.e., transient in nature).** Hence, it shall not be considered as air sensitive receivers according to Annex 12 of the EIA Technical Memorandum. Adverse emissions impacts are not expected. A summary of identified chimneys at Ma Tau Kok Gas Works is provided in **Table 4.2**.

Table 4.2 Summary of Identified Industrial Chimneys at Towngas Ma Tau Kok Gas Works

Chimney ID	Location	Within 200m from Site Boundary	Window Opening/ Fresh Air Intake within 200m From Boundary	HKPSG Compliance? (Y/N)
Chimney 1	Towngas Ma Tau Kok Gas Works	Y	N	Y
Chimney 2		Y	N	Y
Chimney 3		Y	N	Y
Chimney 4		Y	N	Y
Chimney 5		Y	N	Y
Chimney 6		Y	N	Y
Chimney 7		N	N	Y



4.3. Vehicular Emissions

Open Roads in Close Vicinity

- 4.3.1. Roads located around the proposed development include Sung Wong Toi Road and To Kwa Wan Road. With reference to the Annual Traffic Census (2022) published by the Transport Department, the corresponding section of Sung Wong Toi Road and To Kwa Wan Road in the vicinity of the Site are classified as a District Distributor.
- 4.3.2. The setback distance of the nearest air sensitive uses at the proposed development from the kerb of the nearby roads are summarised in **Table 4.3** and shown in **Figure 4.1** to **Figure 4.3**.
- 4.3.3. As the minimum separation distance between the nearest facade of the air sensitive uses (including domestic block and social welfare facilities) to the road kerbs of abutting open roads are found to be complied with the minimum setback distances as stipulated in Ch.9 the HKPSG for all air sensitive uses in the proposed re-development, there is no air sensitive uses within the buffer distance and adverse air quality impact arising from vehicular emissions is not anticipated.

Table 4.3 Separation Distances between Nearest Roads and Nearest Air Sensitive Uses of the Public Housing Blocks

Road	Road Type	Recommended Buffer Distance for Active and Passive Recreation Uses	HKPSG Compliance? (Y/N)
Sung Wong Toi Road	District Distributor (DD)	>10m	Y
To Kwa Wan Road	District Distributor (DD)	>10m	Y

Nearby Road Portals

- 4.3.4. An EIA was conducted for the Kai Tak Multi-purpose Sports Complex (Sport Complex EIA) (AEIAR- 204/2017) which is bounded by Central Kowloon Route to the south and dissected by Shing Kai Road in the middle. It is a multi-purpose complex comprising majorly a Main Stadium, a Public Sports Ground, an Indoor Sports Centre, and other ancillary or supporting facilities. In the EIA design as extracted in **Appendix 4.1**, Road D2 (current Shing Kai Road) was modelled as a series of portal since it is underneath a proposed landscape deck.
- 4.3.5. At the time of this report, the construction of the Kai Tak Multi-purpose Sports Complex is in progress and the construction of main structure is almost completed. During site visit, the as-built landscape deck at Kai Tak Sport Complex located to the northeast of the Subject Site is confirmed to be in the form of a viaduct above the open road D2, instead of an enclosed structure with a tunnel road underneath (attached **Appendix 4.2**). Therefore, the road emissions of D2 under the landscape deck are assumed to be open road emissions instead of tunnel portal emissions, and it is considered that the HKPSG buffer distance of 200m for industrial chimneys does not apply.
- 4.3.6. For the remaining portal identified for D2 landscape deck that is located outside 200m of the Subject Site, as shown in **Figure 4.1**. Therefore, adverse emissions impacts are not expected.
- 4.3.7. Portal emission sources from Kai Tak Tunnel Portal and Central Kowloon Route (CKR) were also identified in AEIAR-130/2009. The portal is located outside of 200m distance from the Subject Site. Therefore, adverse emissions impacts are not expected.



4.4. Odour Emissions

- 4.4.1. Annex 4 of the Technical Memorandum on Environmental Impact Assessment Process stipulates an odour nuisance limit of 5 odour units (OU) based on an averaging time of 5 seconds.
- 4.4.2. The Kwa Wan Road Sewage Pumping Station is located to the southeast of the Site with around 35m separation from the Site Boundary. Construction of the pumping station was completed around 2018 and the Sewage Pumping Station is assumed to be designed in accordance with EPD's "Environmental Guidance Note for Sewage Pumping Stations which is not a Designated Project", with adopting of suitable odour mitigation measures. A full enclosure design was adopted by the pumping station and adequate deodorization equipment are installed, as confirmed by DSD.
- 4.4.3. Furthermore, a site survey was conducted on 19 January 2024 to identify if there is any odour generated from the Sewage Pumping Station impacting upon the surrounding area. No odour was perceived and no odour generating activity was observed during the odour patrol along the odour patrol route as shown in **Appendix 4.3**. In view of the effective mitigation measures being incorporated in the Sewage Pumping Station design, odour impact at nearby air-sensitive use is insignificant. Thus, potential odour nuisance to the ASRs within the Site is considered to be minimal, and no adverse odour nuisance arising from the nearby sewage pumping station to the ASRs at the proposed development is anticipated.



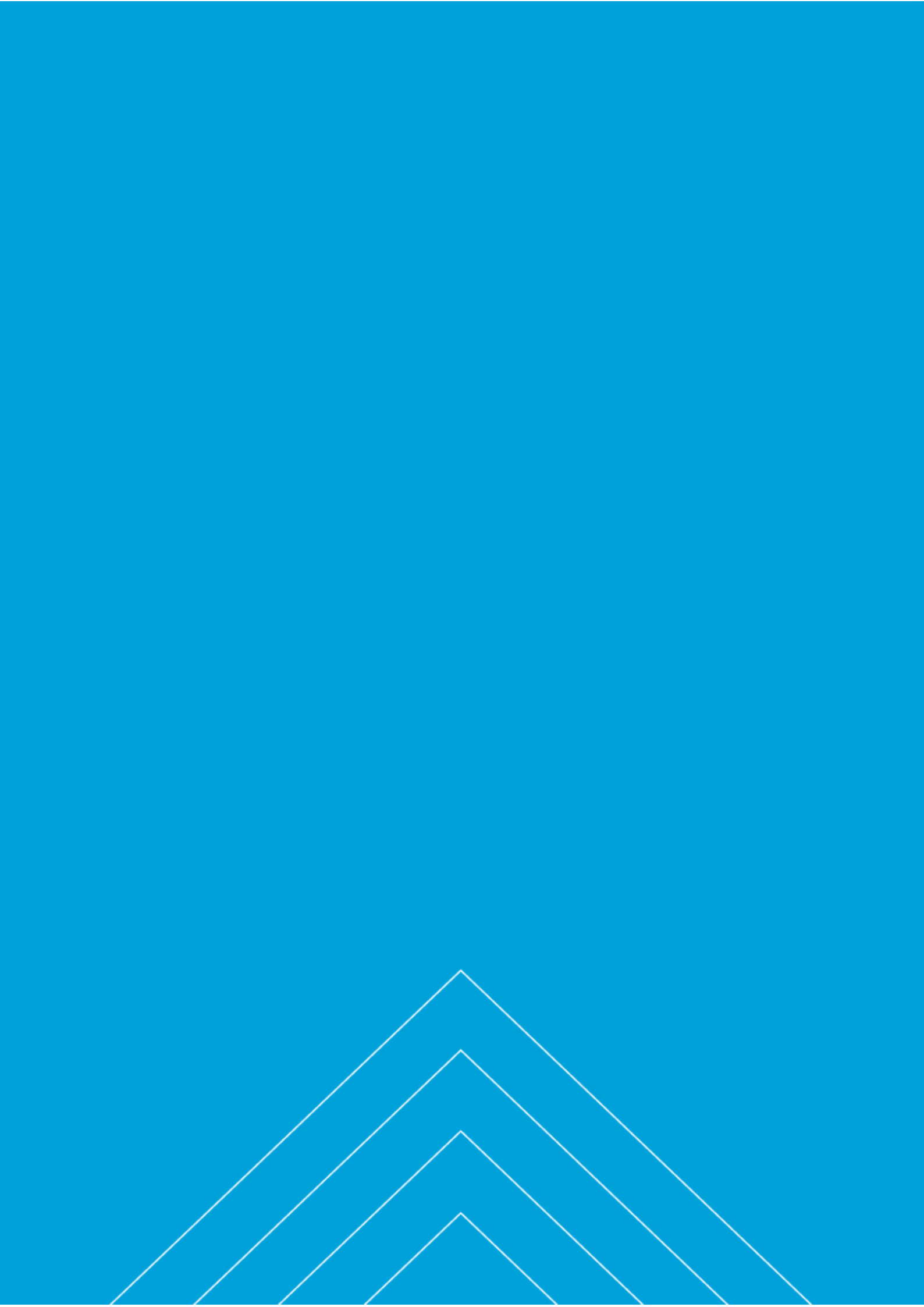
5. Overall Conclusion

5.1. Noise

- 5.1.1. The road traffic noise compliance rate for the base-case scenario of the proposed development at To Kwa Wan Road is **78.0%**. With incorporation of acoustic window and fixed glazing with maintenance window on the public housing blocks as mitigation measures, 100% compliance rate for the proposed development is achieved. The predicted maximum road traffic noise level is $L_{10(1-hr)} 70$ dB(A).
- 5.1.2. It is planned to provide social welfare facilities and offices together with the proposed public housing developments. Based on the assessment result, there is no predicted traffic noise exceedance at the proposed facilities. With careful design and room arrangement, all the non-domestic uses comply with the noise planning standards as stipulated in Ch.9 of the HKPSG. As such, adverse road traffic noise impacts on these welfare facilities are not expected to occur.
- 5.1.3. Based on the fixed plant noise impact assessment results, the predicted accumulative noise levels at the representative NSRs will comply with the daytime and evening and night-time noise criteria. As such, adverse fixed plant noise impacts on the proposed development are not anticipated.

5.2. Air Quality

- 5.2.1. Potential air quality impact due to vehicular emissions and chimney emissions have been reviewed. No adverse air quality impacts due to vehicular emissions and chimney emissions are anticipated as the recommended buffer distances stipulated in the HKPSG can be met for the proposed development.
- 5.2.2. The sewage pumping station in operation in the vicinity is fully enclosed. A site survey was conducted, and no odour was perceived and no odour generating activity was observed during the patrol. No adverse odour nuisance to the potential ASRs within the Site is anticipated.



Figures

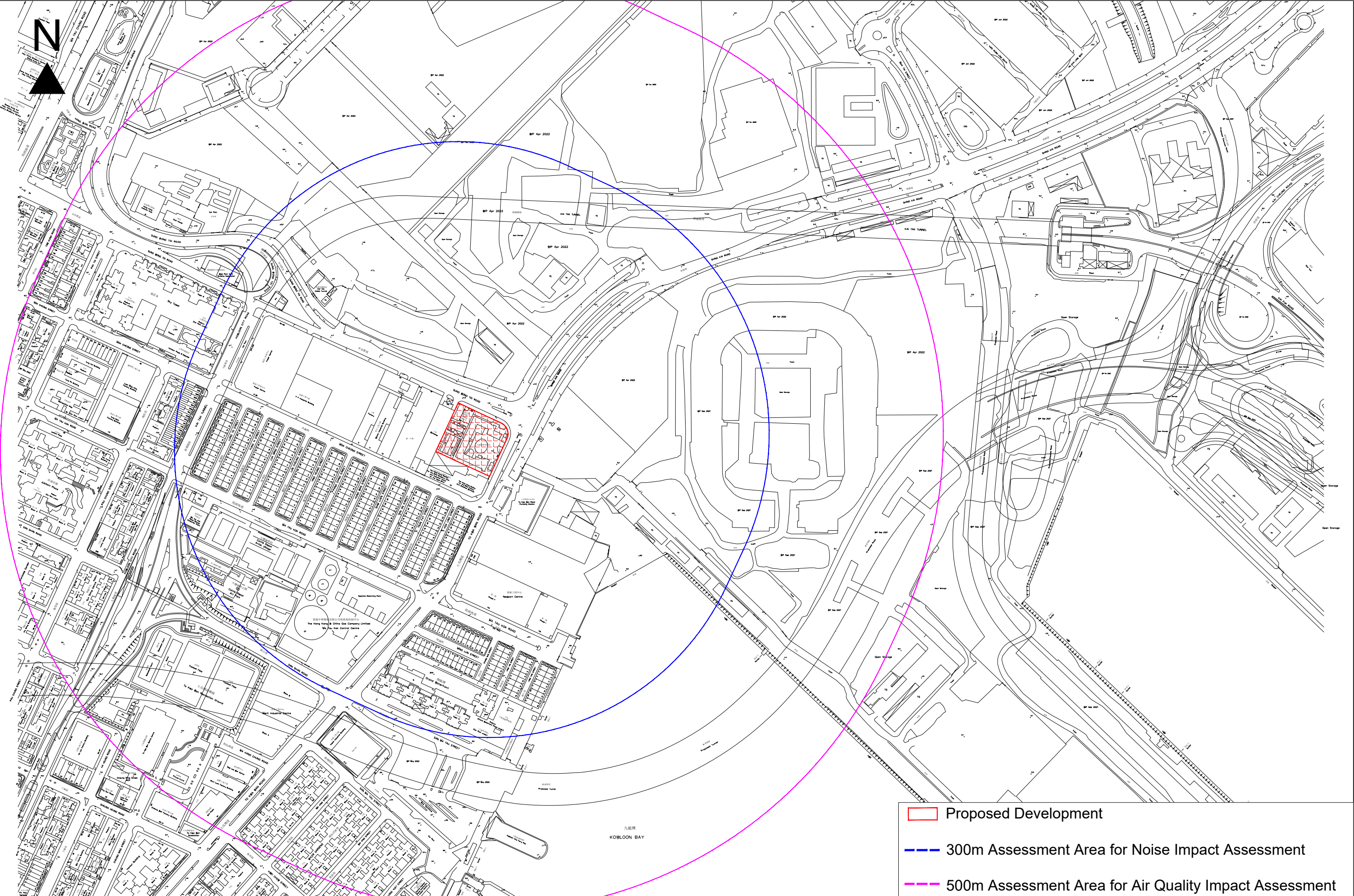





Figures 1.1

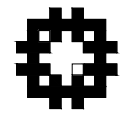
Location of the Proposed Development



3/8/2022 1:41:55 pm
FILENAME: P:\CNHKA\Environment\PROJECT\Hong Kong\INTERNAL\5193425 Term Con T&E [2019-2021]\K02 TKWR EAS\06 Deliverable\2. Draft Report\Working\03_Figures\Figure 1.1 Location of the Subject Site.dwg
MODEL NAME: Default



-  Proposed Development
-  300m Assessment Area for Noise Impact Assessment
-  500m Assessment Area for Air Quality Impact Assessment



香港房屋委員會
Hong Kong Housing Authority



AGREEMENT NO. : CB20180686 - TERM TRAFFIC AND ENVIRONMENTAL CONSULTANCY SERVICES 2019-2021 FOR KOWLOON CENTRAL AND WEST AND ISLANDS REGION NO. K02 : PROPOSED PUBLIC HOUSING DEVELOPMENT AT TO KWA WAN ROAD, ENVIRONMENTAL ASSESSMENT STUDY (EAS)

Title Location of the Project Site	
Scale at A3	Date Dec 2023
Figure No.	Fig. 1.1

Figure 2.1

Location Plan of Representative Noise Sensitive Receivers at (Residential Floor)





Fixed Glazing Provided in Base-case Scenario (5/F - 25/F)

Fixed Glazing Provided in Base-case Scenario (5/F - 25/F)

Fixed Glazing Provided in Base-case Scenario (5/F - 25/F)

Fixed Glazing Provided in Base-case Scenario (5/F - 22/F)

Fixed Glazing Provided in Base-case Scenario (5/F - 25/F)

Fixed Glazing Provided in Base-case Scenario (5/F - 25/F)

Fixed Glazing Provided in Base-case Scenario (4/F - 25/F)

Fixed Glazing Provided in Base-case Scenario (6/F - 15/F)

Fixed Glazing Provided in Base-case Scenario (4/F - 26/F)

Fixed Glazing Provided in Base-case Scenario (5/F - 20/F)

Fixed Glazing Provided in Base-case Scenario (5/F - 32/F)

Fixed Glazing Provided in Base-case Scenario (5/F - 31/F)




Fixed Glazing Provided in Base-case Scenario (5/F - 21/F)

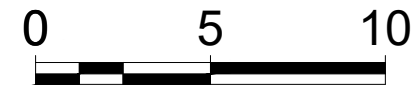
Fixed Glazing Provided in Base-case Scenario (5/F - 17/F)

Fixed Glazing Provided in Base-case Scenario (6/F - 13/F)



LEGEND

-  Site Boundary of the Proposed Development
-  Noise Sensitive Receivers
-  Fixed Glazing with Maintenance Window

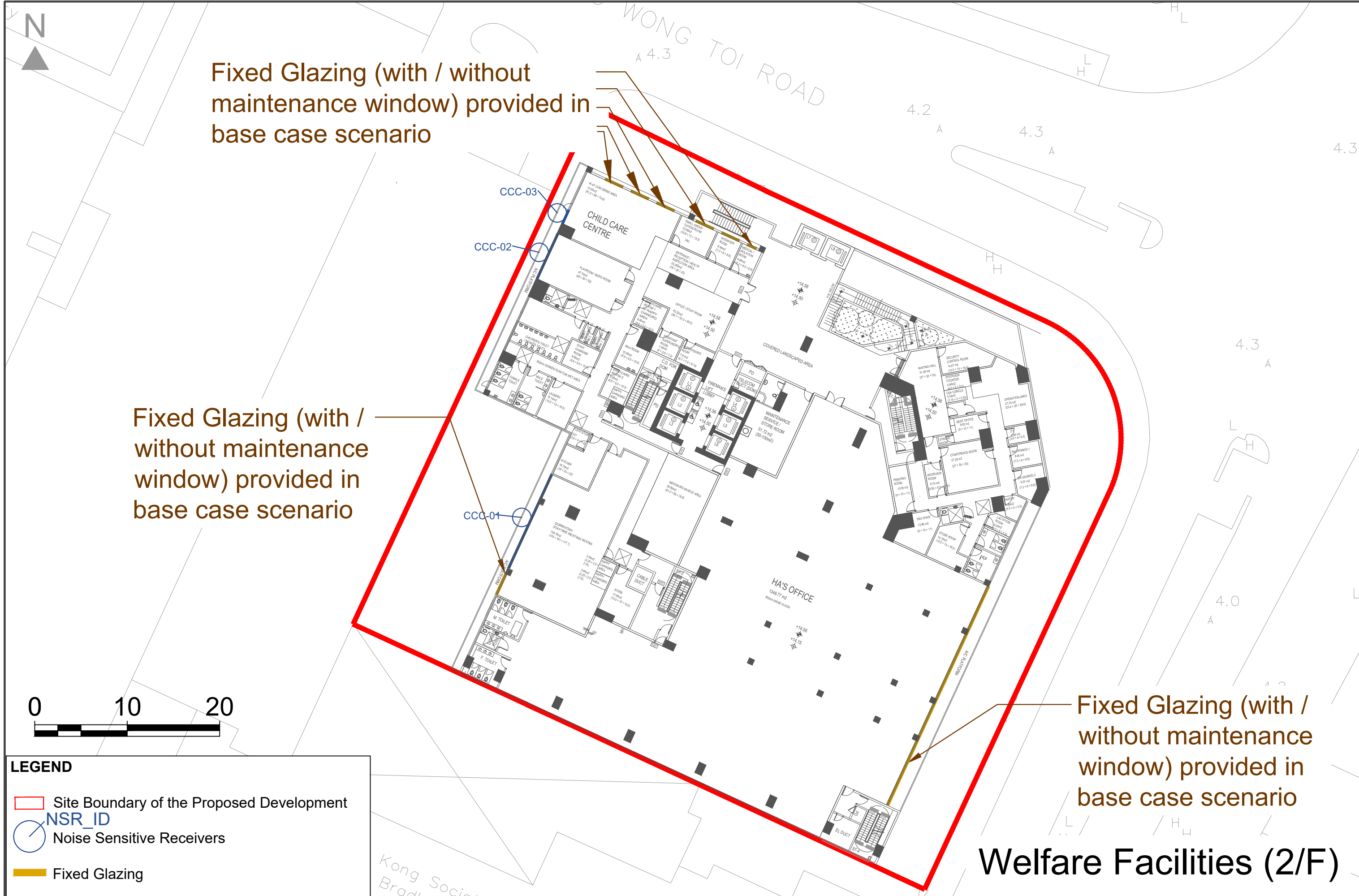


Domestic Floor

Figure 2.2

Location Plan of Representative Noise Sensitive Receivers (Welfare Facilities at 2/F)





Fixed Glazing (with / without maintenance window) provided in base case scenario

Fixed Glazing (with / without maintenance window) provided in base case scenario

Fixed Glazing (with / without maintenance window) provided in base case scenario

Welfare Facilities (2/F)

LEGEND

- Site Boundary of the Proposed Development
- NSR_ID
- Noise Sensitive Receivers
- Fixed Glazing

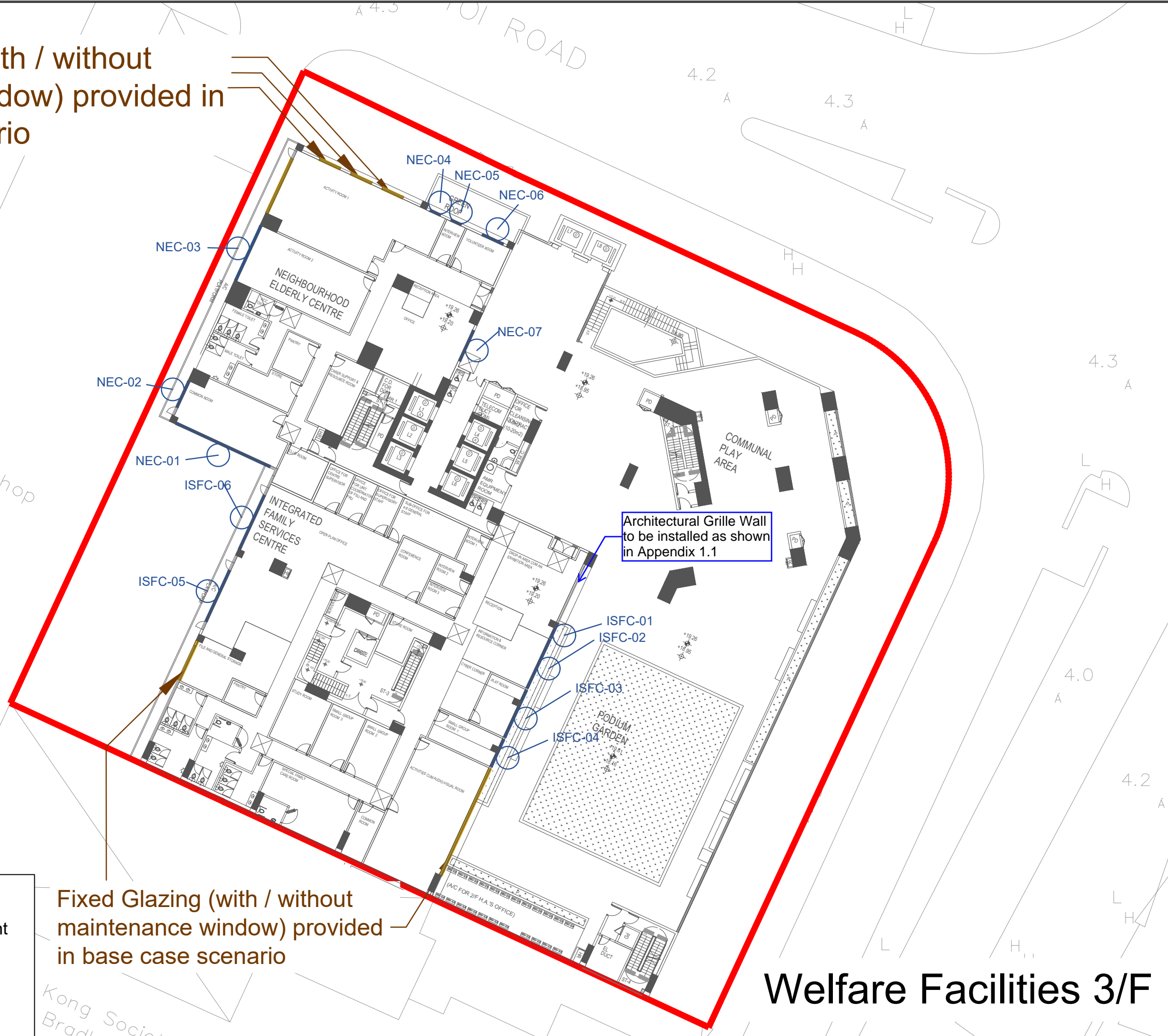
Figure 2.3

Location Plan of Representative Noise Sensitive Receivers (Welfare Facilities at 3/F)

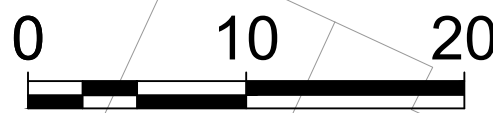




Fixed Glazing (with / without maintenance window) provided in base case scenario



Workshop



LEGEND

- Site Boundary of the Proposed Development
- NSR_ID
 Noise Sensitive Receivers
- Fixed Glazing

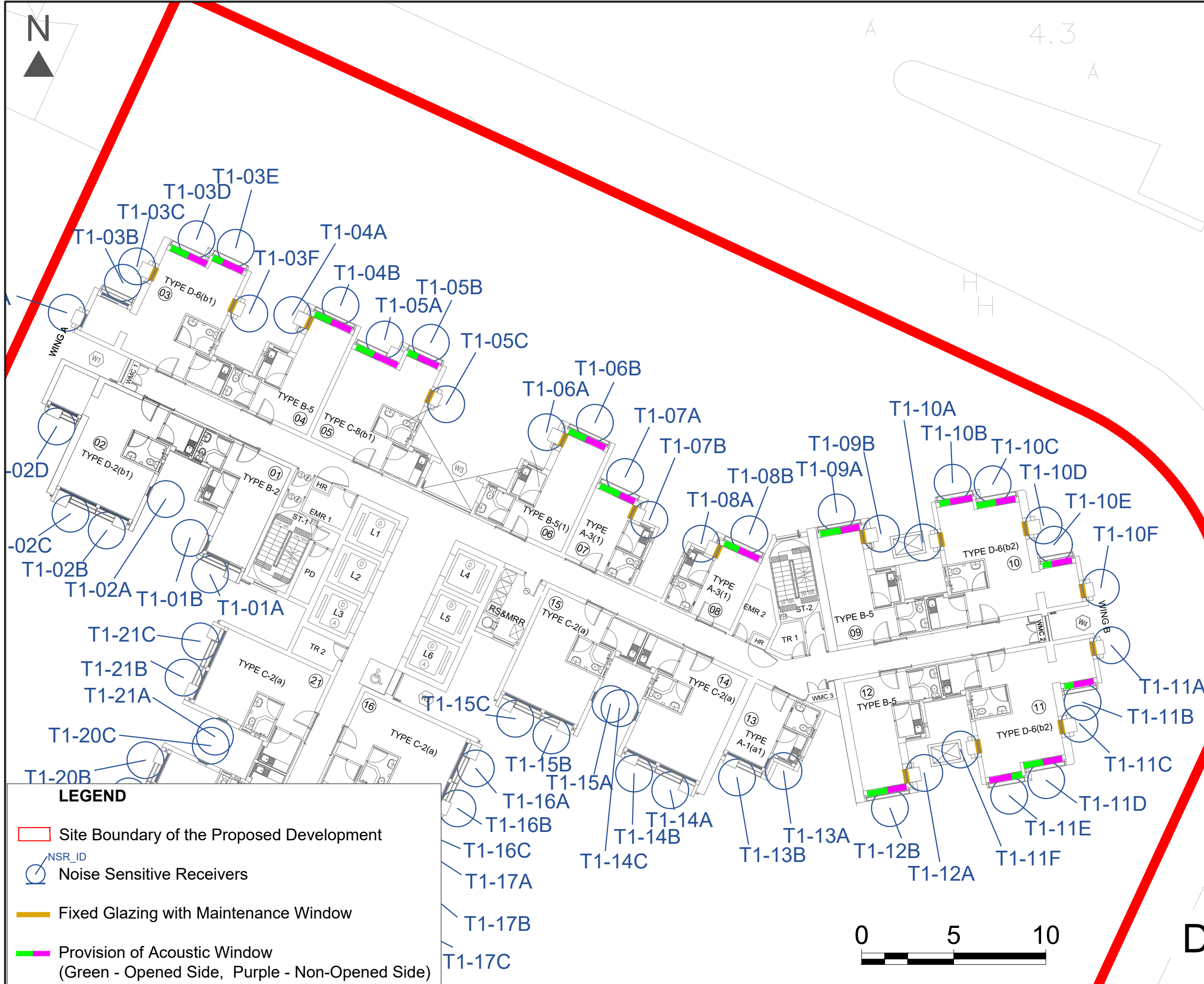
Fixed Glazing (with / without maintenance window) provided in base case scenario

Welfare Facilities 3/F

Figure 2.4

Location Plan of Proposed Noise Mitigation Measures
(Residential Floor)

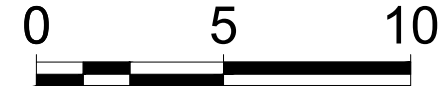




Unit	NAP	Floors	Type of Window
3	T1-03C	5/F-25/F	F.G.
	T1-03D	5/F-25/F	A.W.
	T1-03E	5/F-25/F	A.W.
	T1-03F	5/F-25/F	F.G.
4	T1-04A	5/F-25/F	F.G.
	T1-04B	5/F-25/F	A.W.
5	T1-05A	6/F-24/F	A.W.
	T1-05B	5/F-25/F	A.W.
	T1-05C	5/F-25/F	F.G.
6	T1-06A	5/F-25/F	F.G.
	T1-06B	5/F-25/F	A.W.
7	T1-07A	6/F-14/F	A.W.
	T1-07B	6/F-15/F	F.G.
8	T1-08A	5/F-20/F	F.G.
	T1-08B	5/F-20/F	A.W.
9	T1-09A	5/F-22/F	A.W.
	T1-09B	5/F-22/F	F.G.
10	T1-10A	4/F-25/F	F.G.
	T1-10B	4/F-25/F	A.W.
	T1-10C	4/F-26/F	A.W.
	T1-10D	4/F-26/F	F.G.
	T1-10E	6/F-21/F	A.W.
	T1-10F	5/F-32/F	F.G.
11	T1-11A	5/F-31/F	F.G.
	T1-11B	5/F-17/F	A.W.
	T1-11C	5/F-21/F	F.G.
	T1-11D	5/F-18/F	A.W.
	T1-11E	5/F-17/F	A.W.
	T1-11F	5/F-17/F	F.G.
12	T1-12A	6/F-13/F	F.G.
	T1-12B	6/F-13/F	A.W.

LEGEND

- Site Boundary of the Proposed Development
- NSR_ID Noise Sensitive Receivers
- Fixed Glazing with Maintenance Window
- Provision of Acoustic Window (Green - Opened Side, Purple - Non-Opened Side)



Domestic Floor

Figure 3.1

Locations of Identified Fixed Plant Noise Sources



Figure 3.2

Location of Representation Noise Sensitive Receivers
for Fixed Plant Noise Impact Assessment





100

ROAD

4.2

4.3

H
H

T1-03A

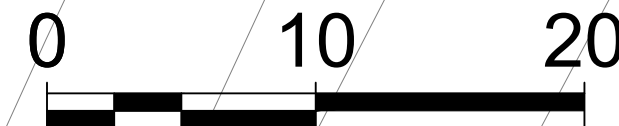
T1-10E

T1-11B

工場
Workshop

4.3

4.0



LEGEND



-  Site Boundary of the Proposed Development
-  NSR_ID
Representative Noise Sensitive Receivers

Figure 4.1

Air Quality Setback from nearby Industrial Chimneys and Portal Emission Sources (Residential)



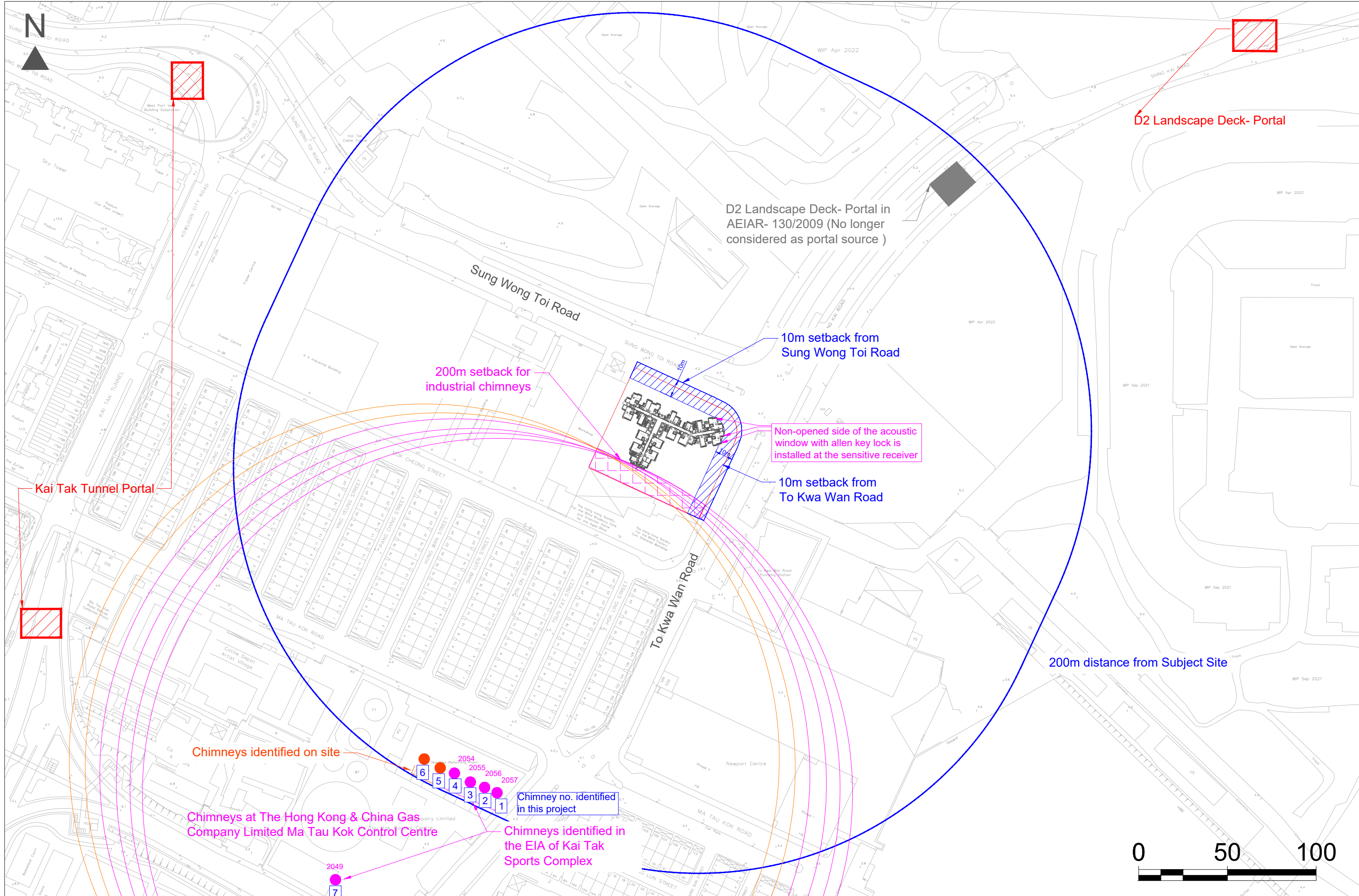


Figure 4.2

Air Quality Setback from nearby Industrial Chimneys and Portal Emission Sources (Social Welfare at 2/F)



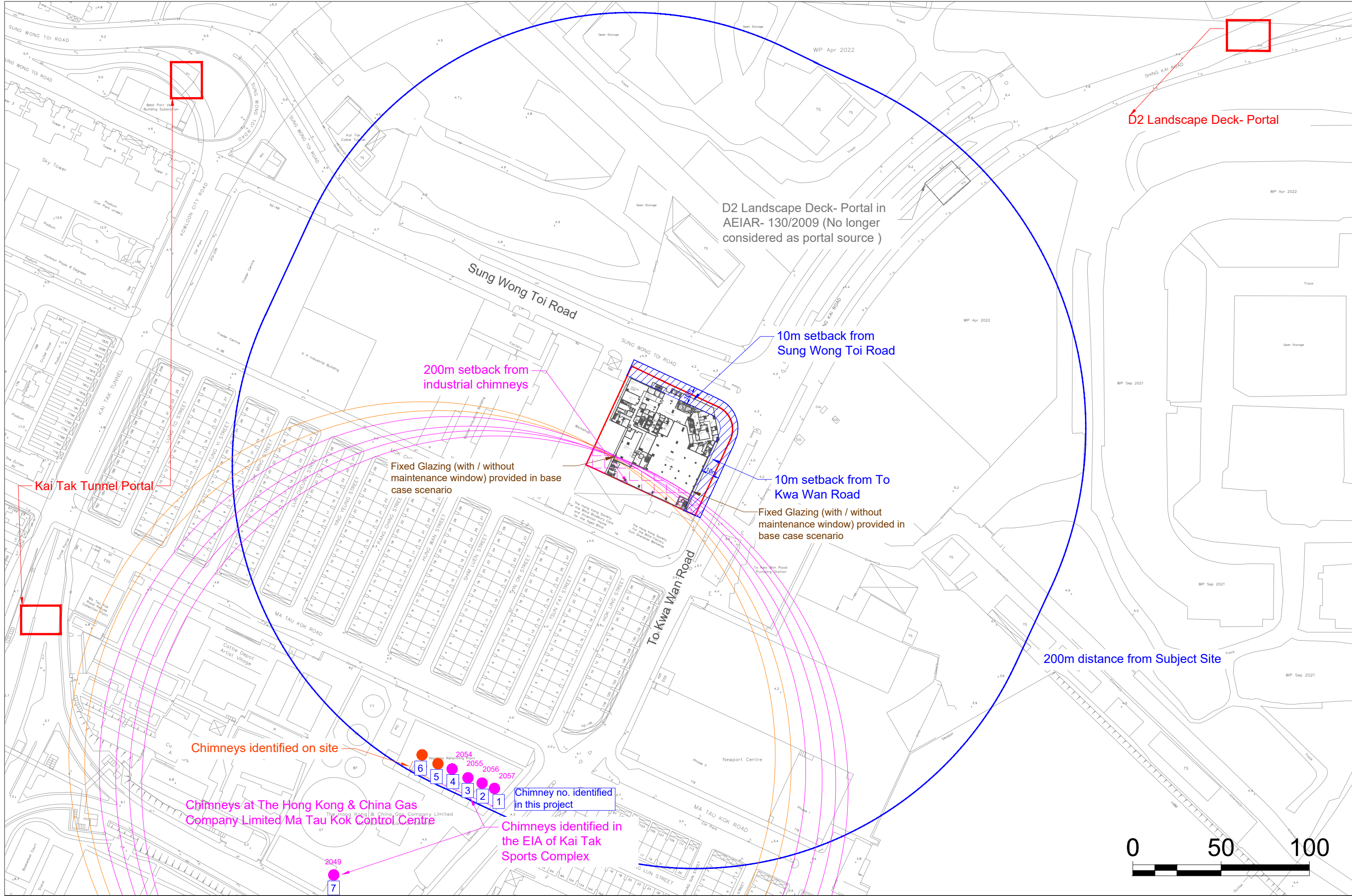
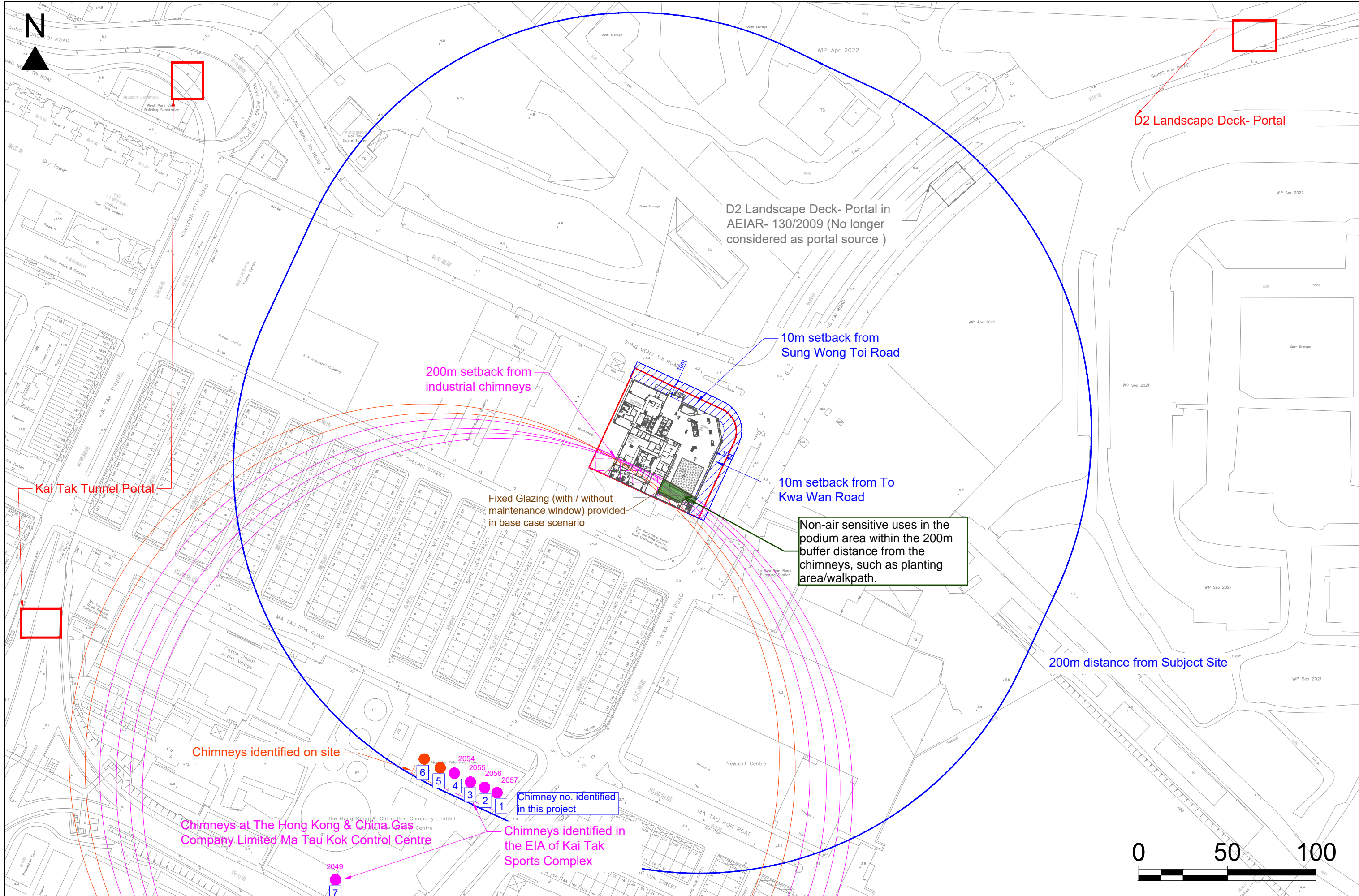


Figure 4.3

Air Quality Setback from nearby Industrial Chimneys and Portal Emission Sources (Social Welfare at 3/F)





Appendices



Appendix 1.1

Development Layout Plans



NOTES:



REVISIONS		INITIAL AND DESIGNATION		
NO	DESCRIPTION AND DATE	DWN	CKD	AUTH

	NAME AND DESIGNATION	INITIAL	DATE
AUTHORISED FOR ISSUE BY HD	WONG SHAN, ELAINE (CA/5)		

ARCHITECT CONSULTANT
CHAU KU & LEUNG ARCHITECTS & ENGINEERS LTD.
 13/F, Tung Ning Building, 2 Miller Street, Central, Hong Kong SAR
 Telephone : 28933299 Direct Line : 2767 + Ext.
 Fax : 25272190 E-mail : howie@ckl.com.hk

AUTHORISED	STEPHEN KU DESIGN DIRECTOR		
ENDORSED	NORA LEUNG SENIOR DESIGN PROFESSIONAL		
CHECKED	JANE SIM DESIGN PROFESSIONAL		
DRAWN	NATALIE CHEUNG PROJECT ARCHITECT		

PROJECT
PROPOSED PUBLIC HOUSING DEVELOPMENT AT TO KWA WAN ROAD, KOWLOON CITY

DRAWING TITLE
SECOND FLOOR PLAN

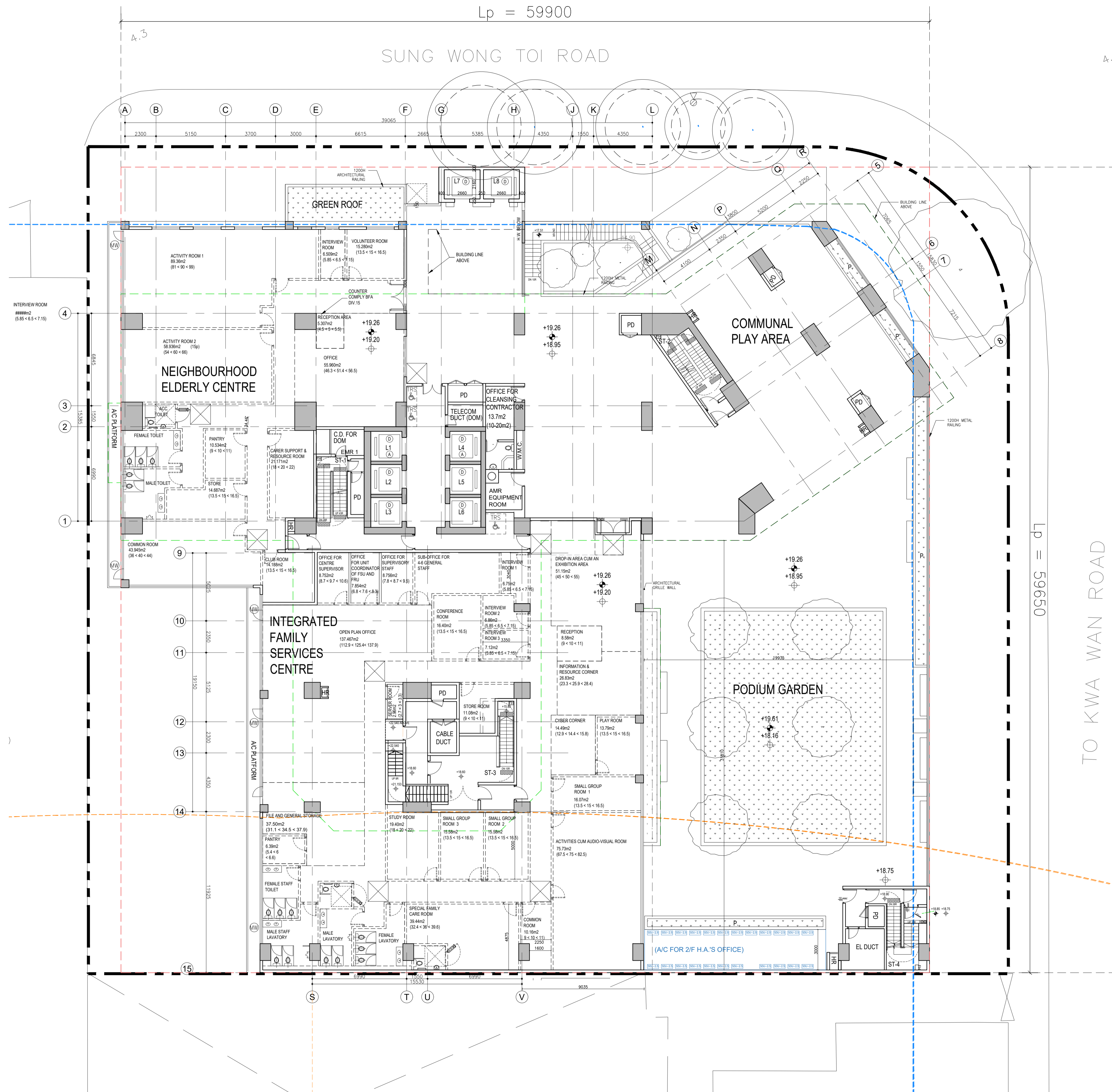
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DRAWING NO.
KC06/-DDRP2/BLK/A/LO-03

SOURCE
 ICU NO.



NOTES:



REVISIONS

NO	DESCRIPTION AND DATE	DWN	CKD	AUTH

NAME AND DESIGNATION	INITIAL	DATE

ARCHITECT CONSULTANT
CHAU KU & LEUNG ARCHITECTS & ENGINEERS LTD.
 13/F, Tung Ning Building, 2 Hillier Street, Central, Hong Kong SAR
 Telephone : 28933299 Direct Line : 2767 + Ext.
 Fax : 25727190 E-mail : howie@ckl.com.hk

AUTHORISED	STEPHEN KU DESIGN DIRECTOR		
ENDORSED	NORA LEUNG SENIOR DESIGN PROFESSIONAL		
CHECKED	JANE SIM DESIGN PROFESSIONAL		
DRAWN	NATALIE CHEUNG PROJECT ARCHITECT		

PROJECT
PROPOSED PUBLIC HOUSING DEVELOPMENT AT TO KWA WAN ROAD, KOWLOON CITY

DRAWING TITLE
THIRD FLOOR PLAN

SCALE 1:150 (A1) 1:300 (A3)

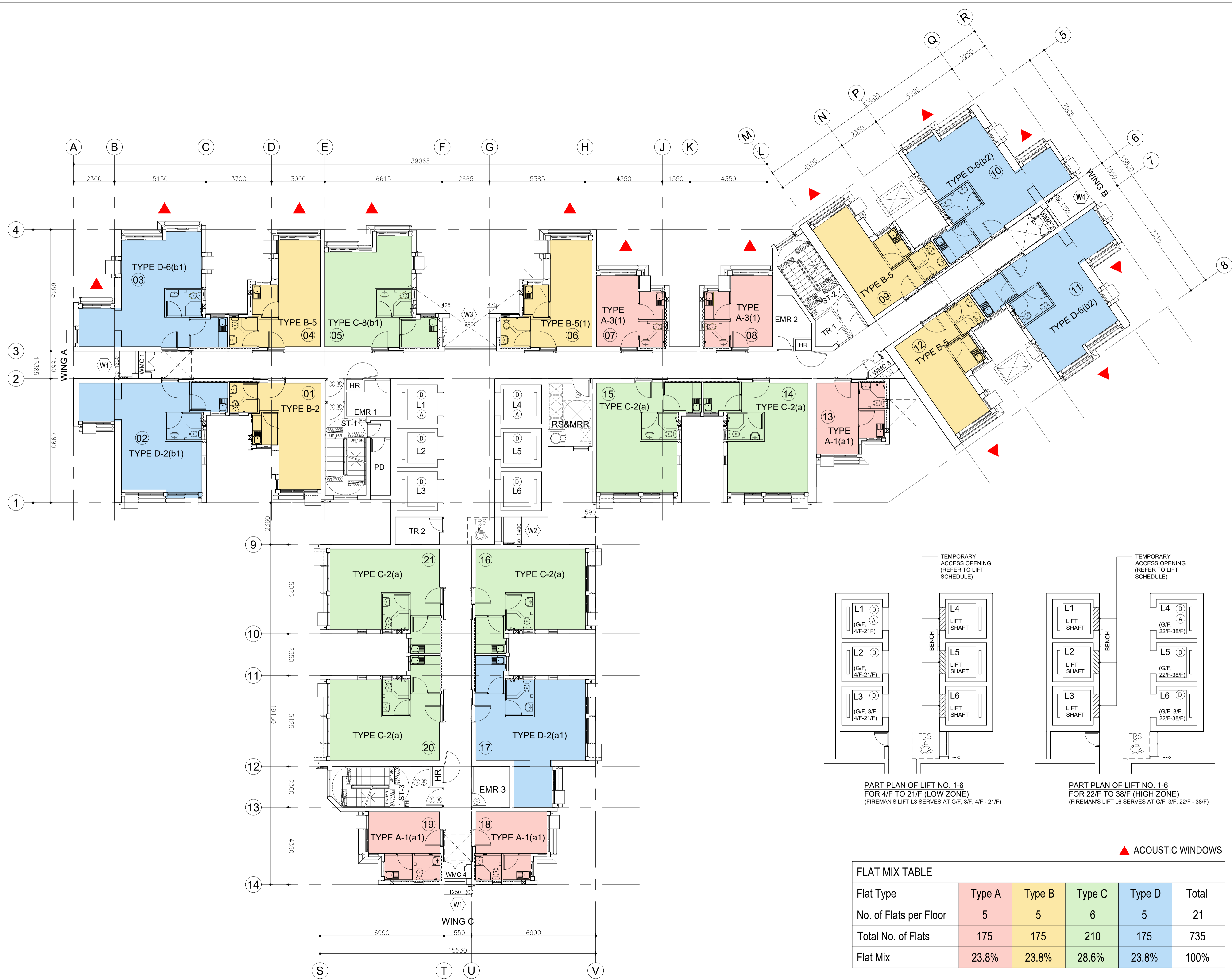
DRAWING NO.
KC06/-DDRP2/BLK/A/LO-04

SOURCE
 ICU NO.



AutoCAD 2000 A1 841 x 594

NOTES:



REVISIONS

NO	DESCRIPTION AND DATE	INITIAL	AND DESIGNATION	DATE

AUTHORISED FOR ISSUE BY	NAME AND DESIGNATION	INITIAL	DATE
	WONG SHAN, ELAINE (CA/5)		

ARCHITECT CONSULTANT
CHAU KU & LEUNG ARCHITECTS & ENGINEERS LTD.
 13/F, Tung Ning Building, 2 Miller Street, Central, Hong Kong SAR
 Telephone : 28933299 Direct Line : 2767 + EXT.
 Fax : 25727190 E-mail : howie@ckl.com.hk

AUTHORISED	STEPHEN KU DESIGN DIRECTOR		
ENDORSED	NORA LEUNG SENIOR DESIGN PROFESSIONAL		
CHECKED	JANE SIM DESIGN PROFESSIONAL		
DRAWN	NATALIE CHEUNG PROJECT ARCHITECT		

PROJECT
PROPOSED PUBLIC HOUSING DEVELOPMENT AT TO KWA WAN ROAD, KOWLOON CITY

DRAWING TITLE
TYPICAL FLOOR PLAN (5/F - 38/F)

SCALE 1:100 (A1) 1:200 (A3)

DRAWING NO.
KC06/-DDRP2/BLK/A/LO-06

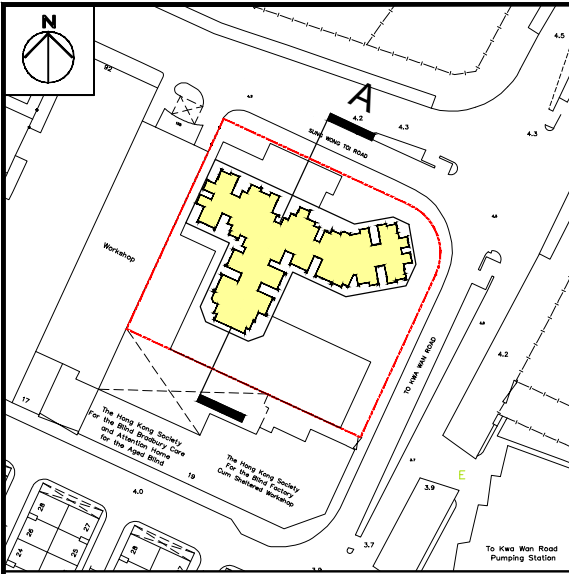
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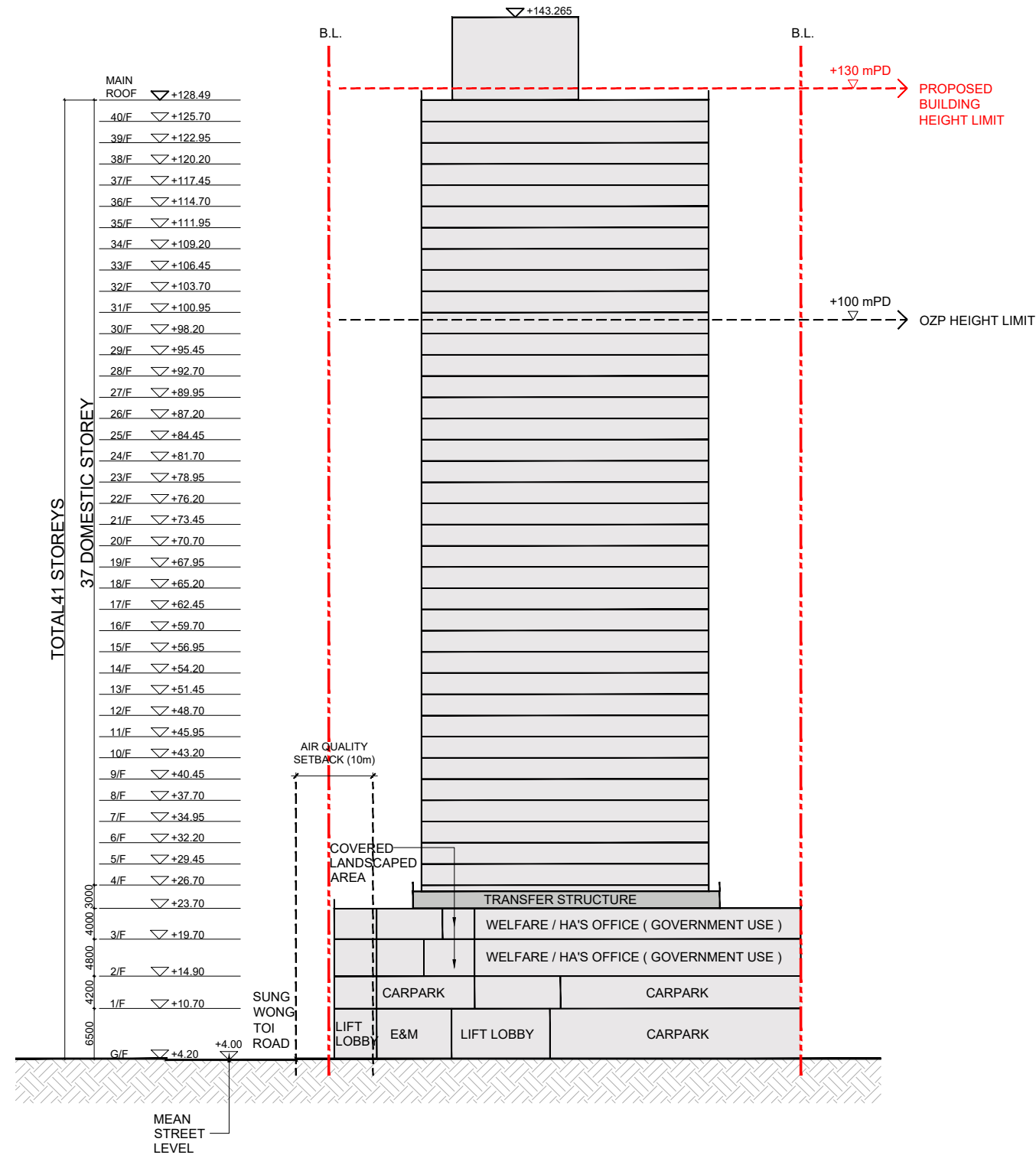
FLAT MIX TABLE

Flat Type	Type A	Type B	Type C	Type D	Total
No. of Flats per Floor	5	5	6	5	21
Total No. of Flats	175	175	210	175	735
Flat Mix	23.8%	23.8%	28.6%	23.8%	100%

▲ ACOUSTIC WINDOWS



KEY PLAN SCALE 1:2000 (A3)



LEGEND:-
- - - - SITE BOUNDARY

PROJECT TITLE
**PROPOSED PUBLIC HOUSING DEVELOPMENT
 AT TO KWA WAN ROAD, KOWLOON CITY**

DRAWING TITLE
**SITE SECTION
 (PROPOSED SCHEME)**

SCALE 1:750(A3)



DRAWING NO. KC06/A/LO-27
 DATE: 21/03/2024

Appendix 2.1

Traffic Forecast Data (Year 2044)

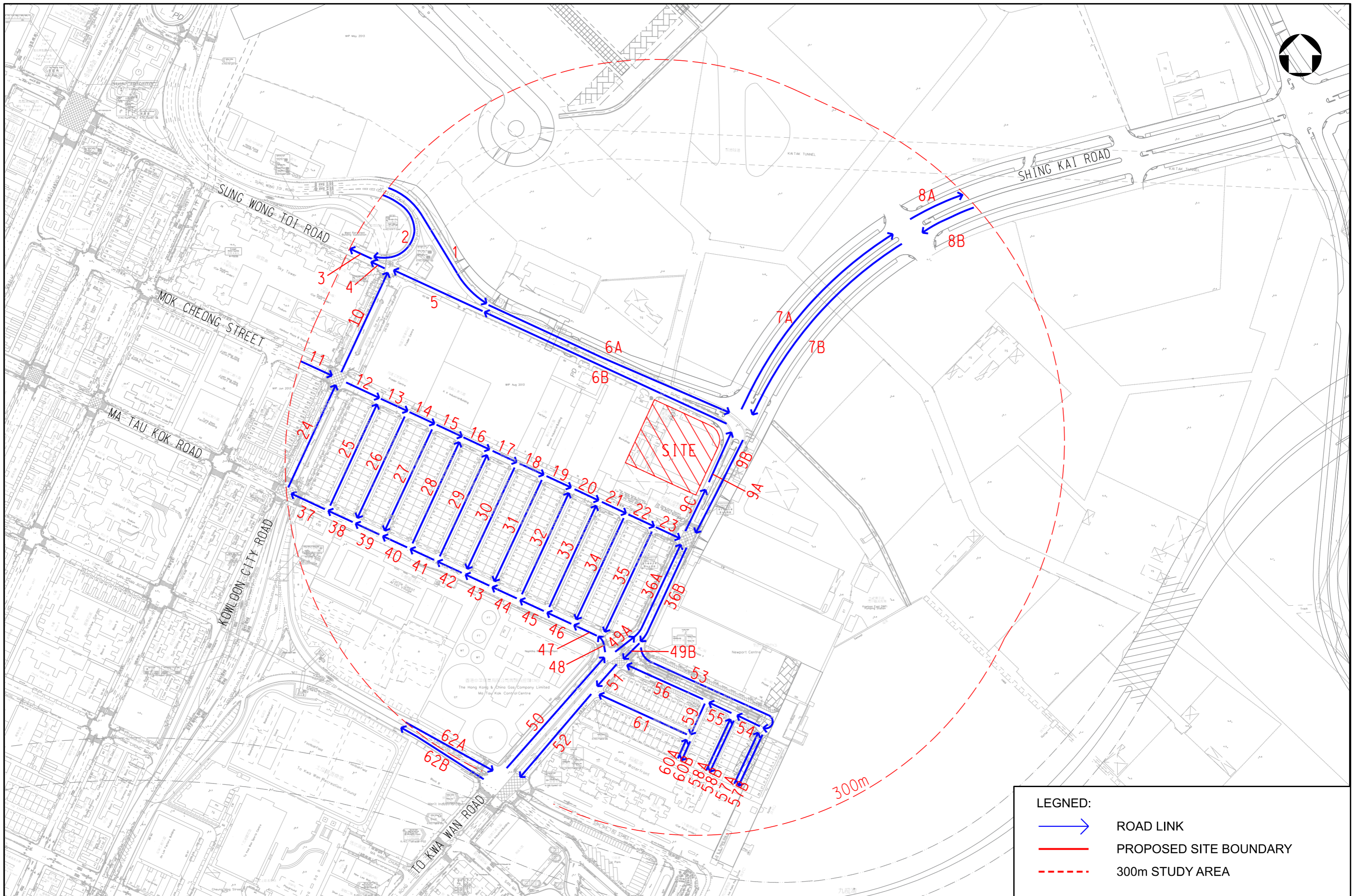


Year 2044 Traffic Data for Environmental Assessment Study - Peak Hours for NIA

Index *	Road Name	Direction	Speed Limit (km/h)	2044 Design Traffic Flows					
				AM			PM		
				Vehicle Breakdown		Total Flows (veh/hr) **	Vehicle Breakdown		Total Flows (veh/hr) **
				LV	HV		LV	HV	
1	Sung Wong Toi Road	NB	50	83%	17%	1,030	88%	12%	1,240
2	Sung Wong Toi Road	SB	50	91%	9%	570	94%	6%	480
3	Sung Wong Toi Road	WB	50	87%	13%	2,270	90%	10%	1,920
4	Sung Wong Toi Road	WB	50	86%	14%	1,710	89%	11%	1,450
5	Sung Wong Toi Road	WB	50	88%	12%	970	92%	8%	780
6A	Sung Wong Toi Road	EB	50	83%	17%	1,030	88%	12%	1,240
6B	Sung Wong Toi Road	WB	50	88%	12%	970	92%	8%	780
7A	Shing Kai Road	NB	50	83%	17%	960	88%	12%	1,100
7B	Shing Kai Road	SB	50	87%	13%	1,150	89%	11%	860
8A	Shing Kai Road	NB	50	83%	17%	930	87%	13%	1,010
8B	Shing Kai Road	SB	50	86%	14%	1,100	88%	12%	770
9A	To Kwa Wan Road	NB	50	80%	20%	690	87%	13%	680
9B	To Kwa Wan Road	SB	50	81%	19%	930	83%	17%	890
9C	To Kwa Wan Road	NB	50	79%	21%	680	88%	12%	680
10	Kowloon City Road	NB	50	84%	16%	750	85%	15%	700
11	Mok Cheong Street	EB	50	53%	47%	290	48%	52%	190
12	Mok Cheong Street	EB	50	61%	39%	380	63%	37%	340
13	Mok Cheong Street	EB	50	61%	39%	390	64%	36%	350
14	Mok Cheong Street	EB	50	60%	40%	370	62%	38%	330
15	Mok Cheong Street	EB	50	56%	44%	350	63%	37%	310
16	Mok Cheong Street	EB	50	56%	44%	360	62%	38%	320
17	Mok Cheong Street	EB	50	56%	44%	360	62%	38%	340
18	Mok Cheong Street	EB	50	56%	44%	360	61%	39%	320
19	Mok Cheong Street	EB	50	52%	48%	350	61%	39%	300
20	Mok Cheong Street	EB	50	53%	47%	360	60%	40%	320
21	Mok Cheong Street	EB	50	54%	46%	400	63%	37%	360
22	Mok Cheong Street	EB	50	55%	45%	400	62%	38%	350
23	Mok Cheong Street	EB	50	53%	47%	390	62%	38%	350
24	Kowloon City Road	NB	50	84%	16%	840	84%	16%	850
25	Lung To Street	NB	50	67%	33%	10	75%	25%	20
26	Fung Yi Street	SB	50	87%	13%	30	68%	32%	30
27	Luk Ming Street	SB	50	75%	25%	30	85%	15%	20
28	Lun Cheung Street	NB	50	62%	38%	10	59%	41%	20
29	Ying Yeung Street	NB	50	50%	50%	10	61%	39%	20
30	Pang Ching Street	SB	50	80%	20%	10	87%	13%	20
31	Hung Wan Street	SB	50	92%	8%	20	84%	16%	20
32	Shim Luen Street	NB	50	73%	27%	20	50%	50%	20
33	Yin On Street	NB	50	71%	29%	60	76%	24%	50
34	Tsun Fat Street	SB	50	75%	25%	10	83%	17%	10
35	Hok Ling Street	SB	50	86%	14%	10	71%	29%	10
36A	To Kwa Wan Road	NB	50	79%	21%	520	87%	13%	530
36B	To Kwa Wan Road	SB	50	73%	27%	1,140	76%	24%	1,060
37	Ma Tau Kok Road	WB	50	54%	46%	340	52%	48%	300
38	Ma Tau Kok Road	WB	50	54%	46%	350	53%	47%	310
39	Ma Tau Kok Road	WB	50	51%	49%	330	51%	49%	290
40	Ma Tau Kok Road	WB	50	51%	49%	300	49%	51%	290
41	Ma Tau Kok Road	WB	50	51%	49%	310	50%	50%	300
42	Ma Tau Kok Road	WB	50	51%	49%	320	50%	50%	320
43	Ma Tau Kok Road	WB	50	51%	49%	310	48%	52%	310
44	Ma Tau Kok Road	WB	50	49%	51%	290	46%	54%	280
45	Ma Tau Kok Road	WB	50	50%	50%	310	46%	54%	300
46	Ma Tau Kok Road	WB	50	53%	47%	360	51%	49%	360
47	Ma Tau Kok Road	WB	50	53%	47%	350	51%	49%	350
48	Ma Tau Kok Road	WB	50	52%	48%	340	50%	50%	350
49A	To Kwa Wan Road	NB	50	79%	21%	520	87%	13%	520
49B	To Kwa Wan Road	SB	50	72%	28%	1,010	77%	23%	940
50	To Kwa Wan Road	NB	50	67%	33%	740	72%	28%	790
51	To Kwa Wan Road	SB	50	72%	28%	1,030	77%	23%	940
52	To Kwa Wan Road	SB	50	72%	28%	1,040	77%	23%	960
53	Ma Tau Kok Road	EB	50	76%	24%	130	73%	27%	120
54	Ma Tau Kok Road	WB	50	76%	24%	150	79%	21%	100
55	Ma Tau Kok Road	WB	50	76%	24%	150	79%	21%	100
56	Ma Tau Kok Road	WB	50	78%	22%	130	83%	17%	80
57A	Hing Yan Street	NB	50	67%	33%	10	67%	33%	10
57B	Hing Yan Street	SB	50	67%	33%	10	67%	33%	10
58A	Hing Yin Street	NB	50	67%	33%	10	67%	33%	10
58B	Hing Yin Street	SB	50	67%	33%	10	67%	33%	10
59	Chung Sun Street	SB	50	58%	42%	20	58%	42%	20
60A	Chung Sun Street	NB	50	67%	33%	10	67%	33%	10
60B	Chung Sun Street	SB	50	67%	33%	10	67%	33%	10
61	Ming Lun Street	WB	50	60%	40%	20	58%	42%	20
62A	San Shan Road	EB	50	84%	16%	820	75%	25%	870
62B	San Shan Road	WB	50	82%	18%	590	90%	10%	450

* Refer to attached Index Plan

** Numbers are rounded up to nearest 10.



LEGEND:

- ROAD LINK
- PROPOSED SITE BOUNDARY
- 300m STUDY AREA

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 MODEL NAME: Default

香港房屋委員會
Hong Kong Housing Authority

SNC-LAVALIN
Member of the SNC-Lavalin Group

ATKINS
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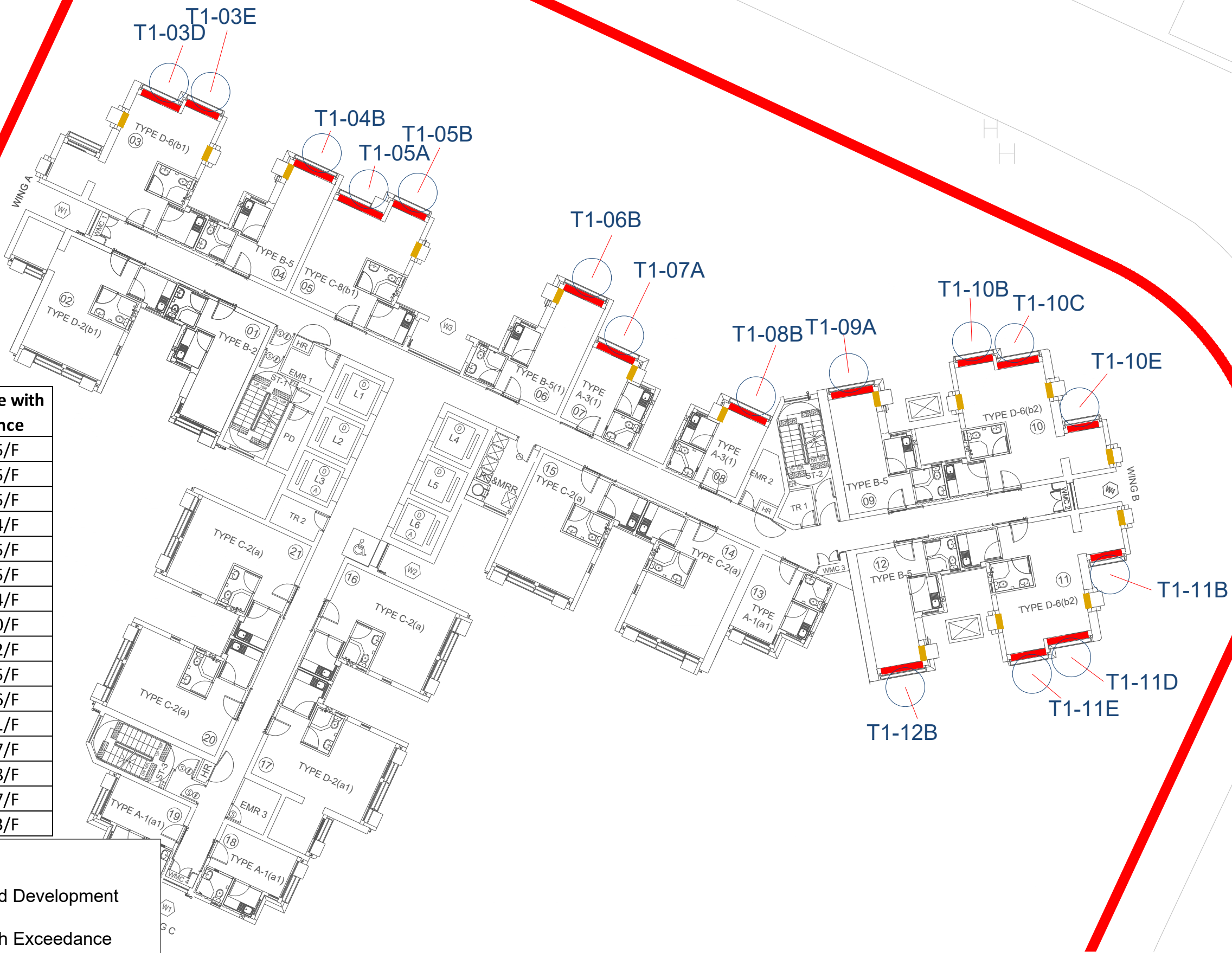
AGREEMENT NO. : CB 20180686 - TERM TRAFFIC AND ENVIRONMENTAL CONSULTANCY SERVICES 2019 - 2021
 FOR KOWLOON CENTRAL AND WEST AND ISLANDS REGION
 INSTRUCTION NO. K02 PROPOSED HOUSING DEVELOPMENT AT TO KWA WAN ROAD - ENVIRONMENTAL ASSESSMENT STUDY (EAS)

Title		INDEX PLAN FOR TRAFFIC FORECAST DATA	
Scale at A3	1 : 3000	Date	FEB 2020
Figure No.	2.1		

Appendix 2.2

Location Plan of the Representative Noise Sensitive
Receivers at Domestic Floors with Road Traffic Noise
Exceedance





NSR	Max SPL with Exceedance	Floor range with Exceedance
T1-03D	73	5/F - 25/F
T1-03E	73	5/F - 25/F
T1-04B	73	5/F - 25/F
T1-05A	73	6/F - 24/F
T1-05B	73	5/F - 25/F
T1-06B	73	5/F - 25/F
T1-07A	71	6/F - 14/F
T1-08B	72	5/F - 20/F
T1-09A	73	5/F - 22/F
T1-10B	74	4/F - 25/F
T1-10C	74	4/F - 26/F
T1-10E	73	6/F - 21/F
T1-11B	73	5/F - 17/F
T1-11D	73	5/F - 18/F
T1-11E	72	5/F - 17/F
T1-12B	71	6/F - 13/F

LEGEND

- Site Boundary of the Proposed Development
- Noise Sensitive Receivers with Exceedance
- Fixed Glazing Provided in Basecase Scenario

Domestic Floor

Appendix 2.3

Predicted Road Traffic Noise Levels for the Proposed Development (Base-case Scenario)



Result Summary (Detail) - Base Case - Welfare Facilities - 2/F to 3/F - AM

	SW															
	CCC			ISFC						NEC						
GBP Floor	CCC-01	CCC-02	CCC-03	ISFC-01	ISFC-02	ISFC-03	ISFC-04	ISFC-05	ISFC-06	NEC-01	NEC-02	NEC-03	NEC-04	NEC-05	NEC-06	NEC-07
2/F	51	69	70	/	/	/	/	/	/	/	/	/	/	/	/	/
3/F	/	/	/	57	57	57	58	54	56	50	66	69	70	69	68	60
Predicted Max Road Traffic Noise Level, dB(A)	51	69	70	57	57	57	58	54	56	50	66	69	70	69	68	60

* The assessment point is located at 1m in front of the most exposed part of an openable window for ventilation at a habitable room (NSRs) and 1.2m above the floor level of individual floors.

No. of Exceedance	
Total no. of units	3
Total no. of units with exceedance	N.A
Predicted Max Road Traffic Noise Level, dB(A)	70
Compliance %	100%

Result Summary (Detail) - Base Case - Welfare Facilities - 2/F to 3/F - PM

GBP Floor	SW															
	CCC			ISFC						NEC						
	CCC-01	CCC-02	CCC-03	ISFC-01	ISFC-02	ISFC-03	ISFC-04	ISFC-05	ISFC-06	NEC-01	NEC-02	NEC-03	NEC-04	NEC-05	NEC-06	NEC-07
2/F	50	68	70	/	/	/	/	/	/	/	/	/	/	/	/	/
3/F	/	/	/	56	56	56	57	54	55	49	66	68	70	68	67	59
Predicted Max Road Traffic Noise Level, dB(A)	50	68	70	56	56	56	57	54	55	49	66	68	70	68	67	59

* The assessment point is located at 1m in front of the most exposed part of an openable window for ventilation at a habitable room (NSRs) and 1.2m above the floor level of individual floors.

No. of Exceedance	
Total no. of units	3
Total no. of units with exceedance	N.A
Predicted Max Road Traffic Noise Level, dB(A)	70
Compliance %	100%

Result Summary (Detail) - Base Case - Domestic Floors - T1 - 4/F to 40/F - AM

GBP Floor	1		2				3					4		5			6		7		8		9		10						
	T1-01A	T1-01B	T1-02A	T1-02B	T1-02C	T1-02D	T1-03A	T1-03B	T1-03C	T1-03D	T1-03E	T1-03F	T1-04A	T1-04B	T1-05A	T1-05B	T1-05C	T1-06A	T1-06B	T1-07A	T1-07B	T1-08A	T1-08B	T1-09A	T1-09B	T1-10A	T1-10B	T1-10C	T1-10D	T1-10E	T1-10F
4/F	50	50	48	51	57	61	69	65	65	68	68	62	63	68	66	69	63	65	70	64	62	62	65	70	65	/	73	71	/	64	69
5/F	51	51	50	52	58	62	69	69	/	71	71	/	/	71	70	71	/	/	72	70	68	/	71	73	/	/	74	74	/	70	/
6/F	52	52	51	53	58	63	69	69	/	73	73	/	/	72	72	72	/	/	73	71	/	/	72	73	/	/	74	74	/	73	/
7/F	53	53	51	54	58	63	70	70	/	73	73	/	/	73	73	73	/	/	73	71	/	/	72	73	/	/	74	74	/	73	/
8/F	54	54	52	55	58	63	70	70	/	73	73	/	/	73	73	73	/	/	73	71	/	/	72	73	/	/	74	74	/	73	/
9/F	55	55	52	55	59	63	70	70	/	73	73	/	/	73	73	73	/	/	73	71	/	/	72	73	/	/	74	74	/	73	/
10/F	56	56	53	56	59	63	70	70	/	73	73	/	/	73	73	73	/	/	73	71	/	/	72	73	/	/	73	73	/	73	/
11/F	56	56	53	57	59	63	70	70	/	73	73	/	/	73	73	73	/	/	73	71	/	/	72	73	/	/	73	73	/	72	/
12/F	57	57	54	57	60	63	70	69	/	72	73	/	/	72	72	73	/	/	72	71	/	/	72	72	/	/	73	73	/	72	/
13/F	57	57	54	58	60	63	70	69	/	72	72	/	/	72	72	72	/	/	72	71	/	/	72	72	/	/	73	73	/	72	/
14/F	57	58	55	58	60	63	69	69	/	72	72	/	/	72	72	72	/	/	72	71	/	/	71	72	/	/	72	72	/	72	/
15/F	58	58	55	59	60	63	69	69	/	72	72	/	/	72	72	72	/	/	72	70	/	/	71	72	/	/	72	72	/	72	/
16/F	58	58	55	59	61	63	69	69	/	72	72	/	/	72	72	72	/	/	72	70	70	/	71	72	/	/	72	72	/	71	/
17/F	58	59	56	59	61	63	69	69	/	72	72	/	/	72	72	72	/	/	72	70	70	/	71	71	/	/	72	72	/	71	/
18/F	58	59	56	59	61	63	69	68	/	71	72	/	/	72	71	72	/	/	72	70	70	/	71	71	/	/	72	72	/	71	/
19/F	58	59	56	59	61	63	69	68	/	71	71	/	/	71	71	71	/	/	71	70	70	/	71	71	/	/	72	72	/	71	/
20/F	58	59	57	60	61	63	69	68	/	71	71	/	/	71	71	71	/	/	71	70	70	/	71	71	/	/	71	71	/	71	/
21/F	59	59	57	60	61	63	69	68	/	71	71	/	/	71	71	71	/	/	71	70	70	70	70	71	/	/	71	71	/	71	/
22/F	59	59	57	60	61	63	68	68	/	71	71	/	/	71	71	71	/	/	71	69	70	69	70	71	/	/	71	71	/	70	/
23/F	59	60	57	60	61	63	68	68	/	71	71	/	/	71	71	71	/	/	71	69	69	69	70	70	69	/	71	71	/	70	/
24/F	59	60	57	60	61	63	68	68	/	71	71	/	/	71	71	71	/	/	71	69	69	69	70	70	69	/	71	71	/	70	/
25/F	59	60	58	60	61	63	68	67	/	71	71	/	/	71	70	71	/	/	71	69	69	69	70	70	69	/	71	71	/	70	/
26/F	59	60	58	60	62	63	68	67	67	70	70	68	68	70	70	70	69	69	70	69	69	69	70	70	69	66	70	71	/	70	/
27/F	59	60	58	61	62	63	68	67	67	70	70	68	68	70	70	70	69	69	70	69	69	69	70	70	68	66	70	70	70	70	/
28/F	59	60	58	61	62	63	68	67	67	70	70	68	68	70	70	70	68	69	70	69	69	69	69	70	68	66	70	70	70	70	/
29/F	59	60	58	61	62	63	68	67	67	70	70	67	68	70	70	70	68	69	70	69	69	69	69	70	68	65	70	70	70	69	/
30/F	59	60	58	61	62	63	68	67	67	70	70	67	68	70	70	70	68	69	70	68	69	69	69	70	68	65	70	70	70	69	/
31/F	59	60	58	61	62	63	67	67	67	70	70	67	68	70	70	70	68	69	70	68	68	68	69	69	68	65	70	70	70	69	/
32/F	59	60	58	61	62	63	67	67	67	70	70	67	68	70	70	70	68	68	70	68	68	68	69	69	68	65	70	70	70	69	/
33/F	59	60	58	61	62	63	67	67	67	70	70	67	68	70	70	70	68	68	70	68	68	68	69	69	68	65	70	70	69	69	70
34/F	60	60	59	61	62	63	67	66	67	70	70	67	67	70	69	70	68	68	70	68	68	68	69	69	68	65	70	70	69	69	70
35/F	60	60	59	61	62	63	67	66	67	69	70	67	67	69	69	69	68	68	69	68	68	68	69	69	68	65	69	69	69	69	70
36/F	60	60	59	62	63	63	67	66	66	69	69	67	67	69	69	69	68	68	69	68	68	68	69	69	67	65	69	69	69	69	70
37/F	60	61	59	62	63	63	67	66	66	69	69	67	67	69	69	69	67	68	69	68	68	68	69	69	67	65	69	69	69	69	70
38/F	60	61	59	62	63	63	67	66	66	69	69	67	67	69	69	69	67	68	69	68	68	68	68	69	67	64	69	69	69	68	70
39/F	60	61	59	62	63	63	67	66	66	69	69	66	67	69	69	69	67	68	69	68	68	68	68	69	67	64	69	69	69	68	70
40/F	60	61	59	62	63	63	67	66	66	69	69	66	67	69	69	69	67	68	69	67	68	67	68	68	67	64	69	69	69	68	70
Predicted Max Road Traffic Noise Level, dB(A)	60	61	59	62	63	63	70	70	67	73	73	68	68	73	73	73	69	69	73	71	70	70	72	73	69	66	74	74	70	73	70

Legend	
Exceeded Hong Kong Planning Standard Guidelines' Standard of 70 dB(A)	
Fixed Glazing to be Provided in the Base-case Scenario	

* The assessment point is located at 1m in front of the most exposed part of an openable window for ventilation at a habitable room (NSRs) and 1.2m above the floor level of individual floors of the residential towers of the proposed development.

No. of Exceedance	
Total no. of units	777
Total no. of units with exceedance	172
Predicted Max Road Traffic Noise Level, dB(A)	74
Compliance %	78%

Result Summary (Detail) - Base Case - Domestic Floors - T1 - 4/F to 40/F - AM

GBP Floor	T1																																	
	11					12			13			14			15			16			17			18		19		20			21			
	T1-11A	T1-11B	T1-11C	T1-11D	T1-11E	T1-11F	T1-12A	T1-12B	T1-13A	T1-13B	T1-14A	T1-14B	T1-14C	T1-15A	T1-15B	T1-15C	T1-16A	T1-16B	T1-16C	T1-17A	T1-17B	T1-17C	T1-17D	T1-18A	T1-18B	T1-19A	T1-19B	T1-20A	T1-20B	T1-20C	T1-21A	T1-21B	T1-21C	
4/F	69	65	67	68	69	63	64	66	60	60	60	59	53	56	57	56	56	56	48	48	57	57	56	57	57	58	58	59	59	58	57	59	55	
5/F	/	72	/	72	72	/	69	70	64	63	62	61	55	59	59	58	59	59	50	49	60	60	60	60	60	59	60	61	61	59	58	60	59	
6/F	/	73	/	73	72	/	/	71	66	65	64	63	56	60	61	60	60	61	51	51	61	62	61	62	60	61	61	61	60	58	61	60		
7/F	/	73	/	73	72	/	/	71	68	67	65	64	56	61	62	61	61	62	52	52	62	63	62	63	63	61	62	62	62	60	58	61	60	
8/F	/	73	/	72	72	/	/	71	68	68	67	65	56	62	63	62	62	63	54	54	63	64	63	63	62	62	63	62	61	58	62	60		
9/F	/	72	/	72	72	/	/	71	69	68	68	67	56	62	64	63	63	64	55	55	64	65	64	64	63	63	63	63	61	58	62	61		
10/F	/	72	/	72	72	/	/	71	69	69	68	67	56	62	65	64	64	65	57	57	65	65	65	65	65	65	63	64	64	63	61	59	62	61
11/F	/	72	/	72	72	/	/	71	69	69	68	67	56	62	66	65	65	66	59	59	66	66	66	66	66	64	64	64	64	61	59	63	61	
12/F	/	72	/	72	71	/	/	71	69	69	69	68	57	62	66	66	66	66	61	61	67	67	67	67	66	64	64	64	61	59	63	61		
13/F	/	71	/	71	71	/	/	71	69	69	69	68	57	62	67	66	66	66	62	62	67	67	67	67	64	65	64	64	61	59	63	61		
14/F	/	71	/	71	71	/	70	70	69	69	69	68	57	62	67	66	67	67	62	62	67	68	67	67	65	65	64	64	61	59	63	61		
15/F	/	71	/	71	71	/	69	70	69	69	69	68	57	62	67	66	67	67	63	63	68	68	68	68	65	65	65	64	61	59	63	61		
16/F	/	71	/	71	71	/	69	70	68	69	69	68	57	62	67	67	67	67	63	63	68	68	68	68	65	65	65	64	61	59	63	61		
17/F	/	71	/	71	71	/	69	70	68	69	69	68	58	63	67	67	67	68	63	63	68	68	68	68	65	65	65	64	61	59	63	61		
18/F	/	70	/	71	70	67	69	70	68	69	68	68	58	63	67	67	67	68	64	64	68	68	68	68	65	65	65	64	61	59	63	61		
19/F	/	70	/	70	70	67	69	70	68	69	68	68	58	63	67	67	68	68	64	64	68	68	68	68	65	65	65	64	60	59	63	61		
20/F	/	70	/	70	70	67	69	70	68	68	68	68	59	63	67	67	68	68	64	64	68	68	68	68	65	65	65	64	60	59	63	61		
21/F	/	70	/	70	70	66	69	70	68	68	68	68	59	63	67	67	68	68	64	64	68	68	68	68	65	65	65	64	60	58	63	61		
22/F	/	70	70	70	70	66	68	69	68	68	68	68	59	63	67	67	68	68	64	64	68	68	68	69	68	65	65	65	64	60	58	63	61	
23/F	/	70	70	70	70	66	68	69	68	68	68	68	60	63	67	67	68	68	64	64	68	68	68	69	68	65	66	65	64	60	58	63	61	
24/F	/	70	70	70	70	66	68	69	68	68	68	68	60	63	67	67	68	68	64	64	68	68	68	69	68	65	66	65	64	60	58	63	61	
25/F	/	69	70	70	70	66	68	69	68	68	68	68	60	63	67	67	68	68	64	63	68	68	68	69	68	65	66	65	64	60	58	62	61	
26/F	/	69	70	70	69	66	68	69	68	68	68	68	61	63	67	67	67	68	64	63	68	68	68	69	68	65	66	65	64	60	58	62	61	
27/F	/	69	70	70	69	66	68	69	68	68	68	68	61	63	67	67	67	68	63	63	68	68	68	69	68	65	66	65	64	60	58	62	61	
28/F	/	69	70	69	69	66	68	69	67	68	68	67	61	63	67	67	67	68	63	63	68	68	68	68	65	66	65	64	60	58	62	61		
29/F	/	69	69	69	69	66	68	69	67	68	68	67	61	63	67	67	67	68	63	63	68	68	68	68	66	66	65	64	60	58	62	61		
30/F	/	69	69	69	69	66	68	69	67	68	68	67	61	63	67	67	67	68	63	63	68	68	68	68	66	66	65	64	60	58	62	61		
31/F	/	69	69	69	69	66	68	69	67	68	68	67	61	63	67	67	67	68	63	63	68	68	68	68	66	66	65	64	59	58	62	61		
32/F	70	68	69	69	69	66	68	69	67	68	68	67	61	63	67	67	67	68	63	63	68	68	68	68	66	66	65	64	59	58	62	61		
33/F	70	68	69	69	69	66	67	68	67	68	68	67	61	63	67	67	67	68	63	63	68	68	68	68	66	66	65	64	59	58	62	61		
34/F	70	68	69	69	69	65	67	68	67	67	68	67	61	63	67	67	67	67	63	63	68	68	68	68	66	66	65	64	59	58	62	61		
35/F	70	68	69	69	69	65	67	68	67	67	67	67	61	63	67	67	67	67	63	63	68	68	68	68	66	66	65	64	59	58	62	61		
36/F	70	68	69	69	69	65	67	68	67	67	67	67	61	63	67	67	67	67	63	63	68	68	68	68	66	66	65	64	59	58	62	61		
37/F	70	68	69	69	69	65	67	68	67	67	67	67	62	63	67	66	67	67	63	62	68	68	68	68	66	66	65	64	59	58	62	61		
38/F	70	68	69	69	68	65	67	68	67	67	67	67	62	63	67	66	67	67	62	62	68	68	68	68	66	66	65	64	59	58	62	61		
39/F	70	68	68	68	68	65	67	68	67	67	67	67	62	63	67	66	67	67	62	62	68	68	68	68	66	66	65	64	59	58	62	61		
40/F	70	68	68	68	68	65	67	68	67	67	67	67	62	63	66	66	67	67	62	62	68	68	68	68	66	66	65	64	59	58	62	61		
Predicted Max Road Traffic Noise Level, dB(A)	70	73	70	73	72	67	70	71	69	69	69	68	62	63	67	67	68	68	64	64	68	68	68	69	68	66	66	65	64	61	59	63	61	

Legend	
Exceeded Hong Kong Planning Standard Guidelines' Standard of 70 dB(A)	
Fixed Glazing to be Provided in the Base-case Scenario	

* The assessment point is located at 1m in front of the most exposed part of an openable window for ventilation at a habitable room (NSRs) and 1.2m above the floor level of individual floors of the residential towers of the proposed development.

No. of Exceedance	
Total no. of units	777
Total no. of units with exceedance	172
Predicted Max Road Traffic Noise Level, dB(A)	74
Compliance %	78%

Result Summary (Detail) - Base Case - Domestic Floors - T1 - 4/F to 40/F - PM

GBP Floor	1		2				3				4		5			6		7		8		9		10							
	T1-01A	T1-01B	T1-02A	T1-02B	T1-02C	T1-02D	T1-03A	T1-03B	T1-03C	T1-03D	T1-03E	T1-03F	T1-04A	T1-04B	T1-05A	T1-05B	T1-05C	T1-06A	T1-06B	T1-07A	T1-07B	T1-08A	T1-08B	T1-09A	T1-09B	T1-10A	T1-10B	T1-10C	T1-10D	T1-10E	T1-10F
4/F	49	49	47	50	56	61	68	64	64	67	68	61	62	67	66	68	62	64	69	63	61	61	64	70	64	/	73	70	/	63	69
5/F	50	51	49	51	57	61	69	68	/	71	71	/	/	70	69	71	/	/	71	69	67	/	70	72	/	/	73	73	/	69	/
6/F	52	52	50	52	57	62	69	69	/	72	72	/	/	72	71	72	/	/	72	70	/	/	71	72	/	/	73	73	/	72	/
7/F	53	53	50	53	57	62	69	69	/	72	72	/	/	72	72	72	/	/	72	71	/	/	72	72	/	/	73	73	/	72	/
8/F	53	53	51	54	57	62	69	69	/	72	72	/	/	72	72	72	/	/	72	71	/	/	72	72	/	/	73	73	/	72	/
9/F	54	54	51	55	58	62	69	69	/	72	72	/	/	72	72	72	/	/	72	70	/	/	71	72	/	/	73	73	/	72	/
10/F	55	55	52	55	58	62	69	69	/	72	72	/	/	72	72	72	/	/	72	70	/	/	71	72	/	/	72	73	/	72	/
11/F	55	55	52	56	58	62	69	69	/	72	72	/	/	72	72	72	/	/	72	70	/	/	71	72	/	/	72	72	/	72	/
12/F	56	56	53	57	59	62	69	69	/	72	72	/	/	72	72	72	/	/	72	70	/	/	71	71	/	/	72	72	/	71	/
13/F	56	56	53	57	59	62	69	68	/	71	71	/	/	72	71	72	/	/	71	70	/	/	71	71	/	/	72	72	/	71	/
14/F	57	57	54	57	59	62	69	68	/	71	71	/	/	71	71	71	/	/	71	70	/	/	71	71	/	/	72	72	/	71	/
15/F	57	57	54	58	59	62	69	68	/	71	71	/	/	71	71	71	/	/	71	70	/	/	71	71	/	/	71	71	/	71	/
16/F	57	57	54	58	60	62	68	68	/	71	71	/	/	71	71	71	/	/	71	70	70	/	70	71	/	/	71	71	/	71	/
17/F	57	58	55	58	60	62	68	68	/	71	71	/	/	71	71	71	/	/	71	69	69	/	70	71	/	/	71	71	/	70	/
18/F	57	58	55	58	60	62	68	68	/	71	71	/	/	71	71	71	/	/	71	69	69	/	70	70	/	/	71	71	/	70	/
19/F	58	58	56	59	60	62	68	67	/	71	71	/	/	71	70	71	/	/	71	69	69	/	70	70	/	/	71	71	/	70	/
20/F	58	58	56	59	60	62	68	67	/	70	70	/	/	70	70	70	/	/	70	69	69	/	70	70	/	/	71	71	/	70	/
21/F	58	58	56	59	60	62	68	67	/	70	70	/	/	70	70	70	/	/	70	69	69	69	70	70	/	/	70	70	/	70	/
22/F	58	59	56	59	60	62	68	67	/	70	70	/	/	70	70	70	/	/	70	69	69	69	69	70	/	/	70	70	/	70	/
23/F	58	59	57	59	60	62	68	67	/	70	70	/	/	70	70	70	/	/	70	68	69	69	69	70	68	/	70	70	/	69	/
24/F	58	59	57	59	60	62	67	67	/	70	70	/	/	70	70	70	/	/	70	68	68	68	69	69	68	/	70	70	/	69	/
25/F	58	59	57	60	61	62	67	67	/	70	70	/	/	70	70	70	/	/	70	68	68	68	69	69	68	/	70	70	/	69	/
26/F	58	59	57	60	61	62	67	67	/	70	70	/	67	68	70	70	68	68	70	68	68	68	69	69	68	65	70	70	/	69	/
27/F	58	59	57	60	61	62	67	66	67	69	70	67	67	70	69	70	68	68	69	68	68	68	69	69	68	65	70	70	69	69	/
28/F	58	59	57	60	61	62	67	66	66	69	69	67	67	69	69	69	67	68	69	68	68	68	69	69	68	65	69	69	69	69	/
29/F	58	59	57	60	61	62	67	66	66	69	69	67	67	69	69	69	67	68	69	68	68	68	69	69	67	65	69	69	69	69	/
30/F	58	59	58	60	61	62	67	66	66	69	69	66	67	69	69	69	67	68	69	68	68	68	68	69	67	65	69	69	69	68	/
31/F	59	59	58	60	61	62	67	66	66	69	69	66	67	69	69	69	67	68	69	68	68	68	68	69	67	64	69	69	69	68	/
32/F	59	59	58	60	61	62	67	66	66	69	69	66	67	69	69	69	67	68	69	67	67	67	68	68	67	64	69	69	69	68	/
33/F	59	60	58	60	61	62	67	66	66	69	69	66	67	69	69	69	67	68	69	67	67	67	68	68	67	64	69	69	69	68	70
34/F	59	60	58	61	61	62	66	66	66	69	69	66	67	69	69	69	67	67	69	67	67	67	68	68	67	64	69	69	68	68	69
35/F	59	60	58	61	62	62	66	66	66	69	69	66	67	69	69	69	67	67	69	67	67	67	68	68	67	64	69	69	68	68	69
36/F	59	60	58	61	62	62	66	66	66	69	69	66	66	69	68	69	67	67	68	67	67	67	68	68	67	64	68	69	68	68	69
37/F	59	60	58	61	62	62	66	65	66	68	68	66	66	68	68	68	67	67	68	67	67	67	68	68	67	64	68	68	68	68	69
38/F	59	60	58	61	62	62	66	65	66	68	68	66	66	68	68	68	66	67	68	67	67	67	68	68	66	64	68	68	68	68	69
39/F	59	60	58	61	62	62	66	65	65	68	68	66	66	68	68	68	66	67	68	67	67	67	68	68	66	64	68	68	68	68	69
40/F	59	60	58	61	62	62	66	65	65	68	68	66	66	68	68	68	66	67	68	67	67	67	67	68	66	64	68	68	68	67	69
Predicted Max Road Traffic Noise Level, dB(A)	59	60	58	61	62	62	69	69	67	72	72	67	68	72	72	72	68	68	72	71	70	69	72	72	68	65	73	73	69	72	70

Legend	
Exceeded Hong Kong Planning Standard Guidelines' Standard of 70 dB(A)	
Fixed Glazing to be Provided in the Base-case Scenario	/

* The assessment point is located at 1m in front of the most exposed part of an openable window for ventilation at a habitable room (NSRs) and 1.2m above the floor level of individual floors of the residential towers of the proposed development.

No. of Exceedance	
Total no. of units	777
Total no. of units with exceedance	110
Predicted Max Road Traffic Noise Level, dB(A)	73
Compliance %	86%

Result Summary (Detail) - Base Case - Domestic Floors - T1 - 4/F to 40/F - PM

GBP Floor	T1																																
	11					12			13			14			15			16			17			18		19		20		21			
	T1-11A	T1-11B	T1-11C	T1-11D	T1-11E	T1-11F	T1-12A	T1-12B	T1-13A	T1-13B	T1-14A	T1-14B	T1-14C	T1-15A	T1-15B	T1-15C	T1-16A	T1-16B	T1-16C	T1-17A	T1-17B	T1-17C	T1-17D	T1-18A	T1-18B	T1-19A	T1-19B	T1-20A	T1-20B	T1-20C	T1-21A	T1-21B	T1-21C
4/F	68	65	66	67	68	62	63	65	59	60	60	59	52	55	56	55	55	55	48	47	56	56	56	56	57	57	58	59	59	57	56	58	54
5/F	/	71	/	71	71	/	68	69	63	62	61	61	55	58	59	58	58	58	49	49	59	59	59	59	60	59	60	60	60	59	57	60	59
6/F	/	72	/	72	71	/	/	70	66	64	63	62	55	59	60	59	59	60	50	50	61	61	61	61	61	60	60	61	61	59	57	60	59
7/F	/	72	/	72	71	/	/	70	67	66	65	63	55	60	61	60	61	61	52	51	62	62	62	62	62	61	61	61	61	60	57	61	59
8/F	/	72	/	72	71	/	/	70	68	67	66	65	55	61	62	61	62	62	53	53	63	63	63	63	63	63	61	62	62	60	57	61	60
9/F	/	71	/	71	71	/	/	70	68	68	67	66	55	61	63	63	63	63	55	54	64	64	63	64	63	62	62	62	62	60	58	61	60
10/F	/	71	/	71	71	/	/	70	68	68	67	66	56	61	64	63	64	64	57	57	65	65	64	64	64	63	63	63	63	60	58	62	60
11/F	/	71	/	71	71	/	/	70	68	68	68	67	56	61	65	64	65	65	58	58	65	66	65	65	65	65	63	63	63	60	58	62	60
12/F	/	71	/	71	71	/	/	70	68	68	68	67	56	61	66	65	65	66	60	60	66	66	66	66	66	66	63	64	63	60	58	62	60
13/F	/	70	/	70	70	/	/	70	68	68	68	67	56	61	66	65	66	66	61	61	66	67	66	66	66	64	64	64	63	60	58	62	60
14/F	/	70	/	70	70	/	69	70	68	68	68	67	56	61	66	66	66	66	62	62	67	67	67	67	67	64	64	64	63	60	58	62	60
15/F	/	70	/	70	70	/	69	69	68	68	68	67	57	62	66	66	66	66	62	62	67	67	67	67	67	64	64	64	63	60	58	62	60
16/F	/	70	/	70	70	/	68	69	68	68	68	67	57	62	66	66	66	66	62	62	67	67	67	67	67	64	64	64	63	60	58	62	60
17/F	/	70	/	70	70	/	68	69	67	68	68	67	57	62	66	66	67	67	63	63	67	67	67	67	67	64	64	64	63	60	58	62	61
18/F	/	69	/	70	70	66	68	69	67	68	68	67	57	62	66	66	67	67	63	63	67	68	67	67	67	64	64	64	63	60	58	62	61
19/F	/	69	/	70	69	66	68	69	67	68	68	67	58	62	66	66	67	67	63	63	67	68	67	68	67	64	64	64	63	60	58	62	61
20/F	/	69	/	69	69	66	68	69	67	68	68	67	58	62	66	66	67	67	63	63	67	68	67	68	68	64	65	64	63	60	58	62	61
21/F	/	69	/	69	69	66	68	69	67	67	67	67	58	62	66	66	67	67	63	63	67	68	67	68	68	64	65	64	63	59	58	62	60
22/F	/	69	70	69	69	65	68	69	67	67	67	67	59	62	66	66	67	67	63	63	67	68	67	68	68	64	65	64	63	59	57	62	60
23/F	/	69	69	69	69	65	68	68	67	67	67	67	59	62	66	66	67	67	63	63	67	68	67	68	68	64	65	64	63	59	57	62	60
24/F	/	69	69	69	69	65	67	68	67	67	67	67	59	62	66	66	67	67	63	63	67	67	67	68	68	64	65	64	63	59	57	62	60
25/F	/	68	69	69	69	65	67	68	67	67	67	67	60	62	66	66	67	67	63	63	67	67	67	68	68	65	65	64	63	59	57	62	60
26/F	/	68	69	69	69	65	67	68	67	67	67	67	60	62	66	66	67	67	63	63	67	67	67	68	67	65	65	64	63	59	57	62	60
27/F	/	68	69	69	68	65	67	68	67	67	67	67	60	62	66	66	67	67	63	62	67	67	67	68	67	65	65	64	63	59	57	62	60
28/F	/	68	69	68	68	65	67	68	67	67	67	67	60	62	66	66	67	67	62	62	67	67	67	68	67	65	65	64	63	59	57	62	60
29/F	/	68	69	68	68	65	67	68	67	67	67	67	60	62	66	66	67	67	62	62	67	67	67	68	67	65	65	64	63	59	57	62	60
30/F	/	68	68	68	68	65	67	68	66	67	67	67	60	62	66	66	67	67	62	62	67	67	67	68	67	65	65	64	63	59	57	62	60
31/F	/	68	68	68	68	65	67	68	66	67	67	66	60	63	66	66	66	66	62	62	67	67	67	68	67	65	65	64	63	59	57	62	60
32/F	70	68	68	68	68	65	67	68	66	67	67	66	60	62	66	66	66	66	62	62	67	67	67	68	67	65	65	64	63	59	57	62	60
33/F	69	67	68	68	68	65	67	68	66	67	67	66	60	63	66	66	66	66	62	62	67	67	67	68	67	65	65	64	63	58	57	62	60
34/F	69	67	68	68	68	65	66	68	66	67	67	66	61	63	66	66	66	66	62	62	67	67	67	68	67	65	65	64	63	58	57	62	61
35/F	69	67	68	68	68	65	66	67	66	67	67	66	61	63	66	66	66	66	62	62	67	67	67	67	67	65	65	64	63	58	57	62	61
36/F	69	67	68	68	68	64	66	67	66	66	67	66	61	63	66	66	66	66	62	62	67	67	67	67	67	65	65	64	63	58	57	62	61
37/F	69	67	68	68	68	64	66	67	66	66	66	66	61	63	66	66	66	66	62	62	67	67	67	67	67	65	65	64	63	58	57	62	60
38/F	69	67	68	68	68	64	66	67	66	66	66	66	61	63	66	66	66	66	62	61	67	67	67	67	67	65	65	64	63	58	57	62	61
39/F	69	67	68	68	68	64	66	67	66	66	66	66	61	62	66	65	66	66	61	61	67	67	67	67	67	65	65	64	63	58	57	62	61
40/F	69	67	67	67	67	64	66	67	66	66	66	66	61	62	66	65	66	66	61	61	67	67	67	67	67	65	65	64	63	58	57	62	61
Predicted Max Road Traffic Noise Level, dB(A)	70	72	70	72	71	66	69	70	68	68	68	67	61	63	66	66	67	67	63	63	67	68	67	68	68	65	65	64	63	60	58	62	61

Legend	
Exceeded Hong Kong Planning Standard Guidelines' Standard of 70 dB(A)	
Fixed Glazing to be Provided in the Base-case Scenario	/

* The assessment point is located at 1m in front of the most exposed part of an openable window for ventilation at a habitable room (NSRs) and 1.2m above the floor level of individual floors of the residential towers of the proposed development.

No. of Exceedance	
Total no. of units	777
Total no. of units with exceedance	110
Predicted Max Road Traffic Noise Level, dB(A)	73
Compliance %	86%

Appendix 2.4

Configurations and Noise Attenuation Performance of the Proposed Acoustic Window

(Retrieved from HD's Technical Note on Summary of Noise Attenuation Performance for MFD with Acoustic Window)



Living Room	-1.0	-0.2	Nil	-1.2
Bedroom 1	Nil	-0.3	Nil	-0.3
Type C-8 (1B)				
Living Room	Nil	-0.3	Nil	-0.3
Bedroom 1	Nil	-1.0	Nil	-1.0
Type D-6 (2B) & Type D-7 (2B)				
Bedroom 2	Nil	0.7	Nil	-0.8*

Remark: (*) floor size correction of -1.5 dB(A) is applied.

According to the ADPEAW report, the noise attenuation effect of the acoustic window located in the living room and the bedroom of **Type C (1B) & Type D (2B)** flat is assessed together as a combined measure. Thus, combined noise attenuation of acoustic windows in the living room and bedroom of **Type C-6 (1B) & Type D-6 (2B), Type C-7 (1B) & Type D-7 (2B) and Type C-8 (1B)** are taken the lowest value of overall noise attenuation correction as stated in Table 7 above for the conservative purpose.

Conclusion

The noise attenuation of the MFD with acoustic window for the public housing development, with suitable correction applied are summarized in **Table 7**.

Table 7 – Summary of Noise Attenuation Performance for MFD with Acoustic Window

Flat Type	Acoustic Window Configurations				Noise Attenuation dB(A)	
	Inner Window Opening (mm)	Outer Window Opening (mm)	Window Overlapping Length (mm)	Gap Width between Window Panel (mm)	With Sound Absorptive Lining	Without Sound Absorptive Lining
Type A-3 (1/2P)	1383mm (H) x 840mm (W)	1383mm (H) x 870mm (W)	340mm	175mm	7.0	5.8
Type B-5 (2/3P)	1383mm (H) x 940mm	1383mm (H) x 1010mm (W)	200mm	175mm	6.6	5.5

Type A-3: NAP T1-7A & T1-8B
Type B-5: NAP T1-4B, T1-6B, T1-9A & T1-12B

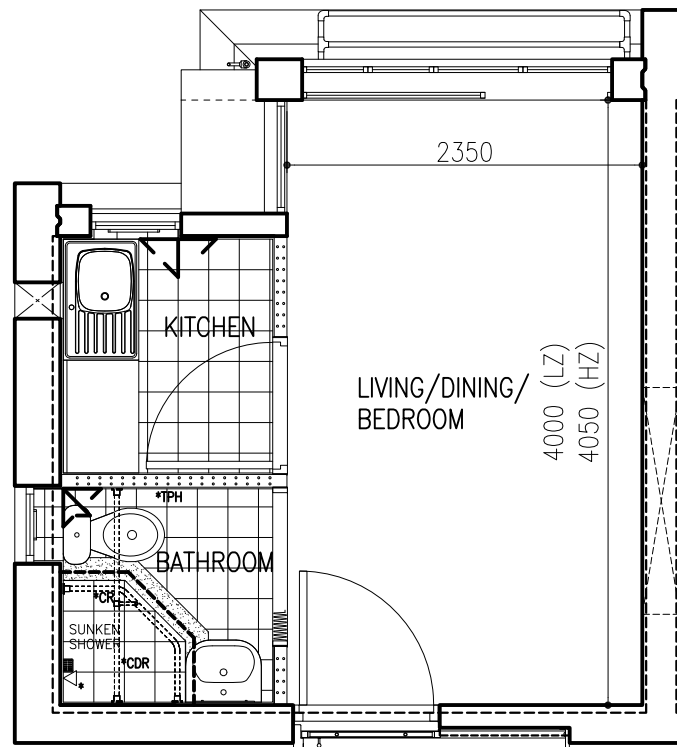
Type D-6 (Living Room): T1-3D, T1-3E, T1-10B, T1-10C, T1-11D & T1-11E

	(W)					
Type C-6 (1B) & Type D-6 (2B)						
Living Room	1383mm (H) x 980mm (W)	1383mm (H) x 1040mm (W)	100mm	175mm	7.0	5.5
Bedroom 1	1383mm (H) x 675mm (W)	1383mm (H) x 600mm (W)	525mm	175mm		
Type C-7 (1B) & Type D-7 (2B)						
Living Room	1383mm (H) x 1040mm (W)	1383mm (H) x 1060mm (W)	140mm	175mm	6.9	5.4
Bedroom 1	1383mm (H) x 575mm (W)	1383mm (H) x 550mm (W)	525mm	175mm		
Type C-8 (1B)						
Type C-8 (Living Room): NAP T1-5A & T1-5B Type D-6 (Bedroom): T1-10E & T1-11B						
Living Room	1383mm (H) x 1060mm (W)	1383mm (H) x 1050mm (W)	330mm	175mm	7.1	5.6
Bedroom 1	1383mm (H) x 675mm (W)	1383mm (H) x 600mm (W)	525mm	175mm		
Type D-6 (2B) & Type D-7 (2B)						
Bedroom 2	1383mm (H) x 550mm (W)	1383mm (H) x 550mm (W)	500mm	175mm	3.9	2.7

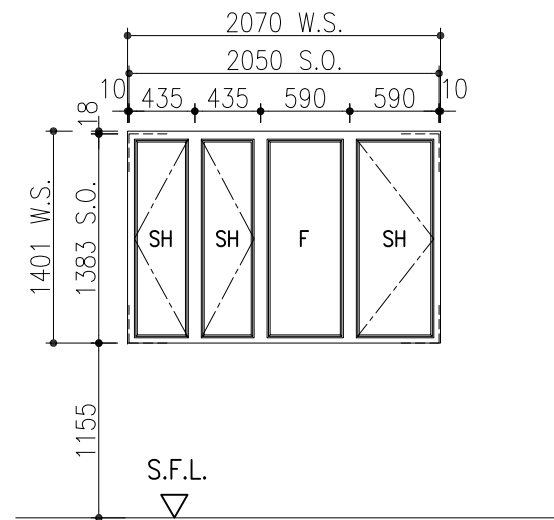
The above values are estimated noise attenuation for interim use. HD will arrange to conduct further study such as on-site measurements, etc. for the acoustic windows in the MFD to refine the noise attenuation value as soon as possible. For the acoustic window configuration deviated from those considered in this technical note/ more refined estimation of the noise attenuation value is required during the interim period, further discussion with Environmental Protection Department (EPD) is required on project basis.

Annex A

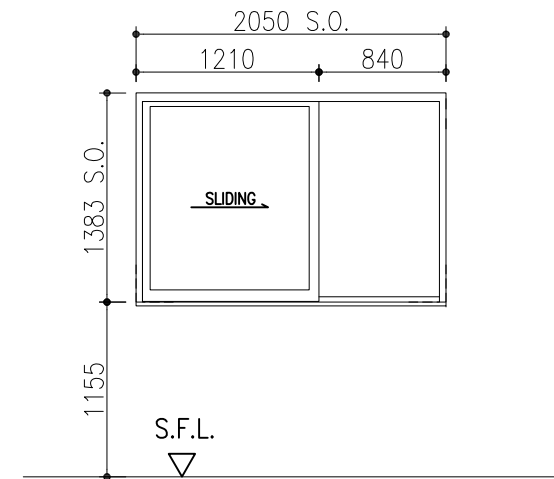
MFD with Acoustic Window



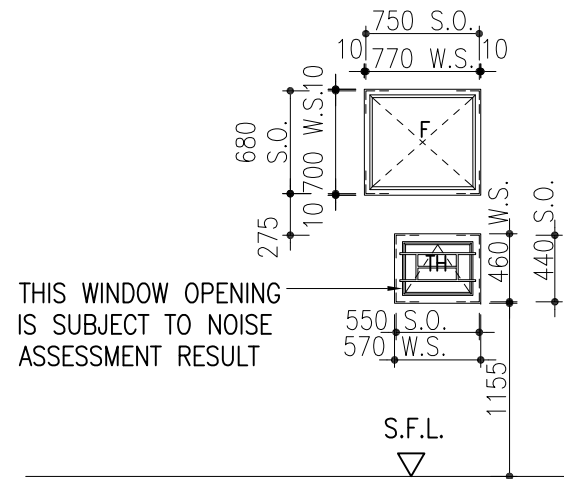
TYPE A-3 FLAT (WITH ACOUSTIC WINDOW)
SCALE 1:50(A3)



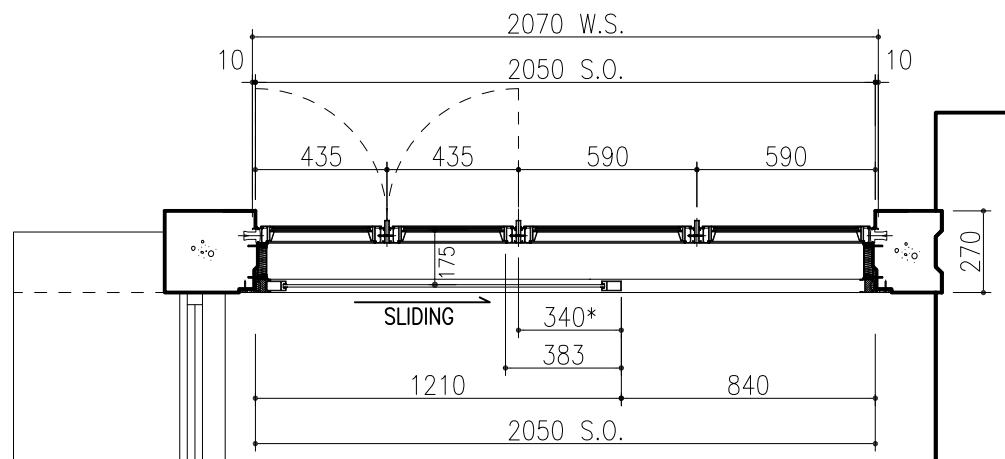
ELEVATION (OUTER LAYER)
SCALE 1:50(A3)



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



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



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

IFA(LZ): 9.40m²

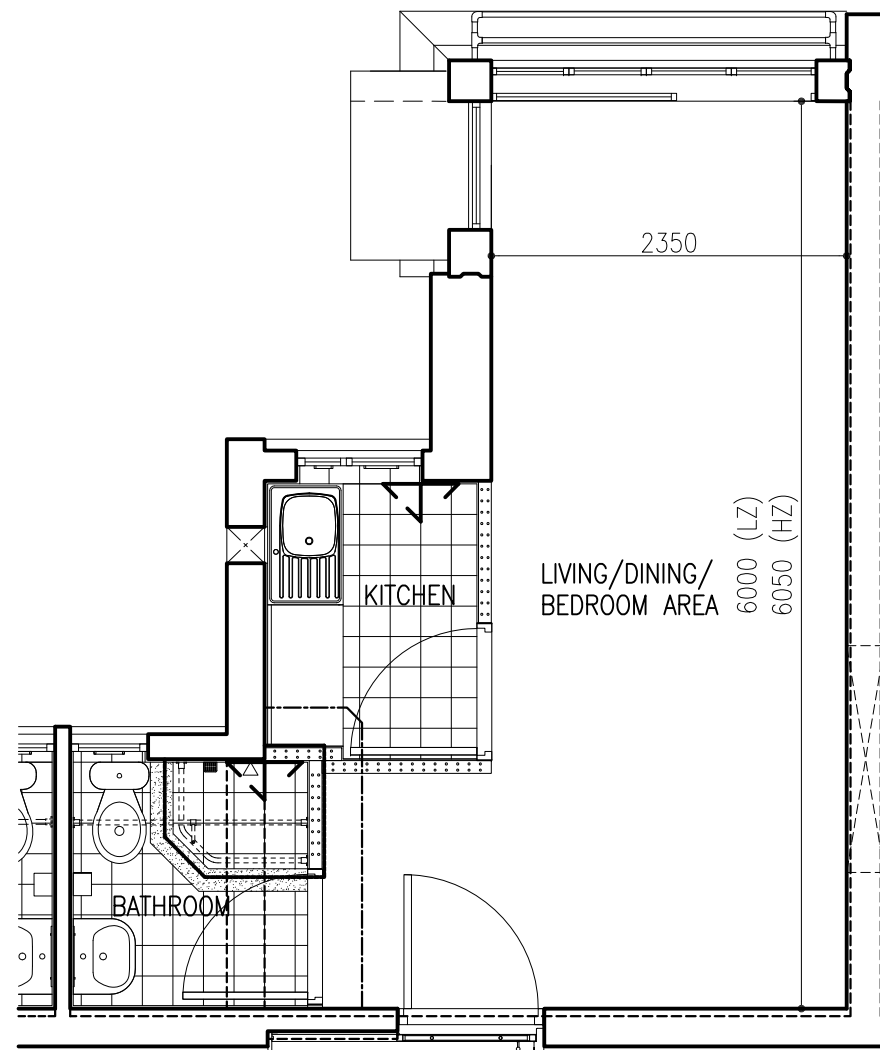
IFA(HZ): 9.62m²

NOTE: ELEVATIONS VIEWED FROM INSIDE

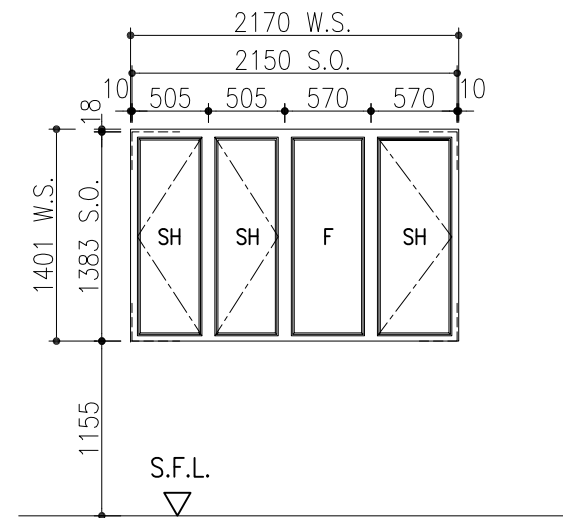
- F - FIXED WINDOW
- TH - TOP HUNG WINDOW
- SH - SIDE HUNG WINDOW
- S.O. - STRUCTURAL OPENING
- W.S. - WINDOW DIMENSION

**MODULAR FLAT WITH
ACOUSTIC WINDOW
TYPE A - 3 FLAT**

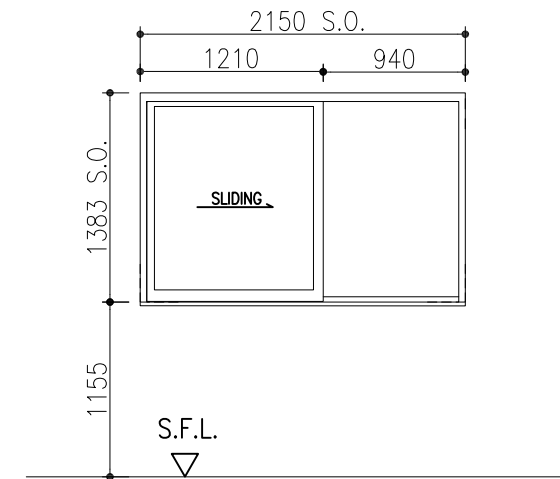
2018-04-23 (FOR EPD)



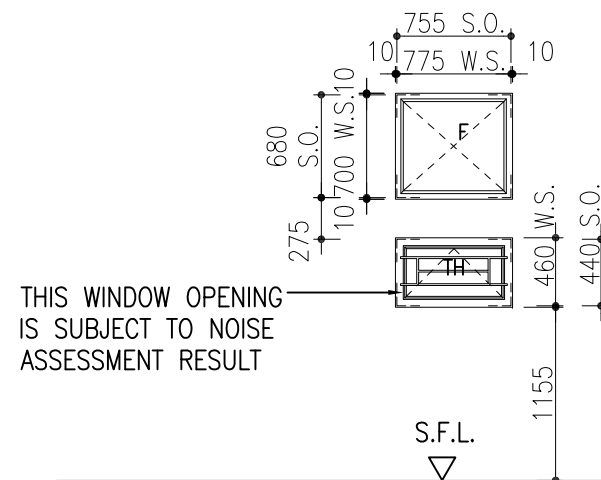
TYPE B-5 FLAT (WITH ACOUSTIC WINDOW) SCALE 1:50(A3)



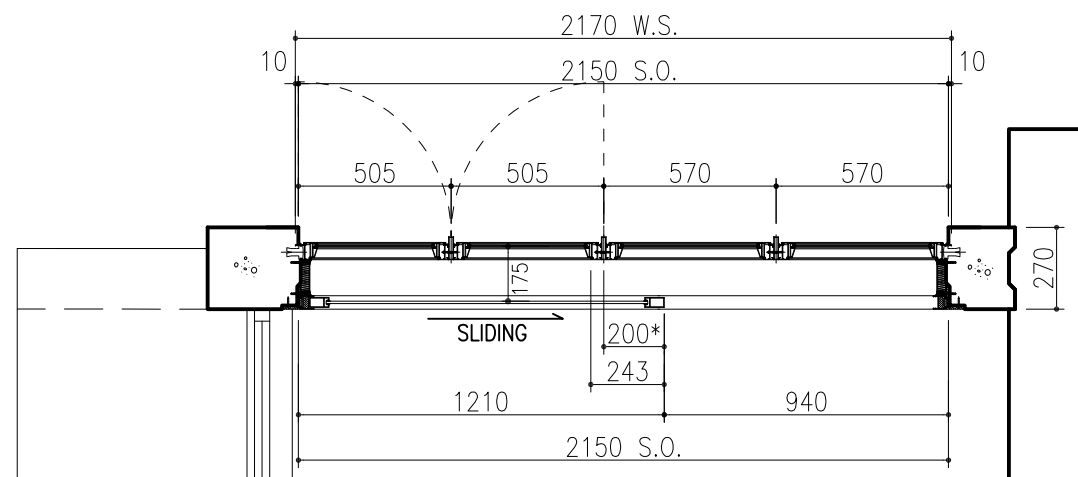
ELEVATION (OUTER LAYER) SCALE 1:50(A3)



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



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



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

IFA(LZ): 15.84m²

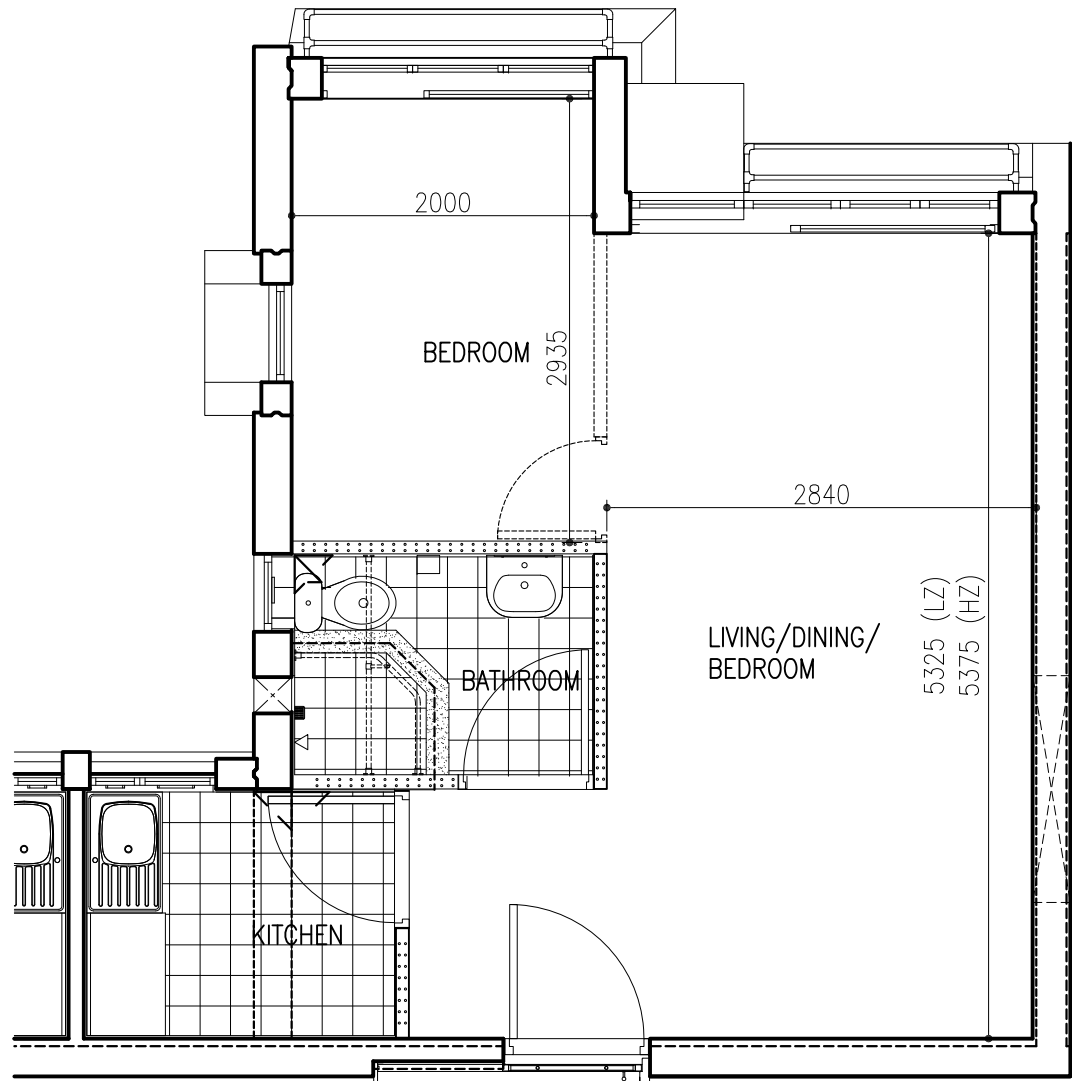
IFA(HZ): 16.17m²

NOTE: ELEVATIONS VIEWED FROM INSIDE

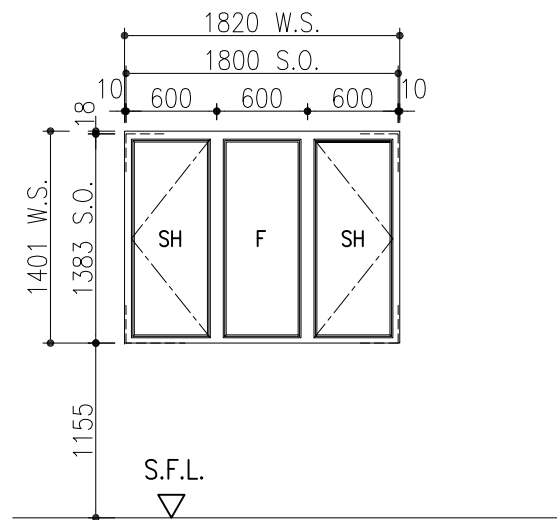
- F - FIXED WINDOW
- TH - TOP HUNG WINDOW
- SH - SIDE HUNG WINDOW
- S.O. - STRUCTURAL OPENING
- W.S. - WINDOW DIMENSION

MODULAR FLAT WITH ACOUSTIC WINDOW TYPE B - 5 FLAT

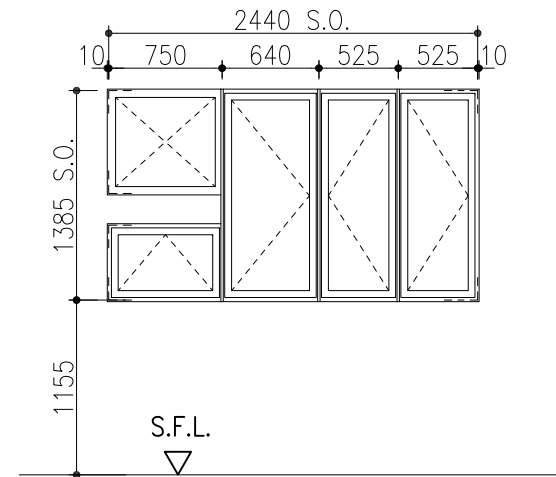
2018-04-23 (FOR EPD)



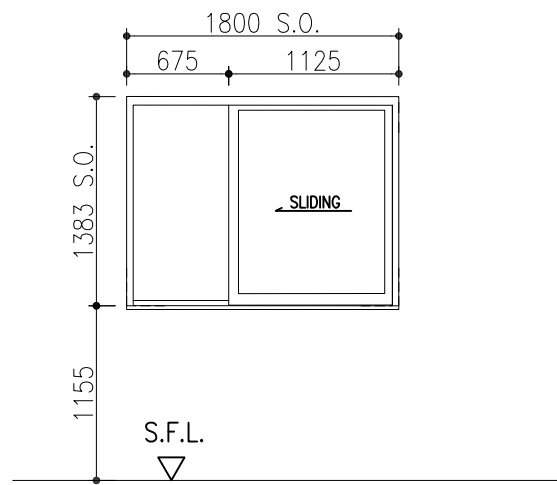
TYPE C-8 FLAT (WITH ACOUSTIC WINDOW) SCALE 1:50(A3)



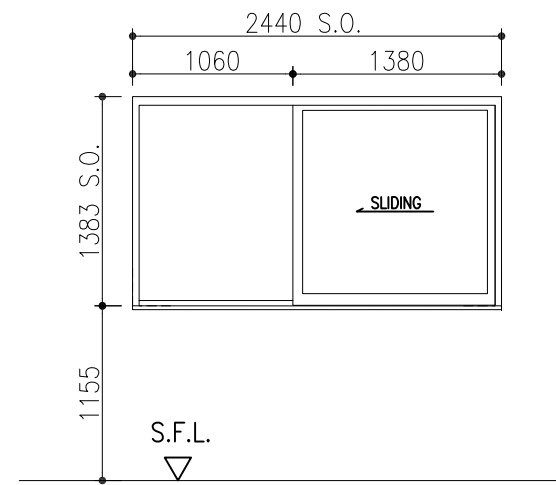
ELEVATION-BEDROOM (OUTER LAYER) SCALE 1:50(A3)



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



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

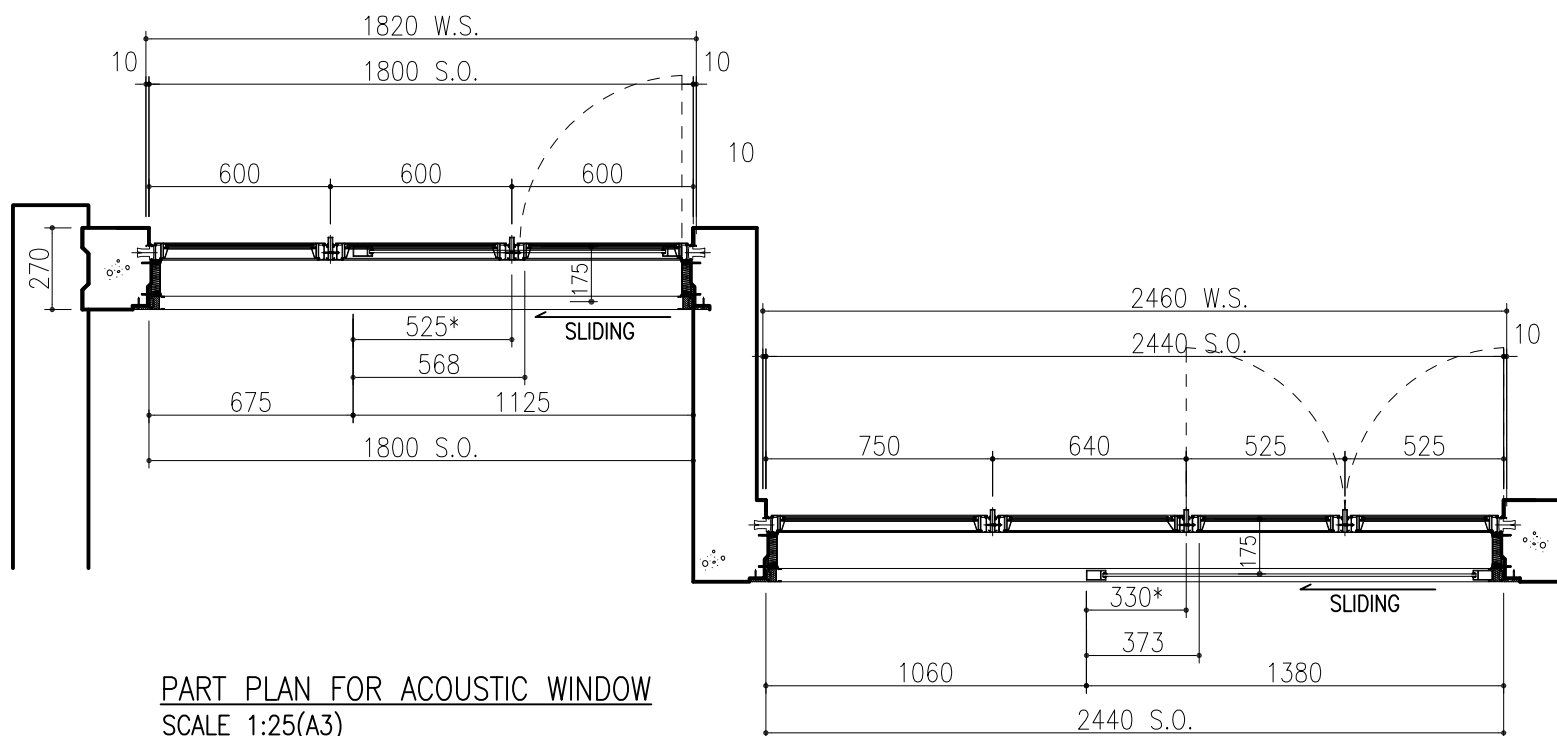


ELEVATION-LIVING ROOM (INNER LAYER) SCALE 1:50(A3)

IFA(LZ)		IFA(HZ)	
-LIVING:	17.14m ²	-LIVING:	17.48m ²
-BR1:	5.89m ²	-BR1:	5.89m ²

NOTE: ELEVATIONS VIEWED FROM INSIDE

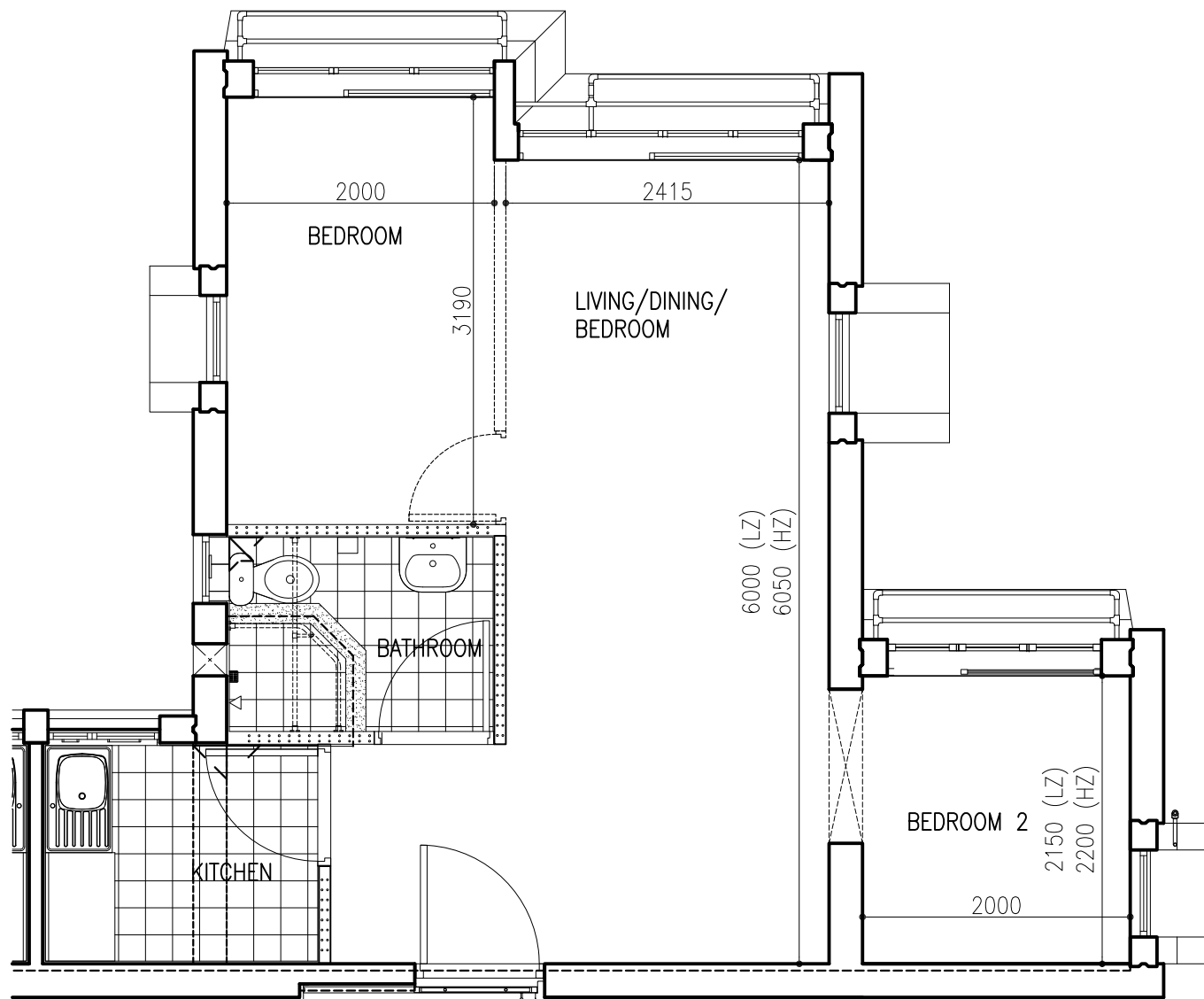
- F - FIXED WINDOW
- SH - SIDE HUNG WINDOW
- S.O. - STRUCTURAL OPENING
- W.S. - WINDOW DIMENSION



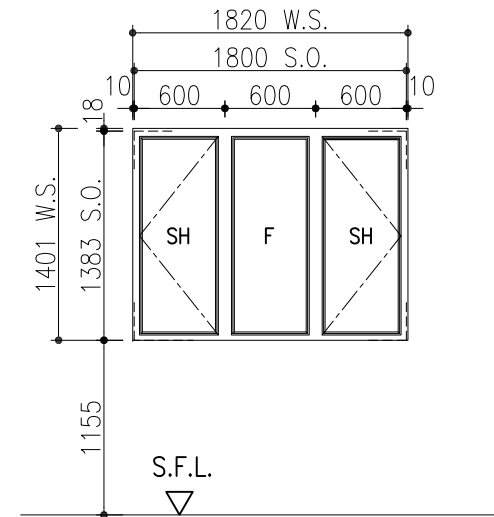
PART PLAN FOR ACOUSTIC WINDOW SCALE 1:25(A3)

MODULAR FLAT WITH ACOUSTIC WINDOW
TYPE C - 8 FLAT
 2018-04-23 (FOR EPD)

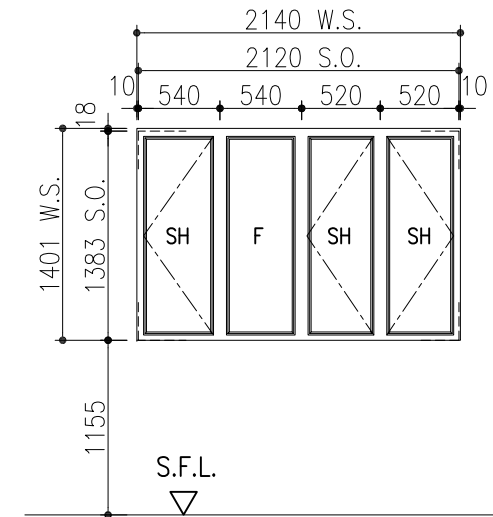
PRELIMINARY



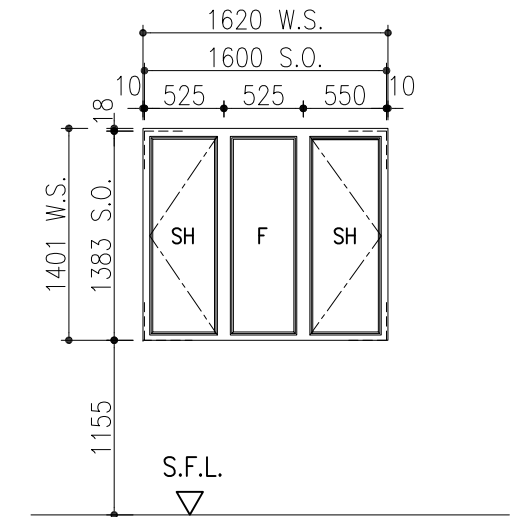
TYPE D-6 FLAT (WITH ACOUSTIC WINDOW) SCALE 1:50(A3)



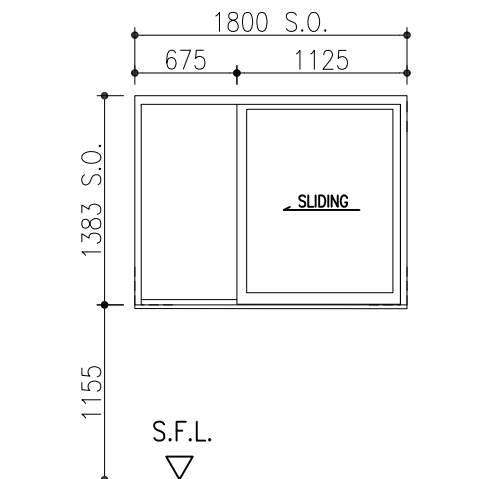
ELEVATION-BEDROOM (OUTER LAYER) SCALE 1:50(A3)



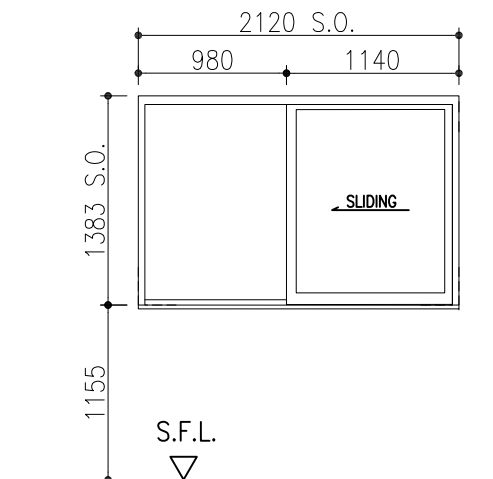
ELEVATION-LIVING ROOM (OUTER LAYER) SCALE 1:50(A3)



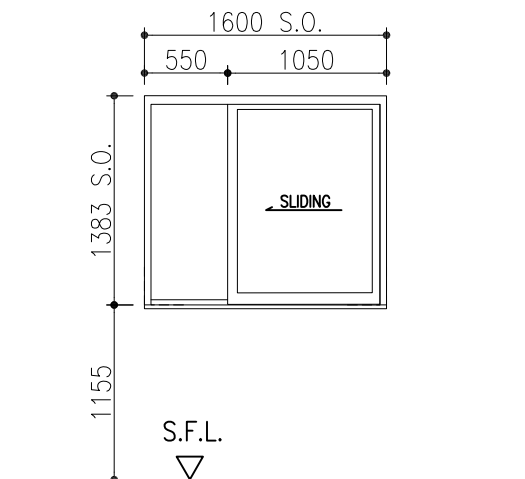
ELEVATION-BEDROOM 2 (OUTER LAYER) SCALE 1:50(A3)



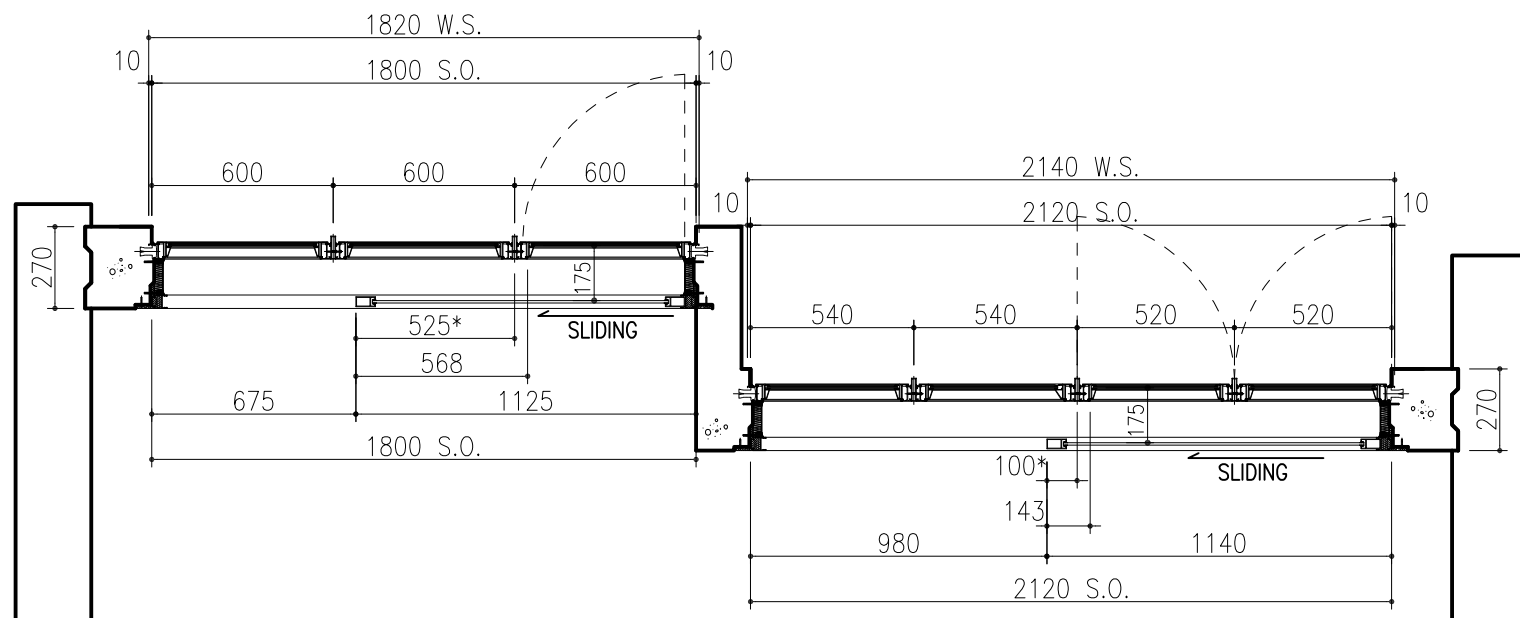
ELEVATION-BEDROOM (INNER LAYER) SCALE 1:50(A3)



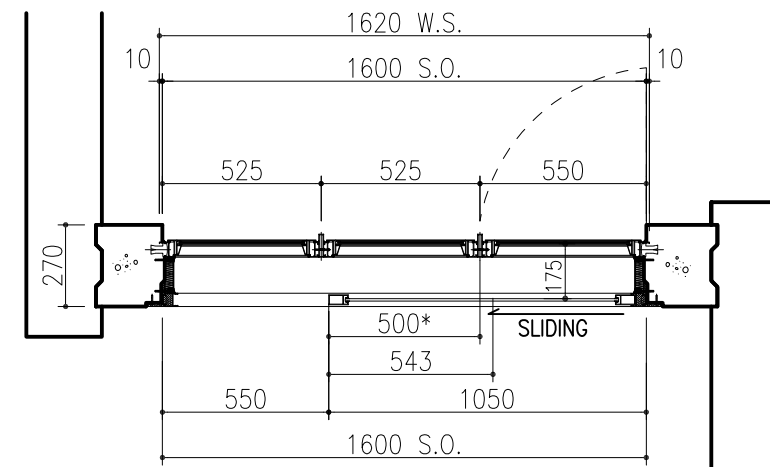
ELEVATION-LIVING ROOM (INNER LAYER) SCALE 1:50(A3)



ELEVATION-BEDROOM 2 (INNER LAYER) SCALE 1:50(A3)



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



PART PLAN FOR ACOUSTIC WINDOW - BEDROOM 2 SCALE 1:25(A3)

IFA(LZ)		IFA(HZ)	
-LIVING:	16.64m ²	-LIVING:	16.83m ²
-BR1:	6.38m ²	-BR1:	6.38m ²
-BR2:	4.49m ²	-BR2:	4.59m ²

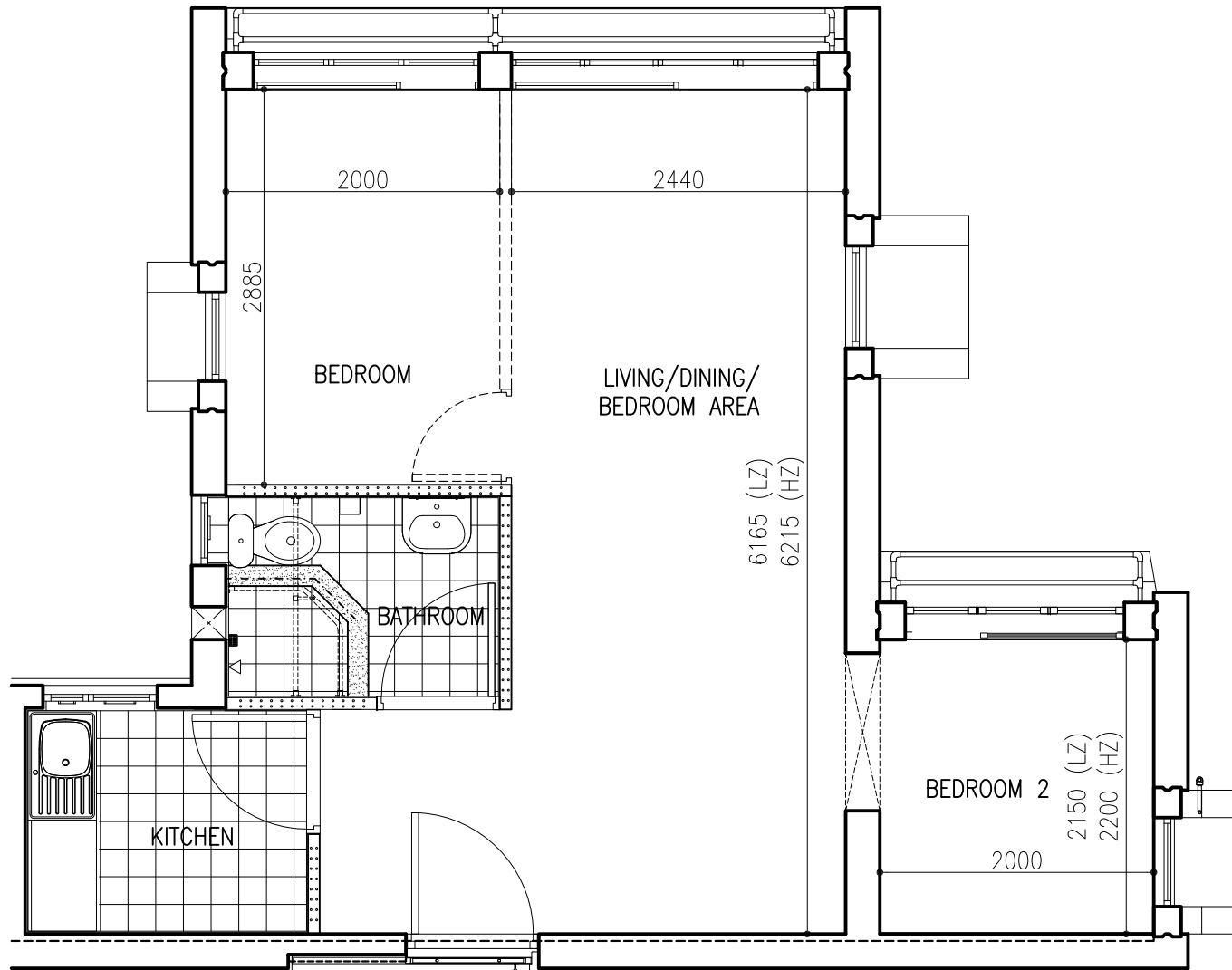
NOTE: ELEVATIONS VIEWED FROM INSIDE

- F - FIXED WINDOW
- SH - SIDE HUNG WINDOW
- S.O. - STRUCTURAL OPENING
- W.S. - WINDOW DIMENSION

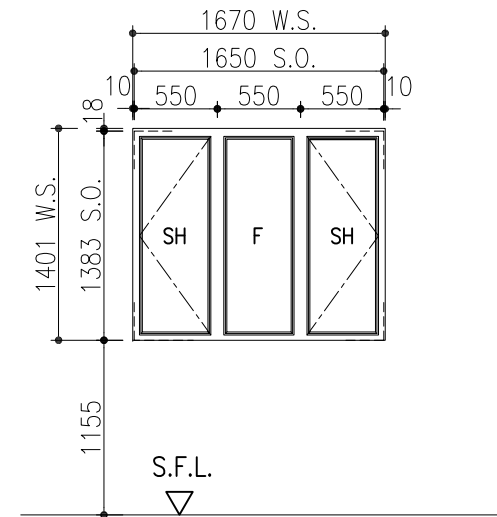
MODULAR FLAT WITH ACOUSTIC WINDOW TYPE D - 6 FLAT

2018-04-23 (FOR EPD)

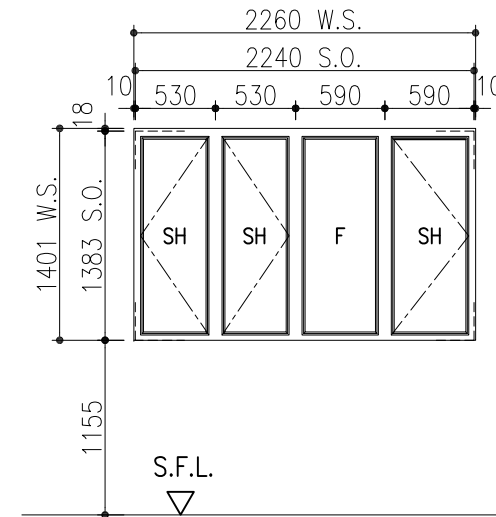
PRELIMINARY



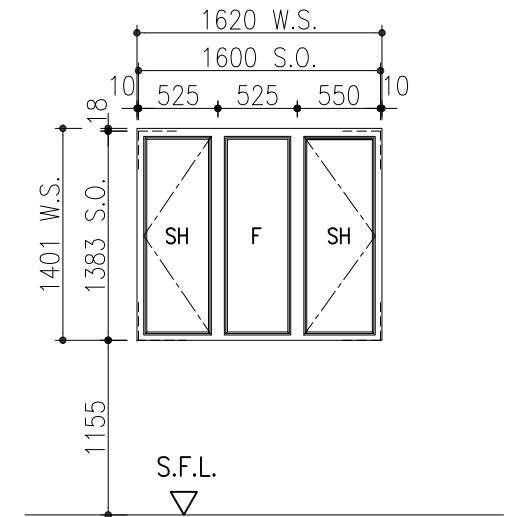
TYPE D-7 FLAT (WITH ACOUSTIC WINDOW) SCALE 1:50(A3)



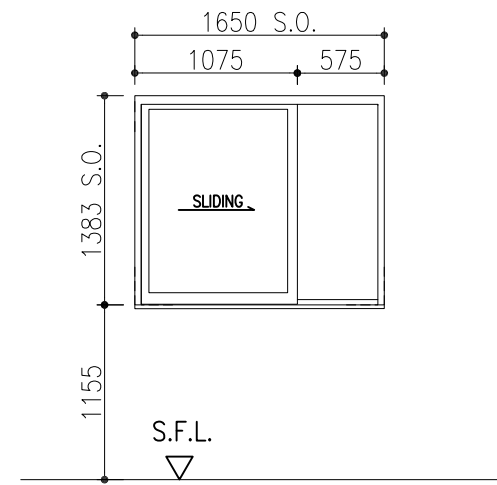
ELEVATION-BEDROOM (OUTER LAYER) SCALE 1:50(A3)



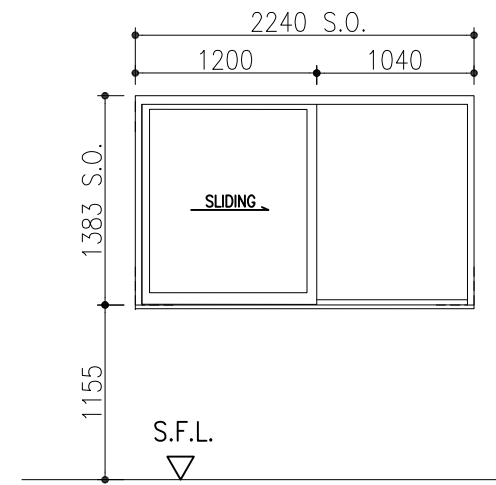
ELEVATION-LIVING ROOM (OUTER LAYER) SCALE 1:50(A3)



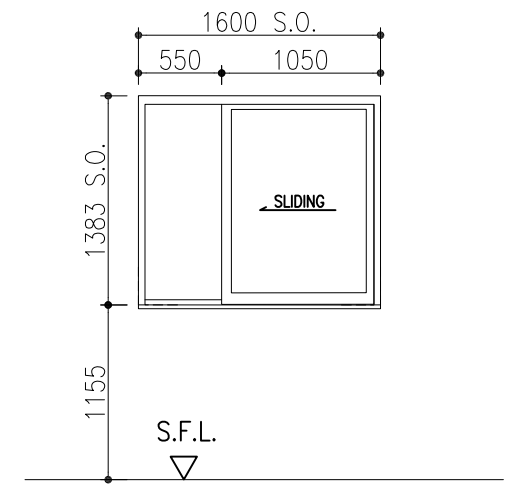
ELEVATION-BEDROOM 2 (OUTER LAYER) SCALE 1:50(A3)



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

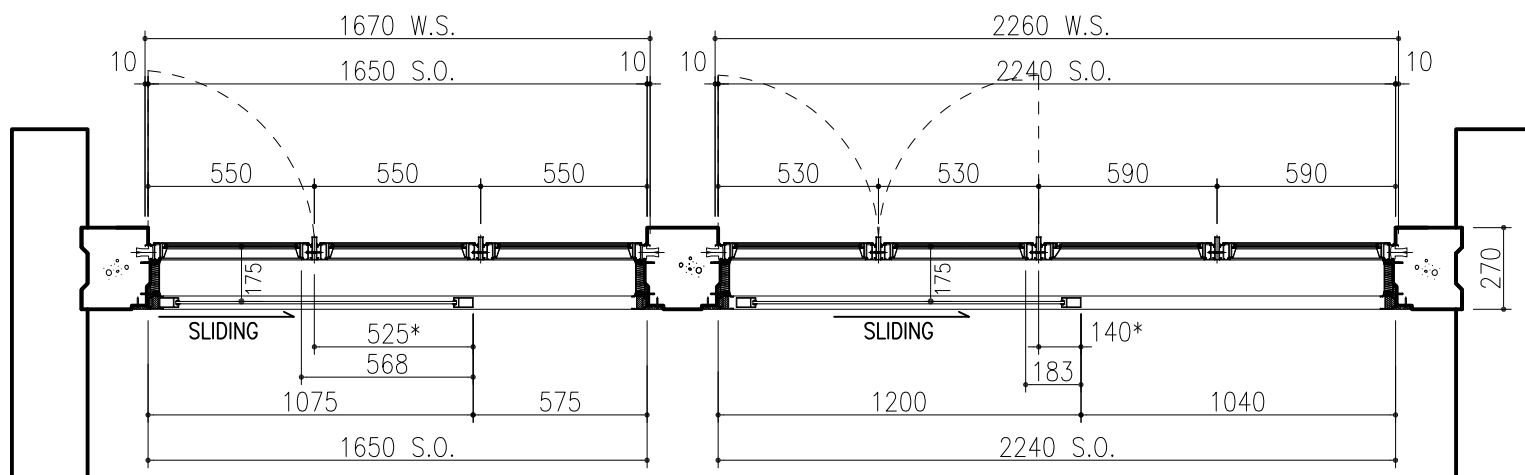


ELEVATION-LIVING ROOM (INNER LAYER) SCALE 1:50(A3)

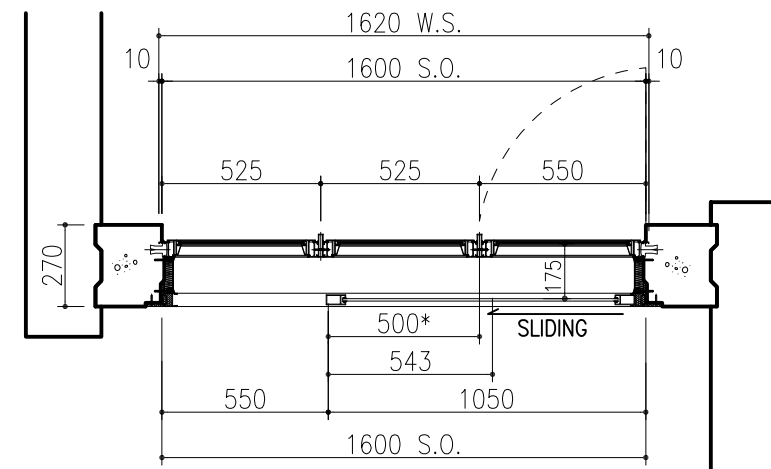


ELEVATION-BEDROOM 2 (INNER LAYER) SCALE 1:50(A3)

IFA(LZ)	IFA(HZ)
-LIVING: 17.19m ²	-LIVING: 17.38m ²
-BR1: 5.77m ²	-BR1: 5.77m ²
-BR2: 4.49m ²	-BR2: 4.59m ²



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



PART PLAN FOR ACOUSTIC WINDOW - BEDROOM 2 SCALE 1:25(A3)

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

MODULAR FLAT WITH ACOUSTIC WINDOW TYPE D - 7 FLAT

2018-04-23 (FOR EPD)

Appendix 2.5

Predicted Road Traffic Noise Levels for the Proposed
Development (Mitigated Scenario)



Result Summary (Detail) - Mitigated Case - Domestic Floors - T1 - 4/F to 40/F - AM

GBP Floor	1		2				3				4		5			6		7		8		9		10								
	T1-01A	T1-01B	T1-02A	T1-02B	T1-02C	T1-02D	T1-03A	T1-03B	T1-03C	T1-03D	T1-03E	T1-03F	T1-04A	T1-04B	T1-05A	T1-05B	T1-05C	T1-06A	T1-06B	T1-07A	T1-07B	T1-08A	T1-08B	T1-09A	T1-09B	T1-10A	T1-10B	T1-10C	T1-10D	T1-10E	T1-10F	
4/F	50	50	48	51	57	61	69	65	65	68	68	62	63	68	66	69	63	65	70	64	62	62	65	70	65	F.G.	68 AW(BT)	66 AW(BT)	F.G.	64	69	
5/F	51	51	50	52	58	62	69	69	F.G.	66 AW(BT)	66 AW(BT)	F.G.	F.G.	65 AW(BT)	70	66 AW(BT)	F.G.	F.G.	67 AW(BT)	70	68	F.G.	65 AW(BT)	67 AW(BT)	F.G.	F.G.	69 AW(BT)	69 AW(BT)	F.G.	70	F.G.	
6/F	52	52	51	53	58	63	69	69	F.G.	67 AW(BT)	67 AW(BT)	F.G.	F.G.	67 AW(BT)	66 AW(BT)	67 AW(BT)	F.G.	F.G.	67 AW(BT)	65 AW(BT)	F.G.	F.G.	66 AW(BT)	68 AW(BT)	F.G.	F.G.	69 AW(BT)	69 AW(BT)	F.G.	70 AW(BT)	F.G.	
7/F	53	53	51	54	58	63	70	70	F.G.	68 AW(BT)	68 AW(BT)	F.G.	F.G.	67 AW(BT)	67 AW(BT)	67 AW(BT)	F.G.	F.G.	67 AW(BT)	66 AW(BT)	F.G.	F.G.	66 AW(BT)	68 AW(BT)	F.G.	F.G.	68 AW(BT)	69 AW(BT)	F.G.	70 AW(BT)	F.G.	
8/F	54	54	52	55	58	63	70	70	F.G.	68 AW(BT)	68 AW(BT)	F.G.	F.G.	68 AW(BT)	67 AW(BT)	67 AW(BT)	F.G.	F.G.	68 AW(BT)	66 AW(BT)	F.G.	F.G.	67 AW(BT)	67 AW(BT)	F.G.	F.G.	68 AW(BT)	68 AW(BT)	F.G.	70 AW(BT)	F.G.	
9/F	55	55	52	55	59	63	70	70	F.G.	67 AW(BT)	68 AW(BT)	F.G.	F.G.	67 AW(BT)	67 AW(BT)	67 AW(BT)	F.G.	F.G.	67 AW(BT)	65 AW(BT)	F.G.	F.G.	66 AW(BT)	67 AW(BT)	F.G.	F.G.	68 AW(BT)	68 AW(BT)	F.G.	70 AW(BT)	F.G.	
10/F	56	56	53	56	59	63	70	70	F.G.	67 AW(BT)	67 AW(BT)	F.G.	F.G.	67 AW(BT)	67 AW(BT)	67 AW(BT)	F.G.	F.G.	67 AW(BT)	65 AW(BT)	F.G.	F.G.	66 AW(BT)	67 AW(BT)	F.G.	F.G.	68 AW(BT)	68 AW(BT)	F.G.	70 AW(BT)	F.G.	
11/F	56	56	53	57	59	63	70	70	F.G.	67 AW(BT)	67 AW(BT)	F.G.	F.G.	67 AW(BT)	67 AW(BT)	67 AW(BT)	F.G.	F.G.	67 AW(BT)	65 AW(BT)	F.G.	F.G.	66 AW(BT)	67 AW(BT)	F.G.	F.G.	68 AW(BT)	68 AW(BT)	F.G.	70 AW(BT)	F.G.	
12/F	57	57	54	57	60	63	70	69	F.G.	67 AW(BT)	67 AW(BT)	F.G.	F.G.	67 AW(BT)	67 AW(BT)	67 AW(BT)	F.G.	F.G.	67 AW(BT)	65 AW(BT)	F.G.	F.G.	66 AW(BT)	67 AW(BT)	F.G.	F.G.	67 AW(BT)	67 AW(BT)	F.G.	70 AW(BT)	F.G.	
13/F	57	57	54	58	60	63	70	69	F.G.	67 AW(BT)	67 AW(BT)	F.G.	F.G.	67 AW(BT)	67 AW(BT)	67 AW(BT)	F.G.	F.G.	67 AW(BT)	65 AW(BT)	F.G.	F.G.	66 AW(BT)	67 AW(BT)	F.G.	F.G.	67 AW(BT)	67 AW(BT)	F.G.	69 AW(BT)	F.G.	
14/F	57	58	55	58	60	63	69	69	F.G.	67 AW(BT)	67 AW(BT)	F.G.	F.G.	67 AW(BT)	66 AW(BT)	67 AW(BT)	F.G.	F.G.	67 AW(BT)	65 AW(BT)	F.G.	F.G.	66 AW(BT)	66 AW(BT)	F.G.	F.G.	67 AW(BT)	67 AW(BT)	F.G.	69 AW(BT)	F.G.	
15/F	58	58	55	59	60	63	69	69	F.G.	66 AW(BT)	66 AW(BT)	F.G.	F.G.	66 AW(BT)	66 AW(BT)	66 AW(BT)	F.G.	F.G.	66 AW(BT)	70	F.G.	F.G.	66 AW(BT)	66 AW(BT)	F.G.	F.G.	67 AW(BT)	67 AW(BT)	F.G.	69 AW(BT)	F.G.	
16/F	58	58	55	59	61	63	69	69	F.G.	66 AW(BT)	66 AW(BT)	F.G.	F.G.	66 AW(BT)	66 AW(BT)	66 AW(BT)	F.G.	F.G.	66 AW(BT)	70	70	F.G.	65 AW(BT)	66 AW(BT)	F.G.	F.G.	67 AW(BT)	67 AW(BT)	F.G.	69 AW(BT)	F.G.	
17/F	58	59	56	59	61	63	69	69	F.G.	66 AW(BT)	66 AW(BT)	F.G.	F.G.	66 AW(BT)	66 AW(BT)	66 AW(BT)	F.G.	F.G.	66 AW(BT)	70	70	F.G.	65 AW(BT)	66 AW(BT)	F.G.	F.G.	66 AW(BT)	66 AW(BT)	F.G.	69 AW(BT)	F.G.	
18/F	58	59	56	59	61	63	69	68	F.G.	66 AW(BT)	66 AW(BT)	F.G.	F.G.	66 AW(BT)	66 AW(BT)	66 AW(BT)	F.G.	F.G.	66 AW(BT)	70	70	F.G.	65 AW(BT)	66 AW(BT)	F.G.	F.G.	66 AW(BT)	66 AW(BT)	F.G.	68 AW(BT)	F.G.	
19/F	58	59	56	59	61	63	69	68	F.G.	66 AW(BT)	66 AW(BT)	F.G.	F.G.	66 AW(BT)	66 AW(BT)	66 AW(BT)	F.G.	F.G.	66 AW(BT)	70	70	F.G.	65 AW(BT)	66 AW(BT)	F.G.	F.G.	66 AW(BT)	66 AW(BT)	F.G.	68 AW(BT)	F.G.	
20/F	58	59	57	60	61	63	69	68	F.G.	66 AW(BT)	66 AW(BT)	F.G.	F.G.	66 AW(BT)	66 AW(BT)	66 AW(BT)	F.G.	F.G.	66 AW(BT)	70	70	F.G.	65 AW(BT)	65 AW(BT)	F.G.	F.G.	66 AW(BT)	66 AW(BT)	F.G.	68 AW(BT)	F.G.	
21/F	59	59	57	60	61	63	69	68	F.G.	66 AW(BT)	66 AW(BT)	F.G.	F.G.	66 AW(BT)	65 AW(BT)	66 AW(BT)	F.G.	F.G.	66 AW(BT)	70	70	70	70	70	69	F.G.	F.G.	66 AW(BT)	66 AW(BT)	F.G.	68 AW(BT)	F.G.
22/F	59	59	57	60	61	63	68	68	F.G.	65 AW(BT)	65 AW(BT)	F.G.	F.G.	65 AW(BT)	65 AW(BT)	65 AW(BT)	F.G.	F.G.	65 AW(BT)	69	70	69	70	70	69	F.G.	F.G.	66 AW(BT)	66 AW(BT)	F.G.	70	F.G.
23/F	59	60	57	60	61	63	68	68	F.G.	65 AW(BT)	65 AW(BT)	F.G.	F.G.	65 AW(BT)	65 AW(BT)	65 AW(BT)	F.G.	F.G.	65 AW(BT)	69	69	69	70	70	69	F.G.	F.G.	65 AW(BT)	65 AW(BT)	F.G.	70	F.G.
24/F	59	60	57	60	61	63	68	68	F.G.	65 AW(BT)	65 AW(BT)	F.G.	F.G.	65 AW(BT)	65 AW(BT)	65 AW(BT)	F.G.	F.G.	65 AW(BT)	69	69	69	70	70	69	F.G.	F.G.	65 AW(BT)	65 AW(BT)	F.G.	70	F.G.
25/F	59	60	58	60	61	63	68	67	F.G.	65 AW(BT)	65 AW(BT)	F.G.	F.G.	65 AW(BT)	65 AW(BT)	65 AW(BT)	F.G.	F.G.	65 AW(BT)	69	69	69	70	70	69	F.G.	F.G.	65 AW(BT)	65 AW(BT)	F.G.	70	F.G.
26/F	59	60	58	60	62	63	68	67	67	70	70	68	68	70	70	70	69	69	70	69	69	69	70	70	69	66	70	65 AW(BT)	F.G.	70	F.G.	
27/F	59	60	58	61	62	63	68	67	67	70	70	68	68	70	70	70	69	69	70	69	69	69	70	70	68	66	70	70	70	70	F.G.	
28/F	59	60	58	61	62	63	68	67	67	70	70	68	68	70	70	70	68	69	70	69	69	69	70	70	68	66	70	70	70	70	F.G.	
29/F	59	60	58	61	62	63	68	67	67	70	70	67	68	70	70	70	68	69	70	69	69	69	70	70	68	65	70	70	70	69	F.G.	
30/F	59	60	58	61	62	63	68	67	67	70	70	67	68	70	70	70	68	69	70	68	69	69	70	70	68	65	70	70	70	69	F.G.	
31/F	59	60	58	61	62	63	67	67	67	70	70	67	68	70	70	70	68	69	70	68	68	68	69	69	68	65	70	70	70	69	F.G.	
32/F	59	60	58	61	62	63	67	67	67	70	70	67	68	70	70	70	68	68	70	68	68	68	69	69	68	65	70	70	70	69	F.G.	
33/F	59	60	58	61	62	63	67	67	67	70	70	67	68	70	70	70	68	68	70	68	68	68	69	69	68	65	70	70	69	69	70	
34/F	60	60	59	61	62	63	67	66	67	70	70	67	67	70	69	70	68	68	70	68	68	68	69	69	68	65	70	70	69	69	70	
35/F	60	60	59	61	62	63	67	66	67	69	70	67	67	69	69	69	68	68	69	68	68	68	69	69	68	65	69	69	69	69	70	
36/F	60	60	59	62	63	63	67	66	66	69	69	67	67	69	69	69	68	68	69	68	68	68	69	69	67	65	69	69	69	69	70	
37/F	60	61	59	62	63	63	67	66	66	69	69	67	67	69	69	69	67	68	69	68	68	68	69	69	67	65	69	69	69	69	70	
38/F	60	61	59	62	63	63	67	66	66	69	69	67	67	69	69	69	67	68	69	68	68	68	68	69	67	64	69	69	69	68	70	
39/F	60	61	59	62	63	63	67	66	66	69	69	66	67	69	69	69	67	68	69	68	68	68	68	69	67	64	69	69	69	68	70	
40/F	60	61	59	62	63	63	67	66	66	69	69	66	67	69	69	69	67	68	69	67	68	67	68	68	67	64	69	69	69	68	70	
Predicted Max Road Traffic Noise Level, dB(A)	60	61	59	62	63	63	70	70	67 F.G.	70 AW(BT)	70 AW(BT)	68 F.G.	68 F.G.	70 AW(BT)	70 AW(BT)	70 AW(BT)	69 F.G.	69 F.G.	70 AW(BT)	70 AW(BT)	70 F.G.	70 F.G.	70 AW(BT)	70 AW(BT)	69 F.G.	66 F.G.	70 AW(BT)	70 AW(BT)	70 F.G.	70 AW(BT)	70 F.G.	

Legend	
Fixed Glazing with Maintenance Window	F.G.
Acoustic Window	AW(BT)

* The assessment point is located at 1m in front of the most exposed part of an openable window for ventilation at a habitable room (NSRs) and 1.2m above the floor level of individual floors of the residential towers of the proposed development.

No. of Exceedance	
Total no. of units	777
Total no. of units with exceedance	N.A
Predicted Max Road Traffic Noise Level, dB(A)	70
Compliance %	100%

Result Summary (Detail) - Mitigated Case - Domestic Floors - T1 - 4/F to 40/F - AM

GBP Floor	T1																																	
	T1-11A	T1-11B	T1-11C	T1-11D	T1-11E	T1-11F	T1-12A	T1-12B	T1-13A	T1-13B	T1-14A	T1-14B	T1-14C	T1-15A	T1-15B	T1-15C	T1-16A	T1-16B	T1-16C	T1-17A	T1-17B	T1-17C	T1-17D	T1-18A	T1-18B	T1-19A	T1-19B	T1-20A	T1-20B	T1-20C	T1-21A	T1-21B	T1-21C	
4/F	69	65	67	68	69	63	64	66	60	60	60	59	53	56	57	56	56	56	48	48	57	57	56	57	57	58	58	59	59	58	57	59	55	
5/F	F.G.	69 AW(BT)	F.G.	66 AW(BT)	67 AW(BT)	F.G.	69	70	64	63	62	61	55	59	59	58	59	59	50	49	60	60	60	60	60	59	60	61	61	59	58	60	59	
6/F	F.G.	70 AW(BT)	F.G.	67 AW(BT)	68 AW(BT)	F.G.	F.G.	65 AW(BT)	66	65	64	63	56	60	61	60	60	61	51	51	61	62	61	62	62	60	61	61	61	60	58	61	60	
7/F	F.G.	70 AW(BT)	F.G.	67 AW(BT)	68 AW(BT)	F.G.	F.G.	66 AW(BT)	68	67	65	64	56	61	62	61	61	62	52	52	62	63	62	63	63	61	62	62	62	60	58	61	60	
8/F	F.G.	70 AW(BT)	F.G.	67 AW(BT)	68 AW(BT)	F.G.	F.G.	66 AW(BT)	68	68	67	65	56	62	63	62	62	63	54	54	63	64	63	63	63	62	62	63	62	61	58	62	60	
9/F	F.G.	70 AW(BT)	F.G.	67 AW(BT)	68 AW(BT)	F.G.	F.G.	66 AW(BT)	69	68	68	67	56	62	64	63	63	64	55	55	64	65	64	64	64	63	63	63	63	61	58	62	61	
10/F	F.G.	69 AW(BT)	F.G.	67 AW(BT)	67 AW(BT)	F.G.	F.G.	66 AW(BT)	69	69	68	67	56	62	65	64	64	65	57	57	65	65	65	65	65	65	63	64	64	63	61	59	62	61
11/F	F.G.	69 AW(BT)	F.G.	66 AW(BT)	67 AW(BT)	F.G.	F.G.	65 AW(BT)	69	69	68	67	56	62	66	65	65	66	59	59	66	66	66	66	66	66	64	64	64	64	61	59	63	61
12/F	F.G.	69 AW(BT)	F.G.	66 AW(BT)	67 AW(BT)	F.G.	F.G.	65 AW(BT)	69	69	69	68	57	62	66	66	66	66	61	61	67	67	67	67	66	64	64	64	64	61	59	63	61	
13/F	F.G.	69 AW(BT)	F.G.	66 AW(BT)	67 AW(BT)	F.G.	F.G.	65 AW(BT)	69	69	69	68	57	62	67	66	66	67	62	62	67	67	67	67	67	64	65	64	64	61	59	63	61	
14/F	F.G.	68 AW(BT)	F.G.	66 AW(BT)	67 AW(BT)	F.G.	70	70	69	69	69	68	57	62	67	66	67	67	62	62	67	68	67	67	67	65	65	64	64	61	59	63	61	
15/F	F.G.	68 AW(BT)	F.G.	66 AW(BT)	66 AW(BT)	F.G.	69	70	69	69	69	68	57	62	67	66	67	67	63	63	68	68	68	68	68	65	65	65	64	61	59	63	61	
16/F	F.G.	68 AW(BT)	F.G.	65 AW(BT)	66 AW(BT)	F.G.	69	70	68	69	69	68	57	62	67	67	67	67	68	63	63	68	68	68	68	68	65	65	65	64	61	59	63	61
17/F	F.G.	68 AW(BT)	F.G.	65 AW(BT)	66 AW(BT)	F.G.	69	70	68	69	69	68	58	63	67	67	67	67	68	63	63	68	68	68	68	68	65	65	65	64	61	59	63	61
18/F	F.G.	70 AW(BT)	F.G.	65 AW(BT)	70	67	69	70	68	69	68	68	58	63	67	67	68	68	64	64	68	68	68	68	68	65	65	65	64	61	59	63	61	
19/F	F.G.	70	F.G.	70	70	67	69	70	68	69	68	68	58	63	67	67	68	68	64	64	68	68	68	68	68	65	65	65	64	60	59	63	61	
20/F	F.G.	70	F.G.	70	70	67	69	70	68	68	68	68	59	63	67	67	68	68	64	64	68	68	68	68	68	65	65	65	64	60	59	63	61	
21/F	F.G.	70	F.G.	70	70	66	69	70	68	68	68	68	59	63	67	67	68	68	64	64	68	68	68	68	68	65	65	65	64	60	58	63	61	
22/F	F.G.	70	70	70	70	66	68	69	68	68	68	68	59	63	67	67	68	68	64	64	68	68	68	69	68	65	65	65	64	60	58	63	61	
23/F	F.G.	70	70	70	70	66	68	69	68	68	68	68	60	63	67	67	68	68	64	64	68	68	68	69	68	65	66	65	64	60	58	63	61	
24/F	F.G.	70	70	70	70	66	68	69	68	68	68	68	60	63	67	67	68	68	64	64	68	68	68	69	68	65	66	65	64	60	58	63	61	
25/F	F.G.	69	70	70	70	66	68	69	68	68	68	68	60	63	67	67	68	68	64	63	68	68	68	69	68	65	66	65	64	60	58	62	61	
26/F	F.G.	69	70	70	69	66	68	69	68	68	68	68	61	63	67	67	67	67	68	64	63	68	68	68	69	68	65	66	65	64	60	58	62	61
27/F	F.G.	69	70	70	69	66	68	69	68	68	68	68	61	63	67	67	67	67	68	63	63	68	68	68	69	68	65	66	65	64	60	58	62	61
28/F	F.G.	69	70	69	69	66	68	69	67	68	68	67	61	63	67	67	67	67	68	63	63	68	68	68	68	68	65	66	65	64	60	58	62	61
29/F	F.G.	69	69	69	69	66	68	69	67	68	68	67	61	63	67	67	67	67	68	63	63	68	68	68	68	68	66	66	65	64	60	58	62	61
30/F	F.G.	69	69	69	69	66	68	69	67	68	68	67	61	63	67	67	67	67	68	63	63	68	68	68	68	68	66	66	65	64	60	58	62	61
31/F	F.G.	69	69	69	69	66	68	69	67	68	68	67	61	63	67	67	67	67	68	63	63	68	68	68	68	66	66	65	64	59	58	62	61	
32/F	70	68	69	69	69	66	68	69	67	68	68	67	61	63	67	67	67	67	68	63	63	68	68	68	68	66	66	65	64	59	58	62	61	
33/F	70	68	69	69	69	66	67	68	67	68	68	67	61	63	67	67	67	67	68	63	63	68	68	68	68	66	66	65	64	59	58	62	61	
34/F	70	68	69	69	69	65	67	68	67	67	68	67	61	63	67	67	67	67	63	63	68	68	68	68	66	66	65	64	59	58	62	61		
35/F	70	68	69	69	69	65	67	68	67	67	67	67	61	63	67	67	67	67	63	63	68	68	68	68	66	66	65	64	59	58	62	61		
36/F	70	68	69	69	69	65	67	68	67	67	67	67	61	63	67	67	67	67	63	63	68	68	68	68	66	66	65	64	59	58	62	61		
37/F	70	68	69	69	69	65	67	68	67	67	67	67	62	63	67	66	67	67	63	62	68	68	68	68	66	66	65	64	59	58	62	61		
38/F	70	68	69	69	68	65	67	68	67	67	67	67	62	63	67	66	67	67	62	62	68	68	68	68	66	66	65	64	59	58	62	61		
39/F	70	68	68	68	68	65	67	68	67	67	67	67	62	63	67	66	67	67	62	62	68	68	68	68	66	66	65	64	59	58	62	61		
40/F	70	68	68	68	68	65	67	68	67	67	67	67	62	63	66	66	67	67	62	62	68	68	68	68	66	66	65	64	59	58	62	61		
Predicted Max Road Traffic Noise Level, dB(A)	70 F.G.	70 AW(BT)	70 F.G.	70 AW(BT)	70 AW(BT)	67 F.G.	70 F.G.	70 AW(BT)	69	69	69	68	62	63	67	67	68	68	64	64	68	68	68	69	68	66	66	65	64	61	59	63	61	

Legend	
Fixed Glazing with Maintenance Window	F.G.
Acoustic Window	AW(BT)

* The assessment point is located at 1m in front of the most exposed part of an openable window for ventilation at a habitable room (NSRs) and 1.2m above the floor level of individual floors of the residential towers of the proposed development.

No. of Exceedance	
Total no. of units	777
Total no. of units with exceedance	N.A
Predicted Max Road Traffic Noise Level, dB(A)	70
Compliance %	100%

Result Summary (Detail) - Mitigated Case - Domestic Floors - T1 - 4/F to 40/F - PM

GBP Floor	1		2				3				4		5			6		7		8		9		10							
	T1-01A	T1-01B	T1-02A	T1-02B	T1-02C	T1-02D	T1-03A	T1-03B	T1-03C	T1-03D	T1-03E	T1-03F	T1-04A	T1-04B	T1-05A	T1-05B	T1-05C	T1-06A	T1-06B	T1-07A	T1-07B	T1-08A	T1-08B	T1-09A	T1-09B	T1-10A	T1-10B	T1-10C	T1-10D	T1-10E	T1-10F
4/F	49	49	47	50	56	61	68	64	64	67	68	61	62	67	66	68	62	64	69	63	61	61	64	70	64	F.G.	67	65	F.G.	63	69
5/F	50	51	49	51	57	61	69	68	F.G.	65	65	F.G.	F.G.	65	69	65	F.G.	F.G.	66	69	67	F.G.	64	67	F.G.	F.G.	68	68	F.G.	69	F.G.
6/F	52	52	50	52	57	62	69	69	F.G.	66	67	F.G.	F.G.	66	66	66	F.G.	F.G.	67	65	F.G.	F.G.	65	67	F.G.	F.G.	68	68	F.G.	69	F.G.
7/F	53	53	50	53	57	62	69	69	F.G.	67	67	F.G.	F.G.	67	66	67	F.G.	F.G.	67	65	F.G.	F.G.	66	67	F.G.	F.G.	68	68	F.G.	70	F.G.
8/F	53	53	51	54	57	62	69	69	F.G.	67	67	F.G.	F.G.	67	66	67	F.G.	F.G.	67	65	F.G.	F.G.	66	67	F.G.	F.G.	67	68	F.G.	69	F.G.
9/F	54	54	51	55	58	62	69	69	F.G.	67	67	F.G.	F.G.	67	66	67	F.G.	F.G.	67	65	F.G.	F.G.	66	66	F.G.	F.G.	67	67	F.G.	69	F.G.
10/F	55	55	52	55	58	62	69	69	F.G.	67	67	F.G.	F.G.	67	66	66	F.G.	F.G.	66	65	F.G.	F.G.	66	66	F.G.	F.G.	67	67	F.G.	69	F.G.
11/F	55	55	52	56	58	62	69	69	F.G.	66	66	F.G.	F.G.	66	66	66	F.G.	F.G.	66	64	F.G.	F.G.	65	66	F.G.	F.G.	67	67	F.G.	69	F.G.
12/F	56	56	53	57	59	62	69	69	F.G.	66	66	F.G.	F.G.	66	66	66	F.G.	F.G.	66	64	F.G.	F.G.	65	66	F.G.	F.G.	66	67	F.G.	69	F.G.
13/F	56	56	53	57	59	62	69	68	F.G.	66	66	F.G.	F.G.	66	66	66	F.G.	F.G.	66	64	F.G.	F.G.	65	66	F.G.	F.G.	66	66	F.G.	68	F.G.
14/F	57	57	54	57	59	62	69	68	F.G.	66	66	F.G.	F.G.	66	66	66	F.G.	F.G.	66	64	F.G.	F.G.	65	66	F.G.	F.G.	66	66	F.G.	68	F.G.
15/F	57	57	54	58	59	62	69	68	F.G.	66	66	F.G.	F.G.	66	65	66	F.G.	F.G.	66	70	F.G.	F.G.	65	65	F.G.	F.G.	66	66	F.G.	68	F.G.
16/F	57	57	54	58	60	62	68	68	F.G.	65	66	F.G.	F.G.	65	65	65	F.G.	F.G.	65	70	70	F.G.	65	65	F.G.	F.G.	66	66	F.G.	68	F.G.
17/F	57	58	55	58	60	62	68	68	F.G.	65	65	F.G.	F.G.	65	65	65	F.G.	F.G.	65	69	69	F.G.	64	65	F.G.	F.G.	65	66	F.G.	68	F.G.
18/F	57	58	55	58	60	62	68	68	F.G.	65	65	F.G.	F.G.	65	65	65	F.G.	F.G.	65	69	69	F.G.	64	65	F.G.	F.G.	65	65	F.G.	67	F.G.
19/F	58	58	56	59	60	62	68	67	F.G.	65	65	F.G.	F.G.	65	65	65	F.G.	F.G.	65	69	69	F.G.	64	65	F.G.	F.G.	65	65	F.G.	67	F.G.
20/F	58	58	56	59	60	62	68	67	F.G.	65	65	F.G.	F.G.	65	65	65	F.G.	F.G.	65	69	69	F.G.	64	65	F.G.	F.G.	65	65	F.G.	67	F.G.
21/F	58	58	56	59	60	62	68	67	F.G.	65	65	F.G.	F.G.	65	65	65	F.G.	F.G.	65	69	69	69	70	64	F.G.	F.G.	65	65	F.G.	67	F.G.
22/F	58	59	56	59	60	62	68	67	F.G.	65	65	F.G.	F.G.	65	64	65	F.G.	F.G.	65	69	69	69	69	64	F.G.	F.G.	65	65	F.G.	70	F.G.
23/F	58	59	57	59	60	62	68	67	F.G.	64	65	F.G.	F.G.	64	64	64	F.G.	F.G.	64	68	69	69	69	70	68	F.G.	65	65	F.G.	69	F.G.
24/F	58	59	57	59	60	62	67	67	F.G.	64	64	F.G.	F.G.	64	64	64	F.G.	F.G.	64	68	68	68	68	69	68	F.G.	64	64	F.G.	69	F.G.
25/F	58	59	57	60	61	62	67	67	F.G.	64	64	F.G.	F.G.	64	64	64	F.G.	F.G.	64	68	68	68	69	69	68	F.G.	64	64	F.G.	69	F.G.
26/F	58	59	57	60	61	62	67	67	67	70	70	67	68	70	70	70	68	68	70	68	68	68	69	69	68	65	70	64	F.G.	69	F.G.
27/F	58	59	57	60	61	62	67	66	67	69	70	67	67	70	69	70	68	68	69	68	68	68	69	69	68	65	70	70	69	69	F.G.
28/F	58	59	57	60	61	62	67	66	66	69	69	67	67	69	69	69	67	68	69	68	68	68	69	69	68	65	69	69	69	69	F.G.
29/F	58	59	57	60	61	62	67	66	66	69	69	67	67	69	69	69	67	68	69	68	68	68	69	69	67	65	69	69	69	69	F.G.
30/F	58	59	58	60	61	62	67	66	66	69	69	66	67	69	69	69	67	68	69	68	68	68	68	69	67	65	69	69	69	68	F.G.
31/F	59	59	58	60	61	62	67	66	66	69	69	66	67	69	69	69	67	68	69	68	68	68	68	69	67	64	69	69	69	68	F.G.
32/F	59	59	58	60	61	62	67	66	66	69	69	66	67	69	69	69	67	68	69	67	67	67	68	68	67	64	69	69	69	68	F.G.
33/F	59	60	58	60	61	62	67	66	66	69	69	66	67	69	69	69	67	68	69	67	67	67	68	68	67	64	69	69	69	68	70
34/F	59	60	58	61	61	62	66	66	66	69	69	66	67	69	69	69	67	67	69	67	67	67	68	68	67	64	69	69	68	68	69
35/F	59	60	58	61	62	62	66	66	66	69	69	66	67	69	69	69	67	67	69	67	67	67	68	68	67	64	69	69	68	68	69
36/F	59	60	58	61	62	62	66	66	66	69	69	66	66	69	68	69	67	67	68	67	67	67	68	68	67	64	68	69	68	68	69
37/F	59	60	58	61	62	62	66	65	66	68	68	66	66	68	68	68	67	67	68	67	67	67	68	68	67	64	68	68	68	68	69
38/F	59	60	58	61	62	62	66	65	66	68	68	66	66	68	68	68	66	67	68	67	67	67	68	68	66	64	68	68	68	68	69
39/F	59	60	58	61	62	62	66	65	65	68	68	66	66	68	68	68	66	67	68	67	67	67	68	68	66	64	68	68	68	68	69
40/F	59	60	58	61	62	62	66	65	65	68	68	66	66	68	68	68	66	67	68	67	67	67	67	68	66	64	68	68	68	67	69
Predicted Max Road Traffic Noise Level, dB(A)	59	60	58	61	62	62	69	69	67	70	70	67	68	70	70	70	68	68	70	70	70	69	70	70	68	65	70	70	69	70	70

Legend	
Fixed Glazing with Maintenance Window	F.G.
Acoustic Window	AW(BT)

* The assessment point is located at 1m in front of the most exposed part of an openable window for ventilation at a habitable room (NSRs) and 1.2m above the floor level of individual floors of the residential towers of the proposed development.

No. of Exceedance	
Total no. of units	777
Total no. of units with exceedance	N.A
Predicted Max Road Traffic Noise Level, dB(A)	70
Compliance %	100%

Result Summary (Detail) - Mitigated Case - Domestic Floors - T1 - 4/F to 40/F - PM

GBP Floor	T1																																
	11						12		13		14		15			16		17			18		19		20		21						
	T1-11A	T1-11B	T1-11C	T1-11D	T1-11E	T1-11F	T1-12A	T1-12B	T1-13A	T1-13B	T1-14A	T1-14B	T1-14C	T1-15A	T1-15B	T1-15C	T1-16A	T1-16B	T1-16C	T1-17A	T1-17B	T1-17C	T1-17D	T1-18A	T1-18B	T1-19A	T1-19B	T1-20A	T1-20B	T1-20C	T1-21A	T1-21B	T1-21C
4/F	68	65	66	67	68	62	63	65	59	60	60	59	52	55	56	55	55	55	48	47	56	56	56	56	57	57	58	59	59	57	56	58	54
5/F	F.G.	68 AW(BT)	F.G.	65 AW(BT)	66 AW(BT)	F.G.	68	69	63	62	61	61	55	58	59	58	58	58	49	49	59	59	59	59	60	59	59	60	60	59	57	60	59
6/F	F.G.	69 AW(BT)	F.G.	66 AW(BT)	67 AW(BT)	F.G.	F.G.	65 AW(BT)	66	64	63	62	55	59	60	59	59	60	50	50	61	61	61	61	61	60	60	61	61	59	57	60	59
7/F	F.G.	69 AW(BT)	F.G.	66 AW(BT)	67 AW(BT)	F.G.	F.G.	65 AW(BT)	67	66	65	63	55	60	61	60	61	61	52	51	62	62	62	62	62	61	61	61	61	60	57	61	59
8/F	F.G.	69 AW(BT)	F.G.	66 AW(BT)	67 AW(BT)	F.G.	F.G.	65 AW(BT)	68	67	66	65	55	61	62	61	62	62	53	53	63	63	63	63	63	61	62	62	62	60	57	61	60
9/F	F.G.	69 AW(BT)	F.G.	66 AW(BT)	67 AW(BT)	F.G.	F.G.	65 AW(BT)	68	68	67	66	55	61	63	63	63	63	55	54	64	64	63	64	63	62	62	62	62	60	58	61	60
10/F	F.G.	68 AW(BT)	F.G.	66 AW(BT)	66 AW(BT)	F.G.	F.G.	65 AW(BT)	68	68	67	66	56	61	64	63	64	64	57	57	65	65	64	64	64	63	63	63	63	60	58	62	60
11/F	F.G.	68 AW(BT)	F.G.	65 AW(BT)	66 AW(BT)	F.G.	F.G.	65 AW(BT)	68	68	68	67	56	61	65	64	65	65	58	58	65	66	65	65	65	63	63	63	63	60	58	62	60
12/F	F.G.	68 AW(BT)	F.G.	65 AW(BT)	66 AW(BT)	F.G.	F.G.	64 AW(BT)	68	68	68	67	56	61	66	65	65	66	60	60	66	66	66	66	66	63	64	63	63	60	58	62	60
13/F	F.G.	68 AW(BT)	F.G.	65 AW(BT)	66 AW(BT)	F.G.	F.G.	64 AW(BT)	68	68	68	67	56	61	66	65	66	66	61	61	66	67	66	66	66	64	64	64	63	60	58	62	60
14/F	F.G.	68 AW(BT)	F.G.	65 AW(BT)	66 AW(BT)	F.G.	69	70	68	68	68	67	56	61	66	66	66	66	62	62	67	67	67	67	67	64	64	64	63	60	58	62	60
15/F	F.G.	67 AW(BT)	F.G.	65 AW(BT)	66 AW(BT)	F.G.	69	69	68	68	68	67	57	62	66	66	66	67	62	62	67	67	67	67	67	64	64	64	63	60	58	62	60
16/F	F.G.	67 AW(BT)	F.G.	65 AW(BT)	65 AW(BT)	F.G.	68	69	68	68	68	67	57	62	66	66	66	67	62	62	67	67	67	67	67	64	64	64	63	60	58	62	60
17/F	F.G.	67 AW(BT)	F.G.	64 AW(BT)	65 AW(BT)	F.G.	68	69	67	68	68	67	57	62	66	66	67	67	63	63	67	67	67	67	67	64	64	64	63	60	58	62	61
18/F	F.G.	69	F.G.	64 AW(BT)	70	66	68	69	67	68	68	67	57	62	66	66	67	67	63	63	67	68	67	67	67	64	64	64	63	60	58	62	61
19/F	F.G.	69	F.G.	70	69	66	68	69	67	68	68	67	58	62	66	66	67	67	63	63	67	68	67	68	67	64	64	64	63	60	58	62	61
20/F	F.G.	69	F.G.	69	69	66	68	69	67	68	68	67	58	62	66	66	67	67	63	63	67	68	67	68	68	64	65	64	63	60	58	62	61
21/F	F.G.	69	F.G.	69	69	66	68	69	67	67	67	67	58	62	66	66	67	67	63	63	67	68	67	68	68	64	65	64	63	59	58	62	60
22/F	F.G.	69	70	69	69	65	68	69	67	67	67	67	59	62	66	66	67	67	63	63	67	68	67	68	68	64	65	64	63	59	57	62	60
23/F	F.G.	69	69	69	69	65	68	68	67	67	67	67	59	62	66	66	67	67	63	63	67	68	67	68	68	64	65	64	63	59	57	62	60
24/F	F.G.	69	69	69	69	65	67	68	67	67	67	67	59	62	66	66	67	67	63	63	67	67	67	68	68	64	65	64	63	59	57	62	60
25/F	F.G.	68	69	69	69	65	67	68	67	67	67	67	60	62	66	66	67	67	63	63	67	67	67	68	68	65	65	64	63	59	57	62	60
26/F	F.G.	68	69	69	69	65	67	68	67	67	67	67	60	62	66	66	67	67	63	63	67	67	67	68	67	65	65	64	63	59	57	62	60
27/F	F.G.	68	69	69	68	65	67	68	67	67	67	67	60	62	66	66	67	67	63	62	67	67	67	68	67	65	65	64	63	59	57	62	60
28/F	F.G.	68	69	68	68	65	67	68	67	67	67	67	60	62	66	66	67	67	62	62	67	67	67	68	67	65	65	64	63	59	57	62	60
29/F	F.G.	68	69	68	68	65	67	68	67	67	67	67	60	62	66	66	67	67	62	62	67	67	67	68	67	65	65	64	63	59	57	62	60
30/F	F.G.	68	68	68	68	65	67	68	66	67	67	67	60	62	66	66	66	67	62	62	67	67	67	68	67	65	65	64	63	59	57	62	60
31/F	F.G.	68	68	68	68	65	67	68	66	67	67	66	60	63	66	66	66	67	62	62	67	67	67	68	67	65	65	64	63	59	57	62	60
32/F	70	68	68	68	68	65	67	68	66	67	67	66	60	62	66	66	66	67	62	62	67	67	67	68	67	65	65	64	63	59	57	62	60
33/F	69	67	68	68	68	65	67	68	66	67	67	66	60	63	66	66	66	67	62	62	67	67	67	68	67	65	65	64	63	58	57	62	60
34/F	69	67	68	68	68	65	66	68	66	67	67	66	61	63	66	66	66	67	62	62	67	67	67	68	67	65	65	64	63	58	57	62	61
35/F	69	67	68	68	68	65	66	67	66	67	67	66	61	63	66	66	66	66	62	62	67	67	67	67	67	65	65	64	63	58	57	62	61
36/F	69	67	68	68	68	64	66	67	66	66	67	66	61	63	66	66	66	66	62	62	67	67	67	67	67	65	65	64	63	58	57	62	61
37/F	69	67	68	68	68	64	66	67	66	66	66	66	61	63	66	66	66	66	62	62	67	67	67	67	67	65	65	64	63	58	57	62	60
38/F	69	67	68	68	68	64	66	67	66	66	66	66	61	63	66	66	66	66	62	61	67	67	67	67	67	65	65	64	63	58	57	62	61
39/F	69	67	68	68	67	64	66	67	66	66	66	66	61	62	66	65	66	66	61	61	67	67	67	67	67	65	65	64	63	58	57	62	61
40/F	69	67	67	67	67	64	66	67	66	66	66	66	61	62	66	65	66	66	61	61	67	67	67	67	67	65	65	64	63	58	57	62	61
Predicted Max Road Traffic Noise Level, dB(A)	70 F.G.	69 AW(BT)	70 F.G.	70 AW(BT)	70 AW(BT)	66 F.G.	69 F.G.	70 AW(BT)	68	68	68	67	61	63	66	66	67	67	63	63	67	68	67	68	68	65	65	64	63	60	58	62	61

Legend	
Fixed Glazing with Maintenance Window	F.G.
Acoustic Window	AW(BT)

* The assessment point is located at 1m in front of the most exposed part of an openable window for ventilation at a habitable room (NSRs) and 1.2m above the floor level of individual floors of the residential towers of the proposed development.

No. of Exceedance	
Total no. of units	777
Total no. of units with exceedance	N.A
Predicted Max Road Traffic Noise Level, dB(A)	70
Compliance %	100%

Appendix 3.1

Site Survey and Photograph Records of Identified Fixed Plant Noise Sources and Fixed Plant Noise Source Inventory



Site Survey and Photograph Records of Identified Fixed Plant Noise Sources

<p>MCS3_1 to MCS3_6: Cooling Tower at Freder Center</p>	<p>MCS5_1: Cooling Tower at KK Industrial Building</p>
	
<p>MCS9_1 to MCS9_3: Air-cooled Chillers at Mok Cheong Street no. 9 (not in operation)</p>	<p>MCS11_2: Cooling Tower at Mok Cheong Street no. 11</p>
	
<p>MCS13_1 to MCS13_2 Air-cooled Chillers at Mok Cheong Street no. 13 (not in operation)</p>	<p>SPS: Noise Emitting Facade Louver at To Kwa Wan Road Pumping Station</p>
	

HLS_7: Vehicle Workshop at Hok Ling Street



HLS_10: Vehicle Workshop at Hok Ling Street



HLS_11: Vehicle Workshop at Hok Ling Street



HLS_13: Vehicle Workshop at Hok Ling Street



HLS_15 Vehicle Workshop at Hok Ling Street



HLS_16 Vehicle Workshop at Hok Ling Street



HLS_19: Vehicle Workshop at Hok Ling Street



HLS_20 & HLS_22: Vehicle Workshop at Hok Ling Street



HLS_21 Vehicle Workshop at Hok Ling Street



HLS_23 & HLS_25: Vehicle Workshop at Hok Ling Street



HLS_24 & HLS_26: Vehicle Workshop at Hok Ling Street



HLS_27: Vehicle Workshop at Hok Ling Street



TTS_4: Vehicle Workshop at Tsun Fat Street



TTS_5 & TTS_7: Vehicle Workshop at Tsun Fat Street



TTS_10 & TTS_8: Vehicle Workshop at Tsun Fat Street



TTS_12 & TTS_14: Vehicle Workshop at Tsun Fat Street



TTS_13: Vehicle Workshop at Tsun Fat Street



TTS_15: Vehicle Workshop at Tsun Fat Street



TTS_18: Vehicle Workshop at Tsun Fat Street



TTS_19: Vehicle Workshop at Tsun Fat Street



TTS_20: Vehicle Workshop at Tsun Fat Street



TTS_22: Vehicle Workshop at Tsun Fat Street



TTS_21 & TTS_23 & TTS_25: Vehicle Workshop at Tsun Fat Street



TTS_26 & TTS_24: Vehicle Workshop at Tsun Fat Street



YOS_5: Vehicle Workshop at Yin On street



YOS_7: Vehicle Workshop at Yin On street



YOS_9: Vehicle Workshop at Yin On street



YOS_13: Vehicle Workshop at Yin On street



YOS_12 & YOS_14: Vehicle Workshop at Yin On street



YOS_15: Vehicle Workshop at Yin On street



YOS_16 & YOS_18: Vehicle Workshop at Yin On street



YOS_19: Vehicle Workshop at Yin On street



YOS_21: Vehicle Workshop at Yin On street



YOS_22 & YOS_24: Vehicle Workshop at Yin On street



YOS_23: Vehicle Workshop at Yin On street



YOS_25: Vehicle Workshop at Yin On street



YOS_26 & YOS_28: Vehicle Workshop at Yin On street



YOS_27: Vehicle Workshop at Yin On street



SLS_27: Recycling Workshop at Shim Luen Street



SLS_28: Vehicle Workshop at Shim Luen Street



HWS_28: Vehicle Workshop at Hung Wan Street



LCS28_Recycling Workshop at Ying Yeung Street



FYS27: Vehicle Workshop at Fung Yi Street



FYS28: Vehicle Workshop at Fung Yi Street



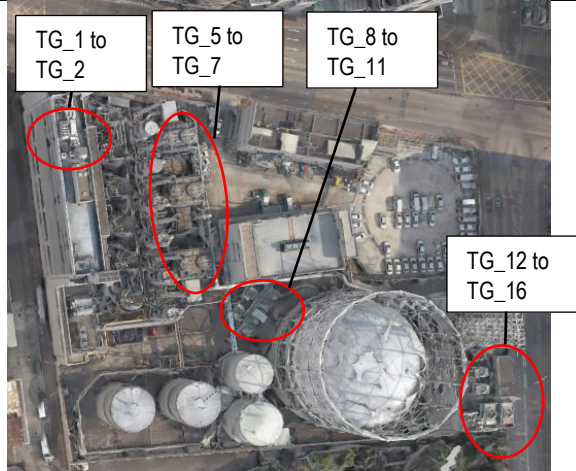
KCR_208: Vehicle Workshop at Kowloon City Road



NP_1 to NP_18: Cooling Tower/Air Cooled Chillers at Newport Centre Phase 1 & 2 (To be redeveloped by URA)



TG_1 to TG_16: Cooling Tower/Air Cooled Chillers at The Hong Kong & China Gas Company Limited Ma Tau Kok Control Centre



HP_1 & HP_2: Cooling Tower at Harbour Plaza 8 Degrees



Fixed Plant Noise Source Inventory

Source ID	Noise Source	X	Y	SWL, dB(A)		At Source Noise Shielding	Operation %(D)	Operation %(N)	Tonality, dB	Intermittency, dB	Impulsiveness, dB
				Z (for refer							
FYS_27	Vehicle Workshop	837774.2	820357.7	6	98	-	50%	0%	0	0	0
FYS_28	Vehicle Workshop	837790.6	820348.4	16.3	98	-	50%	0%	0	0	0
HLS_7	Vehicle Workshop	837968.4	820190.5	16.3	98	Partially Enclosed	50%	0%	0	0	0
HLS_10	Vehicle Workshop	837981.5	820196.4	16.3	98	Partially Enclosed	50%	0%	0	0	0
HLS_11	Vehicle Workshop	837974	820202	6	98	Partially Enclosed	50%	0%	0	0	0
HLS_12	Vehicle Workshop	837984.3	820201.9	38.3	98	Partially Enclosed	50%	0%	0	0	0
HLS_13	Vehicle Workshop	837976.7	820206.8	38.3	98	Partially Enclosed	50%	0%	0	0	0
HLS_15	Vehicle Workshop	837979.2	820213.3	6	98	Partially Enclosed	50%	0%	0	0	0
HLS_16	Vehicle Workshop	837989.8	820214.3	6	98	Partially Enclosed	50%	0%	0	0	0
HLS_19	Vehicle Workshop	837983.7	820224.3	6	98	Partially Enclosed	50%	0%	0	0	0
HLS_20	Vehicle Workshop	837995.3	820225.7	6	98	Partially Enclosed	50%	0%	0	0	0
HLS_21	Vehicle Workshop	837986.8	820230.3	6	98	Partially Enclosed	50%	0%	0	0	0
HLS_23	Vehicle Workshop	837989.5	820236.2	6	98	Partially Enclosed	50%	0%	0	0	0
HLS_24	Vehicle Workshop	838001.1	820238.6	6	98	Partially Enclosed	50%	0%	0	0	0
HLS_25	Vehicle Workshop	837992.2	820241.8	6	98	Partially Enclosed	50%	0%	0	0	0
HLS_26	Vehicle Workshop	838007.2	820248.2	6	98	-	50%	0%	0	0	0
HLS_27	Vehicle Workshop	837990.5	820255.4	6	98	-	50%	0%	0	0	0
HP_1	Outdoor equipment - Chiller	837709	820425	64.2	96	-	100%	100%	0	0	0
HP_2	Outdoor equipment - Chiller	837703	820427	64.2	96	-	100%	100%	0	0	0
HWS_28	Vehicle Workshop	837909.4	820293.3	6	98	-	50%	0%	0	0	0
KCR_28	Vehicle Workshop	837738.5	820372	6	98	-	50%	0%	0	0	0
LCS_28	General Workshop	837842.8	820326.2	6	98	-	50%	0%	0	0	0
MCS11_2	Outdoor equipment - Cooling Tower	837924.6	820349.7	8	92	-	100%	0%	0	0	0
MCS3_1	Outdoor equipment - Cooling Tower	837821.7	820415.6	8	92	-	100%	0%	0	0	0
MCS3_2	Outdoor equipment - Cooling Tower	837825.6	820423.1	8	92	-	100%	0%	0	0	0
MCS3_3	Outdoor equipment - Cooling Tower	837824.6	820421.3	8	92	-	100%	0%	0	0	0
MCS3_4	Outdoor equipment - Cooling Tower	837823.6	820419.2	8	92	-	100%	0%	0	0	0
MCS3_5	Outdoor equipment - Cooling Tower	837819.4	820409.1	8	92	-	100%	0%	0	0	0
MCS3_6	Outdoor equipment - Cooling Tower	837820.5	820411.9	8	92	-	100%	0%	0	0	0
MCS5_1	Outdoor equipment - Cooling Tower	837841.9	820369	8	92	-	100%	100%	0	0	0
PCS_28	Vehicle Workshop	837882.8	820304.8	6	98	-	50%	0%	0	0	0
SLS_27	General Workshop	837919	820289.3	22.6	98	-	50%	0%	0	0	0
SLS_28	Vehicle Workshop	837933.7	820281.4	22.9	98	-	50%	0%	0	0	0
SPS	Facade louver	838068	820254.1	22.9	86	-	100%	100%	0	0	0
TG_1	Outdoor equipment - Cooling Tower	837802.9	820092.1	22.9	96	-	100%	100%	0	0	0
TG_2	Outdoor equipment - Cooling Tower	837805.5	820096	22.9	96	-	100%	100%	0	0	0
TG_3	Outdoor equipment - Cooling Tower	837812.1	820094.1	22.9	96	-	100%	100%	0	0	0
TG_4	Outdoor equipment - Cooling Tower	837815.8	820091.9	22.9	96	-	100%	100%	0	0	0
TG_5	Outdoor equipment - Cooling Tower	837820.3	820089.4	32.1	96	-	100%	100%	0	0	0
TG_15	Outdoor equipment - Chiller	837932.6	820161.5	23.2	94	-	100%	100%	0	0	0
TG_16	Outdoor equipment - Chiller	837935.2	820160.2	23.2	94	-	100%	100%	0	0	0
TTS_4	Vehicle Workshop	837946.8	820185.4	6	98	Partially Enclosed	50%	0%	0	0	0
TTS_5	Vehicle Workshop	837941.2	820195.4	6	98	Partially Enclosed	50%	0%	0	0	0
TTS_7	Vehicle Workshop	837944.2	820202	6	98	Partially Enclosed	50%	0%	0	0	0
TTS_8	Vehicle Workshop	837952.4	820198	6	98	Partially Enclosed	50%	0%	0	0	0
TTS_9	Vehicle Workshop	837947	820207.5	6	98	Partially Enclosed	50%	0%	0	0	0
TTS_11	Vehicle Workshop	837949.8	820213.3	6	98	Partially Enclosed	50%	0%	0	0	0

Source ID	Noise Source	X	Y	SWL, dB(A)		At Source Noise Shielding	Operation %(D)	Operation %(N)	Tonality, dB	Intermittency, dB	Impulsiveness, dB
				Z (for refer							
TTS_12	Vehicle Workshop	837957.9	820209.5	6	98	Partially Enclosed	50%	0%	0	0	0
TTS_14	Vehicle Workshop	837960.4	820215.1	6	98	Partially Enclosed	50%	0%	0	0	0
TTS_15	Vehicle Workshop	837954.6	820224.5	6	98	Partially Enclosed	50%	0%	0	0	0
TTS_18	Vehicle Workshop	837965.6	820225.6	6	98	Partially Enclosed	50%	0%	0	0	0
TTS_20	Vehicle Workshop	837968	820231.5	6	98	Partially Enclosed	50%	0%	0	0	0
TTS_21	Vehicle Workshop	837962.4	820240.8	6	98	Partially Enclosed	50%	0%	0	0	0
TTS_22	Vehicle Workshop	837970.5	820236.7	6	98	Partially Enclosed	50%	0%	0	0	0
TTS_23	Vehicle Workshop	837965.5	820247.7	6	98	Partially Enclosed	50%	0%	0	0	0
TTS_24	Vehicle Workshop	837973.8	820243.9	6	98	Partially Enclosed	50%	0%	0	0	0
TTS_25	Vehicle Workshop	837968.6	820253.5	6	98	Partially Enclosed	50%	0%	0	0	0
TTS_26	Vehicle Workshop	837976.4	820249.3	6	98	Partially Enclosed	50%	0%	0	0	0
TTS_27	Vehicle Workshop	837968.4	820266.7	6	98	-	50%	0%	0	0	0
YOS_5	Vehicle Workshop	837917.7	820206.3	6	98	Partially Enclosed	50%	0%	0	0	0
YOS_7	Vehicle Workshop	837920.3	820213.2	6	98	Partially Enclosed	50%	0%	0	0	0
YOS_11	Vehicle Workshop	837924.6	820225.2	6	98	Partially Enclosed	50%	0%	0	0	0
YOS_12	Vehicle Workshop	837933.7	820220.1	6	98	Partially Enclosed	50%	0%	0	0	0
YOS_15	Vehicle Workshop	837930.4	820236	6	98	Partially Enclosed	50%	0%	0	0	0
YOS_16	Vehicle Workshop	837938.5	820231.2	6	98	Partially Enclosed	50%	0%	0	0	0
YOS_18	Vehicle Workshop	837941.2	820237.1	6	98	Partially Enclosed	50%	0%	0	0	0
YOS_19	Vehicle Workshop	837935.7	820246.5	6	98	Partially Enclosed	50%	0%	0	0	0
YOS_21	Vehicle Workshop	837937.8	820252.4	6	98	Partially Enclosed	50%	0%	0	0	0
YOS_22	Vehicle Workshop	837946.6	820248	6	98	Partially Enclosed	50%	0%	0	0	0
YOS_23	Vehicle Workshop	837941.5	820258.4	6	98	Partially Enclosed	50%	0%	0	0	0
YOS_24	Vehicle Workshop	837949.5	820254.7	6	98	Partially Enclosed	50%	0%	0	0	0
YOS_25	Vehicle Workshop	837943.8	820265	6	98	Partially Enclosed	50%	0%	0	0	0
YOS_26	Vehicle Workshop	837951.4	820260.9	6	98	Partially Enclosed	50%	0%	0	0	0
YOS_27	Vehicle Workshop	837942.8	820277.7	6	98	-	50%	0%	0	0	0
YOS_28	Vehicle Workshop	837958.6	820271	6	98	-	50%	0%	0	0	0

Appendix 3.2

Extracted information from the Approved EIA for
Development at San Hing Road and Hong Po Road,
Tuen Mun (AEIAR-263/2020)



Table 5-25 Noise Levels at the Representative NSRs for Fixed Plants

NSR	Location	Mitigated SPL, dB(A), Leq (30 min)	Noise Criteria (Day/Night), dB(A), Leq (30 min)
PN2B	Sung Wong Toi Road R(A) site	47	60/50
PN5	KTD Site 2B5	43	60/50
PN7	KTD Site 2B1	43	60/50
PN8	KTD Site 1K3	45	60/50
PN9	KTD Site 1L3	43	60/50

Cumulative noise impact

5.9.18 As mentioned in **Section 5.9.16**, noise level from the fixed plant could be effectively reduced by adoption of the above noise mitigation measures. The mitigated cumulative noise impact for the noise from a sports event in the Main Stadium and the fixed plant, and the noise from a sports event in the Public Sports Ground and the fixed plant are shown in **Table 5-26** and **Table 5-27** respectively. Assessment results indicated that the cumulative noise impact on all the identified NSRs would comply with the noise criteria. No further mitigation measures are required.

Table 5-26 Mitigated Cumulative Noise Levels from Sports Events at Main Stadium (Retractable Roof Fully Opened) and the Fixed Plant

NSR	Location	Predicted Noise Level / Assessment Criteria, dB(A), Leq (30 min)	
		Daytime / Evening	Night-time (11:00 p.m. – 7:00 a.m.)
N1	Ma Tau Kok 13 Streets	47/60	No Night Time Sport Event in Main Stadium
N2	Sky Tower	51/65	
PN1	KTD Site 5A4	48/60	
PN2	Sung Wong Toi Road R(A) Site	56/60	
PN3	Sung Wong Toi Road CDA Site	51/65	
PN4	Sung Wong Toi Road CDA Site	49/65	
PN5	KTD Site 2B4	49/60	
PN6	KTD Site 2B3	51/60	
PN7	KTD Site 2B1	50/60	
PN8	KTD Site 1K3	54/60	
PN9	KTD Site 1L3	44/60	

Table 5-27 Mitigated Cumulative Noise Levels from Sports Events at Public Sports Ground and the Fixed Plant

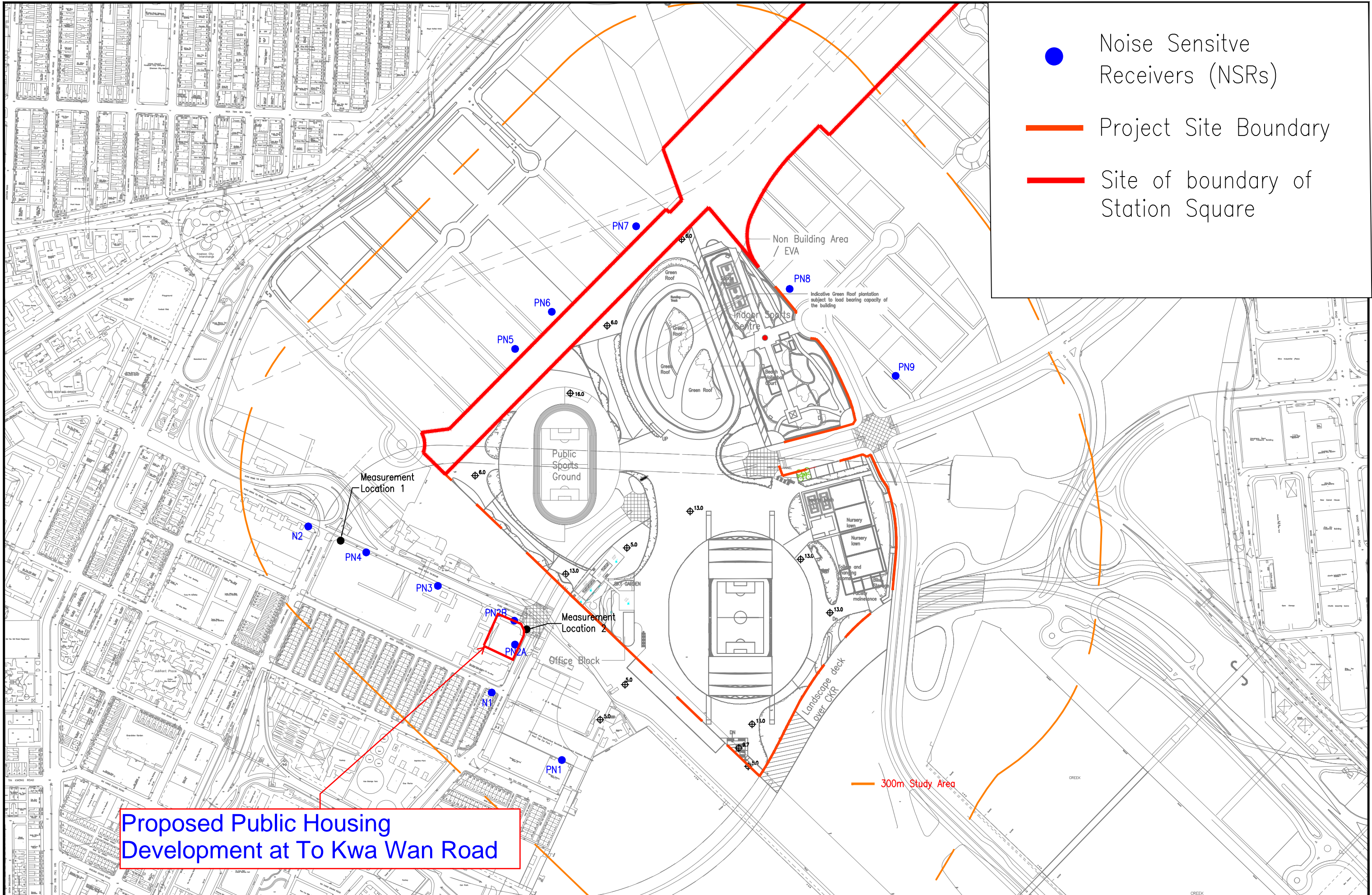
NSR	Location	Predicted Noise Level / Assessment Criteria, dB(A), Leq (30 min)	
		Daytime / Evening	Night-time (11:00 p.m. – 7:00 a.m.)
N1	Ma Tau Kok 13 Streets	52/60	No Night Time Sport Event in Public Sports Ground
N2	Sky Tower	56/65	
PN1	KTD Site 5A4	54/60	
PN2	Sung Wong Toi Road R(A) Site	60/60	
PN3	Sung Wong Toi Road CDA Site	58/65	
PN4	Sung Wong Toi Road CDA Site	56/65	
PN5	KTD Site 2B4	59/60	
PN6	KTD Site 2B3	60/60	
PN7	KTD Site 2B1	57/60	
PN8	KTD Site 1K3	59/60	
PN9	KTD Site 1L3	52/60	

Noise from Music, Singing and Instrument Performing Activities

- 5.9.19 With the implementation of the recommended mitigation measures (**Sections 5.6.1 – 5.6.4** refer), the potential noise impact arising from the musical events at the Main Stadium during daytime/evening period (i.e. 7 a.m. to 11 p.m.) would comply with the noise criteria stipulated under the Noise Control Guidelines for Music, Singing and Instrument Performing Activities. Should the future operator plan to implement any musical events at the Main Stadium during night-time period (i.e. 11 p.m. to 7 a.m.), the operator is obliged to ensure that the noise impacts arising from the said night-time musical events will comply with the noise requirements under the NCO.

Human Noise during Crowd Dispersion

- 5.9.20 In addition to normal dispersal routes above the podium, routes have been proposed on the ground level for directing the crowd towards the future Kai Tak Station and To Kwa Wan Station for crowd dispersion at night-time. Under such circumstances, the crowd would be directed to disperse under the podium at ground level. There would be covers above some sections of the night-time crowd dispersal routes. Such covers would partially screen the crowd dispersal routes from the planned residential sites although the covers are not to be provided as noise mitigation measures for the Project. For the crowd moving toward the Kai Tak Station, spectators would be directed to leave the site through or along the Indoor Sports Centre Building (ISCB) to reduce the exposed sections of the crowd dispersal routes. For the dispersal routes toward To Kwa Wan Station, the exit from the Project site is designed near the Sung Wong Toi Park. The proposed night-time crowd dispersal routes are presented in **Figure 5-6**.



- Noise Sensitive Receivers (NSRs)
- Project Site Boundary
- Site of boundary of Station Square

Proposed Public Housing Development at To Kwa Wan Road

	The joint venture of Cinotech Consultants Ltd. and Maurice Lee & Associates Ltd.	Sub-Consultant 	Drafting by	TC	12/15	SCALE: 1:5000 @ A3 SIZE 	PROJECT: Kai Tak Multi-purpose Sports Complex TITLE: Location of Selected Representative NSRs for Operational Noise Impact Assessment
			Designed by	TC	12/15		
			Checked by	KS	01/16		Figure 5-2
			Approved by	HF	01/16		1

Appendix 3.3

Extracted information from the Approved EIA for Kai Tak Multi-purpose Sports Complex (AEIAR-204/2017)



Fixed Noise Source Inventory

Noise Source ID	Noise Sources	Source Description	Avg. Measured SPL, dB(A)	Measurement Distance from Source (d), m	SWL, dB(A) (SPL + 20 log (d)+8)	SWL adopted in Noise from Fixed Source Calculation, dB(A), Day time	SWL adopted in Noise from Fixed Source Calculation, dB(A), Night time	Remarks
FS1	力信	Car Repairing Workshop	-	-	-	98	0	Refer to FS18
FS2	加昌貿易海運	Car Repairing Workshop	-	-	-	98	0	
FS4	Car Repairing workshop	Car Repairing Workshop	-	-	-	98	0	
FS5	天輝	Car washing workshop	77	3	94	94	0	By on-site measurement
FS6	東聯汽車維修	Car Repairing Workshop	-	-	-	98	0	Refer to FS18
FS7	恒力	Car Repairing Workshop	-	-	-	98	0	
FS8	Unnamed car parking	Car Repairing Workshop	-	-	-	98	0	
FS9	Enclosed Workshop	Car Repairing Workshop	-	-	-	98	0	
FS10	Self-served car washing workshop	Car washing workshop	-	-	-	94	0	
FS11	榮泰	Car Repairing Workshop	-	-	-	98	0	Refer to FS18
FS12	Calco Industrial Products Ltd.	Car Repairing Workshop	-	-	-	98	0	
FS13	Car Repairing workshop	Car Repairing Workshop	-	-	-	98	0	
FS14	Unknown workshop	Unknown workshop	58	5	80	80	0	By on-site measurement
FS15	CHEP	Covered storage with forklift	65	8	91	91	0	Reference is made to an approved planning application A/TM-LTTY/273
FS16	緯力貨倉 (Wai Yik)	Storage with forklift	63	13	93	93	0	By on-site measurement
FS17	龍顏(Lung Ngai)	Tyre pumping	-	-	89	92	0	SWL of tyre pumping made reference to an approved planning application A/YL-KTN/501; SWL of Hammering made reference to Tin Lung (FS18); Car Cleansing was measured on-site.
		Hammering	-	-	87		0	
		Car Cleansing	59	5	81		0	
FS18	天隆(Tin Lung)	Pneumatic screwdriver	-	-	97	98	0	SWL of pneumatic screwdriver and tyre pumping made reference to an approved planning application A/YL-KTN/501. Hammering was measured on-site.
		Tyre pumping	-	-	89		0	
		Hammering	63	6	87		0	
FS19	隆德 (Lung Tak)	Car repairing workshop	-	-	-	98	0	Refer to FS18
FS20	Chuen Fat Marble Tools	Marble grinding	73	3	90	90	0	By on-site measurement
PFS-01	PTI-01	Proposed Public Transport Interchange	-	-	-	84	77	By Back-calculation of Maximum Allowable SWL for the Proposed PTI (Appendix 5.17)
PFS-02	PTI-01		-	-	-	83	76	
PFS-03	PTI-02		-	-	-	84	77	
PFS-04	PTI-02		-	-	-	86	79	
PFS-05	Proposed Sewage Pumping Station	Spumps, Screens and Extraction Fans	-	-	-	89	89	Reference is made to the Project Profile of Proposed Sewage Pumping Station at Attachment 1

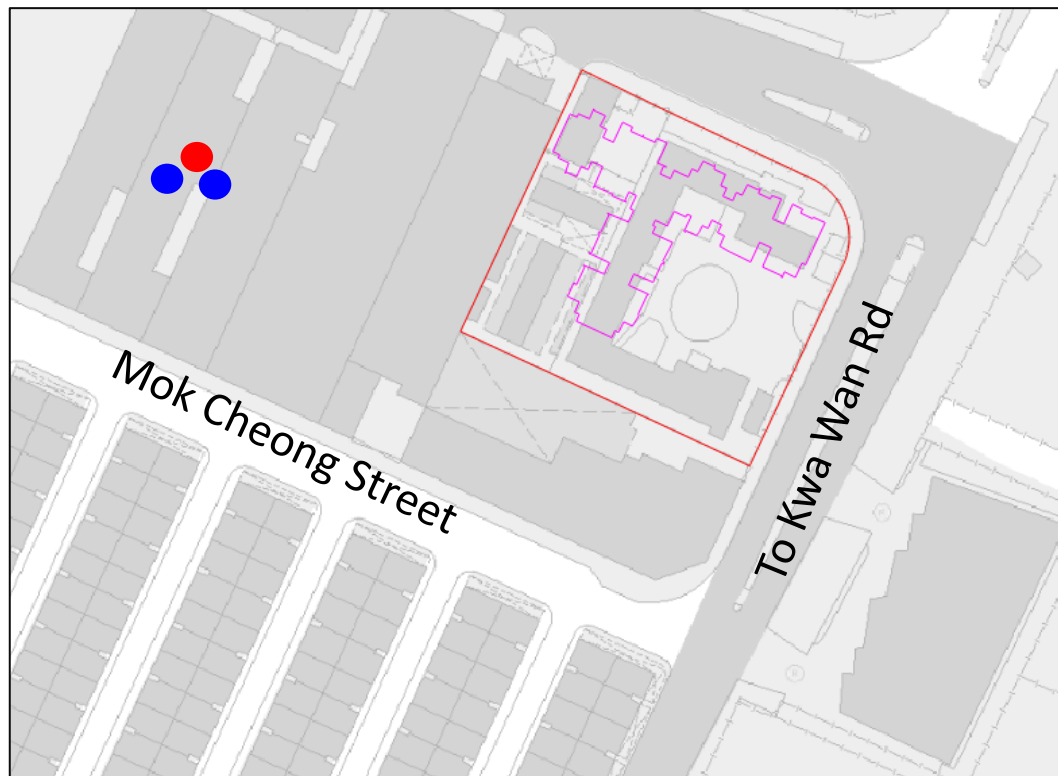
SWL source for vehicle workshop

Appendix 3.4




Noise Measurement Results for Rooftop Cooling Tower at No. 11 Mok Cheong Street



Site Measurement Results for Rooftop Cooling Tower Muk Cheong Street No. 11



Legend:

-  Noise Source
-  Measurement Point
-  Site Boundary



Measurement Date:
21 October 2022

Measurement Start Time:
16:40




Average L_{eq} measured at 1m: 74 dB(A)
Dimension of Cooling Tower: 1.8m(D) x 2.1m (H)
(Surface of measurement box of 62 sqm according to ISO3746)
SWL of Cooling Tower = $74 + 10 \cdot \log(62) = 92\text{dB(A)}$

Remark: Noise measurements were conducted with minimal interference from the nearby noise sources, e.g. road traffic noise.

Site Measurement Results for To Kwa Wan Road Sewage Pumping Station



Legend:

-  Louver with noise emission
-  Measurement Point
-  Site Boundary



Measurement Date:
21 October 2022

Measurement Start Time:
17:30

L_{eq} measured at 3m: 68 dB(A)

Remark: Noise measurements were conducted with minimal interference from the nearby noise sources, e.g. road traffic noise.

Appendix 3.5

URA's Announcement on Ming Lun Street/Ma Tau Kok Road Development Scheme and To Kwa Wan Road/Ma Tau Kok Road Development Scheme



Press Releases

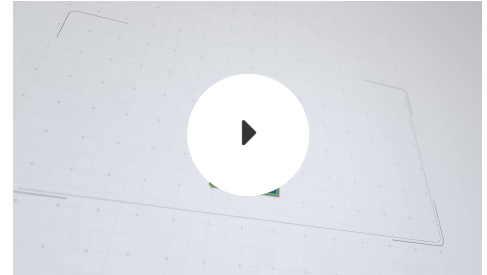
7 OCT 2022

URA Commences Two Redevelopment Projects in To Kwa Wan to Create a Vibrant Harbourfront through Effective Planning

The Urban Renewal Authority (URA) today (7 October 2022) commences the statutory planning procedures for two redevelopment projects in To Kwa Wan. By adopting a “planning-led, district-based” urban renewal approach to regenerate the built environment of the old district, a holistic plan will be formulated to restructure and re-plan the land uses of the area to improve the living environment of the residents. In the meantime, the redevelopment will also improve the connectivity of To Kwa Wan with the Kai Tak Development Area and create a vibrant harbourfront, bringing greater planning benefits to the community.

There are a large number of aged buildings in the older area of Kowloon City where residents and stakeholders have expressed their requests for a better road network, living environment and community facilities through urban renewal. The URA has taken these aspirations into consideration, and has conducted a comprehensive and holistic planning study to examine the land-use planning and renewal opportunities for the area, so as to pave way for regenerating the built environment and improving the standard of housing.

The two projects commenced in To Kwa Wan today are Ming Lun Street/Ma Tau Kok Road Development Scheme (KC-018) and To Kwa Wan Road/Ma Tau Kok Road Development Scheme (KC-019). KC-018, also known as “5 Streets”, covers buildings of about 110 street numbers. These eight-storey buildings are



Media Briefing on Commencement of Ming Lun Street/Ma Tau Kok Road Development Scheme and To Kwa Wan Road/Ma Tau Kok Road Development Scheme.



General Manager (Planning and Design) of the URA, Mr Lawrence Mak (right), and General Manager (Acquisition and Clearance) of the URA, Mr Kelvin Chung (left), announce the commencement of two redevelopment projects in To Kwa Wan.



currently occupied by about 1,400 families and 100 ground-floor shops. They are generally in the age of about 60, without elevators, and in dilapidated conditions. KC-019 covers the redevelopment of two industrial buildings. According to the relevant statutory plan, the area has been zoned for comprehensive redevelopment for residential and commercial uses with the provision of a waterfront promenade and other supporting facilities.

At the media briefing today, URA General Manager (Planning and Design), Mr Lawrence Mak, said, “The two projects will be implemented under the ‘planning-led, district-based’ approach in accordance with the objectives set out in the 2011 Urban Renewal Strategy. By incorporating ‘5 Streets’, the two industrial buildings and the adjoining underused streets in the holistic planning, opportunities to improve the local streetscape and overall living conditions can be optimised, realising an area-wide regeneration of the built environment in the old district.”

As the project sites are strategically located at the harbourfront area, the URA has incorporated the Government’s visions of enhancing the city’s harbourfront environment in its comprehensive study.

Mr Mak continued, “Through the re-planning of land use under a holistic master plan, a portion of the new buildings after redevelopment will be set back from the waterfront to create space for a waterfront promenade of about 20 metres wide. It will connect with the facilities in the Kai Tak Development Area including a dining cove, a waterfront promenade and the Kai Tak Sports Park, achieving the design objective of shaping a world-class harbourfront.”

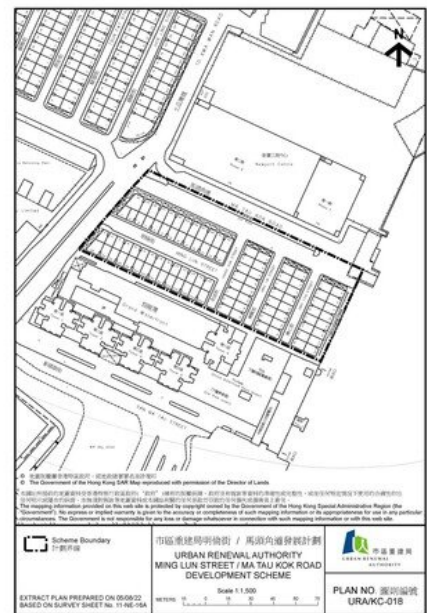
In addition, through a properly-planned building layout and design, an at-grade waterfront plaza between the residential blocks and the commercial podium will be provided. The plaza, which is at least 25 metres wide, will enhance walkability between To Kwa Wan Road and the waterfront promenade, and at the same time, provide space to accommodate on-street dining and shops, creating a pleasant atmosphere for public enjoyment.

Besides, the buildings facing To Kwa Wan Road will be set back upon completion of the projects to provide sufficient space to align with the Government’s intention to widen To Kwa Wan Road from four lanes to six, enhancing the accessibility with the Kai Tak Development Area.

Planning vision and planning gain of the two redevelopment projects in To Kwa Wan.



Existing view of Ming Lun Street/Ma Tau Kok Road Development Scheme and To Kwa Wan Road/Ma Tau Kok Road Development Scheme.



Site plan of Ming Lun Street/Ma Tau Kok Road Development Scheme

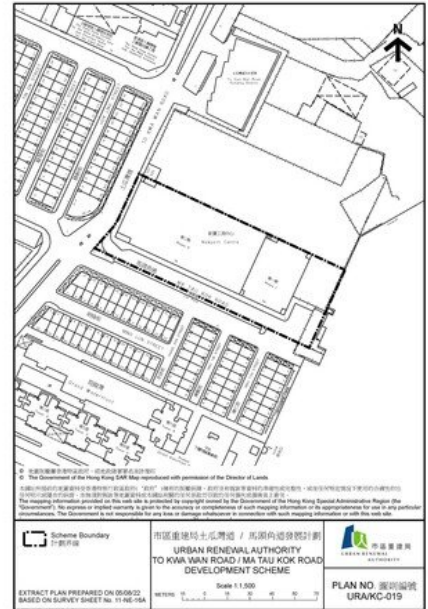
In accordance with the Urban Renewal Authority Ordinance, a URA notice announcing the commencement of KC-018 and KC-019 can be found in today's publication of the Gazette. As the implementation involves the amendment of the Outline Zoning Plan of the district, the URA will submit two draft Development Scheme Plans to the Town Planning Board (TPB) on or before 10 October 2022. All related information will be made available by TPB for public inspection. Full details are available on the notice in the Gazette.

General Manager (Acquisition and Clearance) of the URA, Mr Kelvin Chung, said that the URA would start the acquisition of property interests and make compensation/rehousing offers to eligible tenants in accordance with the policy prevailing at the time when the approval to implement KC-018 and KC-019 is granted by the Chief Executive in Council.

KC-019 is URA's third industrial building redevelopment project. Back in 2012 and 2013, the URA commenced two industrial building redevelopment pilot scheme projects in the Central and Western district and Cheung Sha Wan respectively. Having considered various factors, the URA eventually withdrew these pilot projects during the implementation periods. A major factor for the withdrawal was that a few owners and some property developers who held a certain proportion of the properties, preferred to retain them for self-use or to redevelop on their own rather than selling them to the URA.

Taking into consideration the difficulties encountered in implementing the pilot projects, the URA is reviewing the policies for the acquisition of property interest of industrial units. Meanwhile, the URA is also exploring the feasibility of introducing an alternative by allowing owner(s) who, as of the date of the commencement of KC-019, own not less than a prescribed number of properties in the project area and satisfy other criteria specified by the URA, to participate in the development, instead of receiving pecuniary compensation by selling their properties to the URA. The terms and conditions and relevant details will be provided to owners at an appropriate time.

The new initiative being explored aims to facilitate the acquisition arrangements for KC-019 so as to expedite the redevelopment of the industrial buildings under a holistic master layout plan with KC-018 for more planning benefits. As such, the measures involved, would not be applicable to other URA projects.



Site plan of To Kwa Wan Road/Ma Tau Kok Road Development Scheme

URA staff has been deployed earlier today to the site area to conduct a freezing survey to ascertain the actual number of affected residents or users, and the occupancy status of the property.

As social distancing measures are still in force, the URA will take enhanced infection control measures throughout the period of freezing survey. These measures include enabling URA interviewers to store their vaccination records as well as the negative test results of the Rapid Antigen Test taken on the date of the survey in the URA's "Health Code 4.0" application on his/her mobile phone. Such information will be shown to the occupants for verification before entering the property for the freezing survey.

Following the commencement of the two projects, the URA will conduct online video briefing sessions for affected residents on topics covering the planning procedure and the URA's prevailing acquisition and compensation arrangements.

The URA will also assign case officers to contact the affected households and business tenants to explain the acquisition policies, timeline and arrangement of the implementation, as well as the latest progress of the projects. An urban renewal social service team staffed by professional social workers of Hong Kong Lutheran Social Service has been appointed by the Urban Renewal Fund to provide relevant assistance and guidance to owners and residents in need. The contact number of the social service team is 3596 6850. Affected residents can also visit the URA Headquarters in person, call the URA's Hotline at 2588 2333 for enquiries, or visit the URA website at www.ura.org.hk for information about the projects.

Appendix: Details and Proposed Development Parameters for the Redevelopment Schemes

Project	KC-018
Project Location	Nos. 91-113 Ma Tau Kok Road (odd numbers), Nos. 1-28A Ming Lun Street, Nos. 1-15 Chung Sun Street (odd numbers), Nos. 1-16 Hing Yin Street, Nos. 1-17 Hing Yan Street, and Nos. 19-31

	Hing Yan Street (odd numbers), involving about 100 street numbers
Project Area	About 11,430 square metres
Number of Affected Property Interests*	About 820
Number of Affected Households/Users	About 1,410 households
Number of Affected Ground Floor shops	About 100

Proposed Development Contents **

Total Gross Floor Area	About 79,720 square metres
Domestic Floor Area	About 68,220 square metres
Number of residential flats (small-to-medium sized flats)	About 1,280

Non-domestic Gross Floor Area	About 10,500 square metres
Government, Institution and Community Facilities	About 1,000 square metres
Affiliated Underground Parking (for private cars)	About 430
Estimated Completion Year	2033



*Subject to the results of the freezing survey

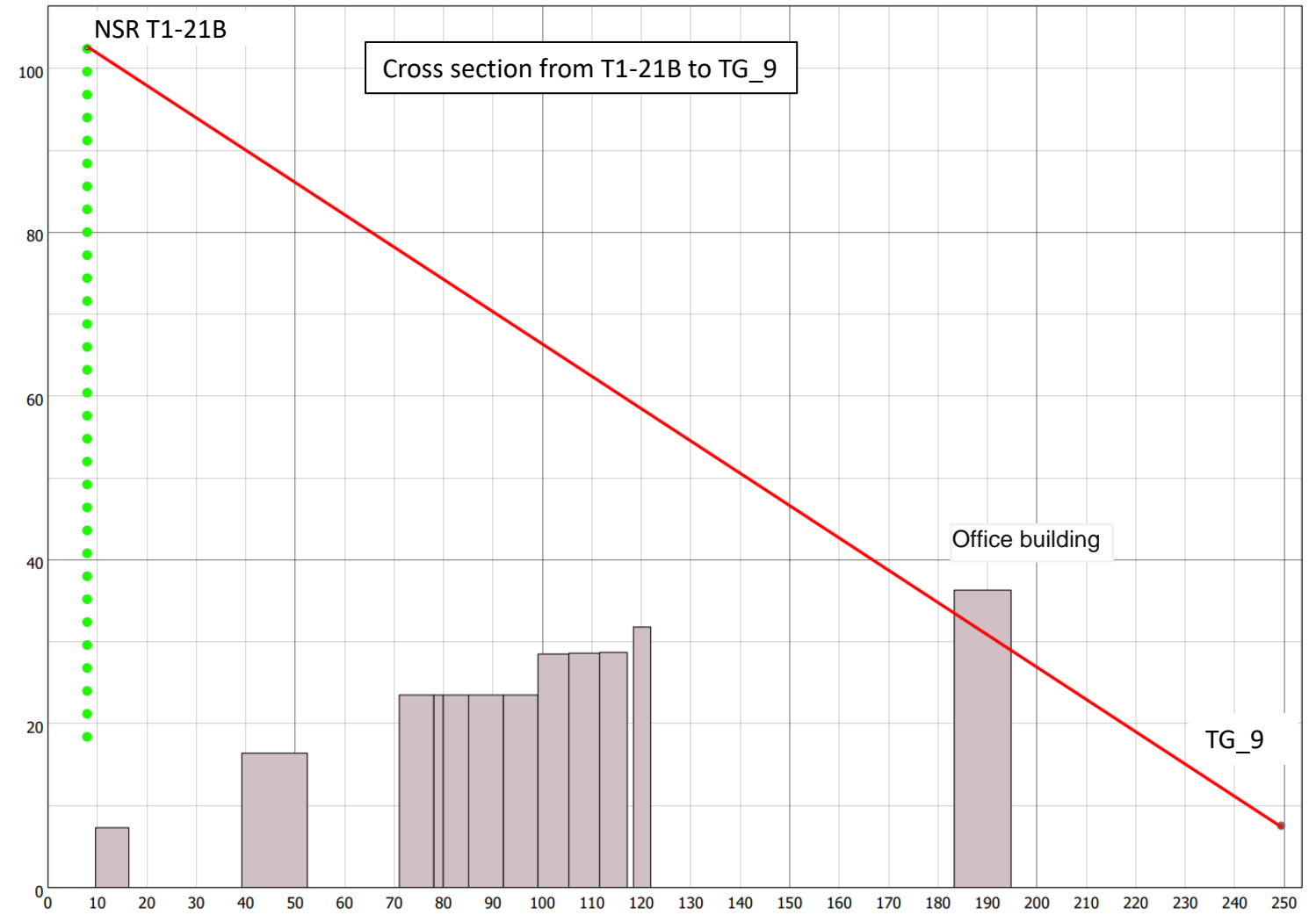
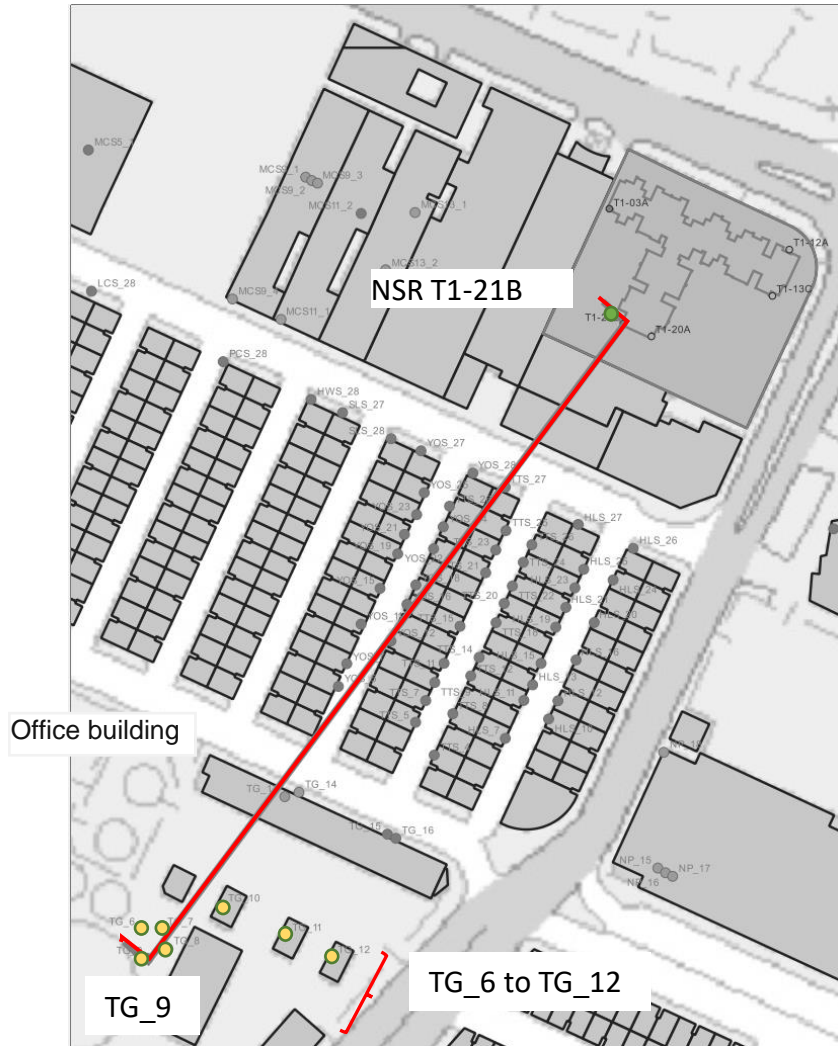
**Subject to future detailed design

Appendix 3.6

Sightline Analysis for Noise Sources at Towngas Ma
Tau Kok Gas Works



Line of sight from worstcase noise source and NSR Location (NSR T1-21B to TG_9)



No line of sight at worst case noise source and NSR locations, therefore, there is no line of sight from all NSRs to noise sources TG_6 to TG_12

Appendix 3.7

Reference Catalogue for Chiller and Cooling Tower at
Towngas Ma Tau Kok Gas Works



Manufacturer catalogues of Chiller

30RBM/30RBP

Nominal cooling capacity 164-528 kW



COOLING



High full and part-load efficiency

Compact and simple to install

Low sound level

Very low refrigerant charge

Superior reliability

The AquaSnap liquid chillers are the best value solution for commercial and industrial applications where installers, consultants and building owners require reduced installed costs, optimal performances and maximum quality.

The new generation AquaSnap features two new versions:

- The AquaSnap (30RBM) version features a compact all-in-one package optimised for full-load applications where reduced investment cost (low Capex) is required. For cold or hot climates, the AquaSnap can be equipped with specific options to operate from -20 °C up to 52 °C.
- The AquaSnap Greenspeed® (30RBP) version features a compact all-in-one package optimised for part-load applications where high ESEER/IPLV are required. The AquaSnap Greenspeed® equipped with variable speed condenser fans and variable speed pump provides premium part load efficiency to reduce utility costs over the lifespan of the chiller. Additionally, the low sounds levels achieved at part load conditions can be very beneficial for sensitive acoustic applications. Besides operating efficiently and quietly, AquaSnap Greenspeed® operates from -20 °C up to 48 °C as standard.

The AquaSnap liquid chillers are designed to meet current and future Ecodesign and F-Gas European regulation requirements in terms of energy efficiency and reduced CO₂ emissions. They use the best technologies available today:

- Reduced refrigerant charge of non-ozone depleting refrigerant R-410A
- Scroll compressors
- Greenspeed® variable-speed driven fans (30RBP models)
- Novation® micro-channel heat exchangers with new aluminum alloy

AIR-COOLED SCROLL CHILLERS WITH GREENSPEED® INTELLIGENCE 30RBM/30RBP 160-520

- Brazed plate heat exchangers with reduced water pressure drops
- Auto-adaptive microprocessor control with Greenspeed® intelligence
- Touch Pilot control with web connectivity possibilities and colour touch screen user display
- Extra energy savings through multiple options: Direct-expansion free cooling system on one or two circuits, hydronic free-cooling system, partial or total heat recovery.

chilled water supply and return piping (plug & play), within the dimensions of the standard unit.

Recommended by Carrier, the AquaSnap can be equipped with one or two Greenspeed® variable-speed pumps to save significant pumping energy cost (more than two-thirds), ensure tighter water flow control, and improved overall system reliability.

Both AquaSnap versions can be equipped with an integrated hydronic module, limiting the installation to straight-forward operations like connection of the power supply and the

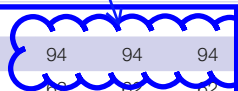
For operation in the most stringent environments that cumulates high temperature, dusts and sand, the AquaSnap (30RBM) can be equipped with optional IP54 electrical box and cabinet fan to operate up to 52 °C outside air temperature.



Physical data

30RBM		160	180	200	220	260	300	330	360	400	430	470	520	
Cooling														
Air conditioning application as per EN14511-3:2013† - standard unit														
Nominal cooling capacity	kW	168	181	198	216	261	300	331	365	397	430	464	523	
ESEER	kW/kW	4.00	4.07	4.01	4.00	4.00	4.07	4.08	4.10	4.05	4.07	4.04	4.03	
EER	kW/kW	3.04	3.12	2.98	2.97	2.90	2.97	2.92	2.95	2.90	2.94	2.90	2.90	
Eurovent class cooling		B	A	B	B	B	B	B	B	B	B	B	B	
Air conditioning application††- standard unit														
Nominal cooling capacity	kW	168	182	199	216	262	301	331	366	398	431	465	524	
ESEER	kW/kW	4.12	4.20	4.16	4.17	4.16	4.20	4.19	4.24	4.17	4.19	4.17	4.17	
EER	kW/kW	3.07	3.16	3.02	3.01	2.93	3.00	2.94	2.98	2.93	2.97	2.93	2.93	
IPLV	kW/kW	4.57	4.57	4.54	4.51	4.50	4.61	4.61	4.69	4.58	4.62	4.55	4.58	
Sound levels														
Standard unit														
Sound power level***	dB(A)	91	92	92	92	92	93	93	93	93	94	94	94	
Sound pressure level at 10 m****	dB(A)	59	60	60	60	60	60	60	61	61	62	62	62	
Standard unit + option 15*														
Sound power level***	dB(A)	89	90	90	90	90	91	91	92	92	93	93	93	
Sound pressure level at 10 m****	dB(A)	57	58	58	58	58	59	59	60	60	61	61	61	
Standard unit + option 15LS*														
Sound power level***	dB(A)	85	85	85	86	86	86	86	87	87	88	88	88	
Sound pressure level at 10 m****	dB(A)	53	53	53	54	54	54	54	55	55	55	55	56	
Dimensions - standard unit														
Length	mm	2410					3604				4797			
Width	mm	2253					2253				2253			
Height	mm	2297					2297				2297			
Operating Weight **														
Standard unit	kg	1216	1257	1257	1387	1408	1865	1901	2069	2125	2545	2563	2761	
Standard unit + option 15*	kg	1299	1339	1340	1495	1516	1991	2027	2212	2269	2707	2726	2941	
Standard unit + option 15 + option 116S*	kg	1438	1479	1479	1634	1670	2151	2231	2416	2472	2950	2967	3221	

SWL of 94 dB(A) is adopted as the worst case scenario



† Eurovent-certified performances in accordance with standard EN14511-3:2013.
Cooling mode conditions: Evaporator water entering/leaving temperature 12 °C/7 °C, outside air temperature 35 °C. Evaporator fouling factor 0.00 m². kW/W
†† Gross performances, not in accordance with EN14511-3:2013. These performances do not take into account the correction for the proportional heating capacity and power input generated by the water pump to overcome the internal pressure drop in the heat exchanger. Evaporator water entering/leaving temperature 12 °C/7 °C, outside air temperature 35 °C. evaporator fouling factor 0.00 m². kW/W
* Options: 15 = Low noise level, 15LS = Very low noise level, 116S = High Pressure dual-pump hydronic module
** Weights are guidelines only. Refer to the unit nameplate.
*** In dB ref=10⁻¹² W, (A) weighting. Declared dualnumber noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3 dB(A)). Measured in accordance with ISO 9614-1 and certified by Eurovent.
**** In dB ref 20 µPa, (A) weighting. Declared dualnumber noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3 dB(A)). For information, calculated from the sound power level Lw(A).

Eurovent certified data

Physical data

30RBM		160	180	200	220	260	300	330	360	400	430	470	520
Compressors		Hermetic scroll 48.3 tr/s											
Circuit A		1	1	1	2	2	2	2	3	3	3	3	4
Circuit B		2	2	2	2	2	3	3	3	3	4	4	4
No. of control stages		3	3	3	4	4	5	5	6	6	7	7	8
Refrigerant** - Standard unit		R410A											
Circuit A	kg	8.40	10.90	10.90	12.60	13.10	14.70	15.40	20.30	21.10	23.50	23.50	26.75
	teqCO ₂	17.5	22.8	22.8	26.3	27.4	30.7	32.2	42.4	44.1	49.1	49.1	55.9
Circuit B	kg	12.25	12.60	12.60	12.70	13.10	20.20	20.20	20.40	22.20	26.70	26.80	26.95
	teqCO ₂	25.6	26.3	26.3	26.5	27.4	42.2	42.2	42.6	46.4	55.7	56.0	56.3
Capacity control		Pro-Dialog+ Control											
Minimum capacity	%	33	33	33	25	25	20	20	17	17	14	14	13
Condensers		All-aluminium micro-channel heat exchanger (MCHE)											
Fans - Standard unit		Axial Flying Bird 4 with rotating shroud											
Quantity		3	4	4	4	4	5	5	6	6	7	7	8
Maximum total air flow	l/s	13542	18056	18056	18056	18056	22569	22569	27083	27083	31597	31597	36111
Maximum rotation speed	tr/s	16	16	16	16	16	16	16	16	16	16	16	16
Evaporator		Twin-circuit plate heat exchanger											
Water content	l	15	15	15	15	19	27	35	33	42	44	47	53
Max. water-side operating pressure without hydronic module	kPa	3200	3200	3200	3200	3200	3200	3200	3200	3200	3200	3200	3200
Hydronic Module (option)		Pump, Victaulic screen filter, safety valve, water valve and air purge, pressure sensors, expansion tank (option)											
Pump		Centrifugal, monocell, 48.3 r/s, low or high pressure (as required), single or dual pump (as required)											
Expansion tank volume	l	50	50	50	50	50	80	80	80	80	80	80	80
Max. water-side operating pressure with hydronic module	kPa	400	400	400	400	400	400	400	400	400	400	400	400
Water connections with or without hydronic module		Victaulic type											
Diameter	inch	3	3	3	3	3	4	4	4	4	4	4	4
Outside tube diameter	mm	88.9	88.9	88.9	88.9	88.9	114.3	114.3	114.3	114.3	114.3	114.3	114.3
Chassis paint colour		Colour code RAL 7035											

† Eurovent-certified performances in accordance with standard EN14511-3:2013.

Cooling mode conditions: Evaporator water entering/leaving temperature 12 °C/7 °C, outside air temperature 35 °C. Evaporator fouling factor 0.00 m². kW

†† Gross performances, not in accordance with EN14511-3:2013. These performances do not take into account the correction for the proportional heating capacity and power input generated by the water pump to overcome the internal pressure drop in the heat exchanger. Evaporator water entering/leaving temperature 12 °C/7 °C, outside air temperature 35 °C. evaporator fouling factor 0.00 m². kW

* Options: 15 = Low noise level, 15LS = Very low noise level, 116S = High Pressure dual-pump hydronic module

** Weights are guidelines only. Refer to the unit nameplate.

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

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

Eurovent certified data

Physical data



30RBP 160 180 200 220 260 300 330 360 400 430 470 520

Cooling

Air conditioning application as per EN14511-3:2013† - standard unit

Nominal cooling capacity	kW	168	180	197	216	261	300	331	365	397	430	464	523
ESEER	kW/kW	4.18	4.21	4.14	4.18	4.15	4.37	4.28	4.37	4.26	4.36	4.44	4.30
EER	kW/kW	3.04	3.12	2.98	2.97	2.90	2.97	2.92	2.95	2.90	2.94	2.90	2.90
Eurovent class cooling		B	A	B	B	B	B	B	B	B	B	B	B

Air conditioning application††- standard unit

Nominal cooling capacity	kW	168	181	198	216	262	301	331	366	398	431	465	524
ESEER	kW/kW	4.31	4.36	4.29	4.37	4.32	4.53	4.41	4.53	4.39	4.50	4.60	4.48
EER	kW/kW	3.07	3.16	3.03	3.01	2.93	3.00	2.94	2.98	2.93	2.97	2.93	2.93
IPLV	kW/kW	4.76	4.85	4.73	4.85	4.75	5.00	4.83	5.00	4.81	4.92	5.00	4.84

Sound levels

Standard unit

Sound power level***	dB(A)	91	92	92	92	92	93	93	93	93	94	94	94
Sound pressure level at 10 m****	dB(A)	59	60	60	60	60	60	60	61	61	62	62	62

Standard unit + option 15*

Sound power level***	dB(A)	89	90	90	90	90	91	91	92	92	93	93	93
Sound pressure level at 10 m****	dB(A)	57	58	58	58	58	59	59	60	60	61	61	61

Standard unit + option 15LS*

Sound power level***	dB(A)	85	85	85	86	86	86	86	87	87	88	88	88
Sound pressure level at 10 m****	dB(A)	53	53	53	54	54	54	54	55	55	55	55	56

Dimensions - standard unit

Length	mm	2410					3604					4797	
Width	mm	2253					2253					2253	
Height	mm	2297					2297					2297	

Operating Weight **

Standard unit	kg	1252	1293	1293	1423	1445	1901	1937	2105	2162	2603	2621	2827
Standard unit + option 15*	kg	1334	1376	1376	1531	1553	2027	2063	2249	2306	2765	2783	3007
Standard unit + option 15 + option 116S*	kg	1473	1515	1516	1670	1707	2187	2267	2452	2509	3007	3024	3287

Compressors

Hermetic scroll 48.3 tr/s

Circuit A		1	1	1	2	2	2	2	3	3	3	3	4
Circuit B		2	2	2	2	2	3	3	3	3	4	4	4
No. of control stages		3	3	3	4	4	5	5	6	6	7	7	8

Refrigerant** - Standard unit

R410A

Circuit A	kg	8.40	10.90	10.90	12.60	13.10	14.70	15.40	20.30	21.10	23.50	23.50	26.75
	teqCO ₂	17.5	22.8	22.8	26.3	27.4	30.7	32.2	42.4	44.1	49.1	49.1	55.9
Circuit B	kg	12.25	12.60	12.60	12.70	13.10	20.20	20.20	20.40	22.20	26.70	26.80	26.95
	teqCO ₂	25.6	26.3	26.3	26.5	27.4	42.2	42.2	42.6	46.4	55.7	56.0	56.3

Capacity control

Pro-Dialog+ Control

Minimum capacity	%	33	33	33	25	25	20	20	17	17	14	14	13
------------------	---	----	----	----	----	----	----	----	----	----	----	----	----

Condensers

All-aluminium micro-channel heat exchanger (MCHE)

† Eurovent-certified performances in accordance with standard EN14511-3:2013.

†† Cooling mode conditions: Evaporator water entering/leaving temperature 12 °C/7 °C, outside air temperature 35 °C. Evaporator fouling factor 0.00 m². kW

††† Gross performances, not in accordance with EN14511-3:2013. These performances do not take into account the correction for the proportional heating capacity and power input generated by the water pump to overcome the internal pressure drop in the heat exchanger. Evaporator water entering/leaving temperature 12 °C/7 °C, outside air temperature 35 °C. evaporator fouling factor 0.00 m². kW

* Options: 15 = Low noise level, 15LS = Very low noise level, 116S = High Pressure dual-pump hydronic module

** Weights are guidelines only. Refer to the unit nameplate.

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

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

Eurovent certified data

Physical data

30RBP		160	180	200	220	260	300	330	360	400	430	470	520
Fans - Standard unit		Axial Flying Bird 4 with rotating shroud											
Quantity		3	4	4	4	4	5	5	6	6	7	7	8
Maximum total air flow	l/s	13542	18056	18056	18056	18056	22569	22569	27083	27083	31597	31597	36111
Maximum rotation speed	tr/s	16	16	16	16	16	16	16	16	16	16	16	16
Evaporator		Twin-circuit plate heat exchanger											
Water content	l	15	15	15	15	19	27	35	33	42	44	47	53
Max. water-side operating pressure without hydronic module	kPa	3200	3200	3200	3200	3200	3200	3200	3200	3200	3200	3200	3200
Hydronic Module (option)		Pump, Victaulic screen filter, safety valve, water valve and air purge, pressure sensors, expansion tank (option)											
Pump		Centrifugal, monocell, 48.3 r/s, low or high pressure (as required), single or dual pump (as required)											
Expansion tank volume	l	50	50	50	50	50	80	80	80	80	80	80	80
Max. water-side operating pressure with hydronic module	kPa	400	400	400	400	400	400	400	400	400	400	400	400
Water connections with or without hydronic module		Victaulic type											
Diameter	inch	3	3	3	3	3	4	4	4	4	4	4	4
Outside tube diameter	mm	88.9	88.9	88.9	88.9	88.9	114.3	114.3	114.3	114.3	114.3	114.3	114.3
Chassis paint colour		Colour code RAL 7035											

† Eurovent-certified performances in accordance with standard EN14511-3:2013.

Cooling mode conditions: Evaporator water entering/leaving temperature 12 °C/7 °C, outside air temperature 35 °C. Evaporator fouling factor 0.00 m². kW

†† Gross performances, not in accordance with EN14511-3:2013. These performances do not take into account the correction for the proportional heating capacity and power input generated by the water pump to overcome the internal pressure drop in the heat exchanger. Evaporator water entering/leaving temperature 12 °C/7 °C, outside air temperature 35 °C. evaporator fouling factor 0.00 m². kW

* Options: 15 = Low noise level, 15LS = Very low noise level, 116S = High Pressure dual-pump hydronic module

** Weights are guidelines only. Refer to the unit nameplate.

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

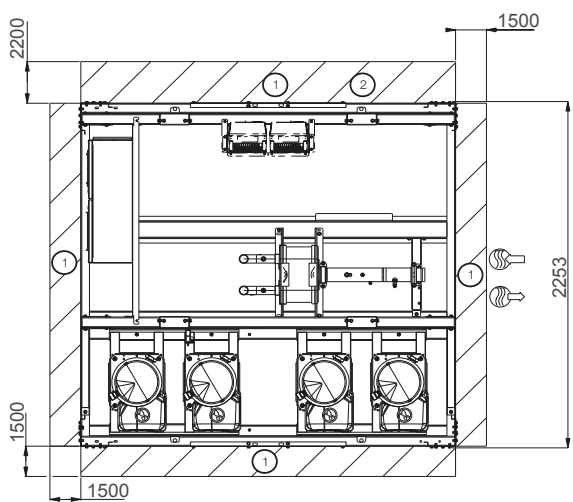
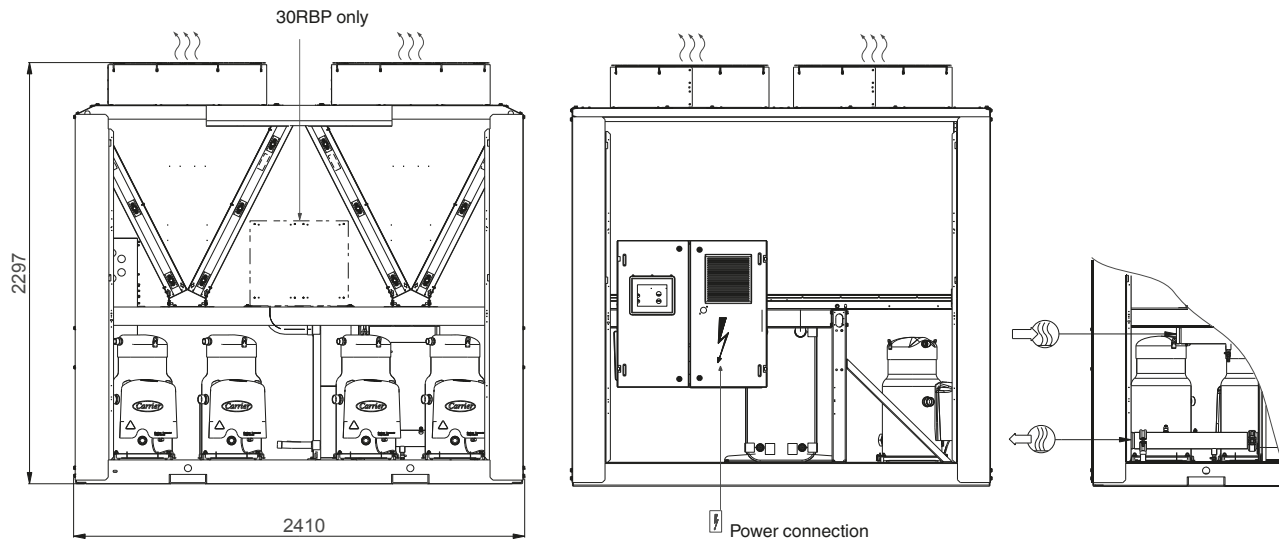
**** In dB ref 20 µPa, (A) weighting. Declared dualnumber noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3 dB(A)). For information, calculated from the sound power level Lw(A).

Eurovent certified data

Dimensions/clearances

30RBM/30RBP 160-260 (with and without hydronic module)

Unit without hydronic module

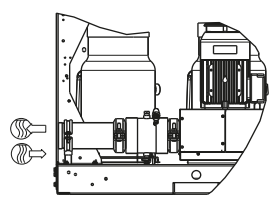
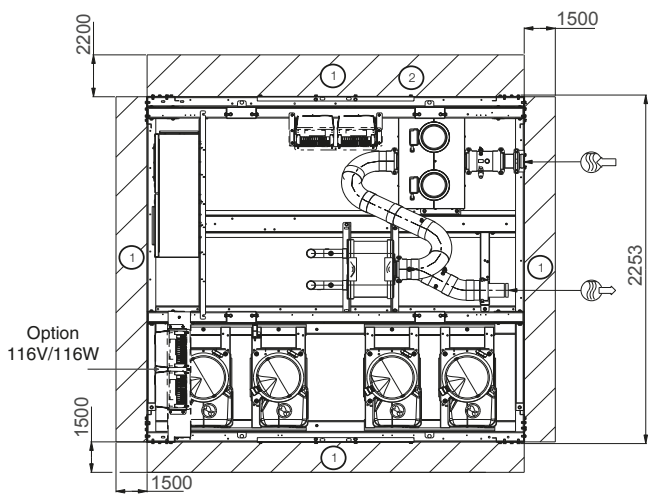


- Legend:**
All dimensions are in mm.
- ① Clearances required for maintenance and air flow
 - ② Clearances required for removal of coil
 - Water inlet
 - Water outlet
 - Air outlet, do not obstruct
 - Control box

Note: Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings, available on request.

For the positioning of the fixing points, weight distribution points and centre of gravity coordinates please refer to the dimensional drawings.

Unit with hydronic module





RYOWO (HOLDING) CO., LTD

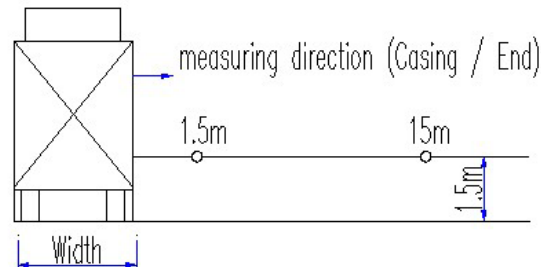
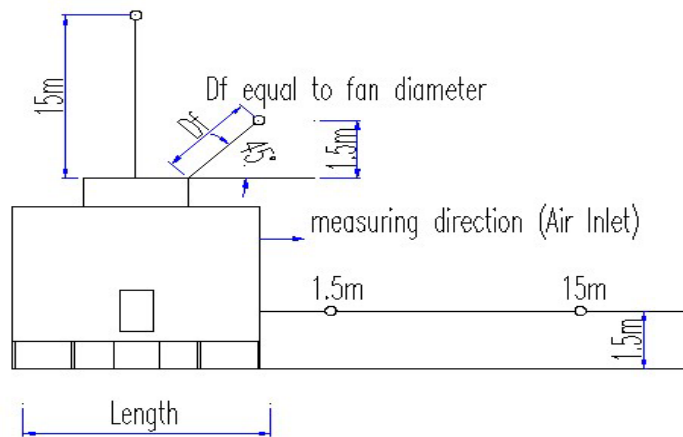
Rm.1218,Argyle Centre 1,688 Nathan Road,Mongkok,Kowloon,Hong Kong.
 Tel: (852) 2391-8381/5 Fax: (852) 2789-3802
 www.ryowo.com ryinfo@ryowo.com

APRIL 2008



SOUND DATA SHEET FOR COOLING TOWER

Product Line: FWS Series / CTI STD-201 Certified
Model: FWS-700-37
Number of Fans: ONE
Fan Motor Power: 37 kW
Number of Motors: ONE



Octave Band Hz	Sound Pressure Level (SPL), dBA										Sound Power Level (PWL) dBA
	Air Inlet		End		Air Inlet		End		Over Head		
	1.5m	15m	1.5m	15m	1.5m	15m	1.5m	15m	1.5m	15m	
63	54	41	49	40	54	41	49	40	54	44	73
125	66	51	58	45	66	51	58	45	65	56	83
250	74	58	65	53	74	58	65	53	71	60	89
500	71	62	63	55	71	62	63	55	73	62	92
1K	69	59	62	54	69	59	62	54	74	61	90
2K	66	53	55	45	66	53	55	45	68	56	84
4K	60	47	48	41	60	47	48	41	65	54	80
8K	56	43	55	35	56	43	55	35	60	47	74
dBA	77	65	69	59	77	65	69	59	79	67	96

Notes:

- 1/ The effects of multiple cell units and sound attenuating accessories are excluded in the sound data.
- 2/ Data developed in accordance with Cooling Technology Institute (CTI) ATC-128 for small towers.

The SWL of 96 dB(A) is adopted as the SWL of the cooling towers of Towngas Ma Tau Kok Gas Works

Appendix 3.8




Site Measurement Results for To Kwa Wan Sewage Pumping Station



Site Measurement Results for To Kwa Wan Road Sewage Pumping Station



Legend:

-  Louver with noise emission
-  Measurement Point
-  Site Boundary



Measurement Date:
21 October 2022

Measurement Start Time:
17:34

L_{eq} measured at 3m: 68 dB(A)

Remark: Noise measurements were conducted with minimal interference from the nearby noise sources, e.g. road traffic noise.

Appendix 3.9

Correspondence with Fixed Noise Sources Owners



From: [REDACTED]@dsd.gov.hk
Sent: 06 October 2022 14:31
To: [REDACTED]
Cc: [REDACTED]; [REDACTED]@dsd.gov.hk; [REDACTED]@dsd.gov.hk
Subject: Re: [Internet]Request for Information -Fixed Plant Operation Details of To Kwa Wan Road Pumping Station

Dear [REDACTED]

Please be advised that the previously provided information is still valid.

Best Regards,

[REDACTED]
[REDACTED], DSD
Office: [REDACTED]
Mobile: [REDACTED]



From: [REDACTED] <[REDACTED]@atkinsglobal.com>
To: [REDACTED]@dsd.gov.hk <[REDACTED]@dsd.gov.hk>
Cc: [REDACTED] <[REDACTED]@atkinsglobal.com>, [REDACTED]@dsd.gov.hk <[REDACTED]@dsd.gov.hk>, [REDACTED]@dsd.gov.hk <[REDACTED]@dsd.gov.hk>
Date: 06/10/2022 11:54
Subject: [Internet]Request for Information -Fixed Plant Operation Details of To Kwa Wan Road Pumping Station
Serial No.:

=====
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You are advised not to click the URLs or open the attachment unless you know i

This email has been verified against its claimed domain and passed. The identi
email domain may be true, but it doesn't mean it is from the claimed sender ar
=====

**HKHA Environmental Assessment Study for a Proposed Development at To Kwa Wan Road
Request for Information: Fixed Plant Operation Details of To Kwa Wan Road Pumping
Station**

Dear [REDACTED]

Since we are updating the Environmental Assessment for the site at To Kwa Wan Road , we would like to confirm
the validity of below fixed plant information for To Kwa Wan Pumping Station which was obtained in Year

2020. Location plan (Appendix 1) showing our proposed development site and To Kwa Wan Road Pumping Station is attached for your easy reference.

Grateful if you could advise us whether the details as shown below and the information in the attached email are still valid.

Information is provided as follows:

- 1. The number and location of pump set(s) within the station; Total 4 nos. of main pump (3 duty + 1 standby) installed at basement dry well.*
- 2. The model and specification (e.g. rmp and horsepower) if possible; and,*
- 3. Operation schedule of the pump set(s), i.e. daily and weekly operation hours. The pumps are operated by auto mode subject to water level at wet well without operation schedule.*

Please also find attached appointment letter issued by Hong Kong Housing Authority (Appendix 2) for your reference.

Should you have any questions regarding the above, please do not hesitate to me on [REDACTED] [REDACTED]@atkinglobal.com or Mr [REDACTED] [REDACTED]@atkinglobal.com on [REDACTED]. It would be highly appreciated if you can provide the required information by 13 October 2022 if possible. Thank you for your kind assistance.

Best Regards,

[REDACTED]
Atkins China Ltd.

Tel: [REDACTED]

13/F Wharf T&T Centre, Harbour City, Tsim Sha Tsui, Kowloon, Hong Kong

From: [REDACTED]@dsd.gov.hk [REDACTED]@dsd.gov.hk>

Sent: 03 September 2020 09:50

To: [REDACTED] <[REDACTED]@atkinglobal.com>

Cc: [REDACTED]@dsd.gov.hk; [REDACTED]@dsd.gov.hk

Subject: RE: Request for Information - Pumping Operation Details of To Kwa Wan Road Pumping Station

Dear [REDACTED]

Information is provided as follows:

- 1. The number and location of pump set(s) within the station; Total 4 nos. of main pump (3 duty + 1 standby) installed at basement dry well.*
- 2. The model and specification (e.g. rmp and horsepower) if possible; and,*
- 3. Operation schedule of the pump set(s), i.e. daily and weekly operation hours. The pumps are operated by auto mode subject to water level at wet well without operation schedule.*

Best Regards,

[REDACTED]
[REDACTED] DSD

Office: [REDACTED]

Mobile: [REDACTED]

From: [REDACTED] <[REDACTED]@atkinglobal.com>
To: [REDACTED] <[REDACTED]@dsd.gov.hk> <[REDACTED]@dsd.gov.hk>
Cc: [REDACTED] <[REDACTED]@dsd.gov.hk>, [REDACTED] <[REDACTED]@atkinglobal.com>, [REDACTED] <[REDACTED]@atkinglobal.com>, "Tse, Pandora" <[REDACTED]@atkinglobal.com>
Date: 31/08/2020 12:35
Subject: RE: Request for Information - Pumping Operation Details of To Kwa Wan Road Pumping Station
Serial No.:

Dear Mr. [REDACTED]

**HKHA Technical Study for a Proposed Development in To Kwa Wan
Request for Information: Pumping Operation Details of To Kwa Wan Road Pumping Station**

Atkins China Limited has been appointed by the Hong Kong Housing Authority (HKHA) to undertake a technical study for a proposed development at To Kwa Wan. The letter of Appointment of Consultant for the captioned Assignment issued by HKHA is attached for your information.

Based on our desktop studies and site observations, pumping operation has been identified at the To Kwa Wan Road Pumping Station. Location plan is attached for your easy reference. We would like to obtain the following information regarding the operation for our technical study that aims to assess the noise impact on the future users of the proposed development:

1. The number and location of pump set(s) within the station;
2. The model and specification (e.g. rmp and horsepower) if possible; and,
3. Operation schedule of the pump set(s), i.e. daily and weekly operation hours.

Should you have any questions regarding the above, please do not hesitate to contact Mr. [REDACTED] of the Assistant Consultant ([REDACTED]@atkinglobal.com) or Mr. [REDACTED] of the Consultant ([REDACTED]@atkinglobal.com). We look forward to your prompt reply. Thank you for your kind assistance.

Best Regards,

Assistant Environmental Consultant, Design Engineering Services
Hong Kong, Asia Pacific
Engineering, Design and Project Management

+852

13/F Wharf T&T Centre, Harbour City, Tsim Sha Tsui, Kowloon, Hong Kong

Company

From: <>@dsd.gov.hk <>@dsd.gov.hk>
Sent: Thursday, August 27, 2020 10:09 AM
To: <>@atkinglobal.com>
Subject: Re: Request for Information - Pumping Operation Details of To Kwa Wan Road Pumping Station

Dear Mr. <>

Please contact Mr. <> (E-mail : <>@dsd.gov.hk) for your request.

Regards,

<>

<>

<> Mobile: <>



From: <>@atkinglobal.com>
To: <>@dsd.gov.hk" <>@dsd.gov.hk>
Cc: <>@atkinglobal.com>, <>g" <>@atkinglobal.com>, <>
<>@atkinglobal.com>

Dear Sirs/Madams,

**HKHA Technical Study for a Proposed Development in To Kwa Wan
Request for Information: Pumping Operation Details of To Kwa Wan Road Pumping Station**

Atkins China Limited has been appointed by the Hong Kong Housing Authority (HKHA) to undertake a technical study for a proposed development at To Kwa Wan. The letter of Appointment of Consultant for the captioned Assignment issued by HKHA is attached for your information.

Based on our desktop studies and site observations, pumping operation has been identified at the To Kwa Wan Road Pumping Station. Location plan is attached for your easy reference. We would like to obtain the following information regarding the operation for our technical study that aims to assess the noise impact on the future users of the proposed development:

1. The number and location of pump set(s) within the station;
2. The model and specification (e.g. rmp and horsepower) if possible; and,
3. Operation schedule of the pump set(s), i.e. daily and weekly operation hours.

Should you have any questions regarding the above, please do not hesitate to contact Mr. [REDACTED] of the Assistant Consultant ([REDACTED]@atkinsglobal.com) or Mr. [REDACTED] of the Consultant ([REDACTED]@atkinsglobal.com). We look forward to your prompt reply. Thank you for your kind assistance.

Best Regards,

[REDACTED]
Assistant Environmental Consultant, Design Engineering Services
Hong Kong, Asia Pacific
Engineering, Design and Project Management

+852 [REDACTED]

13/F Wharf T&T Centre, Harbour City, Tsim Sha Tsui, Kowloon, Hong Kong

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=====
This message has been analyzed by Deep Discovery Email Inspector.

----- Message from "[REDACTED]@dsd.gov.hk" <[REDACTED]@dsd.gov.hk> on Thu, 3 Sep 2020 01:49:33 +0000 -

To: "[REDACTED]" <[REDACTED]@atkinglobal.com>

cc: "[REDACTED]@dsd.gov.hk" <[REDACTED]@dsd.gov.hk>, "[REDACTED]@dsd.gov.hk" <[REDACTED]@dsd.gov.hk>

Subject: RE: Request for Information - Pumping Operation Details of To Kwa Wan Road Pumping Station

Dear [REDACTED]

Information is provided as follows:

1. The number and location of pump set(s) within the station; **Total 4 nos. of main pump (3 duty + 1 standby) installed at basement dry well.**
2. The model and specification (e.g. rmp and horsepower) if possible; and,
3. Operation schedule of the pump set(s), i.e. daily and weekly operation hours. **The pumps are operated by auto mode subject to water level at wet well without operation schedule.**

Best Regards,

[REDACTED]

[REDACTED] DSD

Office: [REDACTED]

Mobile: [REDACTED]



From: [REDACTED] <[REDACTED]@atkinglobal.com>

To: [REDACTED]@dsd.gov.hk" <[REDACTED]@dsd.gov.hk>

Cc: [REDACTED]@dsd.gov.hk" <[REDACTED]@dsd.gov.hk>, [REDACTED] <[REDACTED]@atkinglobal.com>, [REDACTED] <[REDACTED]@atkinglobal.com>, [REDACTED] <[REDACTED]@atkinglobal.com>

Date: 31/08/2020 12:35

Subject: RE: Request for Information - Pumping Operation Details of To Kwa Wan Road Pumping Station

Serial No.:

Dear Mr. [REDACTED]

HKHA Technical Study for a Proposed Development in To Kwa Wan Request for Information: Pumping Operation Details of To Kwa Wan Road Pumping Station

Atkins China Limited has been appointed by the Hong Kong Housing Authority (HKHA) to undertake a technical study for a proposed development at To Kwa Wan. The letter of Appointment of Consultant for the captioned Assignment issued by HKHA is attached for your information.

Based on our desktop studies and site observations, pumping operation has been identified at the To Kwa Wan Road Pumping Station. Location plan is attached for your easy reference. We would like to obtain the following information regarding the operation for our technical study that aims to assess the noise impact on the future users of the proposed development:

1. The number and location of pump set(s) within the station;
2. The model and specification (e.g. rmp and horsepower) if possible; and,
3. Operation schedule of the pump set(s), i.e. daily and weekly operation hours.

Should you have any questions regarding the above, please do not hesitate to contact Mr. [REDACTED] of the Assistant Consultant ([REDACTED] [REDACTED] [@atkinsglobal.com](mailto:[REDACTED]@atkinsglobal.com)) or Mr. [REDACTED] of the Consultant ([REDACTED] [REDACTED] [@atkinsglobal.com](mailto:[REDACTED]@atkinsglobal.com)). We look forward to your prompt reply. Thank you for your kind assistance.

Best Regards,

[REDACTED]
Assistant Environmental Consultant, Design Engineering Services
Hong Kong, Asia Pacific
Engineering, Design and Project Management

+852 [REDACTED]

13/F Wharf T&T Centre, Harbour City, Tsim Sha Tsui, Kowloon, Hong Kong

Company

From: [REDACTED]@dsd.gov.hk <[REDACTED]@dsd.gov.hk>
Sent: Thursday, August 27, 2020 10:09 AM
To: [REDACTED] <[REDACTED]@atkinsglobal.com>
Subject: Re: Request for Information - Pumping Operation Details of To Kwa Wan Road Pumping Station

Dear Mr. [REDACTED]

Please contact Mr. [REDACTED] (E-mail : [REDACTED] [@dsd.gov.hk](mailto:[REDACTED]@dsd.gov.hk)) for your request.

Regards,

[REDACTED]

[REDACTED]

Tel.: [REDACTED] Mobile: [REDACTED]

Zero "意外"
ACCIDENT
地盤零意外 關懷建未來
Zero Accident, we Build, we Care





From: "[REDACTED]" <[REDACTED]@atkinsglobal.com>
To: "[REDACTED]@dsd.gov.hk" <[REDACTED]@dsd.gov.hk>
Cc: "[REDACTED]" <[REDACTED]@atkinsglobal.com>, [REDACTED] <[REDACTED]@atkinsglobal.com>, [REDACTED] <[REDACTED]@atkinsglobal.com>
Date: 17/07/2020 11:09
Subject: Request for Information - Pumping Operation Details of To Kwa Wan Road Pumping Station
Serial No.:

Dear Sirs/Madams,

**HKHA Technical Study for a Proposed Development in To Kwa Wan
Request for Information: Pumping Operation Details of To Kwa Wan Road Pumping Station**

Atkins China Limited has been appointed by the Hong Kong Housing Authority (HKHA) to undertake a technical study for a proposed development at To Kwa Wan. The letter of Appointment of Consultant for the captioned Assignment issued by HKHA is attached for your information.

Based on our desktop studies and site observations, pumping operation has been identified at the To Kwa Wan Road Pumping Station. Location plan is attached for your easy reference. We would like to obtain the following information regarding the operation for our technical study that aims to assess the noise impact on the future users of the proposed development:

1. The number and location of pump set(s) within the station;
2. The model and specification (e.g. rpm and horsepower) if possible; and,
3. Operation schedule of the pump set(s), i.e. daily and weekly operation hours.

Should you have any questions regarding the above, please do not hesitate to contact Mr. [REDACTED] of the Assistant Consultant ([REDACTED]@atkinsglobal.com) or Mr. [REDACTED] of the Consultant ([REDACTED]@atkinsglobal.com). We look forward to your prompt reply. Thank you for your kind assistance.

Best Regards,



Assistant Environmental Consultant, Design Engineering Services
Hong Kong, Asia Pacific
Engineering, Design and Project Management

+852 

13/F Wharf T&T Centre, Harbour City, Tsim Sha Tsui, Kowloon, Hong Kong

Company

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Appendix 3.10

Detailed Calculation of Fixed Plant Noise Assessment



Summary for Fixed Plant Noise Calculation

NSR ID	Scenario	Predicted Fixed Plant Noise Level			Criteria, dB(A)	Compliance
		Planned Noise Sources, dB(A)	Existing Noise Sources, dB(A)	Overall, dB(A)		
T1-03A	Daytime and Evening	-	63	63	65	Y
T1-10E		60	55	61	65	Y
T1-11B		-	60	60	65	Y
T1-18B		-	64	64	65	Y
T1-19A		-	64	64	65	Y
T1-03A	Nighttime	-	51	51	55	Y
T1-10E		-	45	45	55	Y
T1-11B		-	51	51	55	Y
T1-18B		-	52	52	55	Y
T1-19A		-	51	51	55	Y

Detail Fixed Plant Noise Calculation - T1-03A

Period	Daytime and evening
NSR ID	T1-03A
NSR Name	Tower 1 (Domestic)
Coor - x	837999.4
Coor - y	820351.3
Criteria	65
Fixed noise level at receiver	63
Compliance	Y

Source ID	Source Name	Source coor-x	Source coor-y	Source coor-z	SWL, dB(A)	Operation Time %	At source noise shielding	Blockage of direct line of sight	Horizontal Distance, m	Correction of operation time	Distance Attenuation, dB(A)	Screening Correction, dB(A)	Tonality Correction, dB(A)	Intermittency, dB(A)	Impulsiveness, dB(A)	Façade Correction, dB(A)	Predicted Noise Level, L _{eq} (30min) dB(A)
FYS_27	Vehicle Workshop	837774	820358	6	98	50%	-	-	225	-3	-55.1	0	0	0	0	3	43
FYS_28	Vehicle Workshop	837791	820348	16	98	50%	-	-	209	-3	-54.4	0	0	0	0	3	44
HLS_7	Vehicle Workshop	837968	820191	16	98	50%	Partially Enclosed	Y	164	-3	-52.3	-10	0	0	0	3	36
HLS_10	Vehicle Workshop	837982	820196	16	98	50%	Partially Enclosed	Y	156	-3	-51.9	-10	0	0	0	3	36
HLS_11	Vehicle Workshop	837974	820202	6	98	50%	Partially Enclosed	Y	151	-3	-51.6	-10	0	0	0	3	36
HLS_12	Vehicle Workshop	837984	820202	38	98	50%	Partially Enclosed	Y	150	-3	-51.5	-10	0	0	0	3	36
HLS_13	Vehicle Workshop	837977	820207	38	98	50%	Partially Enclosed	Y	146	-3	-51.3	-10	0	0	0	3	37
HLS_15	Vehicle Workshop	837979	820213	6	98	50%	Partially Enclosed	Y	139	-3	-50.9	-10	0	0	0	3	37
HLS_16	Vehicle Workshop	837990	820214	6	98	50%	Partially Enclosed	Y	137	-3	-50.8	-10	0	0	0	3	37
HLS_19	Vehicle Workshop	837984	820224	6	98	50%	Partially Enclosed	Y	128	-3	-50.1	-10	0	0	0	3	38
HLS_20	Vehicle Workshop	837995	820226	6	98	50%	Partially Enclosed	Y	126	-3	-50.0	-10	0	0	0	3	38
HLS_21	Vehicle Workshop	837987	820230	6	98	50%	Partially Enclosed	Y	122	-3	-49.7	-10	0	0	0	3	38
HLS_23	Vehicle Workshop	837989	820236	6	98	50%	Partially Enclosed	Y	116	-3	-49.3	-10	0	0	0	3	39
HLS_24	Vehicle Workshop	838001	820239	6	98	50%	Partially Enclosed	-	113	-3	-49.0	-5	0	0	0	3	44
HLS_25	Vehicle Workshop	837992	820242	6	98	50%	Partially Enclosed	Y	110	-3	-48.8	-10	0	0	0	3	39
HLS_26	Vehicle Workshop	838007	820248	6	98	50%	-	-	103	-3	-48.3	0	0	0	0	3	50
HLS_27	Vehicle Workshop	837990	820255	6	98	50%	-	-	96	-3	-47.7	0	0	0	0	3	50
HP_1	Outdoor equipment - Chiller	837709	820425	64	96	100%	-	Y	300	0	-57.5	-10	0	0	0	3	31
HP_2	Outdoor equipment - Chiller	837703	820427	64	96	100%	-	Y	306	0	-57.7	-10	0	0	0	3	31
HWS_28	Vehicle Workshop	837909	820293	6	98	50%	-	-	107	-3	-48.6	0	0	0	0	3	49
KCR_28	Vehicle Workshop	837739	820372	6	98	50%	-	-	262	-3	-56.4	0	0	0	0	3	42
LCS_28	General Workshop	837843	820326	6	98	50%	-	-	159	-3	-52.0	0	0	0	0	3	46
MCS11_2	Outdoor equipment - Cooling Tower	837925	820350	8	92	100%	-	-	75	0	-45.5	0	0	0	0	3	50
MCS3_1	Outdoor equipment - Cooling Tower	837822	820416	8	92	100%	-	-	189	0	-53.5	0	0	0	0	3	41
MCS3_2	Outdoor equipment - Cooling Tower	837826	820423	8	92	100%	-	-	188	0	-53.5	0	0	0	0	3	42
MCS3_3	Outdoor equipment - Cooling Tower	837825	820421	8	92	100%	-	-	188	0	-53.5	0	0	0	0	3	42
MCS3_4	Outdoor equipment - Cooling Tower	837824	820419	8	92	100%	-	-	188	0	-53.5	0	0	0	0	3	41
MCS3_5	Outdoor equipment - Cooling Tower	837819	820409	8	92	100%	-	-	189	0	-53.5	0	0	0	0	3	41
MCS3_6	Outdoor equipment - Cooling Tower	837821	820412	8	92	100%	-	-	189	0	-53.5	0	0	0	0	3	41
MCS5_1	Outdoor equipment - Cooling Tower	837842	820369	8	92	100%	-	-	159	0	-52.0	0	0	0	0	3	43
PCS_28	Vehicle Workshop	837883	820305	6	98	50%	-	-	126	-3	-50.0	0	0	0	0	3	48
PS1_	Planned Noise Sources	838016	820586	6	99	0%	-	Y	235	NA	-55.4	-10	0	0	0	3	0
PS2_	Planned Noise Sources	838143	820398	6	104.6	0%	-	Y	151	NA	-51.6	-10	0	0	0	3	0
PS3_	Planned Noise Sources	838199	820344	6	104.6	0%	-	Y	200	NA	-54.0	-10	0	0	0	3	0
PS4_	Planned Noise Sources	838306	820444	6	109.8	0%	-	Y	320	NA	-58.1	-10	0	0	0	3	0
SLS_27	General Workshop	837919	820289	23	98	50%	-	-	102	-3	-48.1	0	0	0	0	3	50
SLS_28	Vehicle Workshop	837934	820281	23	98	50%	-	-	96	-3	-47.6	0	0	0	0	3	50
SPS	Facade louver	838068	820254	23	86	100%	-	Y	119	0	-49.5	-10	0	0	0	3	29
TG_1	Outdoor equipment - Cooling Tower	837803	820092	23	96	100%	-	-	325	0	-58.2	0	0	0	0	3	41
TG_2	Outdoor equipment - Cooling Tower	837805	820096	23	96	100%	-	-	321	0	-58.1	0	0	0	0	3	41
TG_3	Outdoor equipment - Cooling Tower	837812	820094	23	96	100%	-	-	318	0	-58.1	0	0	0	0	3	41
TG_4	Outdoor equipment - Cooling Tower	837816	820092	23	96	100%	-	-	318	0	-58.0	0	0	0	0	3	41
TG_5	Outdoor equipment - Cooling Tower	837820	820089	32	96	100%	-	-	317	0	-58.0	0	0	0	0	3	41
TG_6	Outdoor equipment - Chiller	837858	820133	6	96	0%	-	Y	261	NA	-56.3	-10	0	0	0	3	0
TG_7	Outdoor equipment - Chiller	837864	820133	6	96	0%	-	Y	257	NA	-56.2	-10	0	0	0	3	0
TG_8	Outdoor equipment - Chiller	837866	820127	6	96	0%	-	Y	261	NA	-56.3	-10	0	0	0	3	0
TG_9	Outdoor equipment - Chiller	837860	820124	8	96	0%	-	Y	267	NA	-56.5	-10	0	0	0	3	0
TG_10	Outdoor equipment - Chiller	837882	820140	23	96	0%	-	Y	242	NA	-55.7	-10	0	0	0	3	0
TG_11	Outdoor equipment - Chiller	837902	820131	38	96	0%	-	Y	241	NA	-55.6	-10	0	0	0	3	0
TG_12	Outdoor equipment - Chiller	837916	820124	38	96	0%	-	Y	242	NA	-55.7	-10	0	0	0	3	0
TG_13	Outdoor equipment - Compressor	837901	820173	23	102	0%	-	-	204	NA	-54.2	0	0	0	0	3	0
TG_14	Outdoor equipment - Compressor	837906	820174	23	102	0%	-	-	200	NA	-54.0	0	0	0	0	3	0
TG_15	Outdoor equipment - Chiller	837933	820161	23	94	100%	-	-	201	0	-54.1	0	0	0	0	3	43
TG_16	Outdoor equipment - Chiller	837935	820160	23	94	100%	-	-	202	0	-54.1	0	0	0	0	3	43
TTS_4	Vehicle Workshop	837947	820185	6	98	50%	Partially Enclosed	Y	174	-3	-52.8	-10	0	0	0	3	35
TTS_5	Vehicle Workshop	837941	820195	6	98	50%	Partially Enclosed	Y	166	-3	-52.4	-10	0	0	0	3	36
TTS_7	Vehicle Workshop	837944	820202	6	98	50%	Partially Enclosed	Y	159	-3	-52.0	-10	0	0	0	3	36
TTS_8	Vehicle Workshop	837952	820198	6	98	50%	Partially Enclosed	Y	160	-3	-52.1	-10	0	0	0	3	36
TTS_9	Vehicle Workshop	837947	820207	6	98	50%	Partially Enclosed	Y	153	-3	-51.7	-10	0	0	0	3	36
TTS_11	Vehicle Workshop	837950	820213	6	98	50%	Partially Enclosed	Y	147	-3	-51.3	-10	0	0	0	3	37
TTS_12	Vehicle Workshop	837958	820209	6	98	50%	Partially Enclosed	-	148	-3	-51.4	-5	0	0	0	3	42
TTS_14	Vehicle Workshop	837960	820215	6	98	50%	Partially Enclosed	-	142	-3	-51.0	-5	0	0	0	3	42

TTS_15	Vehicle Workshop	837955	820225	6	98	50%	Partially Enclosed	Y	134	-3	-50.6	-10	0	0	0	3	37
TTS_18	Vehicle Workshop	837966	820226	6	98	50%	Partially Enclosed	-	130	-3	-50.3	-5	0	0	0	3	43
TTS_20	Vehicle Workshop	837968	820231	6	98	50%	Partially Enclosed	-	124	-3	-49.9	-5	0	0	0	3	43
TTS_21	Vehicle Workshop	837962	820241	6	98	50%	Partially Enclosed	Y	117	-3	-49.3	-10	0	0	0	3	39
TTS_22	Vehicle Workshop	837970	820237	6	98	50%	Partially Enclosed	-	118	-3	-49.4	-5	0	0	0	3	44
TTS_23	Vehicle Workshop	837965	820248	6	98	50%	Partially Enclosed	Y	109	-3	-48.8	-10	0	0	0	3	39
TTS_24	Vehicle Workshop	837974	820244	6	98	50%	Partially Enclosed	-	110	-3	-48.9	-5	0	0	0	3	44
TTS_25	Vehicle Workshop	837969	820254	6	98	50%	Partially Enclosed	Y	103	-3	-48.2	-10	0	0	0	3	40
TTS_26	Vehicle Workshop	837976	820249	6	98	50%	Partially Enclosed	-	105	-3	-48.4	-5	0	0	0	3	45
TTS_27	Vehicle Workshop	837968	820267	6	98	50%	-	-	90	-3	-47.1	0	0	0	0	3	51
YOS_5	Vehicle Workshop	837918	820206	6	98	50%	Partially Enclosed	-	166	-3	-52.4	-5	0	0	0	3	41
YOS_7	Vehicle Workshop	837920	820213	6	98	50%	Partially Enclosed	-	159	-3	-52.0	-5	0	0	0	3	41
YOS_11	Vehicle Workshop	837925	820225	6	98	50%	Partially Enclosed	-	147	-3	-51.3	-5	0	0	0	3	42
YOS_12	Vehicle Workshop	837934	820220	6	98	50%	Partially Enclosed	Y	147	-3	-51.3	-10	0	0	0	3	37
YOS_15	Vehicle Workshop	837930	820236	6	98	50%	Partially Enclosed	-	134	-3	-50.6	-5	0	0	0	3	42
YOS_16	Vehicle Workshop	837939	820231	6	98	50%	Partially Enclosed	Y	135	-3	-50.6	-10	0	0	0	3	37
YOS_18	Vehicle Workshop	837941	820237	6	98	50%	Partially Enclosed	Y	128	-3	-50.2	-10	0	0	0	3	38
YOS_19	Vehicle Workshop	837936	820247	6	98	50%	Partially Enclosed	-	123	-3	-49.8	-5	0	0	0	3	43
YOS_21	Vehicle Workshop	837938	820252	6	98	50%	Partially Enclosed	-	117	-3	-49.3	-5	0	0	0	3	44
YOS_22	Vehicle Workshop	837947	820248	6	98	50%	Partially Enclosed	Y	116	-3	-49.3	-10	0	0	0	3	39
YOS_23	Vehicle Workshop	837941	820258	6	98	50%	Partially Enclosed	-	109	-3	-48.8	-5	0	0	0	3	44
YOS_24	Vehicle Workshop	837950	820255	6	98	50%	Partially Enclosed	Y	109	-3	-48.7	-10	0	0	0	3	39
YOS_25	Vehicle Workshop	837944	820265	6	98	50%	Partially Enclosed	-	103	-3	-48.2	-5	0	0	0	3	45
YOS_26	Vehicle Workshop	837951	820261	6	98	50%	Partially Enclosed	Y	102	-3	-48.2	-10	0	0	0	3	40
YOS_27	Vehicle Workshop	837943	820278	6	98	50%	-	-	93	-3	-47.4	0	0	0	0	3	51
YOS_28	Vehicle Workshop	837959	820271	6	98	50%	-	-	90	-3	-47.1	0	0	0	0	3	51
																Total	63

Detail Fixed Plant Noise Calculation - T1-03A

Period	Nighttime
NSR ID	T1-03A
NSR Name	Tower 1 (Domestic)
Coor - x	837999.4
Coor - y	820351.3
Criteria	55
Fixed noise level at receiver	51
Compliance	Y

Source ID	Source Name	Source coor-x	Source coor-y	Source coor-z	SWL, dB(A)	Operation Time %	At source noise shielding	Blockage of direct line of sight	Horizontal Distance,m	Correction of operation time	Distance Attenuation, dB(A)	Screening Correction, dB(A)	Tonality Correction, dB(A)	Intermittency, dB(A)	Impulsiveness, dB(A)	Façade Correction, dB(A)	Predicted Noise Level, L _{eq} (30min) dB(A)
HP_1	Outdoor equipment - Chiller	837709	820425	64	96	100%	-	Y	300	0	-57.5	-10	0	0	0	3	31
HP_2	Outdoor equipment - Chiller	837703	820427	64	96	100%	-	Y	306	0	-57.7	-10	0	0	0	3	31
MCS5_1	Outdoor equipment - Cooling Tower	837842	820369	8	92	100%	-	-	159	0	-52.0	0	0	0	0	3	43
SPS	Facade louver	838068	820254	23	86	100%	-	Y	119	0	-49.5	-10	0	0	0	3	29
TG_1	Outdoor equipment - Cooling Tower	837803	820092	23	96	100%	-	-	325	0	-58.2	0	0	0	0	3	41
TG_2	Outdoor equipment - Cooling Tower	837805	820096	23	96	100%	-	-	321	0	-58.1	0	0	0	0	3	41
TG_3	Outdoor equipment - Cooling Tower	837812	820094	23	96	100%	-	-	318	0	-58.1	0	0	0	0	3	41
TG_4	Outdoor equipment - Cooling Tower	837816	820092	23	96	100%	-	-	318	0	-58.0	0	0	0	0	3	41
TG_5	Outdoor equipment - Cooling Tower	837820	820089	32	96	100%	-	-	317	0	-58.0	0	0	0	0	3	41
TG_15	Outdoor equipment - Chiller	837933	820161	23	94	100%	-	-	201	0	-54.1	0	0	0	0	3	43
TG_16	Outdoor equipment - Chiller	837935	820160	23	94	100%	-	-	202	0	-54.1	0	0	0	0	3	43
Total																51	

Detail Fixed Plant Noise Calculation - T1-10E

Period	Daytime and evening
NSR ID	T1-10E
NSR Name	Tower 1 (Domestic)
Coor - x	838053.2
Coor - y	820338.7
Criteria	65
Fixed noise level at receiver	55
Compliance	Y

Source ID	Source Name	Source coor-x	Source coor-y	Source coor-Z	SWL, dB(A)	Operation Time %	At source noise shielding	Blockage of direct line of sight	Horizontal Distance,m	Correction of operation time	Distance Attenuation, dB(A)	Screening Correction, dB(A)	Tonality Correction, dB(A)	Intermittency, dB(A)	Impulsiveness, dB(A)	Façade Correction, dB(A)	Predicted Noise Level, L _{eq(30min)} dB(A)
FYS_27	Vehicle Workshop	837774	820358	6	98	50%	-	Y	280	-3	-56.9	-10	0	0	0	3	31
FYS_28	Vehicle Workshop	837791	820348	16	98	50%	-	Y	263	-3	-56.4	-10	0	0	0	3	32
HLS_7	Vehicle Workshop	837968	820191	16	98	50%	Partially Enclosed	Y	171	-3	-52.6	-10	0	0	0	3	35
HLS_10	Vehicle Workshop	837982	820196	16	98	50%	Partially Enclosed	Y	159	-3	-52.0	-10	0	0	0	3	36
HLS_11	Vehicle Workshop	837974	820202	6	98	50%	Partially Enclosed	Y	158	-3	-52.0	-10	0	0	0	3	36
HLS_12	Vehicle Workshop	837984	820202	38	98	50%	Partially Enclosed	Y	153	-3	-51.7	-10	0	0	0	3	36
HLS_13	Vehicle Workshop	837977	820207	38	98	50%	Partially Enclosed	Y	153	-3	-51.7	-10	0	0	0	3	36
HLS_15	Vehicle Workshop	837979	820213	6	98	50%	Partially Enclosed	Y	146	-3	-51.3	-10	0	0	0	3	37
HLS_16	Vehicle Workshop	837990	820214	6	98	50%	Partially Enclosed	Y	140	-3	-50.9	-10	0	0	0	3	37
HLS_19	Vehicle Workshop	837984	820224	6	98	50%	Partially Enclosed	Y	134	-3	-50.5	-10	0	0	0	3	37
HLS_20	Vehicle Workshop	837995	820226	6	98	50%	Partially Enclosed	Y	127	-3	-50.1	-10	0	0	0	3	38
HLS_21	Vehicle Workshop	837987	820230	6	98	50%	Partially Enclosed	Y	127	-3	-50.1	-10	0	0	0	3	38
HLS_23	Vehicle Workshop	837989	820236	6	98	50%	Partially Enclosed	Y	121	-3	-49.6	-10	0	0	0	3	38
HLS_24	Vehicle Workshop	838001	820239	6	98	50%	Partially Enclosed	Y	113	-3	-49.1	-10	0	0	0	3	39
HLS_25	Vehicle Workshop	837992	820242	6	98	50%	Partially Enclosed	Y	115	-3	-49.2	-10	0	0	0	3	39
HLS_26	Vehicle Workshop	838007	820248	6	98	50%	-	Y	102	-3	-48.1	-10	0	0	0	3	40
HLS_27	Vehicle Workshop	837990	820255	6	98	50%	-	Y	104	-3	-48.4	-10	0	0	0	3	40
HP_1	Outdoor equipment - Chiller	837709	820425	64	96	100%	-	-	355	0	-59.0	0	0	0	0	3	40
HP_2	Outdoor equipment - Chiller	837703	820427	64	96	100%	-	-	361	0	-59.2	0	0	0	0	3	40
HWS_28	Vehicle Workshop	837909	820293	6	98	50%	-	Y	151	-3	-51.6	-10	0	0	0	3	36
KCR_28	Vehicle Workshop	837739	820372	6	98	50%	-	Y	316	-3	-58.0	-10	0	0	0	3	30
LCS_28	General Workshop	837843	820326	6	98	50%	-	Y	211	-3	-54.5	-10	0	0	0	3	34
MCS11_2	Outdoor equipment - Cooling Tower	837925	820350	8	92	100%	-	Y	129	0	-50.2	-10	0	0	0	3	35
MCS3_1	Outdoor equipment - Cooling Tower	837822	820416	8	92	100%	-	Y	244	0	-55.7	-10	0	0	0	3	29
MCS3_2	Outdoor equipment - Cooling Tower	837826	820423	8	92	100%	-	Y	243	0	-55.7	-10	0	0	0	3	29
MCS3_3	Outdoor equipment - Cooling Tower	837825	820421	8	92	100%	-	Y	243	0	-55.7	-10	0	0	0	3	29
MCS3_4	Outdoor equipment - Cooling Tower	837824	820419	8	92	100%	-	Y	243	0	-55.7	-10	0	0	0	3	29
MCS3_5	Outdoor equipment - Cooling Tower	837819	820409	8	92	100%	-	Y	244	0	-55.8	-10	0	0	0	3	29
MCS3_6	Outdoor equipment - Cooling Tower	837821	820412	8	92	100%	-	Y	244	0	-55.7	-10	0	0	0	3	29
MCS5_1	Outdoor equipment - Cooling Tower	837842	820369	8	92	100%	-	Y	214	0	-54.6	-10	0	0	0	3	30
PCS_28	Vehicle Workshop	837883	820305	6	98	50%	-	Y	174	-3	-52.8	-10	0	0	0	3	35
SLS_27	General Workshop	837919	820289	23	98	50%	-	Y	143	-3	-51.1	-10	0	0	0	3	37
SLS_28	Vehicle Workshop	837934	820281	23	98	50%	-	Y	132	-3	-50.4	-10	0	0	0	3	38
SPS	Facade louver	838068	820254	23	86	100%	-	Y	86	0	-46.7	-10	0	0	0	3	32
TG_1	Outdoor equipment - Cooling Tower	837803	820092	23	96	100%	-	Y	351	0	-58.9	-10	0	0	0	3	30
TG_2	Outdoor equipment - Cooling Tower	837805	820096	23	96	100%	-	Y	347	0	-58.8	-10	0	0	0	3	30
TG_3	Outdoor equipment - Cooling Tower	837812	820094	23	96	100%	-	Y	343	0	-58.7	-10	0	0	0	3	30
TG_4	Outdoor equipment - Cooling Tower	837816	820092	23	96	100%	-	Y	342	0	-58.7	-10	0	0	0	3	30
TG_5	Outdoor equipment - Cooling Tower	837820	820089	32	96	100%	-	Y	341	0	-58.7	-10	0	0	0	3	30
TG_15	Outdoor equipment - Chiller	837933	820161	23	94	100%	-	Y	214	0	-54.6	-10	0	0	0	3	32
TG_16	Outdoor equipment - Chiller	837935	820160	23	94	100%	-	Y	214	0	-54.6	-10	0	0	0	3	32
TTS_4	Vehicle Workshop	837947	820185	6	98	50%	Partially Enclosed	Y	187	-3	-53.4	-10	0	0	0	3	35
TTS_5	Vehicle Workshop	837941	820195	6	98	50%	Partially Enclosed	Y	182	-3	-53.2	-10	0	0	0	3	35
TTS_7	Vehicle Workshop	837944	820202	6	98	50%	Partially Enclosed	Y	175	-3	-52.9	-10	0	0	0	3	35
TTS_8	Vehicle Workshop	837952	820198	6	98	50%	Partially Enclosed	Y	173	-3	-52.8	-10	0	0	0	3	35
TTS_9	Vehicle Workshop	837947	820207	6	98	50%	Partially Enclosed	Y	169	-3	-52.5	-10	0	0	0	3	35
TTS_11	Vehicle Workshop	837950	820213	6	98	50%	Partially Enclosed	Y	163	-3	-52.2	-10	0	0	0	3	36
TTS_12	Vehicle Workshop	837958	820209	6	98	50%	Partially Enclosed	Y	161	-3	-52.1	-10	0	0	0	3	36
TTS_14	Vehicle Workshop	837960	820215	6	98	50%	Partially Enclosed	Y	155	-3	-51.8	-10	0	0	0	3	36
TTS_15	Vehicle Workshop	837955	820225	6	98	50%	Partially Enclosed	Y	151	-3	-51.6	-10	0	0	0	3	36
TTS_18	Vehicle Workshop	837966	820226	6	98	50%	Partially Enclosed	Y	143	-3	-51.1	-10	0	0	0	3	37
TTS_20	Vehicle Workshop	837968	820231	6	98	50%	Partially Enclosed	Y	137	-3	-50.7	-10	0	0	0	3	37
TTS_21	Vehicle Workshop	837962	820241	6	98	50%	Partially Enclosed	Y	134	-3	-50.5	-10	0	0	0	3	37
TTS_22	Vehicle Workshop	837970	820237	6	98	50%	Partially Enclosed	Y	131	-3	-50.4	-10	0	0	0	3	38
TTS_23	Vehicle Workshop	837965	820248	6	98	50%	Partially Enclosed	Y	126	-3	-50.0	-10	0	0	0	3	38
TTS_24	Vehicle Workshop	837974	820244	6	98	50%	Partially Enclosed	Y	124	-3	-49.8	-10	0	0	0	3	38
TTS_25	Vehicle Workshop	837969	820254	6	98	50%	Partially Enclosed	Y	120	-3	-49.6	-10	0	0	0	3	38
TTS_26	Vehicle Workshop	837976	820249	6	98	50%	Partially Enclosed	Y	118	-3	-49.4	-10	0	0	0	3	39
TTS_27	Vehicle Workshop	837968	820267	6	98	50%	-	Y	111	-3	-48.9	-10	0	0	0	3	39
YOS_5	Vehicle Workshop	837918	820206	6	98	50%	Partially Enclosed	Y	189	-3	-53.6	-10	0	0	0	3	34
YOS_7	Vehicle Workshop	837920	820213	6	98	50%	Partially Enclosed	Y	183	-3	-53.2	-10	0	0	0	3	35
YOS_11	Vehicle Workshop	837925	820225	6	98	50%	Partially Enclosed	Y	172	-3	-52.7	-10	0	0	0	3	35

YOS_12	Vehicle Workshop	837934	820220	6	98	50%	Partially Enclosed	Y	168	-3	-52.5	-10	0	0	0	3	35
YOS_15	Vehicle Workshop	837930	820236	6	98	50%	Partially Enclosed	Y	160	-3	-52.1	-10	0	0	0	3	36
YOS_16	Vehicle Workshop	837939	820231	6	98	50%	Partially Enclosed	Y	157	-3	-51.9	-10	0	0	0	3	36
YOS_18	Vehicle Workshop	837941	820237	6	98	50%	Partially Enclosed	Y	151	-3	-51.6	-10	0	0	0	3	36
YOS_19	Vehicle Workshop	837936	820247	6	98	50%	Partially Enclosed	Y	149	-3	-51.5	-10	0	0	0	3	37
YOS_21	Vehicle Workshop	837938	820252	6	98	50%	Partially Enclosed	Y	144	-3	-51.2	-10	0	0	0	3	37
YOS_22	Vehicle Workshop	837947	820248	6	98	50%	Partially Enclosed	Y	140	-3	-50.9	-10	0	0	0	3	37
YOS_23	Vehicle Workshop	837941	820258	6	98	50%	Partially Enclosed	Y	138	-3	-50.8	-10	0	0	0	3	37
YOS_24	Vehicle Workshop	837950	820255	6	98	50%	Partially Enclosed	Y	133	-3	-50.5	-10	0	0	0	3	37
YOS_25	Vehicle Workshop	837944	820265	6	98	50%	Partially Enclosed	Y	132	-3	-50.4	-10	0	0	0	3	38
YOS_26	Vehicle Workshop	837951	820261	6	98	50%	Partially Enclosed	Y	128	-3	-50.1	-10	0	0	0	3	38
YOS_27	Vehicle Workshop	837943	820278	6	98	50%	-	Y	126	-3	-50.0	-10	0	0	0	3	38
YOS_28	Vehicle Workshop	837959	820271	6	98	50%	-	Y	116	-3	-49.3	-10	0	0	0	3	39
Total																3	55

Detail Fixed Plant Noise Calculation - T1-10E

Period	Nighttime
NSR ID	T1-10E
NSR Name	Tower 1 (Domestic)
Coor - x	838053.2
Coor - y	820338.7
Criteria	55
Fixed noise level at receiver	45
Compliance	Y

Source ID	Source Name	Source coor-x	Source coor-y	Source coor-Z	SWL, dB(A)	Operation Time %	At source noise shielding	Blockage of direct line of sight	Horizontal Distance,m	Correction of operation time	Distance Attenuation, dB(A)	Screening Correction, dB(A)	Tonality Correction, dB(A)	Intermittency, dB(A)	Impulsiveness, dB(A)	Façade Correction, dB(A)	Predicted Noise Level, L _{eq} (30min) dB(A)
HP_1	Outdoor equipment - Chiller	837709	820425	64	96	100%	-	-	355	0	-59.0	0	0	0	0	3	40
HP_2	Outdoor equipment - Chiller	837703	820427	64	96	100%	-	-	361	0	-59.2	0	0	0	0	3	40
MCSS_1	Outdoor equipment - Cooling Tower	837842	820369	8	92	100%	-	Y	214	0	-54.6	-10	0	0	0	3	30
SPS	Facade louver	838068	820254	23	86	100%	-	Y	86	0	-46.7	-10	0	0	0	3	32
TG_1	Outdoor equipment - Cooling Tower	837803	820092	23	96	100%	-	Y	351	0	-58.9	-10	0	0	0	3	30
TG_2	Outdoor equipment - Cooling Tower	837805	820096	23	96	100%	-	Y	347	0	-58.8	-10	0	0	0	3	30
TG_3	Outdoor equipment - Cooling Tower	837812	820094	23	96	100%	-	Y	343	0	-58.7	-10	0	0	0	3	30
TG_4	Outdoor equipment - Cooling Tower	837816	820092	23	96	100%	-	Y	342	0	-58.7	-10	0	0	0	3	30
TG_5	Outdoor equipment - Cooling Tower	837820	820089	32	96	100%	-	Y	341	0	-58.7	-10	0	0	0	3	30
TG_15	Outdoor equipment - Chiller	837933	820161	23	94	100%	-	Y	214	0	-54.6	-10	0	0	0	3	32
TG_16	Outdoor equipment - Chiller	837935	820160	23	94	100%	-	Y	214	0	-54.6	-10	0	0	0	3	32
Total																45	

Detail Fixed Plant Noise Calculation - T1-11B

Period	Daytime and evening
NSR ID	T1-11B
NSR Name	Tower 1 (Domestic)
Coor - x	838054.8
Coor - y	820330.1
Criteria	65
Fixed noise level at receiver	60
Compliance	Y

Source ID	Source Name	Source coor-x	Source coor-y	Source coor-z	SWL, dB(A)	Operation Time %	At source noise shielding	Blockage of direct line of sight	Horizontal Distance,m	Correction of operation time	Distance Attenuation, dB(A)	Screening Correction, dB(A)	Tonality Correction, dB(A)	Intermittency, dB(A)	Impulsiveness, dB(A)	Façade Correction, dB(A)	Predicted Noise Level, L _{eq(30min)} dB(A)
FYS_27	Vehicle Workshop	837774	820358	6	98	50%	-	Y	282	-3	-57.0	-10	0	0	0	3	31
FYS_28	Vehicle Workshop	837791	820348	16	98	50%	-	Y	265	-3	-56.5	-10	0	0	0	3	32
HLS_7	Vehicle Workshop	837968	820191	16	98	50%	Partially Enclosed	-	164	-3	-52.3	-5	0	0	0	3	41
HLS_10	Vehicle Workshop	837982	820196	16	98	50%	Partially Enclosed	Y	152	-3	-51.7	-10	0	0	0	3	36
HLS_11	Vehicle Workshop	837974	820202	6	98	50%	Partially Enclosed	-	151	-3	-51.6	-5	0	0	0	3	41.4
HLS_12	Vehicle Workshop	837984	820202	38	98	50%	Partially Enclosed	Y	146	-3	-51.3	-10	0	0	0	3	36.7
HLS_13	Vehicle Workshop	837977	820207	38	98	50%	Partially Enclosed	-	146	-3	-51.3	-5	0	0	0	3	41.7
HLS_15	Vehicle Workshop	837979	820213	6	98	50%	Partially Enclosed	-	139	-3	-50.9	-5	0	0	0	3	42.1
HLS_16	Vehicle Workshop	837990	820214	6	98	50%	Partially Enclosed	Y	133	-3	-50.5	-10	0	0	0	3	37.5
HLS_19	Vehicle Workshop	837984	820224	6	98	50%	Partially Enclosed	-	128	-3	-50.1	-5	0	0	0	3	42.9
HLS_20	Vehicle Workshop	837995	820226	6	98	50%	Partially Enclosed	Y	120	-3	-49.6	-10	0	0	0	3	38
HLS_21	Vehicle Workshop	837987	820230	6	98	50%	Partially Enclosed	-	121	-3	-49.6	-5	0	0	0	3	43
HLS_23	Vehicle Workshop	837989	820236	6	98	50%	Partially Enclosed	-	114	-3	-49.2	-5	0	0	0	3	44
HLS_24	Vehicle Workshop	838001	820239	6	98	50%	Partially Enclosed	Y	106	-3	-48.5	-10	0	0	0	3	39
HLS_25	Vehicle Workshop	837992	820242	6	98	50%	Partially Enclosed	-	108	-3	-48.7	-5	0	0	0	3	44
HLS_26	Vehicle Workshop	838007	820248	6	98	50%	-	-	95	-3	-47.5	0	0	0	0	3	50
HLS_27	Vehicle Workshop	837990	820255	6	98	50%	-	-	99	-3	-47.9	0	0	0	0	3	50
HP_1	Outdoor equipment - Chiller	837709	820425	64	96	100%	-	-	359	0	-59.1	0	0	0	0	3	40
HP_2	Outdoor equipment - Chiller	837703	820427	64	96	100%	-	-	365	0	-59.2	0	0	0	0	3	40
HWS_28	Vehicle Workshop	837909	820293	6	98	50%	-	Y	150	-3	-51.5	-10	0	0	0	3	36
KCR_28	Vehicle Workshop	837739	820372	6	98	50%	-	Y	319	-3	-58.1	-10	0	0	0	3	30
LCS_28	General Workshop	837843	820326	6	98	50%	-	Y	212	-3	-54.5	-10	0	0	0	3	33
MCS11_2	Outdoor equipment - Cooling Tower	837925	820350	8	92	100%	-	Y	132	0	-50.4	-10	0	0	0	3	35
MCS3_1	Outdoor equipment - Cooling Tower	837822	820416	8	92	100%	-	Y	248	0	-55.9	-10	0	0	0	3	29
MCS3_2	Outdoor equipment - Cooling Tower	837826	820423	8	92	100%	-	Y	247	0	-55.9	-10	0	0	0	3	29
MCS3_3	Outdoor equipment - Cooling Tower	837825	820421	8	92	100%	-	Y	248	0	-55.9	-10	0	0	0	3	29
MCS3_4	Outdoor equipment - Cooling Tower	837824	820419	8	92	100%	-	Y	248	0	-55.9	-10	0	0	0	3	29
MCS3_5	Outdoor equipment - Cooling Tower	837819	820409	8	92	100%	-	Y	248	0	-55.9	-10	0	0	0	3	29
MCS3_6	Outdoor equipment - Cooling Tower	837821	820412	8	92	100%	-	Y	248	0	-55.9	-10	0	0	0	3	29
MCS5_1	Outdoor equipment - Cooling Tower	837842	820369	8	92	100%	-	Y	216	0	-54.7	-10	0	0	0	3	30
PCS_28	Vehicle Workshop	837883	820305	6	98	50%	-	Y	174	-3	-52.8	-10	0	0	0	3	35
SLS_27	General Workshop	837919	820289	23	98	50%	-	Y	142	-3	-51.0	-10	0	0	0	3	37
SLS_28	Vehicle Workshop	837934	820281	23	98	50%	-	-	130	-3	-50.3	0	0	0	0	3	48
SPS	Facade louver	838068	820254	23	86	100%	-	-	77	0	-45.7	0	0	0	0	3	43
TG_1	Outdoor equipment - Cooling Tower	837803	820092	23	96	100%	-	Y	347	0	-58.8	-10	0	0	0	3	30
TG_2	Outdoor equipment - Cooling Tower	837805	820096	23	96	100%	-	-	342	0	-58.7	0	0	0	0	3	40
TG_3	Outdoor equipment - Cooling Tower	837812	820094	23	96	100%	-	-	339	0	-58.6	0	0	0	0	3	40
TG_4	Outdoor equipment - Cooling Tower	837816	820092	23	96	100%	-	-	337	0	-58.6	0	0	0	0	3	40
TG_5	Outdoor equipment - Cooling Tower	837820	820089	32	96	100%	-	-	336	0	-58.5	0	0	0	0	3	40
TG_15	Outdoor equipment - Chiller	837933	820161	23	94	100%	-	-	208	0	-54.4	0	0	0	0	3	43
TG_16	Outdoor equipment - Chiller	837935	820160	23	94	100%	-	-	208	0	-54.4	0	0	0	0	3	43
TTS_4	Vehicle Workshop	837947	820185	6	98	50%	Partially Enclosed	Y	181	-3	-53.1	-10	0	0	0	3	35
TTS_5	Vehicle Workshop	837941	820195	6	98	50%	Partially Enclosed	Y	176	-3	-52.9	-10	0	0	0	3	35
TTS_7	Vehicle Workshop	837944	820202	6	98	50%	Partially Enclosed	Y	169	-3	-52.6	-10	0	0	0	3	35
TTS_8	Vehicle Workshop	837952	820198	6	98	50%	Partially Enclosed	Y	167	-3	-52.5	-10	0	0	0	3	36
TTS_9	Vehicle Workshop	837947	820207	6	98	50%	Partially Enclosed	Y	163	-3	-52.3	-10	0	0	0	3	36
TTS_11	Vehicle Workshop	837950	820213	6	98	50%	Partially Enclosed	Y	157	-3	-51.9	-10	0	0	0	3	36
TTS_12	Vehicle Workshop	837958	820209	6	98	50%	Partially Enclosed	Y	155	-3	-51.8	-10	0	0	0	3	36
TTS_14	Vehicle Workshop	837960	820215	6	98	50%	Partially Enclosed	Y	149	-3	-51.4	-10	0	0	0	3	37
TTS_15	Vehicle Workshop	837955	820225	6	98	50%	Partially Enclosed	Y	146	-3	-51.3	-10	0	0	0	3	37
TTS_18	Vehicle Workshop	837966	820226	6	98	50%	Partially Enclosed	Y	137	-3	-50.8	-10	0	0	0	3	37
TTS_20	Vehicle Workshop	837968	820231	6	98	50%	Partially Enclosed	Y	131	-3	-50.4	-10	0	0	0	3	38
TTS_21	Vehicle Workshop	837962	820241	6	98	50%	Partially Enclosed	-	129	-3	-50.2	-5	0	0	0	3	43
TTS_22	Vehicle Workshop	837970	820237	6	98	50%	Partially Enclosed	Y	126	-3	-50.0	-10	0	0	0	3	38
TTS_23	Vehicle Workshop	837965	820248	6	98	50%	Partially Enclosed	-	122	-3	-49.7	-5	0	0	0	3	43
TTS_24	Vehicle Workshop	837974	820244	6	98	50%	Partially Enclosed	Y	118	-3	-49.5	-10	0	0	0	3	39
TTS_25	Vehicle Workshop	837969	820254	6	98	50%	Partially Enclosed	-	115	-3	-49.2	-5	0	0	0	3	44
TTS_26	Vehicle Workshop	837976	820249	6	98	50%	Partially Enclosed	Y	113	-3	-49.0	-10	0	0	0	3	39
TTS_27	Vehicle Workshop	837968	820267	6	98	50%	-	-	107	-3	-48.6	0	0	0	0	3	49
YOS_5	Vehicle Workshop	837918	820206	6	98	50%	Partially Enclosed	Y	185	-3	-53.3	-10	0	0	0	3	35
YOS_7	Vehicle Workshop	837920	820213	6	98	50%	Partially Enclosed	Y	178	-3	-53.0	-10	0	0	0	3	35
YOS_11	Vehicle Workshop	837925	820225	6	98	50%	Partially Enclosed	Y	167	-3	-52.5	-10	0	0	0	3	36

YOS_12	Vehicle Workshop	837934	820220	6	98	50%	Partially Enclosed	Y	164	-3	-52.3	-10	0	0	0	3	36
YOS_15	Vehicle Workshop	837930	820236	6	98	50%	Partially Enclosed	Y	156	-3	-51.9	-10	0	0	0	3	36
YOS_16	Vehicle Workshop	837939	820231	6	98	50%	Partially Enclosed	Y	153	-3	-51.7	-10	0	0	0	3	36
YOS_18	Vehicle Workshop	837941	820237	6	98	50%	Partially Enclosed	Y	147	-3	-51.3	-10	0	0	0	3	37
YOS_19	Vehicle Workshop	837936	820247	6	98	50%	Partially Enclosed	Y	145	-3	-51.3	-10	0	0	0	3	37
YOS_21	Vehicle Workshop	837938	820252	6	98	50%	Partially Enclosed	Y	140	-3	-51.0	-10	0	0	0	3	37
YOS_22	Vehicle Workshop	837947	820248	6	98	50%	Partially Enclosed	Y	136	-3	-50.7	-10	0	0	0	3	37
YOS_23	Vehicle Workshop	837941	820258	6	98	50%	Partially Enclosed	Y	134	-3	-50.5	-10	0	0	0	3	37
YOS_24	Vehicle Workshop	837950	820255	6	98	50%	Partially Enclosed	Y	130	-3	-50.2	-10	0	0	0	3	38
YOS_25	Vehicle Workshop	837944	820265	6	98	50%	Partially Enclosed	Y	129	-3	-50.2	-10	0	0	0	3	38
YOS_26	Vehicle Workshop	837951	820261	6	98	50%	Partially Enclosed	Y	124	-3	-49.9	-10	0	0	0	3	38
YOS_27	Vehicle Workshop	837943	820278	6	98	50%	-	-	124	-3	-49.8	0	0	0	0	3	48
YOS_28	Vehicle Workshop	837959	820271	6	98	50%	-	-	113	-3	-49.1	0	0	0	0	3	49
Total																3	60

Detail Fixed Plant Noise Calculation - T1-11B

Period **Nighttime**
 NSR ID **T1-11B**
 NSR Name **Tower 1 (Domestic)**
 Coor - x 838054.8
 Coor - y 820330.1
 Criteria 55
 Fixed noise level at receiver 51
 Compliance **Y**

Source ID	Source Name	Source coor-x	Source coor-y	Source coor-z	SWL, dB(A)	Operation Time %	At source noise shielding	Blockage of direct line of sight	Horizontal Distance,m	Correction of operation time	Distance Attenuation, dB(A)	Screening Correction, dB(A)	Tonality Correction, dB(A)	Intermittency, dB(A)	Impulsiveness, dB(A)	Façade Correction, dB(A)	Predicted Noise Level, L _{eq} (30min) dB(A)
HP_1	Outdoor equipment - Chiller	837709	820425	64	96	100%	-	-	359	0	-59.1	0	0	0	0	3	40
HP_2	Outdoor equipment - Chiller	837703	820427	64	96	100%	-	-	365	0	-59.2	0	0	0	0	3	40
MCS5_1	Outdoor equipment - Cooling Tower	837842	820369	8	92	100%	-	Y	216	0	-54.7	-10	0	0	0	3	30
SPS	Facade louver	838068	820254	23	86	100%	-	-	77	0	-45.7	0	0	0	0	3	43
TG_1	Outdoor equipment - Cooling Tower	837803	820092	23	96	100%	-	Y	347	0	-58.8	-10	0	0	0	3	30
TG_2	Outdoor equipment - Cooling Tower	837805	820096	23	96	100%	-	-	342	0	-58.7	0	0	0	0	3	40
TG_3	Outdoor equipment - Cooling Tower	837812	820094	23	96	100%	-	-	339	0	-58.6	0	0	0	0	3	40
TG_4	Outdoor equipment - Cooling Tower	837816	820092	23	96	100%	-	-	337	0	-58.6	0	0	0	0	3	40
TG_5	Outdoor equipment - Cooling Tower	837820	820089	32	96	100%	-	-	336	0	-58.5	0	0	0	0	3	40
TG_15	Outdoor equipment - Chiller	837933	820161	23	94	100%	-	-	208	0	-54.4	0	0	0	0	3	43
TG_16	Outdoor equipment - Chiller	837935	820160	23	94	100%	-	-	208	0	-54.4	0	0	0	0	3	43
Total																51	

Detail Fixed Plant Noise Calculation - T1-18B

Period	Daytime and evening
NSR ID	T1-18B
NSR Name	Tower 1 (Domestic)
Coor - x	838011.4
Coor - y	820312.7
Criteria	65
Fixed noise level at receiver	64
Compliance	Y

Source ID	Source Name	Source coor-x	Source coor-y	Source coor-Z	SWL, dB(A)	Operation Time %	At source noise shielding	Blockage of direct line of sight	Horizontal Distance,m	Correction of operation time	Distance Attenuation, dB(A)	Screening Correction, dB(A)	Tonality Correction, dB(A)	Intermittency, dB(A)	Impulsiveness, dB(A)	Façade Correction, dB(A)	Predicted Noise Level, L _{eq(30min)} dB(A)
FYS_27	Vehicle Workshop	837774	820358	6	98	50%	-	-	241	-3	-55.7	0	0	0	0	3	42
FYS_28	Vehicle Workshop	837791	820348	16	98	50%	-	Y	224	-3	-55.0	-10	0	0	0	3	33
HLS_7	Vehicle Workshop	837968	820191	16	98	50%	Partially Enclosed	Y	130	-3	-50.2	-10	0	0	0	3	37.7
HLS_10	Vehicle Workshop	837982	820196	16	98	50%	Partially Enclosed	Y	120	-3	-49.6	-10	0	0	0	3	38.4
HLS_11	Vehicle Workshop	837974	820202	6	98	50%	Partially Enclosed	Y	117	-3	-49.4	-10	0	0	0	3	38.6
HLS_12	Vehicle Workshop	837984	820202	38	98	50%	Partially Enclosed	-	114	-3	-49.1	-5	0	0	0	3	43.8
HLS_13	Vehicle Workshop	837977	820207	38	98	50%	Partially Enclosed	Y	111	-3	-48.9	-10	0	0	0	3	39
HLS_15	Vehicle Workshop	837979	820213	6	98	50%	Partially Enclosed	Y	105	-3	-48.4	-10	0	0	0	3	40
HLS_16	Vehicle Workshop	837990	820214	6	98	50%	Partially Enclosed	-	101	-3	-48.1	-5	0	0	0	3	44.9
HLS_19	Vehicle Workshop	837984	820224	6	98	50%	Partially Enclosed	Y	93	-3	-47.3	-10	0	0	0	3	40.6
HLS_20	Vehicle Workshop	837995	820226	6	98	50%	Partially Enclosed	-	89	-3	-46.9	-5	0	0	0	3	46
HLS_21	Vehicle Workshop	837987	820230	6	98	50%	Partially Enclosed	Y	86	-3	-46.7	-10	0	0	0	3	41
HLS_23	Vehicle Workshop	837989	820236	6	98	50%	Partially Enclosed	Y	80	-3	-46.0	-10	0	0	0	3	42
HLS_24	Vehicle Workshop	838001	820239	6	98	50%	Partially Enclosed	-	75	-3	-45.5	-5	0	0	0	3	48
HLS_25	Vehicle Workshop	837992	820242	6	98	50%	Partially Enclosed	Y	73	-3	-45.3	-10	0	0	0	3	43
HLS_26	Vehicle Workshop	838007	820248	6	98	50%	-	-	65	-3	-44.2	0	0	0	0	3	54
HLS_27	Vehicle Workshop	837990	820255	6	98	50%	-	-	61	-3	-43.7	0	0	0	0	3	54
HP_1	Outdoor equipment - Chiller	837709	820425	64	96	100%	-	-	323	0	-58.2	0	0	0	0	3	41
HP_2	Outdoor equipment - Chiller	837703	820427	64	96	100%	-	-	329	0	-58.3	0	0	0	0	3	41
HWS_28	Vehicle Workshop	837909	820293	6	98	50%	-	Y	104	-3	-48.3	-10	0	0	0	3	40
KCR_28	Vehicle Workshop	837739	820372	6	98	50%	-	-	279	-3	-56.9	0	0	0	0	3	41
LCS_28	General Workshop	837843	820326	6	98	50%	-	Y	169	-3	-52.6	-10	0	0	0	3	35
MCS11_2	Outdoor equipment - Cooling Tower	837925	820350	8	92	100%	-	Y	94	0	-47.5	-10	0	0	0	3	38
MCS3_1	Outdoor equipment - Cooling Tower	837822	820416	8	92	100%	-	Y	216	0	-54.7	-10	0	0	0	3	30
MCS3_2	Outdoor equipment - Cooling Tower	837826	820423	8	92	100%	-	Y	216	0	-54.7	-10	0	0	0	3	30
MCS3_3	Outdoor equipment - Cooling Tower	837825	820421	8	92	100%	-	Y	216	0	-54.7	-10	0	0	0	3	30
MCS3_4	Outdoor equipment - Cooling Tower	837824	820419	8	92	100%	-	Y	216	0	-54.7	-10	0	0	0	3	30
MCS3_5	Outdoor equipment - Cooling Tower	837819	820409	8	92	100%	-	Y	215	0	-54.6	-10	0	0	0	3	30
MCS3_6	Outdoor equipment - Cooling Tower	837821	820412	8	92	100%	-	Y	215	0	-54.7	-10	0	0	0	3	30
MCS5_1	Outdoor equipment - Cooling Tower	837842	820369	8	92	100%	-	Y	179	0	-53.0	-10	0	0	0	3	32
PCS_28	Vehicle Workshop	837883	820305	6	98	50%	-	Y	129	-3	-50.2	-10	0	0	0	3	38
SLS_27	General Workshop	837919	820289	23	98	50%	-	-	95	-3	-47.6	0	0	0	0	3	50
SLS_28	Vehicle Workshop	837934	820281	23	98	50%	-	Y	84	-3	-46.5	-10	0	0	0	3	42
SPS	Facade louver	838068	820254	23	86	100%	-	-	81	0	-46.2	0	0	0	0	3	43
TG_1	Outdoor equipment - Cooling Tower	837803	820092	23	96	100%	-	-	304	0	-57.6	0	0	0	0	3	41
TG_2	Outdoor equipment - Cooling Tower	837805	820096	23	96	100%	-	-	299	0	-57.5	0	0	0	0	3	41
TG_3	Outdoor equipment - Cooling Tower	837812	820094	23	96	100%	-	-	296	0	-57.4	0	0	0	0	3	42
TG_4	Outdoor equipment - Cooling Tower	837816	820092	23	96	100%	-	-	295	0	-57.4	0	0	0	0	3	42
TG_5	Outdoor equipment - Cooling Tower	837820	820089	32	96	100%	-	-	294	0	-57.4	0	0	0	0	3	42
TG_15	Outdoor equipment - Chiller	837933	820161	23	94	100%	-	-	171	0	-52.6	0	0	0	0	3	44
TG_16	Outdoor equipment - Chiller	837935	820160	23	94	100%	-	-	170	0	-52.6	0	0	0	0	3	44
TTS_4	Vehicle Workshop	837947	820185	6	98	50%	Partially Enclosed	Y	143	-3	-51.1	-10	0	0	0	3	37
TTS_5	Vehicle Workshop	837941	820195	6	98	50%	Partially Enclosed	-	137	-3	-50.7	-5	0	0	0	3	42
TTS_7	Vehicle Workshop	837944	820202	6	98	50%	Partially Enclosed	-	130	-3	-50.2	-5	0	0	0	3	43
TTS_8	Vehicle Workshop	837952	820198	6	98	50%	Partially Enclosed	Y	129	-3	-50.2	-10	0	0	0	3	38
TTS_9	Vehicle Workshop	837947	820207	6	98	50%	Partially Enclosed	-	123	-3	-49.8	-5	0	0	0	3	43
TTS_11	Vehicle Workshop	837950	820213	6	98	50%	Partially Enclosed	-	117	-3	-49.4	-5	0	0	0	3	44
TTS_12	Vehicle Workshop	837958	820209	6	98	50%	Partially Enclosed	Y	116	-3	-49.3	-10	0	0	0	3	39
TTS_14	Vehicle Workshop	837960	820215	6	98	50%	Partially Enclosed	Y	110	-3	-48.8	-10	0	0	0	3	39
TTS_15	Vehicle Workshop	837955	820225	6	98	50%	Partially Enclosed	-	105	-3	-48.4	-5	0	0	0	3	45
TTS_18	Vehicle Workshop	837966	820226	6	98	50%	Partially Enclosed	Y	98	-3	-47.9	-10	0	0	0	3	40
TTS_20	Vehicle Workshop	837968	820231	6	98	50%	Partially Enclosed	Y	92	-3	-47.3	-10	0	0	0	3	41
TTS_21	Vehicle Workshop	837962	820241	6	98	50%	Partially Enclosed	-	87	-3	-46.8	-5	0	0	0	3	46
TTS_22	Vehicle Workshop	837970	820237	6	98	50%	Partially Enclosed	Y	86	-3	-46.7	-10	0	0	0	3	41
TTS_23	Vehicle Workshop	837965	820248	6	98	50%	Partially Enclosed	-	80	-3	-46.0	-5	0	0	0	3	47
TTS_24	Vehicle Workshop	837974	820244	6	98	50%	Partially Enclosed	Y	78	-3	-45.9	-10	0	0	0	3	42
TTS_25	Vehicle Workshop	837969	820254	6	98	50%	Partially Enclosed	-	73	-3	-45.3	-5	0	0	0	3	48
TTS_26	Vehicle Workshop	837976	820249	6	98	50%	Partially Enclosed	Y	72	-3	-45.2	-10	0	0	0	3	43
TTS_27	Vehicle Workshop	837968	820267	6	98	50%	-	-	63	-3	-44.0	0	0	0	0	3	54
YOS_5	Vehicle Workshop	837918	820206	6	98	50%	Partially Enclosed	Y	142	-3	-51.0	-10	0	0	0	3	37
YOS_7	Vehicle Workshop	837920	820213	6	98	50%	Partially Enclosed	Y	135	-3	-50.6	-10	0	0	0	3	37
YOS_11	Vehicle Workshop	837925	820225	6	98	50%	Partially Enclosed	Y	123	-3	-49.8	-10	0	0	0	3	38

YOS_12	Vehicle Workshop	837934	820220	6	98	50%	Partially Enclosed	Y	121	-3	-49.7	-10	0	0	0	3	38
YOS_15	Vehicle Workshop	837930	820236	6	98	50%	Partially Enclosed	Y	112	-3	-49.0	-10	0	0	0	3	39
YOS_16	Vehicle Workshop	837939	820231	6	98	50%	Partially Enclosed	Y	109	-3	-48.8	-10	0	0	0	3	39
YOS_18	Vehicle Workshop	837941	820237	6	98	50%	Partially Enclosed	Y	103	-3	-48.3	-10	0	0	0	3	40
YOS_19	Vehicle Workshop	837936	820247	6	98	50%	Partially Enclosed	Y	101	-3	-48.0	-10	0	0	0	3	40
YOS_21	Vehicle Workshop	837938	820252	6	98	50%	Partially Enclosed	Y	95	-3	-47.6	-10	0	0	0	3	40
YOS_22	Vehicle Workshop	837947	820248	6	98	50%	Partially Enclosed	Y	92	-3	-47.2	-10	0	0	0	3	41
YOS_23	Vehicle Workshop	837941	820258	6	98	50%	Partially Enclosed	Y	89	-3	-46.9	-10	0	0	0	3	41
YOS_24	Vehicle Workshop	837950	820255	6	98	50%	Partially Enclosed	Y	85	-3	-46.6	-10	0	0	0	3	41
YOS_25	Vehicle Workshop	837944	820265	6	98	50%	Partially Enclosed	Y	83	-3	-46.4	-10	0	0	0	3	42
YOS_26	Vehicle Workshop	837951	820261	6	98	50%	Partially Enclosed	Y	79	-3	-46.0	-10	0	0	0	3	42
YOS_27	Vehicle Workshop	837943	820278	6	98	50%	-	-	77	-3	-45.7	0	0	0	0	3	52
YOS_28	Vehicle Workshop	837959	820271	6	98	50%	-	-	67	-3	-44.6	0	0	0	0	3	53
Total																3	64

Detail Fixed Plant Noise Calculation - T1-18B

Period	Nighttime
NSR ID	T1-18B
NSR Name	Tower 1 (Domestic)
Coor - x	838011.4
Coor - y	820312.7
Criteria	55
Fixed noise level at receiver	52
Compliance	Y

Source ID	Source Name	Source coor-x	Source coor-y	Source coor-z	SWL, dB(A)	Operation Time %	At source noise shielding	Blockage of direct line of sight	Horizontal Distance,m	Correction of operation time	Distance Attenuation, dB(A)	Screening Correction, dB(A)	Tonality Correction, dB(A)	Intermittency, dB(A)	Impulsiveness, dB(A)	Façade Correction, dB(A)	Predicted Noise Level, L _{eq} (30min) dB(A)
HP_1	Outdoor equipment - Chiller	837709	820425	64	96	100%	-	-	323	0	-58.2	0	0	0	0	3	41
HP_2	Outdoor equipment - Chiller	837703	820427	64	96	100%	-	-	329	0	-58.3	0	0	0	0	3	41
MCS5_1	Outdoor equipment - Cooling Tower	837842	820369	8	92	100%	-	Y	179	0	-53.0	-10	0	0	0	3	32
SPS	Facade louver	838068	820254	23	86	100%	-	-	81	0	-46.2	0	0	0	0	3	43
TG_1	Outdoor equipment - Cooling Tower	837803	820092	23	96	100%	-	-	304	0	-57.6	0	0	0	0	3	41
TG_2	Outdoor equipment - Cooling Tower	837805	820096	23	96	100%	-	-	299	0	-57.5	0	0	0	0	3	41
TG_3	Outdoor equipment - Cooling Tower	837812	820094	23	96	100%	-	-	296	0	-57.4	0	0	0	0	3	42
TG_4	Outdoor equipment - Cooling Tower	837816	820092	23	96	100%	-	-	295	0	-57.4	0	0	0	0	3	42
TG_5	Outdoor equipment - Cooling Tower	837820	820089	32	96	100%	-	-	294	0	-57.4	0	0	0	0	3	42
TG_15	Outdoor equipment - Chiller	837933	820161	23	94	100%	-	-	171	0	-52.6	0	0	0	0	3	44
TG_16	Outdoor equipment - Chiller	837935	820160	23	94	100%	-	-	170	0	-52.6	0	0	0	0	3	44
Total																	52

Detail Fixed Plant Noise Calculation - T1-19A

Period	Daytime and evening
NSR ID	T1-19A
NSR Name	Tower 1 (Domestic)
Coor - x	838002.8
Coor - y	820316.7
Criteria	65
Fixed noise level at receiver	64
Compliance	Y

Source ID	Source Name	Source coor-x	Source coor-y	Source coor-Z	SWL, dB(A)	Operation Time %	At source noise shielding	Blockage of direct line of sight	Horizontal Distance,m	Correction of operation time	Distance Attenuation, dB(A)	Screening Correction, dB(A)	Tonality Correction, dB(A)	Intermittency, dB(A)	Impulsiveness, dB(A)	Façade Correction, dB(A)	Predicted Noise Level, L _{eq(30min)} dB(A)
FYS_27	Vehicle Workshop	837774	820358	6	98	50%	-	-	232	-3	-55.3	0	0	0	0	3	43
FYS_28	Vehicle Workshop	837791	820348	16	98	50%	-	-	215	-3	-54.6	0	0	0	0	3	43
HLS_7	Vehicle Workshop	837968	820191	16	98	50%	Partially Enclosed	Y	131	-3	-50.3	-10	0	0	0	3	38
HLS_10	Vehicle Workshop	837982	820196	16	98	50%	Partially Enclosed	Y	122	-3	-49.7	-10	0	0	0	3	38
HLS_11	Vehicle Workshop	837974	820202	6	98	50%	Partially Enclosed	Y	118	-3	-49.5	-10	0	0	0	3	38.5
HLS_12	Vehicle Workshop	837984	820202	38	98	50%	Partially Enclosed	Y	116	-3	-49.3	-10	0	0	0	3	38.7
HLS_13	Vehicle Workshop	837977	820207	38	98	50%	Partially Enclosed	Y	113	-3	-49.1	-10	0	0	0	3	38.9
HLS_15	Vehicle Workshop	837979	820213	6	98	50%	Partially Enclosed	Y	106	-3	-48.5	-10	0	0	0	3	39.5
HLS_16	Vehicle Workshop	837990	820214	6	98	50%	Partially Enclosed	Y	103	-3	-48.3	-10	0	0	0	3	39.7
HLS_19	Vehicle Workshop	837984	820224	6	98	50%	Partially Enclosed	Y	94	-3	-47.5	-10	0	0	0	3	40.5
HLS_20	Vehicle Workshop	837995	820226	6	98	50%	Partially Enclosed	-	91	-3	-47.2	-5	0	0	0	3	46
HLS_21	Vehicle Workshop	837987	820230	6	98	50%	Partially Enclosed	Y	88	-3	-46.9	-10	0	0	0	3	41
HLS_23	Vehicle Workshop	837989	820236	6	98	50%	Partially Enclosed	Y	82	-3	-46.2	-10	0	0	0	3	42
HLS_24	Vehicle Workshop	838001	820239	6	98	50%	Partially Enclosed	-	78	-3	-45.9	-5	0	0	0	3	47
HLS_25	Vehicle Workshop	837992	820242	6	98	50%	Partially Enclosed	Y	76	-3	-45.6	-10	0	0	0	3	42
HLS_26	Vehicle Workshop	838007	820248	6	98	50%	-	-	69	-3	-44.7	0	0	0	0	3	53
HLS_27	Vehicle Workshop	837990	820255	6	98	50%	-	-	62	-3	-43.9	0	0	0	0	3	54
HP_1	Outdoor equipment - Chiller	837709	820425	64	96	100%	-	Y	313	0	-57.9	-10	0	0	0	3	31
HP_2	Outdoor equipment - Chiller	837703	820427	64	96	100%	-	Y	319	0	-58.1	-10	0	0	0	3	31
HWS_28	Vehicle Workshop	837909	820293	6	98	50%	-	-	96	-3	-47.7	0	0	0	0	3	50
KCR_28	Vehicle Workshop	837739	820372	6	98	50%	-	-	270	-3	-56.6	0	0	0	0	3	41
LCS_28	General Workshop	837843	820326	6	98	50%	-	-	160	-3	-52.1	0	0	0	0	3	46
MCS11_2	Outdoor equipment - Cooling Tower	837925	820350	8	92	100%	-	-	85	0	-46.6	0	0	0	0	3	48
MCS3_1	Outdoor equipment - Cooling Tower	837822	820416	8	92	100%	-	-	206	0	-54.3	0	0	0	0	3	41
MCS3_2	Outdoor equipment - Cooling Tower	837826	820423	8	92	100%	-	-	207	0	-54.3	0	0	0	0	3	41
MCS3_3	Outdoor equipment - Cooling Tower	837825	820421	8	92	100%	-	-	207	0	-54.3	0	0	0	0	3	41
MCS3_4	Outdoor equipment - Cooling Tower	837824	820419	8	92	100%	-	-	206	0	-54.3	0	0	0	0	3	41
MCS3_5	Outdoor equipment - Cooling Tower	837819	820409	8	92	100%	-	-	205	0	-54.3	0	0	0	0	3	41
MCS3_6	Outdoor equipment - Cooling Tower	837821	820412	8	92	100%	-	-	206	0	-54.3	0	0	0	0	3	41
MCS5_1	Outdoor equipment - Cooling Tower	837842	820369	8	92	100%	-	-	169	0	-52.6	0	0	0	0	3	42
PCS_28	Vehicle Workshop	837883	820305	6	98	50%	-	-	121	-3	-49.6	0	0	0	0	3	48
SLS_27	General Workshop	837919	820289	23	98	50%	-	-	88	-3	-46.9	0	0	0	0	3	51
SLS_28	Vehicle Workshop	837934	820281	23	98	50%	-	-	78	-3	-45.8	0	0	0	0	3	52
SPS	Facade louver	838068	820254	23	86	100%	-	Y	90	0	-47.1	-10	0	0	0	3	32
TG_1	Outdoor equipment - Cooling Tower	837803	820092	23	96	100%	-	Y	301	0	-57.6	-10	0	0	0	3	31
TG_2	Outdoor equipment - Cooling Tower	837805	820096	23	96	100%	-	-	296	0	-57.4	0	0	0	0	3	42
TG_3	Outdoor equipment - Cooling Tower	837812	820094	23	96	100%	-	-	293	0	-57.3	0	0	0	0	3	42
TG_4	Outdoor equipment - Cooling Tower	837816	820092	23	96	100%	-	-	292	0	-57.3	0	0	0	0	3	42
TG_5	Outdoor equipment - Cooling Tower	837820	820089	32	96	100%	-	-	292	0	-57.3	0	0	0	0	3	42
TG_15	Outdoor equipment - Chiller	837933	820161	23	94	100%	-	-	170	0	-52.6	0	0	0	0	3	44
TG_16	Outdoor equipment - Chiller	837935	820160	23	94	100%	-	-	170	0	-52.6	0	0	0	0	3	44
TTS_4	Vehicle Workshop	837947	820185	6	98	50%	Partially Enclosed	Y	143	-3	-51.1	-10	0	0	0	3	37
TTS_5	Vehicle Workshop	837941	820195	6	98	50%	Partially Enclosed	-	136	-3	-50.7	-5	0	0	0	3	42
TTS_7	Vehicle Workshop	837944	820202	6	98	50%	Partially Enclosed	-	129	-3	-50.2	-5	0	0	0	3	43
TTS_8	Vehicle Workshop	837952	820198	6	98	50%	Partially Enclosed	Y	129	-3	-50.2	-10	0	0	0	3	38
TTS_9	Vehicle Workshop	837947	820207	6	98	50%	Partially Enclosed	-	123	-3	-49.8	-5	0	0	0	3	43
TTS_11	Vehicle Workshop	837950	820213	6	98	50%	Partially Enclosed	-	116	-3	-49.3	-5	0	0	0	3	44
TTS_12	Vehicle Workshop	837958	820209	6	98	50%	Partially Enclosed	Y	116	-3	-49.3	-10	0	0	0	3	39
TTS_14	Vehicle Workshop	837960	820215	6	98	50%	Partially Enclosed	Y	110	-3	-48.8	-10	0	0	0	3	39
TTS_15	Vehicle Workshop	837955	820225	6	98	50%	Partially Enclosed	-	104	-3	-48.3	-5	0	0	0	3	45
TTS_18	Vehicle Workshop	837966	820226	6	98	50%	Partially Enclosed	Y	98	-3	-47.9	-10	0	0	0	3	40
TTS_20	Vehicle Workshop	837968	820231	6	98	50%	Partially Enclosed	Y	92	-3	-47.3	-10	0	0	0	3	41
TTS_21	Vehicle Workshop	837962	820241	6	98	50%	Partially Enclosed	-	86	-3	-46.7	-5	0	0	0	3	46
TTS_22	Vehicle Workshop	837970	820237	6	98	50%	Partially Enclosed	Y	86	-3	-46.7	-10	0	0	0	3	41
TTS_23	Vehicle Workshop	837965	820248	6	98	50%	Partially Enclosed	-	78	-3	-45.9	-5	0	0	0	3	47
TTS_24	Vehicle Workshop	837974	820244	6	98	50%	Partially Enclosed	Y	78	-3	-45.9	-10	0	0	0	3	42
TTS_25	Vehicle Workshop	837969	820254	6	98	50%	Partially Enclosed	-	72	-3	-45.1	-5	0	0	0	3	48
TTS_26	Vehicle Workshop	837976	820249	6	98	50%	Partially Enclosed	Y	72	-3	-45.2	-10	0	0	0	3	43
TTS_27	Vehicle Workshop	837968	820267	6	98	50%	-	-	61	-3	-43.7	0	0	0	0	3	54
YOS_5	Vehicle Workshop	837918	820206	6	98	50%	Partially Enclosed	Y	139	-3	-50.9	-10	0	0	0	3	37
YOS_7	Vehicle Workshop	837920	820213	6	98	50%	Partially Enclosed	Y	132	-3	-50.4	-10	0	0	0	3	38
YOS_11	Vehicle Workshop	837925	820225	6	98	50%	Partially Enclosed	Y	120	-3	-49.6	-10	0	0	0	3	38

YOS_12	Vehicle Workshop	837934	820220	6	98	50%	Partially Enclosed	Y	119	-3	-49.5	-10	0	0	0	3	38
YOS_15	Vehicle Workshop	837930	820236	6	98	50%	Partially Enclosed	Y	108	-3	-48.7	-10	0	0	0	3	39
YOS_16	Vehicle Workshop	837939	820231	6	98	50%	Partially Enclosed	Y	107	-3	-48.6	-10	0	0	0	3	39
YOS_18	Vehicle Workshop	837941	820237	6	98	50%	Partially Enclosed	Y	101	-3	-48.1	-10	0	0	0	3	40
YOS_19	Vehicle Workshop	837936	820247	6	98	50%	Partially Enclosed	Y	97	-3	-47.7	-10	0	0	0	3	40
YOS_21	Vehicle Workshop	837938	820252	6	98	50%	Partially Enclosed	-	91	-3	-47.2	-5	0	0	0	3	46
YOS_22	Vehicle Workshop	837947	820248	6	98	50%	Partially Enclosed	Y	89	-3	-47.0	-10	0	0	0	3	41
YOS_23	Vehicle Workshop	837941	820258	6	98	50%	Partially Enclosed	-	85	-3	-46.5	-5	0	0	0	3	46
YOS_24	Vehicle Workshop	837950	820255	6	98	50%	Partially Enclosed	Y	82	-3	-46.3	-10	0	0	0	3	42
YOS_25	Vehicle Workshop	837944	820265	6	98	50%	Partially Enclosed	Y	78	-3	-45.9	-10	0	0	0	3	42
YOS_26	Vehicle Workshop	837951	820261	6	98	50%	Partially Enclosed	Y	76	-3	-45.6	-10	0	0	0	3	42
YOS_27	Vehicle Workshop	837943	820278	6	98	50%	-	-	72	-3	-45.1	0	0	0	0	3	53
YOS_28	Vehicle Workshop	837959	820271	6	98	50%	-	-	64	-3	-44.1	0	0	0	0	3	54
Total																3	64

Detail Fixed Plant Noise Calculation - T1-19A

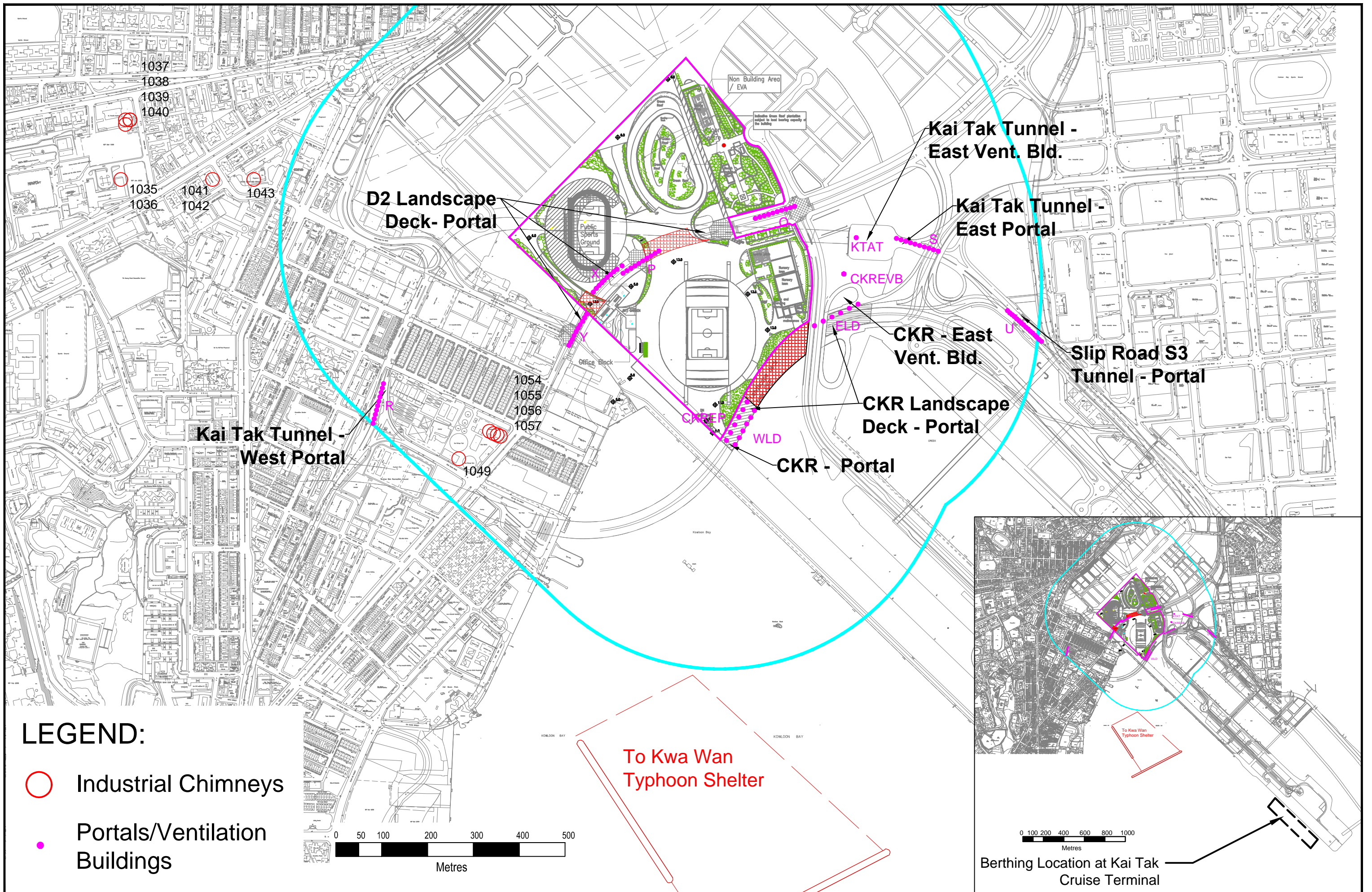
Period	Nighttime
NSR ID	T1-19A
NSR Name	Tower 1 (Domestic)
Coor - x	838002.8
Coor - y	820316.7
Criteria	55
Fixed noise level at receiver	51
Compliance	Y

Source ID	Source Name	Source coor-x	Source coor-y	Source coor-z	SWL, dB(A)	Operation Time %	At source noise shielding	Blockage of direct line of sight	Horizontal Distance,m	Correction of operation time	Distance Attenuation, dB(A)	Screening Correction, dB(A)	Tonality Correction, dB(A)	Intermittency, dB(A)	Impulsiveness, dB(A)	Façade Correction, dB(A)	Predicted Noise Level, L _{eq} (30min) dB(A)
HP_1	Outdoor equipment - Chiller	837709	820425	64	96	100%	-	Y	313	0	-57.9	-10	0	0	0	3	31
HP_2	Outdoor equipment - Chiller	837703	820427	64	96	100%	-	Y	319	0	-58.1	-10	0	0	0	3	31
MCS5_1	Outdoor equipment - Cooling Tower	837842	820369	8	92	100%	-	-	169	0	-52.6	0	0	0	0	3	42
SPS	Facade louver	838068	820254	23	86	100%	-	Y	90	0	-47.1	-10	0	0	0	3	32
TG_1	Outdoor equipment - Cooling Tower	837803	820092	23	96	100%	-	Y	301	0	-57.6	-10	0	0	0	3	31
TG_2	Outdoor equipment - Cooling Tower	837805	820096	23	96	100%	-	-	296	0	-57.4	0	0	0	0	3	42
TG_3	Outdoor equipment - Cooling Tower	837812	820094	23	96	100%	-	-	293	0	-57.3	0	0	0	0	3	42
TG_4	Outdoor equipment - Cooling Tower	837816	820092	23	96	100%	-	-	292	0	-57.3	0	0	0	0	3	42
TG_5	Outdoor equipment - Cooling Tower	837820	820089	32	96	100%	-	-	292	0	-57.3	0	0	0	0	3	42
TG_15	Outdoor equipment - Chiller	837933	820161	23	94	100%	-	-	170	0	-52.6	0	0	0	0	3	44
TG_16	Outdoor equipment - Chiller	837935	820160	23	94	100%	-	-	170	0	-52.6	0	0	0	0	3	44
Total																51	

Appendix 4.1

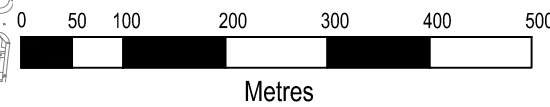
Extracted Information of Emission Sources identified at
Kai Tak Multi-purpose Sports Complex EIA Report



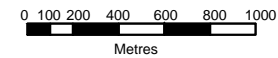


LEGEND:

- Industrial Chimneys
- Portals/Ventilation Buildings



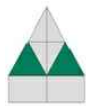
To Kwa Wan Typhoon Shelter



Berthing Location at Kai Tak Cruise Terminal



The joint venture of
Cinotech Consultants Ltd. and
Maurice Lee & Associates Ltd.



Drafting by	KT	06/15
Designed by	KT	06/15
Checked by	KS	06/15
Approved by	KS	06/15

SCALE: AS SHOWN

PROJECT: Kai Tak Multi-purpose Sports Complex
TITLE: Locations of Portals, Ventilation Buildings, Industrial Chimneys and Typhoon Shelter

DRAWING NO: Figure 3-4

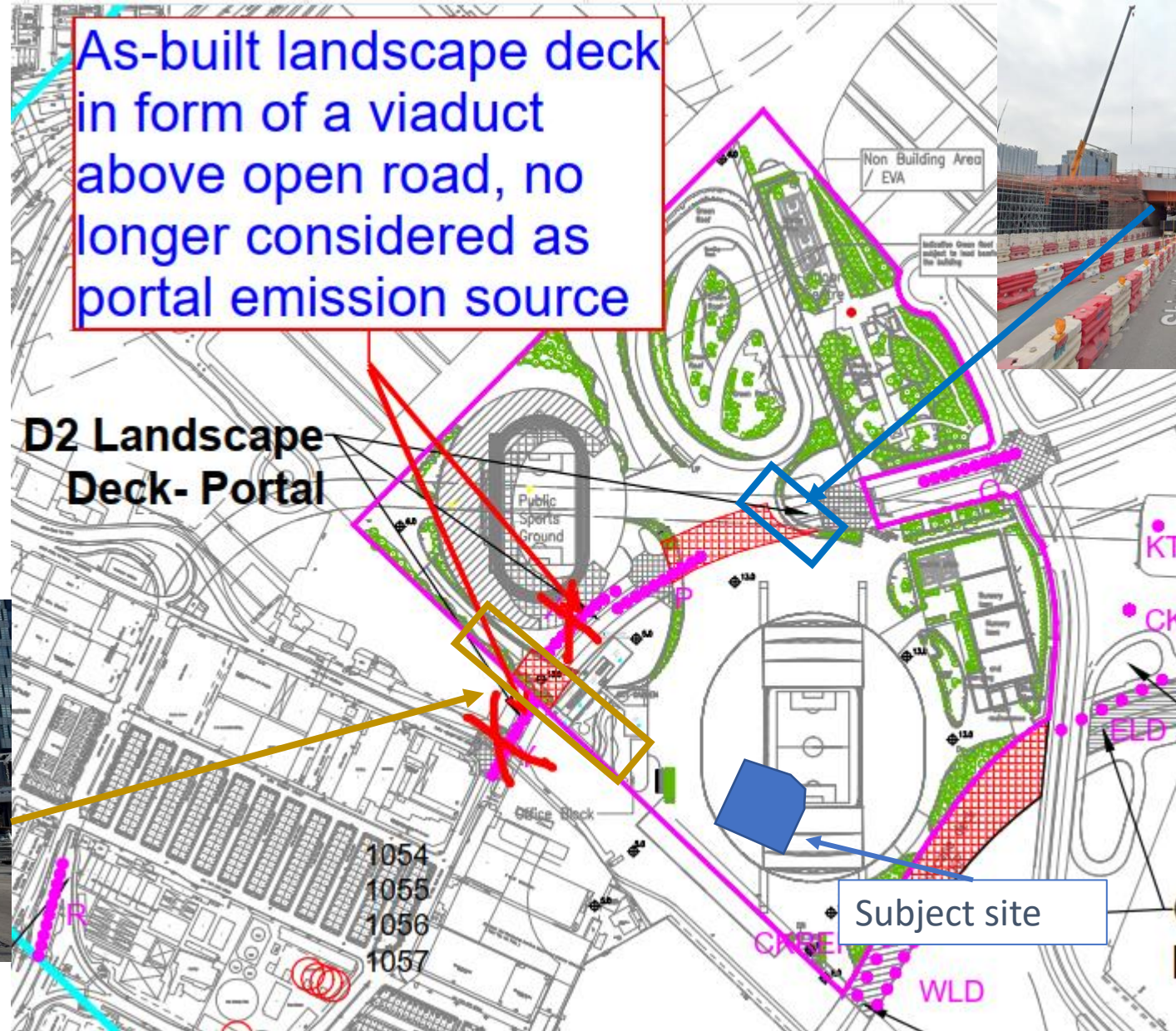
REV: 0

Appendix 4.2

Site Survey Photo for the as-built Landscape Deck
closer to the Subject Site



Site Survey Photo for the As-built Landscape Deck closer to the Subject Site



Appendix 4.3

Site Odour Survey



Odour Patrol along Site Boundary on 21 Oct 2022

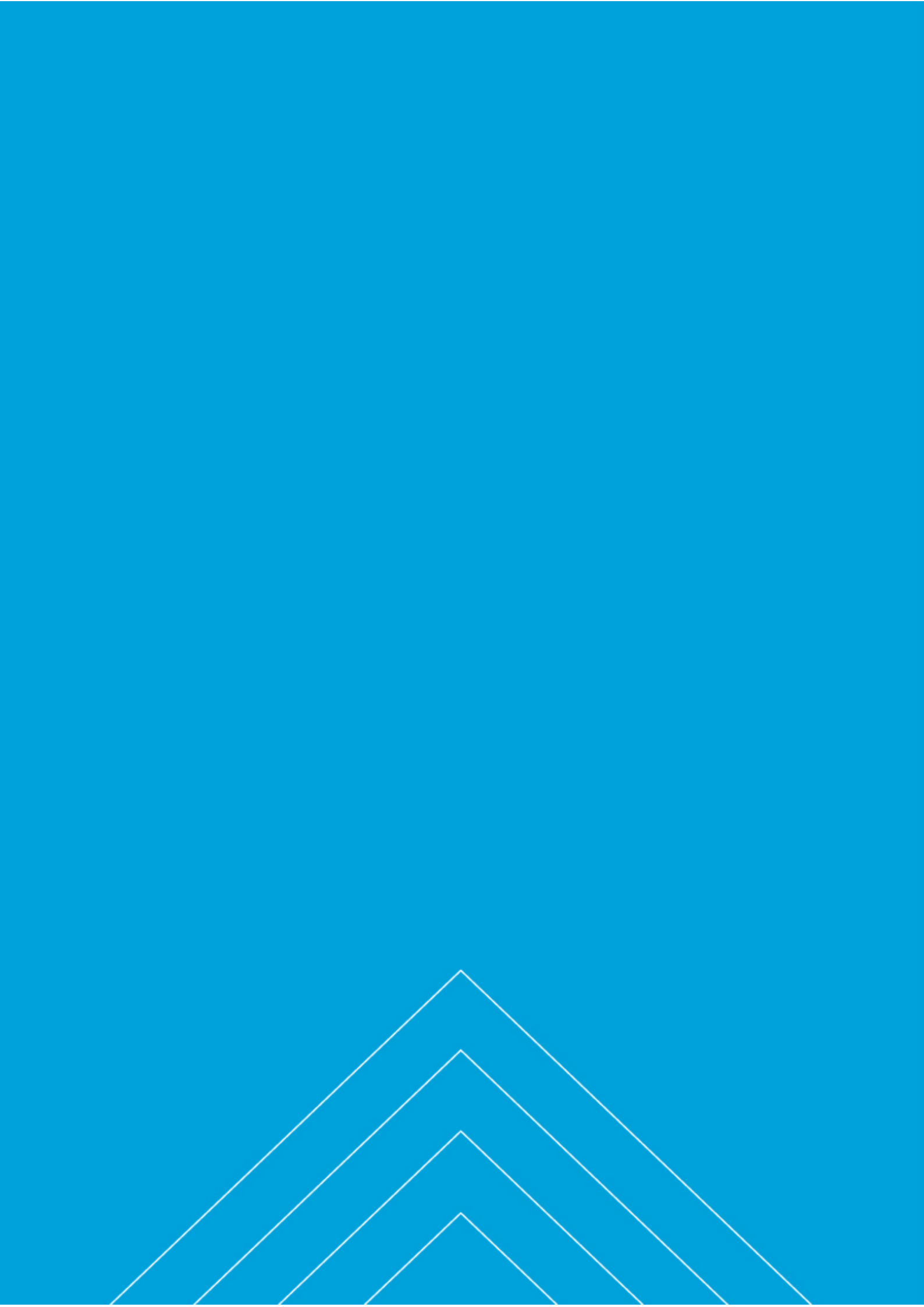


No odour was perceived and no odour generating activity was observed during the odour patrol

Route of odour patrol

To Kwa Wan Road Pumping Station





阿特金斯顧問有限公司 **Atkins China Limited**
13/F Wharf T&T Centre
Harbour City
Tsim Sha Tsui
Kowloon
Hong Kong

Tel: +852 2972 1000
Fax: +852 2890 6343