Appendix 1

Replacement pages of

Environmental Assessment

List of Figures

List of Tables

List of Appendices

2 Site Context

2.1 Site Location and Its Environs

2.1.1.1 The Site is bounded by Tai Po Road – Tai Po Kau to its South. The Japanese International School is located at the West of the Site, while Po Leung Kuk Tin Ka Ping Millennium Primary School is at the Northeast of the Site. The site area is approximately 2,210.2m^2.

2.1.1.2 Figure 2.1 shown the Site Location and its environs.

2.2 Proposed Development

2.2.1.1 The Proposed Development is a 10-storey building which consists of seven department units, i.e. Special Child Care Centre (SCCC), Care and Attention Home Providing Continuum of Care (CoC Home), Small Group Home (SGH), Foster Care Service and Agency-based Enhancement of Professional Staff Support Services (FCS), Staff Training Unit (STU), and Child Care Centre (CCC). There will also be residential places for the elderly, a basement carpark, and a localized sewage treatment plant (STP) on B2/F. The installed capacity of the STP is 168.4m^3/day which is not classified as a Designated Project (DP) under EIAO as it has an installed capacity of not more than 5,000m^3 /day and no reclaimed water will be generated for public use. The anticipated commissioning year of the Proposed Development is 2030.

2.2.1.2 The Proposed Development will involve earthworks and building works, with no dredging operations. No upgrading of drainage channels or river training and diversion work is required for the Proposed Development. The project site is not located within the existing or gazetted country park or special area, conservation area, existing or gazetted marine park or marine reserve, site of cultural heritage, and site of special scientific interest, and no earthworks and building work will be conducted in the above natural reserve area. Therefore, the Proposed Development is not classified as a designated project under EIAO as well as no environmental permit is required.

2.2.1.3 As the noise sensitive rooms within the Proposed Development are potentially subject to adverse noise impacts, noise mitigating designs could be incorporated in Proposed Development, if and when necessary, to alleviate the potential noise impacts.

2.2.1.4 The master layout plan with the floor plans and section drawings are presented in Appendix A.

3.2.1.3 The minimum buffer distance required between roads and air sensitive uses is stipulated in Table 3.1 in Chapter 9 of the HKPSG. The relevant minimum buffer distance is summarised in Table 3.2. As confirmed by the Transport Department, Tai Po Road – Tai Po Kau Is classified as a rural road with limited traffic flow. According to the HKPSG Chapter 9, there is no minimum buffer distance required for developments adjacent to rural road. However, to address air quality concerns and enhance the overall living environment for future residents, a 5m buffer distance has been incorporated between the Proposed Development and Tai Po Road – Tai Po Kau. The detail of the buffer distance is shown in Figure 3.2.

Table 3.2 Required Buffer Distance between the Surrounding Road and the Air Sensitive Receivers of the Proposed Development

Road	Type	Required Buffer Distance	Buffer Distance Provided
Tai Po Road – Tai Po Kau	Rural Road	Not required according to the HKPSG Ch9	>5m

Remark: The identified road type is based on Transport Department's confirmation, please refer to Appendix B.

Table 3.3 Required Buffer Distance between the Pollution Sources and the Air Sensitive Receiver

Pollution Source	Difference in Height between Chimney Exit and the Site	Required Buffer Distance
Industrial Area	<20m	> 200m (Active and passive recreational uses)
	20 – 30m	5 - 200m (Passive recreational uses)
		> 100m (Active and passive recreational uses)
	30 – 40m	5 - 100m (Passive recreational uses)
		> 50m (Active and passive recreational uses)
	40m	5 - 50m (Passive recreational uses)
		> 10m (Active and passive recreational uses)
Odour Source	NA	200m
Dusty Uses		100m

3.2.1.4 The relevant regulations specified by APCO also include the followings:

- Air Pollution Control Ordinance (Cap. 311);
- Air Pollution Control (Construction Dust) Regulation (Cap. 311R);
- Air Pollution Control (Smoke) Regulation (Cap. 311C);
- Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation (Cap. 311Z);

Table 3.5 Concentrations of Pollutants in the Recent Five Years (Year 2019 – 2023) at Tai Po EPD Air Quality Monitoring Station

Pollutant	Averaging Time	Observed Concentration (μg/m³)					5-year Average (μg/m³)
		2019	2020	2021	2022	2023	
Sulphur dioxide (SO_2)	4th Highest 24-hour	10	7	8	5	4	7
	4th Highest 10-minutes	20	19	15	12	27	19
Nitrogen Dioxide (NO_2)	19th Highest 1-hour	142	106	115	93	95	110
	Annual	36	30	32	27	27	30
Respirable Suspended Particulates (RSP)	10th Highest 24-hour	65	58	60	48	53	57
	Annual	31	24	26	21	25	25
Fine Suspended Particulates (FSP)	36th Highest 24-hour	35	28	27	25	26	28
	Annual	20	15	16	14	15	16
Ozone (O_3)	10th Highest 8-hour	197	165	168	188	163	176
CO	1st Highest 8-hour	-	-	-	-	-	-
	Annual	-	-	-	-	-	-

Notes:
1) *CO concentration is not available at Tai Po Station*
2) *The number highlighted in red indicates the exceedance against the AQO*
3) *Source: https://cd.epic.epd.gov.hk/EPICDI/air/station/?lang=en*

3.4.1.2 Based on the background air quality data, it appears that the concentrations of all pollutants have decreased over the years from 2019 to 2023 in general. This could indicate improvements in air quality over the year. By comparing with the Air Quality Objectives in Table 3.1, the concentration of all air pollutants falls within the standard except ozone.

3.4.1.3 Future background air quality has been predicted based on hourly concentration data extracted from the "Pollutants in the Atmosphere and their Transport over Hong Kong" (PATH v3.0) model. The Project commissioning year is Year 2030. The best available data from PATH v3.0 will be the projected background scenario in Year 2030. Pollutant concentration in PATH Grid (42,45) in Year 2030 was extracted and summarized in Table 3.6:

Table 3.6 Background Air Pollutant in Year 2030 Extracted from the PATH v3.0 Model

Pollutant	Averaging Time	PATH Grid (42, 45) Concentration (µg/m^3)
Sulphur Dioxide (SO_2)	10-minute (4th Highest)	24.34
	24-hour (4th Highest)	6.99
Nitrogen Dioxide (NO_2)	1-hour (19th Highest)	43.23
	Annual	11.02
Respirable Suspended Particulates (RSP)	24-hour (10th Highest)	48.72
	Annual	19.1
Fine Suspended Particulates (FSP)	24-hour (36th Highest)	25.4
	Annual	11.64
Ozone (O3)	8-hour (10th Highest)	169.09
CO	1-hour (1st Highest)	527.27
	8-hour (1st Highest)	490.27

Notes:
1. *Source: PATH v3.0 data for grid cell (42,45) at levels L1 from https://aqia.epd.gov.hk/*
2. *The number highlighted in red indicates the exceedance against the AQO*

3.5 Potential Impact during Construction Phase

3.5.1.1 The relevant statutory requirements during construction phase of the Project include the *APCO and Air Pollution Control (Construction Dust) Regulation*. Referring to the *Air Pollution Control (Construction Dust) Regulation*, the proposed project works are considered to be "construction work" as defined in the regulation.

3.5.1.2 The potential sources of air quality impact associated with the proposed construction activities include foundation works and construction works, which will be expected to generate construction dust and smoke emission.

3.5.1.3 According to the information provided by the project team. The excavation area will be around 2,210m^2 with a maximum depth 19m while that of filling of land will be approximately 1902m^2 and the maximum depth of filling is 7m. Given a dump truck capacity of 28m^3, approximately 1024 dump trucks would be required throughout the construction period. The whole excavation process will be lasted for 12 months with total 296 working days (including Saturday). 4 trips per day is therefore anticipated. And 2 dump trucks will travel approximately twice per day for excavated material transportation. The use of bulldozer, dump truck, auger, crane, air compressor, and concrete lorry mixer will be essential for the construction. Table 3.7 below summarizes the number of dump trucks and mechanical equipment to be used per time over the work site during construction.

Table 3.7 Number of Dump Trucks and Mechanical Equipment

Equipment	Quantity
Stage 1 – Hoarding	
Concrete crusher mini-robot mounted	1
Bulldozer, tracked	1
Dump truck (≤38 tonnes)	2
Stage 2 – Piling	
Rotary bored piling – cast in situ (Crane mounted auger)	2
Wheeled mobile crane	2
Air compressor (≤10 m^3/min)	4
Stage 3 – Excavation & Pile Cap	
Wheeled mobile crane	1
Excavator, wheeled/tracked	1
Bar bender and cutter (electric)	1
Compactor, vibratory	2
Large lorry concrete mixer	1
Dump truck (≤38 tonnes)	2
Stage 4 – Superstructure	
Wheeled mobile crane	1
Bar bender and cutter (electric)	1
Compactor, vibratory	2
Large lorry concrete mixer	1
Dump truck (≤38 tonnes)	1
Lorry (≤38 tonnes)	1

Equipment	Quantity

Note:
[1] The listed equipment is quiet PME suggested in the Technical Memorandum on Noise from Construction Work Other Than Percussive Training.

3.5.1.4 During construction, dust generating construction activities will include vehicle movement, site clearance, drilling, ground excavation, and material handling. Vehicle washing facilities will be provided at the entrances and exits of the work site to minimize dust nuisance created to nearby ASRs. The main dust impacts will arise from truck moments along the unpaved haul roads. Secondary impacts will arise through the stockpiling and removal of spoil during hoarding, piling, and excavation works period.

3.5.1.5 Construction dust shall be controlled in accordance with the requirements as listed in the Schedule of the Air Pollution Control (Construction Dust) Regulation of APCO. Also, notice of notifiable works as defined under the Regulation shall be completed by the Contractor and sent to the Environmental Protection Department (EPD). The road improvement work will as well follow relevant guidelines stipulated by EPD to ensure no adverse air quality impact will be induced to nearby ASRs. In addition, there is no concurrent project in the vicinity of the Project Site, thus no cumulative air quality impact is anticipated.

3.5.1.6 Non-road mobile machinery (NRMM) used on construction sites, such as excavators, bulldozers, and cranes, are significant sources of air pollution, emitting pollutants like nitrogen oxides (NOx), carbon dioxide (CO2), and particulate matter (PM). To mitigate these emissions, several measures can be implemented, including adherence to prescribed emission standards.

3.5.1.7 All the non-road vehicles should follow the emissions standards of the following types of newly approved non-road vehicles. For Regulated machines, which include any mobile machines or transportable industrial equipment, must comply with specific emission standards based on their engine type and power output. For compression-ignition engines, the standards are as follows:

Table 3.8 Prescribed Emissions Standards for Regulated Machine

Rated Engine Power Output (P) in kW	Emission Standards Adopted
Compression-ignition Engines	
$37 \le P \le 560$	EU Stage IIIA, US Tier 3 or Japan MoE standards
$19 < P < 37$	EU Stage IIIA, US Tier 2 or Japan MoE standards
Positive-ignition Engines	
$19 < P \le 560$	US Tier 2 or Japan MoE standards

3.5.1.8 Mitigation measures for NRMM emissions during the construction including:

1. Advanced Engine Technologies: Utilizing machinery equipped with technologies such as selective catalytic reduction (SCR) and diesel particulate filters (DPF) to reduce NOx and PM emissions;

2. Regular Maintenance: Ensuring regular maintenance and timely repairs to prevent increased emissions due to engine wear and malfunctioning emission control systems;

3. Fuel Quality: Using cleaner fuels with lower sulfur content to reduce the formation of harmful pollutants. Biodiesel and other alternative fuels can also be considered to lower emissions;

4. Retrofitting Older Equipment: Upgrading older NRMM with modern emission control technologies to meet current standards; and

5. Operational Practices: Implementing best practices such as minimizing idling time, optimizing engine load, and using energy-efficient machinery. For example, shutting down engines when not in use and scheduling construction activities to avoid peak pollution periods can be effective.

3.6 Mitigation Measures during Construction Phase

3.6.1.1 During construction phase, it will be ensured that the Contractor or relevant parties implement dust control measures in accordance with the requirements of the *Air Pollution Control (Construction Dust) Regulation* and all dust control measures recommended in regulation, where applicable, will also be implemented. All dusty processing will be avoided or rearranged in non-school hours and keep school management informed of any possible impact. Typical dust control measures include:

- The work area shall be sprayed with water before, during and after the construction works so as to maintain the entire surface wet;
- Restricting heights from which materials are to be dropped, as far as practicable to minimize the fugitive dust arising from unloading/ loading;
- Immediately before leaving a construction site, all vehicles shall be washed to remove any dusty materials from its body and wheels;
- All spraying of materials and surfaces should avoid excessive water usage;
- Where a vehicle leaving a construction site is carrying a load of dusty materials, the load shall be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle;
- Travelling speeds should be controlled to reduce traffic induced dust dispersion and re-suspension within the site from the operating haul trucks;
- Erection of hoarding of not less than 2.4 m high from ground level along the site boundary;
- Any stockpile of dusty materials shall be covered entirely by impervious sheeting; and/or placed in an area sheltered on the top and 4 sides; and
- All dusty materials shall be sprayed with water immediately prior to any loading, unloading or transfer operation so as to maintain the dusty materials wet;

- Electric power supply should be provided for on-site machinery as far as practicable;
- Avoid the use of diesel generators and machinery to minimize gaseous and articulate emissions;

Enhanced dust mitigation measures will be adopted for the ASRs in proximity to the Proposed Development:

- Adopt site hoarding at sufficient height close to those concerned ASRs;
- Locate the haul road away from those concerned ASRs;
- Avoid dusty works or placing stockpiles near to those concerned ASRs;
- Minimization of unpaved, exposed earth by immediate covering/ permanent paving as soon as the works have been completed.

3.6.1.2 With the implementation of the mitigation measures, no adverse construction dust impact is anticipated.

3.7 Potential Impact during Operation Phase

3.7.1.1 The Proposed Development is mainly for community service and residential uses. No chimney will be provided in the Proposed Development. As a result, there is no expected air pollutants emissions during operation phase and no air sensitive receivers (ASRs) are assigned for the assessment. Moreover, the design and operation of the proposed carparks for the Project will follow *ProPECC PN 2/96 on Control of Air Pollution in Car Parks*. The exhaust outlets of the proposed carpark will be located at the roof floor which faced away from nearby ASRs as far as applicable.

3.7.1.2 According to the Sewerage Impact Assessment (SIA), an underground Sewage Treatment plant (STP) will be provided at the basement under the Proposed Development. The propose STP would treat sewage generated from the Proposed Development only. The Installed capacity of the proposed STP is 168.41 m^3/day. It is not classified as a Designated Project (DP) under EIAO as it will has an installed capacity of not more than 5,000m^3 /day and no reclaimed water will be generated for public use.

3.7.1.3 The proposed STP will be enclosed underground and the potential odour emission impact from the STP would be minimized. General mitigation measures, including enclosure of odorous facilities, maintaining negative pressure to prevent foul air from flowing out, and provision of deodorisation (DO) unit of at least 99.5% removal efficiency (i.e. H_2S), will be implemented to control potential odour impacts. And all odorous emission points, including the vent exhaust of the deodorisation unit, will be located at the roof floor which faced away from nearby ASRs as far as applicable. Good housekeeping practices should also be implemented, including regular inspection of treatment components where odour could be produced, regular cleaning and flushing of screens and other sewage handling equipment, and disposal of collected grit and sludge. After the implementation of the above measures, the potential odour impact due to the operation of the on-site STP would be minimal or negligible

3.7.1.4 According to the desktop survey and the site survey on 10 Jun 2024, no chimney was found within 200m nearby the Site. Thus, no adverse air quality impact will be brought to the Proposed Development by surrounding chimney.

3.7.1.5 A desktop study has been conducted to compare the value of Annual Average Daily Traffic (AADT) of the Tai Po Road against other local distributors with similar or grater traffic flow and located in Tai Po district. Shan Tong Road, Ting Lai Road, On Cheung Road and Ting Kok Road have been selected for the comparison. Table 3.9 shows the summary of the comparison.

Table 3.9 Summary of Traffic Flow Comparison

Road Segment	Road Type	ID	AADT				
			2019	2020	2021	2022	2023
Shan Tong Road (Nan Wan Road to Shan Tong Road	LD	6662	NA	NA	NA	7,520	7,080
Ting Lai Toad (Ting Tai Road to Chung Nga Road)	LD	6070	6,740	6,460	6,720	7,250	6,990
On Cheung Road (Tai Po Tai Wo Road to On Chee Road)	LD	6620	13,560	13,050	13,680	13,160	13,600
Ting Kok Road (Tai Po Tai Wo Road to Kwong Fuk Road)	LD	6621	14,790	14,810	15,210	12,960	12,550
Tai Po Road – Ma Liu Shui (Chung Chi College to Yuen Chau Tsai Interchange) * Road segment include Tai Po Road – Tai Po Kau	RR	6210	7,640	7,970	8,260	7,650	7,340

Note: The values of AADT are extracted from the Annual Traffic Census 2023 published by the Traffic Department.

3.7.1.6 As demonstrated in the analysis above, all four roads exhibit traffic flow volumes that are comparable to or greater than Tai Po Road. According to Table 3.1 in Chapter 9 of the HKPSG, a minimum buffer distance of 5m is required between roads and air sensitive uses for these roads. Given that Tai Po Road shares similar traffic characteristics, the same 5m buffer distance requirement is deemed applicable to it.

4 Noise – Road Traffic Noise

4.1 Introduction

4.1.1.1 This section aims to assess the road traffic noise impact from the nearby road upon the Proposed Development during occupancy.

4.2 Assessment Criteria

4.2.1.1 Noise standards are stipulated in Chapter 9 of the *Hong Kong Planning Standards and Guidelines (HKPSG)* for planning against possible noise impact from road traffic. According to the HKPSG, the road traffic noise standard of L10(1-hour) 70 dB(A) for the use of "All domestic premises including temporary housing accommodation" should be followed.

4.3 Assessment Locations

4.3.1.1 Noise sensitive receivers (i.e. dormitory only) were assigned with assessment points. In general, assessment points were assumed at a height of 1.2m above each residential floor and 1m away from the opened window for ventilation of the noise sensitive receivers. Confirmed by the Project Proponent, only dormitories are relied on opened window for ventilation, where the openable window is well-gasketted with at least 6mm thick window pane. Other sensitive uses for example office, conference room, sick / isolation /quiet room, end-of-life room, training room, etc. will all rely on central AC system for ventilation. Therefore, only dormitories are assigned with assessment points. Assessment point of the noise sensitive receivers for the road traffic noise impact assessment are shown in Figures 4.1a-d.

4.4 Assessment Assumption and Methodology

4.4.1.1 As advised by the Project Traffic Consultant, there is no major road infrastructure development in the vicinity of the Site. It is anticipated that the traffic will grow continuously within 15 years from occupation of the Proposed Development (i.e. Year 2045 = Year of occupancy (Year 2030) + 15 years). Therefore, the road traffic noise levels were predicted based on the projected peak hour traffic flows for the worst year within 15-year from the year of occupancy. The traffic forecast in Year 2045 was provided by the traffic consultant under the same application. The traffic consultant has confirmed that traffic data is prepared based on the methodology which approved by TD. The traffic data from peak hour was taken into consideration in the assessment. All major roads within 300m from the Site were included in the assessment. The traffic forecast data with the TD's endorsement is presented in Appendix B.

4.4.1.2 The road traffic noise impact at the assessment points were predicted using the computer model "NoiseMap Enterprise - RoadNoise" which implements the calculation method as prescribed in the Calculation of Road Traffic Noise (CRTN) developed by UK Department of Transport, Welsh Office in 1988. The predicted noise levels were then compared against the HKPSG noise criterion for evaluating the impact.

4.5 Assessment Results

4.5.1.1 Based on the road traffic noise assessment results, the predicted traffic noise levels range from 36 to 78 dB(A). Further eliminate the road traffic noise is essential in use of practicable noise mitigation measures.

4.5.1.2 The predicted traffic noise levels at the identified NSRs without the application of mitigation measures are given in Appendix C1.

4.6 Noise Mitigation Measures

4.6.1.1 According to the result of the predicted noised levels under the base case, a low noise road surface is proposed as an initial mitigation measure to reduce road traffic noise. Low Noise Road Surface (LNRS) effectively reduces traffic noise by absorbing the noise generated from tyre-road interactions and minimizing tyre tread impact and shock noise. According to the EPD website "Innovation Noise Mitigation Design and Measures", approximately 2.5dB(A) of noise reduction level in average can be achieved. The predicted traffic noise levels at the identified NSRs with the application of low noise road surface are given in Appendix C2. The confirmation of the implementation of LNRS from Highways Department is shown in Appendix K.

4.6.1.2 As indicated by the result of the road traffic noise analysis with proposed LNRS, the predicted traffic noise levels in the simulation range from 36 to 75 dB(A). To comply with the HKPSG's road traffic noise standards (i.e. L10(1-hour) 70 dB(A)), acoustic window application is further proposed.

4.6.1.3 The acoustic window (baffle type) comprises two layers of glass panes. The outer layer has openings for ventilation while the inner layer is a sliding panel aimed at shielding noise. Additional sound absorptive materials can also be applied on the top and both sides of the window frame for further noise reduction.

4.6.1.4 The inner sliding glass panel is introduced to a conventional side-hung window in a staggering position. By properly positioning the openings, noise entering indoor can be reduced while allowing air flow into the room through the air gap between the two layers of glass panel. This design leverages the principle of sound wave interference and absorption. The staggered positioning of the glass panels creates a labyrinthine path for sound waves, which helps in dissipating their energy. The air gap acts as an additional buffer, reducing the transmission of sound. Furthermore, the sound absorptive materials on the window frame enhance the overall noise reduction by absorbing residual sound waves that might penetrate through the glass layers.

4.6.1.5 The Practice Note on Lighting and Ventilation requirements (APP-130) issued by the Building Department (BD) states that the air gap (i.e. the overlapping between the inner and outer window layers) should have an overlapping length of not less than 100mm and a width between 100mm to 175mm, for optimal performance in a closed position.

4.6.1.6 In accordance with the recommended *ProPECC PN 5/23 Application of Innovative Noise Mitigation Designs in Planning Private Residential Developments against Road Traffic Noise*. the baffle type acoustic window configuration was considered for noise attenuation purposes. The acoustic window in two different types is proposed and the typical configurations are presented in Figure 4.3a-b. The reference of acoustic window proposed are presented in Appendix E and the summarised of key configuration table are shown in Table 4.1.

4.6.1.7 There are two different types of acoustic windows proposed. The Type A acoustic window comprises two windows of different sizes and is suitable for larger rooms ranging from 16.9 to 43.1 m² in the Proposed Building. For the larger window, the inner and outer window openings measure 1,040 (W) x 1,383 (H) mm² and 1,060 (W) x 1,383 (H) mm² respectively, with an overlapping length of 200 mm and a gap width of 100 mm. For the smaller window, the height is 1,383 mm, with an inner opening width of 575 mm and an outer opening width of 550 mm. Compared to the reference acoustic window recommended in the reference case "Proposed Public Housing Development at Tung Chung Area 46" for the Type C-7 flat, both the inner and outer window openings of the Type A acoustic window share the same dimensions. While the room size is larger than the reference case, the Type A acoustic window will perform better, ensuring that the noise reduction achieved in the reference case can be met. Additionally, this type includes Sound Absorption Material (SAM) and offers a noise reduction level of 6.9 dB(A).

4.6.1.8 On the other hand, Acoustic Window Type B consists of a single window, designed for smaller rooms between 16.9 and 6.6 m². For Type B acoustic window, both the inner and outer window are 750 (W) x 1,500 (H)mm². However, its adjusted noise reduction level ranges from 8.2 dB(A) to 4.1 dB(A) due to the different room sizes. Compared to the reference acoustic window recommended in *ProPECC PN 5/23*, both the inner and outer window opening of the type B acoustic window share the same dimension, with a gap width of 100 mm. However, the overlapping length of the Type B acoustic window is twice as large as the reference. This indicates that the Type B acoustic window will perform better, ensuring that the noise reduction standards proposed in *ProPECC PN 5/23* can be achieved.

4.6.1.9 After the implemented of the acoustic window, all the NSR complied with the noise criteria stated at Section 4.2.1.1 The configuration of noise reduction of acoustic window (baffle type) and noise reduction after adjustment for improvement measures, room size, etc are shown in Appendix D. The predicted noise level with mitigation measures is shown in Appendix C2.

Table 4.1 Key Configuration of Proposed Acoustic Window

Key Configuration	Acoustic Window (Type A) (Larger)	Acoustic Window (Type A) (Smaller)	Acoustic Window (Type B)
Number of Windows	1	1	1
Room Size (m^2)	43.1 – 27.1		16.9 - 6.6
Inner Window Opening (mm^2)	1,040 (W) x 1,383 (H)	575 (W) x 1,383 (H)	750 (W) x 1,500 (H)
Outer Window Opening (mm^2)	1,060 (W) x 1,383 (H)	550 (W) x 1,383 (H)	750 (W) x 1,500 (H)
Overlapping (mm)	200	200	200
Gap width (mm)	100	100	100
SAM	Yes		Yes

4.6.1.10 The locations of the proposed noise mitigation measures are listed in Table 4.2 below:

Table 4.2 Locations of Proposed Acoustic Windows

NSR ID	Recommended Mitigation Measure(s)	Implemented Floor(s)
NSR 1	Acoustic Window (Type A)	3/F-6/F
NSR 2		2/F
NSR 4		3/F-6/F
NSR 8		2/F-6/F
NSR 5	Acoustic Window (Type B)	2/F
NSR 3		8/F-9/F
NSR 6		8/F-9/F
NSR 7		8/F-9/F

4.6.1.11 With the further application of the proposed mitigation measure on the above NSRs, the traffic noise level will comply with the 70 dB(A) standard. Thus, no adverse traffic noise impacts are anticipated within the Proposed Development. The location of the acoustic window is shown in Figure 4.2a-d.

4.6.1.12 The predicted traffic noise levels at the NSRs with the application of mitigation measures including LNRS and acoustic window it is expected that the noise impact in each specific room will be effectively mitigated, and road noise impact will not be anticipated.

ID	Location	Usage	Major Noise Source
ST1 to ST18	PLK Tin Ka Ping Primary School 3-7/F AC Platform	Educational	Split Type AC
TY3 (1 to 6)	PLK Tin Ka Ping Primary School R/F	Educational	VRV Outdoor Unit
TY4 (1 to 2)	PLK Tin Ka Ping Primary School R/F	Educational	VRV Outdoor Unit
TY5 (1 to 4)	PLK Tin Ka Ping Primary School R/F	Educational	VRV Outdoor Unit
TY6 (1 to 5)	PLK Tin Ka Ping Primary School R/F	Educational	VRV Outdoor Unit
JS1 to JS4	Japanese International School	Educational	Chiller

5.5.3.2 Noise data from equipment share the similar dimension have been applied for the calculation. Sound power level of the chiller in JIS have been estimated for calculation of the overall impacts and the catalogue are shown in Appendix G:

$$SWL = SPL + \left|10 \times \log_{10}\left(\frac{Q}{4\pi r^2}\right)\right|$$

where,

SWL Sound power level, dB(A)
SPL Sound pressure level, dB(A)
Q Directivity Factors
r Distance to sound source

5.5.3.3 Impact due to individual noise source have been calculated and logarithmically summed at the individual NSRs for calculation of the overall impacts:

$$PNL = \sum [SWL_i + C_{dist} + C_{impulse} + C_{tonality} + C_{barrier} + C_{facade} + C_{Intermittency}]$$

Where applicable

PNL = Overall sound pressure level arising from individual noise source after correction

SWL_i = Sound power level of individual noise source

C_{dist} = Correction for distance attenuation

$C_{impulse}$= Correction (+3dB(A)) for impulsive noise in IND-TM, if applicable

$C_{tonality}$ = Correction (+3dB(A)) for tonality as in IND-TM if applicable

7 Water Quality

7.1 Introduction

7.1.1.1 This section addresses the potential sources of water quality impact associated with the construction and operation phases of the project. The relevant statutory requirements and mitigation measures recommended in order to minimize impacts are presented in this section.

7.2 Relevant Legislation, Standards and Guidelines

7.2.1.1 The relevant legislations, standards and guidelines for the review of water quality impact includes the following:

- Water Pollution Control Ordinance (WPCO) (Cap. 358);
- Technical Memorandum for Effluents Discharged into Drainage and Sewerage System Inland and Coastal Waters (TM-DSS);
- Professional Persons Environmental Consultative Committee Practice Note (ProPECC) PN 2/24 "Construction Site Drainage";
- Professional Persons Environmental Consultative Committee Practice Note ProPECC PN 1/23 on Drainage Plans Subject to Comment by the EPD
- EPD's Guidelines for the Design of Small Sewage Treatment Plants; and
- ETWB Technical Circular (Works) No. 5/2005 Protection of Natural Streams/Rivers from Adverse Impacts Arising from Construction Works.

7.2.1.2 According to "Marine Water Quality of Hong Kong 2023" published by EPD, the Proposed Development is located in the inland area of the Tolo Harbour Water Control Zone (WCZ). The water quality objectives for Tolo Harbour WCZ and the water quality objective for watercourses are summarised in Table 7.1 and Table 7.2 respectively.

Table 7.1 Summary of Water Quality Objectives for Tolo Harbour and Channel WCZ

Parameters	Water Quality Objectives	Part or Parts of Zone
Aesthetic Appearance	a) Waste discharges shall cause no noxious or offensive odour or offensive taint or colour in either waters or edible aquatic organisms in the subzone to be present in concentrations detectable by bioassay or organoleptic tests.	Whole Zone
	b) Waste discharges shall cause no visible foam, oil, grease, scum, litter or other objectionable matter in waters of the subzone.	Whole Zone

7.3 Water Sensitive Receivers and Baseline Conditions

7.3.1.1 Within the 500m water quality study area, eighteen potential water quality sensitive receivers (WSR) are identified. The locations of the WSRs are shown in Figure 7.1.

Table 7.3 Representative Water Sensitive Receivers

WSR	Description	Distance from Site Boundary, (m)
WSR1	Natural Stream	277
WSR2	Natural Stream	331
WSR3	Natural Stream	374
WSR4	Channelized Drainage	441
WSR5	Natural Stream	298
WSR6	Tai Po Kau Natural Reserve	363
WSR7	Conservation Area 1	415
WSR8	Conservation Area 2	29
WSR9	Channelised Drainage	260
WSR10	Natural Stream	251
WSR11	Channelised Drainage	81
WSR12	Channelised Drainage	15
WSR13	Channelised Drainage	227
WSR14	Channelised Drainage	79
WSR15	Channelized Drainage	136
WSR16	Natural and Channelised Stream	150
WSR17	Channelized Drainage	164
WSR18	Natural and Channelised Stream	494

7.3.1.2 With reference to "River Water Quality in Hong Kong in 2023" published by the EPD, the nearest water quality monitoring station of the proposed project site is Tai Po Kau Stream Monitoring Station (TR14). The water quality of Tai Po Kau Stream had a oil, grease and mineral oil, spent acid and alkaline solutions/solvent and other chemicals. Accidental spillage of chemicals in the works areas can contaminate the surface soils. The contaminated soil particles may be washed away by construction site runoff or storm runoff causing water pollution.

7.4.3.2 In order to prevent accident spillage. It is required to register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes. Any service shop and minor maintenance facilities should be located outside the water gathering ground and should be on hard standings within a bunded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should only be undertaken with the areas appropriately equipped to control these discharges.

7.4.3.3 Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. Emergency plans and clean up procedures should be provided before the commencement of the construction work to deal with accidental spillage of chemicals. Leakage and spillage of chemicals should be contained and cleaned up immediately so as to minimise the impact to the water quality. With proper arrangement and the emergency plans for accidental spillage of chemicals, no adverse water quality impact is anticipated

7.5 Potential Impact during Operation Phase

7.5.1 Domestic Sewage

7.5.1.1 During the operation phase, domestic sewage, including toilet flushing, will be the major wastewater discharge arising from the Proposed Development. Since the Site is not served by any public sewer, sewage generated will be treated in the underground STP with an Average Dry Weather Flow (ADWF) of 168.41 m^3/day and a treatment level of tertiary treatment, to acceptable standards before being discharged into the existing drainage system near the Site.

7.5.1.2 A Sewerage Impact Assessment (SIA) has been conducted for the Proposed Development. The SIA report discussed the discharge standards to be fulfilled and proposed measures to alleviate the impact of the discharge amount on the existing drainage system. Environmental considerations and emergency measures were addressed as well to ensure there will be no adverse water quality impact arising from the STP operation. Furthermore, all stormwater/rainwater from the Site will be conveyed to the stormwater drain. With a properly designed and maintained of the proposed STP and drainage system, no insurmountable water quality impacts would be expected from operation of the Project.

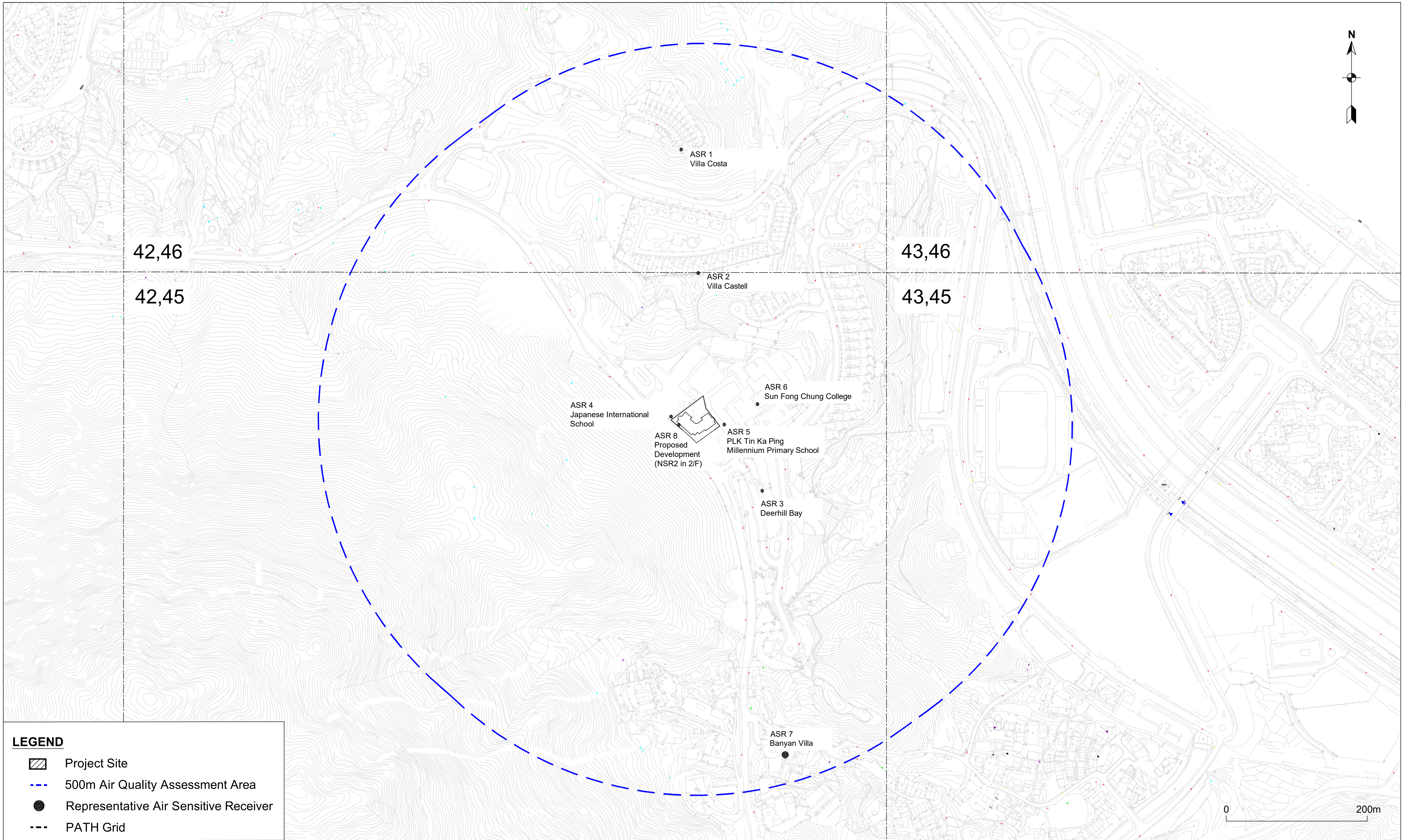
7.5.2 Surface Runoff

7.5.2.1 Pesticides or fertilizers may be used for the maintenance of the landscape area on ground floor subject to the future operational need. This may cause contamination of the runoff by agrochemicals.

7.5.2.2 It is understood that under normal circumstances, any application of pesticides and fertilizers would only be on a need basis based on the health condition of the vegetation and usually at a localized scale. Only registered agrochemicals under the Pesticides Ordinance (Cap.133) shall be used and pesticides with shorter half-life is recommended. Common good practices of agrochemical application should also be followed, such as avoiding the use of agrochemicals before heavy rainstorms and following manufacturer's instructions on the application amount and frequency of the agrochemicals.

7.5.2.3 Potential water quality impact would be the surface runoff from the road surfaces or the open spaces, etc during rainfall events which is known as non-point source pollutions during operational phase. Substances such as dust and lubricant oil deposited and accumulated on the road surfaces will be washed into the drainage system, fish ponds or streams during rainfall. A particular concern with surface run-off will be the 'first flush' of the system during the early phase of storm. The largest quantities of contaminants will be contained within the 'first flush' and the high degree of turbulence in the drains may erode material deposited within the drains. Floating debris and rubbish may also be carried by the surface runoff and may enter and block the stormwater drains. Improper control of the surface runoff may also increase the risk of flooding. To address these issues, Best Management Practices (BMPs) for stormwater discharge will be implemented to minimize pollution. The performance of the permanent drainage system will be designed to comply with the relevant regulations and guidelines (e.g. ProPECC PN 1/23). Thus, the potential flood risk is considered as minimal.

7.5.2.4 With the above-mentioned mitigation measures implemented, no adverse water quality impact is anticipated during both construction and operation phase.



LEGEND

- Project Site
- 500m Air Quality Assessment Area
- Representative Air Sensitive Receiver
- PATH Grid

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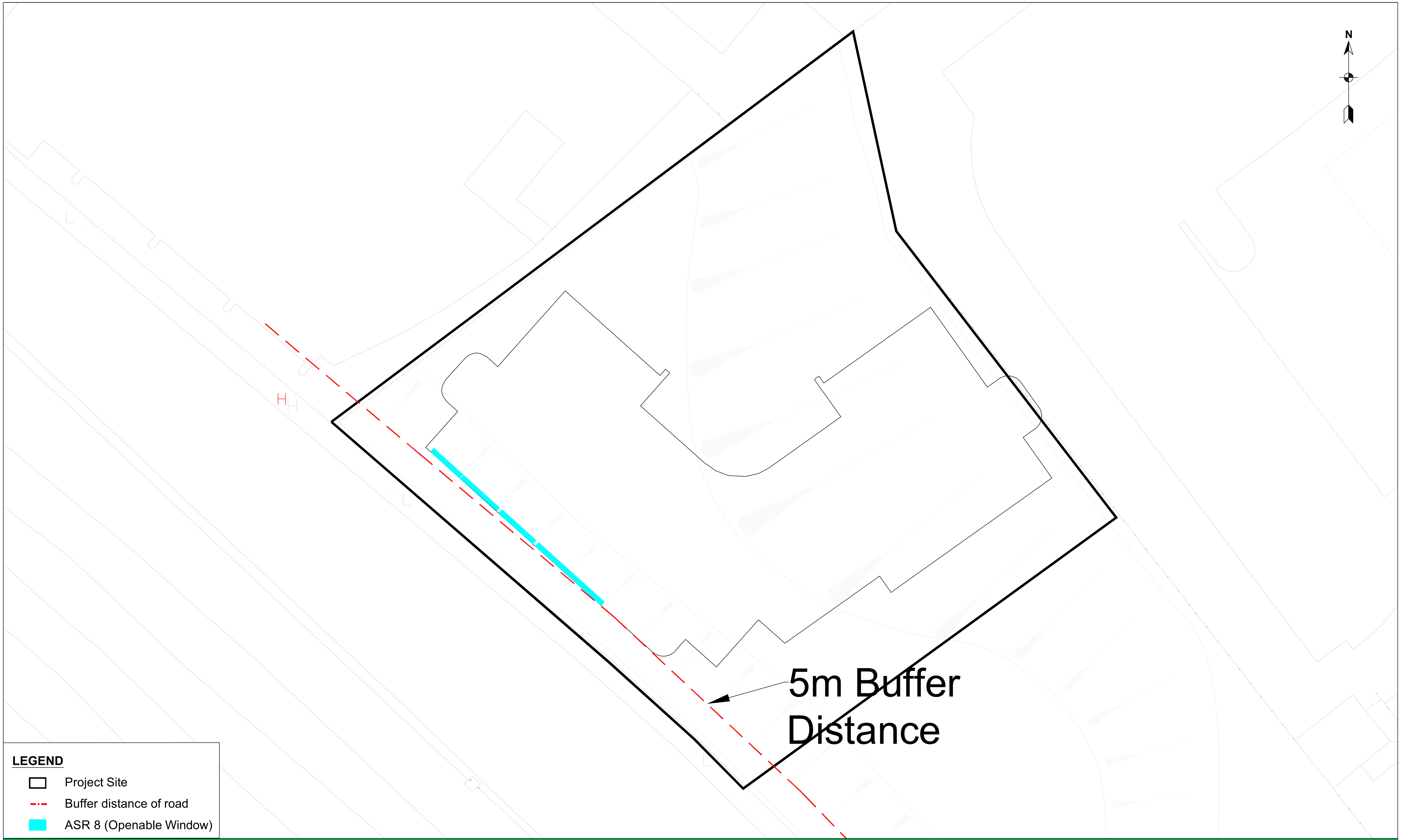
Proposed Development of Hong Kong Sheung Kung Hui St. Christopher's Complex at the Remaining Portion of Taxlord Lot No. T77 in D.D. 34 Tai Po

Location of Air Sensitive Receiver

Figure 3.1

Rev. 1



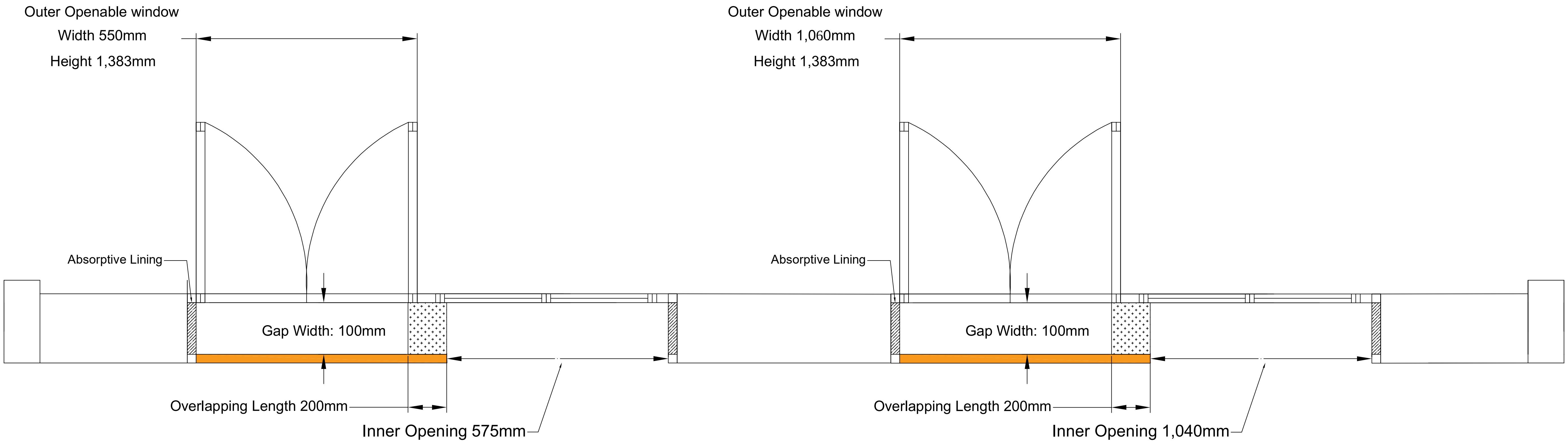
URBAN GREEN

Proposed Development of Hong Kong Sheung Kung Hui St. Christopher's Complex at the Remaining Portion of Taxlord Lot No. T77 in D.D. 34 Tai Po

Buffer Distance of Surrounding Roads

Figure 3.2

Rev. 0



Legend

Sliding Window

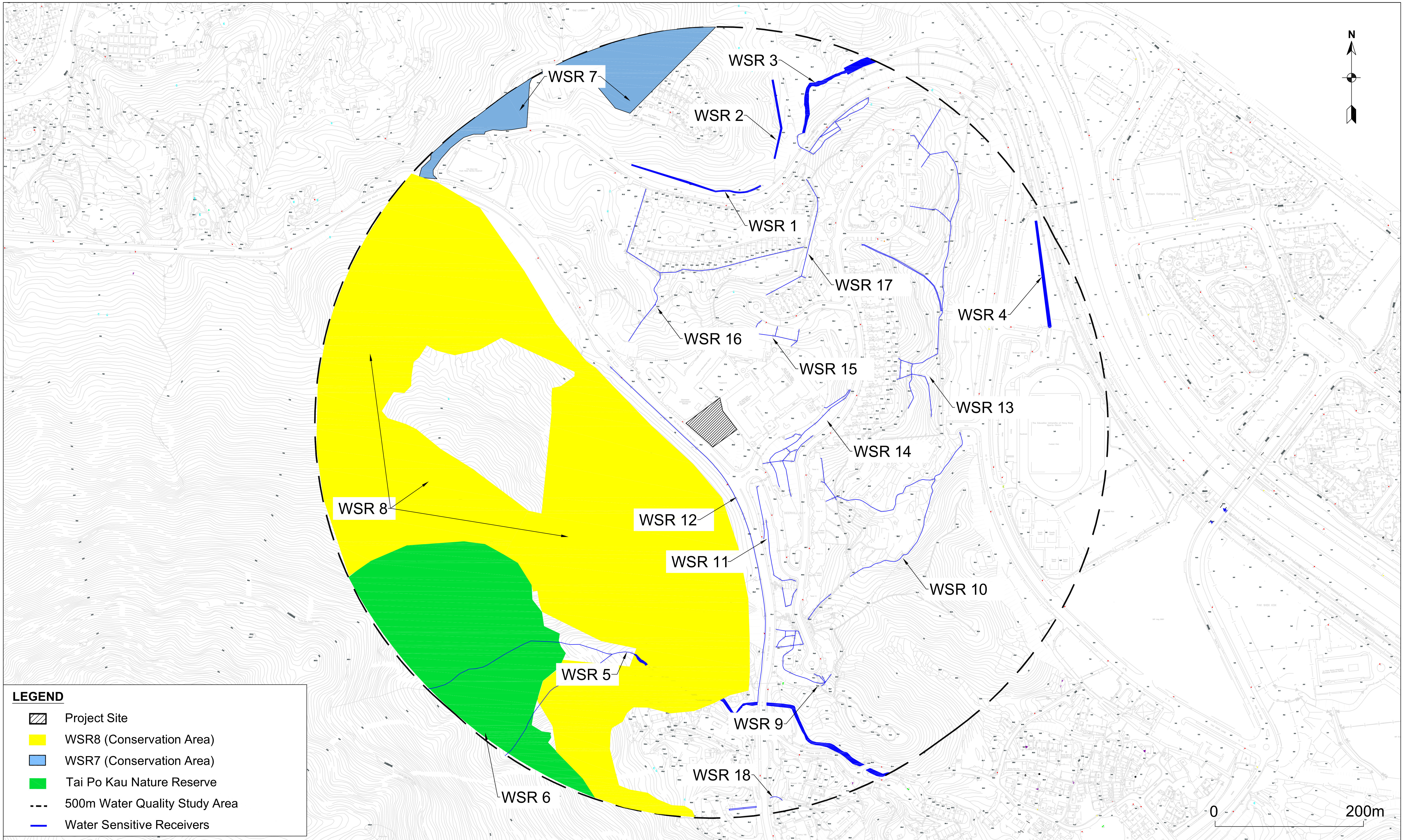
URBAN GREEN

Proposed Development of Hong Kong Sheung Kung Hui St. Christopher's Complex at the Remaining Portion of Taxlord Lot No. T77 in D.D. 34 Tai Po

Configuration of **Type A** Acoustic Window (Baffle Type)

Figure 4.3a

Rev. 0



URBAN GREEN

Proposed Development of Hong Kong Sheung Kung Hui St. Christopher's Complex at the Remaining Portion of Taxlord Lot No. T77 in D.D. 34 Tai Po

Location of Water Sensitive Receiver

Figure 7.1

Rev. 1

Appendix C2

Road Traffic Noise Result (Mitigated Scenario)

Proposed Development of Hong Kong Sheng Kung Hui St. Christopher’s Complex at the Remaining Portion of Taxlord Lot No. T77 In D.D.34. Tai PoSt. Christopher’s Complex at Tai Po

Noise Level Exceedance >70 dB(A)

Predicted Traffic Noise Level (With Proposed Low Noise Road Surface)

Floor/NSR	NSR1	NSR2	NSR3	NSR4	NSR5	NSR6	NSR7	NSR8	NSR9	NSR10	NSR11	NSR12	NSR13	NSR14	NSR15	NSR16	NSR17	NSR18	NSR19	NSR20	NSR21	NSR22	NSR23	NSR24	NSR25	NSR26
	Predicted Noise Level (dB(A))																									
2		75			75			75		64			63	64	43	42	38	36		36						
3	74			75				74		68			67	67	46	47			39		36					
4	74			74				74		68			67	67	47	48			41		39					
5	73			73				73		68			67	67	48	49			44		42					
6	73			73				73		68			67	66	49	50			48		46					
8			72			72	72		68		67	67											52	54	53	56
9			72			72	71		67		67	67										55	56		58	59

Summary Table	
Total no. of flats	71
Total no. of flats with noise exceedance	21
Compliance rate	70%

Predicted Traffic Noise Level (Mitigated)

Floor/NSR	NSR1	NSR2	NSR3	NSR4	NSR5	NSR6	NSR7	NSR8	NSR9	NSR10	NSR11	NSR12	NSR13	NSR14	NSR15	NSR16	NSR17	NSR18	NSR19	NSR20	NSR21	NSR22	NSR23	NSR24	NSR25	NSR26
	Predicted Noise Level (dB(A))																									
2		68			67			68		64			63	64	43	42	38	36		36						
3	68			68				68		68			67	67	46	47			39		36					
4	67			67				67		68			67	67	47	48			41		39					
5	66			66				66		68			67	67	48	49			44		42					
6	66			66				66		68			67	66	49	50			48		46					
8			65			68	66		68		67	67											52	54	53	56
9			65			67	65		67		67	67										55	56		58	59

Summary Table	
Total no. of flats	71
l no. of flats with noise exceedance	0
Compliance rate	100%

*The predicted noise level is not the actual noise level at the external facade after the application of acoustic window. These predicted noise levels are the equivalent noise levels at 1m from the external facade after accounting the reduction in noise levels inside the flat offered by the proposed acoustic window.

Mitigation Measure:

Acoustic Window Type A

Acoustic Window Type B

Appendix D

Noise Reduction Adjustment for Acoustic Windows

Propsoed Development of Hong Kong Sheng Kung Hui St. Christopher's Complex at the Remaining Portion of Taxlord Lot No. T77 in D.D. 34 Tai Po

Road Traffic Noise Impact Assessment

Summry Table of Major Parameters of AW(BT) as per ProPECC PN5/23 & Reference Case (Proposed Puglic Housing Development at Tung Chung Area 46)

Mitigation Measures	Room Area, m^2	Inner Opening (Width), mm	Inner Opening (Height), mm	Outer Opening (Width), mm	Outer Opening (Height), mm	Gap Width, mm	Overlapping, mm	MPA Applied?	Solid Parapet Applied?	Acoustic Ceiling Applied?	SAM Applied?	Noise Attenuation Applied, dB(A)
Acoustic Window (Baffle Type) MFD (Flat Type C-7 (1B) Living Room)	23.1	1040	1383	1060	1383	100 to 175	≥100	No	-	-	Yes	6.9
Acoustic Window (Baffle Type) MFD (Flat Type C-7 (1B) Bedroom)		575	1383	550	1383	100 to 175	≥100	No	-	-	Yes	
Acoustic Window (Baffle Type) AW(BT) (Type A)	18.0	750	1500	750	1500	100 to 175	≥100	No	-	-	Yes	8.5

Note

MPA: Micro Perforated Absorber

SAM: Sound Absorptive Material

Proposed Development of Hong Kong Sheng Kung Hui St. Christopher's Complex at the Remaining Portion of Taxlord Lot No. T77 in D.D. 34 Tai Po

Road Traffic Noise Impact Assessment

Table of Noise Reduction Adjustment

AW(BT) Type A (green)
AW(BT) Type B (orange)

			Proposed Development										Reference Case													
Floor	NSRs	Mitigation Measures	Inner Opening Area, mm	Inner Opening Area (m^2)	Outer Opening Area, mm	Outer Opening Area (m^2)	No. of Window Opening	Gap Width, mm	Overlapping Length, mm	MPA Applied?	SAM applied?	Room Area (RA), m^2	Inner Opening Area, mm	Inner Opening Area (m^2)	Outer Opening Area, mm	Outer Opening Area (m^2)	No. of Window Opening	Gap Width, mm	Overlapping Length, mm	MPA Applied?	SAM applied?	Room Area (RAref), m^2	Ref. Sound Attenuation, dB(A)	Room Size Adjustment 10xlog(RA/RAref)(adjust downward only),dB(a)	Noise Reduction after Adjustment, dB(A)	Noise Reduction adopted, dB(A)
2	NSR2	(Flat Type C-7 (1B) Living Room)	1040(W) x 1383 (H)	1.4	1040(W) x 1383 (H)	1.4	1	100	200	No	Yes	32.7	1040(W) x 1383 (H)	1.4	1040(W) x 1383 (H)	1.4	1	100 to 175	≥ 100	No	Yes	23.1	6.9	-	6.9	**6.9**
		(Flat Type C-7 (1B) Bedroom)	575(W) x 1383 (H)	0.8	550(W) x 1383 (H)	0.8	1	100	200	No	Yes		575(W) x 1383 (H)	0.8	550(W) x 1383 (H)	0.8	1	100 to 175	≥ 100	No	Yes					
2	NSR8	(Flat Type C-7 (1B) Living Room)	1040(W) x 1383 (H)	1.4	1040(W) x 1383 (H)	1.4	1	100	200	No	Yes	27.1	1040(W) x 1383 (H)	1.4	1040(W) x 1383 (H)	1.4	1	100 to 175	≥ 100	No	Yes	23.1	6.9	-	6.9	**6.9**
		(Flat Type C-7 (1B) Bedroom)	575(W) x 1383 (H)	0.8	550(W) x 1383 (H)	0.8	1	100	200	No	Yes		575(W) x 1383 (H)	0.8	550(W) x 1383 (H)	0.8	1	100 to 175	≥ 100	No	Yes					
3	NSR1	(Flat Type C-7 (1B) Living Room)	1040(W) x 1383 (H)	1.4	1040(W) x 1383 (H)	1.4	1	100	200	No	Yes	42.5	1040(W) x 1383 (H)	1.4	1040(W) x 1383 (H)	1.4	1	100 to 175	≥ 100	No	Yes	23.1	6.9	-	6.9	**6.9**
		(Flat Type C-7 (1B) Bedroom)	575(W) x 1383 (H)	0.8	550(W) x 1383 (H)	0.8	1	100	200	No	Yes		575(W) x 1383 (H)	0.8	550(W) x 1383 (H)	0.8	1	100 to 175	≥ 100	No	Yes					
3	NSR4	(Flat Type C-7 (1B) Living Room)	1040(W) x 1383 (H)	1.4	1040(W) x 1383 (H)	1.4	1	100	200	No	Yes	43.1	1040(W) x 1383 (H)	1.4	1040(W) x 1383 (H)	1.4	1	100 to 175	≥ 100	No	Yes	23.1	6.9	-	6.9	**6.9**
		(Flat Type C-7 (1B) Bedroom)	575(W) x 1383 (H)	0.8	550(W) x 1383 (H)	0.8	1	100	200	No	Yes		575(W) x 1383 (H)	0.8	550(W) x 1383 (H)	0.8	1	100 to 175	≥ 100	No	Yes					
3	NSR8	(Flat Type C-7 (1B) Living Room)	1040(W) x 1383 (H)	1.4	1040(W) x 1383 (H)	1.4	1	100	200	No	Yes	41.1	1040(W) x 1383 (H)	1.4	1040(W) x 1383 (H)	1.4	1	100 to 175	≥ 100	No	Yes	23.1	6.9	-	6.9	**6.9**
		(Flat Type C-7 (1B) Bedroom)	575(W) x 1383 (H)	0.8	550(W) x 1383 (H)	0.8	1	100	200	No	Yes		575(W) x 1383 (H)	0.8	550(W) x 1383 (H)	0.8	1	100 to 175	≥ 100	No	Yes					
4	NSR1	(Flat Type C-7 (1B) Living Room)	1040(W) x 1383 (H)	1.4	1040(W) x 1383 (H)	1.4	1	100	200	No	Yes	42.5	1040(W) x 1383 (H)	1.4	1040(W) x 1383 (H)	1.4	1	100 to 175	≥ 100	No	Yes	23.1	6.9	-	6.9	**6.9**
		(Flat Type C-7 (1B) Bedroom)	575(W) x 1383 (H)	0.8	550(W) x 1383 (H)	0.8	1	100	200	No	Yes		575(W) x 1383 (H)	0.8	550(W) x 1383 (H)	0.8	1	100 to 175	≥ 100	No	Yes					
4	NSR4	(Flat Type C-7 (1B) Living Room)	1040(W) x 1383 (H)	1.4	1040(W) x 1383 (H)	1.4	1	100	200	No	Yes	43.1	1040(W) x 1383 (H)	1.4	1040(W) x 1383 (H)	1.4	1	100 to 175	≥ 100	No	Yes	23.1	6.9	-	6.9	**6.9**
		(Flat Type C-7 (1B) Bedroom)	575(W) x 1383 (H)	0.8	550(W) x 1383 (H)	0.8	1	100	200	No	Yes		575(W) x 1383 (H)	0.8	550(W) x 1383 (H)	0.8	1	100 to 175	≥ 100	No	Yes					
4	NSR8	(Flat Type C-7 (1B) Living Room)	1040(W) x 1383 (H)	1.4	1040(W) x 1383 (H)	1.4	1	100	200	No	Yes	41.1	1040(W) x 1383 (H)	1.4	1040(W) x 1383 (H)	1.4	1	100 to 175	≥ 100	No	Yes	23.1	6.9	-	6.9	**6.9**
		(Flat Type C-7 (1B) Bedroom)	575(W) x 1383 (H)	0.8	550(W) x 1383 (H)	0.8	1	100	200	No	Yes		575(W) x 1383 (H)	0.8	550(W) x 1383 (H)	0.8	1	100 to 175	≥ 100	No	Yes					
5	NSR1	(Flat Type C-7 (1B) Living Room)	1040(W) x 1383 (H)	1.4	1040(W) x 1383 (H)	1.4	1	100	200	No	Yes	42.5	1040(W) x 1383 (H)	1.4	1040(W) x 1383 (H)	1.4	1	100 to 175	≥ 100	No	Yes	23.1	6.9	-	6.9	**6.9**
		(Flat Type C-7 (1B) Bedroom)	575(W) x 1383 (H)	0.8	550(W) x 1383 (H)	0.8	1	100	200	No	Yes		575(W) x 1383 (H)	0.8	550(W) x 1383 (H)	0.8	1	100 to 175	≥ 100	No	Yes					
5	NSR4	(Flat Type C-7 (1B) Living Room)	1040(W) x 1383 (H)	1.4	1040(W) x 1383 (H)	1.4	1	100	200	No	Yes	43.1	1040(W) x 1383 (H)	1.4	1040(W) x 1383 (H)	1.4	1	100 to 175	≥ 100	No	Yes	23.1	6.9	-	6.9	**6.9**
		(Flat Type C-7 (1B) Bedroom)	575(W) x 1383 (H)	0.8	550(W) x 1383 (H)	0.8	1	100	200	No	Yes		575(W) x 1383 (H)	0.8	550(W) x 1383 (H)	0.8	1	100 to 175	≥ 100	No	Yes					
5	NSR8	(Flat Type C-7 (1B) Living Room)	1040(W) x 1383 (H)	1.4	1040(W) x 1383 (H)	1.4	1	100	200	No	Yes	41.1	1040(W) x 1383 (H)	1.4	1040(W) x 1383 (H)	1.4	1	100 to 175	≥ 100	No	Yes	23.1	6.9	-	6.9	**6.9**
		(Flat Type C-7 (1B) Bedroom)	575(W) x 1383 (H)	0.8	550(W) x 1383 (H)	0.8	1	100	200	No	Yes		575(W) x 1383 (H)	0.8	550(W) x 1383 (H)	0.8	1	100 to 175	≥ 100	No	Yes					
6	NSR1	(Flat Type C-7 (1B) Living Room)	1040(W) x 1383 (H)	1.4	1040(W) x 1383 (H)	1.4	1	100	200	No	Yes	42.5	1040(W) x 1383 (H)	1.4	1040(W) x 1383 (H)	1.4	1	100 to 175	≥ 100	No	Yes	23.1	6.9	-	6.9	**6.9**
		(Flat Type C-7 (1B) Bedroom)	575(W) x 1383 (H)	0.8	550(W) x 1383 (H)	0.8	1	100	200	No	Yes		575(W) x 1383 (H)	0.8	550(W) x 1383 (H)	0.8	1	100 to 175	≥ 100	No	Yes					
6	NSR4	(Flat Type C-7 (1B) Living Room)	1040(W) x 1383 (H)	1.4	1040(W) x 1383 (H)	1.4	1	100	200	No	Yes	43.1	1040(W) x 1383 (H)	1.4	1040(W) x 1383 (H)	1.4	1	100 to 175	≥ 100	No	Yes	23.1	6.9	-	6.9	**6.9**
		(Flat Type C-7 (1B) Bedroom)	575(W) x 1383 (H)	0.8	550(W) x 1383 (H)	0.8	1	100	200	No	Yes		575(W) x 1383 (H)	0.8	550(W) x 1383 (H)	0.8	1	100 to 175	≥ 100	No	Yes					
6	NSR8	(Flat Type C-7 (1B) Living Room)	1040(W) x 1383 (H)	1.4	1040(W) x 1383 (H)	1.4	1	100	200	No	Yes	41.1	1040(W) x 1383 (H)	1.4	1040(W) x 1383 (H)	1.4	1	100 to 175	≥ 100	No	Yes	23.1	6.9	-	6.9	**6.9**
		(Flat Type C-7 (1B) Bedroom)	575(W) x 1383 (H)	0.8	550(W) x 1383 (H)	0.8	1	100	200	No	Yes		575(W) x 1383 (H)	0.8	550(W) x 1383 (H)	0.8	1	100 to 175	≥ 100	No	Yes					
2	NSR5	AW(BT) Type B	750(W) x 1500 (H)	1.1	750(W) x 1500 (H)	1.1	1	100	200	No	Yes	16.9	750(W) x 1500 (H)	1.1	750(W) x 1500 (H)	1.1	1	100 to 175	≥ 100	No	Yes	18.0	8.5	-0.3	8.2	**8.2**
8	NSR3	AW(BT) Type B	750(W) x 1500 (H)	1.1	750(W) x 1500 (H)	1.1	1	100	200	No	Yes	11.1	750(W) x 1500 (H)	1.1	750(W) x 1500 (H)	1.1	1	100 to 175	≥ 100	No	Yes	18.0	8.5	-2.1	6.4	**6.4**
8	NSR6	AW(BT) Type B	750(W) x 1500 (H)	1.1	750(W) x 1500 (H)	1.1	1	100	200	No	Yes	6.6	750(W) x 1500 (H)	1.1	750(W) x 1500 (H)	1.1	1	100 to 175	≥ 100	No	Yes	18.0	8.5	-4.4	4.1	**4.1**
8	NSR7	AW(BT) Type B	750(W) x 1500 (H)	1.1	750(W) x 1500 (H)	1.1	1	100	200	No	Yes	10.0	750(W) x 1500 (H)	1.1	750(W) x 1500 (H)	1.1	1	100 to 175	≥ 100	No	Yes	18.0	8.5	-2.5	6.0	**6.0**
9	NSR3	AW(BT) Type B	750(W) x 1500 (H)	1.1	750(W) x 1500 (H)	1.1	1	100	200	No	Yes	11.1	750(W) x 1500 (H)	1.1	750(W) x 1500 (H)	1.1	1	100 to 175	≥ 100	No	Yes	18.0	8.5	-2.1	6.4	**6.4**
9	NSR6	AW(BT) Type B	750(W) x 1500 (H)	1.1	750(W) x 1500 (H)	1.1	1	100	200	No	Yes	6.6	750(W) x 1500 (H)	1.1	750(W) x 1500 (H)	1.1	1	100 to 175	≥ 100	No	Yes	18.0	8.5	-4.4	4.1	**4.1**
9	NSR7	AW(BT) Type B	750(W) x 1500 (H)	1.1	750(W) x 1500 (H)	1.1	1	100	200	No	Yes	10.0	750(W) x 1500 (H)	1.1	750(W) x 1500 (H)	1.1	1	100 to 175	≥ 100	No	Yes	18.0	8.5	-2.5	6.0	**6.0**

Appendix E

Reference of Acoustic Window Noise Reduction

Annex K
Summary of Noise Attenuation Performance for MFD with Acoustic Window

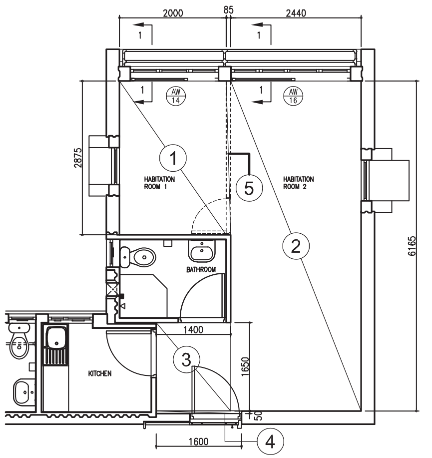
Summary of Noise Attenuation Performance for MFD with Acoustic Window

	Acoustic Window Configurations				Noise Attenuation dB(A)	
Flat Type	**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 (W)	1383mm (H) x 1010mm (W)	200mm	175mm	**6.6**	**5.5**
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		

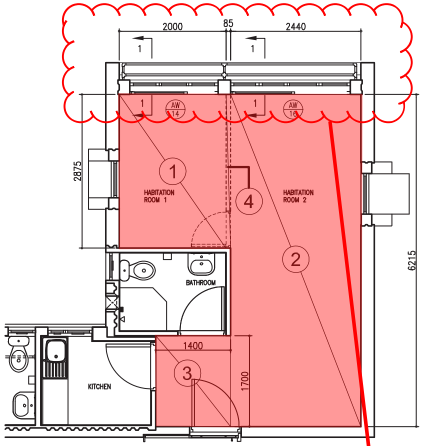
Acoustic Window A

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)						
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**

CALCULATION OF GLAZING AREA



TYPE C-7(b) FLAT (LOW ZONE)
(WITH VPB + VPK)



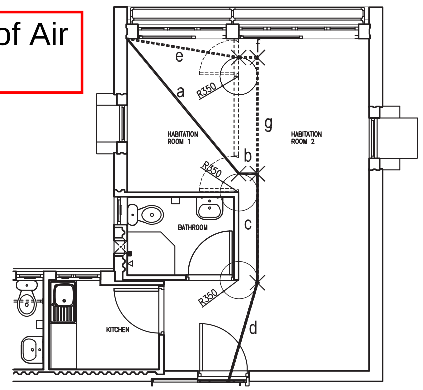
TYPE C-7(b) FLAT (HIGH ZONE)
(WITH VPB + VPK)

Length & Width of Air Gap

GENERAL NOTES

1. THIS DRAWING SHOWS THE TRAVEL DISTANCE AND DEADEND TO STAIRCASE FOR TYPE C-7(b) FLAT(S). ANY OTHER INFORMATION OF FLOOR LAYOUT PLAN SHOULD REFER TO OTHER RELEVANT ICU APPROVED GENERAL BUILDING PLAN (GBP) FOR THIS PROJECT.
2. THIS DRAWING SHOWS THE GLAZING AR[...] TYPE C-7(b) FLAT(S). ANY OTHER INFORMA[...] FOR KITCHEN AND BATHROOM SHALL REF[...] THIS PROJECT.
3. TYPE C-7(b) FLAT(S) ARE FLAT NO. (pro[...] information).
4. ACCORDING TO PNAP APP-130, PARA. 6 OF APPENDIX A, THE WIDTH OF AIR GAP IS BETWEEN 100mm TO 175mm, THE LENGTH OF AIR GAP IS NOT LESS THAN 100mm.
5. THE INTENDED CONSTRUCTION OF NOTIONAL PARTITION(S) CONSISTS OF MAXIMUM 85mm THICK SOLID CONCRETE BLOCK WALL(S) / LIGHTWEIGHT PARTITION(S) (DENSITY NOT MORE THAN 2060 kg/m³) WITH 15mm THICK CEMENT SAND PLASTER (DENSITY NOT MORE THAN 2300 kg/m³) ON BOTH FACES (WITH AGGREGATED AVERAGE DENSITY NOT MORE THAN 2125 kg/m³).
6. ALL ELEVATIONS OF WINDOWS ARE VIEWED FROM OUTSIDE.
7. THE FIXED GLAZING IS EQUIPPED WITH SIDE-HUNG OPENABLE WINDOW FOR OPERATION AND MAINTENANCE PURPOSE AND SPECIAL WINDOW OPENING DEVICE (e.g. ALLEN KEY LOCK) WOULD BE PROVIDED. THIS FIXED GLAZING SHALL BE KEPT CLOSE TO ATTAIN THE NOISE PERFORMANCE AS SPECIFIED UNDER ENVIRONMENTAL ASSESSMENT STUDY.
8. THE AIR-CONDITIONERS PLATFORMS SHOULD NOT PROJECT MORE THAN 750mm IN ACCORDANCE WITH PNAP APP-19.

CALCULATION OF DEADEND TRAVEL DISTANCE



DEADEND TRAVEL DISTANCE (UNDER FS CODE 2011)
FOR TYPE C-7(b) FLAT (HIGH ZONE)
AT A RANGE OF

a + b + c + d =
3.275 + 0.350 + 2.041 + 1.928 = 7.594m
OR
e + f + g + c + d
= 2.114 + 0.350 + 2.175 + 2.041 + 1.928
= 8.608m

≤ 24m (UNDER FS CODE 2011 CLAUSE B11.2 (a)(i))

NOTES

LEGEND:

LZ - LOW ZONE (XX/F TO XX/F)
HZ - HIGH ZONE (XX/F TO XX/F)

IFA - INTERNAL FLOOR AREA

FS CODE - CODE OF PRACTICE FOR FIRE SAFETY IN BUILDINGS

TYPE C-7(b) Flat

ORIGINAL SIGNED

Chief Architect / Development and Standards
Date : 18 DEC 2018

REVISIONS

NO	DESCRIPTION AND DATE	INITIAL AND DESIGNATION DWN	CKD	AUTH

WINDOW / OPENING (AW-14 & AW-16)

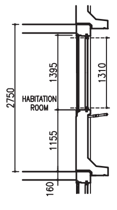
TABLE A (LOW ZONE)

LOCATION	PORTION	AREA (m²)	AREA REQUIRED (m²)			AREA PROVIDED (m²)
HABITATION ROOM 1 (WITH NOTIONAL PARTITION)	1 (AW-14)	(2.000x2.875) = 5.750	GLAZING	1/10	0.575	1.478
			OPENABLE	1/16	0.[illegible]	[illegible]
HABITATION ROOM 2 (WITH NOTIONAL PARTITION)	2, 3 & 4 (AW-16)	(2.440x6.165+ 1.400x1.650+ 1.600x0.050) = 17.433	GLAZING	1/10	1.[illegible]	[illegible]
			OPENABLE	1/16	1.090	1.166
HABITATION ROOM 1 & 2 (WITHOUT NOTIONAL PARTITION)	1-5 (AW-14 & AW-16)	(2.000x2.875)+ (2.440x6.165)+ (1.400x1.650)+ (1.600x0.050)+ (0.085x2.875) =23.427	GLAZING	1/10	2.343	(1.478+2.073) =3.551
			OPENABLE	1/16	1.464	(0.609+1.166) =1.775

Room Area

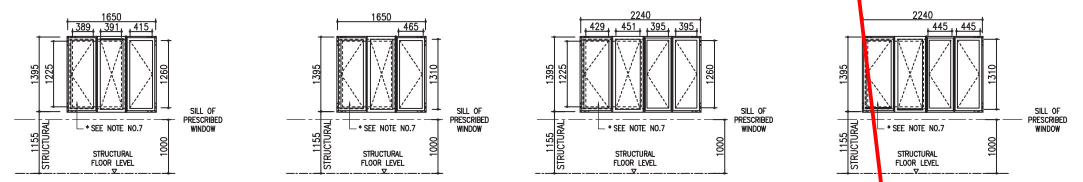
TABLE B (HIGH ZONE)

LOCATION	PORTION	AREA (m²)	AREA REQUIRED (m²)			AREA PROVIDED (m²)
HABITATION ROOM 1 (WITH NOTIONAL PARTITION)	1 (AW-14)	(2.000x2.875) =5.750	GLAZING	1/10	0.575	1.478
			OPENABLE	1/16	0.359	0.609
HABITATION ROOM 2 (WITH NOTIONAL PARTITION)	2 & 3 (AW-16)	(2.440x6.215)+ (1.400x1.700) =17.545	GLAZING	1/10	1.755	2.073
			OPENABLE	1/16	1.097	1.166
HABITATION ROOM 1 & 2 (WITHOUT NOTIONAL PARTITION)	1-4 (AW-14 & AW-16)	(2.000x2.875)+ (2.440x6.215)+ (1.400x1.700)+ (0.085x2.875) =23.539	GLAZING	1/10	2.354	(1.478+2.073) =3.551
			OPENABLE	1/16	1.471	(0.609+1.166) =1.775



SECTION 1-1

CALCULATION OF GLAZING AREA   CALCULATION OF OPENABLE AREA   CALCULATION OF GLAZING AREA   CALCULATION OF OPENABLE AREA



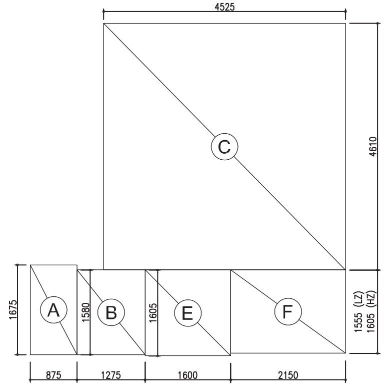
HABITATION ROOM 1

MARK :	AW-14
GLAZING AREA	: 0.415x1.260+0.391x1.225+0.389x1.225 = 1.478m²
OPENABLE AREA (RESULTANT OPENING)	: 0.465x1.310 = 0.609m²

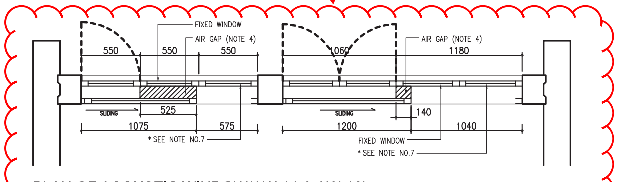
HABITATION ROOM 2

MARK :	AW-16
GLAZING AREA	: 0.429x1.225+0.451x1.225+(0.395x1.260)x2 = 2.073m²
OPENABLE AREA (RESULTANT OPENING)	: (0.445x1.310)x2 = 1.166m²

CALCULATION OF IFA



TYPE C-7(b) FLAT		LOW ZONE		HIGH ZONE	
IFA	PORTION	CALCULATION (m)	AREA (m²)	CALCULATION (m)	AREA (m²)
	A	0.875 X 1.675	1.466	0.875 X 1.675	1.466
	B	1.275 X 1.580	2.015	1.275 X 1.580	2.015
	C	4.525 X 4.610	20.860	4.525 X 4.610	20.860
	D	1.600 X 1.605	2.568	1.600 X 1.605	2.568
	E	2.150 X 1.555	3.343	2.150 X 1.605	3.451
		30.252m²		30.360m²	



PLAN OF ACOUSTIC WINDOW(AW-14 & AW-16)
SCALE 1:25

CALCULATION OF NOTIONAL PARTITION

	IFA (m²) (A)	THE MAXIMUM AGGREGATE LENGTH OF THE ADDITIONAL BLOCK WALL (m) (A)/10 = (B)	TOTAL ADDITIONAL WALL LENGTH (EXCLUDED 1x700mm WIDTH DOOR) (m)
LOW ZONE	30.252	3.025	(2.875 – 0.700) = 2.175 < (B)
HIGH ZONE	30.360	3.036	(2.875 – 0.700) = 2.175 < (B)

* REFER TO NOTES NO.5

	NAME AND DESIGNATION	INITIAL	DATE
AUTHORISED	CA/D&S	ORIGINAL SIGNED	12/2018
CHECKED	SA/27	ORIGINAL SIGNED	12/2018
	A/68	ORIGINAL SIGNED	12/2018
	STO(A)/7	ORIGINAL SIGNED	12/2018
DRAWN	TO(A)/54	ORIGINAL SIGNED	12/2018

PROJECT
MODULAR FLAT DESIGN WITH ACOUSTIC WINDOW (VOLUMETRIC PRECAST BATHROOM AND VOLUMETRIC PRECAST KITCHEN OPTION)

DRAWING TITLE
TYPE C-7(b) FLAT
CALCULATION OF NOTIONAL PARTITION, GLAZING AREA AND DEADEND TRAVEL DISTANCE

SCALE 1:50

DRAWING NO.
MF/AW/VBK/MW/A/ICU809

SOURCE

ICU NO.

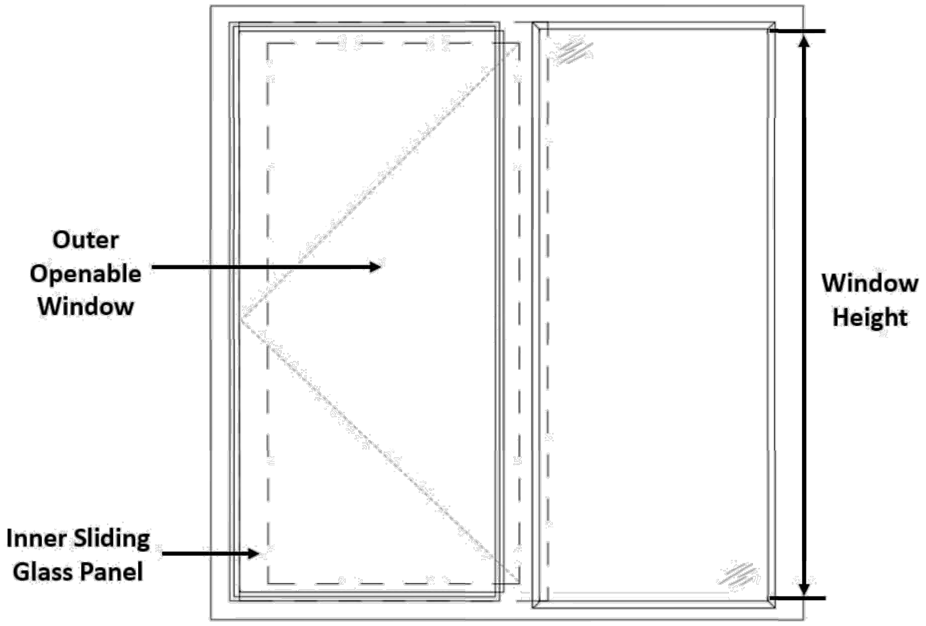
AutoCAD 2000 A1 594 x 841

HOUSING DEPARTMENT

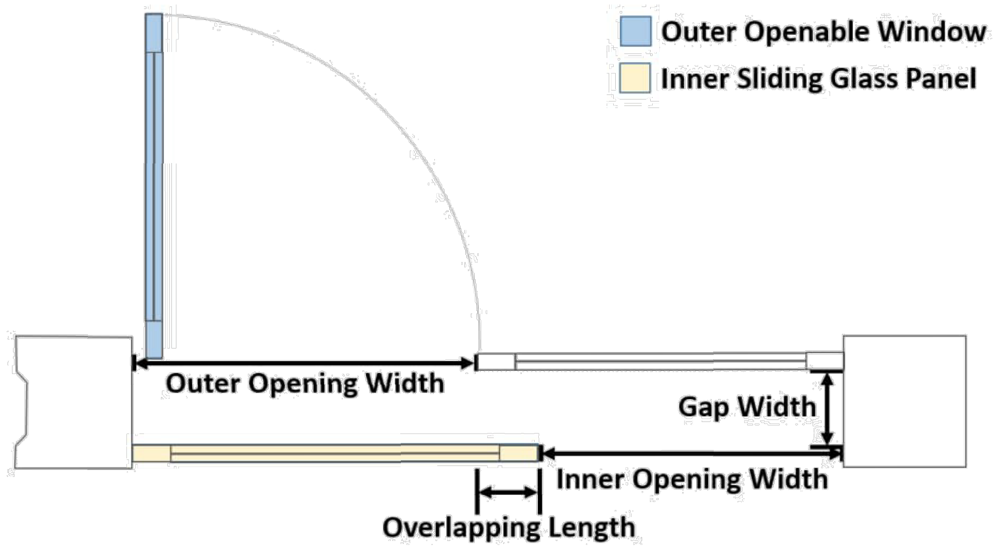
REF :
DATE :
☐ C.E.'s COPY ☐ ______'s COPY ☐ COW's COPY ☐ R.E.'s COPY ☐ BSE's COPY ☐ BSI's COPY ☐ S.E.'s COPY ☐ Q.S's COPY ☐ CONTRACTOR's COPY ☐ OFFICE's COPY

Annex A

(I) Possible design of "Acoustic Window (Baffle Type)" for 8m^2 and 18m^2 habitable rooms (i.e. dining room, living room or bedroom)



INTERNAL VIEW (NOT TO SCALE)



PLAN (NOT TO SCALE)

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

Notes:

a. These are feasible designs of AW(BT) for 8m^2 and 18m^2 rooms.

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

Appendix G

Estimation of Fixed Noise Sources Noise Level and

Nosie Source Photo

Proposed Hong Kong Sheng Kung Hui St. Christopher's Complex at Tai Po
Sound Pressure level Calculation

NSR ID	NSR14
Floor	4/F
Height (mPD)	97

Noise Source ID	Location	Activities/Equipment	Location			Height difference (m)	Directivity Factor (Q)	Estimated SWL dB(A)	Shortest slang Distance from Source to NSRs, m	Correction						Corrected Daytime Noise Level, dB(A)
			X	Y	Z			Daytime & Evening time		Distance	Inpluse Effect	Tonality Effect	Barrier Effect	Façade	Intermittency Effect	
ST-7 4/F	PLK Ting Ka Ping Millennium Primary School 4/F	General Split Type AC	838245	832349	94.395	2.605	4	62	12.1	26.6	-	-	5.0	3	-	33.4
ST-8 4/F	PLK Ting Ka Ping Millennium Primary School 4/F	General Split Type AC	838245	832348	94.395	2.605	4	62	12.2	26.7	-	-	5.0	3	-	33.3
ST-9 4/F	PLK Ting Ka Ping Millennium Primary School 4/F	General Split Type AC	838248	832345	94.395	2.605	4	62	13.1	27.3	-	-	5.0	3	-	32.7
ST-10 4/F	PLK Ting Ka Ping Millennium Primary School 4/F	General Split Type AC	838248	832344	94.395	2.605	4	62	13.3	27.5	-	-	5.0	3	-	32.5
ST-11 4/F	PLK Ting Ka Ping Millennium Primary School 4/F	General Split Type AC	838250	832341	94.395	2.605	4	62	15.4	28.7	-	-	5.0	3	-	31.3
ST-12 4/F	PLK Ting Ka Ping Millennium Primary School 4/F	General Split Type AC	838251	832340	94.395	2.605	4	62	15.8	29.0	-	-	5.0	3	-	31.0
ST-13 4/F	PLK Ting Ka Ping Millennium Primary School 4/F	General Split Type AC	838253	832337	94.395	2.605	4	62	18.6	30.4	-	-	5.0	3	-	29.6
ST-14 4/F	PLK Ting Ka Ping Millennium Primary School 4/F	General Split Type AC	838254	832337	94.395	2.605	4	62	19.1	30.6	-	-	5.0	3	-	29.4
ST-15 4/F	PLK Ting Ka Ping Millennium Primary School 4/F	General Split Type AC	838256	832334	94.395	2.605	4	62	22.3	32.0	-	-	5.0	3	-	28.0
ST-16 4/F	PLK Ting Ka Ping Millennium Primary School 4/F	General Split Type AC	838257	832333	94.395	2.605	4	62	22.9	32.2	-	-	5.0	3	-	27.8
ST-17 4/F	PLK Ting Ka Ping Millennium Primary School 4/F	General Split Type AC	838259	832330	94.395	2.605	4	62	26.3	33.4	-	-	5.0	3	-	26.6
ST-18 4/F	PLK Ting Ka Ping Millennium Primary School 4/F	General Split Type AC	838259	832329	94.395	2.605	4	62	26.9	33.6	-	-	5.0	3	-	26.4
ST-7 5/F	PLK Ting Ka Ping Millennium Primary School 5/F	General Split Type AC	838245	832349	98.14	1.14	4	62	11.9	26.5	-	-	5.0	3	-	33.5
ST-8 5/F	PLK Ting Ka Ping Millennium Primary School 5/F	General Split Type AC	838245	832348	98.14	1.14	4	62	11.9	26.5	-	-	5.0	3	-	33.5
ST-9 5/F	PLK Ting Ka Ping Millennium Primary School 5/F	General Split Type AC	838248	832345	98.14	1.14	4	62	12.9	27.2	-	-	5.0	3	-	32.8
ST-10 5/F	PLK Ting Ka Ping Millennium Primary School 5/F	General Split Type AC	838248	832344	98.14	1.14	4	62	13.1	27.3	-	-	5.0	3	-	32.7
ST-11 5/F	PLK Ting Ka Ping Millennium Primary School 5/F	General Split Type AC	838250	832341	98.14	1.14	4	62	15.2	28.6	-	-	5.0	3	-	31.4
ST-12 5/F	PLK Ting Ka Ping Millennium Primary School 5/F	General Split Type AC	838251	832340	98.14	1.14	4	62	15.6	28.9	-	-	5.0	3	-	31.1
ST-13 5/F	PLK Ting Ka Ping Millennium Primary School 5/F	General Split Type AC	838253	832337	98.14	1.14	4	62	18.5	30.3	-	-	5.0	3	-	29.7
ST-14 5/F	PLK Ting Ka Ping Millennium Primary School 5/F	General Split Type AC	838254	832337	98.14	1.14	4	62	19.0	30.5	-	-	5.0	3	-	29.5
ST-15 5/F	PLK Ting Ka Ping Millennium Primary School 5/F	General Split Type AC	838256	832334	98.14	1.14	4	62	22.2	31.9	-	-	5.0	3	-	28.1
ST-16 5/F	PLK Ting Ka Ping Millennium Primary School 5/F	General Split Type AC	838257	832333	98.14	1.14	4	62	22.7	32.1	-	-	5.0	3	-	27.9
ST-17 5/F	PLK Ting Ka Ping Millennium Primary School 5/F	General Split Type AC	838259	832330	98.14	1.14	4	62	26.2	33.3	-	-	5.0	3	-	26.7
ST-18 5/F	PLK Ting Ka Ping Millennium Primary School 5/F	General Split Type AC	838259	832329	98.14	1.14	4	62	26.8	33.5	-	-	5.0	3	-	26.5
									Total Predicted Noise Level at NSR 1 (4/F)							45
									Criteria, ANL							60

Appendix K

Confirmation Email from Highways Department

Joan Choi

From: detp1.nt@hyd.gov.hk
Sent: Wednesday, March 5, 2025 2:56 PM
To: Emily Tang
Cc: Joan Choi; ctotp.nt@hyd.gov.hk
Subject: Re: Proposed Development of HKSKH St. Christopher Complex on the Vacant Site in Tai Po (Planning No. A/TP/702) - Propose Low Noise Road Surface
Attachments: 4.4 Location of Proposed Low Noise Surface Road.pdf

Dear Emily,

I spoke with your colleague just now.

It is understood that the project is in a preliminary planning stage. Provided that the proposed LNRS design follow HyD's Guidance Notes on Low Noise Road Surfacing (RD/GN/011C) and the works will be implemented by the project proponent at his own expense, we have no objection at this stage to the proposed use of LNRS on road maintained by HyD.

We would provide further comments when detailed design (e.g. material to be adopted) is available. Thanks.

Regards,

Roy LI
DE/TP(1) & DE/TP(2) (Atg.)
NT Region
Highways Department
Tel. 2762 4948

From: "Emily Tang" <emily.tang@urbangreen.hk>
To: "detp1.nt@hyd.gov.hk" <detp1.nt@hyd.gov.hk>
Cc: "Joan Choi" <joan.choi@urbangreen.hk>
Date: 23/01/2025 16:18
Subject: Proposed Development of HKSKH St. Christopher Complex on the Vacant Site in Tai Po (Planning No. A/TP/702) - Propose Low Noise Road Surface

---

Dear Mr. Li,

We are the environmental consultant responsible for conducting the Noise Impact Assessment (NIA) for the Proposed Development of the HKSKH St. Christopher Complex on the vacant site in Tai Po (Planning No. A/TP/702).

We have received a comment from the EPD - Environmental Assessment team regarding our proposed low-noise road surface treatment along sections of Tai Po Road (Tai Po Road (Tai Po Kau)) near the proposed development (as shown in the attached figure) as the noise mitigation measure for the road traffic noise. To facilitate further progress, we would greatly appreciate your confirmation on the feasibility of implementing the proposed low-noise road surface on Tai Po Road (Tai Po Kau). Thank you.

Attached the comment from EPD for your kind reference.

Best regards,
Emily Tang

Urban Green Consultants Limited
23/F, Wui Tat Centre, No. 55 Connaught Road West, Hong Kong
Tel: 3114 1147 Fax: 3114 1580
(File-Checksum-00000001)