Appendix 2

Environmental Appraisal

SECTION 16 PLANNING APPLICATION OF PROPOSED MINOR RELAXATION OF PLOT RATIO RESTRICTION (20% OF NON-DOMESTIC PLOT RATIO CONVERSION TO DOMESTIC PLOT RATIO. TOTAL PLOT RATIO REMAINS UNCHANGED) FOR MIXED USE DEVELOPMENT AT PLANNING AREA 28A AND AREA 28B, HUNG SHUI KIU

ENVIRONMENTAL APPRAISAL

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1. INTRODUCTION

1.1 Background

1.1.1 Under the Approved Hung Shui Kiu and Ha Tsuen Outline Zoning Plan No. S/HSK/2, the Proposed Development is located on the Planning Areas 28A and 28B. The location plan is shown in Figure 1.1. The Proposed Development is zoned as “Other Specified Uses” annotated “Mixed Use” (“OU(MU)”) which the planning intention of this zone is primarily for high-density residential development and commercial development in close proximity to the railway stations.

1.1.2 Ramboll Hong Kong Limited (the Consultant) has been commissioned by the MTR Corporation Limited (hereafter refer to as the "MTRC") to conduct this Environmental Appraisal in support of the Section 16 planning application for the Proposed Minor Relaxation of Plot Ratio Restriction (20% of non-domestic plot ratio conversion to domestic plot ratio. Total plot ratio remains unchanged.) for Mixed Use Development (hereafter refer to as the "Proposed Development") at Hung Shui Kiu at Planning Areas 28A and 28B (hereafter refer to as the "Subject Sites").

1.1.3 This environmental appraisal (EA) serves as a qualitative review of critical environmental issues, including air quality and noise impacts, to demonstrate the proposed development in Planning Areas 28A and 28B of Hung Shui Kiu / Ha Tsuen New Development Area (HSK/HT NDA) are environmentally feasible for the proposed conversion of non-domestic GFA to domestic GFA.

1.1.4 An Environmental Impact Assessment (EIA) Study (Agreement No. CE 2/2011 (CE)) supporting the formulation of a feasible land-use framework of HSK/HT NDA in environmental view was approved in 2016. The findings in the EIA are referenced for the preparation of this appraisal. Detailed assessment would be carried out during the discharge of the relevant lease condition during detailed design stage when the detailed building layout is available. The indicative block plan is for reference only.

1.2 The Proposed Development

1.2.1 The Proposed Development is situated in the Hung Shui Kiu and Ha Tsuen area, near the proposed HSK Station. According to the approved Hung Shui Kiu and Ha Tsuen Outline Zoning Plan (OZP) No. S/HSK/2, the Subject Sites are zoned "Other Specified Uses" annotated "Mixed Use" ("OU(MU)"), primarily for high-density residential development and commercial development in close proximity to the railway stations. The total area of the Subject Sites is about 82,027m^2. Figure 1.1 shows the location of the Subject Sites.

2. AIR QUALITY IMPACT

2.1 Introduction

2.1.1 This chapter focuses on the qualitative review of the potential air quality impacts associated with the construction and operation phase of the Proposed Development. When deemed necessary, appropriate mitigation measures are recommended to reduce the impacts from the Proposed Development and the nearby sources at the Air Sensitive Receivers to satisfy relevant environmental ordinance, standards and guidelines.

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

Air Quality Objectives (AQOs)

2.2.1 Air quality in Hong Kong is governed under the Air Pollution Control Ordinance ("APCO") (Cap. 311) and its subsidiary Regulations. Under this legislation, the Government has designated Air Control Zones ("ACZ") for the whole territory, along with the new Air Quality Objectives ("AQOs") which took effect on 11 April 2025. Therefore, the new AQOs would be required to comply with as the project is finalized after 2025. The AQOs stipulate the statutory limits for 7 pollutants and dictate the maximum number of allowable exceedances over specified time periods. For details of the new AQOs, please refer to Table 2.1 below.

Table 2.1 Hong Kong Air Quality Objectives (AQOs)

Pollutant	Averaging Time	Concentration Limit (ug/m^3)[1]	Number of Exceedances to be allowed
Sulphur Dioxide (SO2)	10-minute	500	3
	24-hour	40	3
RSP or PM_{10}[2]	24-hour	75	9
	Annual	30	N/A
FSP or $PM_{2.5}$[3]	24-hour	37.5	18
	Annual	15	N/A
Nitrogen Dioxide (NO_2)	1-hour	200	18
	24-hour	120	9
	Annual	40	N/A
Ozone (O_3)	8-hour	160	9
	Peak Season	100	N/A
Carbon Monoxide (CO)	1-hour	30,000	0
	8-hour	10,000	0
	24-hour	4,000	0
Lead (Pb)	Annual	0.5	N/A

Note:

[1] All measurements of the concentration of gaseous air pollutants, i.e. sulphur dioxide, nitrogen dioxide, ozone and carbon monoxide, are to be adjusted to a reference temperature of 293 Kelvin and a reference pressure of 101.325 kilopascal.

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

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

[4] In accordance with the EIAO-TM, odour predicted at all ASRs should meet 5 odour units (OUs) based on an averaging time of 5 seconds.

Hong Kong Planning Standards and Guidelines

2.2.2 General design guidelines are stated in the Hong Kong Planning Standards and Guidelines ("HKPSG") as indicated in Table 2.2 below.

Table 2.2 Guidelines on Usage of Open Space Site under Hong Kong Planning Standards and Guidelines

Polluting Source	Parameter	Buffer Distance	Permitted Uses
Road and Highways	Type of Road		
	Trunk Road and Primary Distributor	>20m	Active and passive recreational 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	Difference in Height between Industrial Chimney Exit and the Site		
	<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	Passive recreational uses
Construction and Earth Moving Activities	-	<50m	Passive recreational uses
		>50m	Active and passive recreational uses
Odour Sources	-	>200m	Sensitive 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 area are permitted in any situation.

2.3 Potential Air Quality Impact in Construction Phase

Identification of Potential Emissions

2.3.1 Air pollutant emissions from construction vehicles and machinery will be the potential major source of air quality impact during the construction phase. Significant emissions are not anticipated from the criteria pollutants – NO2, SO_2, and CO, etc. as only a limited number of diesel/ petroleum fuelled machinery would be operated at the Subject Site. Besides, the Subject Site is located at an area where supply of electricity is available. Therefore, it is anticipated that the number of diesel/ petroleum fuelled machinery operated at the Subject Site can be minimized as practically as possible with the use of electric construction machinery. Moreover, under the Air Pollutant Control (Non-road Mobile Machinery) (Emission) Regulation, only approved or exempted non-road mobile machineries (including mobile generator, air compressor, crawler crane, bulldozer, etc.) with a proper label are allowed to be used in the construction site, which would meet the prescribed emission standards and requirement. According to the requirements stipulated in the Air Pollution Control (Fuel Restriction) (Amendment) Regulation 2024 took effect on 1st April 2025, using liquid fuel with a sulphur content of less than 0.001% by weight (such as Ultra Low Sulphur Diesel) for the equipment should be fulfilled to control the SO_2 and PM emissions. Travelling of the dump trucks is another potential source of air emission of construction. At this planning application stage, there is no detailed information on the construction program or amount of excavated material to be handled; however, with reference to other similar scale projects, there is likely to be around 5 dump trucks per hour during the site formation stage of the Development Site. Watering the haul road and the site once per hour would be implemented to minimize the potential dust emission during the travelling of the dump trucks within the site.

Standard Mitigation Measures for Fugitive Dust and Air Emission

2.3.2 Air pollutant emissions mostly arises from construction activities and can be effectively suppressed by incorporating proper mitigation measures into work procedures through contractual clauses with reference to EPD's Recommended Pollution Control Clauses for Construction Contracts, where applicable, good site management, and close monitoring by the resident engineers. The contractor shall be required to follow the requirements of the Air Pollution Control (Construction Dust) Regulations for demolition and construction of the project. With the adaptation of good practices, it is expected that air pollutant emissions of construction dust can be kept at an acceptable level. Mitigation measures including but not limited to the followings with respect to demolition, infrastructure construction of a building should be implemented as appropriate.

2.3.3 Since the site formation work of the site will be carried out by CEDD, there would not have any demolition works to be carried out by this project.

2.3.4 In the case of infrastructure construction works / excavation/ earthworks, the standard dust suppression mitigation measures are described below:

- Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting shall be provided to enclose the scaffolding from the ground floor level of the building;
- Any skip hoist for material transport shall be totally enclosed by impervious sheeting;
- Any relevant requirements set outs in Parts III and IV of Air Pollution Control (Construction Dust) Regulations shall be met;
- Vehicle washing facilities including a high pressure water jet shall be provided at every discernible or designated vehicle exit point;
- Where a site boundary adjoins a road, street, service lane or other area accessible to the public, hoarding of not less than 2.4 m high from ground level shall be provided along the entire length of that portion of the site boundary except for a site entrance or exit;
- Locate all the dusty activities away from any nearby ASRs as far as practicable;
- Erect higher hoarding at the locations with ASRs in immediate proximity to the project site boundary;
- Avoid using exempted non-road mobile machineries;
- Consider connecting construction plant and equipment to mains electricity supply and avoid use of diesel generators and diesel-powered equipment as far as practicable.

Monitoring and Auditing

2.3.5 Monitoring and auditing program will be implemented to ensure that mitigation measures are in place and there is no adverse air quality impact arising from the construction activities of the Proposed Redevelopment on the nearby ASRs during the construction phase.

2.4 Potential Air Quality Impact in Operation Phase

2.4.1 In the approved EIA study, study area for AQIA has been identified by a distance of 500m from the boundary of the HSK NDA. Cumulative air quality impact arising from the vehicular emissions from the open roads, portal emission and emission from ventilation building of Tuen Mun Western Bypass (TMWB) and chimney emissions within the 500 m assessment area has been assessed at the worst-case years. The assessment results conclude that there is no adverse air quality impact upon the Subject Site at the time when the EIA was conducted.

2.4.2 For the Subject Sites in Planning Areas 28A and 28B, vehicular emission is the key air emission sources in the vicinity of the Subject Sites that might impose air quality impacts during operation phase. Based on desktop review and Hong Kong Environmental Database (HKED) - SP licence search, no active chimney was identified within 500m assessment area from the site boundary of the Site.

Review of Vehicular Emissions based on Approved EIA Study

2.4.3 In the Study brief of the Approved EIA study, new road networks are proposed within the HSK NDA. Appendix 2.1 shows the adjacent road networks of the Subject Sites, extracted from the Approved EIA Study and the relevant information listed in the TIA. According to Appendix 2.1 and the main text of the TIA, among the planned road networks, primary distributor road (Road P1) and district distributors (Road D1 to D8) were identified. All other planned road networks, including those adjacent road networks surrounding the Subject Site, were identified as local roads. From desktop review, there is no updates or changes been made to the road networks since the approval of the HSK NDA EIA report.

2.4.4 In view of recommending the appropriate buffer distance from the road networks such that the air quality impacts due to open-road vehicular emissions to the air sensitive uses in the Subject Site could be minimized, worst case scenario should be adopted. Since the adjacent road networks are defined as local roads, with reference to the HKPSG, it is recommended that at least 5m buffer distance from the nearby roads should be provided, such that no air sensitive uses would be located in the buffer distance. Figure 2.1 illustrates the required buffer distance from the adjacent road networks surrounding the Subject Site.

2.4.5 With complying the above-mentioned buffer distance, no adverse impact is anticipated from vehicular emissions.

Review of Air and Odour Emissions within Assessment Area based on Approved EIA Study

2.4.6 In the air quality impact assessment of the approved EIA study, air and odour emission sources are identified to assess the potential adverse air quality impact within the 500m assessment area. Figure 2.2 shows the locations of the identified air and odour emission sources.

Identified air and odour emission sources within the 500m assessment area based on approved EIA study:

a) Vehicular exhaust from road traffic of newly planned roads, including DP2 and DP6, and existing roads including Castle Peak Road; and

b) Odour from nearby planned channels and the new sewage pumping station (SPS) (DP9).

No active chimney was identified within 500m assessment area from the site boundary of the Site based on desktop review.

2.4.7 According to the assessment of the approved EIA study, it is concluded that with proper planning design and implementation of proposed at-source odour mitigation measures, such as deodourising units and enclosure, no unacceptable operational odour impact would be anticipated.

2.4.8 Upon this S16 submission, it is confirmed through desktop review that there is no updates or changes been made to the mentioned planned and existing roads, planned channel revitalisation and sewage treatment works within the assessment area as stated in the approved EIA Study, such that the nature and locations of the identified air and odour emission sources remains the same. By view of this, it can be concluded that adverse air quality impact in the operational phase of the proposed development is not anticipated.

2.4.9 The approved EIA study has confirmed that there will be no adverse residual impact from the construction activities of the concurrent projects within 500m assessment area during the operational phase of the proposed development. Through desktop review, it is also confirmed that there is no updates or changes on the concurrent projects within the 500m assessment area upon this S16 submission. Therefore, the conclusion of the approved EIA study regarding the concerned assessment is still valid.

Review of Air and Odour Emissions from the Proposed Development

2.4.10 The potential air and odour emission sources within the proposed development include a proposed Transport Interchange Hub and F&B areas. Since the proposed development is in a very early stage, there is no available detailed information on the aforementioned potential air and odour emission sources within the proposed development.

2.4.11 Air quality impact assessment would be carried out in the future detailed design stage according to the updated information of the potential emission sources. Nevertheless, the operation of these sources should follow the relevant practice notes and guidelines as illustrated below.

Potential Air Quality Impact from Oily Fume and Cooking Odour

2.4.12 F&B areas will be provided within the Development Site. Exhaust hoods and grease trap will be provided and the air change rate for the F&B area will be designed according to the standard of kitchen as stipulated in Building Department's Practice Note for Authorized Persons (PNAP). Potential odour emissions will be minimised as far as practicable. The following considerations recommended in EPD's Control of Oil Fume and Cooling Odour from Restaurant and Food Business shall be taken into account in the detailed design when positioning the exhaust outlets:

- Locate the outlet at such a place where the ventilation is good and the emissions from them can be adequately dispersed without hindrance;
- Provide sufficient separation distance from any sensitive receptor in the vicinity so that the emissions will not cause, or contribute to, an odour nuisance or other type of air pollution to the public;
- Ensure the emissions from the exhaust system will be directed vertically upwards, unless it can be demonstrated by an environmental professional that other direction is more advantageous in preventing emissions from causing air pollution problems; and
- Ensure that emissions from the exhaust system will not be restricted nor deflected by, for example, the use of plates or caps.

Potential Air Pollution Impact by Transport Interchange Hub

2.4.13 A public transport interchange (PTI) has been proposed. The design of the PTI will be provided in detailed design stage. According to the operation procedures specified in EPD's Practice Note, Control of Air Pollution in Semi-Confined Public Transport Interchanges (ProPECC PN 1/22), the operator of PTI shall instruct all drivers using the PTI to switch off the vehicle engines while waiting to minimize idling emissions. Hence, idling activities within PTI should be very small under normal circumstances. Adequate ventilation systems will be provided to avoid accumulation of emissions within the PTI and designed in accordance with the ProPECC PN 1/22. The exhaust air outlets should be located away from nearby air sensitive uses to avoid causing air pollutant nuisance. If necessary, control equipment such as filters or scrubbing units should be used to minimize the impact induced on surroundings. Ventilation systems should also be maintained at regular intervals to ensure proper operation. With implementation of these measures, adverse air quality impact due to the proposed PTIs within the Proposed Development Sites are not anticipated.

2.4.14 Carpark has been proposed for the Proposed Development. The air quality inside the carpark should satisfy the air pollutant standards as recommended by the ProPECC PN 2/96 Control of Air Pollution in Car Parks. Therefore, the mechanical ventilation system and layout the carpark should be properly designed. Furthermore, the exhaust outlet of the mechanical ventilation system of the carpark, if any, should also be designed by facing away from the nearest air sensitive uses as practicable as possible to ensure not to cause a nuisance to the occupants/ residents of the air sensitive uses including the surrounding developments and the Proposed Development. As the Project is still under initial design stage, the location of the exhaust outlet of the mechanical ventilation system is yet available.

2.4.15 The potential emission sources within the proposed development will comply with the relevant statutory requirements and there would be no adverse air quality or odour nuisances/impacts to the air-sensitive uses of the proposed development, or to any surrounding air-sensitive uses within the 500m assessment area.

2.5 Conclusion

2.5.1 By providing sufficient buffer distance from nearby road networks as promulgated in the HKPSG, no adverse air quality impact from the vehicular emissions is anticipated at the air sensitive use of the Subject Sites during the operational phase.

2.5.2 Through desktop review, it is confirmed that there is no updates or changes been made to the identified air and odour emission sources including planned and existing roads, planned channels and new sewage treatment works within 500m assessment area based on the approved EIA Study, such that the nature and locations of the identified air and odour emission sources remains the same. By view of this, it can be concluded that adverse air quality and odour impacts in the operational phase of the proposed development is not anticipated.

2.5.3 Potential emission sources within the proposed development will comply with the relevant statutory requirements there would be no adverse air quality or odour nuisances/impacts to the air-sensitive uses of the proposed development, or to any surrounding air-sensitive uses within the 500m assessment area.

3. NOISE IMPACT

3.1 Introduction

3.1.1 According to the Approved EIA report, new road networks will be constructed in the vicinity of the Subject Sites, in the purpose of serving the HSK/HT NDA. In the operation phase, potential road traffic noise is anticipated.

3.1.2 The Subject Sites are also situated in the vicinity of Tuen Ma Line. Due to the short distance to Tuen Ma Line and the planned Hung Shui Kiu Station, certain railway noise impact is expected in the Subject Sites.

3.1.3 Existing fixed plant noise sources is found in the surrounding area of the Subject Sites. Moreover, as stated in the project profile of the Approved EIA report, new sewage pumping stations, electricity substations, fire station, etc. were planned in the HSK/HT NDA. Fixed noise impact is anticipated from both the existing and planned fixed noise sources.

3.1.4 This assessment is to evaluate the potential road traffic, railway and fixed noises upon the Proposed Development and to demonstrate that the noise mitigation measures adopted in the development would provide adequate protection to future residents, if any.

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

Traffic Noise

3.2.1 Noise standards are recommended in Chapter 9, "Environment" of the HKPSG for planning against noise impact from sources such as road traffic, railway and aircraft. The applicable standards based on the proposed use are summarized in Table 3.1.

Table 3.1 Summary of Noise Standards Regarding Road Traffic Noise According to Hong Kong Planning Standards and Guidelines

Proposed Usage	Road Traffic Noise Standard (L_{10} (1hr), dB(A))
All domestic premises including temporary housing accommodation	70
Hotels and hostels	70
Offices	70
Educational institutions including kindergartens, child care centres and all others where unaided voice communication is required	65
Places of public worship and courts of law	65
Hospitals, clinics, convalescences and residential care homes for the elderly - Diagnostics rooms - Wards	55

Notes: 1. The above standards apply to uses which rely on opened windows for ventilation.

2. The above standards should be viewed as the maximum permissible noise levels at the external façade.

Railway Noise

3.2.2 According to Technical Memorandum for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Site (IND-TM) published under Noise Control Ordinance, the noise levels shall comply with the Acceptable Noise Level (ANL) which depends on the Area Sensitivity Rating (ASR) and the time period concerned. The ASR of Noise Sensitive Receivers (NSR) is determined on the basis of the perceived usage of the assessment area and the presence of any influencing factors such as major roads, industrial areas and airports.

3.2.3 The ASR of NSRs and ANLs for different NSRs are summarized in Table 3.2 and Table 3.3, respectively.

Table 3.2 Area Sensitivity Ratings of Noise Sensitive Receivers

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

Remarks:

In any event, the ASRs and the ANLs assumed in this report are indicative and are used for assessment only. It should be noted that noise from fixed noise sources is controlled under Section 13 of the NCO. Therefore, the ASRs and ANLs determined in this report shall not prejudice the Noise Control Authority's discretion to determine the noise impact due to fixed noise sources on the basis of prevailing legislation and practices being in force and taking account of contemporary conditions/ situations of adjoining land uses. Nothing in this report shall bind the Noise Control Authority in the context of law enforcement against any of the fixed noise sources being assessed.

Table 3.3 Acceptable Noise Levels for Railway and Fixed Noise Sources

Time Period	ANL, dB(A)		
	ASR "A"	ASR "B"	ASR "C"
Day (0700 to 1900 hours)	60	65	70
Evening (1900 to 2300 hours)	60	65	70
Night (2300 to 0700 hours)	50	55	60

3.2.4 Beside the ANL standard above, the Hong Kong Planning Standards and Guidelines also provide additional criteria for assessing railway noise. These noise criteria are specified in terms of A-weighted maximum noise level and daily railway noise exposure level, as shown in the below table.

Table 3.4 Summary of Noise Standards Regarding Railway Noise According to Hong Kong Planning Standards and Guidelines

Noise Sensitive Uses	Railway Noise, dB(A)	
	Leq (24-hr)	Lmax (2300-0700)
All domestic premises including temporary housing accommodation	65	85
Hotels and hostels		
Offices		
Education institutions including kindergartens and nurseries		
Hospitals, clinics, convalescences and homes for the aged (diagnostic rooms and wards)		

Notes: 1. The above standards apply to uses which rely on opened windows for ventilation.
2. The above standards should be viewed as the maximum permissible noise levels at the external façade.
Source: HKPSG Chapter 9, Table 4-1.

Fixed Noise Source

3.2.5 Noise assessments will 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 (TM), published under the Noise Control Ordinance. The TM lays down statutory Acceptable Noise Levels (ANL). However, in order to plan for a better environment, all fixed noise sources should be so located and designed that when assessed in accordance with the 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 3 of the TM or, in the case of the background being 5 dB(A) lower than the ANL, should not be higher than the background.

3.3 Traffic Noise Impact Assessment

3.3.1 According to the study brief of the EIA study, road networks are proposed in the vicinity of the Subject Sites. Noise from these proposed roads and the existing roads including Castle Peak Road – Hung Shui Kiu Section will be the dominant road traffic noise source during the operational phase of the Proposed Development.

3.3.2 Living room and bedrooms of residential units located at the residential towers are identified as noise sensitive receivers. Any offices and communal facilities at the Proposed Development are also identified as noise sensitives receivers.

Assessment Findings on Approved EIA Study

3.3.3 Traffic noise impacts has been assessed in the approved EIA study. With respect to the Subject Site area, noise sensitive receivers at sites named as “4-25a”, “4-25b”, “4-25c” and “4-29” are assigned. In the Approved EIA study, existing and planned road networks within 300m area of the HSK NDA boundary are assessed.

3.3.4 The assessment results from the Approved EIA study suggested that the predicted unmitigated overall noise level at 4-25a, 4-25b and 4-25c which situated in Planning Area 28B are ranged from 52 – 69 dB(A), while that of 4-29 situated in Planning Area 28A is 71 dB(A). Appendix 3.1 shows the extracted locations of the representative noise sensitive receivers and the results summary table for reference.

Review Based on Approved EIA Study

3.3.5 In the Approved EIA Study, the assessment year for road traffic noise of the Proposed Development have been taken as Year 2048 which is the maximum traffic projection within 15 years after the expected completion year. For the Proposed Development in Planning Areas 28A and 28B, to present a worst-case scenario, it is assumed that the completion year, and thus the assessment year, would be much later than those assumed in the Approved EIA Study.

3.3.6 With an expectation of continuous population growth in the vicinity of the Subject Sites, it is anticipated that the road traffic noise impacts in the assessment year would be worse than that estimated for Year 2048 in the Approved EIA study.

3.3.7 It is noted from the traffic noise impact assessment in the Approved EIA study that there is minor traffic noise exceedance of 1dB(A) found in the Subject Site. Considering the future increasing traffic flows in nearby road networks by the time of completion of the Proposed Development, even under an extreme worst-case scenario of having a doubled traffic flow, the estimated traffic noise levels in the Subject Site would be still around 74 dB(A) only.

3.3.8 In case road traffic noise exceedance is found at the noise sensitive receivers within the Subject Sites in the later development stages, conventional noise mitigation measures including building setback, noise-tolerant structure, noise barrier and acoustic fins are solutions to mitigate the potential noise impacts. In addition, innovative noise mitigation measures including acoustic windows and acoustic balconies, can effectively alleviate the noise exceedance. Referring to the "Application of Innovative Noise Mitigation Designs in Planning Private Residential Developments against Road Traffic Noise Impact" (ProPECC PN 5/23) issued by EPD, with additional enhancement measures including Sound Absorption Material provision and appropriate tilting of the NMMs itself, the noise reduction of acoustic window and acoustic balcony would reach at least 8.5 dB(A) and 12.5 dB(A), and even higher for a habitable room of a larger area. The mentioned Practice Note is attached as Appendix 3.2 for reference. With the large noise reduction contributed by the combined provision of conventional and innovative noise mitigation measures, it is expected that the road traffic noise exceedance based on projection of 15 years from the completion of the Proposed Development could be mitigated, even with buffer.

3.3.9 Adequate noise mitigation measures will be proposed and implemented such that the predicted traffic noise level at noise sensitive uses in the future development would comply with the relevant HKPSG standard, and the future occupants would not be subject to adverse traffic noise impacts. The minimum thickness of the glass panes for all windows in the noise sensitive rooms will be 6mm. It is also agreed that all these windows should be well-gasketted, such that providing the future occupants an option for a quieter indoor noise environment.

Summary

3.3.10 Road traffic noise exceedance is expected in the Proposed Development. In case road traffic noise exceedance is found within the Subject Sites, with appropriate implementation of conventional and innovative noise mitigation measures, it is expected the noise mitigation measures could help alleviate the road traffic noise impacts brought by the existing and planned road networks in the vicinity of the Subject Sites. As such, no adverse traffic noise impacts shall be anticipated on the Proposed Development.

3.4 Railway Noise Assessment

3.4.1 The Subject Sites are located adjacent to Tuen Ma Line. In the study brief of the Approved EIA, Hung Shui Kiu Station is proposed as a new station of Tuen Ma Line at west of the Subject Sites. Figure 3.1 shows the location of the proposed Hung Shui Kiu Station and the Subject Sites. The configurations of Hung Shui Kiu Station is assumed to be similar to Kam Sheung Road Station, which also serve Tuen Ma Line.

Assessment Findings on Approved EIA Study

3.4.2 In the railway noise impact assessment of Approved EIA study, noise sensitive receivers at residential developments at Sites 4-29 and 4-25, which located within the Subject Sites as Planning Areas 28A and 28B respectively, are identified. Area Sensitivity Rating (ASR) "B" are used for those noise sensitive receivers.

Table 3.5 Noise Criteria for Railway Noise Impact Assessment

Criteria	Acceptable Noise Level (ANL)*
Leq (30 minutes) (0700 to 2300)	65 dB(A), Leq (30 min)
Leq (30 minutes) (2300 to 0700)	55 dB(A), Leq (30 min)

*Note: * Accepted Noise Level for Area Sensitivity Ratings of "B" stipulated in the 'Technical Memorandum for the Assessment of Noise from Places other than Domestic premises, Public Places or Construction Sites"*

3.4.3 According to the railway noise impact assessment results from the Approved EIA study, there is no noise exceedance found in Area 28B ($L_{eq(30\text{-}min)}$ of 38 - 52 dB(A) for 0700 to 2300 and 37 – 51 dB(A) for 2300 to 0700).

3.4.4 However, for Area 28A, a 2 dB(A) exceedance is found ($L_{eq(30\text{-}min)}$ of 45 - 59 dB(A) for 0700 to 2300 and 43 – 57 dB(A) for 2300 to 0700).

3.4.5 Appendix 3.3 shows the extracted corresponding assessment results from the Approved EIA Report.

Review based on Approved EIA Study

3.4.6 According to the approved OZP, it is noted that there is a 60 mPD non-domestic development portion located in Planning Area 28A next to the future Hung Shui Kiu Station. Figure 3.2 shows the approved Hung Shui Kiu and Ha Tsuen Outline Zoning Plan No. S/HSK/2. The building located within the non-domestic development portion should be act well as an effective barrier to shield off the railway noise and acoustically protect the domestic zone behind. Thus, for Planning Area 28A, it is expected that the predicted railway noise levels at noise sensitive uses would be much lower than that predicted in the Approved EIA Study. In assessing the railway noise impact to the residential development in Area 28A and 28B, the timing of the said non-domestic development portion and the proposed residential development will be reviewed to address any exposure of railway noise during any interim stage.

3.4.7 In view of the railway noise exceedance found in Planning Area 28A, the Approved EIA study concluded that noise mitigation measures should be applied to reduce the railway noise impact for the NSRs during the Tuen Ma Line operation.

3.4.8 In case railway noise exceedance was found at the noise sensitive receivers within the Subject Sites in the later development stages, conventional noise mitigation measures including building setback, noise-tolerant structure, noise barrier and acoustic fins are the solutions. In addition, innovative noise mitigation measures including acoustic windows and acoustic balconies, can effectively alleviate the railway noise exceedance. The application of acoustic windows and acoustic balconies refers again to the NIA report of the residential development adjacent to Kam Sheung Road Station. The

railway noise reduction of acoustic windows and acoustic balconies reaches 6 dB(A) considering the worst noise performance in particular configurations.

3.4.9 In case railway noise exceedance is found at NSRs in Area 28A, with appropriate application of noise mitigation measures, no railway noise exceedance could be anticipated. No noise mitigation measure is needed in Planning Area 28B as it is concluded in the Approved EIA Study that no railway noise exceedance was found.

Summary

3.4.10 No insurmountable railway noise impact from the Proposed Development is anticipated.

3.5 Fixed Plant Noise Assessment

3.5.1 In the Approved EIA study, planned fixed noise sources are identified and the cumulative fixed noise impact arising from those fixed noise sources located within the 300m assessment area at each identified NSR is assessed.

3.5.2 There is no existing fixed plant noise sources found in the assessment area regarding the Subject Sites referencing the Approved EIA Study.

Assessment Findings on Approved EIA Study

3.5.3 The adopted noise assessment criteria for the fixed plant noise assessment in the Approved EIA study are summarized in Table 3.6.

Table 3.6 Noise Assessment Criteria for Planned Fixed Plant Noise

Time Period	Planned Fixed Plant Noise Criteria		
	ANL-5, dB(A)	Prevailing Background Noise, dB(A)	Adopted Noise Criteria, dB(A)
Day (0700 – 1900) / Evening (1900 – 2300)	60	Prevailing Background Noise, dB(A)	Whichever is lower
Night (2300 – 0700)	50		

Existing Fixed Plant Noise adjacent to the Proposed Development

3.5.4 According to the fixed noise impact assessment of the Approved EIA Study, there is no existing fixed noise sources identified in the 300m assessment area regarding the Subject Sites.

Planned Fixed Plant Noise adjacent to the Proposed Development

3.5.5 According to Approved EIA study, within the 300m Assessment Area based on the Subject Site, the found planned noise sources are Hung Shui Kiu Station, two flood retention facilities and a PTI located at the opposite site of Hung Shui Kiu Station. Figure 3.3 shows the location of the planned fixed noise sources.

3.5.6 The Approved EIA study, the major fixed plant noise sources of Hung Shui Kiu Station include the operation of ventilation fans. As there is currently no design information on the station based on the latest information, the fixed plant noise assessment is conducted to determine the maximum allowable SWL based on the respective separation distances with respect to the representative NSRs. The maximum allowable SWL for the planned station is 93, 93 and 83 dB(A) during Day-, Evening- and Night-time, respectively. It is proposed to install acoustic silencers, as appropriate to ensure the specified maximum SWL as mentioned will not be exceeded. The future design and

selection of the equipment shall also aim to reduce the effect of tonality at the NSRs as much as practicable. However, the latest available information shall also be taken into account at time of detail design to review and update the maximum allowable SWL as appropriate. With the above noise mitigation measures, fixed plant noise impacts from Hung Shui Kiu Station are not anticipated.

3.5.7 The mentioned flood retention facilities will be installed underground with a small concrete building structure for maintenance use. The ventilation fans would be operated during maintenance period only. Thus, no fixed plant noise impacts are expected from the planned flood retention facilities.

3.5.8 According to the Approved EIA study, proposed PTI is found in Site 4-13 in HSK/HT NDA. The PTI and vehicle depot would be decked under proposed building structure and designed with no line-of-sight at the noise sensitive use. The major fixed plant noise sources of PTI and vehicle depot include the operation of ventilation fans. Since there is no design information on the proposed PTI and vehicle depot, the fixed plant noise assessment is conducted to determine the maximum allowable SWL based on the respective separation distances to the representative NSRs. The assessment results suggested that the maximum allowable SWL of the PTI and vehicle depot is 99, 99 and 89 dB(A) during Day-, Evening- and Night-time, respectively. It is proposed to install acoustic silencers, as appropriate to ensure the specified maximum SWL as mentioned will not be exceeded. The future design and selection of the equipment shall also aim to reduce the effect of tonality at the NSRs as much as practicable. However, the latest available information shall also be taken into account at time of detail design to review and update the maximum allowable SWL as appropriate. With the above noise mitigation measures, fixed plant noise impacts from the identified PTI and vehicle depot is not anticipated.

Summary

3.5.9 The potential fixed plant noise impact to the Proposed Development has been assessed. From the assessment results, it is concluded that the Proposed Development would not be subject to adverse fixed noise impact.

3.5.10 Provisions shall be made to control the noise sources by suitable silencers, acoustic louvers and enclosures, if necessary. As such, it is anticipated that the fixed noise impact on the surrounding NSRs due to the operation of the Proposed Development will not exceed the relevant noise standard of the HKPSG and the NCO.

3.6 Conclusion

3.6.1 The potential environmental noise impacts from nearby road traffic, railway to the Proposed Development, and planned fixed plant noise sources from the vicinity of the Proposed Development have been evaluated.

3.6.2 The traffic noise impact to the representative noise sensitive receivers of the Proposed Development has been assessed. It is anticipated there is no significant impact on the Proposed Development caused by the adjacent road networks. Appropriate noise mitigation measures could effectively mitigate the potential road traffic noise exceedance.

3.6.3 The railway noise impact to the representative noise sensitive receivers of the Proposed Development has been assessed. There is no railway noise exceedance found in Planning Area 28B. It is anticipated that there is no significant railway noise impact in Planning Area 28A. Appropriate noise mitigation measures could effectively mitigate the potential railway noise exceedance.

3.6.4 The fixed plant noise impact from the planned fixed plant has been evaluated. No insurmountable adverse fixed plant noise impact from planned fixed plant noise is anticipated during the operation phase of the Proposed Development.

4. OVERALL CONCLUSION

4.1.1 This environmental appraisal has been conducted for verifying the feasibility of the Proposed Development in conversion of 20% non-domestic GFA to domestic GFA regarding the aspects of air quality and noise impacts in accordance with the Hong Kong Planning Standards and Guidelines and the Noise Control Ordinance.

4.1.2 Based on the findings of the Approved EIA Study of Hung Shui Kiu New Development Area, air quality and noise impacts are assessed for the Proposed Development in Planning Areas 28A and 28B.

4.1.3 It can be concluded that with the implementation of the recommended mitigation measures, there are no insurmountable environmental concerns identified to be associated with the operation phase of the Proposed Development.

Figures

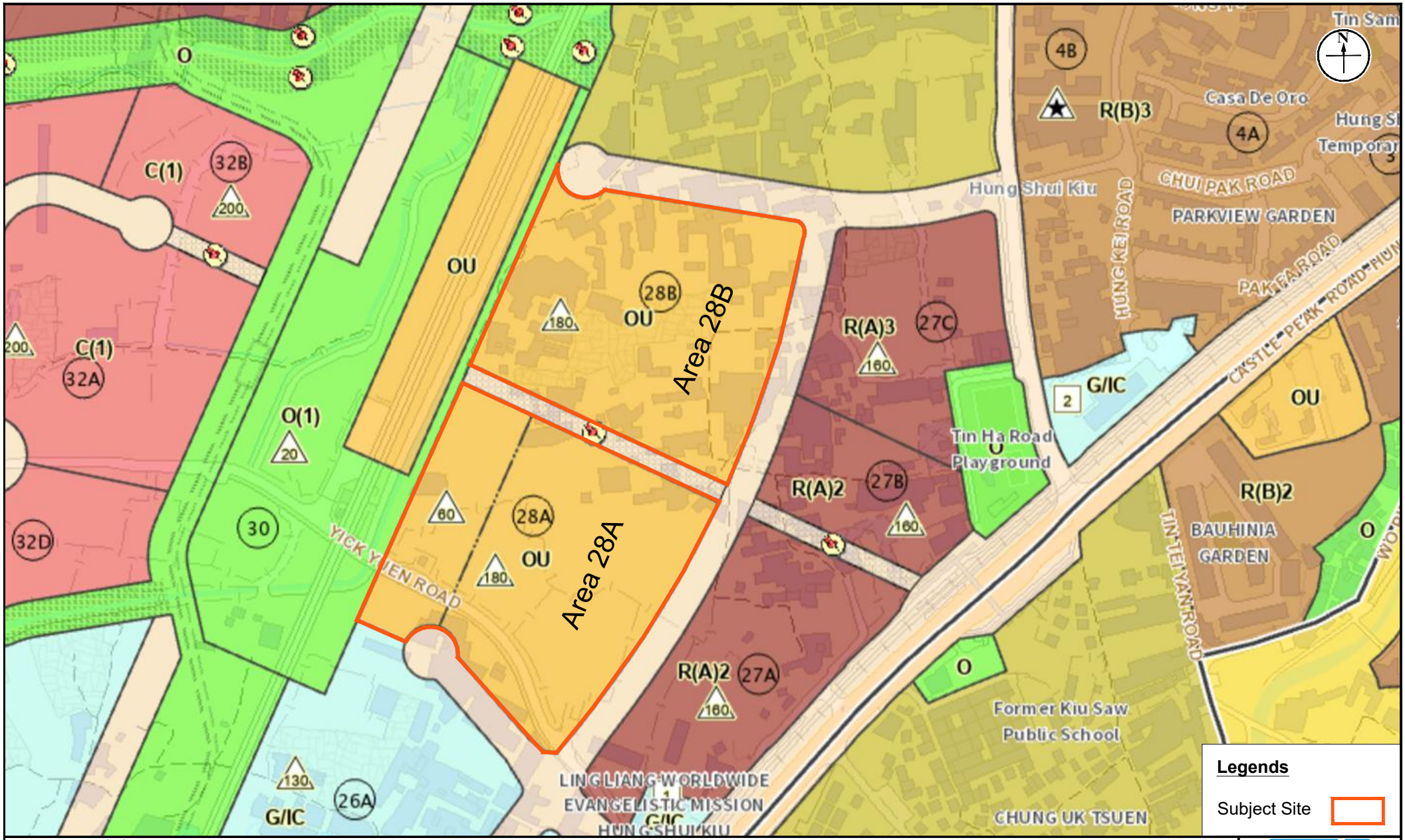

Figure: 1.1	RAMBOLL
Title: Location of the Subject Sites and their Environs	Drawn by: SC
	Checked by: TC
Project: Hung Shui Kiu Planning Areas 28A and 28B	Rev.: 1.0
	Date: Nov 2024

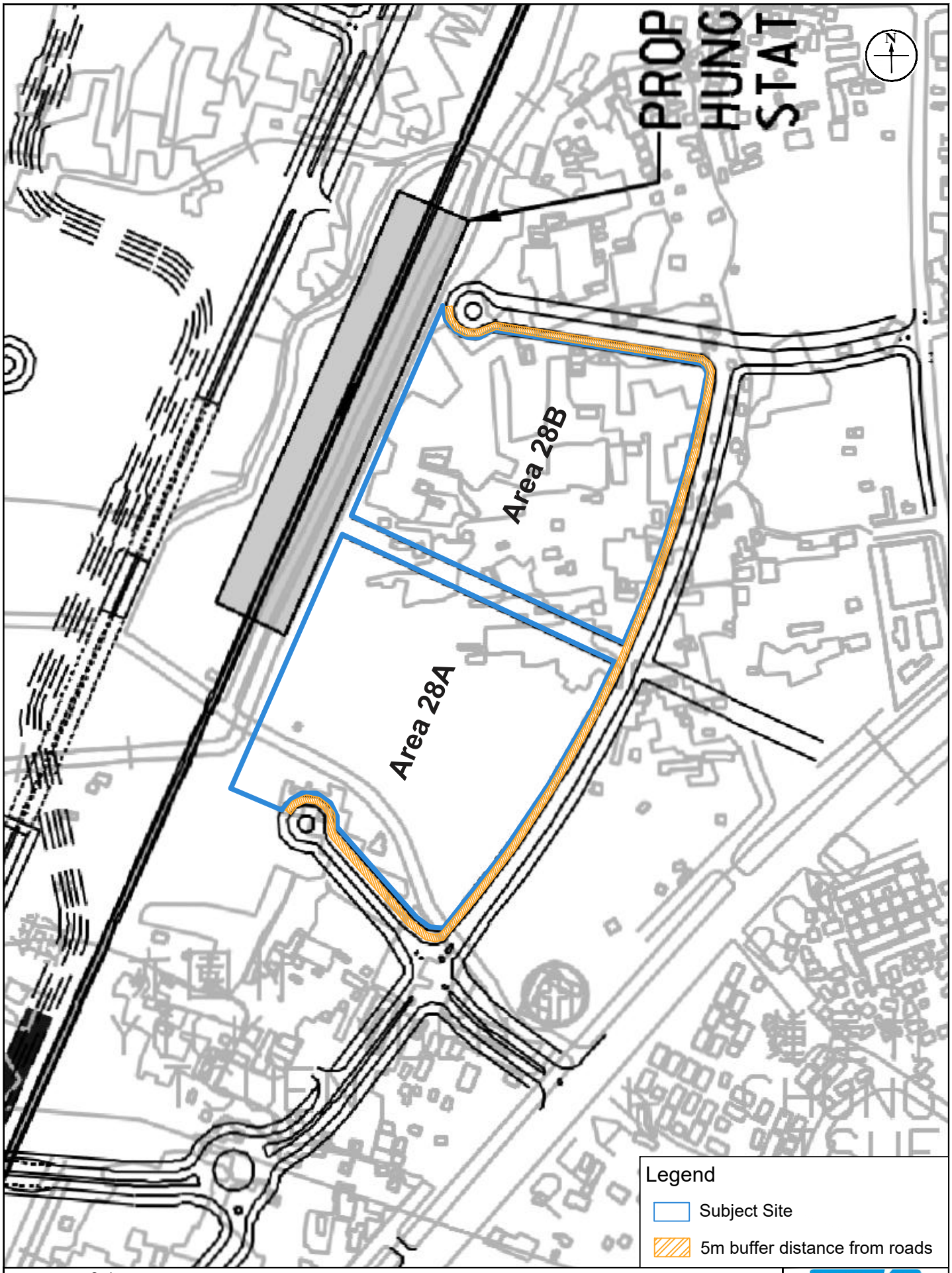

Figure: 2.1		RAMBOLL
Title:	Location of the Subject Sites and the 5m Buffer Distance from Adjacent Planned Road Networks	Drawn by: GY Checked by: TC
Project:	Hung Shui Kiu Planning Areas 28A and 28B	Rev.: 1.0 Date: Dec 2024

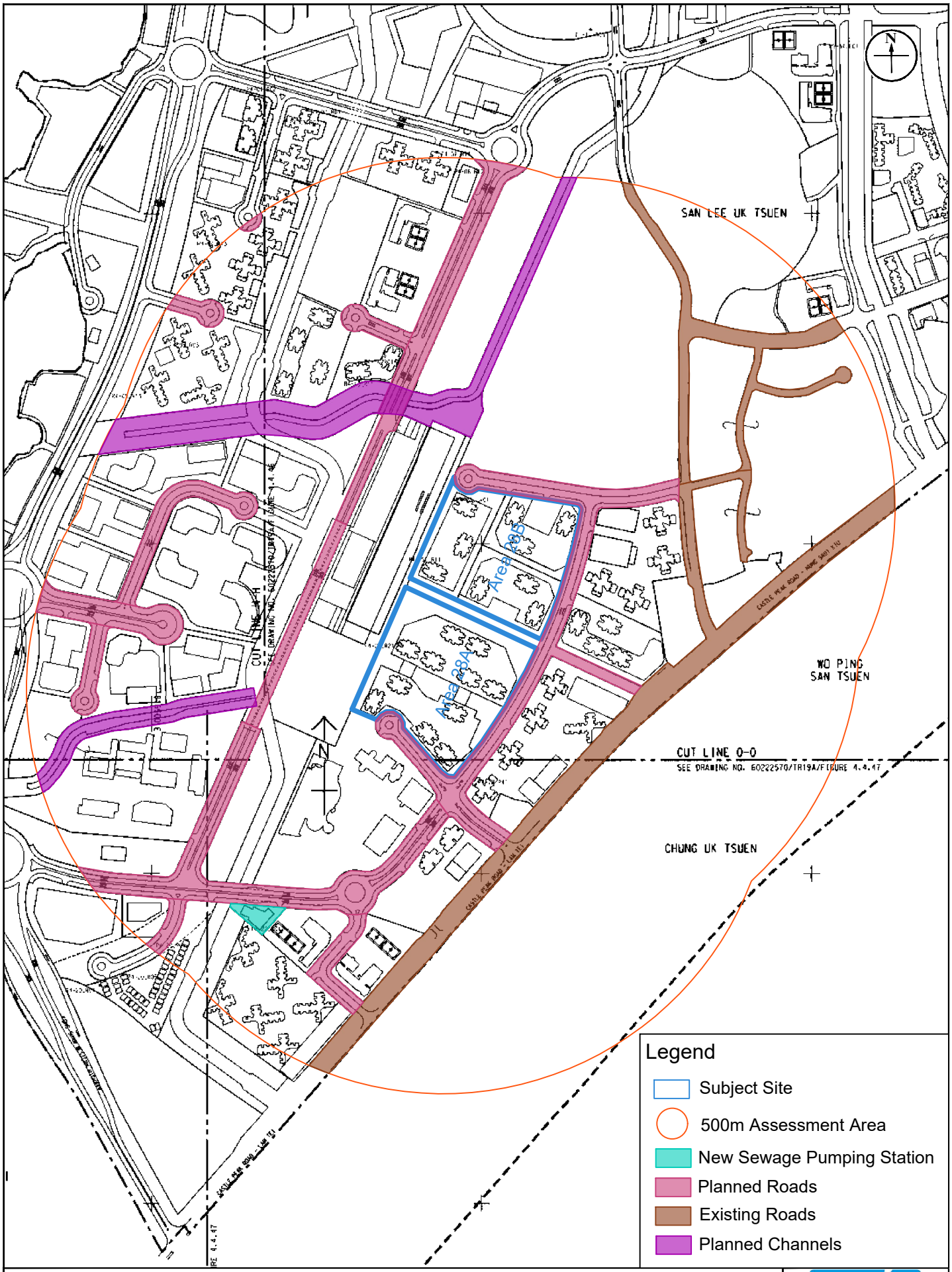

Figure: 2.2		RAMBOLL
Title: Location of Project Site and Emission Sources within 500m Assessment Area based on Approved EIA Study		Drawn by: GY
		Checked by: TC
Project: Hung Shui Kiu Planning Area 28A and 28B		Rev.: 1.0
		Date: May 2025

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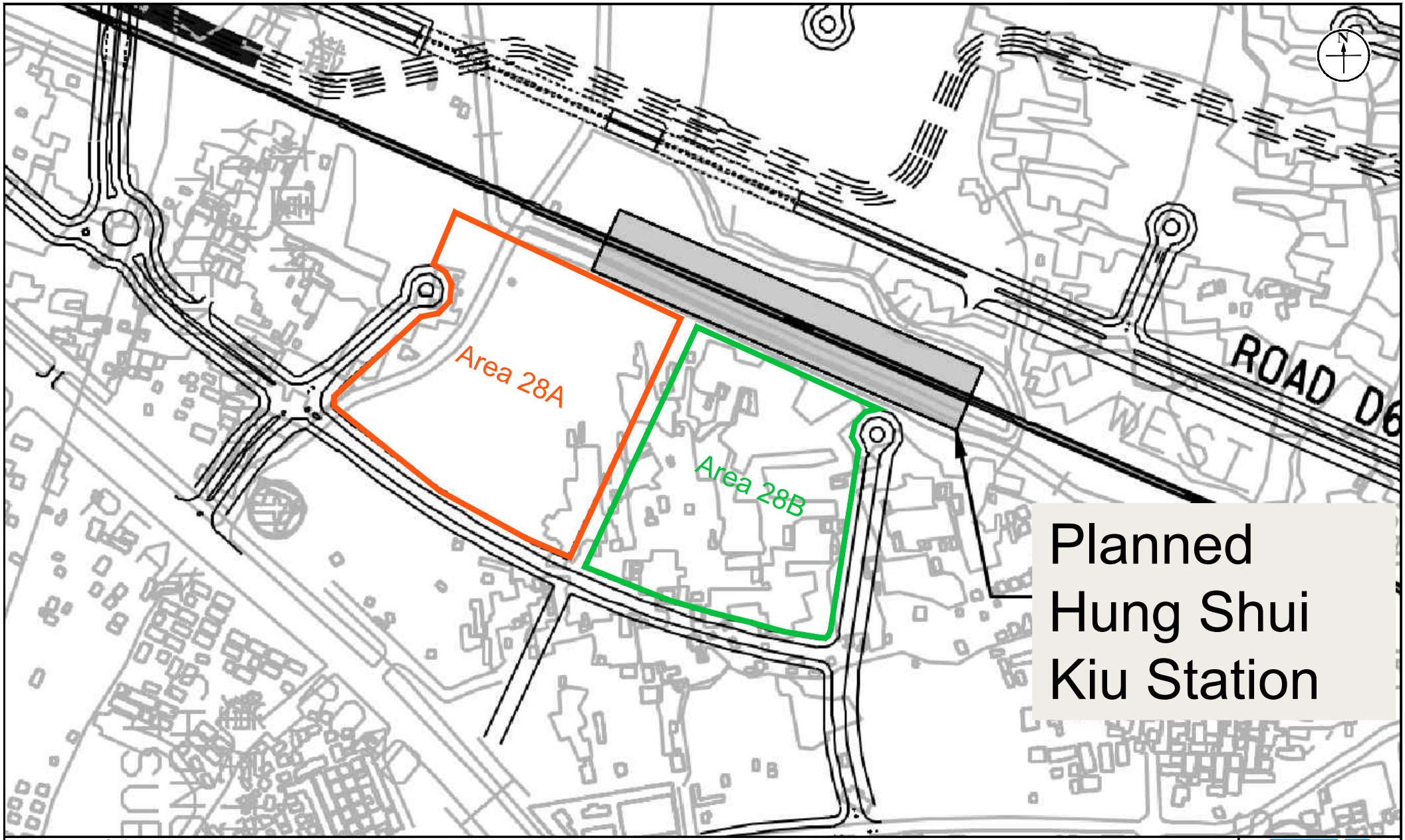


Figure: 3.1		RAMBOLL
Title: Location of the Subject Sites and Planned Hung Shui Kiu Station		Drawn by: GY
		Checked by: TC
Project: Hung Shui Kiu Planning Areas 28A and 28B		Rev.: 1.0
		Date: Nov 2024

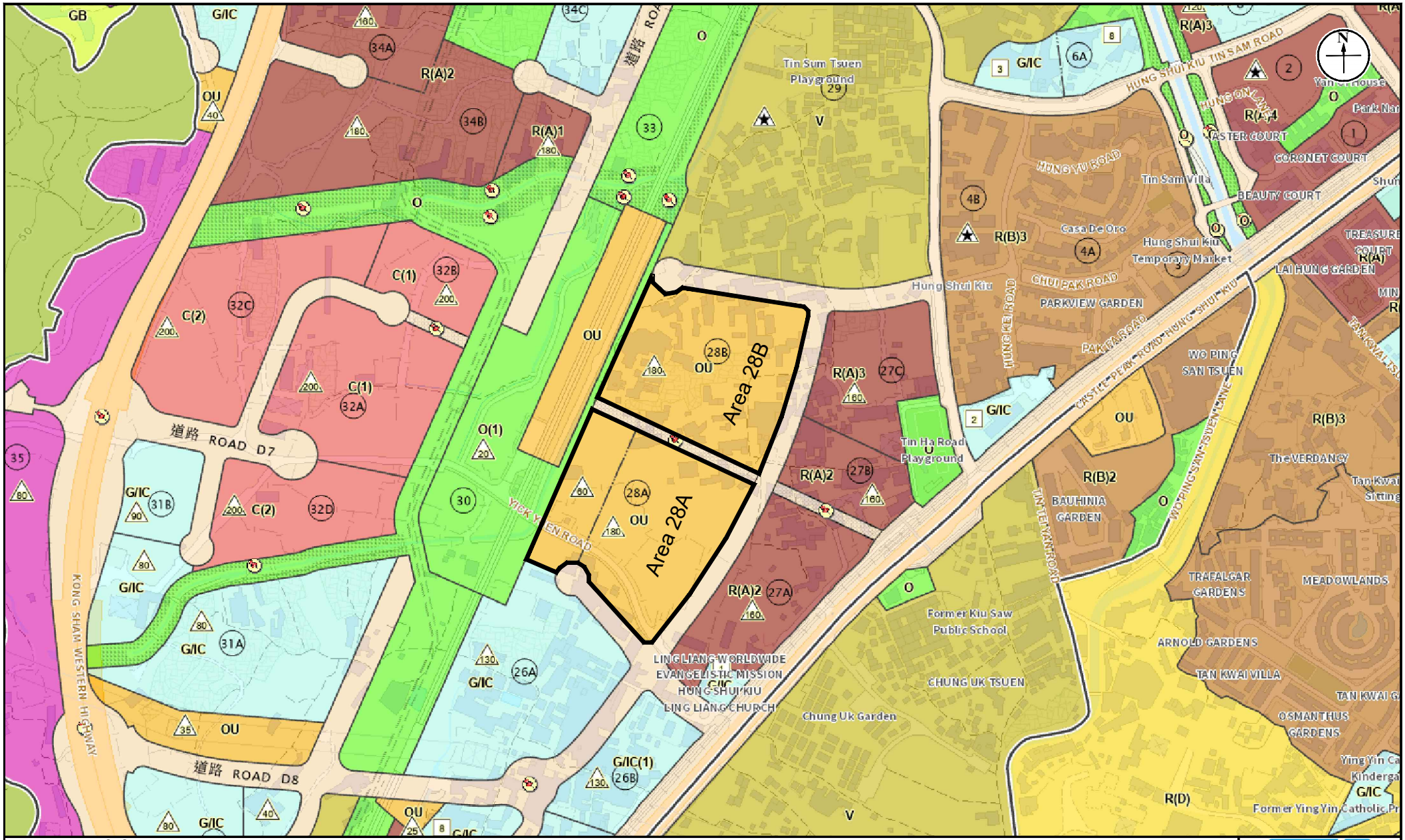


Figure: 3.2	RAMBOLL
Title: The Approved Hung Shui Kiu and Ha Tsuen Outline Zoning Plan No. S/HSK/2	Drawn by: GY
	Checked by: TC
Project: Hung Shui Kiu Planning Areas 28A and 28B	Rev.: 1.0
	Date: Nov 2024

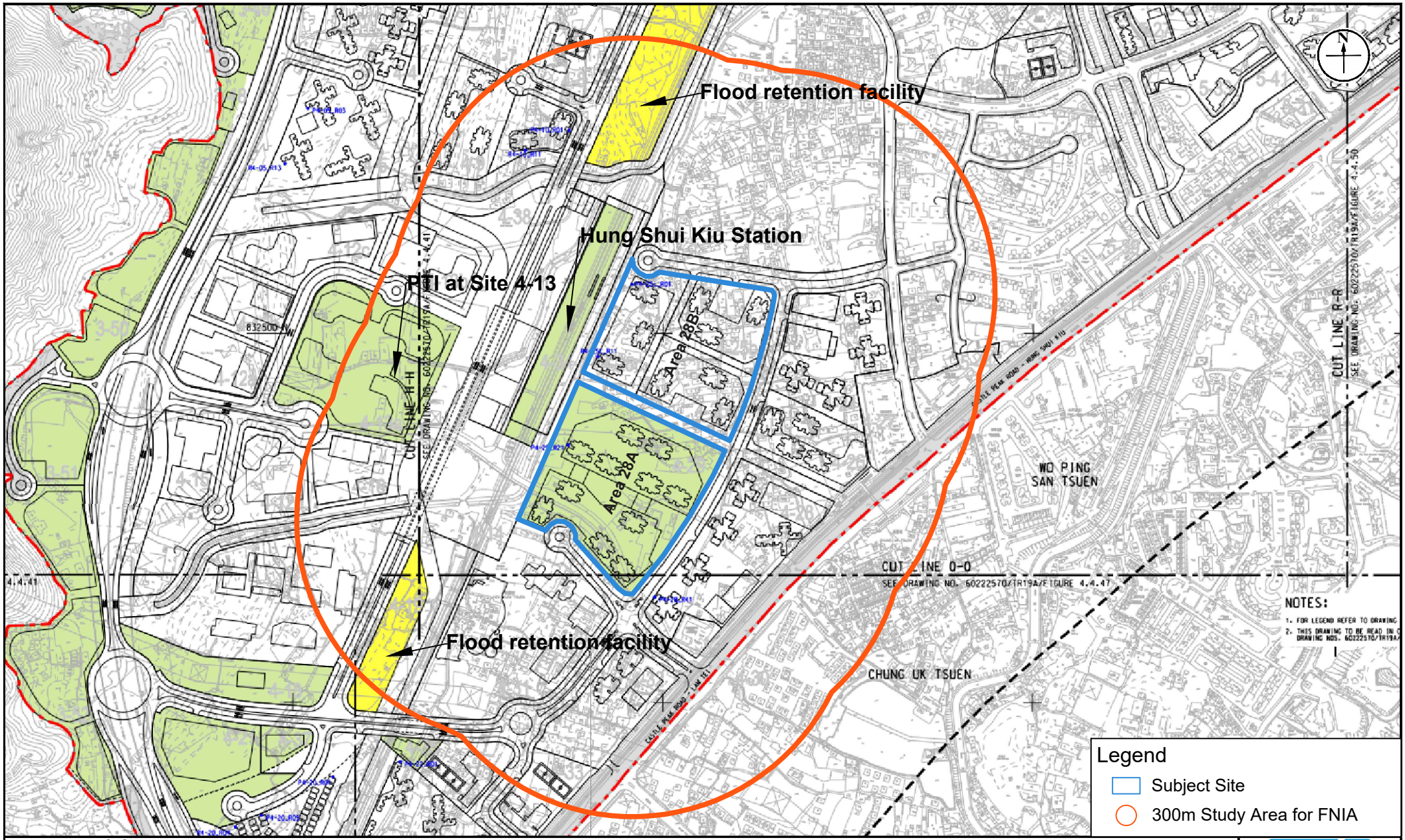
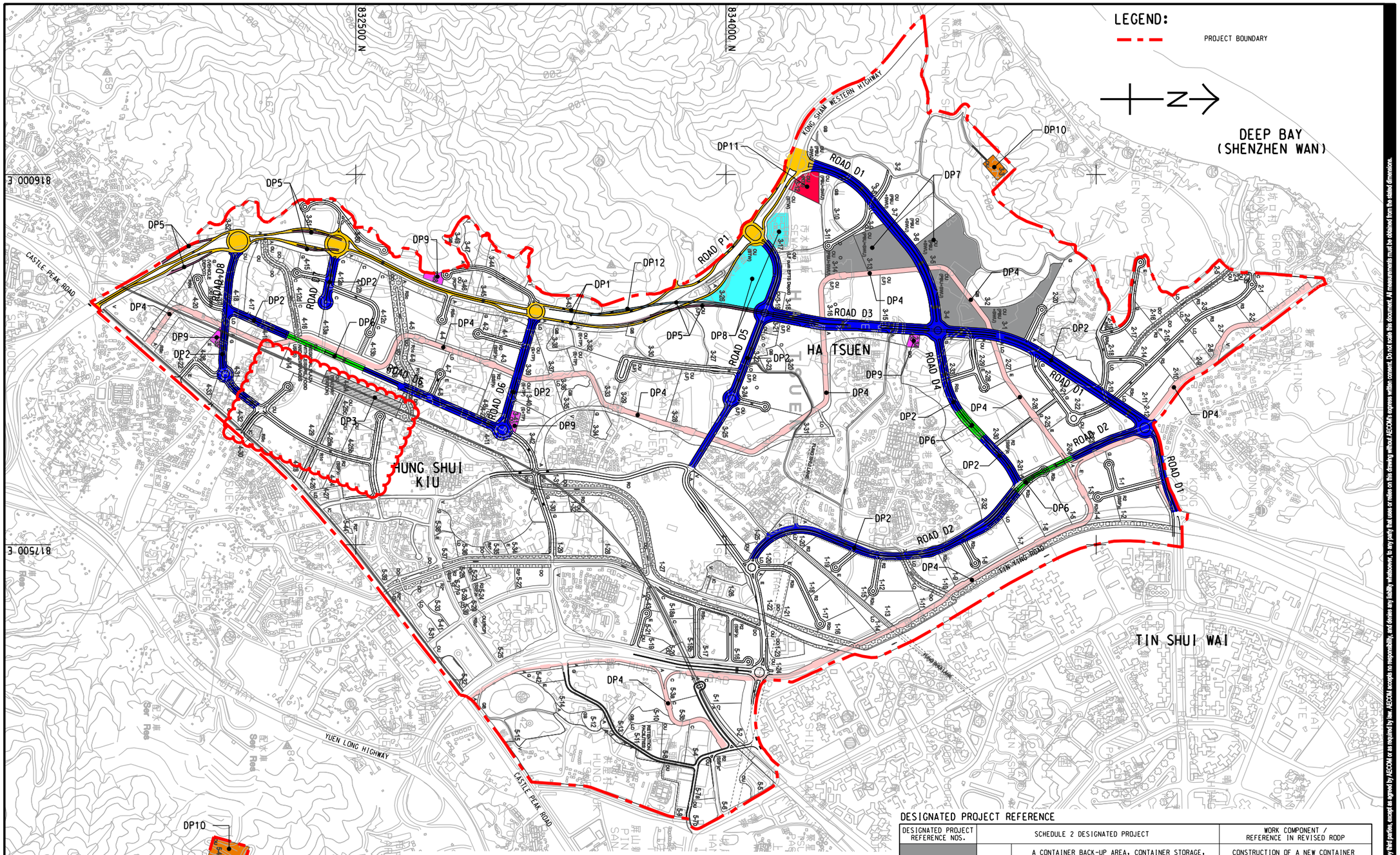
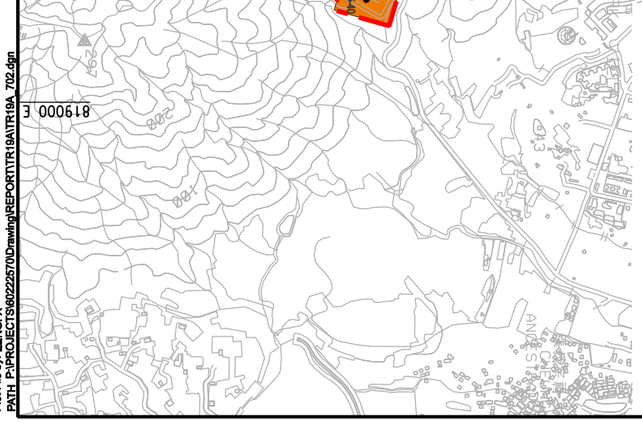


Figure: 3.3	RAMBOLL
Title: Location of Planned Fixed Noise Sources in the vicinity of the Subject Sites within 300m Assessment Area	Drawn by: GY Checked by: TC
Project: Hung Shui Kiu Planning Areas 28A and 28B	Rev.: 1.0 Date: Nov 2024

Appendix 2.1

Information from Environmental Impact Assessment of Hung Shui Kiu New Development Area of Adjacent Roads to the Subject Sites





DESIGNATED PROJECT REFERENCE

DESIGNATED PROJECT REFERENCE NOS.	SCHEDULE 2 DESIGNATED PROJECT		WORK COMPONENT / REFERENCE IN REVISED RODP
DP1*	PART I, A.1	A ROAD WHICH IS AN EXPRESSWAY, TRUNK ROAD, PRIMARY DISTRIBUTOR ROAD OR DISTRICT DISTRIBUTOR ROAD INCLUDING NEW ROADS, AND MAJOR EXTENSIONS OR IMPROVEMENTS TO EXISTING ROAD	CONSTRUCTION OF NEW PRIMARY DISTRIBUTOR ROAD (ROAD P1)
DP2*	PART I, A.1	A ROAD WHICH IS AN EXPRESSWAY, TRUNK ROAD, PRIMARY DISTRIBUTOR ROAD OR DISTRICT DISTRIBUTOR ROAD INCLUDING NEW ROADS, AND MAJOR EXTENSIONS OR IMPROVEMENTS TO EXISTING ROAD	CONSTRUCTION OF EIGHT NEW DISTRIBUTOR ROADS (ROADS D1 TO D8)
DP3	PART I, A.2	A RAILWAY AND ITS ASSOCIATED STATIONS	CONSTRUCTION OF NEW WEST RAIL HSK STATION (SITE 4-34)
DP4 (POTENTIAL DP)	PART I, A.3	A TRAMWAY AND ITS ASSOCIATED STATIONS	CONSTRUCTION OF EFTS - SUBJECT TO FURTHER REVIEW
DP5*	PART I, A.8	A ROAD OR RAILWAY BRIDGE MORE THAN 100m IN LENGTH BETWEEN ABUTMENTS	CONSTRUCTION OF SLIP ROADS BETWEEN: ROAD D8 JUNCTION AND EXISTING CASTLE PEAK ROAD; JUNCTION OF D8/P1 AND JUNCTION OF D7/P1; AND KSWH CONNECTION TO ROAD D3
DP6*	PART I, A.9	A ROAD FULLY ENCLOSED BY DECKING ABOVE AND BY STRUCTURE ON THE SIDES FOR MORE THAN 100m	CONSTRUCTION OF PARTLY DEPRESSED AND PARTLY DECKED-OVER ROADS LOCATED AT ROAD D2, ROAD D4 AND ROAD D6

DESIGNATED PROJECT REFERENCE

DESIGNATED PROJECT REFERENCE NOS.	SCHEDULE 2 DESIGNATED PROJECT		WORK COMPONENT / REFERENCE IN REVISED RODP
DP7 (POTENTIAL DP)	PART I, B.5	A CONTAINER BACK-UP AREA, CONTAINER STORAGE, CONTAINER HANDLING OR CONTAINER PACKING AREA (INCLUDING A CONTAINER VEHICLE PARKING AREA) MORE THAN 5ha IN SIZE AND WITHIN 300m OF AN EXISTING OR PLANNED RECEIVER	CONSTRUCTION OF A NEW CONTAINER BACK-UP AND STORAGE AREA (SITES 3-1, 3-4, 3-5, 3-13 AND 3-14) - SUBJECT TO FURTHER REVIEW
DP8	PART I, F.1	SEWAGE TREATMENT WORKS WITH AN INSTALLED CAPACITY OF MORE THAN 15000m³ PER DAY	CONSTRUCTION OF NEW HSK STW (SITE 3 -26 AND PART OF EXISTING SW STW)
DP9*	PART I, F.3(B)	A SEWAGE PUMPING STATION - (B) WITH AN INSTALLED CAPACITY OF MORE THAN 2000m³ PER DAY AND A BOUNDARY OF WHICH IS LESS THAN 150m FROM AN EXISTING OR PLANNED RECEIVER	CONSTRUCTION OF FOUR NEW SPSs (SITES 2-34, 3-41, 3-48 AND 4-35)
DP10	PART I, F.4	AN ACTIVITY FOR THE REUSE OF TREATED SEWAGE EFFLUENT FROM A TREATMENT PLANT	CONSTRUCTION OF FLUSHING WATER SERVICE RESERVOIRS FOR REUSE OF RECLAIMED WATER AT TAN KWAI TSUEN AND FUNG KONG TSUEN (SITES 3-3 AND 5-40)
DP11	PART I, G.2	A REFUSE TRANSFER STATION	CONSTRUCTION OF ONE RTS (SITE 3-12)
DP12*	PART I, O.1	ALL PROJECTS INCLUDING NEW ACCESS ROADS, RAILWAYS, SEWERS, SEWAGE TREATMENT FACILITIES, EARTHWORKS, DREDGING WORKS AND OTHER BUILDING WORKS PARTLY OR WHOLLY IN AN EXISTING OR GAZETTED PROPOSED COUNTRY PARK OR SPECIAL AREA, A CONSERVATION AREA, AN EXISTING OR GAZETTED PROPOSED MARINE PARK OR MARINE RESERVE, A SITE OF CULTURAL HERITAGE, AND A SITE OF SPECIAL SCIENTIFIC INTEREST.	CONSTRUCTION OF ROAD P1 AND A SLIP-ROAD FROM KSWH TO ROAD D3 PARTLY LOCATED WITHIN THE "CONSERVATION AREA" OF YUEN TAU SHAN

NOTE: * SUBJECT TO AN ENVIRONMENTAL PERMIT APPLICATION UNDER THIS EIA STUDY.

AECOM

PROJECT 項目

HUNG SHUI KIU NEW DEVELOPMENT AREA PLANNING AND ENGINEERING STUDY - INVESTIGATION

CLIENT 業主

CEDD 土木工程拓展署 Civil Engineering and Development Department

規劃署 Planning Department

CONSULTANT 工程顧問公司

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ISSUE/REVISION 修訂

I/R 修訂	DATE 日期	DESCRIPTION 內容摘要	CHK. 校核

STATUS 階段

SCALE 比例: A3 1 : 16000

DIMENSION UNIT 尺寸單位: METRES

KEY PLAN 索引圖

PROJECT NO. 項目編號: 60222570

AGREEMENT NO. 協議編號: CE2/2011 (CE)

SHEET TITLE 圖紙名稱

LOCATION OF DESIGNATED PROJECTS

SHEET NUMBER 圖紙編號

60222570/TR19A/FIGURE 1.2

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ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

Plot File by: ZENGFX
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Your ref
Our ref 278463/02.04/DP/DL/KKC/PM/EH/LFM/PY/JT/CC-2469
File ref 02.04

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To: Distribution List

17 April 2023

Dear Sir/Madam,

Agreement No. CE 1/2020 (CE)
Hung Shui Kiu/Ha Tsuen New Development Area
Package A Works for Second Phase Development – Design and Construction

Submission Ref. REP-034-04 – Final Report on Traffic and Transport Impact Assessments Review (F3C)

Further to our previous submission under letter ref. 278463/02.04/DP/DL/EH/KKC/LFM/PY/GY/JT/CC-1962 dated 14 November 2022, your subsequent comments, we are pleased to submit the Final Report on Traffic and Transport Impact Assessment Review (F3C) (REP-034-04) and Response-to-Comment Table for your retention. Amended part is highlighted in yellow for your ease of reference.

Your comments on Deliverable F3C have been responded in this submission. Your further comments on design will be taken into account in Design Phase.

If you have any queries or require further information, please do not hesitate to contact our Mr. Jay Chu at 2268 3366 (jay.chu@arup.com) / Mr. Raman Lee at 2268 3528 (ramen.lee@arup.com) for technical matters, or our Mr. Peter Yu at 2908 4567 (peter.yu@arup.com) for administrative matter.

Yours faithfully

Ken Chan
Director

Encl. REP-034-04, RtC table

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Drawing Nos. 278463/HWY/200, 261-266

3.2.4 All the roads, cycling and pedestrian facilities are designed to the TPDM standards.

3.2.5 Vertical profiles in a scale of 1:250@A1 are prepared for major road corridors and for road with major level changes. They are presented on **Drawing Nos. 278463/HWY/121 to 135, 221 to 222, 251 to 252**, **421 to 429 and 521 to 526.**

3.2.6 The design parameters for designing the highway alignment are in accordance with TPDM and summarised in below **Table 3.2.1 & 3.2.2**.

Table 3.2.1 Design Parameters for Horizontal Alignment

Design Speed (km/hr)	Desirable Minimum Radius (m)	Absolute Minimum Radius (m)	Transition (0.3m/sec³)	Transition (0.6m/sec³)	Desirable Minimum Sight Distance (m)	Absolute Minimum Sight Distance (m)
100	R4 = 500	R1 = 175	RL = 71000	RL = 36000	215	160
80	R4 = 320	R1 = 115	RL = 37000	RL = 18000	145	110
50	R3 = 88	R1 = 44	RL = 9000	RL = 4500	70	50

Table 3.2.2 Design Parameters for Vertical Alignment

Design Speed (km/hr)	Desirable Maximum Gradient	Absolute Maximum Gradient	Desirable Minimum Vertical Crest Curve	Absolute Minimum Vertical Crest Curve	Desirable Minimum Vertical Sag Curve	Absolute Minimum Vertical Sag Curve
100	4%	8%	K = 100	K = 55	K = 37	K = 26
80	4%	8%	K = 55	K = 30	K = 26	K = 20
50	4% for trunk road, primary distributor and bus route; 5% for others	10%	K = 10	K = 6.5	K = 13	K = 9

3.3 Road Sizing & Cross Section

3.3.1 Roads for the new development areas have been planned, in accordance to principle of TPDM, in a hierarchy of Trunk Roads, Primary Distributor, District Distributor and Local Distributor Roads. The general function of each road type in the proposed highway hierarchy is shown in **Table 3.3.1**.

3.3.2 The road hierarchy in Hung Shui Kiu / Ha Tsuen New Development Area has been established in the P&E Study and formed as basis for EIA. It is reviewed that the established road hierarchy can generally be followed. Road P1 is a primary distributor, Road D1 to D8 are district distributors. Regarding the re-provisioning of Tin Ying Road, its road hierarchy depends on the road sizing adopted. For the recommended Option 2 dual 2-lane Tin Ying Road share use with EFTS, it is recommended that Tin Ying Road will be a district distributor.

Table 3.3.1 Road Hierarchy Function and Characteristic

Hierarchy	Function	Characteristic	Road in HSK/HT NDA
Expressway / Trunk Road	Connecting the main centres of population	High capacity roads; No frontage access or development, Segregation of pedestrians, Widely spaced grade-separated junctions, 24 hour stopping restrictions.	Kong Sham Western Highway (Expressway) Castle Peak Road – Hung Shui Kiu Section (Rural Trunk)
Primary Distributor	Forming the major network of the urban area	Having high capacity junctions, though may be at-grade; Segregated pedestrian facilities wherever possible and frontage access limited if not entirely restricted; 24 hour stopping restrictions	Road P1
District Distributor	Linking Districts to the Primary Distributor Roads	High capacity at-grade junctions; Peak hour stopping restrictions; Parking restrictions throughout the day	Road D1 to D8, Hung Tin Road, Tin Ying Road
Local Distributor	Linking developments to the District Distributor Roads		Other local road network in HSK/HT NDA

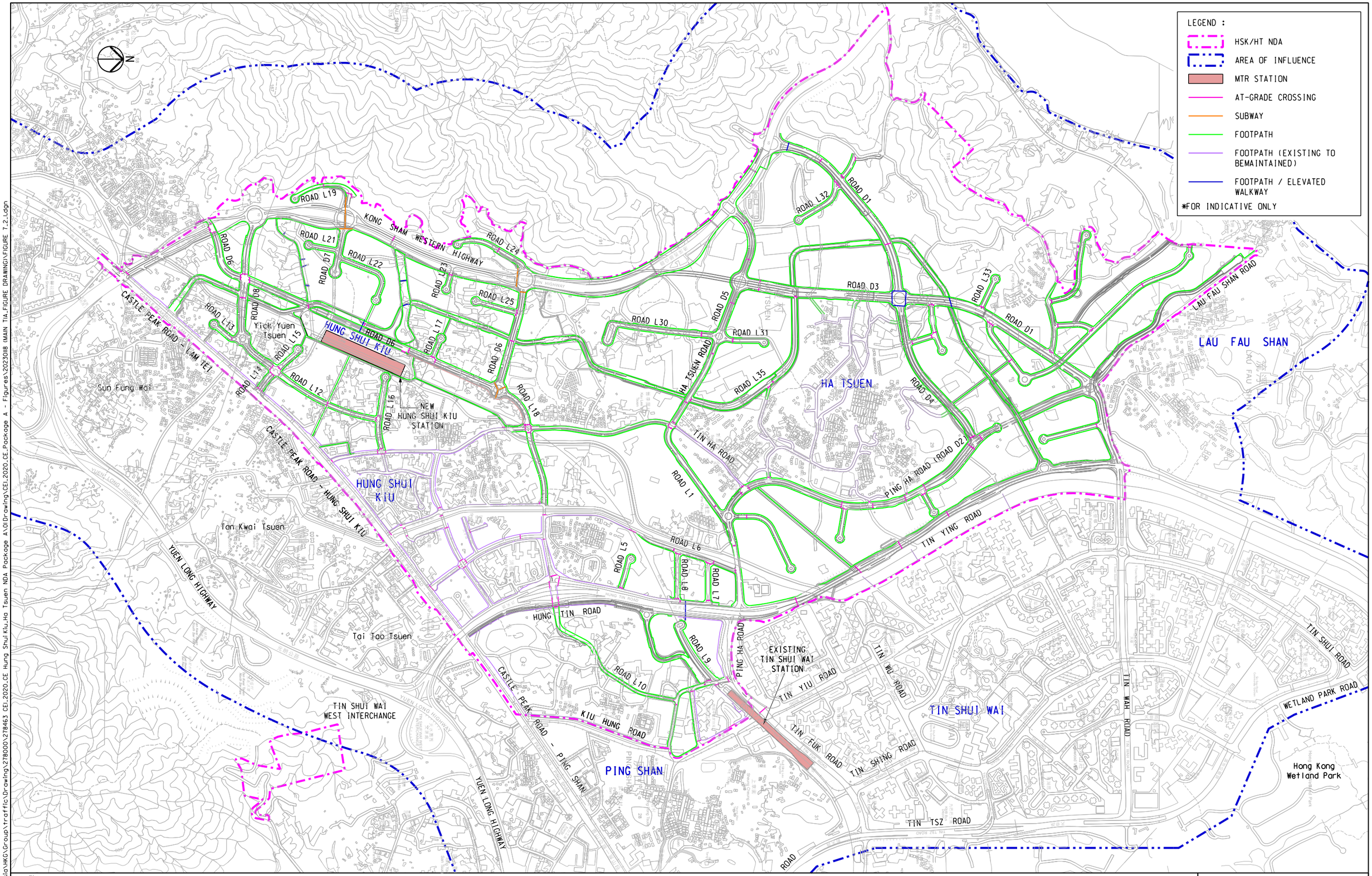
3.3.3 In accordance to the TPDM, the speed limit of new road is classified in a 3-tier system: 100km/hr, 80km/hr and 50km/hr. This applies to new road in Hung Shui Kiu / Ha Tsuen New Development Area.

3.3.4 On modification to existing Tin Ying road, the design speed and speed limit are recommended to be maintained at 70km/hr, in order to be consistent with upstream section of Tin Ying Road and downstream section of Hung Tin Road.

Table 3.4 Summary of Design Speed

Road	Road Type	Design Speed (km/hr)	Speed Limit (km/hr)
Kong Shum Western Highway	Expressway	100	100
Tin Ying Road	District Distributor	70	70
Road P1, Road D1 to D8, other internal roads	Primary Distributor / District Distributor / Local Distributor	50	50

3.3.5 The road cross section is designed in accordance with HKPSG, TPDM and DevB TCW No. 2/2012.



Job Title

CE01/2020 (CE) HUNG SHUI KIU/ HA TSUEN NEW DEVELOPMENT AREA PACKAGE A WORKS FOR SECOND PHASE DEVELOPMENT - DESIGN AND CONSTRUCTION

Figure 7.2.1

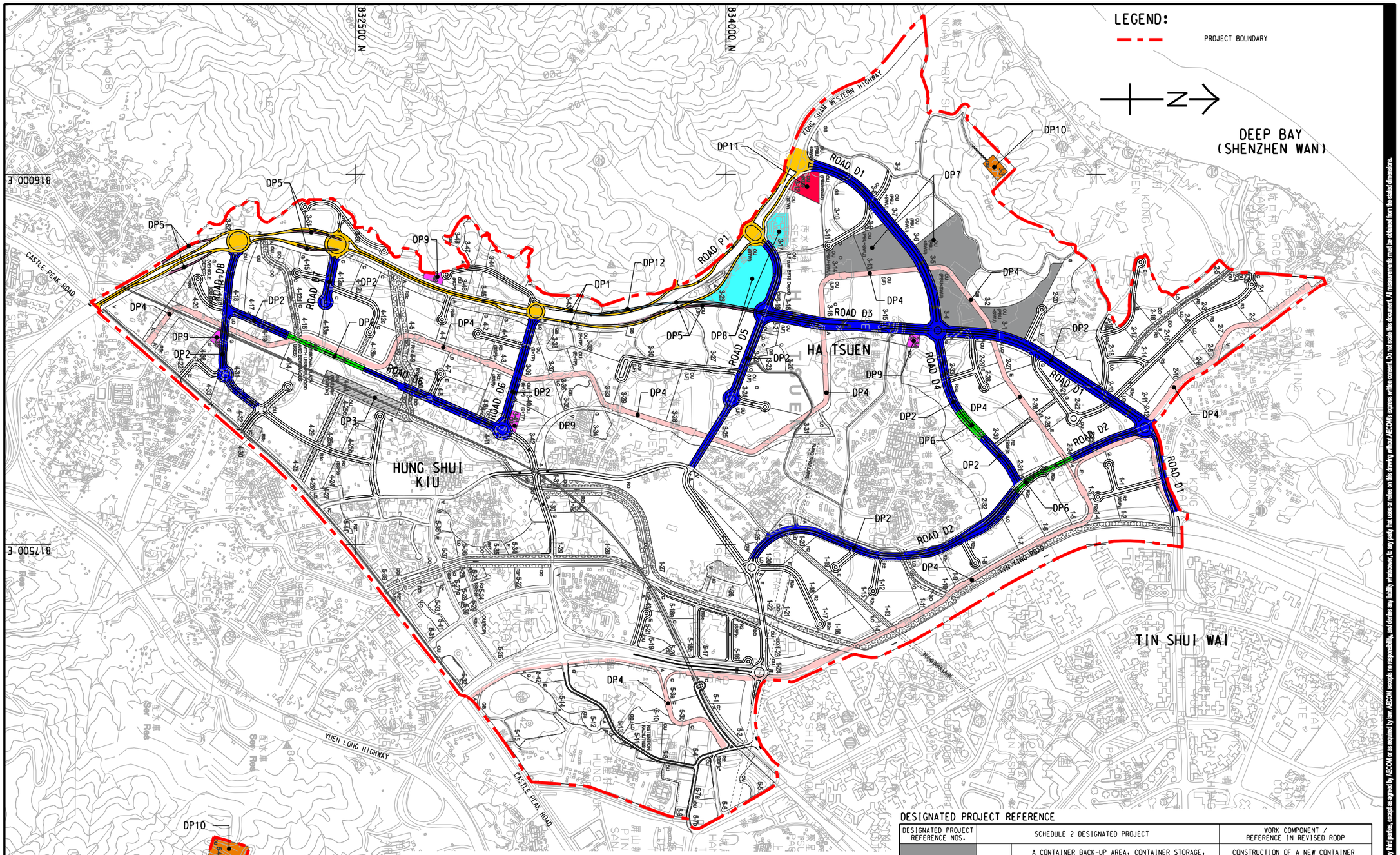
Date	Scale	Drawing Title
01/23	N.T.S.	FUTURE PEDESTRIAN NETWORK WITHIN HSK/HT NDA
Drawn: WKKL	Job No.: 278463	

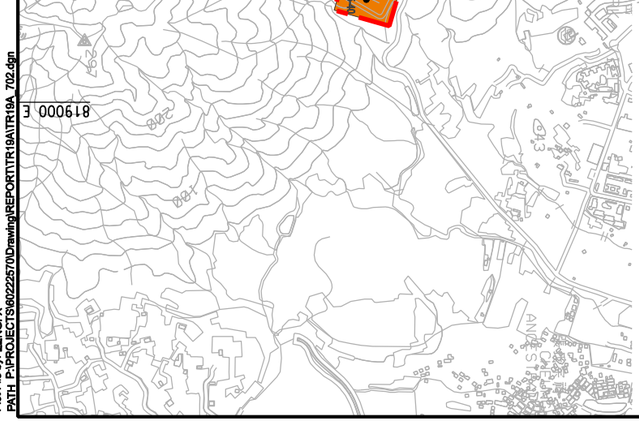
ARUP

PRINTED BY: william.lai 20/1/2023 17:13:07
FILENAME: \\global\EastAsia\HKG\Group\traffic\Drawing\278000\278463 CEI_2020_CE Hung Shui Kiu_Ha Tsuen NDA Package A\01Drawing\CEI_2020_CE_Package A - Figures\20230118 (MAIN TIA_FIGURE DRAWING)\FIGURE 7.2.1.dgn

Appendix 3.1

Information from Environmental Impact Assessment of Hung Shui Kiu New Development Area regarding Road Traffic Noise Impact Assessment





DESIGNATED PROJECT REFERENCE

DESIGNATED PROJECT REFERENCE NOS.	SCHEDULE 2 DESIGNATED PROJECT		WORK COMPONENT / REFERENCE IN REVISED RODP
DP1*	PART I, A.1	A ROAD WHICH IS AN EXPRESSWAY, TRUNK ROAD, PRIMARY DISTRIBUTOR ROAD OR DISTRICT DISTRIBUTOR ROAD INCLUDING NEW ROADS, AND MAJOR EXTENSIONS OR IMPROVEMENTS TO EXISTING ROAD	CONSTRUCTION OF NEW PRIMARY DISTRIBUTOR ROAD (ROAD P1)
DP2*	PART I, A.1	A ROAD WHICH IS AN EXPRESSWAY, TRUNK ROAD, PRIMARY DISTRIBUTOR ROAD OR DISTRICT DISTRIBUTOR ROAD INCLUDING NEW ROADS, AND MAJOR EXTENSIONS OR IMPROVEMENTS TO EXISTING ROAD	CONSTRUCTION OF EIGHT NEW DISTRIBUTOR ROADS (ROADS D1 TO D8)
DP3	PART I, A.2	A RAILWAY AND ITS ASSOCIATED STATIONS	CONSTRUCTION OF NEW WEST RAIL HSK STATION (SITE 4-34)
DP4 (POTENTIAL DP)	PART I, A.3	A TRAMWAY AND ITS ASSOCIATED STATIONS	CONSTRUCTION OF EFTS - SUBJECT TO FURTHER REVIEW
DP5*	PART I, A.8	A ROAD OR RAILWAY BRIDGE MORE THAN 100m IN LENGTH BETWEEN ABUTMENTS	CONSTRUCTION OF SLIP ROADS BETWEEN: ROAD D8 JUNCTION AND EXISTING CASTLE PEAK ROAD; JUNCTION OF D8/P1 AND JUNCTION OF D7/P1; AND KSWH CONNECTION TO ROAD D3
DP6*	PART I, A.9	A ROAD FULLY ENCLOSED BY DECKING ABOVE AND BY STRUCTURE ON THE SIDES FOR MORE THAN 100m	CONSTRUCTION OF PARTLY DEPRESSED AND PARTLY DECKED-OVER ROADS LOCATED AT ROAD D2, ROAD D4 AND ROAD D6

DESIGNATED PROJECT REFERENCE

DESIGNATED PROJECT REFERENCE NOS.	SCHEDULE 2 DESIGNATED PROJECT		WORK COMPONENT / REFERENCE IN REVISED RODP
DP7 (POTENTIAL DP)	PART I, B.5	A CONTAINER BACK-UP AREA, CONTAINER STORAGE, CONTAINER HANDLING OR CONTAINER PACKING AREA (INCLUDING A CONTAINER VEHICLE PARKING AREA) MORE THAN 5ha IN SIZE AND WITHIN 300m OF AN EXISTING OR PLANNED RECEIVER	CONSTRUCTION OF A NEW CONTAINER BACK-UP AND STORAGE AREA (SITES 3-1, 3-4, 3-5, 3-13 AND 3-14) - SUBJECT TO FURTHER REVIEW
DP8	PART I, F.1	SEWAGE TREATMENT WORKS WITH AN INSTALLED CAPACITY OF MORE THAN 15000m³ PER DAY	CONSTRUCTION OF NEW HSK STW (SITE 3 -26 AND PART OF EXISTING SW STW)
DP9*	PART I, F.3(B)	A SEWAGE PUMPING STATION - (B) WITH AN INSTALLED CAPACITY OF MORE THAN 2000m³ PER DAY AND A BOUNDARY OF WHICH IS LESS THAN 150m FROM AN EXISTING OR PLANNED RECEIVER	CONSTRUCTION OF FOUR NEW SPSs (SITES 2-34, 3-41, 3-48 AND 4-35)
DP10	PART I, F.4	AN ACTIVITY FOR THE REUSE OF TREATED SEWAGE EFFLUENT FROM A TREATMENT PLANT	CONSTRUCTION OF FLUSHING WATER SERVICE RESERVOIRS FOR REUSE OF RECLAIMED WATER AT TAN KWAI TSUEN AND FUNG KONG TSUEN (SITES 3-3 AND 5-40)
DP11	PART I, G.2	A REFUSE TRANSFER STATION	CONSTRUCTION OF ONE RTS (SITE 3-12)
DP12*	PART I, O.1	ALL PROJECTS INCLUDING NEW ACCESS ROADS, RAILWAYS, SEWERS, SEWAGE TREATMENT FACILITIES, EARTHWORKS, DREDGING WORKS AND OTHER BUILDING WORKS PARTLY OR WHOLLY IN AN EXISTING OR GAZETTED PROPOSED COUNTRY PARK OR SPECIAL AREA, A CONSERVATION AREA, AN EXISTING OR GAZETTED PROPOSED MARINE PARK OR MARINE RESERVE, A SITE OF CULTURAL HERITAGE, AND A SITE OF SPECIAL SCIENTIFIC INTEREST.	CONSTRUCTION OF ROAD P1 AND A SLIP-ROAD FROM KSWH TO ROAD D3 PARTLY LOCATED WITHIN THE "CONSERVATION AREA" OF YUEN TAU SHAN

NOTE: * SUBJECT TO AN ENVIRONMENTAL PERMIT APPLICATION UNDER THIS EIA STUDY.

AECOM

PROJECT 項目

HUNG SHUI KIU NEW DEVELOPMENT AREA PLANNING AND ENGINEERING STUDY - INVESTIGATION

CLIENT 業主

土木工程拓展署 Civil Engineering and Development Department

規劃署 Planning Department

CONSULTANT 工程顧問公司

AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS 分判工程顧問公司

ISSUE/REVISION 修訂

I/R 修訂	DATE 日期	DESCRIPTION 內容摘要	CHK. 校核

STATUS 階段

SCALE 比例: A3 1 : 16000

DIMENSION UNIT 尺寸單位: METRES

KEY PLAN 索引圖

PROJECT NO. 項目編號: 60222570

AGREEMENT NO. 協議編號: CE2/2011 (CE)

SHEET TITLE 圖紙名稱

LOCATION OF DESIGNATED PROJECTS

SHEET NUMBER 圖紙編號

60222570/TR19A/FIGURE 1.2

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ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

Plot File by: ZENGFX
PATH P:\PROJECTS\60222570\Drawing\REPORT\TR19A\TR19A_702.dgn

NSR ID	Use	Description	NAP ID	Criteria, dB(A)	Predicted Unmitigated Overall Noise Level, dB(A)	Compliance of Noise Criteria
P2-10	R3	Site 2-10	P2-10_R01 to P2-10_R31	70	62-70	Yes
P2-11	R3c	Site 2-11	P2-11_R01 to P2-11_R31	70	66-74	No
P2-14	R3	Site 2-14	P2-14_R01 to P2-14_R12	70	62-68	Yes
P2-15	E	Site 2-15	P2-15_R01	70	62-64	Yes
P2-16	E	Site 2-16	P2-16_E01 to P2-16_R15	65	63-69	No
P2-18	RR4	Site 2-18	P2-18_R01 to P2-18_R05	70	69-71	No
P2-19	RR4	Site 2-19	P2-19_R01	70	66-67	Yes
P2-24	E	Site 2-24	P2-24_E01 to P2-24_E11	65	59-70	Yes
P2-25	G	Site 2-25	P2-25_H01	70	69-71	No
P2-26	E	Site 2-26	P2-26_E01 to P2-26_E11	65	63-70	No
P2-28	E	Site 2-28	P2-28_E01 to P2-28_E02	65	60-68	No
P2-30	RSc	Site 2-30	P2-30_R01 to P2-30_R21	70	48-70	Yes
P2-31	R2(SSF)c	Site 2-31	P2-31_R01 to P2-31_R21	70	61-68	Yes
P4-01	G	Site 4-01	P4-01_R01 to P4-01_R13	70	64-75	No
P4-03	R2(SSF)c	Site 4-03	P4-03_R01 to P4-03_R11	70	61-76	No
P4-04	RSc	Site 4-04	P4-04_R01 to P4-04_R24	70	56-71	No
P4-05	RSc	Site 4-05	P4-05_R01 to P4-05_R14	70	65-72	No
P4-06	R2(SSF)c	Site 4-06	P4-06_R01 to P4-06_R12	70	66-74	No
P4-08	E	Site 4-08	P4-08_E01 to P4-08_E11	65	61-65	Yes
P4-09	R1c	Site 4-09	P4-09_E06	70	62-68	Yes
P4-17	OU	Site 4-17	P4-17_E01 to P4-17_E06	65	57-73	No
P4-20	RR4	Site 4-20	P4-20_R01 to P4-20_R04	70	64-72	No
P4-22	RSc	Site 4-22	P4-22_R01 to P4-22_R42	70	52-71	No
P4-24	R2(SSF)c	Site 4-24	P4-24_R01 to P4-24_R46	70	66-75	No
P4-25a	OU(C&R)	Site 4-25a	P4-25a_R01	70	65-69	Yes
P4-25b	OU(C&R)	Site 4-25b	P4-25b_R01 to P4-25b_R11	70	61-71	No
P4-25c	OU(C&R)	Site 4-25c	P4-25c_R01 to P4-25c_R11	70	52-60	Yes
P4-26	R1c	Site 4-26	P4-26_R01 to P4-26_R21	70	64-71	No

NSR ID	Use	Description	NAP ID	Criteria, dB(A)	Predicted Unmitigated Overall Noise Level, dB(A)	Compliance of Noise Criteria
P4-28	RSc	Site 4-28	P4-28_R01 to P4-28_R44	70	54-73	No
P4-29	OU(C&R)	Site 4-29	P4-29_R01 to P4-29_R31	70	50-71	No
P4-32	G	Site 4-32	P4-32_R01 to P4-32_R14	70	63-73	No
P4-33	E	Site 4-33	P4-33_E01 to P4-33_E03	65	67-75	No
P4-36	E	Site 4-36	P4-36_E02 to P4-36_R01	65	66-70	No
P5-07a	OU(C&R)	Site 5-07a	P5-07a_R01 – P5-07a_R21	70	55-71	No
P5-07b	OU(C&R)	Site 5-07b	P5-07b_R01 to P5-07b_R21	70	60-73	No
P5-08	OU(C&R)	Site 5-08	P5-08_R01 to P5-08_R11	70	69-73	No
P5-09	OU(C&R)	Site 5-09	P5-09_R01 to P5-09_R31	70	60-71	No
P5-14	E	Site 5-14	P5-14_E01 to P5-14_E11	65	67-74	No
P5-16	R2(SSF)c	Site 5-16	P5-16_R01 to P5-16_R11	70	58-79	No
P5-17	RSc	Site 5-17	P5-17_E04 to P5-17_R12	65	54-75	No
P5-21	E	Site 5-21	P5-21_E01 to P5-21_E02	65	61-66	No
P5-22	Site 5-22	R3	P5-22_R01 to P5-22_R03	70	65-77	No
P5-24	R2(SSF)c	Site 5-24	P5-24_R01 to P5-24_R23	70	43-68	Yes
P5-26	R2(SSF)	Site 5-26	P5-26_R01 to P5-26_R04	70	63-74	No
P5-28	G	Site 5-28	P5-28_H01 to P5-32_R01 to P5-32_R82	70	64-72	No
P5-32	OU(C&R)	Site 5-32	P5-32_R01 to P5-32_R82	70	62-80	No
P5-34	E	Site 5-34	P5-34_E01 to P5-34_E11	65	60-73	No
P5-37	E	Site 5-37	P5-37_E01 to P5-37_E02	65	70-74	No

Note: Full names of the abbreviations of uses should be referred to the List of Abbreviations.

4.7.11 For the planned NSRs within the Project area (see **Table 4.26**), the predicted road traffic noise levels would be in the range of 43 to 80 dB(A). Despite the environmentally friendly designs are considered in the Revised RODP, results indicate that most planned residential and educational NSRs would still exceed the noise criteria by up to 10 dB(A) and 14 dB(A) respectively. Hence, direct mitigation measures for these affected NSRs are required. For those non-compliance planned educational institutes, mitigation measures as discussed in **Section 4.7.15** are considered under the Class Assessment Document following ETWB Technical Circular (Works) No. 13/2003.

Appendix 3.2

Practice Note "ProPECC PN 5/23"

ENVIRONMENTAL PROTECTION DEPARTMENT
PRACTICE NOTE FOR PROFESSIONAL PERSONS

Application of Innovative Noise Mitigation Designs in Planning Private Residential Developments against Road Traffic Noise Impact

Preamble

This Practice Note (PN) is developed to provide guidelines to practitioners and professionals, e.g. environmental / acoustic consultants, in evaluating noise reduction performance of Innovative Noise Mitigation Designs (INMDs)[1] i.e. Acoustic Window and Enhanced Acoustic Balcony. This PN also aims at providing technical information in designing and applying Acoustic Window and Enhanced Acoustic Balcony against road traffic noise impact in planning private residential developments in Hong Kong[2].

Acoustic Window and Enhanced Acoustic Balcony

2. "Acoustic Window" and "Enhanced Acoustic Balcony" are INMDs developed by the Environmental Protection Department in collaboration with Housing Department and Buildings Department. One of the unique characteristics of INMDs is that they offer high degree of noise reduction and at the same time allow natural ventilation. The idea of shutting off noise from outside of habitable room while providing natural ventilation becomes more popular in building designs because the "open window living environment" promotes sustainable living.

3. "Acoustic Window" comprises two layers of glass panel. An additional glass panel layer is introduced to a conventional side-hung window in a staggering position. The outer layer is a conventional push-pull type window whilst the inner one consists of a half-size sliding window. 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 (Figure 1). "Acoustic Window" can be designed to meet the natural ventilation requirement stipulated in *Building (Planning) Regulations (B(P)R)* for residential developments. Possible designs of Acoustic

[1] *This PN provides information for general practice. In case of special cases or issues involving additional features or measures, enquiry should be made to the Environmental Protection Department. The proposed INMDs should comply with relevant legislation and guideline(s)*

[2] *This PN is prepared for planning of private residential developments. For public housing developments planned, designed and constructed by the Housing Authority, there are other sets of documents covering similar guidelines and other procedural matters.*

Window for 8m^2 and 18m^2 habitable rooms (i.e. dining room, living room or bedroom) can be found in Annex A(I).

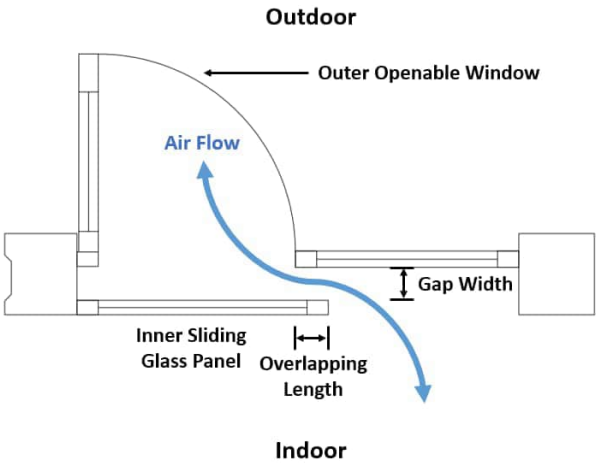


Figure 1 – A Plan on Acoustic Window (Baffle Type)

4. Typical acoustic balcony has a depth of more than 1000mm, solid parapet height of about 1200mm, and balcony ceiling lined with Sound Absorptive Material (SAM). "Enhanced Acoustic Balcony" is specially designed balcony which adopts a combination of mitigation features for the purpose of noise reduction (Figure 2), it incorporates more noise reduction features, e.g. full-height side wall(s), increased solid parapet height of not less than 1450mm, additional screen wall(s), Micro-perforated Absorber (MPA) and/or additional SAM on more surfaces. Possible designs of Enhanced Acoustic Balcony for 14m^2 and 18m^2 habitable rooms (i.e. dining room, living room or bedroom) can be found in Annex A(II).

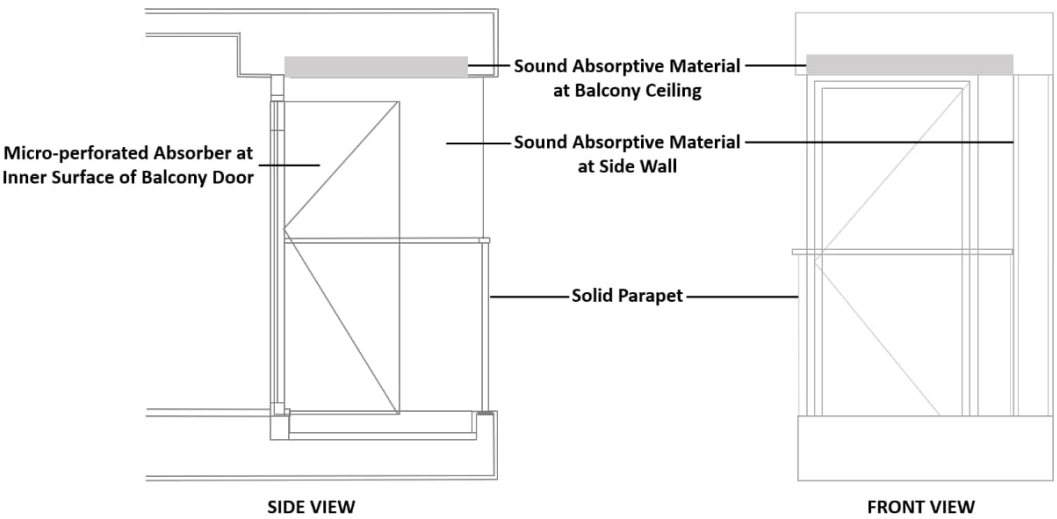


Figure 2 – Conceptual design of "Enhanced Acoustic Balcony"

Noise Reduction Effectiveness of Innovative Noise Mitigation Designs (INMDs)

5. Noise reduction effectiveness of "Acoustic Window" and "Enhanced Acoustic Balcony" are expressed in Relative Noise Reduction (RNR) which is the difference between (i) the IN-OUT difference of averaged noise levels (in terms of L_{10}) of the habitable room with INMD, obtained in actual site measurement or in laboratory measurement, and (ii) that of the habitable room with conventional window. For details, please refer to Annex B. In the same annex, two sets of RNR are listed respectively for "Acoustic Window (Baffle Type)" (AW(BT)) in $8m^2$ and $18m^2$ habitable rooms and "Enhanced Acoustic Balcony (Baffle Type)" (EAB(BT)) in $14m^2$ and $18m^2$ habitable rooms for easy reference of practitioners and professionals.

6. When conducting Noise Impact Assessment (NIA) Study, practitioners and professionals can subtract the RNR of the INMDs adopted in the designs of the residential developments from the assessed traffic noise level. If the resultant noise level rounded to the nearest whole number is smaller than or equal to 70 dB(A) L_{10}(1hr), it is considered to meet the traffic noise standard in Table 4.1 of Ch. 9 of the Hong Kong Planning Standards and Guidelines (HKPSG).

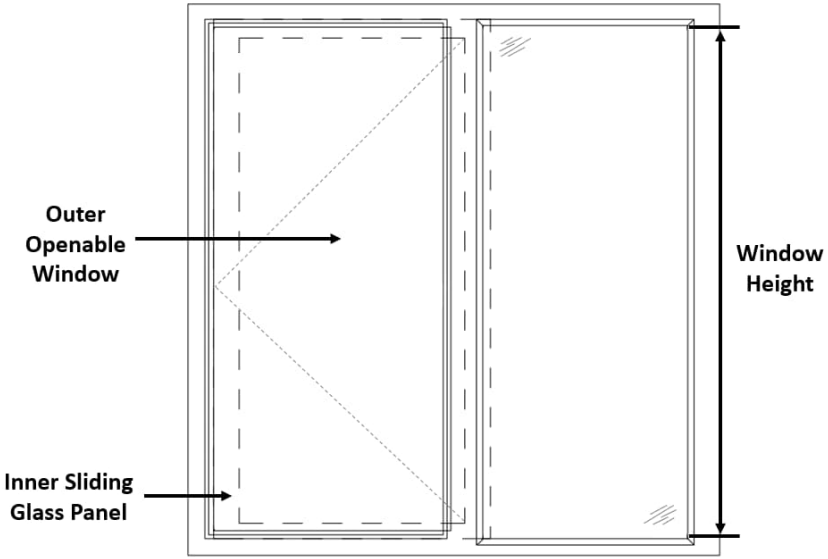
7. For the examples of residential developments adopting "Acoustic Window" and "Enhanced Acoustic Balcony", please visit the following web-link:

https://www.epd.gov.hk/epd/Innovative/greeny/eng/
(Innovative Noise Mitigation Designs and Measures)

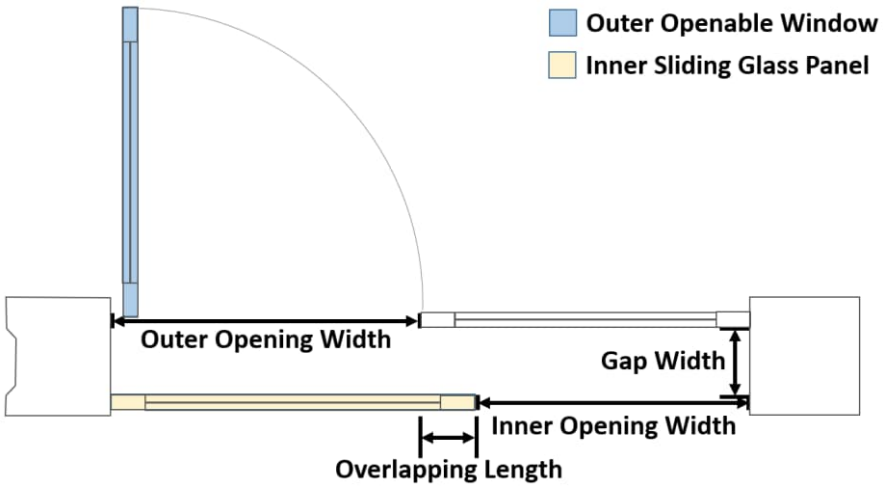
(Samuel H.K. Chui)
Director of Environmental Protection

Environmental Protection Department
Issued: December 2023

(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)

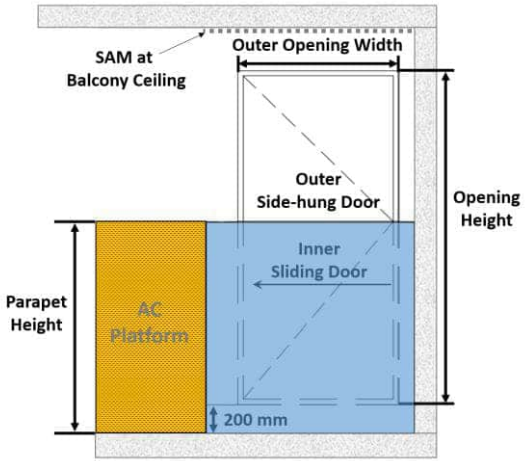
Possible Designs of "Acoustic Window (Baffle Type)" for 8m^2 and 18m^2 rooms					
Room Size (m^2)	**Room Dimensions (mm^3)**	**Inner Window Opening (mm^2)**	**Outer Window Opening (mm^2)**	**Overlapping Length (mm)**	**Gap Width (mm)**
8	**3200 (W) x 2500 (D) x 3400 (H)**	**580 (W) x 870 (H)**	**600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

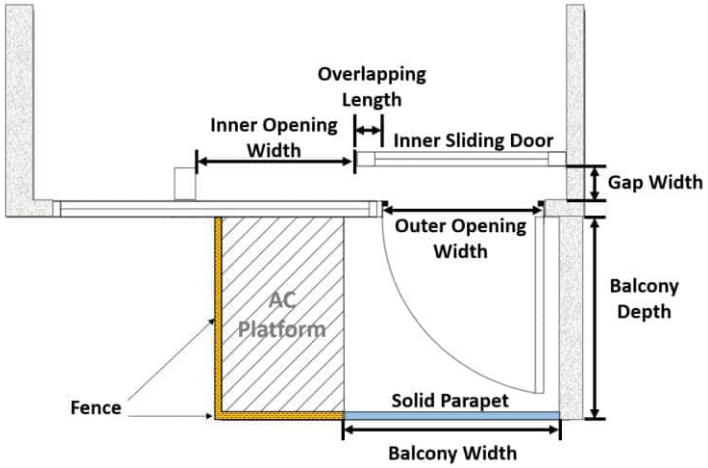
a. These are feasible designs of AW(BT) for 8m^2 and 18m^2 rooms.

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.

(II) Possible designs of "Enhanced Acoustic Balcony (Baffle Type)" in 14m² and 18m² habitable rooms (i.e. dining room, living room or bedroom)



EXTERNAL VIEW (NOT TO SCALE)



PLAN (NOT TO SCALE)

Fence (≥ 70% Permeability) Solid Parapet

Possible Designs of "Enhanced Acoustic Balcony (Baffle Type)" for 14m² and 18m² rooms								
Room size (m²)	**Room Dimensions (mm³)**	**Balcony Width (mm)**	**Balcony Depth (mm)**	**Parapet Height (mm)**	**Inner Opening (mm²)**	**Outer Opening (mm²)**	**Overlapping Length (mm)**	**Gap Width (mm)**
14	**3400 (W) x 4100 (D) x 3100 (H)**	**≥ 1440**	**≥ 1300**	**≥ 1450**	**1025 (W) x 2210 (H)**	**1150 (W) x 2210 (H)**	**≥ 100**	**100**
18	**5300 (W) x 3390 (D) x 3400 (H)**	**≥ 2055**	**≥ 1300**	**≥ 1450**	**1150 (W) x 2210 (H)**	**1150 (W) x 2210 (H)**	**≥ 100**	**100**

Notes:

1. These are feasible designs of EAB for 14m² and 18m² rooms. The room with EAB should meet the natural lighting and ventilation requirements in regulations 30 & 31 of the Building (Planning) Regulations (B(P)R). The AC platform should comply with the requirements under Appendix B of Code of Practice on Access for External Maintenance 2021 (AfEM Code), and balconies for residential buildings should comply with the criteria and conditions set out in Joint Practice Note (JPN) 1 for application of exemption from gross floor area and/or site coverage under the B(P)R.

2. SAM at balcony ceiling refers to sound absorptive material of noise reduction coefficient ≥ 0.7. It is an essential feature to attain the basic noise reduction performance in Annex B.

3. Comparable noise performance is anticipated should the AC platform be replaced by balcony with solid parapet.

Annex B

Relative Noise Reduction (RNR) of Innovative Noise Mitigation Designs (INMDs)

1. RNR of INMDs is the difference between (i) the IN-OUT difference of averaged noise levels (in terms of L_{10}) of the habitable room with INMD, obtained in actual site measurement or in laboratory measurement, and (ii) that of the habitable room with conventional window.

$$RNR = ANR_{INMD} - ANR_{CW}$$

where RNR = Relative noise reduction [dB(A) L_{10}(1hr)]
ANR_{INMD} = *Adjusted noise reduction with [@] INMD (in acoustic mode) [dB(A) L_{10}(1hr)]
ANR_{CW} = *Adjusted noise reduction with [#] CW (conventional window meeting B(P)R and natural ventilation requirement) [dB(A) L_{10}(1hr)]

** Adjusted with traffic noise spectrum according to the BS EN 1793-2:2012. This would be applied only if source of traffic noise is not from the actual road traffic but by means of a line of speakers.*
[@] INMD (in acoustic mode) means that "Acoustic Window (Baffle Type)" or "Enhanced Acoustic Balcony (Baffle Type)"is operated in acoustic mode delivering the noise reduction effect while INMD itself meets B(P)R and natural ventilation requirement.
[#] CW (conventional side-hung window) meeting B(P)R and natural ventilation requirement means that the openable area of conventional side-hung window is not less than 1/16 of the floor area of the room under B(P)R.

RNRs for Acoustic Window (Baffle Type) in 8m^2 and 18m^2 habitable room and for Enhanced Acoustic Balcony (Baffle Type) in 14m^2 and 18m^2 habitable room

2. Table 1 and Table 2 below show the base case such that conventional window is at the same horizontal incident angle as mitigated case against dominant line source. The practitioners and professionals would find these tables useful at the stage of detailed noise impact assessment of residential development when building layout is largely formed [i].

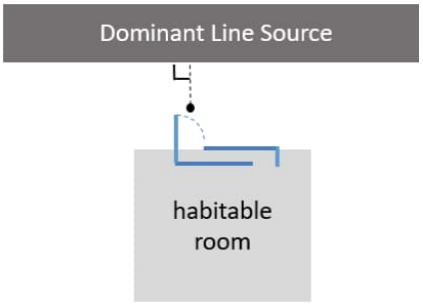
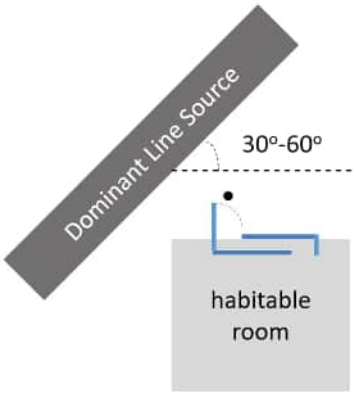
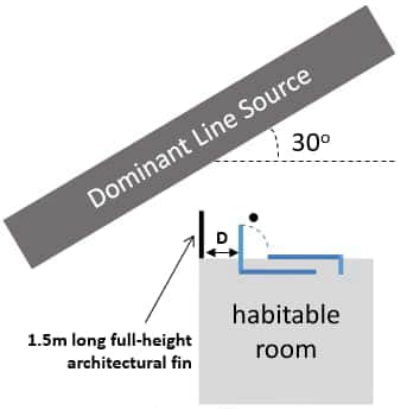
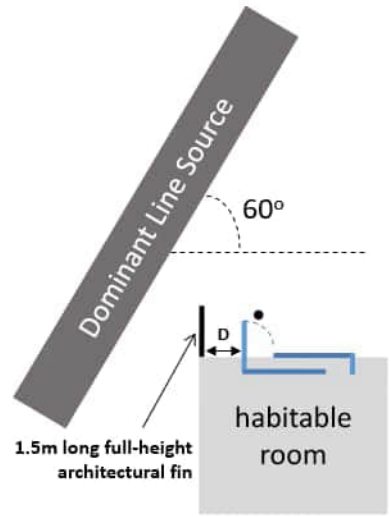
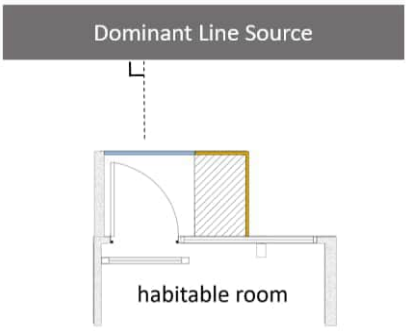
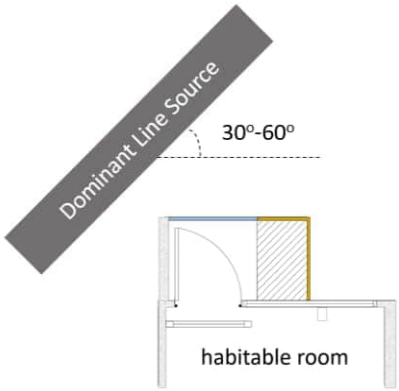
Table 1: Summary on RNR of Acoustic Window (Baffle Type) (for use in NIA) ***Plan not to scale**		**Correction dB(A) L10(1hr)**	
		8m²	**18m²**
	**(a) Provision of AW(BT) parallel to dominant line source** (whichever side the outer side-hung window is)	- **6.0** - **7.5** **(added SAM[1])**	- **7.0**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

Table 1: Summary on RNR of Acoustic Window (Baffle Type) (for use in NIA) *Plan not to scale		Correction dB(A) L10(1hr)	
		8m²	18m²
 D = Distance from architectural fin to nearest window frame should be at most 900mm.	**(b2) If tilted AW(BT) is at 60° horizontal incident angle to dominant line source** **+ 1.5m long full-height architectural fin[2]** *** AW(BT) + architectural fin should be considered as ONE package of noise mitigation measures. Outer side-hung window of AW(BT) and architectural fin should be installed at the side nearer to dominant line source.**	**- 9.0** **- 10.5 (added SAM[1])**	**- 10.0** **- 11.5 (added SAM[1])**

Note 1: The additional Sound Absorptive Material (SAM) shall be of Noise Reduction Coefficient ≥ 0.7 and applied at top and outer opening side of mullion. The material of SAM is subject to the requirements of section 3 of Building (Construction) Regulation.

Note 2: The 1.5m long full-height architectural fin may be subject to the requirements for natural lighting and ventilation, gross floor area and site coverage under the B(P)R.

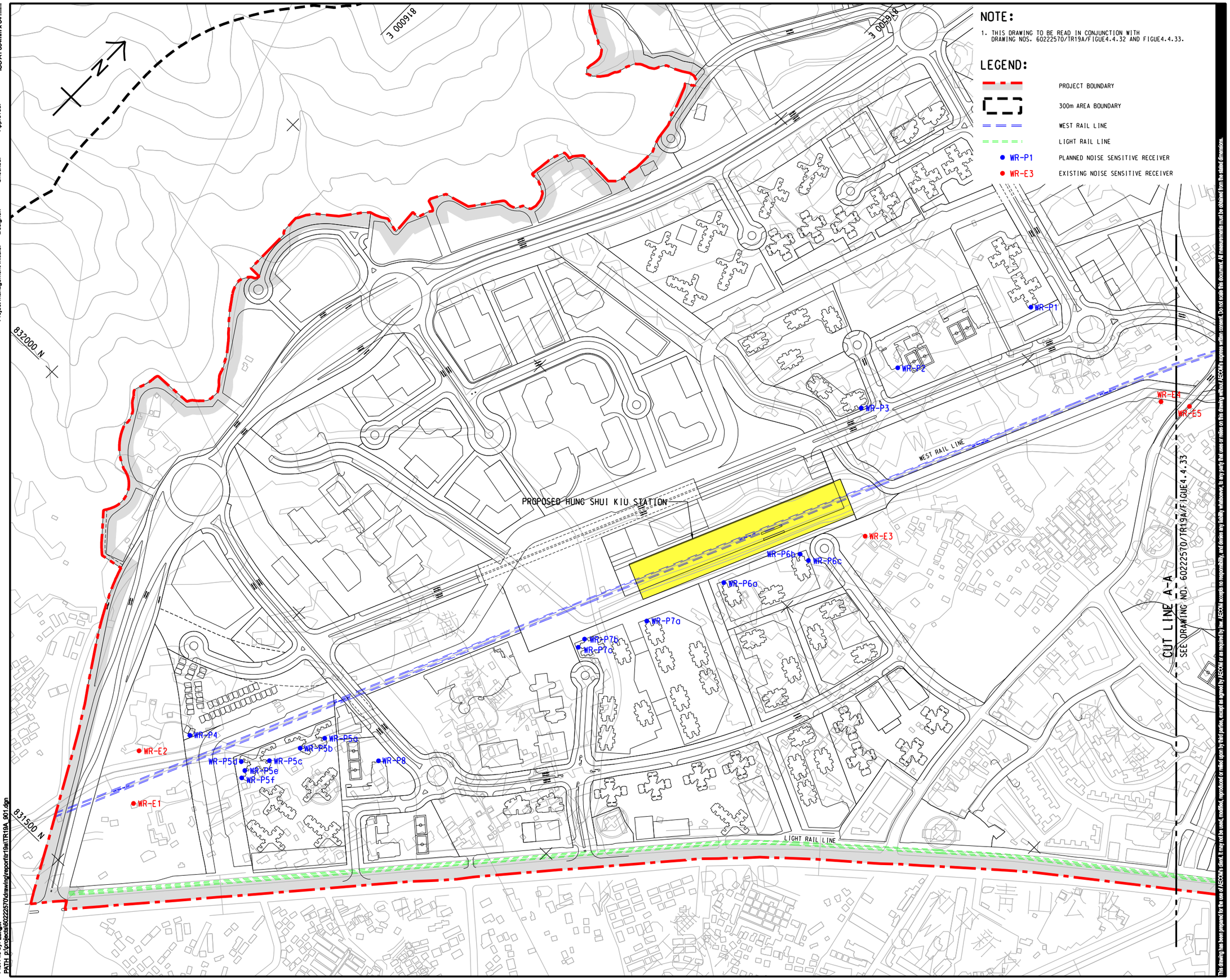
Table 2: Summary on RNR of Enhanced Acoustic Balcony (Baffle Type) (for use in NIA) *Plan not to scale		Correction dB(A) L10(1hr)	
		14m²	18m²
	**(a) Provision of EAB(BT) parallel to dominant line source**	**- 8.0** **- 9.5 (added SAM[1])**	**- 9.0** **- 10.5 (added SAM[1])**
	**(b) Tilting the EAB(BT)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

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

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

Appendix 3.3

Information from Environmental Impact Assessment of Hung Shui Kiu New Development Area regarding Railway Noise Impact Assessment



Project Management Initials: Designer: Checked: Approved: ISO A1 594mm x 841mm

Plot File by: zangfk
PATH: p:\projects\60222570\drawing\report\tr19a\TR19A_901.dgn

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PROJECT 項目

HUNG SHUI KIU NEW DEVELOPMENT AREA PLANNING AND ENGINEERING STUDY - INVESTIGATION

CLIENT 業主

CEDD 土木工程拓展署 Civil Engineering and Development Department

規劃署 Planning Department

CONSULTANT 工程顧問公司

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ISSUE/REVISION 修訂

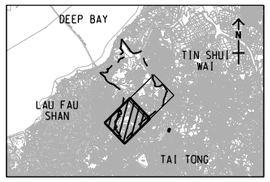
I/R 修訂	DATE 日期	DESCRIPTION 內容摘要	CHK. 校核

STATUS 階段

SCALE 比例 — **DIMENSION UNIT** 尺寸單位

A3 1 : 5000

KEY PLAN A3 1 : 300000 索引圖



PROJECT NO. 項目編號: 60222570

AGREEMENT NO. 協議編號: CE2/2011 (CE)

SHEET TITLE 圖紙名稱

LOCATIONS OF REPRESENTATIVE NOISE SENSITIVE RECEIVERS FOR RAIL NOISE (WEST RAIL)

SHEET 1 OF 2

SHEET NUMBER 圖紙編號

60222570/TR19A/FIGURE 4.4.32

NAP	Description	Area Sensitivity Rating	Noise Criteria, dB(A)		mPD	Leq, 30min, dB(A)		L_{max}, dB(A)	Leq, 24 hrs, dB(A)
			0700-2300 hrs	2300-0700 hrs		0700-2300 hrs	2300-0700 hrs		
WR-E5	Premises to the West of San Lee Uk Tsuen Block 3,Galore Garden	A	60	50	6.9-9.9	47-48	46-47	52-54	47-48
WR-E6	Shek Po Tsuen Village House Premises to the southwest of Yick Yuen Tsuen Premises to the east of Oakland Court	A	60	50	6.4-15.4	47-49	45-47	51-54	47-49
WR-E7	Premises to the southwest of Tin Sum Tsuen	A	60	50	5.2-8.2	45	44	46-47	45
Project Planned WRL NSRs									
WR-P1	Residential Development in Site 4-6	B	65	55	10.0-141.0	42-52	41-51	42-53	42-52
WR-P2	School in Site 4-8	B	65	[a]	11.0-47.0	42-47	[a]	41-48	42-48
WR-P3	Residential Development in Site 4-10	B	65	55	11.0-166.0	43-54	41-52	43-55	43-54
WR-P4	Residential Development in Site 4-20	B	65	55	11.0-19.0	50-54	48-53	56-62	49-54
WR-P5a	Residential Development in Site 4-22	B	65	55	11.0-127.0	42-53	41-52	48-62	40-53
WR-P5b	Residential Development in Site 4-22	B	65	55	11.0-127.0	41-53	40-51	49-64	40-53
WR-P5c	Residential Development in Site 4-2	B	65	55	11.0-127.0	39-49	39-48	45-60	36-49
WR-P5d	Residential Development in Site 4-22	B	65	55	11.0-127.0	45-58	44-**56**	51-67	44-58
WR-P5e	Residential Development in Site 4-22	B	65	55	11.0-127.0	46-58	45-**57**	51-65	45-58
WR-P5f	Residential Development in Site 4-22	B	65	55	11.0-127.0	47-59	46-**58**	52-66	47-59
WR-P6a	Residential Development in Site 4-25	B	65	55	12.0-178.0	39-52	38-51	40-57	37-52
WR-P6b	Residential Development in Site 4-25	B	65	55	12.0-178.0	39-52	37-51	39-57	37-52
WR-P6c	Residential Development in Site 4-25	B	65	55	12.0-178.0	38-51	37-49	37-55	37-51

NAP	Description	Area Sensitivity Rating	Noise Criteria, dB(A)		mPD	Leq, 30min, dB(A)		L_{max}, dB(A)	Leq, 24 hrs, dB(A)
			0700-2300 hrs	2300-0700 hrs		0700-2300 hrs	2300-0700 hrs		
WR-P7a	Residential Development in Site 4-29	B	65	55	13.0-171.0	44-56	43-55	49-63	44-56
WR-P7b	Residential Development in Site 4-29	B	65	55	13.0-171.0	47-59	45-**57**	50-64	47-59
WR-P7c	Residential Development in Site 4-29	B	65	55	13.0-171.0	45-57	44-**56**	50-64	45-57
WR-P8	School in Site 4-36	B	65	[a]	12.0-48.0	43-52	[a]	46-56	43-52
WR-P9a	Residential Development in Site 5-17	B	65	55	7.0-111.0	42-54	41-53	48-61	42-54
WR-P9b	Residential Development in Site 5-17	B	65	55	7.0-111.0	44-55	42-54	49-62	44-55
WR-P10	School in Site 5-21	B	65	[a]	6.0-43.0	49-**67**	[a]	56-74	48-**67**
WR-P11	School in Site 5-34	B	65	[a]	7.0-43.0	42-46	[a]	42-47	42-46

Notes:
[a] Educational use is not considered as a night-time NSR.
Numbers in bold denote exceedances of the noise criteria.

LRT Noise

4.8.10 The predicted air-borne noise levels from LRT with respect to the representative site layouts confirmed with relevant departments are presented in **Table 4.37**. The full list of predicted levels with respect to mPD is shown in **Appendix 4.8.4.** It is noticed that low level of the NSRs LR-P5a & P6 would exceed the night-time criteria. It is predicted that a total of about 30 planned dwellings will be exposed to LRT noise impact under unmitigated scenario. Mitigation measures are required to reduce the rail noise impact during LRT operation.