Appendix I

Environmental Assessment Study

Section 12A Planning Application for Proposed Innovation and Technology Hub at Various Lots in D.D.82 and D.D. 86 and Adjoining Government Land, Man Kam To, New Territories

Environmental Assessment Study

REP-01-004

Draft Final

Job number 287082

Arup Hong Kong Limited
Level 5 Festival Walk
80 Tat Chee Avenue
Kowloon Tong
Kowloon
Hong Kong
www.arup.com

ARUP

Contents

Appendices

Appendix 2.1

Master Layout Plan and Typical Floor Plan

Appendix 4.1

CRTN Simple Calculation for Planned Internal Road

Appendix 5.1

Predicted Cumulative Fixed Noise Level for NSRs

Appendix 8.1

Historical Aerial Photos

Appendix 8.2

Photo Record of Site Survey

Appendix 8.3

Site Walkover Checklist

Appendix 8.4

Relevant Correspondence with FSD

Appendix 8.5

Relevant Correspondence with EPD

Executive Summary

This Environmental Assessment Study (EAS) was prepared in support of the Section 12A Planning Application for Proposed Innovation and Technology Hub at Various Lots in D.D.82 and D.D. 86 and Adjoining Government Land, Man Kam To, New Territories. The total area of the Application Site (the Site) is about 125,863m^2.

Lin Ma Hang Road is located more than 300m from noise sensitive buildings. In consideration of the large separation distance and screening from buildings, adverse road traffic noise impact on the proposed development is not anticipated.

Two potential fixed noise sources, including the existing pumping station and Ta Ku Ling Ling Ying Public School have been identified within 300m assessment area of the proposed residential blocks, and ancillary dormitories. No noticeable fixed noise was perceived at the boundary of these potential fixed noise sources. Hence, potential fixed noise impact on the proposed development is not anticipated.

For the planned fixed plant noise sources within the proposed development, the maximum permissible total Sound Power Levels (SWLs) have been derived. By adopting the derived maximum permissible total SWLs and proper mitigation measures, adverse noise impact from the planned fixed plant noise sources during operational phase is not anticipated.

Potential dust impact would be generated from the construction activities during the construction phase. Adverse dust impact is not anticipated with the implementation of the recommended dust control measure and good site practices.

The current scheme has allowed sufficient setback distances from the nearby roads to meet the minimum requirement as stipulated in HKPSG. No chimney is identified within 500m of the Application Site. Hence, no adverse air quality impact on the proposed development is anticipated.

A preliminary land contamination site appraisal through desktop research and site survey has been conducted. Results indicate that land contamination within the Application Site is not anticipated.

Waste management implications due to construction and operational phases are not anticipated provided good practices are in place.

For water quality, adverse impacts due to construction and operational phases are not anticipated, given mitigation measures and proper connection with public drainage and sewerage network should be maintained.

It is concluded that there are no adverse environmental impacts on the Application Site at the Various Lots in D.D.82 and D.D. 86 and Adjoining Government Land, Man Kam To, New Territories for the proposed Innovation and Technology Hub.

1 Introduction

1.1.1.1 This Environmental Assessment Study (EAS) was prepared in support of the Section 12A Planning Application for Proposed Innovation and Technology Hub (I&T Hub) at Various Lots in D.D.82 and D.D. 86 and Adjoining Government Land, Man Kam To, New Territories.

1.1.1.2 The Application Site, with a site area of about 125,863m^2, is located at Man Kam To in the North District. It is on a gentle sloping from site level of about 6mPD near Ping Yuen River to 25mPD near the eastern foot of Lo Shue Ling. In accordance with the Approved Man Kam To Outline Zoning Plan (OZP) No. S/NE-MKT/4, the current land use zoning of the Application Site are "Agriculture" ("AGR"), "Green Belt" ("GB") and "Government, Institution or Community" ("G/IC").

1.1.1.3 This EAS is conducted to evaluate the potential environmental impacts on the proposed development with respect to the guidance for environmental considerations provided in Chapter 9 – Environment of the Hong Kong Planning Standards & Guidelines (HKPSG). The major potential environmental impacts on the site include:

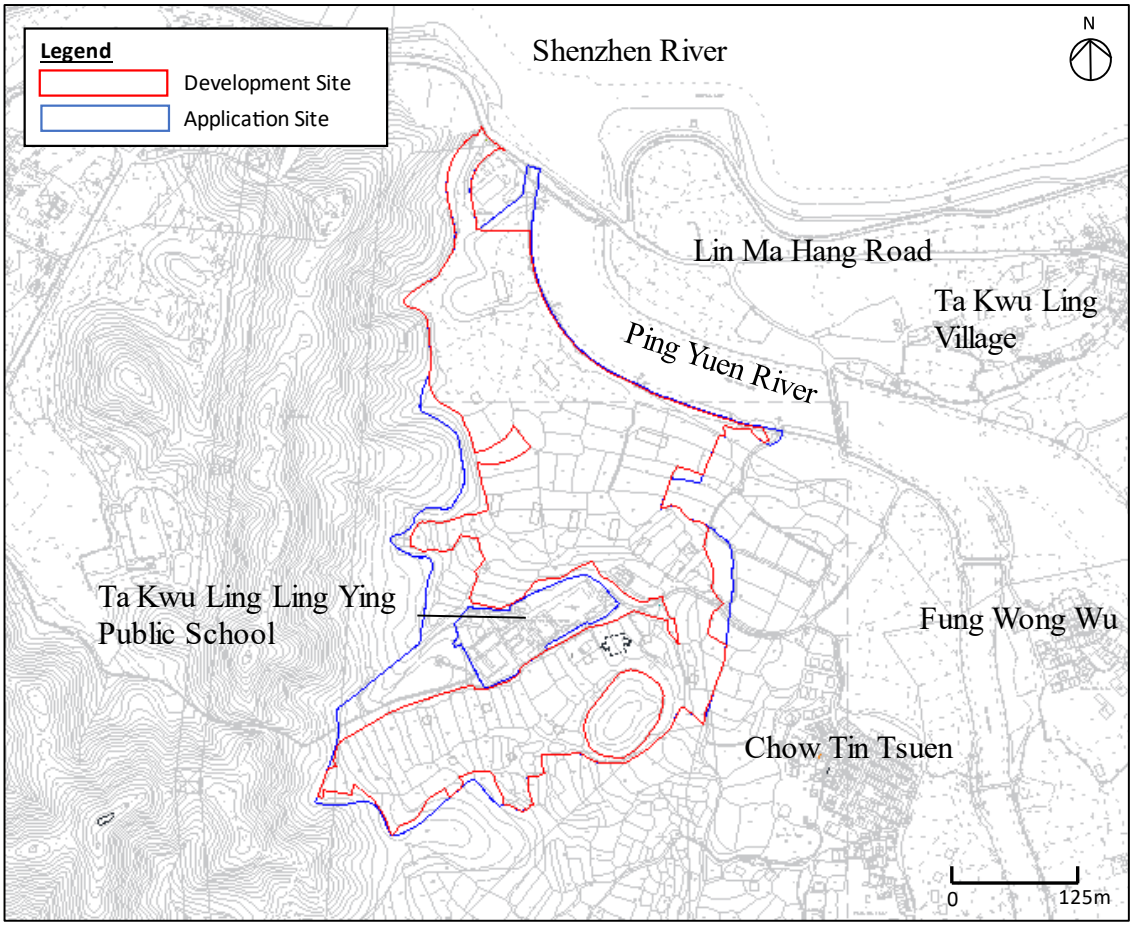
- traffic noise impact from the nearby road network;
- fixed noise impact from nearby fixed noise sources; and
- air quality impact due to nearby road network and chimneys.

2 Site Location and Building Design

2.1 Site Location and Description

2.1.1.1 The Application Site is located to the south of Lin Man Hang Road. Currently, the Application Site is largely vacant with vegetation and inactive farmland, and covers a portion of the access road from Lin Ma Hang Road leading to the existing River Ganges Pumping Station. Ta Ku Ling Ling Ying Public School is sandwiched by the Application Site. Some existing residential premises are located adjacent to Ta Ku Ling Ling Ying Public School within the Development Site, and they will be cleared for the proposed development. Further away to the east is Chow Tin Tsuen. The location of the Application Site and Development Site are illustrated in **Figure 2.1**.

Figure 2.1: Site location



2.1.1.2 In accordance with the Approved Man Kam Tong Outline Zoning Plan (OZP) No. S/NE-MKT/4, the Application Site is currently zoned as "Agriculture" ("AGR"), "Green Belt" ("GB") and "Government, Institution or Community" ("G/IC"). The areas in the vicinity are mainly zoned as "Recreation" ("REC"), "Village Type Development" ("V"), "Government, Institution or Community" ("G/IC") and "Green Belt" ("GB").

2.2 Building Design

2.2.1.1 The proposed development consists of three towers of 16 storeys R&D Centre and three towers of 12 storeys Data Centre to nurture the development of I&T industry. One 6 storeys Commercial Centres, a one storey kindergarten located on the ground floor of ancillary dormitories, will support the daily needs of the working and living population. There are three 30-31 storeys ancillary dormitories towers providing a total of 1,392 units. For the remaining development, there are five residential towers with a total of 2,320 flats. A four-storey standalone clubhouse is proposed to be situated close to the ancillary dormitories and residential towers. A Transport Interchange (TI) is planned at the ground level of R&D Centre on the northern portion of the site. Ancillary parking spaces are to be provided at the basement level. The tentative population intake year of the whole development is Year 2028.

2.2.1.2 The latest master layout plan and typical floor plans are illustrated in **Appendix 2.1**. The internal layout plans for other non-domestic facilities (e.g. kindergarten) are yet to be available at this Section 12A planning application stage.

2.2.1.3 The key development parameters for the Application Site are given in **Table 2.1**. The detailed layout plans and schematic section drawings are provided in the Planning Statement.

Table 2.1: Key development parameters for the proposed development

		Parameters
Application Site Area [1]		About 125,863 m^2
Development Site Area		About 102,461 m^2
Building Height		
• *R&D Centre*	Building Height	83m
	mPD	90mPD
	No. of Storeys [2]	16
• *Data Centre*	Building Height	73m
	mPD	80mPD
	No. of Storeys [2]	12
• *Commercial Centre*	Building Height	30m
	mPD	37mPD
	No. of Storeys [2]	6
• *Ancillary Dormitories*	Building Height	99-102.15m
	mPD	110mPD
	No. of Storeys [3]	30-31
• *Other Residential Uses*	Building Height	99-105.3m
	mPD	120mPD
	No. of Storeys [3]	30-32
No. of Units		3,712
• *Ancillary Dormitories*		*1,392*
• *Other Residential uses*		*2,320*
Average Flat Size [4]		37.7 m^2
Target Completion Year		2028

Note:

[1] Application Site includes the Development Site and remaining land parcels adjoining the Development Site for better rationalisation of boundary and land use zoning.
[2] The no. of storeys exclude basement carparks.
[3] The no. of storeys exclude 1-storey lobby and basement carparks.
[4] Average flat size is assumed as 37.7m^2 which has excluded area required for corridor, lift shaft, lobby, staircase, etc.

2.3 EIAO Implication

2.3.1.1 This section is to identify if the proposed works/facilities of the development would constitute any Designated Project(s) (DPs) under the Environmental Impact Assessment Ordinance (EIAO). Details are discussed below.

Engineering Feasibility Study for Urban Development Projects

2.3.1.2 The proposed development site is less than 20ha with population less than 100,000, and hence it does not fall into any Schedule 3 of EIAO.

Road Works

2.3.1.3 The Site is currently served by Lin Ma Hang Road. This section of Lin Ma Hang Road between Man Kam To Road and Ping Yuen River has been widened into a standard 7.3m wide single 2-lane road under "Development of Columbarium at Sandy Ridge Cemetery - Infrastructural Works at Man Kam To Road and Lin Ma Hang Road (CV/2017/02)" undertaken by Civil Engineering and Development Department (CEDD). According to the approved Environmental Impact Assessment (EIA) report (AEIAR-198/2016), the widened Lin Ma Hang Road is a local distributor. Ingress and egress points of the Site will be provided at Lin Ma Hang Road which is considered as minor work only. Therefore, it does not fall into the category of Item A.1 of Schedule 2 of EIAO and does not constitute a DP under EIAO.

Sewerage Works

2.3.1.4 Sewage generated from the Application Site will be conveyed by the internal sewerage system to the proposed STP for treatment. The treated sewage will be discharge to Ping Yuen River. Based on the latest engineering design, a new Sewage Treatment Plant (STP) is proposed at the northern end of the Development. The design capacity of the new STP is about 3,200 m^3/day, and there is no existing or planned (i) residential area; (ii) place of worship; (iii) educational institution; (iv) health care institution; (v) site of special scientific interest; (vi) site of cultural heritage; (vii) bathing beach; (viii) marine park; (ix) marine reserve; or (x) fish culture zone, identified within 200m from its boundary. Therefore, it does not fall into the category of Item F.1 and Item F.2 of Schedule 2 of EIAO and does not constitute a DP under EIAO.

Drainage Works

2.3.1.5 There are existing watercourses running within and in close vicinity of the proposed development. Watercourses within the proposed development would be replaced by a proposed local drainage system that connects to the existing downstream drainage system. The watercourse in the directly upstream of the proposed development would be diverted to the existing downstream drainage system via proposed drainage channels or box culverts, under different development scenarios. The changes in total flow discharged to existing drainage system will be minor and no adverse drainage impact is expected. The stormwater from the proposed development is proposed to be discharged into the proposed local drainage system and then the existing downstream drainage box culverts along the Ping Yuen River.

2.3.1.6 As confirmed by the Engineers, all proposed drainage works will be connected to the existing public drainage system and the runoff will be discharged to Shenzhen River via trunk box culverts stretched along Ping Yuen River. The outfall at Ping Yuen River do not encroach into the 300m distance from the nearest boundary of the sensitive areas listed in Item I.1. Therefore, the proposed drainage works do not fall into the category of Item I.1 of Schedule 2 of EIAO and do not constitute a DP under EIAO.

Water Supply Works

2.3.1.7 The proposed fresh water mains for the proposed development will be connected to the existing fresh water mains along/near Lin Ma Hang Road. The largest fresh water and salt water mains with a diameter of 300mm, which is less than 1.2m. Besides, no submarine water supply pipeline is involved. Therefore, the water supply works does not fall into Item E.3 of Schedule 2 of EIAO.

Works within Nearby Sensitive Areas Listed in Item Q.1

2.3.1.8 All works of the Project will not encroach 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. Therefore, the proposed works for the Site do not fall into the category of Item Q.1 of Schedule 2 of EIAO and do not constitute a DP under EIAO.

3 Site Inspection

3.1.1.1 Site visit was carried out in June 2022. Photographs taken at the site and the neighbouring areas are given in **Photo 3.1** to **Photo 3.12** below.

3.1.1.2 The Application Site (**Photo 3.1**) is currently occupied by vegetation (**Photo 3.2**). The site is mainly bounded by Lin Ma Hang Road (**Photo 3.3**) to the north. The site is surrounded by village houses (**Photo 3.4**) to the east (i.e. Chow Tin Tsuen), Ping Yuen River (**Photo 3.5**) to the northeast. Ta Kwu Ling Ling Ying Public School (**Photo 3.6**) is located to the west of the Application Site, while River Ganges Pumping Station (**Photo 3.7**) is found to the north of the Application Site. Across the Ping Yuen River are the village houses (**Photo 3.8 & 3.9**) (i.e. Ta Kwu Ling San Tsuen and Phoenix Lake Village) to the east and northeast.

3.1.1.3 Based on site observation, the noise climate in the vicinity of the Application Site was dominated by road traffic noise from Lin Ma Hang Road. No noisy activities or operation were observed at the existing pumping station and school, and no significant noise were perceived at the Site.

Photo 3.1: Application Site	**Photo 3.2:** Vegetation area in Application Site
	
Photo 3.3: Lin Ma Hang Road	**Photo 3.4:** Chow Tin Tsuen
	

Photo 3.5: Ping Yuen River	**Photo 3.6**: Ta Kwu Ling Ling Ying Public School
	
Photo 3.7: River Ganges Pumping Station	**Photo 3.8:** Ta Kwu Ling San Tsuen
	
Photo 3.9: Phoenix Lake Village	
	

4 Review of Road Traffic Noise Impact

4.1 Concerned Road Sections and Noise Sensitive Receivers

4.1.1.1 The noise climate in the vicinity of the Application Site was generally dominated by road traffic noise from Lin Ma Hang Road.

4.1.1.2 With reference to the HKPSG, Noise Sensitive Receivers (NSRs) shall include residential uses (all domestic premises including temporary housing accommodation), institutional uses (educational institutions including kindergarten, child care centres and all others where unaided voice communication is required), hotels, hostels, offices, places of public worship, courts of law, hospitals, clinics, convalescences, residential care homes for the elderly, amphitheatres, auditoria, libraries, performing arts centres and country parks. Based on the current development plan, the proposed residential towers, ancillary dormitories, R&D centre, data centre, commercial centre, kindergarten within the Application Site are regarded as NSRs.

4.2 Noise Criteria

4.2.1.1 In accordance with the HKPSG, the maximum permissible hourly road traffic noise levels at the external facades of different uses of NSRs for the proposed development are summarized in **Table 4.1**. These criteria apply to premises relying on opened windows as a primary means for ventilation.

4.2.1.2 As described in **Section 2.1**, the floor plans of the kindergarten yet to be available at this Section 12A planning application stage. As confirmed by the Applicant, the proposed R&D centre, data centre, commercial centre and kindergarten will be operating with central air-conditioning system and will not rely on openable window for ventilation. Hence, the noise criterion of HKPSG does not apply to these proposed facilities.

Table 4.1: Summary of noise criteria for road traffic noise

Proposed/Developments Facilities	Noise Sensitive Room with Openable Windows for Ventilation [1]	Uses	Noise Standards for Road Traffic Noise, $L_{10(1\ hour)}$ dB(A)
Residential Blocks	Residential Units	Domestic	70
Ancillary Dormitories	Residential Units	Domestic	70

Note:
[1] The type of facilities and use of noise sensitive rooms are generally determined with respect to with reference to Table 4.1 of HKPSG, unless otherwise specified. All sensitive rooms which rely on opened windows for ventilation are identified.

4.3 Existing Roads and Planned Internal Roads

4.3.1.1 Internal road network is proposed to serve as a main spine of the I&T Hub providing adequate vehicular and pedestrian access. Upon entering the Application Site from Lin Ma Hang Road, a single 2-lane arrangement is proposed for traffic circulation within the proposed development and as emergency vehicular access ("EVA"). The entrances of internal road network will be implemented with security control gates limiting the access to users of I&T facilities and residential development. Right of access is also provided for the users of Ta Ku Ling Ling Ying Public School who can reach the school site across the Application Site.

4.3.1.2 Besides, the proposed internal road network is an at-grade cul-de-sac and the works do not involve turning cul-de-sac into a link road. The scale of the proposed new road is comparable to the works described in Appendix A (Annex E) of Technical Circular (Works) No. 13/2003. It is considered that the proposed new road would have limited potential for environmental impacts.

4.3.1.3 The only major road identified within 300m of the Application Site is Lin Ma Hang Road. This section of Lin Ma Hang Road has been widened into a standard 7.3m wide single 2-lane local distributor road under "Development of Columbarium at Sandy Ridge Cemetery - Infrastructural Works at Man Kam To Road and Lin Ma Hang Road (CV/2017/02)" undertaken by CEDD. Other roads within 300m of the Application Site are sub-standard village access roads which the traffic flow is very low.

4.3.1.4 As advised by the Traffic Consultant, the maximum traffic flow within 15 years upon population intake of the residential development will occur in Year 2043. Traffic Impact Assessment (TIA) including the methodology on the traffic forecast for the EAS has been submitted to Transport Department (TD) for endorsement. The traffic consultant had checked and confirmed the validity of the traffic data, which was derived based on the traffic forecast methodology submitted to TD. The predicted peak hourly traffic flows of Lin Ma Hang Road are presented in **Table 4.2**. The existing road and proposed internal road have shown in **Figure 4.1**.

Figure 4.1: The location of existing road and proposed internal road

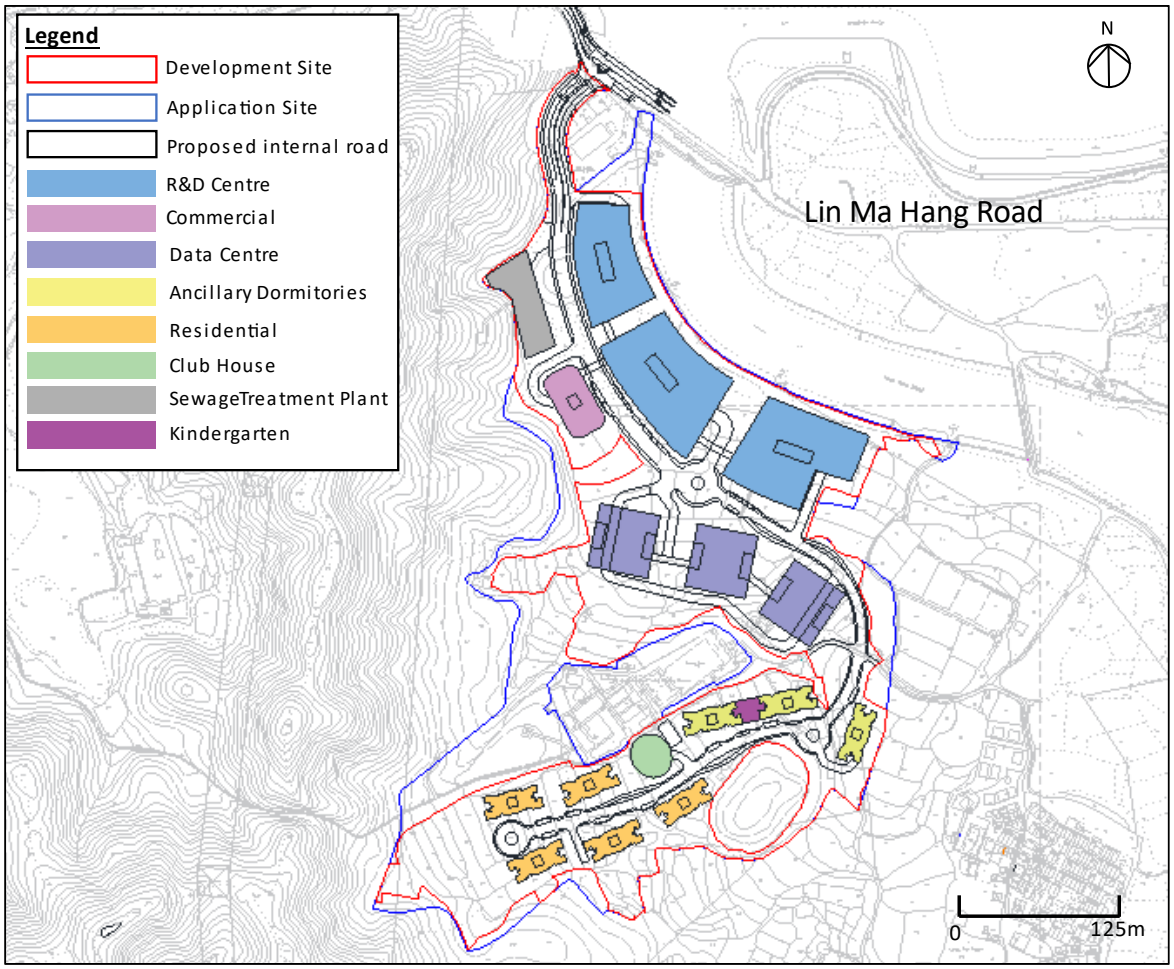


Table 4.2: Predicted peak hourly traffic flow data on major roads

Road Description	Direction [1]	Speed Limit (km/hr)	Year 2043	
			Traffic Flow (veh/hr)	% of Heavy Vehicles
Lin Ma Hang Road	EB	50	565	19%
Lin Ma Hang Road	WB	50	600	19%
Proposed Internal Access Road	NB	30	495	17%
Proposed Internal Access Road	SB	30	545	17%

Note:
[1] EB = East Bound; WB = West Bound

4.4 Design Consideration

4.4.1.1

In accordance with HKPSG, the severity of road traffic noise impact on sensitive uses depends on many variables, some of which can be controlled or influenced by land use planning. These variables include separation from road alignment, line-of-sight and shielding. Therefore, efforts have been made to ensure that the road traffic noise impact on the proposed development will be minimised. Some general considerations that have been taken in the building design include the following:

- providing distance separation between the noise receiver and the vehicles;

- reducing the angle of view of receiver on road traffic; and
- using natural landscape, embankment or noise tolerant buildings.

4.5 Design of the Development

4.5.1.1 During the planning and design stage, efforts have been made to meet the HKPSG's recommendations as far as practicable. Details are described below:

4.5.2 Building Setback

4.5.2.1 The noise sensitive buildings have been deposited with optimised setback distance from Lin Ma Hang Road as far as practicable. The setback distances between the surrounding major roads and the noise sensitive buildings of the proposed development are summarised in **Table 4.3** below.

Table 4.3: Separation distances between the proposed noise sensitive buildings and nearby major roads

Name of Road	Noise Sensitive Building	Shortest Horizontal Setback Distance from the Major Road
Lin Ma Hang Road	Residential Towers	460m
	Ancillary Dormitories	355m

4.5.2.2 Lin Ma Hang Road is located more than 300m from noise sensitive buildings. In consideration of large separation distance, potential road traffic noise impact from Lin Ma Hang Road is not anticipated.

4.5.3 Building Layout and Orientation

4.5.3.1 During the process of designing the layout for the proposed development, due consideration has been given to avoid noise impact from Lin Ma Hang Road as much as practicable. In the northern portion of the Application Site, it has intentionally planned with non-noise sensitive buildings rooms such as R&D centre, data centre and commercial centre. The building structures of these facilities would provide noise screening to the noise sensitive buildings, including the proposed residential towers and ancillary dormitories from Lin Ma Hang Road.

4.6 Qualitative Review of the Road Traffic Noise Impact

4.6.1.1 The recommendations stipulated in HKPSG have been fully considered and adopted in the current design of the development. The noise sensitive buildings, including the proposed residential towers, and ancillary dormitories will be located more than 300m from Lin Ma Hang Road at the southern portion of the Application Site. The proposed R&D centre, data centre and commercial centre are planned at the northern portion of the Application Site and these buildings would provide noise screening to the noise sensitive buildings (i.e. the

proposed residential towers, and ancillary dormitories) from Lin Ma Hang Road. In consideration of the large separation distance and screening from buildings, adverse road traffic noise impact on the proposed development is not anticipated.

4.6.1.2 A sensitivity test has been conducted to predict the road traffic noise impact from the proposed internal access roads. The sensitivity test calculation has taken into account the predicted traffic flow of Year 2043, % of heavy good vehicles, road speed, road surface type, distance attenuation and facade correction. The predicted road traffic noise level for the nearest NSRs at Chow Tin Tsuen (N2) is 66dB(A), which comply with the stipulated noise standard of 70dB(A). Therefore, no adverse road traffic noise impact from the proposed internal roads is anticipated. The calculation is provided in **Appendix 4.1**.

5 Fixed Noise Assessment

5.1 Review of Existing Fixed Noise Sources

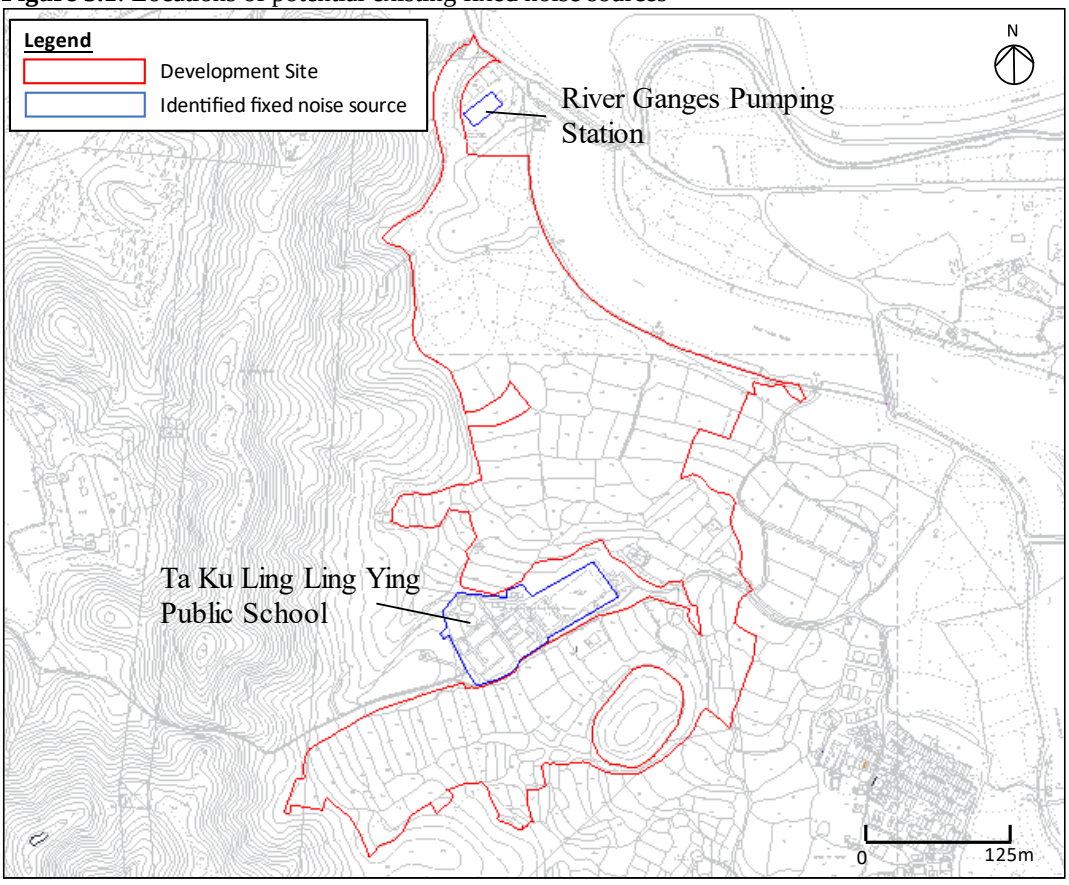
5.1.1.1 As confirmed by the Applicant, the proposed I&T Hub will be operating with central air-conditioning system and will not rely on openable window for ventilation. Hence, only the proposed residential blocks, and ancillary dormitories are considered to be noise sensitive uses in this review.

5.1.1.2 Desktop study and site survey have been carried out in June 2022 to identify any potential fixed noise sources within 300m assessment area of the proposed residential blocks, ancillary dormitories. **Figure 5.1** indicates the locations of the identified fixed noise sources. These include the existing pumping station to the north of the site and Ta Ku Ling Ling Ying Public School encroached in the middle of the site. All major and significant fixed noise sources which may have potential noise impact on the planned NSRs of the proposed development have been identified and summarized in **Table 5.1**.

Table 5.1: Summary of identified fixed noise sources

Name of Fixed Noise Source	Source
River Ganges Pumping Station	• Operation: Exhaust and pumps enclosed in the building • It is located at the northern entrance of the proposed I&T Hub and about 430m from the proposed residential development. Site access is not allowed. Based on site inspection, no noticeable fixed noise was perceived at the boundary of the pumping station. Given the large separation distance, potential fixed noise impact on the proposed development is not anticipated.
Ta Ku Ling Ling Ying Public School	• It is located adjacent to the north of the proposed residential development. Site access is not allowed. Based on the desktop study, no fixed plant is identified. No noticeable fixed noise was perceived at the boundary of the school during the site inspection. Given the reason above, potential fixed noise impact on the proposed development is not anticipated.

Figure 5.1: Locations of potential existing fixed noise sources



5.2 Assessment for Planned Fixed Noise Sources

5.2.1.1 Chillers will be installed on the facades and rooftops of the proposed I&T Hub, which may have potential noise impact on the nearby NSRs. Since detailed information and specifications of the chillers are not available at the time of noise assessment, the maximum permissible total sound power levels (SWLs) are determined for future detailed design of the fixed plant.

5.2.2 Assessment Methodology for Planned Fixed Plant Noise

5.2.2.1 The following assessment methodology is adopted for fixed plant noise impact:

- Identify and locate the planned fixed plant noise sources;
- Identify and locate representative NSRs that may be affected by the noise sources;
- Determine noise criteria for day/evening-time and night-time for each NSR;
- Determine the distance attenuation, screening effect and façade effect according to standard acoustic principles; and
- Determine the maximum permissible SWLs of fixed noise sources in accordance with standard acoustic principles.

5.2.3 Representative Noise Sensitive Receivers

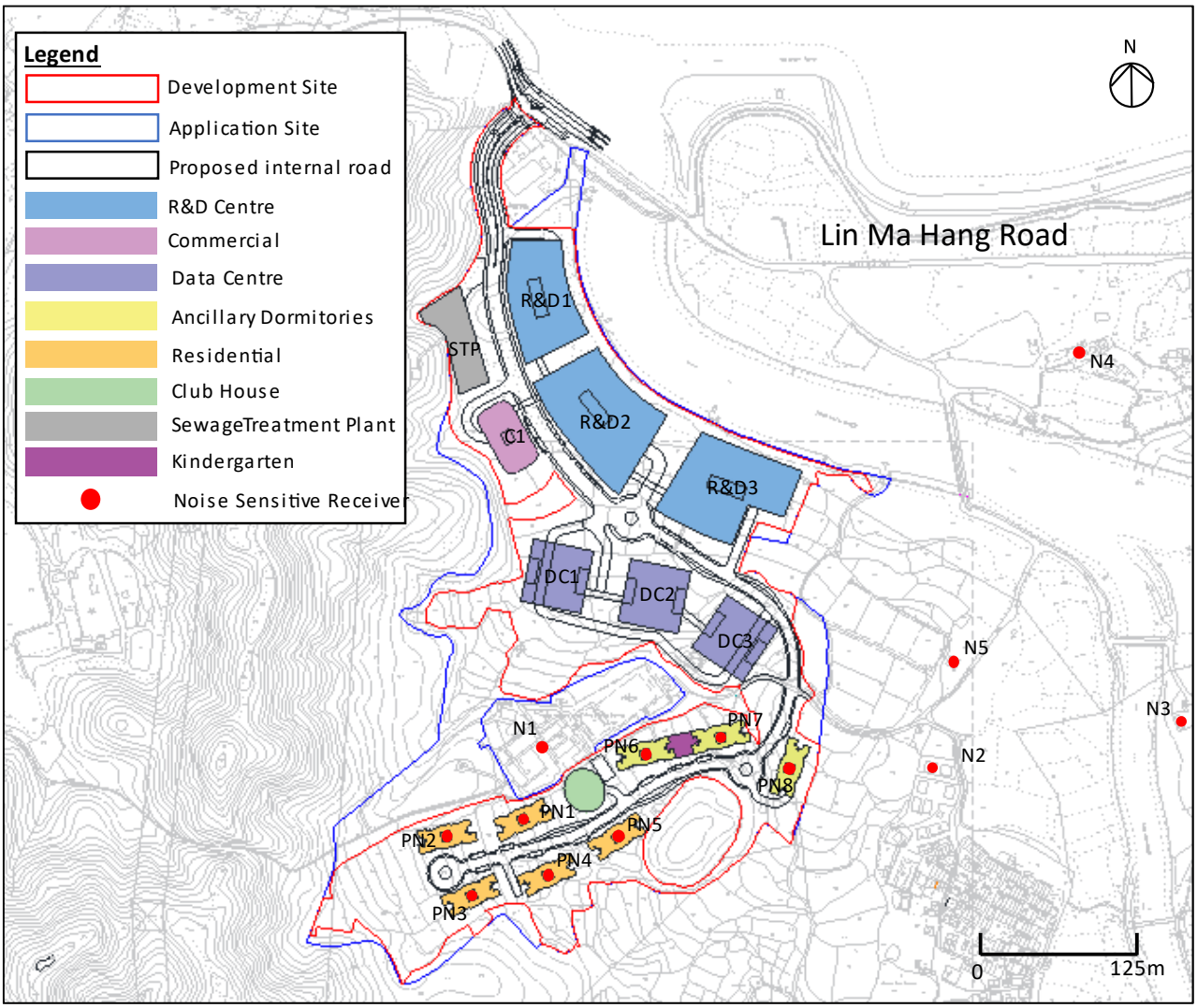
5.2.3.1 For fixed noise impact assessment, the representative NSRs associated with the relevant noise criteria (ANL and ANL-5) are summarised in **Table 5.2**. **Figure 5.2** indicates the locations of the representative NSRs.

Table 5.2 Representative noise sensitive receivers during operation phase and their noise criteria

NSR ID	Description	Land use	No. of storeys	Area Sensitivity Rating [1]	ANL-5 (Day or Evening-time/ Night-time), dB(A)
Existing NSRs					
N1	Ta Ku Ling Ling Ying Public School	Institutional	3	B	60 / 50
N2	Chow Tin Tsuen	Residential	2-4	B	60 / 50
N3	Phoenix Lake Village	Residential	2-4	A	55 / 45
N4	Ta Kwu Ling San Tsuen	Residential	2-4	A	55 / 45
N5	Village House near Chow Tin Tsuen	Residential	2-4	B	60 / 50
Planned NSRs					
PN1	Residential Towers 1	Residential	31	B	60 / 50
PN2	Residential Towers 2	Residential	30	B	60 / 50
PN3	Residential Towers 3	Residential	30	B	60 / 50
PN4	Residential Towers 4	Residential	31	B	60 / 50
PN5	Residential Towers 5	Residential	32	B	60 / 50
PN6	Ancillary Dormitories 1	Residential	30	B	60 / 50
PN7	Ancillary Dormitories 2	Residential	30	B	60 / 50
PN8	Ancillary Dormitories 3	Residential	31	B	60 / 50

Note:
[1] The corresponding ASRs of the NSRs are determined based on the best available information. The ASRs determined in this report should not bind the Authority when enforcing the NCO based on the contemporary conditions.

Figure 5.2: Locations of the representative NSRs



5.2.4 Fixed Noise Criteria

5.2.4.1 According to Section 4.2.13 in Chapter 9 of the HKPSG, noise assessments for industrial noise source would normally be conducted in accordance with the Technical Memorandum for the Assessment of Noise from Places Other Than Domestic Premises, Public Places or Construction Sites (TM-Places) under the Noise Control Ordinance (Cap. 400). The TM-Places lays down statutory Acceptable Noise Levels (ANLs). The HKPSG also states that in order to plan for a better environment, all planned 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 5dB(A) below the appropriate ANL shown in Table 3 of the TM-Places or, in the case of the background being 5dB(A) lower than the ANL, should not be higher than the background.

5.2.4.2 The site is mainly planned for mid-rise I&T Hub and high-rise residential development. Other developments of commercial, education, government facilities, etc., are also considered. The types of area (i) rural area; (ii) low density residential area consisting of

low-rise or isolated high-rise developments; and (iii) urban area according to TM-Places cannot reflect the future environment of the subject site and are all not applicable. Thus, the whole site shall fall into type (iv) "Area other than those above" according to TM-Places.

5.2.4.3 There is no Influencing Factor (IF) under the TM-Places that affects the Application Site. Therefore, an Area Sensitivity Rating (ASR) of "B" shall be applied to all the NSRs of the proposed residential blocks. The ANL for ASR of "B" should be 65dB(A) and 55dB(A) for daytime and evening time period, and night-time period respectively. There are planned fixed noise sources in the proposed development and hence the criteria of ANL-5dB(A) is applicable to the planned fixed noise sources.

5.2.4.4 For existing NSRs, some of them (i.e. NSR N3 & N4) located away from the Application Site and considered to be falling into Type (ii) low density residential area, an Area Sensitivity Rating (ASR) of "A" shall be applied. Prevailing noise levels have been measured at two existing NSRs (i.e. NSR N1 & N2) in October 2022 during daytime, evening and night-time periods. A summary of the prevailing noise measurement results is given in **Table 5.3**.

Table 5.3 Calculation of maximum permissible SWL at representative NSRs

Measurement Location	Prevailing Noise Levels, dB(A)		
	Day[1]	Evening[1]	Night[1]
Ta Ku Ling Ling Ying Public School	44	44	40
Chow Tin Tsuen	45	44	40

Notes:
[1] Day: 0700 to 1900 hours, Evening: 1900 to 2300 hours, Night: 2300 – 0700 hours.

5.2.5 Assessment Results for Fixed Plant Noise

5.2.5.1 The exact location of the chiller plants was not available during the planning stage. As advised by the Project Engineer, all mechanical plants for the proposed building development will be enclosed in the plant rooms only with the exhausts located on the building facades and rooftops. A conservative approach was taken by assuming the exhausts having the shortest horizontal distance from the building facades of the proposed development blocks to each NSR, as shown in **Figure 5.2**.

5.2.5.2 Corrections, including distance attenuation and façade reflection have been included in this fixed plant noise impact assessment. Since the locations of the exhaust are yet to be determined in this stage, distance attenuation has been applied by determining the shortest horizontal distances between the building facades of the proposed development's retail block and the representative NSRs. Furthermore, 3dB(A) correction for façade reflection has also been applied. In this assessment, tonality correction is not incorporated in the calculation of maximum permissible SWLs. If the tonality effect is identified in the future, tonality correction should be applied according to the TM-Places. In addition, for NSRs with direct line of sight to more than one building block of the proposed development, the

cumulative noise impacts from planned fixed noise sources at different development blocks have been considered.

5.2.5.3 The noise criteria (i.e. ANL-5) for the planned fixed plant noise sources at planned NSRs (i.e. NSR PN1 & PN7) are 60dB(A) and 50dB(A) for day/evening-time and night-time respectively, while for existing NSRs (i.e. NSR N1 – N5), the noise criteria (i.e. the prevailing background noise levels) for the planned fixed plant noise sources are 44dB(A) and 40dB(A) for day/evening-time and night-time respectively. The maximum permissible SWLs was determined by considering the nearest NSRs (i.e. N1 & PN7). The maximum permissible SWLs at day/evening-time and night-time periods are summarised in **Table 5.4**.

Table 5.4 Calculation of maximum permissible SWL at representative NSRs

Building ID	**Max. permissible SWL (Day or evening-time/ night-time)[1][2][3][4], dB(A)**
STP	86/86
C1	86/-
DC1	82/82
DC2	82/82
DC3	82/82
R&D1	84/-
R&D2	84/-
R&D3	84/-

Notes:
[1] Tonality correction is not applied in the calculation of maximum permissible SWL. In case tonality effect is identified during design stage, tonality correction should be considered, according to the TM-Places.
[2] It is confirmed by the project proponent that there is no night-time operation for commercial center (C1), and R&D Centres (R&D1, R&D2 and R&D3). Only data centers (i.e. DC1, DC2 & DC3) and STP will be operated during night-time period.
[3] Assuming that same type of building has the same max. permissible SWL.
[4] Assuming the operation is the same all day, the max. permissible SWL of DC1, DC2, DC3 and STP at day/evening time are also determined from night-time criteria which is more stringent.

5.2.6 Predicted Fixed Noise Impact at NSRs

5.2.6.1 Based on the determined maximum permissible SWLs, the fixed noise impact on the representative NSRs have been predicted. The predicted facade noise levels of the representative NSRs are summarised in **Table 5.5**. Detailed calculations are presented in **Appendix 5.1**.

Table 5.5: Assessment results for noise from industrial noise sources

NSR ID	Description	ASR	ANL-5 or Prevailing Background Noise Levels (Day or Evening-time/ Night-time), dB(A)	Predicted Noise Level (Day or Evening-time/ Night-time), dB(A) [1]	Comply with ANL-5 (Y/N)
Existing NSR					
N1	Ta Ku Ling Ling Ying Public School	B	44/40	44/-[2]	Y
N2	Chow Tin Tsuen	B	44/40	39/36	Y
N3	Phoenix Lake Village	A	44/40	34/30	Y
N4	Ta Kwu Ling San Tsuen	A	44/40	38/33	Y
N5	Village House near Chow Tin Tsuen	B	44/40	40/37	Y
Planned NSR					
PN1	Residential Towers 1	B	60/50	41/39	Y
PN2	Residential Towers 2	B	60/50	40/37	Y
PN3	Residential Towers 3	B	60/50	39/36	Y
PN4	Residential Towers 4	B	60/50	39/37	Y
PN5	Residential Towers 5	B	60/50	41/38	Y
PN6	Ancillary Dormitories 1	B	60/50	45/43	Y
PN7	Ancillary Dormitories 2	B	60/50	49/48	Y
PN8	Ancillary Dormitories 3	B	60/50	44/42	Y

Notes:
[1] For conservative assessment, the shortest horizontal distances between the assessment points and industrial noise sources are adopted in the calculation. No screening correction has been taken into account.
[2] No night-time operation is considered for educational institution.

5.2.6.2 Results indicate that all representative NSRs are predicted to comply with the NCO criteria. Hence, adverse noise impact from the proposed development is not anticipated. Notwithstanding the conservative approach adopted in this assessment, The maximum permissible SWLs for the planned fixed plant noise source is subject to future design changes of the proposed commercial building. Nonetheless, mitigation measures should be considered as recommended in the next section.

5.3 Recommended Mitigation Measures for Planned Fixed Plant Noise

5.3.1.1 According to "Good Practices on Ventilation System Noise Control" issued by EPD, noisy equipment should be placed, wherever practicable, at a greater distance from receivers and behind some large enough obstruction (e.g. a building or a barrier) to avoid any direct line of sight between the receivers and noisy equipment. This should be a factor of consideration when deciding on the location of the chiller group for the proposed I&T Hub's buildings. This suggests that the most optimal location of the plant room exhaust should be installed at the facades facing towards the internal road network to avoid direct facing the NSRs.

5.3.1.2 In case the total SWL of exhausts is higher than the maximum permissible SWL, Installation of silencers / acoustic louvers at the exhaust shall be considered to minimise the noise impact.

5.3.1.3 The proposed maximum permissible SWL for fixed noise sources and recommended mitigation measures specified in this report shall be implemented by the Contractor. The Contractor shall select fixed plants that can achieve the proposed maximum permissible SWL, as well as adopting the proposed mitigation strategies and measures when necessary. The Contractor should also carry out a noise commissioning test for all fixed noise sources before operation of the Project, in order to ensure compliance of the operational airborne noise levels with the planning fixed source noise criteria under HKPSG.

5.3.1.4 With the above measures, adverse noise impact from the planned fixed plant noise sources due to the operation of the proposed commercial development is not anticipated. The Contractor should also carry out a noise commissioning test for all fixed noise sources before operation of the Project, in order to ensure compliance of the operational airborne noise levels with the planning fixed source noise criteria under NCO.

5.4 Review of Noise Nuisance Arising from the Proposed Transport Interchange

5.4.1.1 The proposed TT (TI) is fully covered with full height side walls. The covered TT (TI) will be designed with the ingress/egress and opening on the south-eastern facade to make use of natural lighting and ventilation as far as possible. This would minimise noise impacts from the openings on the planned residential development to the southeast of the TT (TI). The TT (TI) will be designed with no line of sight to the receivers in the proximity. Potential noise nuisances arising from the TT is not anticipated.

5.4.1.2 Besides, absorptive lining will be provided on ceiling and interior walls of the TT (TI) as far as practicable to minimise the reverberance in the TT (TI). The provision of absorptive lining could also reduce energy escaping out from the openings of TT (TI). The extent will be determined to meet the requirements of the Technical Schedule of Public Transport Interchange in next detailed design stage.

6 Review of Construction Noise Impact

6.1 Legislation, Standards and Guidelines

6.1.1 General

6.1.1.1 The relevant legislation and associated guidance applicable to the present study for the assessment of noise impact include:

- Noise Control Ordinance (NCO) (Cap. 400);
- TM on Noise from Construction Work other than Percussive Piling (TM-GW);
- TM on Noise from Percussive Piling (TM-PP); and
- TM on Noise from Construction Work in Designated Areas (TM- DA).

6.1.2 Construction Noise Standards

6.1.2.1 There is no statutory noise limit for general construction works during daytime (i.e. 0700 to 1900 hours on any day not being a Sunday or general holiday) under the Noise Control Ordinance (NCO) and related Technical Memoranda (TMs) while the NCO provides statutory control of general construction works during restricted hours (i.e. 1900 to 0700 hours (of the next day) from Monday to Saturday and at any time on Sundays or general holidays). Nevertheless, ProPECC PN1/24 "Minimizing Noise from Construction Activities" stipulates criteria of 65 to 75dB(A) for construction activities during non-restricted hours (7 a.m. to 7 p.m. on any day not being a Sunday or general holiday). **Table 6.1** below shows the criteria as stipulated in ProPECC PN1/24 "Minimizing Noise from Construction Activities".

Table 6.1: Noise standards for construction activities

Noise Sensitive Receivers	**Leq(30min) * dB(A)**
All domestic premises Temporary housing accommodation Hostels Convalescences homes Homes for the aged	75
Places of public worship Courts of law Hospitals and medical clinics Educational institutions (including kindergartens and nurseries)	70 65 (During examination)
* Note: Leq(30min) is a standard measure of noise level which means the continuous equivalent noise level over a 30 minute interval.	

6.2 Evaluation of Construction Phase Impact

6.2.1.1 Potential source of noise impact during construction phase would be construction noise generated from the use of Powered Mechanical Equipment (PME) for various construction activities. The key construction activities include site clearance, demolition, soil excavation for basement, piling works and superstructure works, which would involve the use of excavator, breaker, dump truck, etc.

6.2.1.2 The shortest horizontal separation distance between the site and the nearest NSR (i.e. Ta Kwu Ling Ling Ying Public School (N1)) is less than 10m. The Contractor would be required to implement the mitigation measures mentioned in ProPECC PN 1/24 "Minimizing Noise from Construction Activities" as good practices. By adopting appropriate mitigation measures and good site practices, the construction noise impact can be minimised.

6.3 Recommended Mitigation Measures

6.3.1.1 In accordance with ProPECC PN 1/24 "Minimizing Noise from Construction Activities", the following mitigation measures should be given wherever practicable:

- Use of quiet construction method;
- Implementation of good site practices to limit noise emissions at source;
- Use of Quality Powered Mechanical Equipment (QPME);
- Installation of temporary noise barriers, panels or enclosures around the site boundary;
- Siting noisy equipment, such as emergency generators, water pumps, as far as possible from the NSR; and
- Scheduling of work to avoid simultaneous operations of noisy equipment.

6.3.1.2 The above recommended practices would need to be implemented in worksite as good practices whenever possible. Reference shall also be made to EPD's recommended pollution control clauses for construction contracts. With the implementation of the recommended mitigation measures, no insurmountable construction noise impact is therefore anticipated.

7 Review of Potential Air Quality Impact

7.1 Legislation, Standards and Guidelines

7.1.1 General

7.1.1.1 The relevant legislations, standards and guidelines applicable to the present study for the assessment of air quality impacts include:

- Air Pollution Control Ordinance (APCO) (Cap. 311);
- Air Pollution Control (Construction Dust) Regulation;
- Air Pollution Control (Non-road Machinery) (Emission) Regulation;
- Air Pollution Control (Fuel Restriction) Regulations; and
- Hong Kong Planning Standards and Guidelines (HKPSG).

7.1.2 Air Pollution Control Ordinance

7.1.2.1 The principal legislation for controlling air pollutants is the APCO (Cap. 311) and its subsidiary regulations, which defines statutory Air Quality Objectives (AQOs).

7.1.2.2 The APCO (Cap. 311) provides the power for controlling air pollutants from a variety of stationary and mobile sources and encompasses a number of AQOs. In addition to the APCO, the following overall policy objectives are laid down in Chapter 9 of the HKPSG as follows:

- Limit the contamination of the air in Hong Kong, through land use planning and through the enforcement of the APCO to safeguard the health and well-being of the community; and
- Ensure that the AQOs for 7 common air pollutants are met as soon as possible.

7.1.2.3 The prevailing AQOs, which took effect on 1 January 2022, are listed in **Table 7.1** below.

Table 7.1: Hong Kong air quality objectives

Pollutant	**Limits on Concentration, µg/m^3 [1] (Number of Exceedance per year allowed in brackets)**				
	10-min	**1-hr**	**8-hr**	**24-hr [2]**	**Annual [2]**
Sulphur Dioxide (SO_2)	500 (3)	-	-	50 (3)	-
Respirable Suspended Particulates (RSP, or PM_{10}) [3]	-	-	-	100 (9)	50
Fine Suspended Particulates (FSP, or $PM_{2.5}$) [4]	-	-	-	50 (35/18) [5]	25
Carbon Monoxide (CO)	-	30,000 (0)	10,000 (0)	-	-
Nitrogen Dioxide (NO_2)	-	200 (18)	-	-	40

Pollutant	Limits on Concentration, µg/m^3 [1] (Number of Exceedance per year allowed in brackets)				
	10-min	1-hr	8-hr	24-hr [2]	Annual [2]
Ozone (O_3)	-	-	160 (9)	-	-
Lead (Pb)	-	-	-	-	0.5

Note:
[1] Measured at 293K and 101.325 kPa (for gaseous pollutants only).
[2] Arithmetic mean.
[3] RSP means suspended particulates in air with a nominal aerodynamic diameter of 10 micrometres or smaller.
[4] FSP means suspended particulates in air with a nominal aerodynamic diameter of 2.5 micrometres or smaller.
[5] A more stringent standard of 24-hour AQO for FSP (i.e. tightening the number of allowable exceedances to 18 days per calendar year) would be adopted for government projects.Air Pollution Control (Construction Dust) Regulation

7.1.2.4 The Air Pollution Control (Construction Dust) Regulation specifies processes that require special dust control. The Contractors are required to inform the Environmental Protection Department (EPD) and adopt proper dust suppression measures while carrying out "Notifiable Works" (which requires prior notification by the regulation) and "Regulatory Works" to meet the requirements as defined under the regulation.

7.1.3 Air Pollution Control (Non-road mobile Machinery) (Emission) Regulation

7.1.3.1 Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation specifies that all Non-road Mobile Machinery (NRMMs), except those exempted, used in specified activities and locations including construction sites, container terminals and back up facilities, restricted areas of the airport, designated waste disposal facilities and specified processes are required to comply with the prescribed emission standards.

7.1.4 Air Pollution Control (Fuel Restriction) Regulations

7.1.4.1 The Air Pollution Control (Fuel Restriction) Regulation specifies the restriction on use of fuels by relevant plants other than those operated in premises solely for dwelling, on vessels, motor vehicles, railway locomotive or aircrafts as well as premises solely for conduct of electricity works. Conventional solid fuel with sulphur content not more than 1% by weight as well as liquid fuel with sulphur content of not more than 0.005% by weight and viscosity of not more than 6 centistokes at 40oC should be used.

7.1.5 Hong Kong Planning Standards and Guidelines

7.1.5.1 Chapter 9 of HKPSG outlines the environmental requirements that need to be considered in land use planning. The recommended guidelines, standards and guidance cover the selection of suitable locations for the developments and sensitive uses, provision of environmental facilities, and design, layout, phasing and operational controls to minimise adverse environmental impacts. It also lists out environmental factors influencing land use planning and recommends buffer distances for land uses. The HKPSG also recommends minimum setback distance from different categories of air pollution sources. **Table 7.2** shows these minimum setback distances.

Table 7.2: Guidelines on buffer distance between air pollution sources and different land uses

Pollution Source	Parameter	Buffer Distance	Permitted Uses
Road and Highways	*Type of Road*		
	Trunk Road and Primary Distributor	> 20m	Active and passive recreation uses
		3 – 20m	Passive recreational uses
		< 3m	Amenity areas
	District Distributor	> 10m	Active and passive recreational uses
		< 10m	Passive recreational uses
	Local Distributor	> 5m	Active and passive recreational uses
		< 5m	Passive recreational uses
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	Active and passive recreation uses
Construction and Earth Moving Activities	-	< 50m	Passive recreational uses
		> 50m	Active and passive recreational uses

Note:
[1] 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.
[2] 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.
[3] The guidelines are generally applicable to major industrial areas but NOT individual large industrial establishments which are likely to be significant air pollution sources. EPD shall be consulted when planning open space sites close to such establishments.
[4] Amenity areas are permitted in any situation.

7.2 Baseline Information

7.2.1 Existing Air Quality Conditions

7.2.1.1 Historical air quality monitoring data from the Air Quality Monitoring Station (AQMS) operated by EPD have been examined. North AQMS is nearest EPD AQMS to the proposed development, however, North AQMS has only started commissioning since July 2020. Due to the lack of available long-term monitoring data of North AQMS, the Tai Po AQMS which is the second closest to the proposed development with more historical monitoring data is also considered. The air quality monitoring data in North AQMS in Year 2020 to Year 2022 and Tai Po AQMS in Year 2018 to 2022 are tabulated in **Table 7.3** and **Table 7.4** respectively.

Table 7.3: Air quality monitoring data (North AQMS, 2020 to 2022)

Pollutant	Parameter	Concentrations, µg/m^3 [2]			3-year mean [3]	AQO, µg/m^3 [1]
		2020	2021	2022		
SO_2	4th highest 10-minute	19	18	27	21 [4%]	500 (3)
	4th highest 24-hour	8	7	7	7 [6%]	50 (3)
NO_2	19th highest 1-hour	112	135	115	121 [60%]	200 (18)
	Annual	-	36	31	34 [84%]	40
CO	Max. 1-hour	1830	2150	1710	1897 [6%]	30,000
	Max. 8-hour	1238	1550	1304	1364 [14%]	10,000
O_3	10th highest 8-hour	**166**	**187**	**197**	183 [115%]	160 (9)
RSP	10th highest 24-hour	55	62	50	56 [56%]	100 (9)
	Annual	-	25	23	24 [48%]	50
FSP	19th highest 24-hour [3]	29	29	29	29 [58%]	50 (35/18)
	36th highest 24-hour	23	25	25	24 [48%]	
	Annual	-	15	14	15 [58%]	25

Notes:

[1] Number of exceedance allowed under the AQO is shown in ( ), % of the AQO is shown in [ ].

[2] The 3-year mean is the average of the yearly values. North General Air Quality Monitoring Stations commissioned on 10 July 2020.

[3] A more stringent standard of 24-hour AQO for FSP (i.e. tightening the number of allowable exceedances to 18 days per calendar year) would be adopted for government projects.

[4] Monitoring results exceeding the AQO are shown as **bolded** characters.

7.2.1.2 Based on the monitoring data in North AQMS, 10th highest 8-hour O_3 concentrations exceeded the respective AQOs of 160µg/m^3 from Year 2020 to Year 2022. The annual NO_2 concentrations comply with the respective AQOs of 40µg/m^3 from Year 2021 to Year 2022. For the rest of the pollutants were well within the AQOs.

Table 7.4: Air quality monitoring data (Tai Po AQMS, 2018-2022)

Pollutant	Parameter	Concentrations, µg/m^3					5-year mean [1]	AQO, µg/m^3 [1]
		2018	2019	2020	2021	2022		
SO_2	4th highest 10-minute	24	20	19	15	12	18 [4%]	500 (3)
	4th highest 24-hour	8	10	7	8	5	8 [7%]	50 (3)
NO_2	19th highest 1-hour	125	142	106	115	93	116 [61%]	200 (18)
	Annual	36	36	30	32	27	32 [84%]	40
CO [4]	Max. 1-hour	-	-	-	-	-	-	30,000
	Max. 8-hour	-	-	-	-	-	-	10,000
O_3	10th highest 8-hour	**167**	**197**	**165**	**168**	**188**	60 [63%]	160 (9)
RSP	10th highest 24-hour	68	65	58	60	48	27 [53%]	100 (9)
	Annual	31	31	24	26	21	35 [70%]	50
FSP	19th highest 24-hour [2]	38	41	33	34	30	35 [70%]	50 (35/18)
	36th highest 24-hour	33	35	28	27	25	30 [59%]	
	Annual	19	20	15	16	14	17 [50%]	25

Notes:

[1] Number of exceedance allowed under the AQO is shown in ( ), % of the AQO is shown in [ ]. The 5-year mean is the average of the yearly values.

[2] A more stringent standard of 24-hour AQO for FSP (i.e. tightening the number of allowable exceedances to 18 days per calendar year) would be adopted for government projects.

[3] Monitoring results exceeding the AQO are shown as **bolded** characters.

[4] CO has not been recorded in Tai Po AQMS.

7.2.1.3 Based on the monitoring data in Tai Po AQMS, 10th highest 8-hour O_3 concentrations exceeded the respective AQOs of 160µg/m^3 in the past 5 years. No obvious trend could be found in the data. The concentrations ranged from 165µg/m^3 in Year 2020 to 197µg/m^3 in Year 2019.

7.2.1.4 The 10th highest daily RSP concentrations ranged from 48 µg/m^3 in Year 2022 to 68 µg/m^3 in Year 2018, which complied with the AQO of 100µg/m^3. The annual RSP concentrations graduately decreased from 31µg/m^3 to 21µg/m^3 between Year 2018 and Year 2022, all well within the AQO of 50µg/m^3.

7.2.1.5 The trend for FSP concentrations was similar to that for RSP concentrations. The 36th and annual FSP concentrations decreased during Year 2018 and Year 2022 in general, from

33µg/m^3 to 25µg/m^3 and from 19µg/m^3 to 14µg/m^3 respectively, both complying with the AQO of 50µg/m^3 and 25µg/m^3respectively. No obvious trend could be found in the 19 th FSP concentrations. The concentrations ranged from 30µg/m^3 in Year 2022 to 41µg/m^3 in Year 2019, all well within the AQO of 50µg/m^3.

7.2.1.6 For NO_2 concentrations, the 19th highest 1-hour NO_2 concentrations increased from 125µg/m^3 in Year 2018 to 142µg/m^3 in Year 2019 and yet decreased to 93µg/m^3 in Year 2022, whilst the annual concentrations decreased from 36µg/m^3 in Year 2018 to 30µg/m^3 in Year 2020 and then increased to 36µg/m^3 in Year 2022. Both complied with the AQO of 200µg/$m^3$and 40µg/m^3 respectively.

7.2.1.7 Monitoring records of SO_2 indicated that these two pollutants were in relatively low levels. Both pollutants were well within the AQOs.

7.2.1.8 Future Background Air Quality Conditions

7.2.1.9 The air quality described in **Section 7.2.1** is based on historical data. In order to predict the air quality taking into account the technology changes and deliberate government policies to improve air quality, both in Hong Kong and the surrounding areas, the regional air quality model developed by EPD, PATH v2.1 (Pollutants in the Atmosphere and their Transport over Hong Kong), has been adopted to establish the future background air quality for the air quality assessment. It simulates wind field, transportation and chemical transformation and outputs pollutant concentrations over Hong Kong and the PRD region at a find grid size of 1 km. Far-field emission sources including roads, marine, airports, power plants and industries within the PRDEZ and Hong Kong are considered in the PATH model. **Table 7.5** summarises the pollutants concentration data predicted by PATH v2.1 for Year 2025. **Figure 7.1** illustrates the locations of the concerned PATH grids.

Figure 7.1: Location of Concerned PATH Grids

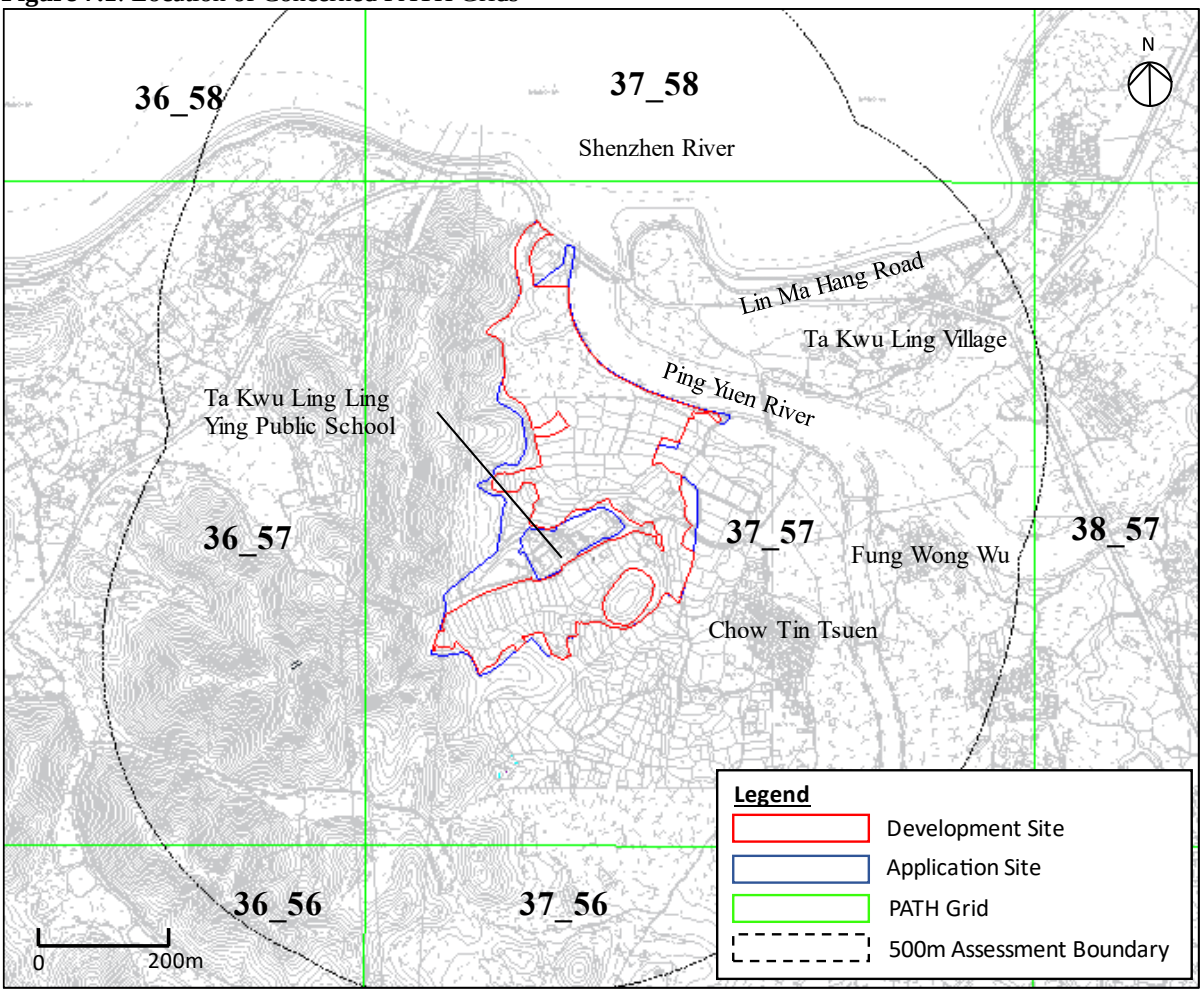


Table 7.5: Future background air quality conditions for concerned PATH grids (Year 2025)

Pollutant	Parameter	Concentrations in various Grids, µg/m³ [6]						AQO, µg/m³ [1]
		36_56	36_57	36_58	37_56	37_57	37_58	
SO_2 [2]	4th highest 10-minute	83	94	120	80	92	116	500 (3)
	4th highest 24-hour	14	18	21	14	15	19	50 (3)
NO_2	19th highest 1-hour	131	134	143	118	123	131	200 (18)
	Annual	14	15	17	13	14	15	40
CO	Max. 1-hour	938	943	953	923	930	944	30,000
	Max. 8-hour	849	850	856	842	845	852	10,000
O_3	10th highest 8-hour	**215**	**213**	**209**	**210**	**208**	**212**	160 (9)
RSP [3]	10th highest 24-hour	70	71	70	70	70	68	100 (9)
	Annual	29	30	29	29	30	29	50
FSP [4]	19th highest 24-hour [5]	41	41	37	41	41	38	50 (35/18) [5]
	36th highest 24-hour	27	28	26	27	28	26	
	Annual	17	17	16	17	17	16	25

Notes:

[1] Number of exceedances allowed against AQOs is shown in ( ).

[2] Values are estimated based on EPD's "Guidelines on the Estimation of 10-minute Average SO_2 Concentration for Air Quality Assessment in Hong Kong.

[3] According to Section 2.8 of EPD's "Guideline on Choices of Models and Model Parameters", adjustment of PATH v2.1's output of RSP concentrations by adding 11.0μg/m^3 and 10.3μg/m^3 into 10th highest daily RSP concentration and annual RSP concentration have been followed respectively.

[4] According to Section 2.8 of EPD's "Guideline on Choices of Models and Model Parameters", adjustment of PATH v2.1's output of FSP concentrations by adding 3.5μg/m^3 into annual FSP concentration have been followed.

[5] A more stringent standard of 24-hour AQO for FSP (i.e. tightening the number of allowable exceedances to 18 days per calendar year) would be adopted for government projects.

[6] Concentrations exceeding the AQOs are shown as **bolded** and underlined characters.

7.2.1.10 It can be seen from the above **Table 7.5** that, with the implementation of the emission reduction measures by both the Hong Kong and Guangdong Governments, future PATH background air quality at Year 2025 (i.e. gridded average) would comply with relevant AQOs except O_3.

7.3 Construction Dust Impact

7.3.1.1 The key construction activities of the Application Site include site clearance of temporary structure, piling works, soil excavation for basement and superstructure, etc. within the site area. Recommended good site practices as stipulated in the Air Pollution Control (Construction Dust) Regulation shall be adopted to minimize construction dust impact, the construction dust is unlikely to cause adverse impact on the sensitive receivers. The locations of the ASRs are shown in **Figure 7.2** and listed in **Table 7.6** below.

Figure 7.2: Locations of nearby ASRs

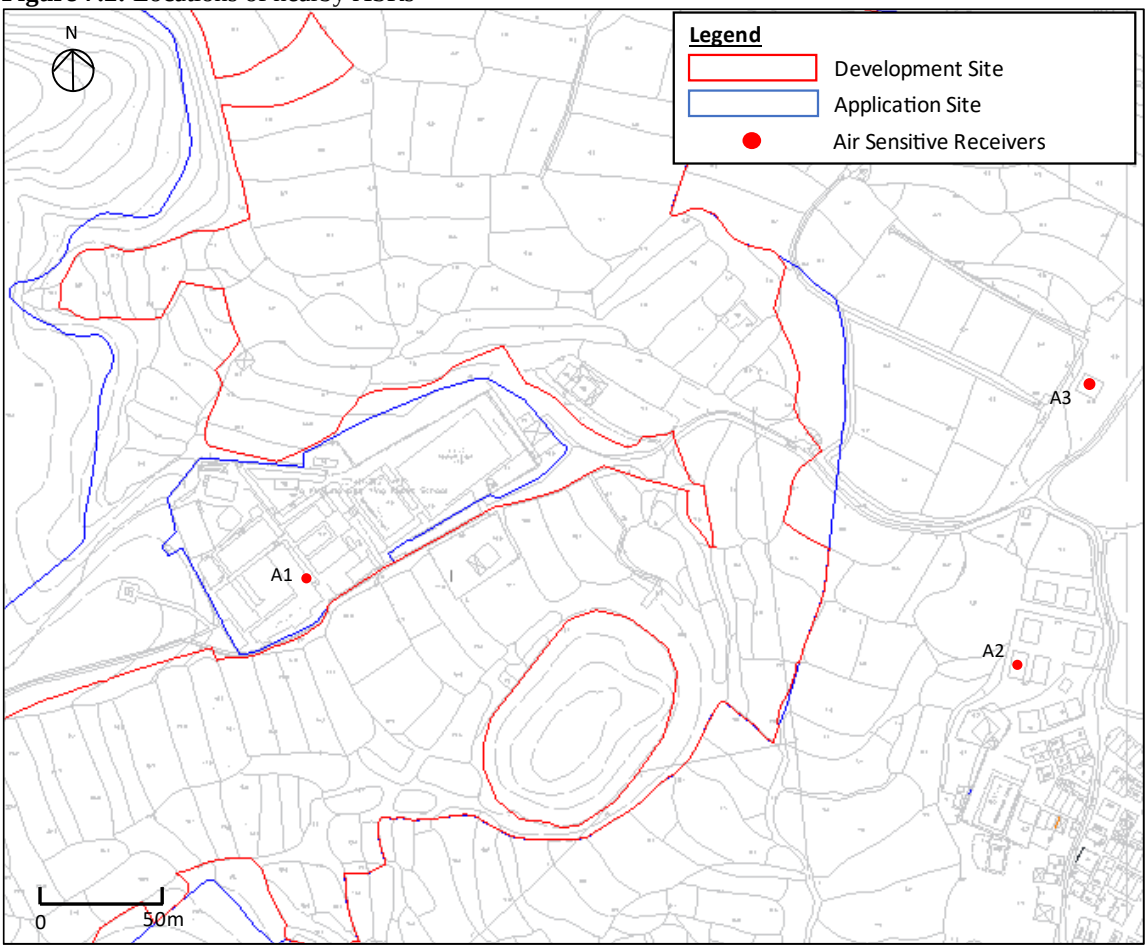


Table 7.6: Horizontal distances between application site boundary and nearby ASRs

No.	ASR	Horizontal distance between application site boundary and nearby ASRs
A1	Ta Kwu Ling Ling Ying Public School	<5m
A2	House 186, Chow Tin Tsuen	80m
A3	Village House near Chow Tin Tsuen	92m

7.3.1.2 Based on the latest available information at the time of preparing this Report, the size of site formation area would be about 102,461m^2. The horizontal separation distance from the nearest ASR identified (i.e. Ta Kwu Ling Ying Public School) is less than 5m. Nevertheless, given the proper implementation of recommended good site practices as stipulated in the Air Pollution Control (Construction Dust) Regulation in place; any potential construction dust impact is expected to be minimized.

7.3.1.3 The Contractor is recommended to follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation. It stipulates the construction dust control requirements for both Notifiable and Regulatory Works to be carried out by the

Contractor. The following dust suppression measures should be incorporated by the Contractor to control the dust nuisance throughout the construction phase:

- Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading;
- Any dusty material remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads;
- A stockpile of dusty material should not extend beyond the pedestrian barriers, fencing or traffic cones;
- The load of dusty materials on vehicles leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle;
- Where practicable, vehicles washing facilities including a high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores;
- When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided as far as practicable along the site boundary with provision for public crossing. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period;
- The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials;
- Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation take place should be sprayed with water or a dust suppression chemical continuously;
- Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet;
- Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding;
- Any skip hoist for material transport should be totally enclosed by impervious sheeting;
- Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the three sides;
- Immediately before leaving a construction site, all vehicles shall be washed to remove any dusty materials from its body and wheels;
- Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed; and

- Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shortcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies.

7.3.1.4 Given that ASR A1 (i.e. Ta Kwu Ling Ling Ying Public School) is located close to the Application Site, the following measures shall be considered near those ASRs during construction phase to further minimize the dust impact:

- 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.

7.3.1.5 Furthermore, guidelines stipulated in EPD's Recommended Pollution Control Clauses for Construction Contracts should also be incorporated in the contract documents to abate dust impacts. The clauses include:

- The Contractor shall observe and comply with the Air Pollution Control Ordinance and its subsidiary regulations, particularly the Air Pollution Control (Open Burning) Regulation, Air Pollution Control (Construction Dust) Regulation , Air Pollution Control (Non-road Mobile Machinery)(Emission) Regulation , Air Pollution Control (Fuel Restriction) Regulation and Air Pollution Control (Smoke) Regulation;
- In addition to the statutory requirements of the Regulations, the Contractor of the public works contracts shall also observe the requirements as set out in the government circulars, including DEVB's TC No, 13/2020 (Timely Application of Temporary Electricity and Water Supply for Public Works Contracts and Wider Use of Electric Vehicles in Public Works Contracts) and DEVB's TC No. 1/2015 (Emissions Control of NRMM in Capital Works Contracts of Public Works);
- The Contractor shall undertake at all times to prevent dust nuisance and smoke as a result of his activities, and minimise the emission of air pollutants from construction plant and equipment;
- The Contractor shall ensure that there will be adequate water supply/storage for dust suppression;
- The Contractor shall devise, arrange methods of working and carrying out the works in such a manner so as to minimise dust impacts on the surrounding environment, and shall provide experienced personnel with suitable training to ensure that these methods are implemented;
- For better smoke control, the Contractor shall not use diesel hammer for percussive piling; and
- Before the commencement of any work, the Engineer may require the methods of working, plant, equipment and air pollution control system to be used on the site to be made available for inspection and approval to ensure that they are suitable for the project.

7.4 Vehicular Emissions

7.4.1.1 Hong Kong Planning Standards and Guidelines (HKPSG) provides environmental guidance for residential developments on air quality. The guidelines recommend the minimum buffer distance required for active and passive recreational uses.

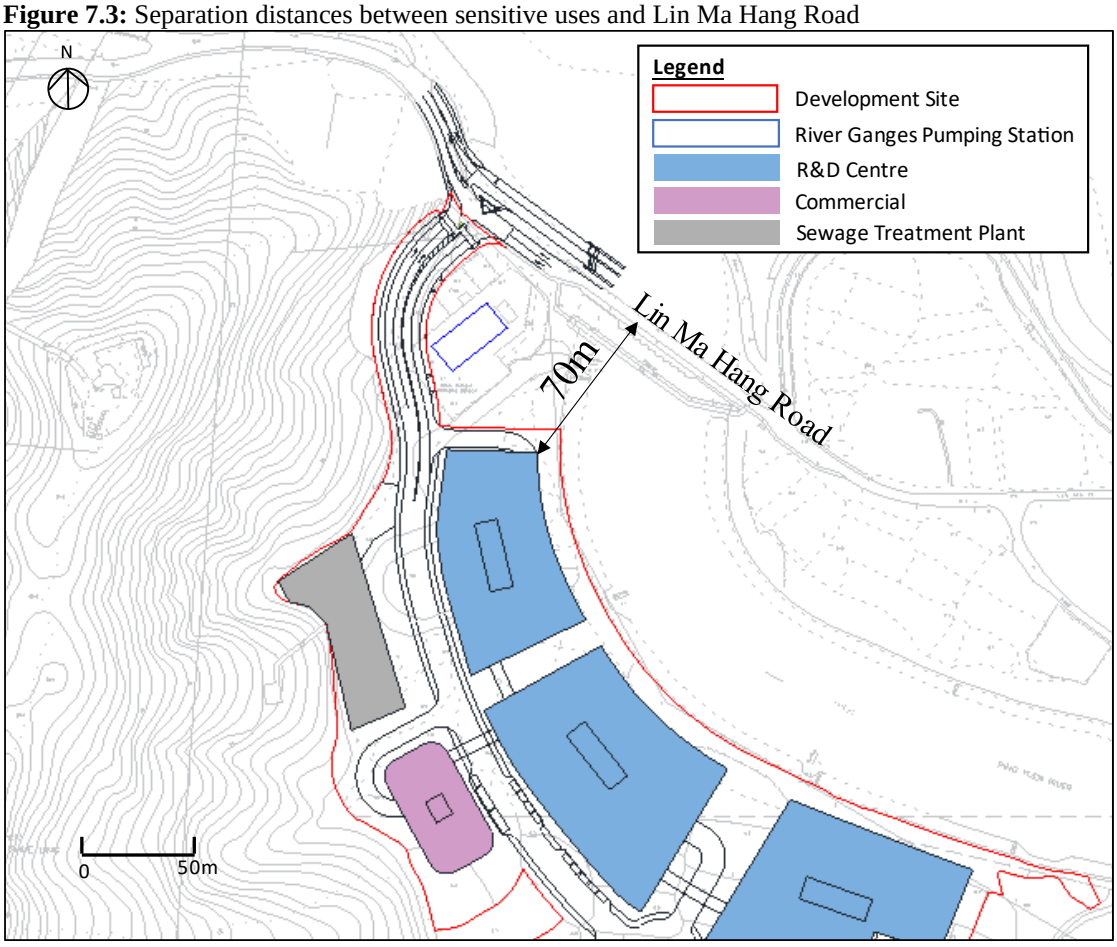
7.4.1.2 The buffer distances between the sensitive uses of the current development scheme and the surrounding major roads are summarized in **Table 7.7** and illustrated in **Figures 7.3** below.

Table 7.7: Separation distances between sensitive uses and nearby major roads

Name of Road	Type of Road	HKPSG Recommended Setback Distance	Shortest Horizontal Setback Distance from the Nearest Air Sensitive Uses to Road Kerb
Lin Ma Hang Road	LD[1]	>5m	~70m

Note:
[1] According to the approved Environmental Impact Assessment (EIA) report (AEIAR-198/2016), the widened Lin Ma Hang Road is a LD - local distributor.

Figure 7.3: Separation distances between sensitive uses and Lin Ma Hang Road



7.4.1.3 The internal road network within the proposed development is private access road with security gate limited the access. Therefore, it is not regard as road system stated in Table 3.1 of the HKPSG and the buffer distance requirement is not applicable.

7.4.1.4 The current scheme can satisfy the setback distance requirements as stipulated in the HKPSG. No sensitive active and passive uses have been planned within the recommended buffer zone of 5m setback from road kerbs of Lin Ma Hang Road. Besides, no pedestrian area (i.e. seating place) have been planned within the recommended buffer zone. Adverse vehicular emission impact on the proposed residential development is therefore not anticipated.

7.5 Chimney Emissions

7.5.1.1 There is no chimney found within 500m of the study area. Besides, there will be no industrial chimney emissions planned within the proposed development. Hence, adverse chimney emission impact on the proposed development is not anticipated.

7.6 Odour Emission Impact

7.6.1.1 The proposed development is located nearby Shen Zhen River, Ping Yuen River and Loufang Sewage Treatment Plant. As stipulated in HKPSG for odour sources, Shen Zhen River and Ping Yuen River are not regarded as an odour source. According to the desktop review, the Loufang Sewage Treatment Plant (STP) is located over 200m from the nearest building of the proposed development. It is observed from aerial photo that most of the facilities within Loufang STP are enclosed. Mitigation measures have also been adopted such as biodegradable deodorized system.

7.6.1.2 Several site visits have conducted between June 2022 and September 2022, no odour smell was perceived at the Application Site. Nevertheless, buildings with central air conditioning (i.e. commercial building) in the development would be installed an odour removal system (i.e. activated carbon filter or selective catalytic filter etc.) to minimize any odour impact caused by odour source if found necessary.

7.6.1.3 The proposed development has proposed a sewage treatment plant (STP) to support the development. According to the current design, the proposed STP would have a designed capacity of 3,200m^3/day ADWF. The major process equipment (including screen and grit removal, and the associated washing facilities) of the proposed STP would be the odour sources to the nearby ASRs during operational phase. Mitigation measures including covering up of the major odour source, providing adequate ventilation, use of active carbon at exhaust and odour removal system, fully enclosure of trucks transporting the sludge, would be provided during operation. In order to avoid potential odour emissions from the decommissioning activities, the existing sewage pumping station and rising main

will be flushed out and sludge will be pumped away before the start of decommissioning works. Hence, potential odour impact to the nearby planned and existing ASRs can be controlled.

7.7 Potential Air Quality Impact Arising from the Proposed TI

7.7.1.1 The proposed TI is fully covered with the ingress/egress and opening at the south-eastern facade. The proposed TI is located in relatively open areas with low-rise surrounding building as recommended in Section 3.3.8 of Chapter 9 of the HKPSG. According to the Technical Schedule of Public Transport Interchange, assessments of the TI will be conducted during its detailed design stage to ensure that the air quality at passenger waiting areas inside a semiconfined TI could meet both the 1-hour and 5-minute average air quality guidelines as stipulated in ProPECC PN 1/98 "Control of Air Pollution in Semi-Confined Public Transport Interchanges". The major considerations for designing and operating a TI to meet these guidelines in the ProPECC PN 1/98 shall be taken as far as practicable, such as TI's layout to minimize the accumulation of air pollutant, location of fresh air inlets to capture fresh air of a quality which is comparable to the ambient background level and be away from any major air pollution sources such as busy roads or polluted air outlets, location of exhaust air outlets to be away from nearby residents or other receptors to avoid causing an air pollutant nuisance. Furthermore, adequate mechanical ventilation and necessary pollution control measures shall be provided to avoid accumulation of aerial emission as required in HKPSG.

7.7.1.2 The TI shall be properly designed to ensure in compliance with the air quality guidelines as stipulated in the Practice Note. Besides, under the Motor Vehicle Idling (Fixed Penalty) Ordinance (the Ordinance) (Cap. 611), the driver of a motor vehicle is prohibited from causing or permitting any internal combustion engine which forms part of a motor vehicle to operate for more than three minutes in aggregate within any continuous sixty-minute period while the vehicle is stationary, unless an exemption applies. Vehicles inside a TI are therefore normally not in idling mode. It is considered that associated vehicular emission generated from the TI is not significant and potential air quality impact arising from TI is not anticipated.

8 Land Contamination Appraisal

8.1 Site Description

8.1.1.1 The Application Site is situated at Man Kam To, New Territories. The site is currently occupied by green belt and village houses. The site is adjacent to the existing Ta Kwu Ling Ling Ying Public School The location of Application Site is indicated in **Figure 2.1**.

8.2 Relevant Legislation, Standard and Guidelines

8.2.1.1 This land contamination appraisal is prepared in accordance with the following Guidance Notes:

- Guidance Manual for Use of Risk-Based Remediation Goals (RBRGs) for Contaminated Land Management, Environmental Protection Department (EPD), 2007 (Revised in April 2023);
- Guidance Note for Contaminated Land Assessment and Remediation, EPD, 2007 (Revised in April 2023); and
- Practice Guide for Investigation and Remediation of Contaminated Land, EPD, 2011 (Revised in April 2023).

8.3 Review of Aerial Photographs and Historical Land Uses

8.3.1.1 Selected historical aerial photographs between 1973 to 2021 (i.e. 1973, 1982, 1991, 2002, 2010 and 2021) have been reviewed to identify any past land uses which may have the potential for causing land contamination. The historical aerial photographs are given in **Appendix 8.1**. The key findings are summarised in **Table 8.1** below.

Table 8.1: Description of historical land uses

Year	Description
1973	• The Application Site was filled with agricultural land and green belt. • Ping Yuen River was observed to the northeast of the Application Site. • Chow Tin Tsuen was observed to the southeast of the Application Site. • Ta Kwu Ling Ling Ying Public School was observed to the west of the Application Site.
1982	• River Ganges Pumping Station was observed to the northeast of the Application Site. • Village house was observed in the south of the Application Site. • No other significant change in historical land use was observed as compared with that in Year 1973.
1991	• Some agricultural land in the south of the Application Site was replaced by green belt. • No other significant change in historical land use was observed as compared with

Year	Description
	that in Year 1982.
2002	• Some agricultural land in the north of the Application Site was replaced by green belt. • No other significant change in historical land use was observed as compared with that in Year 1991.
2010	• No significant change in historical land use was observed as compared with that in Year 2002.
2022	• Some agricultural land in the northeast of the Application Site was replaced by green belt and vacant land. • No other significant change in historical land use was observed as compared with that in Year 2010.

8.4 Site Survey Findings

8.4.1.1 Site survey was conducted in June 2022 to identify any existing land uses within the Application Site and the adjoining sites which may have potential for causing land contamination. Photo record of the site survey is given in **Appendix 8.2** and the site walkover checklist is given in **Appendix 8.3**. Green belt and scattered village houses and were observed within the Application Site. Ta Kwu Ling Ling Ying Public School and River Ganges Pumping Station is observed adjacent to the Application site. Ping Yuen River is observed to the northeast of the Application Site. Potential land contamination activities were not identified. By site observation, chemicals and dangerous goods (DGs) were not found within the site. No potential land contamination issue was observed during the site visits.

8.5 Relevant Information Request

8.5.1 Fire Services Department

8.5.1.1 Information request on any Dangerous Goods (DGs) license registered, and any record of DGs spillage/leakage incidents within the Application Site have been sent to FSD. The correspondence with FSD is attached in **Appendix 8.4**.

8.5.1.2 Based on the reply from FSD, there is no Dangerous Goods Licence was issued in the Application Site. A total of one incident record was found as vegetation fire, which would not cause land contamination.

8.5.2 Environmental Protection Department

8.5.2.1 Information request on any Chemical Waste Producer (CWP) registered, and any record of chemical spillage/leakage incidents within the Application Site were made to EPD. The correspondence with EPD is attached in **Appendix 8.5**.

8.5.2.2 Based on the reply from EPD, there was no record of reported accident spillage or leakage of chemicals in the past five years. The registration record of chemical waste producer has also been reviewed at the Territory Control Office of EPD on 14 July 2022. No valid and invalid registration record of chemical waste producer was found.

8.6 Identification of Potentially Contaminated Site

8.6.1.1 Review of desktop data and site visits have been conducted. In addition, as confirmed through site visits, potentially land contamination activities not observed within the Application Site. Chemicals/DGs and relevant spillages/incidents were not found within the Application Site. It is therefore concluded that land contamination is not anticipated in the Application Site.

9 Waste Management

9.1 Relevant Legislation, Standard and Guidelines

9.1.1.1 The relevant legislation, standards and guidelines applicable to the study for the assessment of waste management implications include:

- Criteria and guidelines for evaluating and assessing waste management implications as specified in Annexes 7 and 15 of the Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM);
- Waste Disposal Ordinance (WDO) (Cap. 354) and subsidiary Regulations;
- Land (Miscellaneous Provisions) Ordinance (Cap. 28);
- Public Health and Municipal Services Ordinance (Cap. 132) – Public Cleansing and Prevention of Nuisances Regulation; and
- Works Bureau Technical Circular (WBTC) No. 12/2000 Fill Management.

9.1.1.2 The following documents and guidelines in **Table 9.1** are also related to waste management and disposal

Table 9.1 Other Relevant Documents and Information

Bureau / Department	Documents / Guidelines / Technical Circulars
Development Bureau	• WBTC No. 2/93, Public Dumps • WBTC No 2/93B, Public Filling Facilities • WBTC No. 16/96, Wet Soil in Public Dumps • WBTC Nos. 4/98 and 4/98A, Use of Public Fill in Reclamation and Earth Filling Project • WBTC No. 19/2001, Metallic Site Hoardings and Signboards • WBTC No. 12/2002, Specification Facilitating the Use of Recycled Aggregates • DEVB TCW No. 06/2010, Trip-ticket System for Disposal of Construction and Demolition Material • DEVB TCW No. 08/2010, Enhanced Specification for Site Cleanliness and Tidiness • DEVB TCW No. 09/2011, Enhanced Control Measures for Management of Public Fill • ETWB TCW No. 19/2005, Environmental Management on Construction Sites • ETWB TC(W) No. 33/2002 – Management of Construction and Demolition Material Including Rock
Buildings Department	• ADV-19, Practice Note for Authorized Persons and Registered Structural Engineers on Construction and Demolition Waste

Bureau / Department	Documents / Guidelines / Technical Circulars
CEDD	• Project Administration Handbook for Civil Engineering Works in 2022, Management of C&D Materials • CEDD TC No. 11/2019, Management of Construction and Demolition Materials
Environmental Protection Department	• A Guide to the Chemical Waste Control Scheme • A Guide to the Registration of Chemical Waste Producers • Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes • Monitoring of Solid Waste in Hong Kong 2022

9.2 Identification and Evaluation of Impact

9.2.1.1 During the construction phase, key construction activities which would potentially result in the generation of waste include minor site clearance including any temporary structure, piling works, soil excavation for basement and superstructure, etc. within the site area. These activities would result in the generation of wastes including both inert and non-inert construction and demolition (C&D) materials, chemical wastes and general refuse from on-site workforce. Based on the preliminary design, it is estimated that about 580,000m^3 of inert soft C&D materials (e.g. excavated soil, demolition C&D materials) and 18,117m^3 of non-inert C&D materials will be generated during the construction phase of the site clearance and site formation works. Measures, such as the opportunity for on-site sorting, reusing C&D materials etc., are recommended to minimize materials to be disposed. Alternatives should also be explored which generate minimal amount of waste through design modifications and programming of works at design stage. According to Section 4.1.3 of the Project Administrative Handbook for Civil Engineering Works (2023 Edition) published by CEDD, a Construction and Demolition Material Management Plan (C&DMMP) at the feasibility study or preliminary design stage should be drawn up for project generates more than 50,000 m^3 of C&D materials to minimise C&D materials generation and encourage proper management of such materials. Prior to the commencement of the construction works, the Contractor should incorporate these recommendations into a Waste Management Plan to provide an overall framework for waste management and reduction. Recommendations have been made for implementation by the Contractor during the construction period to minimize waste generation and off-site disposal. With the implementation of the recommended measures, adverse waste management implications are not anticipated.

9.2.1.2 The operational phase of the proposed development would generate municipal solid waste which comprises of solid waste from households, commercial and industrial sources. With reference to the latest data from “Monitoring of Solid Waste in Hong Kong 2022” by EPD, the MSW disposal rate was 1.51 kg/person/day in Year 2022, and the recovery rate for

recycling was 32% of the MSW generation. The estimated MSW based on planned residential and employment populations respectively is summarized in **Table 9.2**.

Table 9.2 Estimated quantities of MSW from planned Residential and Employment Population during operation phase

Estimated MSW from Residential Population (tpd)[1]				**Estimated MSW from Employment Population (tpd)[1]**			
Residential Population	Generated [2]	Required Disposal [2]	Recycled [2]	Employment Population	Generated [2]	Required Disposal [2]	Recycled [2]
10,022	22.2	15.1	7.1	6,207	13.8	9.4	4.4

Note:
[1] tpd: tonne per day
[2] MSW disposal rate was 1.51 kg/person/day according to "Monitoring of Solid Waste in Hong Kong 2022" by EPD (https://www.wastereduction.gov.hk/sites/default/files/msw2022.pdf). By calculation, the MSW generation rate was 2.22kg/person/day. MSW recovery rate for recycling was 32% of the MSW generation. by calculation, the MSW recycling rate was 0.71kg/person/day.

9.2.1.3 A reputable waste collector should be employed to provide routine cleaning of the proposed development to minimize odour, pest and litter impacts associated with the generation of general refuse. Recycling bins should also be provided to encourage recycling. With the implementation of the recommended mitigation measures for the handling, transportation and disposal of the identified waste, adverse residual waste management implications are not anticipated for the operational phase.

9.2.1.4 R&D buildings is planned within the proposed development and it is expected that chemical waste may be produced from the laboratories of these R&D premises during the operation phase. However, it is anticipated that the total quantity of chemical waste such as acids, alkalis and organic solvent produced by the laboratories would be insignificant. Nonetheless, to minimise potential environmental hazard due to waste handling, localized chemical waste storage areas should be located close to the source of waste generation for temporary storage. Drum-type containers with proper labelling should be used to collect chemical wastes for storage at the designated areas. Registration as chemical waste producers with EPD should be made by representatives of the school and R&D premises prior to operation. All chemical wastes generated should be dealt with according to the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes under the provisions of the Waste Disposal (Chemical Waste) (General) Regulation.

9.2.1.5 Screening and grits and dewater sludge will be generated from the operation of the on-site STP. It is estimated that approximate 1.12m^3 per week of screening and grits and around 196m^3 per week of dewatered sludge would be generated during the operation phase of the project. Screening and grits generated will be transferred to closed containers before

transportation and disposal at designated landfill sites. The collected dewater sludge shall be transported to the nearby public sewage treatment plants where anaerobic digestion systems are in place for energy recovery and waste reduction by designated sewage tankers for disposal. Disposal in landfills should be considered as a last resort.

9.2.1.6 Given that the Application Site is still under planning stage, detailed waste quantity estimation is not available. Nevertheless, with all these wastes are handled, transported and disposed of in accordance with the relevant legislative requirements and the recommended mitigation measures are properly implemented, adverse waste management implications during construction phase and operational phase are not anticipated.

10 Water Quality Impact

10.1 Description of the Environment

10.1.1.1 The Application Site falls within the Deep Bay WCZ and is located on the south of Shenzhen River and Ping Yuen River. Water quality impacts on Ping Yuen River may be anticipated. The Application Site is located inland, therefore water quality impact to coastal water is not anticipated.

10.1.1.2 According to the River Water Quality in Hong Kong in 2022 published by EPD, the water quality of River Ganges **(**Ping Yuen River) obtained an overall WQO compliance of 82% in 2022. The Water Quality Index (WQI) grading of the upstream monitoring station (GR3) was "Excellent", while both mid-stream station (GR2) and downstream station (GR1) remained "Fair". Detailed river water quality monitoring data for **GR1, GR2, GR3** of year 2022 are presented in **Table 10.1**.

Table 10.1: Summary of the EPD's Routine River Water Quality Data for River Ganges in 2022

Parameters	**River Ganges** [1][2][3][4][5]		
	GR1	**GR2**	**GR3**
Dissolved Oxygen (mg/L)	8.7	6.0	7.4
	(6.6 – 12.1)	(4.6 – 6.6)	(6.4 – 8.1)
pH	7. 4	7.1	7.1
	(7.2 - 8.1)	(6.9 - 7.3)	(6.7 - 7.3)
Suspended Solids (mg/L)	10.3	14.0	18.0
	(3.9 - 29.0)	(3.2 - 40.0)	(4.1 - 180.0)
5-Day Biochemical Oxygen Demand (mg/L)	5.2	3.1	1.2
	(2.6 – 16.0)	(2.2 - 12.0)	(0.3 – 3.2)
Chemical Oxygen Demand (mg/L)	19	17	6
	(9 - 31)	(10 - 58)	(3 -12)
Oil & Grease (mg/L)	<0.5	<0.5	<0.5
	(<0.5 - <0.5)	(<0.5 - <0.5)	(<0.5 - <0.5)
***E. coli* (counts/100ml)**	5 300	7 100	840
	(500 - 28 000)	(1 200 - 12 000)	(150 - 3 400)
Faecal Coliforms (counts/100mL)	23 000	19 000	8 800
	(1 100 – 2 300 000)	(3 000 - 170 000)	(1400 - 60 000)
Ammonia Nitrogen (mg/L)	4.450	4000	0.100
	(0.590 – 14.000)	(0.250 – 16.000)	(0.015 – 8.100)
Nitrate Nitrogen (mg/L)	1.100	0.850	0.180
	(0.380 – 1.800)	(0.130 – 1.500)	(0.099 - 0.420)
Total Kjeldahl Nitrogen (mg/L)	5.45	6.50	0.43
	(1.20 - 16.00)	(0.93 - 18.00)	(0.14 - 11.00)
Orthophosphate Phosphorous (mg/L)	0.305	0.190	0.003
	(0.160 – 1.200)	(0.019 - 0.290)	(<0.002 - 0.140)

Parameters	River Ganges [1][2][3][4][5]		
	GR1	GR2	GR3
Total Phosphorous (mg/L)	0.58	0.53	0.03
	(0.38 – 1.90)	(0.37 - 0.93)	(<0.02 - 0.19)
Sulphide (mg/L)	<0.02	<0.02	<0.02
	(<0.02 - 0.02)	(<0.02 - <0.02)	(<0.02 - <0.02)
Aluminium (µg/L)	<50	<50	<50
	(<50 - <50)	(<50 - <50)	(<50 - <50)
Cadmium (µg/L)	<0.1	<0.1	<0.1
	(<0.1 - <0.1)	(<0.1 - <0.1)	(<0.1 - <0.1)
Chromium (µg/L)	<1	<1	<1
	(<1 - 1)	(<1 - <1)	(<1 - <1)
Copper (µg/L)	2	<1	<1
	(<1 - 6)	(<1 - 5)	(<1 - 1)
Lead (µg/L)	<1	<1	<1
	(<1 - <1)	(<1 - <1)	(<1 - 1)
Zinc (µg/L)	<10	<10	<10
	(<10 - 17)	(<10 - 20)	(<10 - 18)
Flow (m^3/s)	0.078	0.182	0.023
	(0.009 – 0.218)	(0.024 - 1.056)	(0.004 - 0.103)

Notes:
[1] Data presented are in annual medians of monthly samples; except those for faecal coliforms and *E. coli* which are in annual geometric means.
[2] Figures in brackets are annual ranges.
[3] NM indicates no measurement taken.
[4] Values at or below laboratory report limits are presented as laboratory reporting limits.
[5] Equal values for annual medians (or geometric means) and ranges indicate that all data are the same as or below reporting limits.

10.2 Water Sensitive Receivers

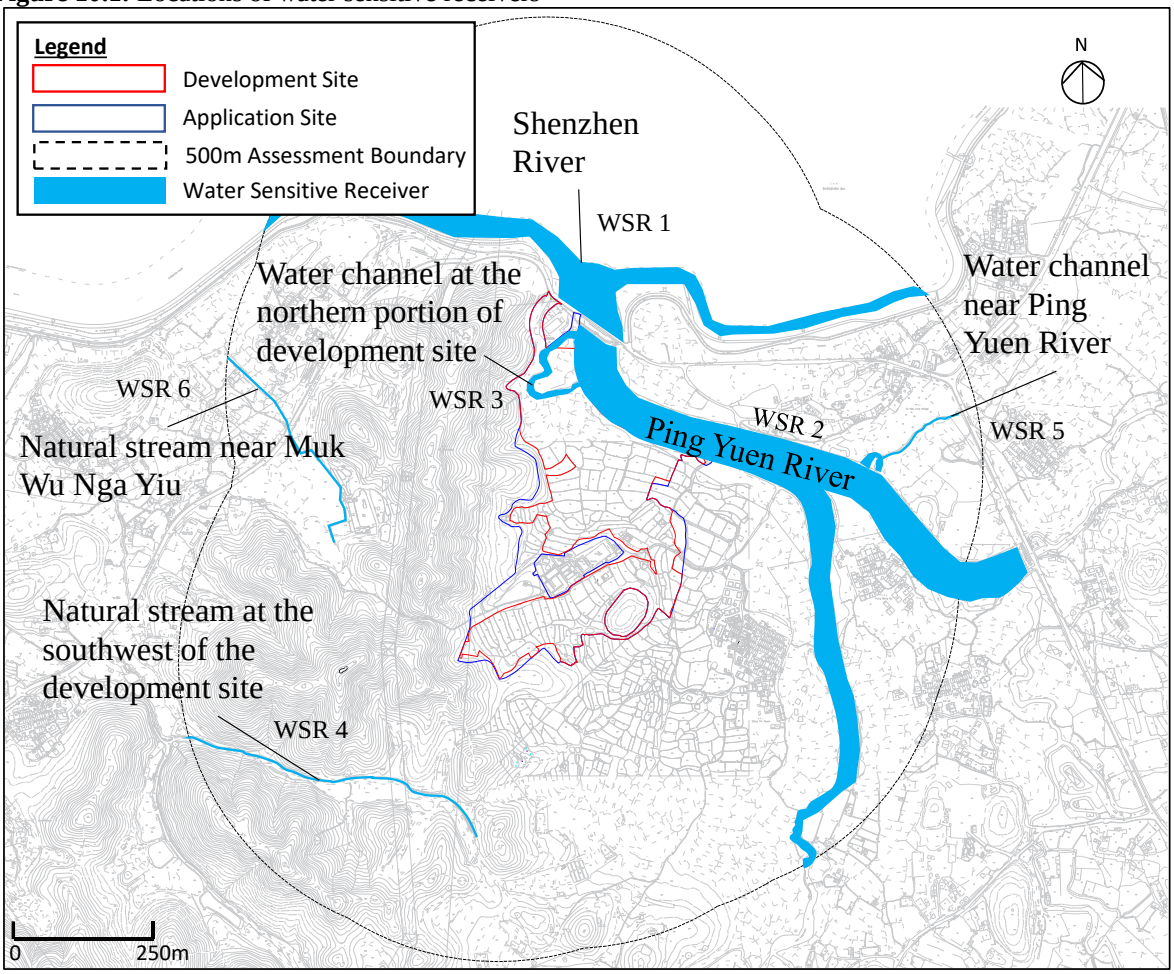
10.2.1.1 There are several Water Sensitive Receivers (WSRs) identified within 500m from the Application Site. These WSRs are listed in **Table 10.2** and presented in **Figure 10.1**.

Table 10.2: Water sensitive receivers

ID	WSRs	Status	Approx. Nearest Distance of WSR to the Application Site
WSR 1	Shenzhen River	Watercourse	20m
WSR 2	Ping Yuen River	Perennial Channelized Watercourse	<10m
WSR 3	Water channel at the northern portion of application site	Water Channel	Within Application Site
WSR 4	Natural stream at the southwest of the development	Water Channel	230m

ID	WSRs	Status	Approx. Nearest Distance of WSR to the Application Site
	site		
WSR 5	Water channel near Ping Yuen River	Water Channel	370m
WSR 6	Natural stream near Muk Wu Nga Yiu	Watercourse	300m

Figure 10.1: Locations of water sensitive receivers



10.3 Construction Phase Impact Evaluation

10.3.1 Construction Site Runoff

10.3.1.1 During rainstorm events, construction site runoff would come from all over the works site. The surface runoff might be polluted by:

- Runoff and erosion from site surfaces, earth working areas and stockpiles;
- Wash water from dust suppression sprays and wheel washing facilities; and
- Chemicals spillage such as fuel, oil, solvents and lubricants from maintenance of construction machinery and equipment.

10.3.1.2 Construction runoff may cause physical, biological and chemical effects. The physical effects include potential blockage of drainage channels and increase of suspended solid levels in the receiving water bodies. Runoff containing significant amounts of concrete and cement–derived material may cause primary chemical effects such as increasing turbidity and discoloration, elevation in pH, and accretion of solids. A number of secondary effects may also result in toxic effects to water biota due to elevated pH values, and reduced decay rates of faecal microorganisms and photosynthetic rate due to the decreased light penetration.

10.3.1.3 Construction site runoff could be carefully controlled and mitigated through the recommended mitigation measures outlined in **Section 10.4**. Construction site runoff impacts would therefore be reduced to satisfactory levels before discharges such that adverse water quality impact would not be anticipated.

10.3.2 Sewage from Workforce

10.3.2.1 Sewage effluents will arise from the sanitary facilities provided for the on–site construction workforce. The sewage is characterized by high levels of biochemical oxygen demand (BOD), ammonia, E. coli and oil / grease.

10.3.2.2 The sewage generated should be properly managed to minimize the adverse impact of odour and potential health risks to the workers by attracting pests and other disease vectors.

10.3.2.3 Adequate portable chemical toilets should be provided to ensure all sewage is properly collected. It is anticipated that no adverse environmental implications would arise if the chemical toilets are properly maintained and licensed collectors are employed for the collection and disposal of sewage on a regular basis.

10.3.3 Alteration of Watercourses

10.3.3.1 Watercourses are running close and within the proposed development. Due to close proximity to the proposed development, the streams would unavoidably be affected. Therefore, watercourses in the directly upstream of the proposed development would be diverted to the existing downstream drainage system via proposed drainage channels or box culverts. Watercourses within the proposed development would be replaced by a proposed local drainage system that connects to the existing downstream drainage system. Details shall be referred to the separated Drainage Impact Assessment and Sewerage Impact Assessment.

10.4 Recommended Mitigation Measures for Construction Phase

10.4.1 Construction Site Runoff

10.4.1.1 In accordance with the Practice Note for Professional Persons on Construction Site Drainage, EPD, 2023 (ProPECC PN 2/23), the proposed construction phase mitigation measures is given below.

- At the start of site establishment, perimeter cut–off drains to direct off–site water around the site should be constructed with internal drainage works and erosion and sedimentation control facilities implemented. Channels (both temporary and permanent drainage pipes and culverts), earth bunds or sand bag barriers should be provided on site to direct storm water to silt removal facilities. The design of the temporary on–site drainage system will be undertaken by the contractor prior to the commencement of construction.
- Diversion of natural storm water should be provided as far as possible. The design of temporary on–site drainage should prevent runoff going through site surface, construction machinery and equipment in order to avoid or minimize polluted runoff. Sedimentation tanks with sufficient capacity, constructed from pre–formed individual cells of approximately 6 to 8m^3 capacities, are recommended as a general mitigation measure which can be used for settling surface runoff prior to disposal. The system capacity shall be flexible and able to handle multiple inputs from a variety of sources and suited to applications where the influent is pumped.
- The dikes or embankments for flood protection should be implemented around the boundaries of earthwork areas. Temporary ditches should be provided to facilitate the runoff discharge into an appropriate watercourse, through a silt/sediment trap. The silt/sediment traps should be incorporated in the permanent drainage channels to enhance deposition rates.
- The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC PN 2/23. The detailed design of the sand/silt traps should be undertaken by the contractor prior to the commencement of construction.
- Construction works should be programmed to minimize surface excavation works during the rainy seasons (April to September). All exposed earth areas should be completed and vegetated as soon as possible after earthworks have been completed. If excavation of soil cannot be avoided during the rainy season, or at any time of year when rainstorms are likely, exposed slope surfaces should be covered by tarpaulin or other means.
- All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly following rainstorms. Deposited silt and grit should be removed regularly and disposed of by spreading evenly over stable, vegetated areas.
- Measures should be taken to minimise the ingress of site drainage into excavations. If the excavation of trenches in wet periods is necessary, it should be dug and backfilled in short sections wherever practicable. Water pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities.
- All open stockpiles of construction materials (for example, aggregates, sand and fill material) of more than 50m^3 should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system.

- Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being directed into foul sewers.
- Precautions should be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecasted, and actions to be taken during or after rainstorms are summarised in Appendix A2 of ProPECC PN 2/23. Particular attention should be paid to the control of silty surface runoff during storm events.
- All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facilities should be provided at every construction site exit where practicable. Wash–water should have sand and silt settled out and removed at least on a weekly basis to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel–wash bay to the public road should be paved with sufficient back fall toward the wheel–wash bay to prevent vehicle tracking of soil and silty water to public roads and drains.
- Oil interceptors should be provided in the drainage system downstream of any oil/fuel pollution sources. The oil interceptors should be emptied and cleaned regularly to prevent the release of oil and grease into the storm water drainage system after accidental spillage. A bypass should be provided for the oil interceptors to prevent flushing during heavy rain.
- Construction solid waste, debris and rubbish on site should be collected, handled and disposed of properly to avoid water quality impacts.
- All fuel tanks and storage areas should be provided with locks and sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank to prevent spilled fuel oils from reaching water sensitive receivers nearby.

10.4.1.2 By adopting the above mitigation measures with best management practices, it is anticipated that the impacts of construction site runoff from the construction site will be reduced to satisfactory levels before discharges. The details of best management practices will be highly dependent to actual site condition and the Contractor shall apply for a discharge license under WPCO.

10.4.2 Sewage from Workforce

10.4.2.1 Portable chemical toilets and sewage holding tanks should be provided for handling the construction sewage generated by the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets to cater employed populations and be responsible for appropriate disposal and maintenance.

10.4.2.2 Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment during the construction phase. Regular environmental audit on the construction site should be conducted in order to provide an effective control of any malpractices and achieve continual improvement of environmental performance on site.

10.4.3 Alteration of Watercourses

10.4.3.1 Prior to the proposed diversion of the watercourses, it is recommended that the channel shall be constructed and implemented in advance. The watercourses should remain undisturbed during construction of the channel. The site formation and associated infrastructure work within the site can only be commenced after the diversion works. Therefore, adverse impacts are not anticipated due to the alteration of these watercourses.

10.4.3.2 Good site practices as described in ETWB TC (Works) No. 5/2005 "Protection of natural streams / rivers from adverse impacts arising from construction works" and ProPECC PN 2/23 "Construction Site Drainage" should be adopted where applicable. The following major measures shall be implemented:

- Cofferdams and impermeable sheet piles should be installed as appropriate to isolate the water flow from the construction works area.
- Dewatering or flow diversion shall be conducted prior to the construction works to prevent water overflow to the surrounding area.
- Watercourse removal and flow diversion should be conducted in dry season as far as practicable when the water flow is low.
- Water drained from the watercourse shall be diverted to new/ temporary drainage for watercourse diversion. For watercourse removal, the water drained shall be collected and treated to meet the requirements of WPCO and TM-DSS before discharge.
- Any excavated land-based sediment from the removal/ diversion of watercourse shall be properly stored at bunded areas away from any watercourse and covered with tarpaulin before transporting out of the site.

10.5 Operational Phase Impact Evaluation and Recommended Mitigation Measures

10.5.1 Runoff from the Development

10.5.1.1 The proposed development will lead to an increase in area of impermeable surfaces and hence the peak surface runoff rates. Besides, vehicle dust, tyre scraps and oils might be washed away from the road surface to the nearby water courses by surface runoff or road surface cleaning. Subject to detailed design and requirement of relevant government departments, the capacities of road drainage system shall cater the runoff from 50 year-return-period rainstorm. Proper drainage systems with silt traps and oil interceptors should be installed and connected to the existing drainage system. The design of road gullies with silt traps should be incorporated in the detailed design stage.

10.5.1.2 Runoff will be controlled by best management practice. Runoff will be intercepted by properly designed and managed silt traps at appropriate spacings so that common roadside debris, refuse and fallen leaves etc. can be captured before allowing the runoff to drain into watercourses. At the outlets to watercourses, the Project Proponent or the delegated

operation parties should manage the road/open area cleaning prior to the occurrence of a storm. Moreover, it is recommended each of the cleaning events should be carried out during low traffic flow period, preferably using either manual methods or mechanical means such as vacuum sweeper/truck equipped with side broom to sweep road sludge and debris into the suction nozzle to increase the removal efficiency of pollutants. The collected pollutants would be tankered away for off-site disposal at landfill sites. After the removal of the pollutants, the pollution levels from stormwater would be much reduced.

10.5.1.3 The Professional Persons Environmental Consultative Committee Practice Note 1/23 Drainage Plans subject to Comment by the Environmental Protection Department (ProPECC PN 1/23), also provides guidelines and practices for handling, treatment and disposal of various effluent discharges to stormwater drains and foul sewers. The design of site drainage and disposal of site effluents generated within the proposed development area should follow the relevant guidelines and practices as given in the ProPECC PN 1/23.

10.5.2 Sewage from the Development

10.5.2.1 As mentioned above, the proposed development will be properly sewered and adverse water quality impact is not anticipated. A separate Sewerage Impact Assessment has been conducted to assess the impact of sewage generation as a result of the proposed development. Details of mitigation measures, if necessary, shall be referred to the Sewerage Impact Assessment.

10.5.2.2 Sewage generated from the Application Site would be conveyed by the internal sewerage system to the onsite STP for treatment. The discharge of wastewater generated from the water features of the developments as well as the proposed outdoor swimming pool located in the club house would also be conveyed to the proposed sewerage system for treatment. Tertiary STP adopting Membrane Bioreactor (MBR) Technology with ultra-filtration is recommended as the treatment process of the proposed STP. It requires smaller footprint and generates high quality effluent to meet the discharge requirements. The treated sewage would be discharge to Ping Yuen River. Hence, no adverse water quality impact is anticipated during normal operations.

10.5.2.3 Contingency measures including standby power supply, alarms and storage tank shall be allowed to prevent discharge of treated or untreated sewage effluent in emergency situation (e.g. pump failure, electricity cut off, pipe bursting, etc). Contingency measures shall be documented in a contingency plan to be prepared by the operator of the STP. The contingency plan shall cover situations when the STP is out of service, and shall be implemented throughout operation of the onsite STP.

11 Conclusion

11.1.1.1 An Environmental Assessment Study has been conducted to support the Section 12A Planning Application for Proposed Innovation and Technology Hub at Various Lots in D.D.82 and D.D. 86 and Adjoining Government Land, Man Kam To, New Territories.

11.1.1.2 The recommendations stipulated in HKPSG have been fully considered and adopted in the current design of the development. In consideration of the large separation distance and screening from buildings, adverse road traffic noise impact on the proposed development is not anticipated.

11.1.1.3 Two potential fixed noise sources, including the existing pumping station and Ta Ku Ling Ling Ying Public School have been identified within 300m assessment area of the proposed residential blocks, and ancillary dormitories. Based on site inspection, no noticeable fixed noise was perceived at the boundary of these potential fixed noise sources. Given the reason above, potential fixed noise impact on the noise sensitive uses of the proposed development is not anticipated.

11.1.1.4 For the planned fixed plant noise source on the facades and rooftops of the proposed I&T Hub, the maximum permissible total SWLs have been derived. By adopting the maximum permissible SWLs and proper mitigation measures, adverse noise impact from the planned fixed plant noise sources during operational phase is not anticipated.

11.1.1.5 A transport terminus TI is proposed within the development. The TI will be designed with no line of sight to the receivers in the proximity. Potential noise nuisances arising from the TI is not anticipated.

11.1.1.6 During the construction phase, adverse construction noise impact can be well controlled by following the good site practices recommended, such as use of QPME and movable noise barriers.

11.1.1.7 Potential dust impact would be generated from the construction activities during the construction phase. Adverse dust impact is not anticipated with the implementation of the recommended dust control measure and good site practices.

11.1.1.8 The current design scheme has allowed sufficient setback from the surrounding roads to meet the minimum requirement as stipulated in the HKPSG. Hence potential vehicular emission impact is not anticipated.

11.1.1.9 Based on the site surveys, no chimney is identified within 500m of the Application Site. Hence, adverse air quality impact due to chimney emission is not anticipated.

11.1.1.10 With the implementation of proper ventilation, deodourising and exhaust system, no adverse odourous impacts is anticipated from the proposed STP.

11.1.1.11 The TI will be designed to ensure the compliance with air quality guidelines in the ProPECC. By adopting the design considerations as stipulated in the ProPECC, potential air quality impacts arising from the operation of the TI are not anticipated.

11.1.1.12 A preliminary land contamination site appraisal through desktop review and site survey has been conducted to review any past and existing land uses within and adjoining the Application Site. It is found that there is no potential of land contamination within and adjoining the Application Site.

11.1.1.13 For waste management, implications due to construction and operational phases are not anticipated provided good practices are in place.

11.1.1.14 For water quality, adverse impacts due to construction and operational phases are not anticipated, given mitigation measures and proper connection with public drainage and sewerage network should be maintained.

11.1.1.15 It is concluded that there are no insurmountable environmental impacts on the proposed Innovation and Technology Hub at Various Lots in D.D.82 and D.D. 86 and Adjoining Government Land, Man Kam To, New Territories.

Appendix 2.1

Master Layout Plan and Typical Floor Plan

LEGEND

- APPLICATION SITE BOUNDARY
- DEVELOPMENT SITE BOUNDARY
- SITE FORMATION LEVEL
- SITE RUN-IN/OUT
- ACCESS TO BASEMENT CARPARK
- R&D CENTRE
- DATA CENTRE
- RESIDENTIAL
- COMMERCIAL
- ANCILLARY DORMITORIES
- CLUBHOUSE
- LANDSCAPE AREA
- SEWAGE TREATMENT PLANT
- PROMENADE

N

PROPOSED FOOTBRIDGE

R 1 32 storeys ◆120mPD
R 2 31 storeys ◆120mPD
R 3 31 storeys ◆120mPD
R 4 32 storeys ◆120mPD
R 5 33 storeys ◆120mPD
CH 1 4 storeys ◆34.7mPD
Existing School
AD 1 31 storeys ◆110mPD
KINDERGARTEN 1 storey ◆15.5mPD
AD 2 31 storeys ◆110mPD
AD 3 32 storeys ◆110mPD
FUNG SHUI WOODLAND
DC 1 12 storeys ◆80mPD
DC 2 12 storeys ◆80mPD
DC 3 12 storeys ◆80mPD
C 1 6 storeys ◆37mPD
STP 2 storeys ◆17mPD
R&D 1 16 storeys ◆90mPD
R&D 2 16 storeys ◆90mPD (Transport Interchange on the ground floor)
R&D 3 16 storeys ◆90mPD
EVA

ACCESS ROAD TO EXISTING SCHOOL
DRIVEWAY / EVA
PROPOSED FOOTBRIDGE
10M PROMENADE
EXISTING PUMPING STATION

Deloitte. 德勤

WCWP International Limited
11/F Skyway House, 3 Sham Mong Road, Hong Kong
T +852 2893 3000 wcwp@deloitte.com.hk

Rev.	Date	Description

Notes
1. Do not scale drawings. Dimensions govern.
2. Verify dimensions in field. Notify WCWP of discrepancies.
3. Dimensions in mm unless otherwise noted.
4. Not for construction unless expressly certified.

Key Plan

Client
Hong Kong International Innovation Tech Hub

Consultants

Issue
Planning Application

BD Ref: BD 2/9188/10 (PT. II)
FSD Ref: FP 8/9584/VII <131>

Authorized Person

Project
The Nexus

Project Number: 20027
Date: 20230629
Scale: 1:3000 at A3
Drawn/Approved: CL/TL

Title
Master Layout Plan

Number: MLP-001
Revision: -

LEGEND

APPLICATION SITE BOUNDARY

DEVELOPMENT SITE BOUNDARY

STUDIO (26sqm)

1 BEDROOM (33sqm)

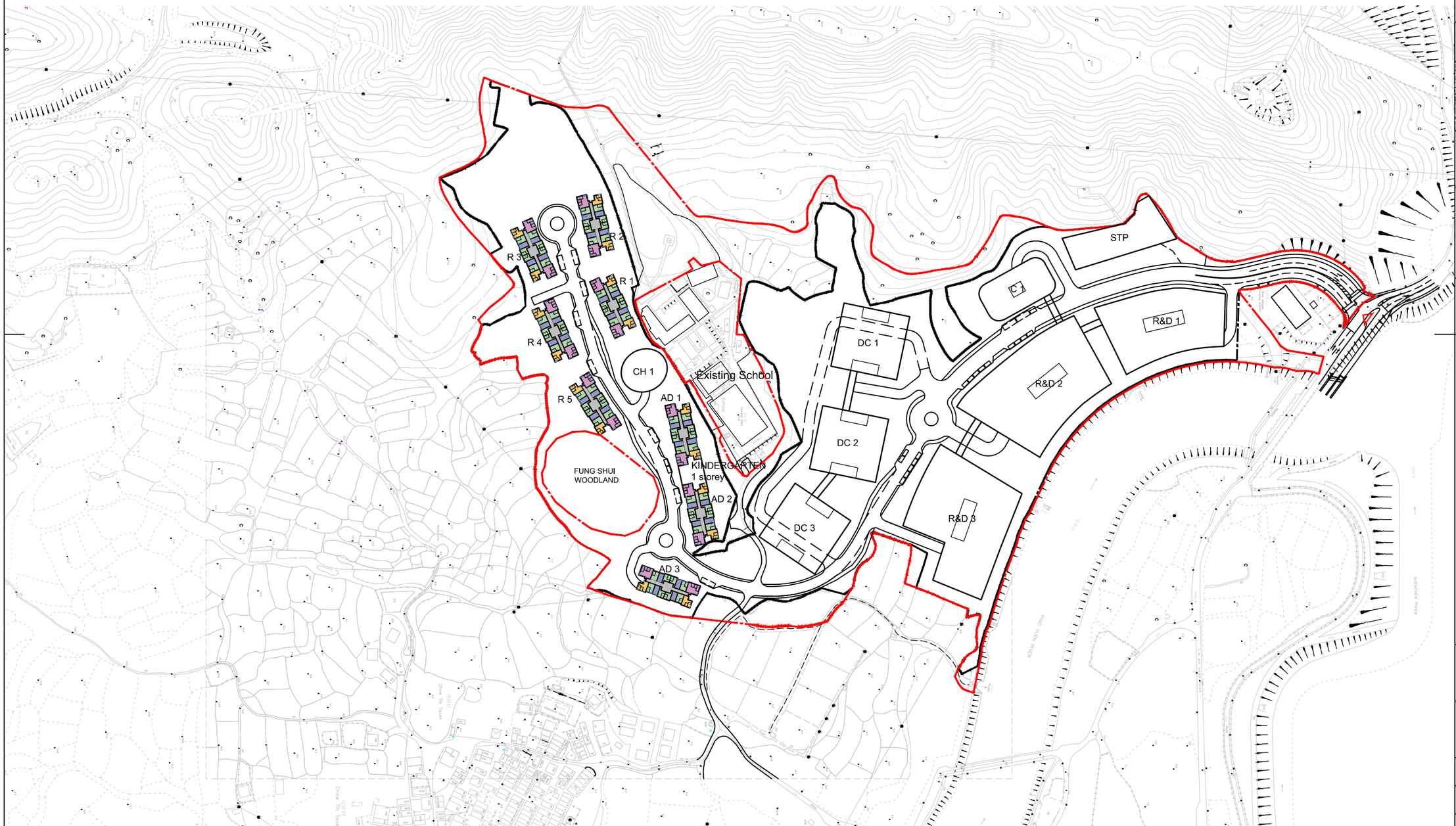
2 BEDROOM (43sqm)

3 BEDROOM (77sqm)

CORE, CORRIDOR AND E&M

INDICATION OF WINDOW OPENING

N



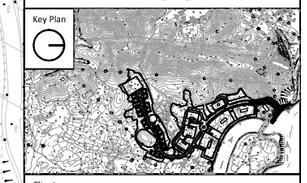
Deloitte. 德勤

WCWP International Limited
11/F Skyway House, 3 Sham Mong Road, Hong Kong
T +852 2893 3000 wcwp@deloitte.com.hk

Rev.	Date	Description

Notes
1. Do not scale drawings. Dimensions govern.
2. Verify dimensions in field. Notify WCWP of discrepancies.
3. Dimensions in mm unless otherwise noted.
4. Not for construction unless expressly certified.

Key Plan



Client
Hong Kong International Innovation Tech Hub

Consultants

Issue
Planning Application

BD Ref: BD 2/9188/10 (PT. II)
FSD Ref: FP 8/9584/VII <131>

Authorized Person

Project
The Nexus

Project Number	Date
20027	20230814
Scale	Drawn/Approved
1:3000 at A3	CL/TL

Title
Typical Floor Plan (Low Zone)

Number	Revision
TYP-007	-

\\cn1hkgo06p0002\data\projects\2020\20027\Drawings\01 Study and BIM\02 Scheme\20230811_MLP\20230811_Typ Low(TPY-007).dwg ISO full bleed A3 (420.00 x 297.00 MM) 1:1 20230811 3:19 PM

v20220101

LEGEND

APPLICATION SITE BOUNDARY

DEVELOPMENT SITE BOUNDARY

STUDIO (26sqm)

1 BEDROOM (33sqm)

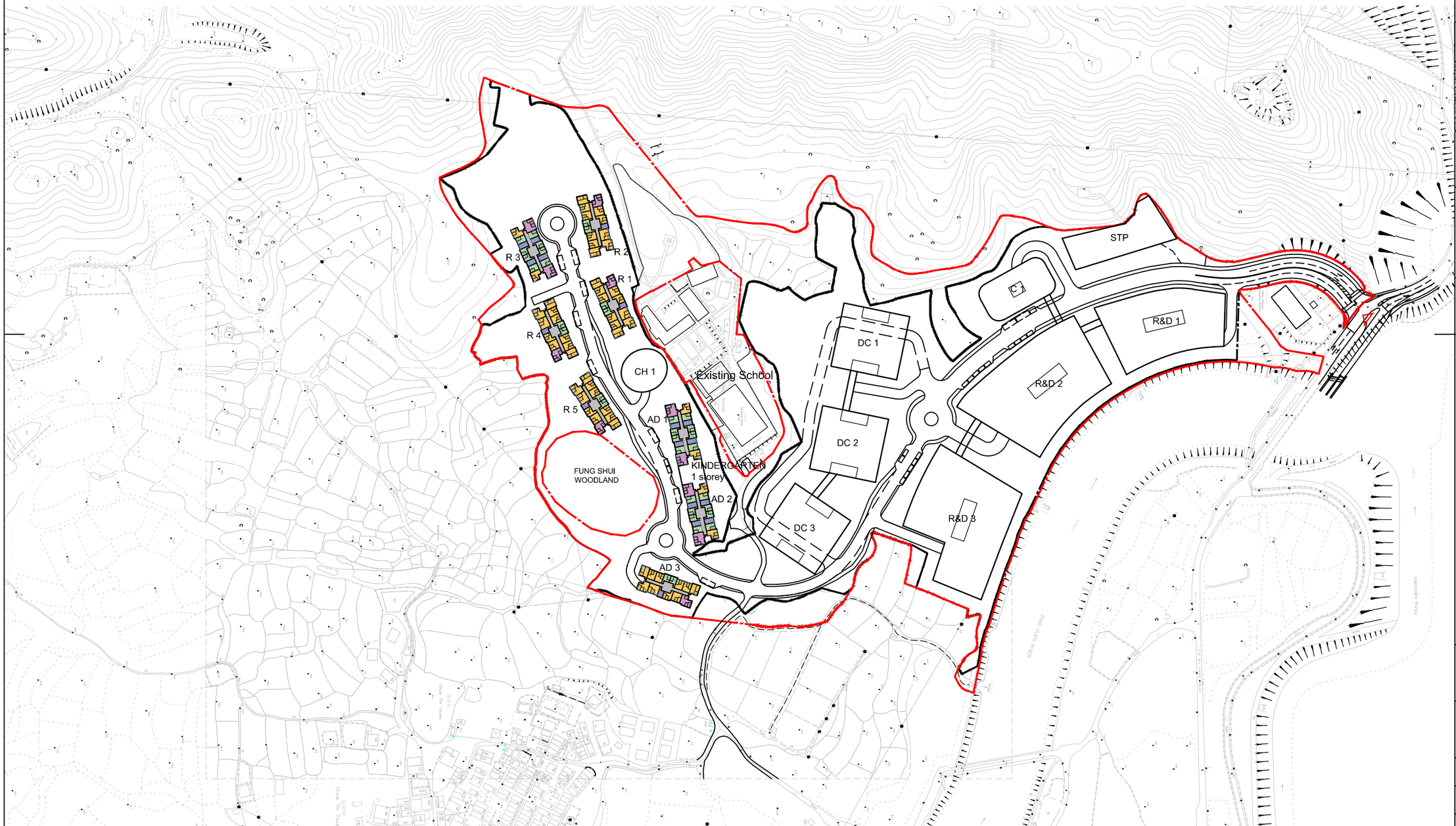
2 BEDROOM (43sqm)

3 BEDROOM (77sqm)

CORE, CORRIDOR AND E&M

INDICATION OF WINDOW OPENING

N



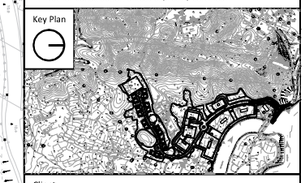
Deloitte. 德勤

WCWP International Limited
11/F Skyway House, 3 Sham Mong Road, Hong Kong
T +852 2893 3000 wcwp@deloitte.com.hk

Rev.	Date	Description

Notes
1. Do not scale drawings. Dimensions govern.
2. Verify dimensions in field. Notify WCWP of discrepancies.
3. Dimensions in mm unless otherwise noted.
4. Not for construction unless expressly certified.

Key Plan



Client
Hong Kong International Innovation Tech Hub

Consultants

Issue
Planning Application

BD Ref: BD 2/9188/10 (PT. II)
FSD Ref: FP 8/9584/VII <131>

Authorized Person

Project
The Nexus

Project Number	Date
20027	20230814
Scale	Drawn/Approved
1:3000 at A3	CL/TL

Title
Typical Floor Plan (Mid Zone)

Number	Revision
TYP-008	-

LEGEND

APPLICATION SITE BOUNDARY

DEVELOPMENT SITE BOUNDARY

STUDIO (26sqm)

1 BEDROOM (33sqm)

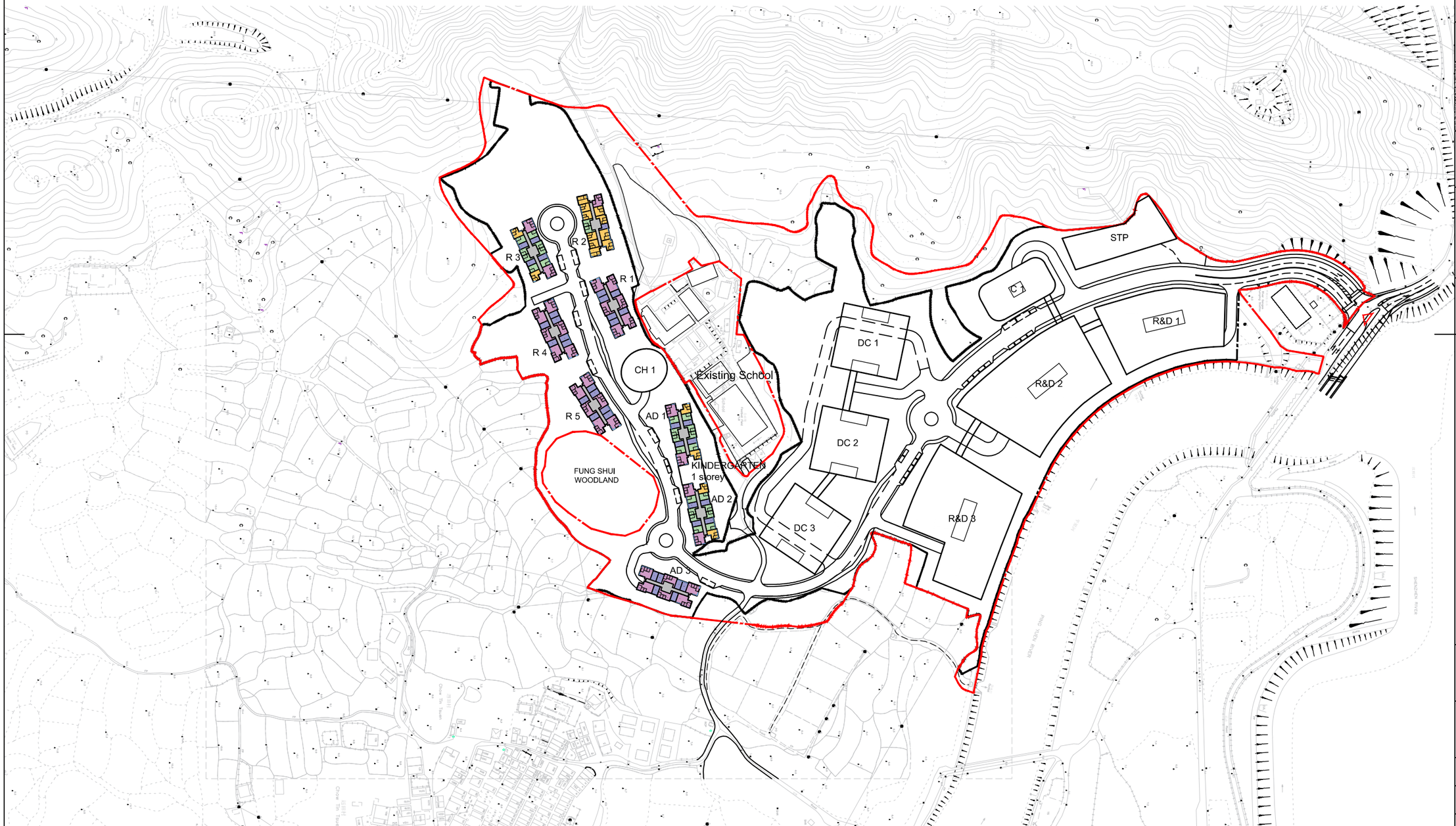
2 BEDROOM (43sqm)

3 BEDROOM (77sqm)

CORE, CORRIDOR AND E&M

INDICATION OF WINDOW OPENING

N



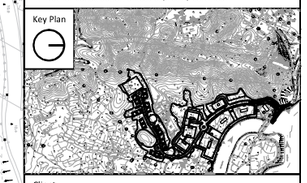
Deloitte. 德勤

WCWP International Limited
11/F Skyway House, 3 Sham Mong Road, Hong Kong
T +852 2893 3000 wcwp@deloitte.com.hk

Rev.	Date	Description

Notes
1. Do not scale drawings. Dimensions govern.
2. Verify dimensions in field. Notify WCWP of discrepancies.
3. Dimensions in mm unless otherwise noted.
4. Not for construction unless expressly certified.

Key Plan



Client
Hong Kong International Innovation Tech Hub

Consultants

Issue
Planning Application

BD Ref: BD 2/9188/10 (PT. II)
FSD Ref: FP 8/9584/VII <131>

Authorized Person

Project
The Nexus

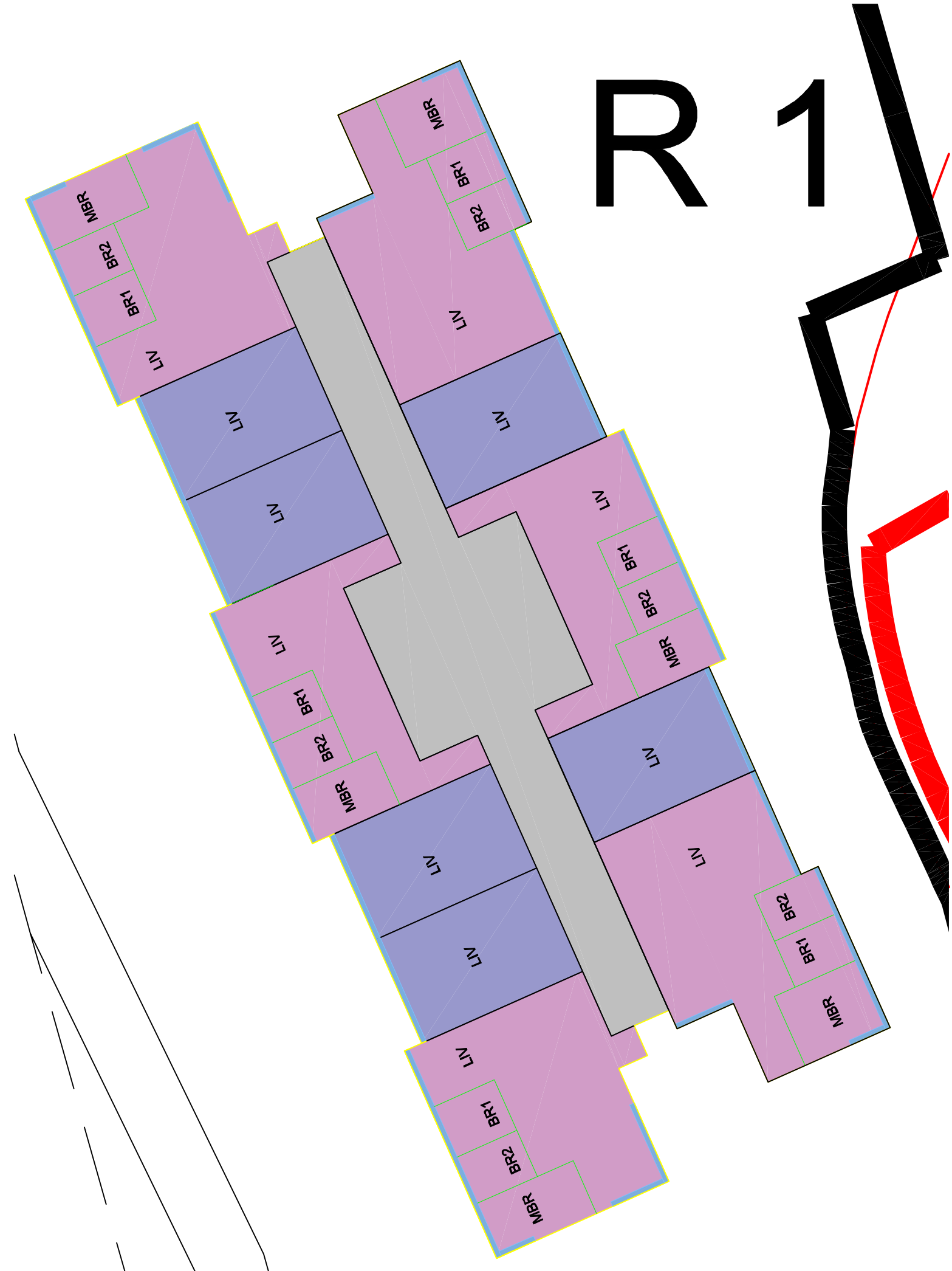
Project Number	Date
20027	20230814
Scale	Drawn/Approved
1:3000 at A3	CL/TL

Title
Typical Floor Plan (High Zone)

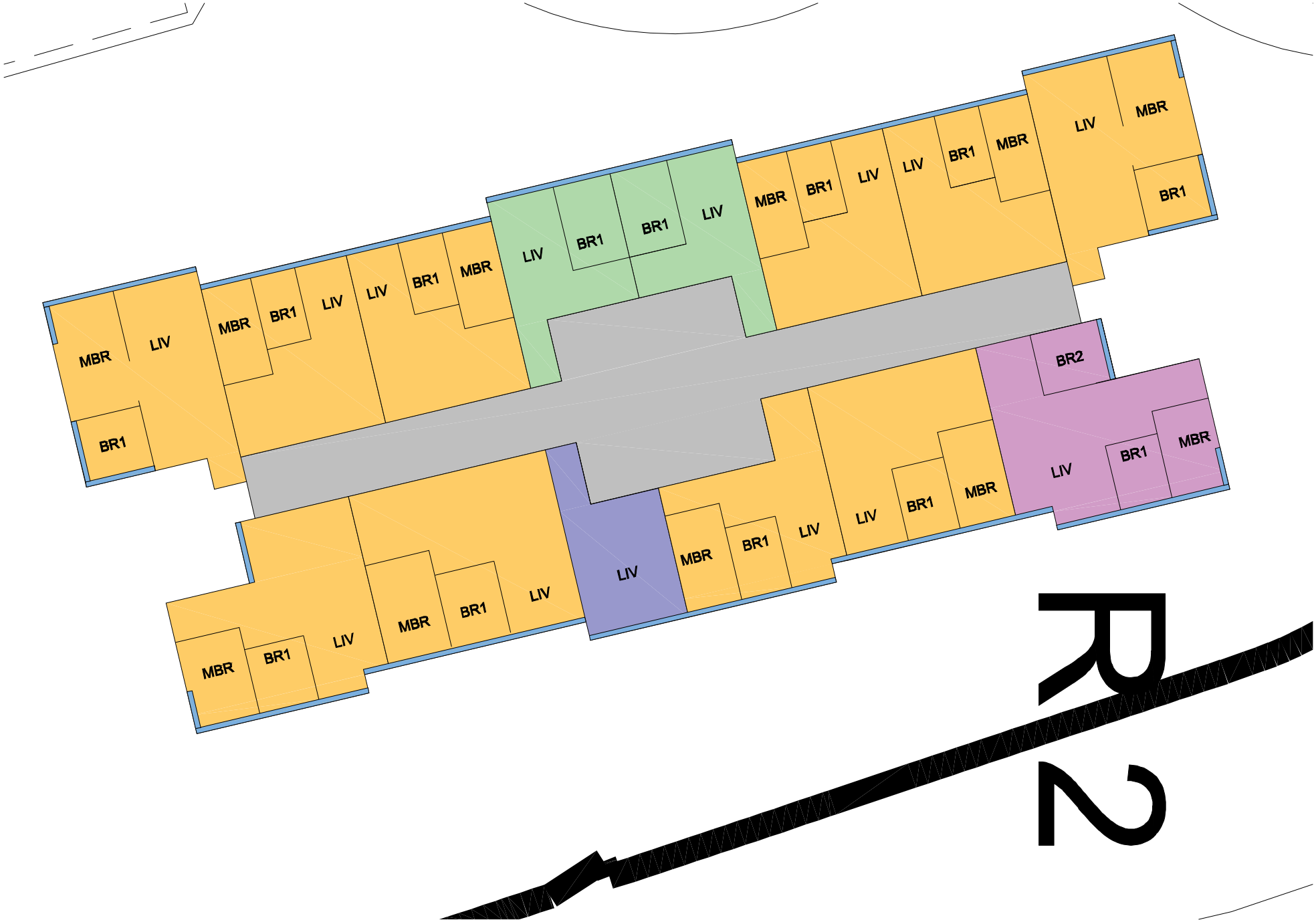
Number	Revision
TYP-009	-


R 1
MBR
BR2
BR1
LIV


R 1
MBR
BR1
LIV
MBR
BR1
BR2
LIV
MBR
BR1
LIV
LIV
BR1
MBR
MBR
BR1
LIV
LIV
BR1
MBR
LIV
BR1
BR1
LIV
LIV
LIV
BR1
MBR
MBR
BR1
LIV
LIV
BR1
MBR
LIV
BR1
MBR


R 1
MBR
BR2
BR1
LIV

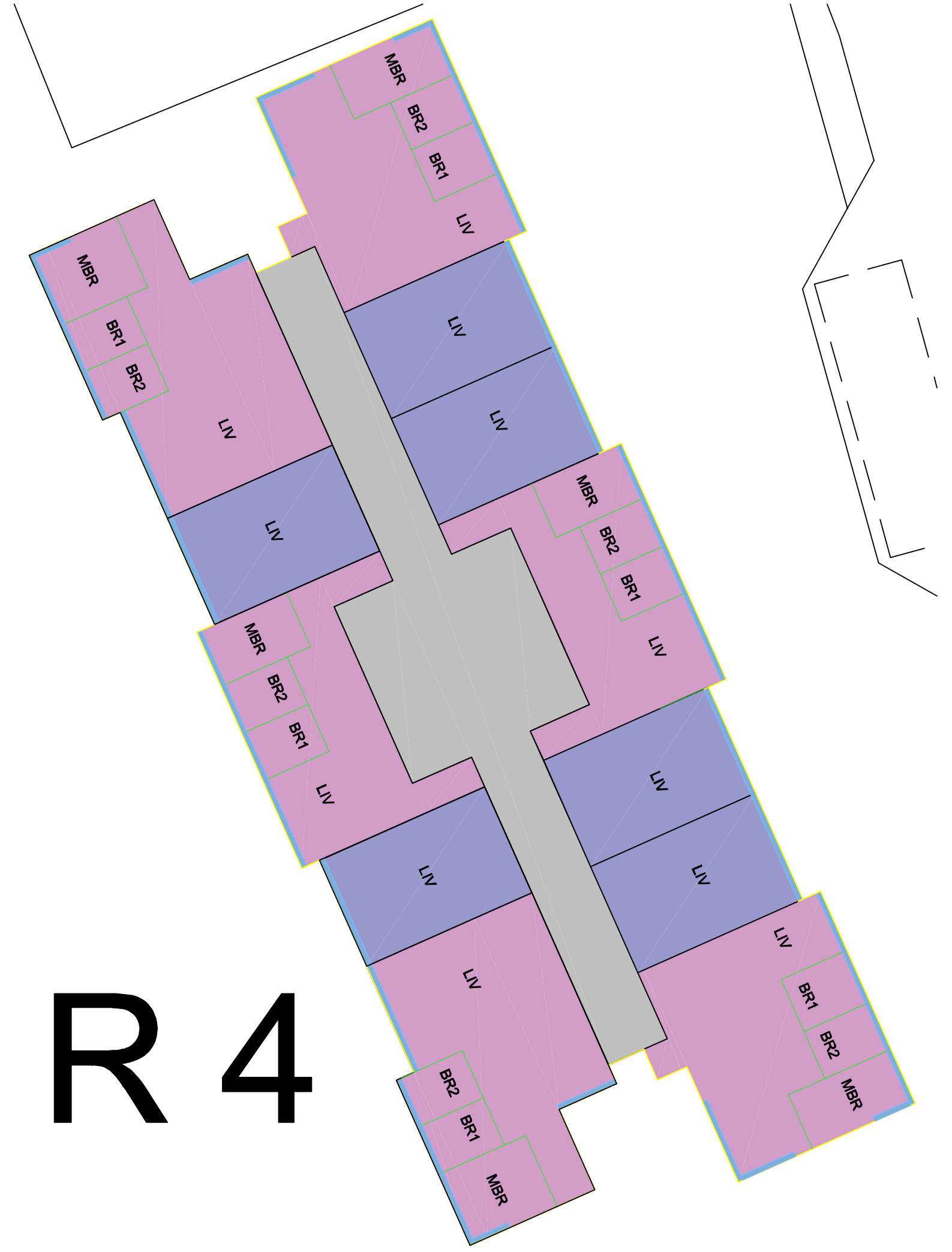

R2
MBR
BR2
BR1
LIV
MBR
BR1
LIV
BR1
LIV
LIV
BR1
LIV
LIV
LIV
LIV
BR1
BR1
LIV
LIV
LIV
LIV
LIV
BR1
LIV
BR1
LIV
BR1
MBR
LIV
BR1
BR2
MBR


MBR
LIV
BR1
MBR
BR1
LIV
LIV
BR1
MBR
LIV
BR1
BR1
LIV
MBR
BR1
LIV
LIV
BR1
MBR
LIV
MBR
BR1
BR2
LIV
BR1
MBR
MBR
BR1
LIV
MBR
BR1
LIV
LIV
MBR
BR1
LIV
LIV
BR1
MBR
R
2

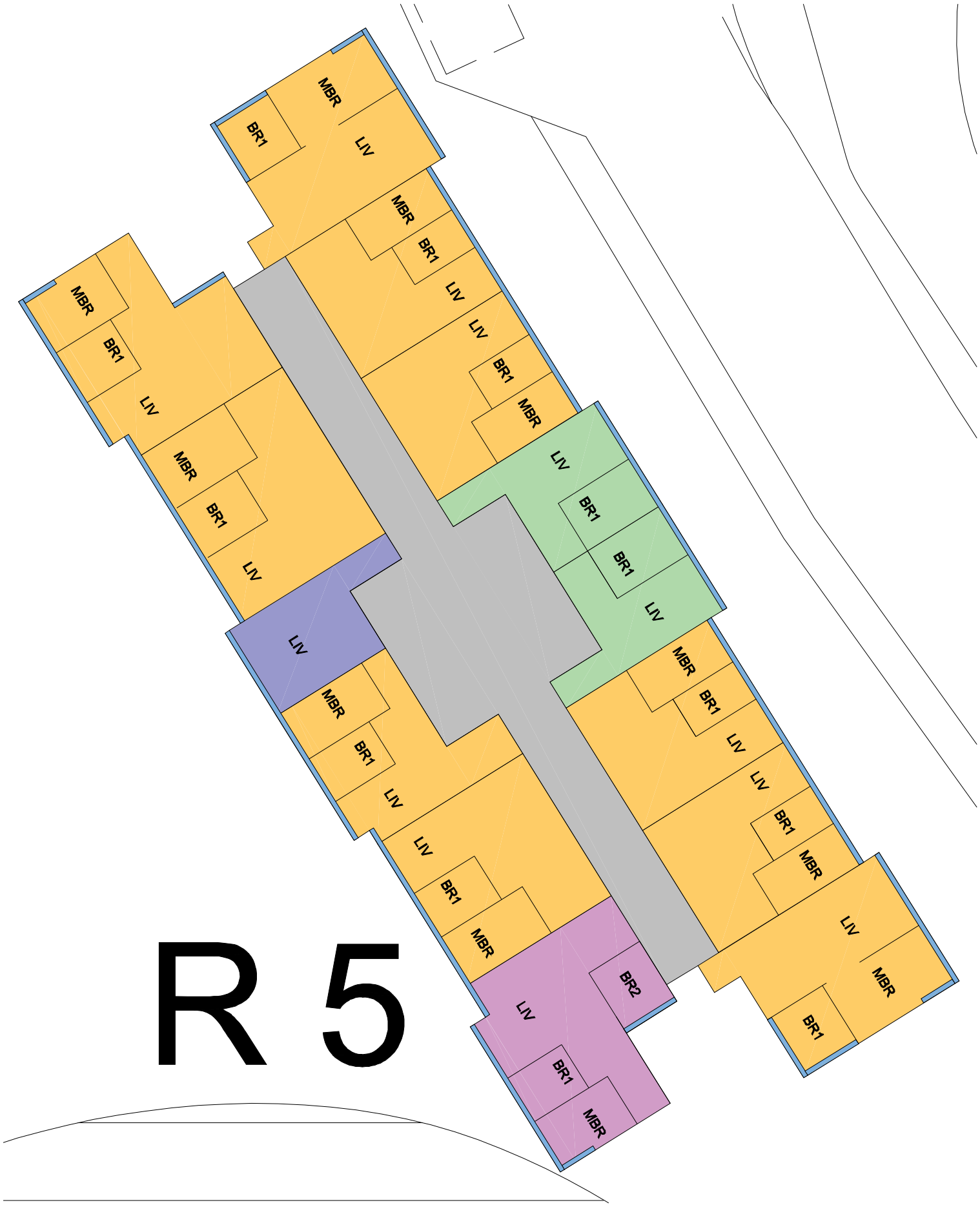

R 3
MBR
BR2
BR1
LIV
MBR
BR1
LIV
BR1
LIV
LIV
LIV
LIV
BR1
BR1
LIV
LIV
BR1
BR1
LIV
LIV
LIV
LIV
BR1
LIV
BR1
MBR

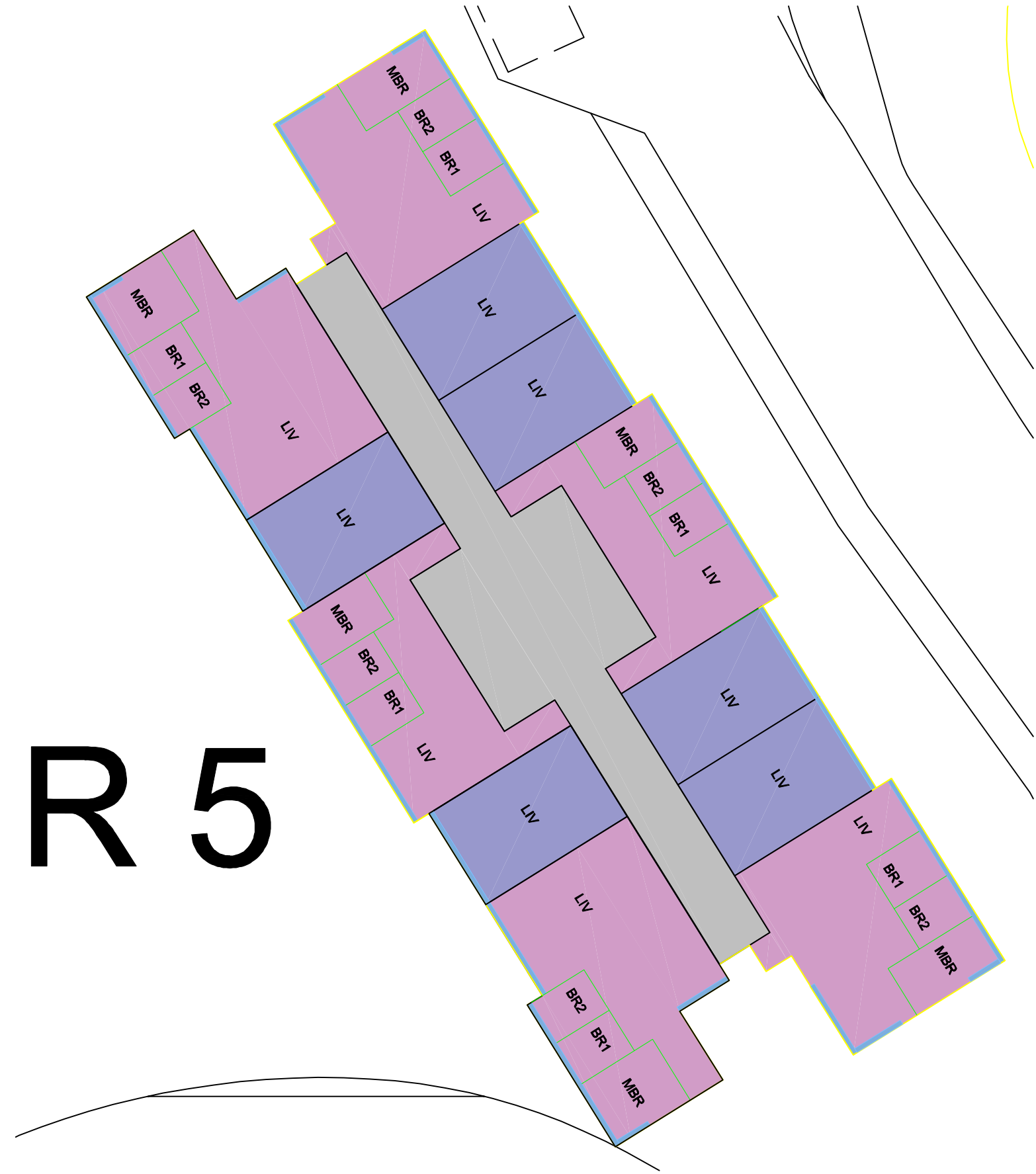

R 4
MBR
BR2
BR1
LIV
MBR
BR1
LIV
BR1
LIV
LIV
LIV
LIV
BR1
BR1
LIV
LIV
BR1
BR1
LIV
LIV
LIV
LIV
BR1
LIV
BR1
MBR
LIV
BR1
BR2
MBR


R 4
MBR
BR1
LIV
BR2


MBR
BR2
BR1
LIV
MBR
BR1
BR2
LIV
LIV
LIV
LIV
MBR
BR2
BR1
LIV
MBR
BR2
BR1
LIV
LIV
LIV
LIV
LIV
BR2
BR1
MBR
LIV
BR1
BR2
MBR
R 4


R 5
MBR
BR2
BR1
LIV
MBR
BR1
LIV
BR1
LIV
LIV
BR1
LIV
LIV
LIV
BR1
BR1
LIV
LIV
BR1
BR1
LIV
LIV
LIV
BR1
LIV
LIV
BR1
LIV
BR1
BR2
MBR
LIV
BR1
MBR


R 5
MBR
BR1
LIV
BR2

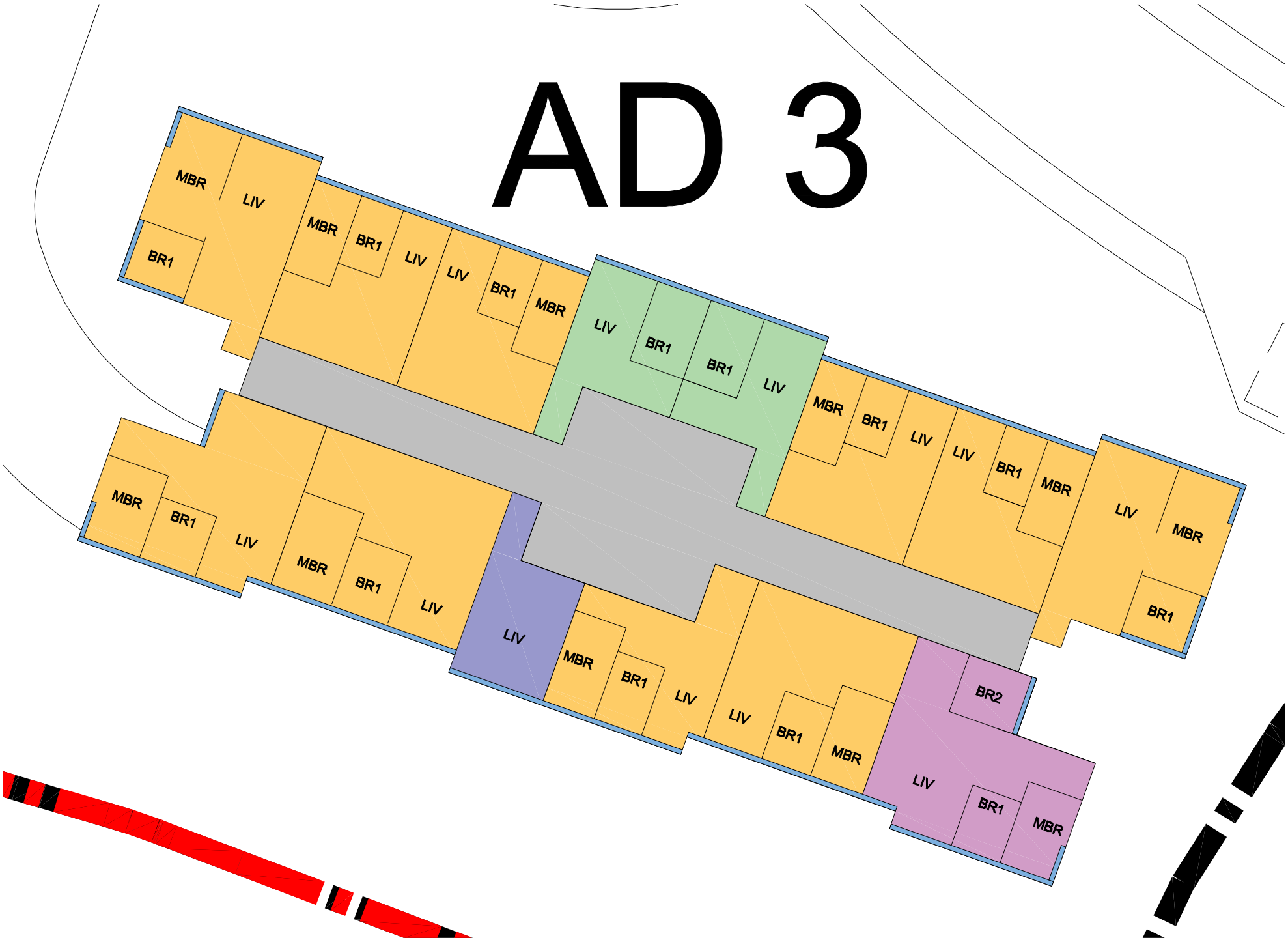

R 5
MBR
BR2
BR1
LIV
LIV
LIV
MBR
BR1
BR2
LIV
LIV
MBR
BR2
BR1
LIV
MBR
BR2
BR1
LIV
LIV
LIV
LIV
BR2
BR1
MBR
LIV
BR1
BR2
MBR

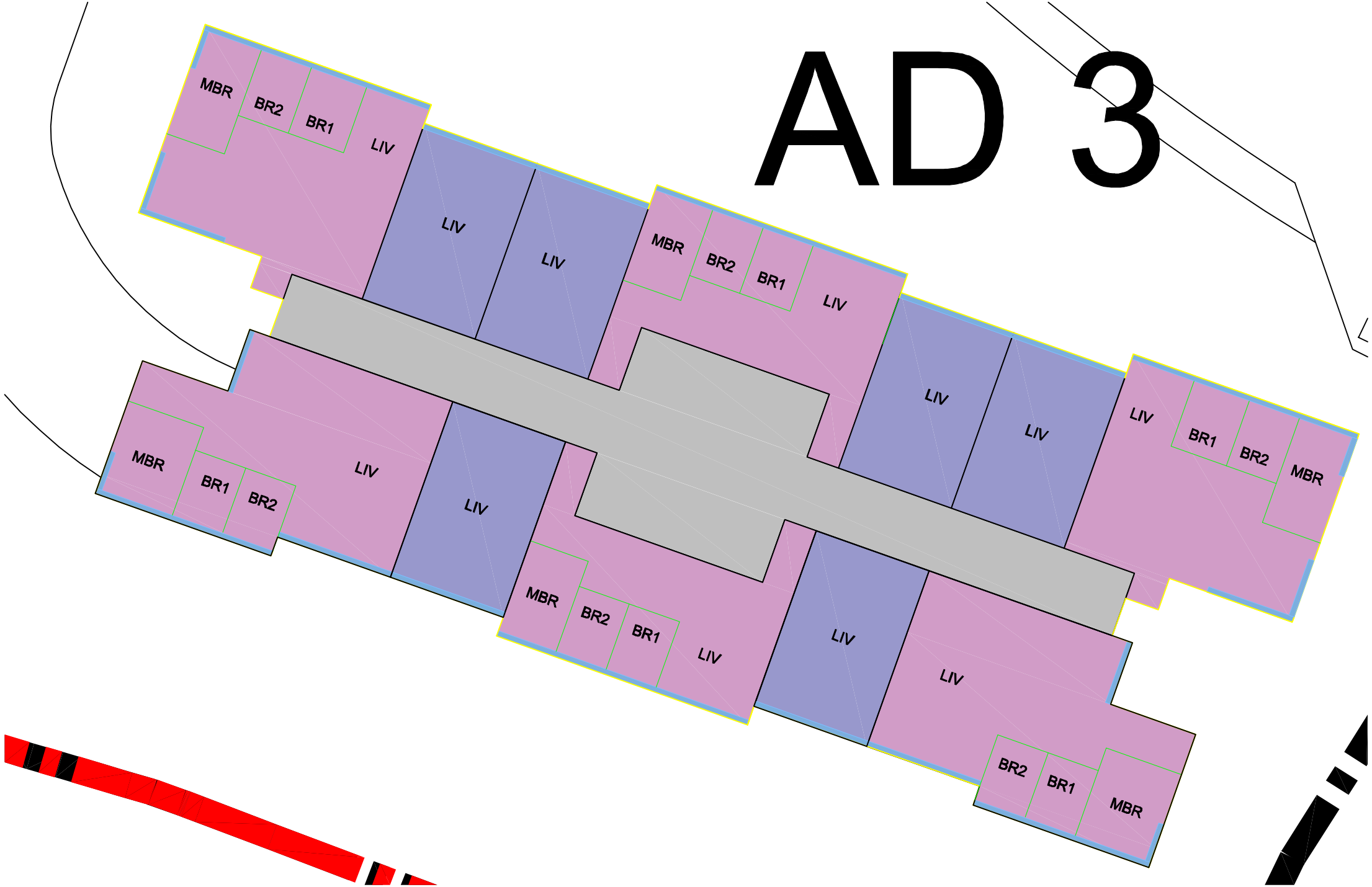

AD 1
MBR
BR2
BR1
LIV
KI


AD 2
MBR
BR2
BR1
LIV
MBR
BR1
LIV
BR1
LIV
BR1
LIV
LIV
LIV
LIV
BR1
BR1
LIV
LIV
BR1
BR1
LIV
LIV
LIV
LIV
LIV
BR1
LIV
BR1
LIV
BR1
MBR
LIV
BR1
BR2
MBR


AD 3
MBR
BR2
BR1
LIV
BR1
LIV
LIV
LIV
BR1
BR1
LIV
LIV
LIV
BR1
LIV
BR1
BR2
MBR
MBR
BR1
LIV
BR1
LIV
LIV
LIV
BR1
BR1
LIV
LIV
LIV
BR1
LIV
BR1
MBR

AD 3




AD 3
MBR
BR2
BR1
LIV

Appendix 4.1

CRTN Simple Calculation for Planned Internal Road

Title: Appendix 4.1 CRTN Calculation for N2 at Chow Tin Tsuen

							Correction dB(A)				
Link	**Flow (veh/hr)**	**% HGV**	**Speed (km/h)**	**Horiz Dist (m)**	**Vert Dist (m)**	**Road Surface[1]**	**Speed/HGV[2]**	**Distance[3]**	**Surface[4]**	**BNL dB(A)[5]**	**FNL dB(A)[6]**
Proposed Internal Access Road (NB)	495	17.0%	30	109	1.20	concrete	*1.0*	*-9.2*	*-1.0*	69.1	62.4
Proposed Internal Access Road (SB)	545	17.0%	30	108	1.20	concrete	*1.0*	*-9.2*	*-1.0*	69.6	62.9
									Total Noise Level dB(A)		65.7

Note:

[1] Road Surface - Concrete, Pervious

[2] $$= 33log\left(Speed + 40 + \frac{500}{Speed}\right) + 10log\left(1 + \frac{5\ (\%HGV)}{Speed}\right) - 68.8$$

[3] $$= -10log\sqrt{\left(\frac{(Horiz\ Dist + 3.5)^2 + Vert\ Dist^2}{13.5}\right)}$$

[4] Concrete = -1

Pervious = -3.5

[5] $$= 42.2 + 10\log\ (Flow)$$

[6] = [5] + [2] + [3] + [4] + Facade Effect

Appendix 5.1

Predicted Cumulative Fixed Noise Level for NSRs

Title: Appendix 5.1 Predicted Cumulative Fixed Noise Level for NSRs

NSR ID	Building ID	Maximum Permissible SWL, dB(A) [2][4][5]		Shortest Horizontal Distance from Source to the nearst NSR[1], m	Distance Attenuation, dB(A) [3]	Façade Correction, dB(A)	Predicted Noise Level, dB(A)		Noise Criteria (ANL-5), dB(A)	
		Day/ Evening time	Night-time				Day/ Evening time	Night-time [6]	Day/ Evening time	Night-time
N1	STP	86	86	258	56.2	3	33	-	60	50
	C1	86	-	195	53.8	3	35	-		
	DC1	82	82	87	46.8	3	38	-		
	DC2	82	82	90	47.1	3	38	-		
	DC3	82	82	114	49.1	3	36	-		
	R&D1	84	-	282	57.0	3	30	-		
	R&D2	84	-	186	53.4	3	34	-		
	R&D3	84	-	180	53.1	3	34	-		
Cumulative Noise Level, dB(A)							44	-		

Notes:
[1] The chiller will be installed on the podium of the proposed commercial building, assumed with 1m buffer distance from the edge of the building.
[2] The max. permissible SWL of DC1, DC2 and DC3 at day/evening time are determined by max. permissible SWL of DC1, DC2 and DC3 at night-time
[3] Distance Attenuation = 20 log D + 8, where D is the distance between the NSR and the source in metre.
[4] Confirmed by the project proponent that there is no night-time operation for commercial center (C1), and R&D Centres (R&D1, R&D2 and R&D3). Only data centers (i.e. DC1, DC2 & DC3) and STP will be operated at night-time period.
[5] Assume that same type of building has the same max. permissible SWL.
[6] No night-time operation is considered for N1

Title: Appendix 5.1 Predicted Cumulative Fixed Noise Level for NSRs

NSR ID	Building ID	Maximum Permissible SWL, dB(A) [2][4][5]		Shortest Horizontal Distance from Source to the nearst NSR[1], m	Distance Attenuation , dB(A) [3]	Façade Correction, dB(A)	Predicted Noise Level, dB(A)		Noise Criteria (ANL-5), dB(A)	
		Day/ Evening time	Night-time				Day/ Evening time	Night-time	Day/ Evening time	Night-time
N2	STP	86	86	454	61.1	3	28	28	60	50
	C1	86	-	386	59.7	3	29	-		
	DC1	82	82	294	57.4	3	28	28		
	DC2	82	82	218	54.8	3	30	30		
	DC3	82	82	154	51.8	3	33	33		
	R&D1	84	-	428	60.6	3	26	-		
	R&D2	84	-	319	58.1	3	29	-		
	R&D3	84	-	221	54.9	3	32	-		
Cumulative Noise Level, dB(A)							39	36		

Notes:
[1] The chiller will be installed on the podium of the proposed commercial building, assumed with 1m buffer distance from the edge of the building.
[2] The max. permissible SWL of DC1, DC2 and DC3 at day/evening time are determined by max. permissible SWL of DC1, DC2 and DC3 at night-time
[3] Distance Attenuation = 20 log D + 8, where D is the distance between the NSR and the source in metre.
[4] Confirmed by the project proponent that there is no night-time operation for commercial center (C1), and R&D Centres (R&D1, R&D2 and R&D3). Only data centers (i.e. DC1, DC2 & DC3) and STP will be operated at night-time period.
[5] Assume that same type of building has the same max. permissible SWL.

Title: Appendix 5.1 Predicted Cumulative Fixed Noise Level for NSRs

NSR ID	Building ID	Maximum Permissible SWL, dB(A) [2][4][5]		Shortest Horizontal Distance from Source to the nearst NSR[1], m	Distance Attenuation , dB(A) [3]	Façade Correction, dB(A)	Predicted Noise Level, dB(A)		Noise Criteria (ANL-5), dB(A)	
		Day/ Evening time	Night-time				Day/ Evening time	Night-time	Day/ Evening time	Night-time
N3	STP	86	86	636	64.1	3	25	25	55	45
	C1	86	-	577	63.2	3	26	-		
	DC1	82	82	512	62.2	3	23	23		
	DC2	82	82	433	60.7	3	24	24		
	DC3	82	82	379	59.6	3	25	25		
	R&D1	84	-	585	63.3	3	24	-		
	R&D2	84	-	500	62.0	3	25	-		
	R&D3	84	-	381	59.6	3	27	-		
Cumulative Noise Level, dB(A)							34	30		

Notes:
[1] The chiller will be installed on the podium of the proposed commercial building, assumed with 1m buffer distance from the edge of the building.
[2] The max. permissible SWL of DC1, DC2 and DC3 at day/evening time are determined by max. permissible SWL of DC1, DC2 and DC3 at night-time
[3] Distance Attenuation = 20 log D + 8, where D is the distance between the NSR and the source in metre.
[4] Confirmed by the project proponent that there is no night-time operation for commercial center (C1), and R&D Centres (R&D1, R&D2 and R&D3). Only data centers (i.e. DC1, DC2 & DC3) and STP will be operated at night-time period.
[5] Assume that same type of building has the same max. permissible SWL.

Title: Appendix 5.1 Predicted Cumulative Fixed Noise Level for NSRs

NSR ID	Building ID	Maximum Permissible SWL, dB(A) [2][4][5]		Shortest Horizontal Distance from Source to the nearst NSR[1], m	Distance Attenuation , dB(A) [3]	Façade Correction, dB(A)	Predicted Noise Level, dB(A)		Noise Criteria (ANL-5), dB(A)	
		Day/ Evening time	Night-time				Day/ Evening time	Night-time	Day/ Evening time	Night-time
N4	STP	86	86	438	60.8	3	28	28	55	45
	C1	86	-	406	60.2	3	29	-		
	DC1	82	82	386	59.7	3	25	25		
	DC2	82	82	324	58.2	3	27	27		
	DC3	82	82	298	57.5	3	28	28		
	R&D1	84	-	361	59.2	3	28	-		
	R&D2	84	-	302	57.6	3	29	-		
	R&D3	84	-	211	54.5	3	33	-		
Cumulative Noise Level, dB(A)							38	33		

Notes:
[1] The chiller will be installed on the podium of the proposed commercial building, assumed with 1m buffer distance from the edge of the building.
[2] The max. permissible SWL of DC1, DC2 and DC3 at day/evening time are determined by max. permissible SWL of DC1, DC2 and DC3 at night-time
[3] Distance Attenuation = 20 log D + 8, where D is the distance between the NSR and the source in metre.
[4] Confirmed by the project proponent that there is no night-time operation for commercial center (C1), and R&D Centres (R&D1, R&D2 and R&D3). Only data centers (i.e. DC1, DC2 & DC3) and STP will be operated at night-time period.
[5] Assume that same type of building has the same max. permissible SWL.

Title: Appendix 5.1 Predicted Cumulative Fixed Noise Level for NSRs

NSR ID	Building ID	Maximum Permissible SWL, dB(A) [2][4][5]		Shortest Horizontal Distance from Source to the nearst NSR[1], m	Distance Attenuation , dB(A) [3]	Façade Correction, dB(A)	Predicted Noise Level, dB(A)		Noise Criteria (ANL-5), dB(A)	
		Day/ Evening time	Night-time				Day/ Evening time	Night-time	Day/ Evening time	Night-time
N5	STP	86	86	419	60.4	3	29	29	60	50
	C1	86	-	359	59.1	3	30	-		
	DC1	82	82	288	57.2	3	28	28		
	DC2	82	82	210	54.4	3	31	31		
	DC3	82	82	134	50.5	3	34	34		
	R&D1	84	-	379	59.6	3	27	-		
	R&D2	84	-	289	57.2	3	30	-		
	R&D3	84	-	170	52.6	3	34	-		
Cumulative Noise Level, dB(A)							40	37		

Notes:
[1] The chiller will be installed on the podium of the proposed commercial building, assumed with 1m buffer distance from the edge of the building.
[2] The max. permissible SWL of DC1, DC2 and DC3 at day/evening time are determined by max. permissible SWL of DC1, DC2 and DC3 at night-time
[3] Distance Attenuation = 20 log D + 8, where D is the distance between the NSR and the source in metre.
[4] Confirmed by the project proponent that there is no night-time operation for commercial center (C1), and R&D Centres (R&D1, R&D2 and R&D3). Only data centers (i.e. DC1, DC2 & DC3) and STP will be operated at night-time period.
[5] Assume that same type of building has the same max. permissible SWL.

Title: Appendix 5.1 Predicted Cumulative Fixed Noise Level for NSRs

NSR ID	Building ID	Maximum Permissible SWL, dB(A) [2][4][5]		Shortest Horizontal Distance from Source to the nearst NSR[1], m	Distance Attenuation , dB(A) [3]	Façade Correction, dB(A)	Predicted Noise Level, dB(A)		Noise Criteria (ANL-5), dB(A)	
		Day/ Evening time	Night-time				Day/ Evening time	Night-time	Day/ Evening time	Night-time
PN1	STP	86	86	330	58.4	3	31	31	60	50
	C1	86	-	262	56.4	3	33	-		
	DC1	82	82	153	51.7	3	33	33		
	DC2	82	82	156	51.9	3	33	33		
	DC3	82	82	170	52.6	3	32	32		
	R&D1	84	-	348	58.8	3	28	-		
	R&D2	84	-	252	56.0	3	31	-		
	R&D3	84	-	249	55.9	3	31	-		
Cumulative Noise Level, dB(A)							41	39		

Notes:
[1] The chiller will be installed on the podium of the proposed commercial building, assumed with 1m buffer distance from the edge of the building.
[2] The max. permissible SWL of DC1, DC2 and DC3 at day/evening time are determined by max. permissible SWL of DC1, DC2 and DC3 at night-time
[3] Distance Attenuation = 20 log D + 8, where D is the distance between the NSR and the source in metre.
[4] Confirmed by the project proponent that there is no night-time operation for commercial center (C1), and R&D Centres (R&D1, R&D2 and R&D3). Only data centers (i.e. DC1, DC2 & DC3) and STP will be operated at night-time period.
[5] Assume that same type of building has the same max. permissible SWL.

Title: Appendix 5.1 Predicted Cumulative Fixed Noise Level for NSRs

NSR ID	Building ID	Maximum Permissible SWL, dB(A) [2][4][5]		Shortest Horizontal Distance from Source to the nearst NSR[1], m	Distance Attenuation , dB(A) [3]	Façade Correction, dB(A)	Predicted Noise Level, dB(A)		Noise Criteria (ANL-5), dB(A)	
		Day/ Evening time	Night-time				Day/ Evening time	Night-time	Day/ Evening time	Night-time
PN2	STP	86	86	337	58.6	3	30	30	60	50
	C1	86	-	277	56.8	3	32	-		
	DC1	82	82	179	53.1	3	32	32		
	DC2	82	82	197	53.9	3	31	31		
	DC3	82	82	221	54.9	3	30	30		
	R&D1	84	-	395	59.9	3	27	-		
	R&D2	84	-	283	57.0	3	30	-		
	R&D3	84	-	285	57.1	3	30	-		
Cumulative Noise Level, dB(A)							40	37		

Notes:
[1] The chiller will be installed on the podium of the proposed commercial building, assumed with 1m buffer distance from the edge of the building.
[2] The max. permissible SWL of DC1, DC2 and DC3 at day/evening time are determined by max. permissible SWL of DC1, DC2 and DC3 at night-time
[3] Distance Attenuation = 20 log D + 8, where D is the distance between the NSR and the source in metre.
[4] Confirmed by the project proponent that there is no night-time operation for commercial center (C1), and R&D Centres (R&D1, R&D2 and R&D3). Only data centers (i.e. DC1, DC2 & DC3) and STP will be operated at night-time period.
[5] Assume that same type of building has the same max. permissible SWL.

Title: Appendix 5.1 Predicted Cumulative Fixed Noise Level for NSRs

NSR ID	Building ID	Maximum Permissible SWL, dB(A) [2][4][5]		Shortest Horizontal Distance from Source to the nearst NSR[1], m	Distance Attenuation , dB(A) [3]	Façade Correction, dB(A)	Predicted Noise Level, dB(A)		Noise Criteria (ANL-5), dB(A)	
		Day/ Evening time	Night-time				Day/ Evening time	Night-time	Day/ Evening time	Night-time
PN3	STP	86	86	372	59.4	3	30	30	60	50
	C1	86	-	308	57.8	3	31	-		
	DC1	82	82	209	54.4	3	31	31		
	DC2	82	82	214	54.6	3	30	30		
	DC3	82	82	228	55.2	3	30	30		
	R&D1	84	-	395	59.9	3	27	-		
	R&D2	84	-	306	57.7	3	29	-		
	R&D3	84	-	304	57.7	3	29	-		
Cumulative Noise Level, dB(A)							39	36		

Notes:
[1] The chiller will be installed on the podium of the proposed commercial building, assumed with 1m buffer distance from the edge of the building.
[2] The max. permissible SWL of DC1, DC2 and DC3 at day/evening time are determined by max. permissible SWL of DC1, DC2 and DC3 at night-time
[3] Distance Attenuation = 20 log D + 8, where D is the distance between the NSR and the source in metre.
[4] Confirmed by the project proponent that there is no night-time operation for commercial center (C1), and R&D Centres (R&D1, R&D2 and R&D3). Only data centers (i.e. DC1, DC2 & DC3) and STP will be operated at night-time period.
[5] Assume that same type of building has the same max. permissible SWL.

Title: Appendix 5.1 Predicted Cumulative Fixed Noise Level for NSRs

NSR ID	Building ID	Maximum Permissible SWL, dB(A) [2][4][5]		Shortest Horizontal Distance from Source to the nearst NSR[1], m	Distance Attenuation , dB(A) [3]	Façade Correction, dB(A)	Predicted Noise Level, dB(A)		Noise Criteria (ANL-5), dB(A)	
		Day/ Evening time	Night-time				Day/ Evening time	Night-time	Day/ Evening time	Night-time
PN4	STP	86	86	373	59.4	3	30	30	60	50
	C1	86	-	300	57.5	3	31	-		
	DC1	82	82	190	53.6	3	31	31		
	DC2	82	82	190	53.6	3	31	31		
	DC3	82	82	203	54.1	3	31	31		
	R&D1	84	-	385	59.7	3	27	-		
	R&D2	84	-	288	57.2	3	30	-		
	R&D3	84	-	281	57.0	3	30	-		
Cumulative Noise Level, dB(A)							39	37		

Notes:
[1] The chiller will be installed on the podium of the proposed commercial building, assumed with 1m buffer distance from the edge of the building.
[2] The max. permissible SWL of DC1, DC2 and DC3 at day/evening time are determined by max. permissible SWL of DC1, DC2 and DC3 at night-time
[3] Distance Attenuation = 20 log D + 8, where D is the distance between the NSR and the source in metre.
[4] Confirmed by the project proponent that there is no night-time operation for commercial center (C1), and R&D Centres (R&D1, R&D2 and R&D3). Only data centers (i.e. DC1, DC2 & DC3) and STP will be operated at night-time period.
[5] Assume that same type of building has the same max. permissible SWL.

Title: Appendix 5.1 Predicted Cumulative Fixed Noise Level for NSRs

NSR ID	Building ID	Maximum Permissible SWL, dB(A) [2][4][5]		Shortest Horizontal Distance from Source to the nearst NSR[1], m	Distance Attenuation , dB(A) [3]	Façade Correction, dB(A)	Predicted Noise Level, dB(A)		Noise Criteria (ANL-5), dB(A)	
		Day/ Evening time	Night-time				Day/ Evening time	Night-time	Day/ Evening time	Night-time
PN5	STP	86	86	369	59.3	3	30	30	60	50
	C1	86	-	296	57.4	3	32	-		
	DC1	82	82	175	52.9	3	32	32		
	DC2	82	82	158	52.0	3	33	33		
	DC3	82	82	145	51.2	3	34	34		
	R&D1	84	-	375	59.5	3	28	-		
	R&D2	84	-	264	56.4	3	31	-		
	R&D3	84	-	237	55.5	3	32	-		
Cumulative Noise Level, dB(A)							41	38		

Notes:
[1] The chiller will be installed on the podium of the proposed commercial building, assumed with 1m buffer distance from the edge of the building.
[2] The max. permissible SWL of DC1, DC2 and DC3 at day/evening time are determined by max. permissible SWL of DC1, DC2 and DC3 at night-time
[3] Distance Attenuation = 20 log D + 8, where D is the distance between the NSR and the source in metre.
[4] Confirmed by the project proponent that there is no night-time operation for commercial center (C1), and R&D Centres (R&D1, R&D2 and R&D3). Only data centers (i.e. DC1, DC2 & DC3) and STP will be operated at night-time period.
[5] Assume that same type of building has the same max. permissible SWL.

Title: Appendix 5.1 Predicted Cumulative Fixed Noise Level for NSRs

NSR ID	Building ID	Maximum Permissible SWL, dB(A) [2][4][5]		Shortest Horizontal Distance from Source to the nearst NSR[1], m	Distance Attenuation , dB(A) [3]	Façade Correction, dB(A)	Predicted Noise Level, dB(A)		Noise Criteria (ANL-5), dB(A)	
		Day/ Evening time	Night-time				Day/ Evening time	Night-time	Day/ Evening time	Night-time
PN6	STP	86	86	313	57.9	3	31	31	60	50
	C1	86	-	240	55.6	3	33	-		
	DC1	82	82	120	49.6	3	35	35		
	DC2	82	82	85	46.6	3	38	38		
	DC3	82	82	73	45.3	3	40	40		
	R&D1	84	-	315	58.0	3	29	-		
	R&D2	84	-	197	53.9	3	33	-		
	R&D3	84	-	162	52.2	3	35	-		
Cumulative Noise Level, dB(A)							45	43		

Notes:
[1] The chiller will be installed on the podium of the proposed commercial building, assumed with 1m buffer distance from the edge of the building.
[2] The max. permissible SWL of DC1, DC2 and DC3 at day/evening time are determined by max. permissible SWL of DC1, DC2 and DC3 at night-time
[3] Distance Attenuation = 20 log D + 8, where D is the distance between the NSR and the source in metre.
[4] Confirmed by the project proponent that there is no night-time operation for commercial center (C1), and R&D Centres (R&D1, R&D2 and R&D3). Only data centers (i.e. DC1, DC2 & DC3) and STP will be operated at night-time period.
[5] Assume that same type of building has the same max. permissible SWL.

Title: Appendix 5.1 Predicted Cumulative Fixed Noise Level for NSRs

NSR ID	Building ID	Maximum Permissible SWL, dB(A) [2][4][5]		Shortest Horizontal Distance from Source to the nearst NSR[1], m	Distance Attenuation , dB(A) [3]	Façade Correction, dB(A)	Predicted Noise Level, dB(A)		Noise Criteria (ANL-5), dB(A)	
		Day/ Evening time	Night-time				Day/ Evening time	Night-time	Day/ Evening time	Night-time
PN7	STP	86	86	319	58.1	3	31	31	60	50
	C1	86	-	246	55.8	3	33	-		
	DC1	82	82	130	50.3	3	35	35		
	DC2	82	82	79	46.0	3	39	39		
	DC3	82	82	30	37.5	3	47	47		
	R&D1	84	-	318	58.0	3	29	-		
	R&D2	84	-	196	53.8	3	33	-		
	R&D3	84	-	138	50.8	3	36	-		
Cumulative Noise Level, dB(A)							49	48		

Notes:
[1] The chiller will be installed on the podium of the proposed commercial building, assumed with 1m buffer distance from the edge of the building.
[2] The max. permissible SWL of DC1, DC2 and DC3 at day/evening time are determined by max. permissible SWL of DC1, DC2 and DC3 at night-time
[3] Distance Attenuation = 20 log D + 8, where D is the distance between the NSR and the source in metre.
[4] Confirmed by the project proponent that there is no night-time operation for commercial center (C1), and R&D Centres (R&D1, R&D2 and R&D3). Only data centers (i.e. DC1, DC2 & DC3) and STP will be operated at night-time period.
[5] Assume that same type of building has the same max. permissible SWL.

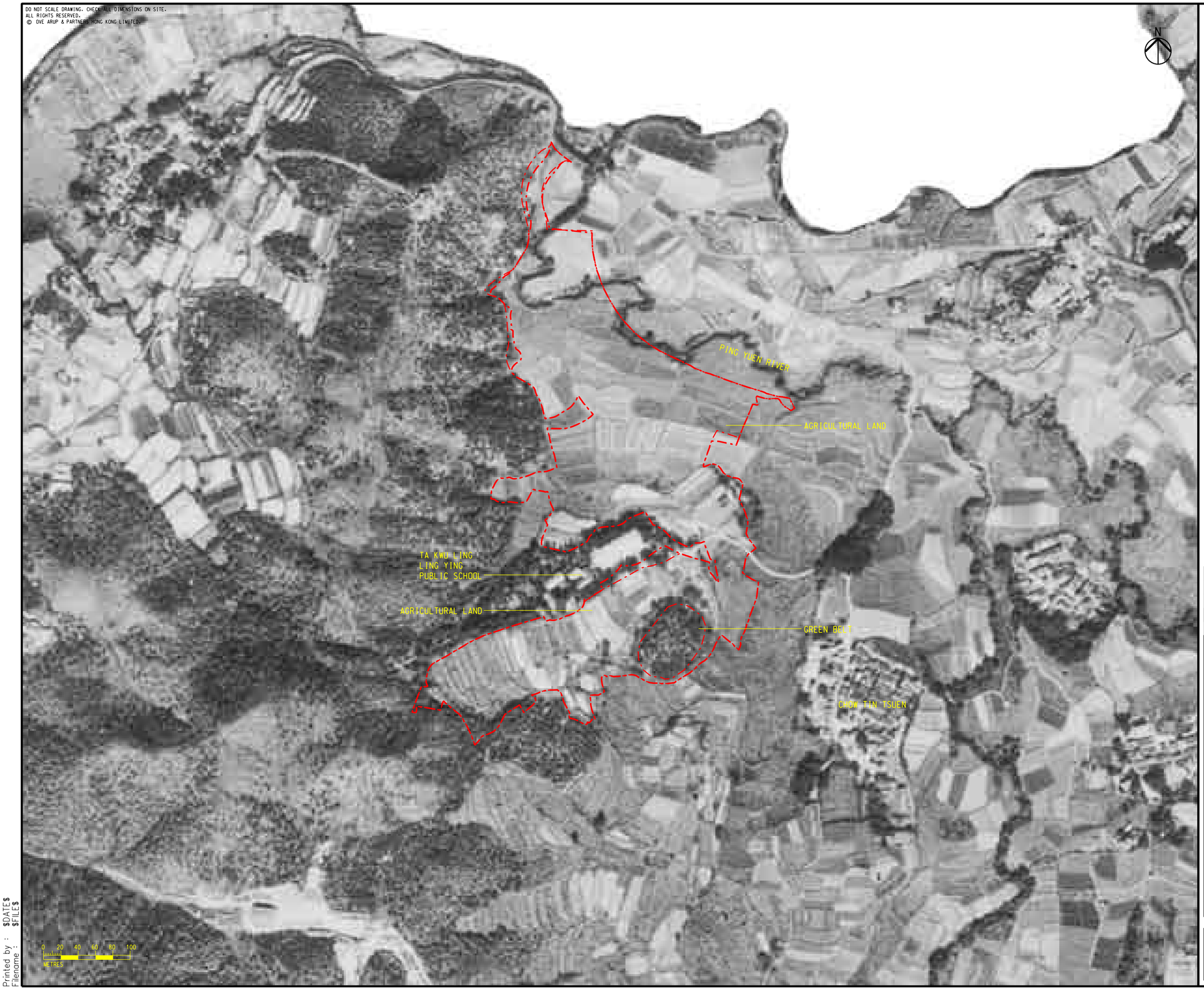
Title: Appendix 5.1 Predicted Cumulative Fixed Noise Level for NSRs

NSR ID	Building ID	Maximum Permissible SWL, dB(A) [2][4][5]		Shortest Horizontal Distance from Source to the nearst NSR[1], m	Distance Attenuation , dB(A) [3]	Façade Correction, dB(A)	Predicted Noise Level, dB(A)		Noise Criteria (ANL-5), dB(A)	
		Day/ Evening time	Night-time				Day/ Evening time	Night-time	Day/ Evening time	Night-time
PN8	STP	86	86	371	59.4	3	30	30	60	50
	C1	86	-	300	57.5	3	31	-		
	DC1	82	82	192	53.7	3	31	31		
	DC2	82	82	125	49.9	3	35	35		
	DC3	82	82	65	44.3	3	41	41		
	R&D1	84	-	367	59.3	3	28	-		
	R&D2	84	-	242	55.7	3	31	-		
	R&D3	84	-	170	52.6	3	34	-		
Cumulative Noise Level, dB(A)							44	42		

Notes:
[1] The chiller will be installed on the podium of the proposed commercial building, assumed with 1m buffer distance from the edge of the building.
[2] The max. permissible SWL of DC1, DC2 and DC3 at day/evening time are determined by max. permissible SWL of DC1, DC2 and DC3 at night-time
[3] Distance Attenuation = 20 log D + 8, where D is the distance between the NSR and the source in metre.
[4] Confirmed by the project proponent that there is no night-time operation for commercial center (C1), and R&D Centres (R&D1, R&D2 and R&D3). Only data centers (i.e. DC1, DC2 & DC3) and STP will be operated at night-time period.
[5] Assume that same type of building has the same max. permissible SWL.

Appendix 8.1

Historical Aerial Photos



LEGEND

DEVELOPMENT SITE

Rev	Description	By	Date
A	FIRST ISSUE	GL	07/22

Consultant

ARUP

Project Title

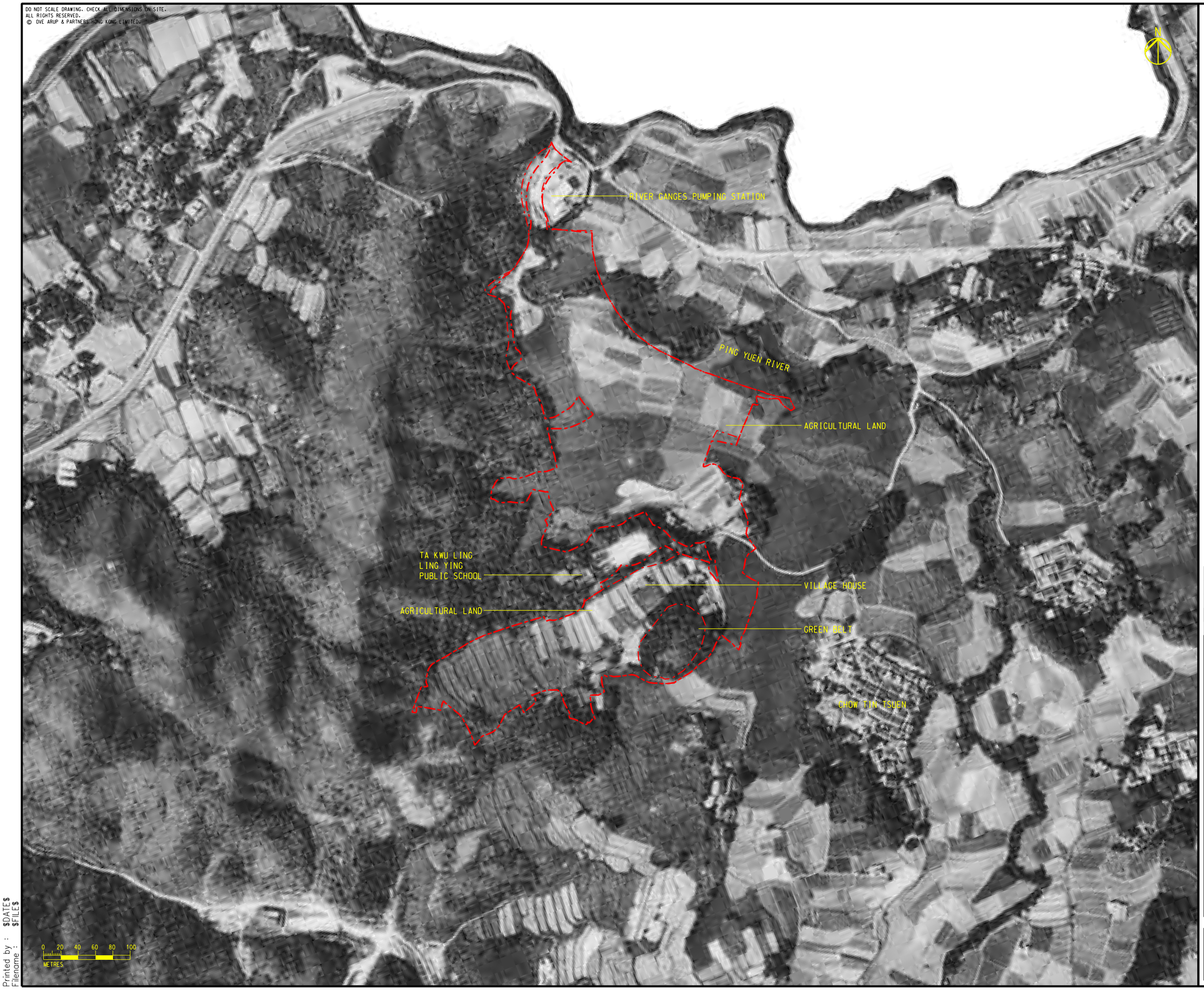
Section 12A Planning Application for Proposed Innovation and Technology Hub at Various Lots in D.D.82 and D.D. 86 and Adjoining Government Land, Man Kam To, New Territories

Drawing title

HISTORICAL AERIAL PHOTO - YEAR 1973

Drawing no.			Rev.
APPENDIX 8.1			A
Drawn: GL	Date: 07/22	Checked: JS	Approved: FC
Scale: 1:4000 @ A3		Status: PRELIMINARY	

Printed by : $DATE$
Filename : $FILE$



LEGEND

DEVELOPMENT SITE

Rev	Description	By	Date
A	FIRST ISSUE	GL	07/22

Consultant

ARUP

Project Title

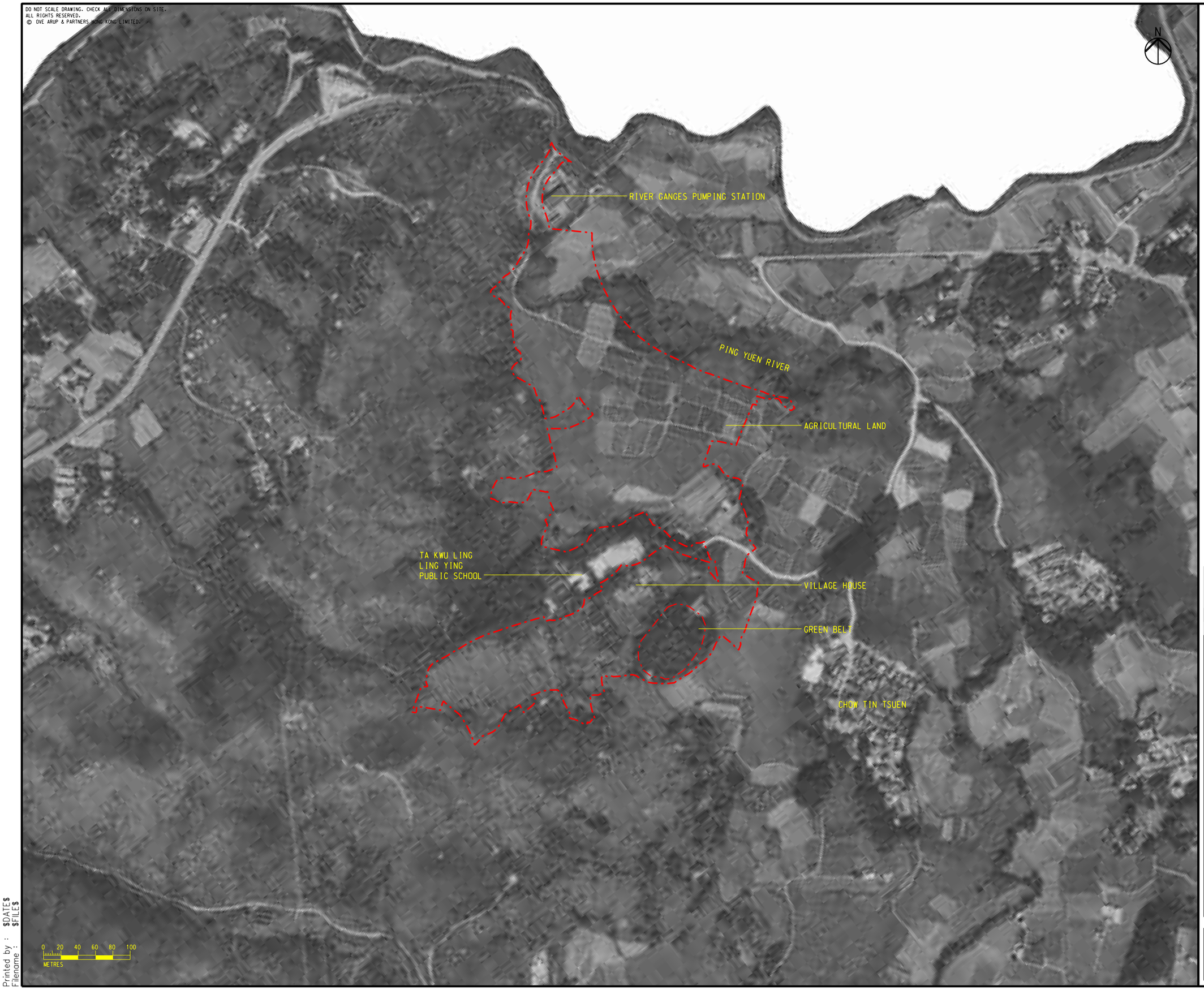
Section 12A Planning Application for Proposed Innovation and Technology Hub at Various Lots in D.D.82 and D.D. 86 and Adjoining Government Land, Man Kam To, New Territories

Drawing title

HISTORICAL AERIAL PHOTO - YEAR 1982

Drawing no.			Rev.
APPENDIX 8.1			A
Drawn: GL	Date: 07/22	Checked: JS	Approved: FC
Scale: 1:4000 @ A3		Status: PRELIMINARY	

Printed by : $DATE$
Filename : $FILE$



LEGEND

DEVELOPMENT SITE

Rev	Description	By	Date
A	FIRST ISSUE	GL	07/22

Consultant

ARUP

Project Title

Section 12A Planning Application for Proposed Innovation and Technology Hub at Various Lots in D.D.82 and D.D. 86 and Adjoining Government Land, Man Kam To, New Territories

Drawing title

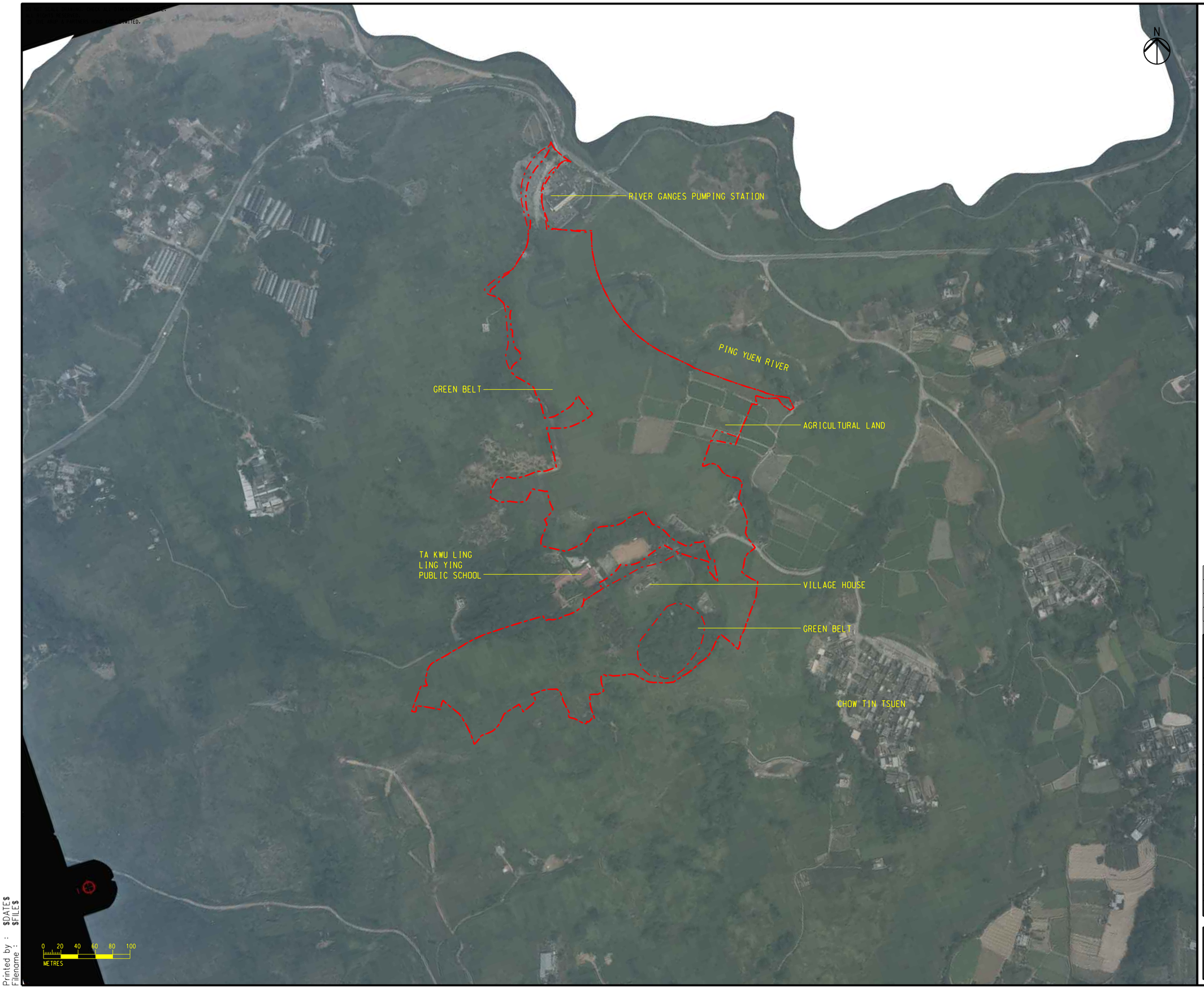
HISTORICAL AERIAL PHOTO - YEAR 1991

Drawing no.	Rev.
APPENDIX 8.1	A

Drawn	Date	Checked	Approved
GL	07/22	JS	FC

Scale	Status
1:4000 @ A3	PRELIMINARY

Printed by : $DATE$
Filename : $FILE$



LEGEND

DEVELOPMENT SITE

Rev	Description	By	Date
A	FIRST ISSUE	GL	07/22

Consultant

ARUP

Project Title

Section 12A Planning Application for Proposed Innovation and Technology Hub at Various Lots in D.D.82 and D.D. 86 and Adjoining Government Land, Man Kam To, New Territories

Drawing title

HISTORICAL AERIAL PHOTO - YEAR 2002

Drawing no.			Rev.
APPENDIX 8.1			A
Drawn: GL	Date: 07/22	Checked: JS	Approved: FC
Scale: 1:4000 @ A3		Status: PRELIMINARY	

Printed by : $DATE$
Filename : $FILE$

LEGEND

DEVELOPMENT SITE

Rev	Description	By	Date
A	FIRST ISSUE	GL	07/22

Consultant

ARUP

Project Title

Section 12A Planning Application for Proposed Innovation and Technology Hub at Various Lots in D.D.82 and D.D. 86 and Adjoining Government Land, Man Kam To, New Territories

Drawing title

HISTORICAL AERIAL PHOTO
- YEAR 2010

Drawing no.	Rev.
APPENDIX 8.1	A

Drawn	Date	Checked	Approved
GL	07/22	JS	FC

Scale	Status
1:4000 @ A3	PRELIMINARY

Printed by : $DATE$
Filename : $FILE$

LEGEND

DEVELOPMENT SITE

Rev	Description	By	Date
A	FIRST ISSUE	GL	07/22

Consultant

ARUP

Project Title

Section 12A Planning Application for Proposed Innovation and Technology Hub at Various Lots in D.D.82 and D.D. 86 and Adjoining Government Land, Man Kam To, New Territories

Drawing title

HISTORICAL AERIAL PHOTO - YEAR 2022

Drawing no.	Rev.
APPENDIX 8.1	A

Drawn	Date	Checked	Approved
GL	07/22	JS	FC

Scale	Status
1:4000 @ A3	PRELIMINARY

Printed by : $DATE$
Filename : $FILE$

Appendix 8.2

Photo Record of Site Survey

PHOTO 1

PHOTO 2

PHOTO 3

PHOTO 4

PHOTO 5

PHOTO 1
PHOTO 5
PHOTO 2
PHOTO 4
PHOTO 3
PING YUEN RIVER
FUNG WONG WU
CHOW TIN TSUEN

N

0 20 40 60 80 100
METRES

LEGEND
DEVELOPMENT SITE
VIEW ANGLE

A	FIRST ISSUE	GL	07/22
Rev	Description	By	Date

Consultant
ARUP

Project Title
Section 12A Planning Application for Proposed Innovation and Technology Hub at Various Lots in D.D.82 and D.D. 86 and Adjoining Government Land, Man Kam To, New Territories

Drawing title
PHOTO RECORD OF SITE SURVEY

Drawing no.			Rev.
APPENDIX 8.2			A
Drawn: GL	Date: 07/22	Checked: JS	Approved: FC
Scale: 1:4000 @ A3		Status: PRELIMINARY	

Printed by : $DATE$
Filename : $FILE$

Appendix 8.3

Site Walkover Checklist

1) GENERAL SITE DETAILS	
Site Owner/ Client	N/A
Property Address	Area at Various Lots in D.D.82 and D.D. 86 and Adjoining Government Land, Man Kam To
Person Conducting the Questionnaire (name & position)	Charlotte Zhang, Consultant Hugo Lee, Assistant Consultant
Authorised Owner/ Client Representative (if applicable) (name, position & telephone)	N/A

2) ACTIVITIES	
Briefly describe activities carried out on site, including types of products/chemicals/materials handled. **Obtain a flow schematic if possible.**	Green belt and residential
Number of employees:	
- Full-time:	N/A
- Part-time:	N/A
- Temporary/Seasonal:	N/A
Maximum no. of people on site at any time:	N/A
Typical hours of operation:	N/A
Number of shifts:	N/A
Days per week:	N/A
Weeks per year:	N/A
Scheduled plant shut-down:	N/A
Detail the main sources of energy at the site:	
Gas (Yes/No)	N/A
Electricity (Yes/No)	N/A
Coal (Yes/No)	N/A
Oil (Yes/No)	N/A
Other (Yes/No)	N/A

3) SITE DESCRIPTION	
This section is intended to gather information on site setting and environmental receptors on, adjacent or close to the site.	
What is the total site area:	~107,120m^2
What area of the site is covered by buildings (%):	5%
Please list all current and previous owners/occupiers if possible.	N/A
Is a site plan available? (Yes/No) If yes, please attach.	N/A
Are there any other parties on site as tenants or sub-tenants? (Yes/No) If yes, identify those parties.	N/A
Describe surrounding land use (residential, industrial, rural, etc.) and identify neighbouring facilities and types of industry.	
North:	Ping Yuen River
South:	Green belt
East:	Green belt
West:	Green belt
Describe the topography of the area (flat terrain, rolling hills, mountains, by a large body of water, vegetation, etc.).	Flat terrain
State the size and location of the nearest residential communities.	Chow Tin Tsuen
Are there any sensitive habitats nearby, such as nature reserves, parks, wetlands, or sites of special scientific interest?	No

4) QUESTIONNAIRE WITH EXISTING/ PREVIOUS SITE OWNER OR OCCUPIER		
	Yes/No	**Notes**
1. What are the main activities/operations at the above address?	-	N/A
2. How long have you been occupying the site?	-	N/A
3. Were you the first occupant on site? (If yes, what was the usage of the site prior to occupancy.)	-	N/A
4. Prior to your occupancy, who occupied the site?	-	N/A
5. What were the main activities/operations during their occupancy?	-	N/A
6. Have there been any major changes in operations carried out at the site in the last 10 years?	-	N/A
7. Have any polluting activities been carried out in the vicinity of the site in the past?	-	N/A
8. To the best of your knowledge, has the site ever been used as a petrol filling station/car service garage?	-	N/A
9. Are there any boreholes/wells or natural springs either on the site or in the surrounding area?	-	N/A
10. Do you have any registered hazardous installations as defined under relevant ordinances? (If yes, please provide details.)	-	N/A
11. Are any chemicals used in your daily operations? (If yes, please provide details.)	-	N/A
- Where do you store these chemicals?	-	N/A
12. Material inventory lists, including quantities and locations available? (If yes, how often are these inventories updated?)	-	N/A
13. Has the facility produced a separate hazardous substance inventory?	-	N/A
14. Have there ever been any incidents or accidents (e.g. spills, fires, injuries, etc.) involving any of these materials? (If yes, please provide details.)	-	N/A
15. How are materials received (e.g. rail, truck, etc.) and stored on site (e.g. drums, tanks, carboys, bays, silos, cisterns, vaults and cylinders)?	-	N/A

4) QUESTIONNAIRE WITH EXISTING/ PREVIOUS SITE OWNER OR OCCUPIER (CONTINUED)		
	Yes/No	**Notes**
16. Do you have any underground storage tanks? (If yes, please provide details.)	-	N/A
- How many underground storage tanks do you have on site?	-	N/A
- What are the tanks constructed of?	-	N/A
- What are the contents of these tanks?	-	N/A
- Are the pipelines above or below ground?	-	N/A
- If the pipelines are below ground, has any leak and integrity testing been performed?	-	N/A
- Have there been any spills associated with these tanks?	-	N/A
17. Are there any disused underground storage tanks?	-	N/A
18. Do you have regular check for any spillage and monitoring of chemicals handled? (If yes, please provide details.)	-	N/A
19. How are the wastes disposed of?	-	N/A
20. Have you ever received any notices of violation of environmental regulations or received public complains? (If yes, please provide details.)	-	N/A
21. Have any spills occurred on site? (If yes, please provide details)	-	N/A
- When did the spill occur?	-	N/A
- What were the substances spilled?	-	N/A
- What was the quantity of material spilled?	-	N/A
- Did you notify the relevant departments of the spill?	-	N/A
- What were the actions taken to clean up the spill?	-	N/A
- What were the areas affected?	-	N/A
22. Do you have any records of major renovation of your site or re-arrangement of underground utilities, pipe work/underground tanks? (If yes, please provide details.)	-	N/A
23. Have disused underground tanks been removed or otherwise secured (e.g. concrete, sand, etc.)?	-	N/A
24. Are there any known contaminations on site? (If yes, please provide details.)	-	N/A
25. Has the site ever been remediated? (If yes, please provide details.)	-	N/A

5) SITE SURVEY INFORMATION	
1. Date of Survey:	22-Jun-22

6) OBSERVATIONS		
	Yes/No	**Notes**
1. Are chemical storage areas provided with secondary containment (i.e. bund walls and floors)?	-	No chemical storage areas observed
2. What are the conditions of the bund walls and floors?	-	N/A
3. Are any surface water drains located near to drum storage and unloading areas?	-	N/A
4. Are any solid or liquid waste (other than wastewater) generated at the site? (If yes, please provide details.)	No	
5. Is there a storage site for the wastes?	No	
6. Is there an on-site landfill?	No	
7. Were any stressed vegetation noted on site during the site reconnaissance? (If yes, please indicate location and approximate size.)	No	
8. Were any stained surfaces noted on-site during the site reconnaissance? (If yes, please provide details.)	No	
9. Are there any potential off-site sources of contamination?	No	
10. Does the site have any equipment which might contain polychlorinated biphenyls (PCBs)?	No	
11. Are there any sumps, effluent pits, interceptors or lagoons on site?	No	
12. Any noticeable odours during site walkover?	No	
13. Are any of the following chemicals used on site: fuels, lubricating oils, hydraulic fluids, cleaning solvents, used chemical solutions, acids, anti-corrosive paints, thinners, coal, ash, oily tanks and bilge sludge, metal wastes, wood preservatives, and polyurethane foam?	No	

Appendix 8.4

Relevant Correspondence with FSD

(192)

消 防 處
香港九龍尖沙咀東部康莊道 1 號
消防處總部大廈

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

本處檔號 **OUR REF.** : (192) in FSD GR 6-5/4 R Pt. 43
來函檔號 **YOUR REF.** : 287082-08/L002/JS/CZ
電子郵件 **E-mail** : hkfsdenq@hkfsd.gov.hk
圖文傳真 **FAX NO.** : 2739 5879
電　　話 **TEL NO.** : 2733 7741

24 October 2022

ARUP
Level 5, Festival Walk,
80 Tat Chee Avenue,
Kowloon Tong, Kowloon
(Attn: Mr. Johnny SO, Consultant)

Dear Mr. SO,

Environmental Assessment Study for Section 12A Planning Application for Proposed Innovation and Technology Hub at Various Lots in D.D.82 and D.D. 86 and Adjoining Government Land, Man Kam To, New Territories
Request for Information of Dangerous Goods & Incident Records

I refer to your letter of 7.7.2022 regarding the captioned request and reply below in response to your questions:-

1. No Dangerous Goods Licence was issued in respect of the captioned address.

2. A total of one incident record was found at the subject location. Please refer to **Appendix A** for details.

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

Yours sincerely,

(NG Wing-chit)
for Director of Fire Services

Appendix A

Environmental Assessment Study for Section 12A Planning Application for Proposed Innovation and Technology Hub at Various Lots in D.D.82 and D.D. 86 and Adjoining Government Land, Man Kam To, New Territories

Request for Information of Dangerous Goods & Incident Records

No.	Date	Type of Incident	Address
1.	22.5.2021	Vegetation Fire	KK058949, NEAR CHOW TIN TSUEN

Our ref 287082-08/L002/JS/CZ

ARUP

BY POST AND FAX (2311 0066)

Level 5, Festival Walk
80 Tat Chee Avenue
Kowloon Tong, Kowloon
Hong Kong

t +852 2528 3031
d +852 2908 4381
f +852 2268 3380

johnny.so@arup.com
www.arup.com

Fire Services Department
Fire Services Headquarters Building
No.1 Hong Chong Road
Tsim Sha Tsui East
Kowloon

7 July 2022

Dear Sir/Madam

Environmental Assessment Study for Section 12A Planning Application for Proposed Innovation and Technology Hub at Various Lots in D.D. 82 and D.D. 86 and Adjoining Government Land, Man Kam To, New Territories

Request for Information of Dangerous Goods and Incident Records

We, Arup, have been appointed by our client as the Consultant to carry out an Environmental Assessment Study for supporting the S12A Planning Application for the captioned assignment. As part of the study, we are required to review the historical and present land use, and evaluate any potential land contamination issues within the Application Site as shown in **Figure 1**. We would like to request the following information for our land contamination assessment:

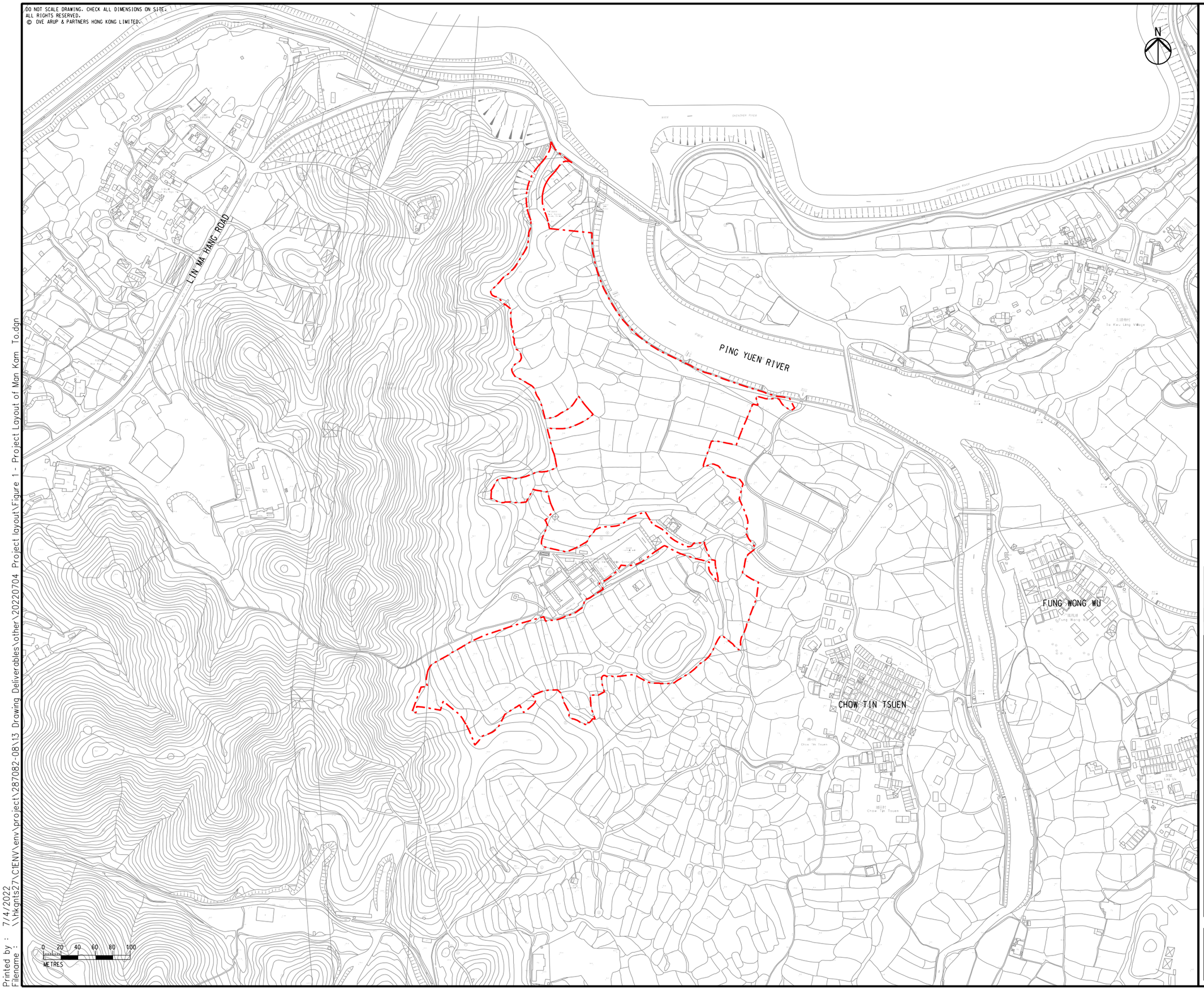
- The records of Dangerous Goods License issued within the Application Site;
- Any other information related to the use and/or storage of dangerous goods within the Application Site; and
- Past and present incident records within the Application Site.

It would be highly appreciated if you could provide the mentioned information by 18 July 2022. If you require any further information, please do not hesitate to contact the undersigned or our Ms. Charlotte Zhang at 2268 3740.

Yours faithfully

Johnny So
Consultant

Encl.
Figure 1



LEGEND

APPLICATION SITE

Rev	Description	By	Date
A	FIRST ISSUE	GL	07/22

Consultant

ARUP

Project Title

Section 12A Planning Application for Proposed Innovation and Technology Hub at Various Lots in D.D.82 and D.D. 86 and Adjoining Government Land, Man Kam To, New Territories

Drawing title

PROJECT LAYOUT
OF MAN KAM TO

Drawing no.			Rev.
FIGURE 1			A
Drawn: GL	Date: 07/22	Checked: JS	Approved: FC
Scale: 1:4000 @ A3		Status: PRELIMINARY	

Printed by : 7/4/2022
Filename : \\hkgnts27\C\ENV\env\project\287082-08\13 Drawing Deliverables\other\20220704 Project layout\Figure 1 - Project Layout of Man Kam To.dgn

Appendix 8.5

Relevant Correspondence with EPD

From: alicewytang@epd.gov.hk <alicewytang@epd.gov.hk>
Sent: Tuesday, July 12, 2022 9:08 AM
To: Johnny So <johnny.so@arup.com>
Cc: cyrillai@epd.gov.hk
Subject: Environmental Assessment Study for Section 12A Planning Application for Proposed Innovation and Technology Hub at Various Lots in D.D. 82 and D.D. 86 and Adjoining Government Land, Man Kam To, New Territories - Request for Information of Chemical Spill...

Dear Mr. So,
I refer to your letter dated 7 July 2022 (Your reference: 287082-08/L001/JS/CZ) on the captioned.

Regarding your enquiries in above letter, this Regional Office has no record of spillage or leakage of chemical waste or chemicals within the concerned site for the past 5 years. You may like to check with other relevant parties or departments for such information as appropriate.

As registered chemical waste producers at the location are concerned, a register of chemical waste producers is available for inspection in the Territorial Control Office of this department. If you would like to inspect, please contact Mr. C. K. TSANG at 2835 1017 for making appointment to view the records. Should you have any query on the matter, please contact the undersigned at 2158 5842. Thank you.

Regards,

Alice TANG
E(RN)34 / EPD

Our ref 287082-08/L001/JS/CZ

ARUP

BY POST AND FAX (2685 1133)

Level 5, Festival Walk
80 Tat Chee Avenue
Kowloon Tong, Kowloon
Hong Kong

t +852 2528 3031
d +852 2908 4381
f +852 2268 3380

johnny.so@arup.com
www.arup.com

Environmental Protection Department
Environmental Compliance Division
Regional Office (North)
10/F, Shatin Government Offices
No.1 Sheung Wo Che Road
Sha Tin, New Territories

7 July 2022

Dear Sir/Madam

Environmental Assessment Study for Section 12A Planning Application for Proposed Innovation and Technology Hub at Various Lots in D.D. 82 and D.D. 86 and Adjoining Government Land, Man Kam To, New Territories

Request for Information of Chemical Spillage Accident Records

We, Arup, have been appointed by our client as the Consultant to carry out an Environmental Assessment Study for supporting the S12A Planning Application for the captioned assignment. As part of the study, we are required to review the historical and present land use, and evaluate any potential land contamination issues within the Application Site as shown in **Figure 1**. We would like to request the following information for our land contamination assessment:

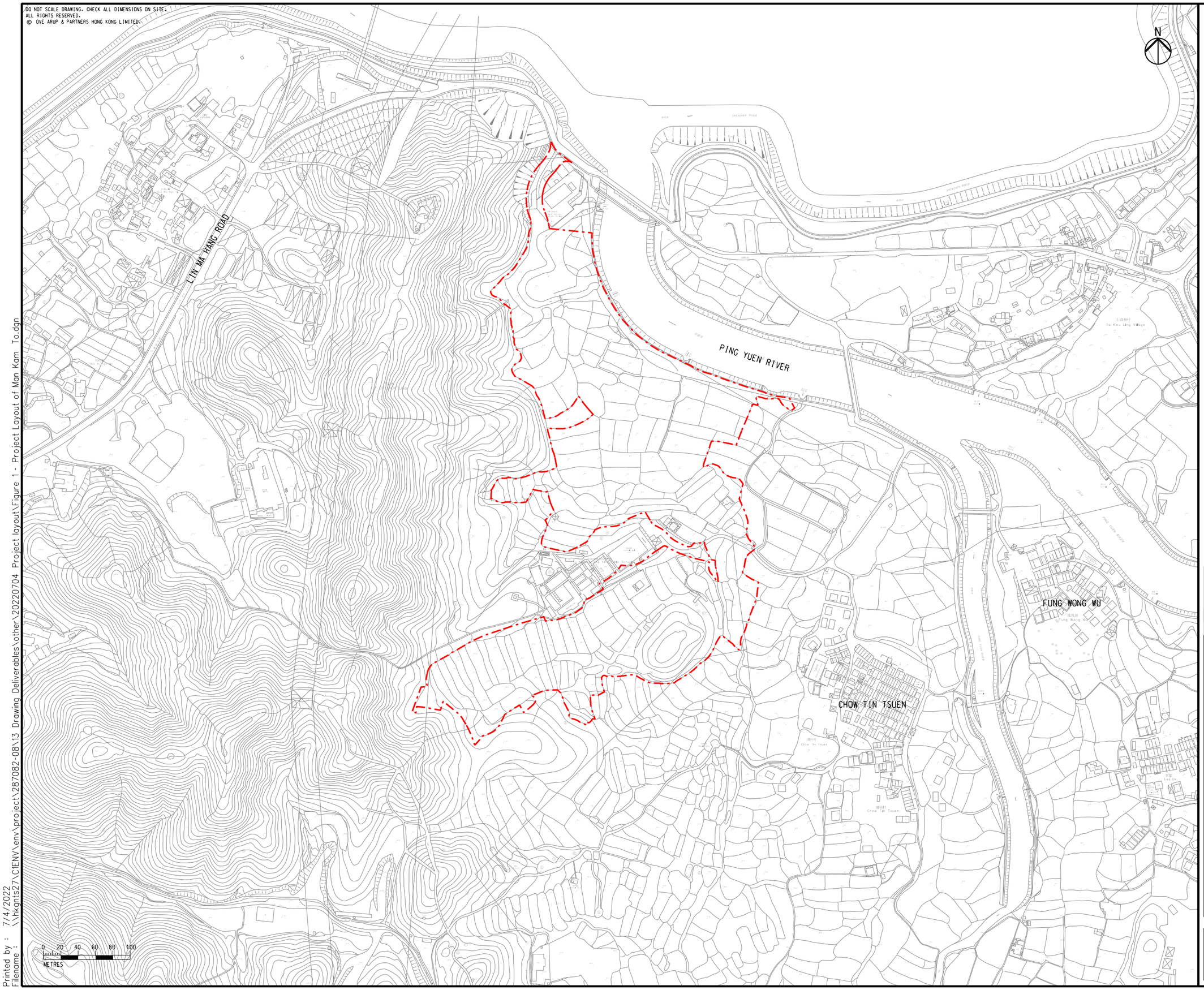
- The records of Chemical Waste Producers Registration within the Application Site; and
- Past and present chemical spillage / leakage records within the Application Site

It would be highly appreciated if you could provide the mentioned information by 18 July 2022. If you require any further information, please do not hesitate to contact the undersigned or our Ms. Charlotte Zhang at 2268 3740.

Yours faithfully

Johnny So
Consultant

Encl.
Figure 1



LEGEND

APPLICATION SITE

Rev	Description	By	Date
A	FIRST ISSUE	GL	07/22

Consultant

ARUP

Project Title

Section 12A Planning Application for Proposed Innovation and Technology Hub at Various Lots in D.D.82 and D.D. 86 and Adjoining Government Land, Man Kam To, New Territories

Drawing title

PROJECT LAYOUT
OF MAN KAM TO

Drawing no.			Rev.
FIGURE 1			A
Drawn: GL	Date: 07/22	Checked: JS	Approved: FC
Scale: 1:4000 @ A3		Status: PRELIMINARY	

Printed by : 7/4/2022
Filename : \\hkgnts27\C\ENV\env\project\287082-08\13 Drawing Deliverables\other\20220704 Project layout\Figure 1 - Project Layout of Man Kam To.dgn