Attachment 1 Responses-to-Comments Table

Comments from Related Departments — Page No.

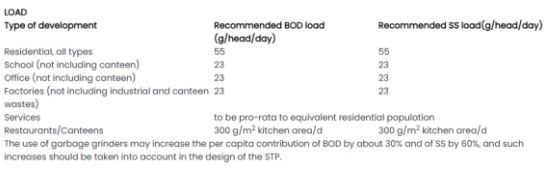
1.	**Drainage Services Department, dated 22 May 2024**	
	<u>Revised SIA</u> 1. Please note that we have no further comment on the revised SIA <u>Revised DIA</u> 1. Please adopt the design allowance as per Stormwater Drainage Manual Corrigendum No. 1/2022 for climate change adjustment. 2. Para 4.4.1 refers. Please advise if the further drainage downstream of SMH1003252 needs to be upgraded to cater for the development. Please review and elaborate. 3. Noting that some pending upgrading in the public drains were considered, the relevant development may only be proceeded when the downstream drainage system is upgraded to no worse than the assumed drainage network adopted in the assessment.	Noted. Noted. Please be clarified that the stormwater Drainage Manual Corrigendum No. 1/2022, where 16% rainfall increase due to climate change has been adopted previously. Please refer to remark no. 7 in Appendix B of **Annex A** – Revised Drainage Impact Assessment. Noted. Please be advised that the further drainage downstream of SMH1003252 to SMH1003255 are needed to be upgraded to cater the discharge. The calculation has been revised. Please refer to Sections 4.3.5, 4.3.7, 4.3.10, 4.3.13, 5.1.3, Tables 4-2 to 4-4, Appendix C and Appendix D of **Annex A**. Noted. The feasible upgrading option of the downstream drainage system has been shown in the calculation. Please refer to Sections 4.3.5, 4.3.7, 4.3.10, 4.3.13, 5.1.3, Tables 4-2 to 4-4, Appendix C and Appendix D of **Annex A**.
2.	**Environmental Protection Department, dated 20 May 2024**	
	Environmental Assessment Report <u>Air Quality Perspective</u> 1 . Section 5.2.5 "Air Pollution Control (Fuel Restriction) Regulation" should read "Air Pollution Control (Fuel Restriction) Regulations". Please amend.	Noted. Section 5.2.5 of **Annex B** – Replacement Pages of the Revised Environment Assessment has been revised.

	2 . Table 5-3 Please show 36th highest daily FSP instead of 19th highest for this non-government project.	Noted. Table 5-3 of **Annex B** has been revised accordingly.
	3 . Section 5.3.4 Please refer to PATHv3.0 instead of PATHv2.1.	Noted. Section 5.3.4 and Table 5-4 of **Annex B** has been revised.
	4 . Section 5.3.5 If the operation year is 2032, please quote the data for year 2030.	Noted. Section 5.3.5 and Table 5-4 of **Annex B** has been revised.
	5 . Section 5.4.2 Please check if there are any ASRs on the south side of the proposed development.	Noted. ASR09 – Ha Shan Kai Wat Village House has been added in Table 5-5 and Figure 5.1 of **Annex B**.
	6 . Section 5.4.5 Please check whether the S12A rezoning application no. Y/NE-TKL/4 would be the concurrent project to this application and whether it should be identified as ASR.	Noted. Please refer to Section 5.4.4, Table 5-5 and Figure 5.1 of **Annex B** for the revised information. ASR08 – S12A rezoning application no. Y/NE-TKL/4 for the proposed residential development phase 1 has been added which will be completed tentatively by 2028. According to the latest information from the application, there is no confirmed development plan and implementation programme.
	7 . Section 5.5.9 Please consider to delete this paragraph which is duplicating with Section 5.5.7.	Noted. Section 5.5.9 of **Annex B** has been deleted.

	8 . Section 5.7 We note there is a pigsty on the south west side of the proposed development. Please check whether the proposed development could meet the buffer distance requirements for odour sources. A quantitative odour impact assessment may be required if the HKPSG requirements could not be fulfilled. Please check with the regional office of EPD for any odour complaint records.	Noted. Enquiries has been made on the pigsty. As confirmed by Environment Protection Department (EPD) dated 27 May 2024, the concerned pig farm has ceased business for many years. Section 5.7.1 of **Annex B** has been revised. For odour emissions, the results of environmental survey and site visits show that the Subject Site falls within 200m buffer of a pigsty located toward the southwest. As referred to the reply from EPD regarding the compliant record of the pigsty showed in Figure 3.1 of **Annex B**, the pigsty has ceased business. No odour impact concerning the pigsty is expected. For the reply from EPD, please also refer to Appendix 5.1 of **Annex B** for information.
	9 . Section 5.7.2 No sewage treatment plant could be found in Appendix 3.1. Please check.	Noted. Please refer to the indication of Sewage Treatment Plant as shown in Drawing Basement Level 1 Plan SK-10 of Appendix 3.1 in **Annex B**.
	<u>Noise Perspective</u> 10 . To ensure the noise mitigation measures proposed by the Applicant will be incorporated into the future development, and considering there is no mechanism to impose approval condition for S.12A rezoning applications, control should be in place under land mechanism by special conditions under the lease modification to require the developer to submit a Noise Impact Assessment and implement the design and mitigation measures recommended therein.	Noted.
	11 . Section 6.3.18 It shall read "...the provision of acoustic window/acoustic door (Baffle type) to let them be well aware of the intended purpose, appropriate use and correct setting."	Noted. Section 6.3.18 of **Annex B** has been revised.

	12. It is noted that the distance correction adopted in the Fixed Plant Noise Impact Assessment Calculation in Appendix 6.7 is incorrect. Please critically review and revise.	Noted. Appendix 6.7 in **Annex B** has been updated.
	<u>Water Quality Perspective</u>	
	13. Figure 7.1 is missing. Please supplement.	
	(a) <u>Water Management and Land Contamination Perspective</u>	Noted. Figure 7.1 has been supplemented in **Annex B**.
	14. Response-to-Comment (9) – Section 8.4.5 to Section 8.4.7	
	It is understood that a site walkover was conducted at the off-site properties immediately adjacent to the Project Site, and site interviews were carried out to better understand their business and operation nature. The Consultant is advised to supplement the relevant site walkover checklist and associated photographic records for further vetting.	Noted. Please be clarified that site walkover was conducted. However, no access to the offsite properties was granted by the operators, where no site interview with the operators could be conducted on-site. Photolog for offsite properties has been supplemented in Sections 8.4.5 to 8.4.7 and Appendices 8.1 and 8.5 have been supplemented with photographic record in **Annex B**.
	15. Response-to-Comment (11) – Section 8.6.4	
	According to Appendix 8.5, a stained surface was also identified in Photo 44 and Photo 45; please review and update the extent of stains along the vehicle access between the construction material and machinery storage areas.	Noted. Section 8.6.4 of **Annex B** has been revised.
	16. Response-to-Comment (11) – Appendix 8.5	
	(a) According to Section 8.6.4, a stained surface was also identified in Photo 43; please incorporate indicative markup on the figure for clarity.	Noted. Sections 8.6.4, 8.6.9 and 8.7.4 of **Annex B** has been revised.
	(b) In addition to the first page of Appendix 8.5, please update the header from "Appendix 8.4" to "Appendix 8.5" to avoid confusion.	Noted. Heading of Appendix 8.5 of **Annex B** has been updated.
	17. Section 8.6.5	
	Please revise "Figure 8" to "Figure 8.1a and Figure 8.1b" for clarity.	Noted. Section 8.6.5 of **Annex B** has been updated.

	18 . Response-to-Comment (13) – Section 8.7.2 The term "illegal land contamination" is confusing, the Consultant is advised to provide clarification or update the wording as appropriate.	Noted. Section 8.7.2 of **Annex B** has been updated.
	19 . Response-to-Comment (13) – Section 8.7.8 Considering the elaboration on the site walkover, the site was divided into four distinctive parts. In addition to the entrance, temporary office, and village house area, please consider incorporating the vegetated area discussed in Section 8.6.8 as an area with no land contamination potential.	Noted. Section 8.7.8 of **Annex B** has been updated. There is no potential source of contamination listed below identified in the Application Site, including Entrance, Temporary Office, Vegetated Area and Village House Area.
	20 . Response-to-Comment (15) – Section 8.7 The Consultant is advised to graphically indicate the potential contamination areas and hotspots that require detailed site investigation in the subsequent stage.	Noted. Sections 8.7.7, 8.7.10, Appendix 8.5 and Figure 8.2 of **Annex B** have been updated.
	21 . Response-to-Comment (22) – Table 9-1 (a) Please append the relevant extract of the reference material for the waste index for further vetting.	Noted. Please refer to Appendix 9.1 supplemented in **Annex B**.
	(b) Please revise "m3" and "m2" to "m^3" and "m^2" for clarity.	Noted. Table 9-1 of **Annex B** has been revised.
	22 . Response-to-Comment (23) – Section 9.5.1 In case the generation of chemical waste is anticipated during the operation phase, please specify that the property management will register with EPD as a chemical waste producer and handle and dispose of chemical waste in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.	Noted. Section 9.5.2 of **Annex B** has been revised.
	Sewerage Impact Assessment Report 23 . Table 4-2 The peak flow of the generated sewage should be 72.1 L/s, not 0.072 L/s. Please verify and revise.	Noted. Table 4-2 of **Annex C** – Revised Sewerage Impact Assessment has been updated.

	24 . Section 4.3.1 The Average Dry Weather Flow (ADWF) is inconsistent with the ADWF in Table 4-2. Please verify and revise.	Noted. Given the sewage generated from residents and services is 2077.0 m^3/day + addition of 6 m^3/day sewage generation from swimming pool, the total ADWF is 2083 m^3/day. ADWF has been updated in Sections 4.3.1, 5.1.1, Table 4-2 and Appendix B of **Annex C**.
	25 . Table 4-6 and Appendix C Please check the pollutant loadings of the staff and update the calculation accordingly.	Noted. The pollutant loadings made reference to the Appendix 2 of Guidelines for the Design of Small Sewage Treatment Plants by EPD (please refer to the image below for information).  LOAD Type of development | Recommended BOD load (g/head/day) | Recommended SS load(g/head/day) Residential, all types | 55 | 55 School (not including canteen) | 23 | 23 Office (not including canteen) | 23 | 23 Factories (not including industrial and canteen wastes) | 23 | 23 Services | to be pro-rata to equivalent residential population Restaurants/Canteens | 300 g/m^2 kitchen area/d | 300 g/m^2 kitchen area/d The use of garbage grinders may increase the per capita contribution of BOD by about 30% and of SS by 60%, and such increases should be taken into account in the design of the STP. The BOD and SS loads of STP has been revised to 0.023 kg/head/day (office) and 0.004 kg/head/day (services staff). Please refer to Tables 4-5, 4-6, 4-7 and Appendix C of **Annex C**. Please also refer to Table 4-1 of **Annex A** for the updated calculation.
	26 . Section 5.1.1 The average sewage discharge is inconsistent with the ADWF in Table 4-2, please verify and revise.	Noted. Given the sewage generated from residents and services is 2077.0 m^3/day + addition of 6 m^3/day sewage generation from swimming pool, the total ADWF is 2083 m^3/day. ADWF has been updated in Sections 4.3.1, 5.1.1, Table 4-2 and Appendix B of **Annex C**.
	27 . Appendix B Please check the Maximum backwash volume of the Swimming Pool and update the table accordingly.	Noted. Table 4-4 and Appendix B of **Annex C** have been updated accordingly.

	28. Please contact the team of CE21/2021 Remaining phase development of NTN and check whether the public sewers are available for collecting the sewage for this development.	Noted. Please be advised that after contacting the CEDD officer of the project team of CE21/2021, no information of remaining phase development of NTN is available at the current stage. Please refer to the revised Section 2.3 of **Annex C** for details.
	29. Response-to-Comment Item 30(a) & Section 4.2 Table 4-2 Please clarify whether the "Total ADWF of the proposed development" should be 2083 m3/day or 2077 m3/day.	Noted. Given the sewage generated from residents and services is 2077.0 m^3/day + addition of 6 m^3/day sewage generation from swimming pool, the total ADWF is 2083 m^3/day. ADWF has been updated in Sections 4.3.1, 5.1.1, Table 4-2 and Appendix B of **Annex C**.
	30. Response-to-Comment Item 33 Contributing population at Table 4-2 (7693) does not align with Table 4-6 (6334+839=7173) and Appendix B (7173), please review and amend as appropriate.	Noted. Please refer to the revised population in Appendix B of **Annex C**.
	31. Response-to-Comment Item 34 Please clarify whether the sewage flow rate should be 2083 m3/day or 2077 m3/day, e.g. Section 4.3.1 (2083 m3/day), Table 4-2 (2077 m3/day), Appendix B (2077 m3/day) and Appendix C (2077 m3/day). Please amend as appropriate.	Noted. Given the sewage generated from residents and services is 2077.0 m^3/day + addition of 6 m^3/day sewage generation from swimming pool, the total ADWF is 2083 m^3/day. ADWF has been updated in Sections 4.3.1, 5.1.1, Table 4-2 and Appendix B of **Annex C**.
	32. Please critically review whole report and appendices to ensure consistency.	Noted. Please refer to **Annex C** for the revised report and appendices.

(Last Updated: 4 July 2024)

Annex A Revised Drainage Impact Assessment

Issue No. : 5
Issue Date : Jun 2024
Project No. : 2127

DRAINAGE IMPACT ASSESSMENT

FOR

APPLICATION FOR AMENDMENT OF PLAN UNDER SECTION 12A FOR THE TOWN PLANNING ORDINANCE (CAP. 131) FOR MIXED USE DEVELOPMENT AT LOTS 796 AND 1008RP IN D.D. 77 AND ADJOINING GOVERNMENT LAND IN PING CHE, TA KWU LING, NEW TERRITORIES

Prepared by

Allied Environmental Consultants Limited

COMMERCIAL-IN-CONFIDENCE

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Document Verification

Project Title	APPLICATION FOR AMENDMENT OF PLAN UNDER SECTION 12A FOR THE TOWN PLANNING ORDINANCE (CAP. 131) FOR MIXED USE DEVELOPMENT AT LOTS 796 AND 1008RP IN D.D. 77 AND ADJOINING GOVERNMENT LAND IN PING CHE, TA KWU LING, NEW TERRITORIES
Project No.	2127
Document Title	DRAINAGE IMPACT ASSESSMENT

Issue No.	Issue Date	Description	Prepared by	Checked by	Approved by
1	Oct 2023	1st Submission	Various	Cathy Man	Grace Kwok
2	Dec 2023	2nd Submission	NGAN Chun Sang	Cathy Man	Grace Kwok
3	Feb 2024	3rd Submission	NGAN Chun Sang	Cathy Man	Grace Kwok
4	Apr 2024	4th Submission	NGAN Chun Sang	Cathy Man	Grace Kwok
5	Jun 2024	5th Submission	NGAN Chun Sang	Cathy Man	Grace Kwok

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Table of Contents

List of Tables

List of Figures

List of Appendices

1. INTRODUCTION

1.1. Background

1.1.1. Allied Environmental Consultants Limited ("AEC") has been appointed to conduct a Drainage Impact Assessment ("DIA") to support of a Section 12A application for the mixed use development at Lot 796 & 1008 RP at D.D. 77 and adjoining government land in Ping Che, Ta Kwu Ling, New territories (hereinafter referred to as "Application Site").

1.1.2. According to the approved Ping Che and Ta Kwu Ling Outline Zoning Plan (OZP No.: S/NE-TKL/14) gazette on 12/03/2010, the Application Site is currently zoned as "Open Storage" ("OS") Zone, the southern part of the Application Site is zoned as "Agriculture" ("AGR") and a minor portion of the Application Site is shown as "Road".

1.2. Objectives

1.2.1. The objectives of this DIA are to review the proposed drainage facilities in the vicinity of the Proposed Development at the Application Site, evaluate potential impacts based on the catchment, recommend appropriate options for stormwater discharge, if necessary.

1.3. Report Structure

1.3.1. The remaining chapters of this report are shown below:

Chapter 2 – Site Context
Chapter 3 – Relevant Guidelines & Standards
Chapter 4 – Drainage Impact Assessment
Chapter 5 – Conclusion

2. SITE CONTEXT

2.1. Site Location and Its Environs

2.1.1. The proposed development is located at Ping Che Road from the north to northeast, the unnamed village road to the east, village, agricultural land and open storage area to the south and west.

2.1.2. ***Figure 2.1*** shows the Site location and its environs.

2.2. Proposed Development Scheme

2.2.1. The proposed site area of the application site is 17,822m^2, with a plot ratio of 5.9 for domestic use and 1.1 for non-domestic use. The total GFA for domestic use is 105,145 m^2, and the 19,603 m^2 for non-domestic use. The proposed development will consist of 5 blocks of residential tower ranging from 47 to 48-storey (excluding basement) in height, provided 2,205 residential unit, and 1 block of commercial tower with 35-storey (excluding basement) in height. The non-domestic use consisted of retail, office, hotel or service apartment, clubhouse, day care centre for the elderly and child care centre, and a proposed on-site Sewerage Treatment Plant (STP) within the Application Site.

2.2.2. The Master Layout Plan (MLP) and Sectional Drawing of the proposed development are shown in ***Appendix A.*** Based on the tentative implementation programme, the planned population intake would be in year 2032.

2.3. Existing Drainage Condition

2.3.1. Drainage information was obtained from the GeoInfo Map services of the Lands Department to gather the background information on drainage infrastructure in the vicinity of the Application Site. Concerned drainage network was identified for estimation of the potential impact to the downstream drainage associated with the proposed development. Stormwater runoff from Proposed Development is collected at the terminal manhole and discharged to existing public stormwater network along the Ping Che Road at the northeast side of the site, flowing to northwest direction and into the Ping Yuen River. The size of the existing stormwater pipe along Ping Che Road is relatively small ranging from 375mm to 600mm.

2.4. Planned Drainage Facilities in the vicinity

2.4.1. With reference to Project Profile prepared for "Remaining Phase Development of the New Territories North (NTN) – NTN New Town and Man Kam To" (NTN Development) in May 2021, (ESB-341/2021), the application site fall within the NTN development. The NTN includes the following individual works items.

- Item F.1, Part I, Schedule 2 - Sewage treatment works with an installed capacity of more than 15,000 m3 per day

- Item F.2, Part I, Schedule 2 - Sewage treatment works- (a) with an installed capacity of more than 5,000 m3 per day

- Item F.3, Part I, Schedule 2 - A sewage pumping station- with an installed capacity of more than 300,000 m3 per day

- Item I.2, Part I, Schedule 2 - A flood storage pond more than 10 ha in size

- Item I.1(b), Part I, Schedule 2 - Drainage channel or river training and diversion works which discharges or discharge into an area which is less than 300 m from the nearest boundary of an existing or planned (i) site of special scientific interest; (ii) site of cultural heritage; (iii) marine park or marine reserve; (iv) fish culture zone; (v) wild animal protection area; (vi) coastal protection area; or (vii) conservation area

2.4.2. In December 2017, Planning Department (PlanD) and Civil Engineering and Development Department (CEDD) completed Preliminary Feasibility Study on Developing the New Territories North (NTN) (the Preliminary NTN Study). It is noted that a proposed drainage works and a Drainage Master Layout Plan have been formulated.

2.4.3. During the course of study, relevant details and construction programme cannot be obtained from North Development Office (NDO) of CEDD, the Project Proponent of the NTN Development.

3. RELEVANT GUIDELINES & STANDARDS

3.1. Legislation, Standards and Guidelines

3.1.1. Water quality in Hong Kong is legislated by the provisions of the Water Pollution Control Ordinance (Cap 358), 1980 (WPCO). Territorial Water has been subdivided into ten Water Control Zones (WCZ) and four supplementary water control zones. A Technical Memorandum on Standards for Effluents discharged into Drainage and Sewerage Systems, Inland and Coastal Water (TMES) has been issued, which requires licensing of all discharges into all public sewers and drains. The water quality standards will have to be met during the operation stage.

3.1.2. Besides as stipulated in the Building (Standards of Sanitary Fitments, Plumbing, Drainage Works and Latrines) Regulations 41(1), 40(2), 41(1), 90 and recap in ProPECC PN 1/23, domestic sewage should be discharged to a foul water sewer and surface water should be discharged via rainwater pipes to stormwater drains during operation phase.

3.2. Assessment Methodology

3.2.1. Under the existing condition before proposed development, the ground level of Application Site is 14.3 mPD. According the Drainage Record Plan, the cover level of nearby existing manhole is around 17 mPD and thus it is assumed that storm water from the Application Site is not discharging to the existing drainage system along Ping Che Road. According to existing flow regime, surface runoff from the Application Site and its vicinity flows towards northwest direction and finally discharged into Ping Yuen River following the topography of Ping Che Area***. Figure 3.1*** illustrates the existing stormwater surface run-off flow path from upstream catchments to the Application Site, and finally collected by Ping Yuen River to the Northwest of the Site.

3.2.2. With the proposed development, the ground level of Application site elevated to 16.0 mPD. ***Figure 3.2*** illustrates an overview of corresponding catchment areas and existing drainage network for this study. As shown in ***Figure 3.2***, the ground level of the Application Site is elevated and lower than that of Catchment A. storm water from Catchment A will be collected by the proposed U- Channel along the site boundary at the east of the Application Site. The surface runoff within the Application Site and the treated effluent from on-site STP together with storm water from Catchment A will be collected and discharge through two terminal manholes (P1: STMH-01 and P2: STMH-02) at the Application Site respectively. They will be connected to the existing 450mm sewer public storm water manholes (D1:

SMH1003241 and D3: SMH1003243).

3.2.3. The drainage calculations are in accordance with the Stormwater Drainage Manual (Fifth Edition, January 2018 and Corrigendum No. 1/2022) published by Drainage Services Department (DSD). Rational Method shall be applied to estimate the peak surface runoff values. The idea behind the Rational Method is that for a spatially and temporally uniform intensity *i*, which continues indefinitely, the runoff at the outlet of a catchment will increase until the time concentration t_c, when the whole catchment is contributing flow to the outlet. The peak runoff is calculated as follows.

$$Q_P = 0.278\ C\ i\ A \quad \ldots\ldots (1)$$

Where

Q_p	=	*peak runoff in m^3/s*
C	=	*runoff coefficient (dimensionless)*
i	=	*rainfall intensity in mm/hr*
A	=	*catchment area in km^2*

3.2.4. Runoff coefficient C depends on the permeability, slope and pond character of the surface; rainfall intensity i, is the average rainfall intensity selected on the basis of the design rainfall duration and return period.

4. DRAINAGE IMPACT ASSESSMENT

4.1. Site Condition

4.1.1. The existing Application Site is used as an open storage, it is partially covered with vegetation (~35% vegetation; ~65% paved). The flow path of the existing stormwater surface runoff is illustrated in ***Figure 3.1***, which indicates that the runoff from immediate upstream will flow through the Application Site, and the runoff will flow further downstream based on the topography. The existing surface runoff is expected to free flow along the surface towards northwest direction, and finally discharge to Ping Yuen River.

4.1.2. The Application Site contains an approximate area of 17,822 m^2. The surface runoff within the Application Site after development and the treated effluent from on-site STP will be collected and discharge through the terminal manhole (P1: STMH-01) at the Application Site and connected to the existing 450mm public storm water manhole (D3: SMH1003243. The at grade greenery area will be maintained at minimum of 20% and the proposed permeable material paving for the Application Site will be at least 15%, subject to detail design at later stage.

4.1.3. Due to the geographical characteristics, the existing surface runoff from the project site are flowing towards northwest direction, and existing project site is receiving runoff from the direct upstream Catchment A. The Proposed Development elevated the level of Application Site from 14.3 mPD to 16.0 mPD, it is expected that the runoff from immediate upstream of the site will be disrupted and intercepted. Therefore, U-channel is proposed along the site boundary at the east of the Application Site to cater the runoff from the Catchment A, collected by the terminal manhole (P2: STMH-02) and discharged to the existing 375mm public stormwater manhole (SMH1003241).

4.1.4. The public stormwater manhole also serving the area Catchment B and Catchment C at the vicinity of the Application site. Catchment B will be discharged to public manhole SMH1003241 while Catchment C will be discharged to SMH1003243.

4.1.5. The flow from the preliminary drainage plan is shown in ***Figure 3.2***, the detailed drainage plan will be submitted at later detailed design stage.

4.2. Peak Flow Estimation

4.2.1. The peak flow from the Proposed development and the surrounding Catchments is calculated

from equation (1) as mentioned in ***Section 3.2.3***. Detailed calculation is tabulated in ***Appendix B*** and summarized in ***Table 4-1*** below.

Table 4-1 Estimated Peak Flow for the Application Site

Catchment	Area (m^2)	Paved Area (%)	Unpaved Area (%)	Runoff under 1 in 50 years scenario (m^3/s)	Receiving Terminal Stormwater Manhole	Receiving Public Stormwater Manhole
Proposed Development						
Application Site	17,822	20	80	1.052	STMH-01	SMH1003243
Catchment A	6,123	30	70	0.270	STMH-02	SMH1003241
Catchment B	6,303	30	70	0.279	-	SMH1003241
Catchment C	6,553	30	70	0.271	-	SMH1003243
STP	-	-	-	0.072	STMH-01	SMH1003243
Total:		-	-	**1.943**		
Existing Scenario						
Application Site	17,822	35	65	0.718	N/A	N/A
Total:		**35**	**65**	**0.718**		

4.3. Potential Impact on Public Stormwater System due to Surface Runoff

4.3.1. The Application site is currently slightly hilly land and partially covered by greenery, while the proposed development is basically built on the paved surface.

4.3.2. Based on the assessment, the overall greenery area of the existing Application Site is approximately 35%. The anticipated surface runoff form the existing site is 0.718m^3/s, the calculation is shown in ***Table 4-1*** and ***Appendix B***.

4.3.3. The Colebrook-White and Manning frictional resistance equations with reference to the Stormwater Drainage Manual (Fifth Edition) are used to calculate the hydraulic capacities of the stormwater drainage pipes. As defined in Section 6.6.2 in Stormwater Drainage Manual, 50 years of the return periods for an Urban Drainage Branch System is adopted for the assessment.

Existing Condition

4.3.4. The hydraulic calculation of runoff from existing Application Site and surrounding catchments is calculated to assess the adequacy of the existing stormwater pipe. The surface run off from Catchment A and Catchment B are expected to discharge into public manhole SMH1003241,

while the Catchment C and existing Application Site are discharged into public manhole SMH1003243. The calculation is shown in ***Appendix C*** and summarized in ***Table 4-2***.

Table 4-2 Summary of Peak Flow and Drainage Capacity before Proposed Development

Manhole		Catchment	Total Flow from Catchment (m^3/s)	Percentage of Capacity
From	To			
SMH1003241	SMH1003242	Catchment A + B	0.548	**505%**
SMH1003242	SMH1003243	Catchment A + B	0.548	**446%**
SMH1003243	SMH1003246	Existing Site + Catchment A + B + C	1.538	**501%**
SMH1003246	SMH1003247	Existing Site + Catchment A + B + C	1.538	**554%**
SMH1003247	SMH1003249	Existing Site + Catchment A + B + C	1.538	**553%**
SMH1003249	SMH1003248	Existing Site + Catchment A + B + C	1.538	**564%**
SMH1003248	SMH1003250	Existing Site + Catchment A + B + C	1.538	**678%**
SMH1003250	SMH1003252	Existing Site + Catchment A + B + C	1.538	**536%**
SMH1003252	SMH1003253	Existing Site + Catchment A + B + C	1.538	**520%**
SMH1003253	SMH1003254	Existing Site + Catchment A + B + C	1.538	**529%**
SMH1003254	SMH1003255	Existing Site + Catchment A + B + C	1.538	**370%**
SMH1003255	Outlet to Ping Yuen River	Existing Site + Catchment A + B + C	1.538	**271%**

*Note: The segments exceeding the capacity are **bolded***

4.3.5. Based on the hydraulic calculation shown in ***Appendix C*** and ***Table 4-2***, the stormwater flow from existing condition will exceed the capacity of the public drainage, ranged from 271% to 678%.

After Proposed Development

4.3.6. The site formation work is expected to increase the level from 14.3mPD to 16.0mPD. As discussed in ***Section 4.1.3***, U-channel drainage is proposed along the site boundary at the east of the Application Site to cater the upstream runoff, collected by the proposed STMH-02 and discharged to the existing 375mm public stormwater manhole (SMH1003241).

4.3.7. There is also expected to be a decrease in overall greenery area within the Application Site after proposed development, the greenery is reduced from ~35% to ~20%. According to the

DIA hydraulic calculations presented in ***Table 4-1*** and ***Appendix B***, it is anticipated that surface runoff will increase, going from 0.718m³/s to 1.052m³/s. The runoff from Application Site and treated effluent from on-site STP together with storm water from Catchment A will be collected and discharge through the STMH-01 and STMH-02 and connected to the existing 450mm public storm water manhole. At the same time, the stormwater runoff from catchment B and Catchment C will be collected and discharge through the SMH1003240 and SMH1003243 respectively and connected to the existing 375mm to 450mm public stormwater manhole. In this connection, the proposed development will lead to increase of 0.406 m³/s in peak flow at existing drainage system along Ping Che Road, taking stormwater from Catchment A into consideration.

4.3.8. According to the calculation as tabulated in ***Appendix B***, the total flows from the Application Site under 1 in 50 years storm event are found to be 1.124 m³/s after the Proposed Development, as summarized in ***Table 4-1***.

4.3.9. The hydraulic calculation of runoff from Application site and surrounding catchments is also included in the calculation to assess the adequacy of the proposed stormwater pipe, the calculation is shown in ***Appendix C*** and summarized in ***Table 4-3.***

Table 4-3 Estimation of Peak Flow and Drainage Capacity Check

Manhole		Catchment	Total Flow from Catchment (m³/s)	Percentage of Capacity
From	To			
STMH-02	SMH1003241	Catchment A	0.270	85%
SMH1003241	SMH1003242	Catchment A + B	0.548	**505%**
SMH1003242	SMH1003243	Catchment A + B	0.548	**446%**
STMH-01	SMH1003243	Application Site + STP	1.124	56%
SMH1003243	SMH1003246	Application Site + STP + Catchment A + B + C	1.943	**633%**
SMH1003246	SMH1003247	Application Site + STP + Catchment A + B + C	1.943	**700%**
SMH1003247	SMH1003249	Application Site + STP + Catchment A + B + C	1.943	**699%**
SMH1003249	SMH1003248	Application Site + STP + Catchment A + B + C	1.943	**712%**
SMH1003248	SMH1003250	Application Site + STP + Catchment A + B + C	1.943	**857%**
SMH1003250	SMH1003252	Application Site + STP + Catchment A + B + C	1.943	**677%**
SMH1003252	SMH1003253	Application Site + STP + Catchment A + B + C	1.943	**657%**
SMH1003253	SMH1003254	Application Site + STP + Catchment A + B + C	1.943	**669%**

SMH1003254	SMH1003255	Application Site + STP + Catchment A + B + C	1.943	**468%**
SMH1003255	Outlet to Ping Yuen River	Application Site + STP + Catchment A + B + C	1.943	**342%**

*Note: The segments exceeding the capacity are **bolded***

4.3.10. Based on the hydraulic calculation shown in ***Appendix C*** and ***Table 4-3***, the stormwater flow for existing public drainage will exceed the capacity after development, ranged from 342% to 857%. The drainage impact is anticipated.

4.3.11. Based on the EIA Project Profile and Study brief for Development of New territories North (NTN) New Town and Man Kam To Development (NTN Development) (ESB-341/2021), Designated Projects including Sewerage Treatment Works (Item F.1 and/or Item F.2), Sewerage Pumping Station(s) (Item F.3), Drainage channel or river training and diversion works (Item I.1(b)) and a flood storage pond more than 10 ha in size (Item I.2, Part I) are included in the NTN Development.

4.3.12. The implementation details of NTN Development are yet to be confirmed, no programme and details can be obtained during the course of study, the changes and upgrading of sewerage and drainage system cannot be identified at this stage. It is expected to have upgrade works of drainage system, however the assessment is evaluate based on the existing scenario without NTN development in place for completeness is expected and the hydraulic calculation is provided in ***Appendix C***.

4.3.13. A hydraulic assessment was conducted, which the upgrading on existing drainage network is taken into account and provided in ***Appendix D***. A minimum pipe diameter, yet feasible to cater the surface runoff discharged from the application site after development is proposed. The results showed that the pipes are required to be updated to 750mm, 1050mm and 1200mm respectively. The summary of the hydraulic calculation is summarized in

4.3.14. ***Table*** 4-4.

Table 4-4 Estimation of Peak Flow and Drainage Capacity After Upgrading works is Considered

Pipe Segment	Upgraded Diameter (mm)	Maximum Capacity of Sewer (m^3/s)	Catchment	Total Flow from Catchment (m^3/s)	Percentage of Used Capacity
P2 – D1	375	0.318	Catchment A	0.270	85%
D1 – D2	750	0.673	Catchment A + B	0.548	81%

D2 – D3	750	0.763	Catchment A + B	0.548	72%
P1 – D3	600	2.009	Application Site + STP	1.124	56%
D3 – D4	1050	2.838	Application Site + STP + Catchment A + B + C	1.943	68%
D4 – D5	1050	2.566	Application Site + STP + Catchment A + B + C	1.943	76%
D5 – D6	1050	2.572	Application Site + STP + Catchment A + B + C	1.943	76%
D6 – D7	1050	2.525	Application Site + STP + Catchment A + B + C	1.943	77%
D7 – D8	1050	2.100	Application Site + STP + Catchment A + B + C	1.943	93%
D8 – D9	1050	2.655	Application Site + STP + Catchment A + B + C	1.943	73%
D9 – D10	1200	2.588	Application Site + STP + Catchment A + B + C	1.943	75%
D10 – D11	1200	2.544	Application Site + STP + Catchment A + B + C	1.943	76%
D11 – D12	1200	2.560	Application Site + STP + Catchment A + B + C	1.943	76%
D12 – D13	1200	3.494	Application Site + STP + Catchment A + B + C	1.943	56%

*Note: The segments exceeding the capacity are **bolded***

4.3.15. Further assessment will be conducted to determine if upgrading works by the Project is required. If there is exceedance or the drainage upgrading works by CEDD for NTN Development is not yet available before the intake of population of the proposed development, mitigation measures and/or upgrading works will be proposed and implemented by the Project.

4.3.16. The size and detailed arrangement of the proposed internal drainage system for the proposed development will be further reviewed in the detailed design stage. Submission will be made to Building Department for approval in due course.

4.4. Mitigation Measures

4.4.1. Based on the assessment, the stormwater peak flow will exceed the capacity of the existing public drainage system along the Ping Che Road. At the moment of limited information available, the scenario of upgrading the public drainage system from SMH1003241 to SMH1003252, upgrade from 375mm, 450mm, 525mm and 600mm to 750mm, 1050mm and 1200mm respectively, are presented as one of the feasible options for proposed mitigation measures.

U-Channel

4.4.2. Due to the alteration of the surface level of Application Site by the proposed development, a series of U-channel drainage is proposed to install along the eastern site boundary of the Application Site. The U-channel is used to accommodate the surface runoff flowing from upstream Cathcment A. The preliminary drainage layout is shown in Figure 3.2, the detailed drainage plan is subjected to detailed design stage later.

4.4.3. For collecting surface runoff within the Proposed Development and upstream catchment, the design of site drainage and disposal of various site effluents generated within the Application Site should follow the relevant guidelines and practices as given in ProPECC PN1/23. Proper drainage facilities will also be provided to discharge the surface runoff to the public drain.

Greenery and Pervious Material

4.4.4. The existing greenery to pavement ratio at the Application Site stands at 0.35 greenery: 0.65 pavement area. In order to mitigate the potential adverse impacts resulting from the proposed development, at-grade greenery and green roof within the proposed development will be maximized as far as practicable. Additionally, the proposed development will incorporate pervious paving material at hard landscape area (except EVA) when feasible. In summary, it is targeted to provide the total greenery and pervious paving area constituting of around 40% of site area, which is equivalent to existing greenery area on site.

Blue-Green Infrastructure

4.4.5. The proposed development will explore and study for incorporation of appropriate blue-green infrastructure following TC(W) No. 9/2020 Blue-Green Drainage Infrastructure" issued by DEVB in July 2020 and the recently issued DSD guidelines for blue-green infrastructure. The rainwater harvesting and detention pond will be considered. In the case of proposed development, the Stormwater Harvesting System (SHS) is installed to collect and treat the stormwater entering the storage tank during rainstorm events, and potentially reuse it toward fulfilling the needs in residences, service trades, hotel and service apartments such as toilet flushing, water features, car washing, street cleansing etc. The layout plan and design of SHS and retention pond are subjected to detailed design stage later.

4.4.6. Application of floodable area and drainage facility co-use in drainage management will also

be considered during detailed design stage when practicable. The client will implement the required mitigation measures before occupation of the project.

4.4.7. Further assessment will be conducted to determine if upgrading works by the Project is required. If there is exceedance or the drainage upgrading works by CEDD for NTN Development is not yet available before the intake of population of the proposed development, mitigation measures and/or upgrading works will be proposed and implemented by the Project. The updated DIA report will be submitted to DSD for approval.

4.4.8. The size and detailed arrangement of the proposed internal drainage system for the proposed development will be further reviewed in the detailed design stage. Submission will be made to Building Department for approval in due course.

Others

4.4.9. The applicant will be responsible for the construction of all necessary drainage system, including the proposed pipe connected to the public stormwater drain as well as other internal drainage infrastructure within the application site.

4.4.10. No fertilisers or pesticides will be routinely used for vegetation management in landscape area in accordance with the General Specification for Building (2012 edition) by Architectural Services Department (ASD). During heavy rainfall, trace of pollutants may be wash-off and is often bound or adsorbed onto particles (i.e. loose soil or litter). The stormwater drainage system on site will be equipped with silt trap to remove the particles and associated pollutants. The stormwater discharge will satisfy the effluent standards and requirements stipulated in the WPCO-TM, notably, with respect to prohibited substances as stated in clauses 8.4 and 9.1, as the case may be.

4.4.11. Layout of major drainage channels within the Proposed Development will be submitted to the relevant authorities. All drainage facilities shall be designed and constructed to conform to the requirements laid down in:

- The Stormwater Drainage Manual, DSD
- The General Specification for Civil Engineering Works, Hong Kong Government
- The DSD Standard Drawings

5. CONCLUSION

5.1.1. A Drainage Impact Assessment (DIA) has been conducted to evaluate the possible impacts on the public drainage network due to the proposed development. The proposed project will involve alteration of the surface level of Application Site. Series of U-channel drainage is proposed to install along the eastern site boundary of the Application Site to collect storm water from the catchment immediately upstream (Catchment A). The stormwater runoff from Application Site, Catchment A, Catchment B, Catchment C and the treated effluent generated from STP will be collected at proposed terminal manholes (STMH-01 and STMH-02) and public stormwater manhole (SMH1003241 and SMH1003243), then discharged into the public drainage along Ping Che Road.

5.1.2. There is a New Territories North (NTN) New Town and Man Kam To Development plan nearby the Application Site, the planned drainage facilities are expected according to the Project Profile for the NTN Development, where design details and construction programme cannot be obtained during the course of study.

5.1.3. Based on the assessment, the peak flow is exceeding the capacity of the existing drainage system. A scenario with upgrading works from SMH1003241 to SMH1003255 until the outlet to Ping Yuen River is proposed as one of the feasible mitigation measures, with limited information available. Further study will be conducted at detailed design stage taken the planned drainage facilities into consideration when relevant information available.

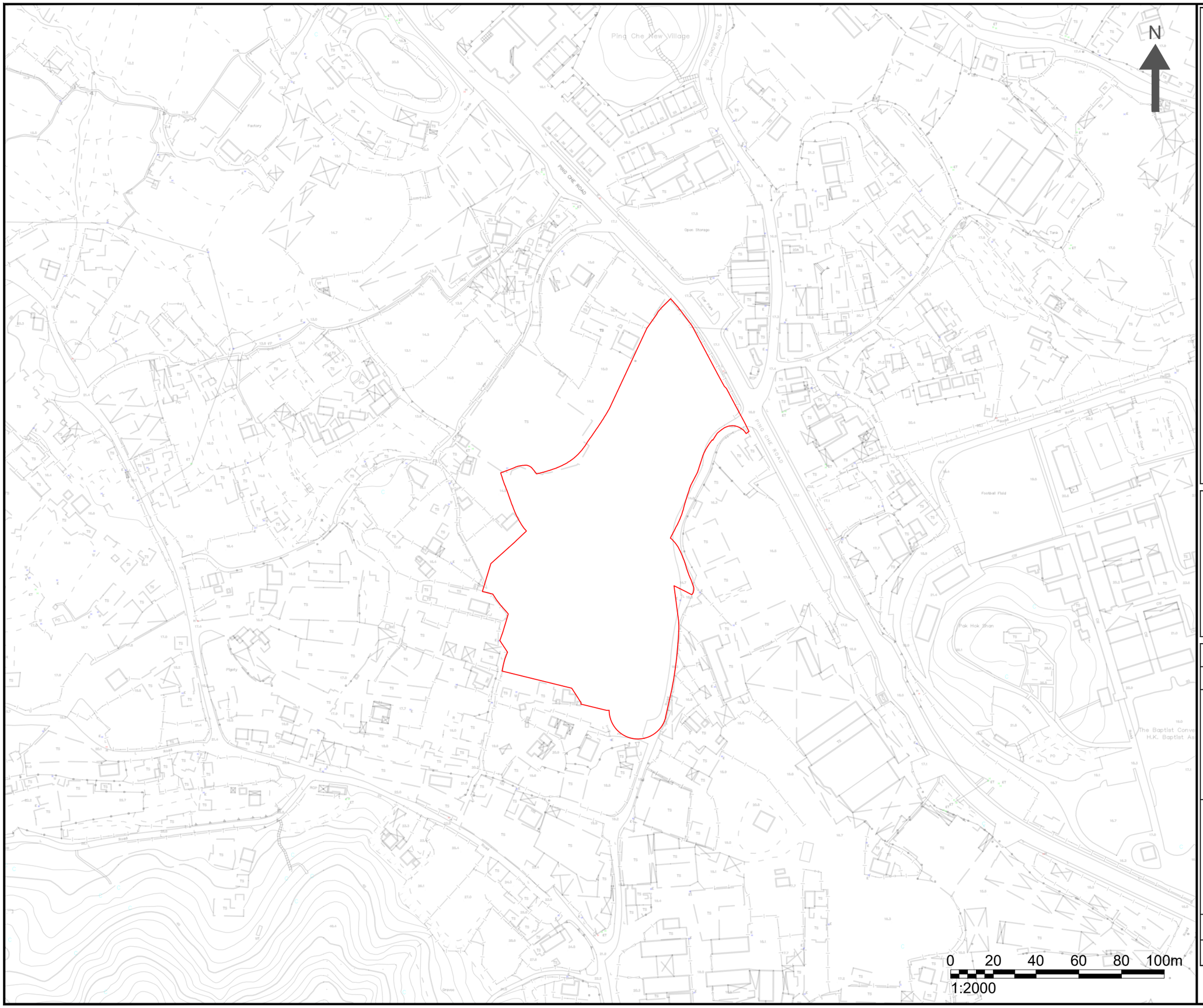
5.1.4. Various mitigation measures will be explored and studied for incorporation in the design for implementation to minimize the discharge of storm water from the Application Site, including

- Greenery (at grade greenery/ green roof)
- Pervious material
- Rainwater harvesting system and retention pond
- Application of Floodable Area and Drainage Facility Co-Use

5.1.5. Based on the above, it is concluded that the drainage impact arising from the proposed development should be acceptable.

Figure 2.1

Application Site Location and Its Environs



NOTES :

APPLICATION SITE

Consultant

Allied Environmental Consultants Limited

Project No. :	2127
Drawing By :	CS

Project :

APPLICATION FOR AMENDMENT OF PLAN UNDER SECTION 12A FOR THE TOWN PLANNING ORDINANCE (CAP. 131) FOR MIXED USE DEVELOPMENT AT LOTS 796 AND 1008RP IN D.D. 77 AND ADJOINING GOVERNMENT LAND IN PING CHE, TA KWU LING, NEW TERRITORIES

Drawing Title :

APPLICATION SITE LOCATION & ITS ENVIRONS

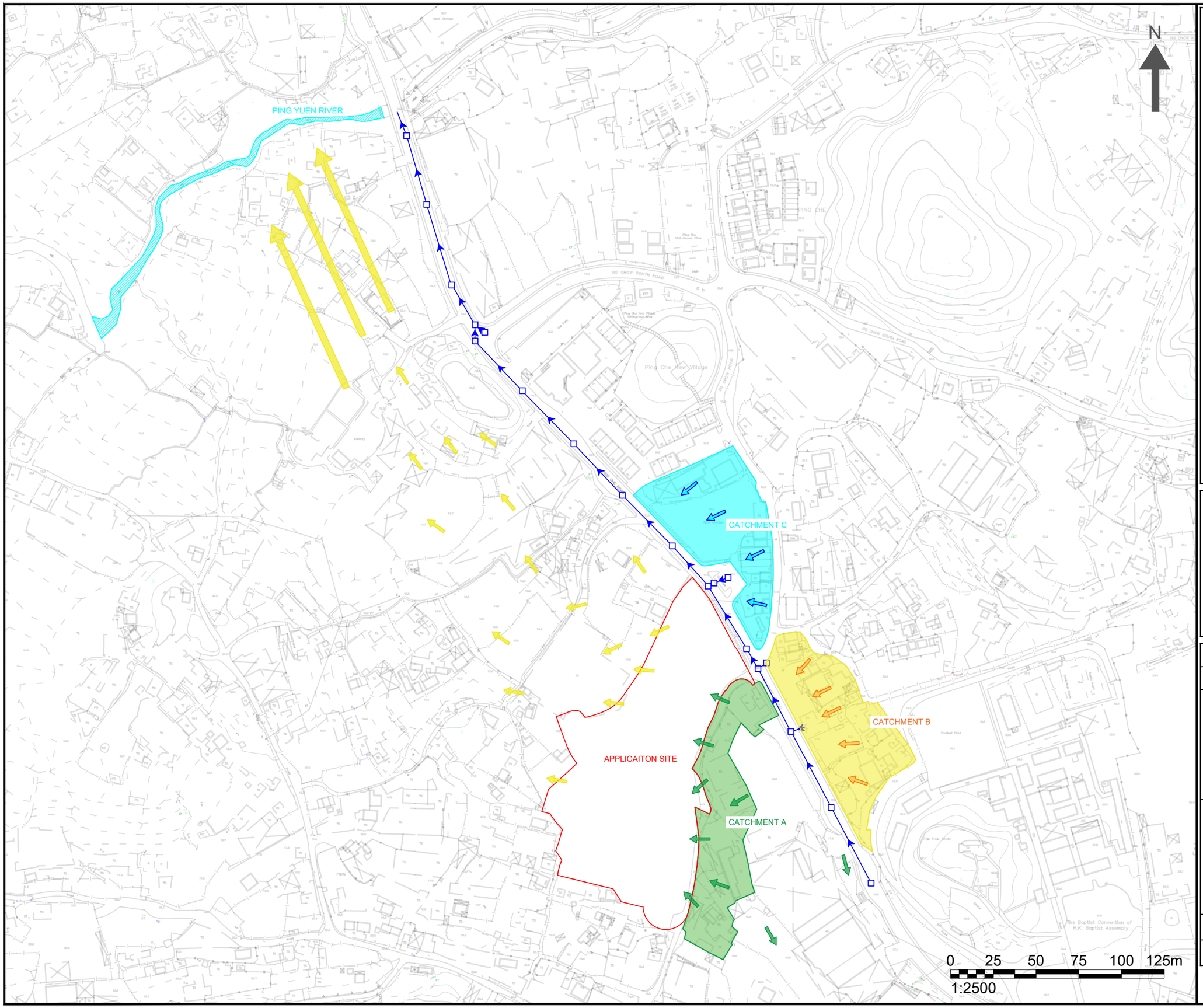
Drawing No : FIGURE 2.1	Revision : 1
Scale : AS SHOWN	Date : OCT 2023

A3 420 x 297

C:\USERS\NGANCHUNSANG\SYNOLOGYDRIVE\2127 PING CHE DD77\05 REPORT\01 AEC REPORT\03 DIA\ISSUE 4\FIG\[2127] DIA FIG 2.1_SITE LOCATION_ISSUE 4.DWG

Figure 3.1

Overview of Existing Surface Runoff Flow Path at the Vicinity of the Application Site



NOTES :

APPLICATION SITE

CATCHMENT AREA

EXISTING DRAINAGE & MANHOLE

EXISTING SURFACE RUNOFF FLOW PATH FROM CATCHMENT A

EXISTING SURFACE RUNOFF FLOW PATH FROM CATCHMENT B

EXISTING SURFACE RUNOFF FLOW PATH FROM CATCHMENT C

EXISTING SURFACE RUNOFF FLOW PATH TO DOWNSTREAM

PING YUEN RIVER

Consultant

Allied Environmental Consultants Limited

Project No. :	2127
Drawing By :	CS

Project :

APPLICATION FOR AMENDMENT OF PLAN UNDER SECTION 12A FOR THE TOWN PLANNING ORDINANCE (CAP. 131) FOR MIXED USE DEVELOPMENT AT LOTS 796 AND 1008RP IN D.D. 77 AND ADJOINING GOVERNMENT LAND IN PING CHE, TA KWU LING, NEW TERRITORIES

Drawing Title :

OVERVIEW OF EXISTING SURFACE RUNOFF FLOW PATH AT THE VICINITY OF APPLICAITON SITE

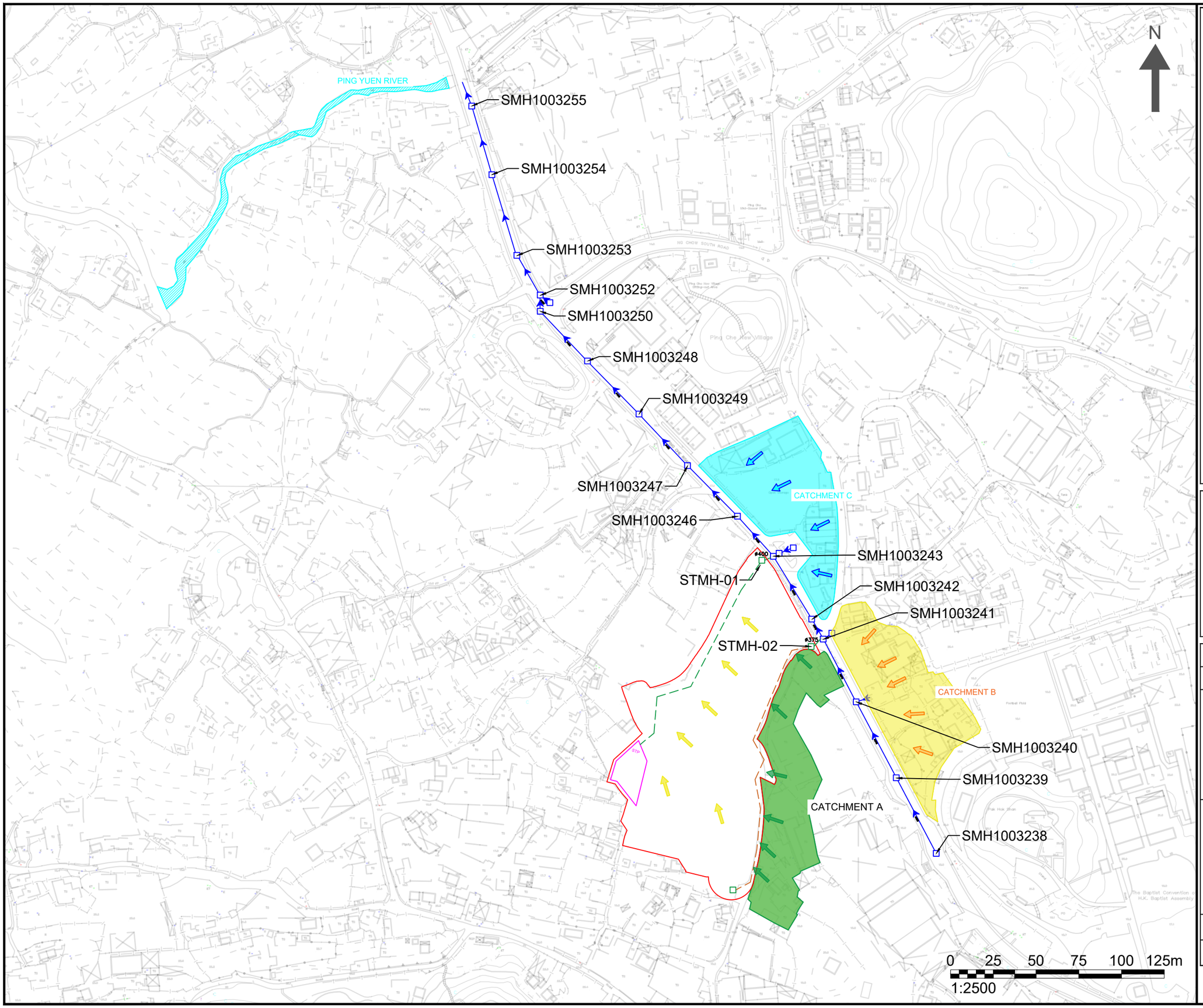
Drawing No :	Revision :
FIGURE 3.1	4
Scale : AS SHOWN	Date : JUN 2024

A3 420 x 297

C:\USERS\NGANCHUNSANG\SYNOLOGYDRIVE\2127 PING CHE DD77\05 REPORT\01 AEC REPORT\03 DIA\ISSUE 5\FINALIZE\FIG\[2127] DIA FIG 3.1_EXISTING FLOW PATH_ISSUE 5_20240613.DWG

Figure 3.2

Overview of Existing Drainage, Proposed Drainage & Catchment Area



NOTES :

- APPLICATION SITE
- CATCHMENT AREA
- PROPOSED ON-SITE SEWAGE TREATMENT PLANT
- EXISTING DRAINAGE & MANHOLE
- PROPOSED DRAINAGE & MANHOLE
- PROPOSED U-CHANNEL DRAINAGE
- SURFACE RUNOFF FLOW PATH FROM PROJECT SITE / CATCHMENT AFTER DEVELOPMENT
- Ping Yuen River

Consultant

Allied Environmental Consultants Limited

Project No. : 2127

Drawing By : CS

Project :

APPLICATION FOR AMENDMENT OF PLAN UNDER SECTION 12A FOR THE TOWN PLANNING ORDINANCE (CAP. 131) FOR MIXED USE DEVELOPMENT AT LOTS 796 AND 1008RP IN D.D. 77 AND ADJOINING GOVERNMENT LAND IN PING CHE, TA KWU LING, NEW TERRITORIES

Drawing Title :

OVERVIEW OF EXISTING DRAINAGE, PROPOSED DRAINAGE & CATCHMENT AREA

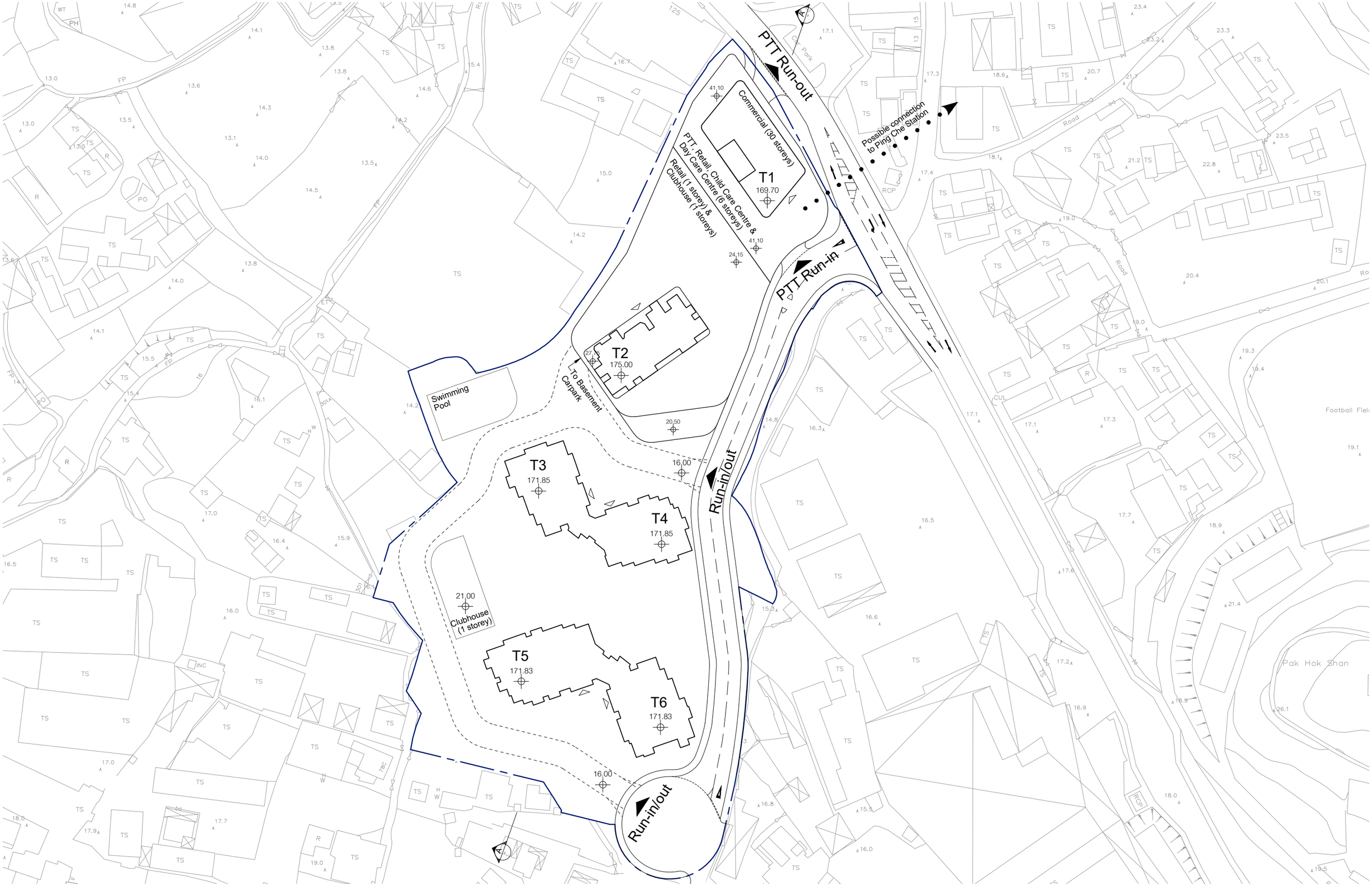
Drawing No :	Revision :
FIGURE 3.2	4
Scale :	Date :
AS SHOWN	JUN 2024

A3 420 x 297

C:\USERS\NGANCHUNSANG\SYNOLOGYDRIVE\2127 PING CHE DD77\05 REPORT\01 AEC REPORT\03 DIA\ISSUE 5\FINALIZE\FIG\[2127] DIA FIG 3.2_DRAINAGE OVERVIEW_ISSUE 5_20240613.DWG

Appendix A

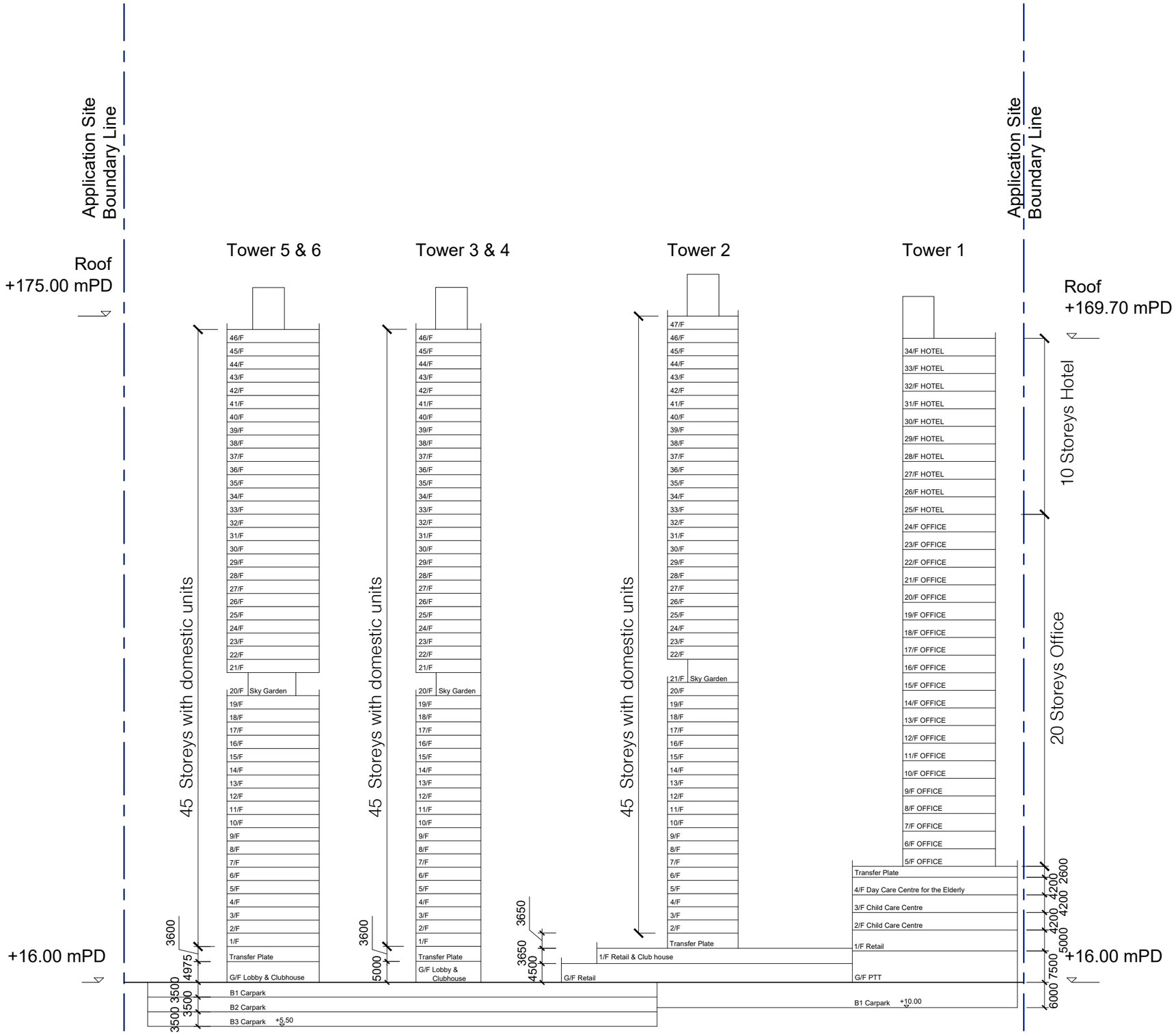
Master Layout Plan and Sectional Drawings



BLOCK PLAN SK-1
PROPOSED DEVELOPMENT AT PING CHE DD77, N.T.

0 10 20 50m

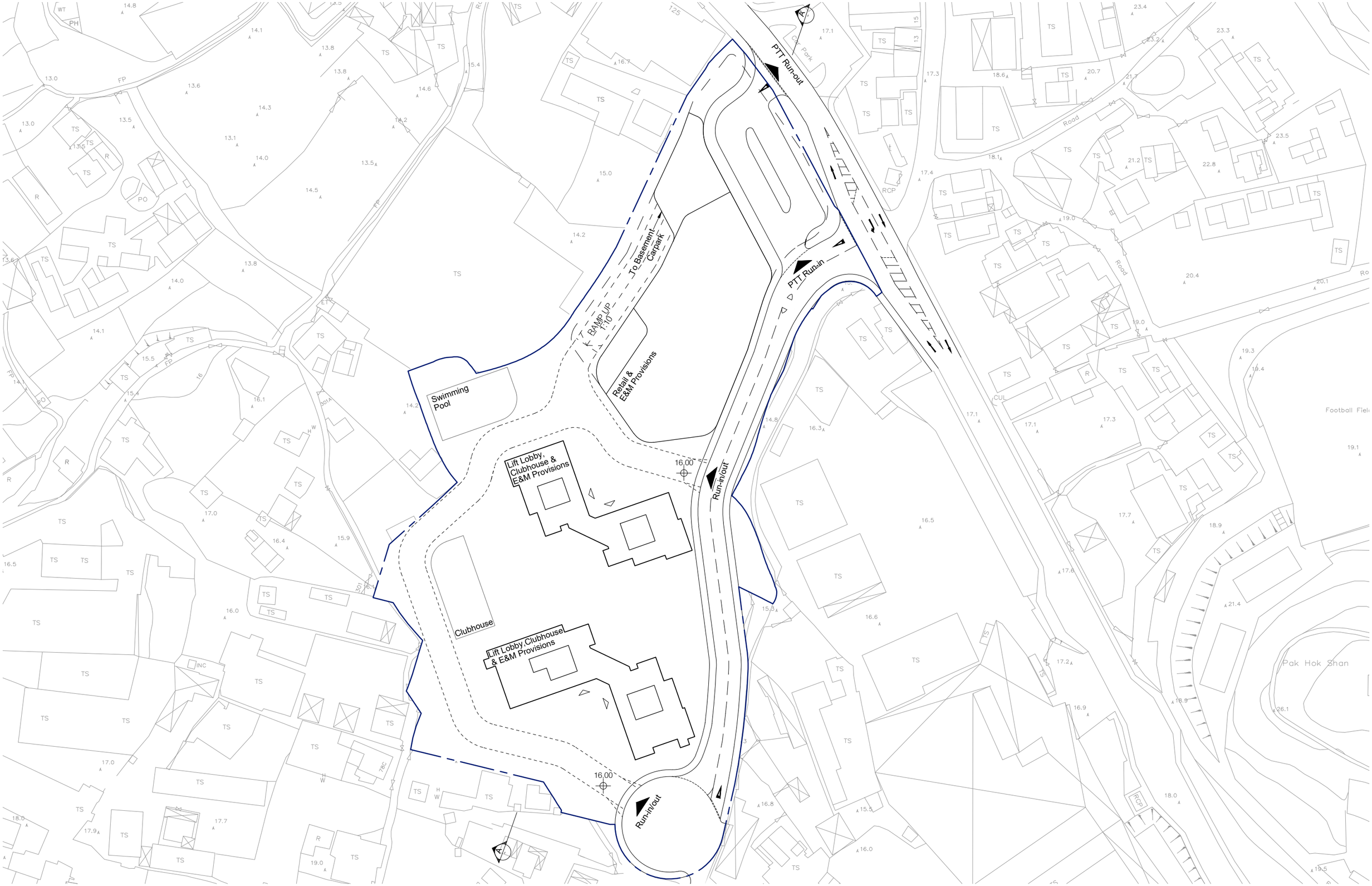
SINGULAR STUDIO LTD
6 OCTOBER 2023



SCHEMATIC SECTION AA' SK-2
PROPOSED DEVELOPMENT AT PING CHE DD77, N.T.

0 10 20 50m

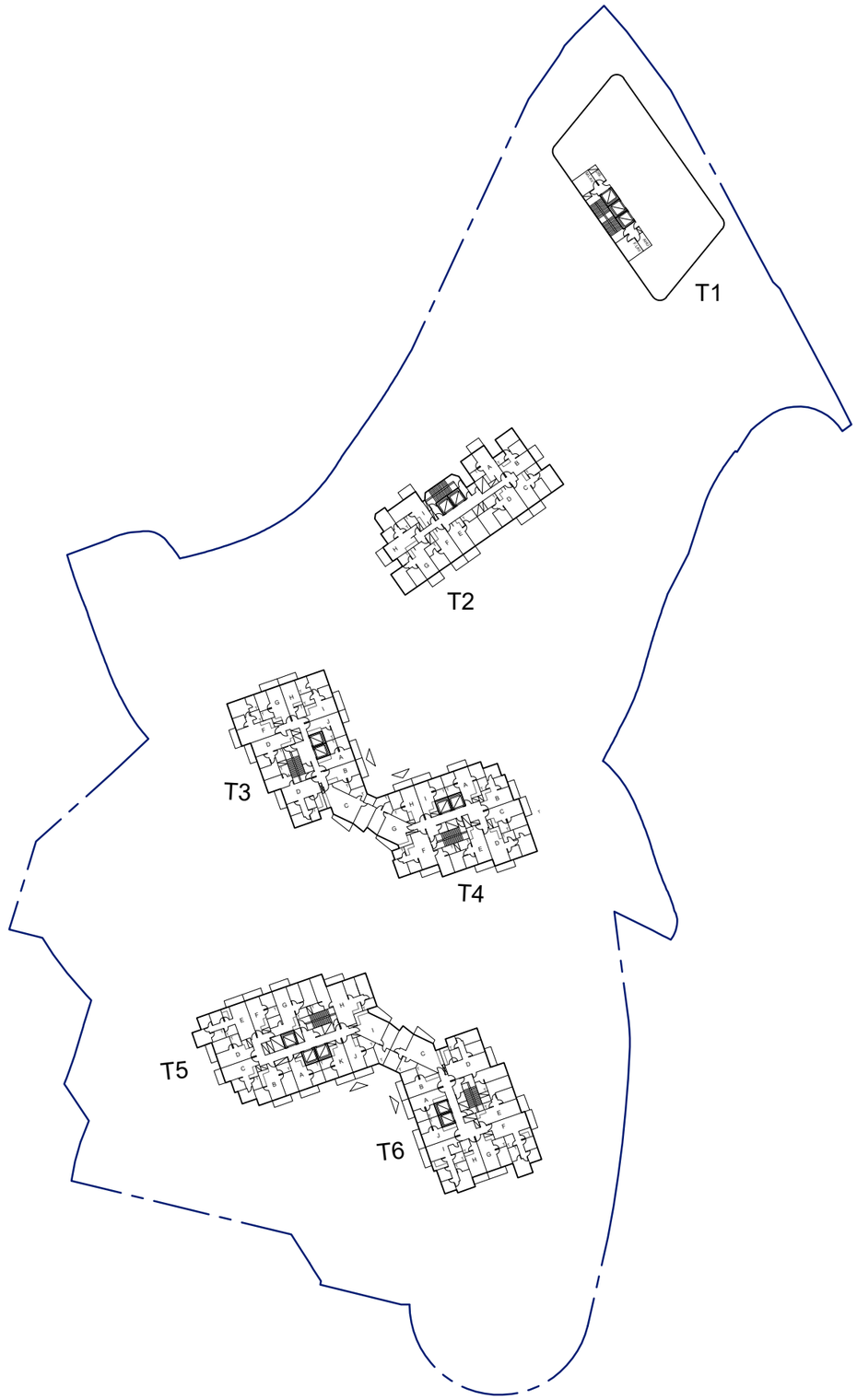
SINGULAR STUDIO LTD
6 OCTOBER 2023



GROUND FLOOR PLAN SK-3
PROPOSED DEVELOPMENT AT PING CHE DD77, N.T.

0 10 20 50m

SINGULAR STUDIO LTD
6 OCTOBER 2023



TYPICAL FLOOR PLAN SK-4
PROPOSED DEVELOPMENT AT PING CHE DD77, N.T.

0 10 20 50m

SINGULAR STUDIO LTD
3 OCTOBER 2023

Appendix B

Peak Runoff Estimation of Sub-catchments and Subject Site after the completion of Proposed Development

Appendix A Peak Runoff Estiamtion

Peak Runoff Estimation of Subcatchments and Subject Site **after** the completion of Proposed Development

Catchment	Total Area of the Catchment (m^2)	Land Use		Topography		Average Slope, H (m per 100m)	Flow Distance, L (m)	Inlet Time, t_o (min) [1]	Flow Time, t_f (min) [2]	Duration, t_c (min) [3]	50 - year return period				Runoff Coefficient, C [6]	Rainfall Increase due to Climate Change, % [7]	50 - year return period	
		Surface Characteristics	Area (m^2)	Inlet invert level (mPD)	Outlet invert level (mPD)						Storm Constant, a [4]	Storm Constant, b [4]	Storm Constant, c [4]	Extreme Mean Intensity, i (mm/hr) [5]			Peak Runoff, Qp (m3/s) [8]	Total Peak Runoff, Qp (m3/s) [8]
Application Site	17822	Concrete	14258	16.0	16.0	0.00	232	5.00	0	5.00	474.6	2.9	0.371	220.45	0.95	16.0	0.963	1.052
		Grass	3564												0.35		0.089	
Catchment A	6123	Concrete	4286	17.2	14.7	1.27	196	11.32	0	11.32	474.6	2.9	0.371	177.27	0.95	16.0	0.233	0.270
		Grass	1837												0.35		0.037	
Catchment B	6303	Concrete	4412	17.5	17.1	0.28	143	11.13	0	11.13	474.6	2.9	0.371	178.16	0.95	16.0	0.241	0.279
		Grass	1891												0.35		0.038	
Catchment C	6553	Concrete	4587	17.4	17.1	0.18	164	13.85	0	13.85	474.6	2.9	0.371	166.81	0.95	16.0	0.234	0.271
		Grass	1966												0.35		0.037	
STP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.072
Existing Condition																		
Application Site	17822	Concrete	11584	16.1	14.3	0.77	232	13.29	0	13.29	474.6	2.9	0.371	168.91	0.95	16.0	0.599	0.718
		Grass	6238												0.35		0.119	

Note:

[1] Brandsby William's equation is referenced from Section 7.5.2 in DSD Stormwater Drainage Manual (Fifth Edition).

$$t_o = \frac{0.1446L}{H^{0.2} A^{0.1}}$$

where t_o = time of concentration of a natural catchment (min.)

A = catchment area (m^2)

H = average slope (m per 100 m), measured along the line of natural flow, from the summit of the catchment to the point under consideration

L = distance (on plan) measured on the line of natural flow between the summit and the point under consideration (m)

Time of concentraction for subject site is assumed as 5 min.

[2] t_f is assumed to be 0 for conservative estimation.

[3] $t_c = t_o + t_f$

[4] Storm constants are referenced to Table 3d in DSD Stormwater Drainage Manual (Fifth Edition) and its Corrigendum No. 1/2024 based on corresponding return periods.

[5] Intensity-Duration-Frequency calculation is referenced from Section 4.3.3 in DSD Stormwater Drainage Manual (Fifth Edition) and its Corrigendum 1/2024.

$$i = \frac{a}{(t_d + b)^c}$$

where i = extreme mean intensity in mm/hr,
t_d = duration in minutes ($t_d \leq 240$), and
a, b, c = storm constants given in Tables 3a, 3b, 3c and 3d.

[6] Runoff coefficient is referenced from Section 7.5.2 in DSD Stormwater Drainage Manual (Fifth Edition). For conservative estimation, coefficient of 0.35 is assumed for unpaved area while that of 0.95 for paved area.

[7] Rainfall increase precentage due to climate change is referenced from Table 28 in DSD Stormwater Drainage Manual (Fifth Edition) and Corrigendum No. 1/2022. 16.0% for End of 21st Century is adopted as worst case scenario.

[8] Rational method for peak runoff estimation is referenced from Section 4.3.3 in DSD Stormwater Drainage Manual (Fifth Edition).

$$Q_p = 0.278\, C\, i\, A$$

where Q_p = peak runoff in m^3/s
C = runoff coefficient (dimensionless)
i = rainfall intensity in mm/hr
A = catchment area in km^2

Appendix C

Estimation of Drainage Flow from Proposed Development and Detailed Hydraulic Calculation

Peak Runoff Estimation of Subcatchments and Subject Site **before** the completion of Proposed Development

ID	From	ID	To	Diameter, D (m) [1]	Cross-section Area, A (m^2) [2]	Wetted Perimeter, P (m) [2]	Hydraulic Radius, R (m) [3]	Length of Pipe, L (m) [1]	Inlet Invert Level (mPD) [1]	Outlet Invert Level (mPD) [1]	Slope, s [4]	Pipe Roughess, k (m) [5]	Velocity, V (m/s) [6]	Full Capacity, Q (m^3/s) [7]	Contributing Catchment Area [8]	Return Periods (Year) [9]	Additional Peak Flow, Q (m^3/s)	Total Flow from All Catch-ment Area (m^3/s)	Occupancy (%)
D1	SMH1003241	D2	SMH1003242	0.375	0.099	1.178	0.084	14.2	15.58	15.52	0.004	0.0006	1.09	0.108	Catchment A + B	50	0.548	0.548	505%
D2	SMH1003242	D3	SMH1003243	0.375	0.099	1.178	0.084	50.0	15.52	15.25	0.005	0.0006	1.24	0.123	Catchment A + B	50	0.000	0.548	446%
D3	SMH1003243	D4	SMH1003246	0.450	0.143	1.414	0.101	35.3	14.75	14.30	0.013	0.0006	2.14	0.307	Existing Site + Catchment A + B + C	50	0.990	1.538	501%
D4	SMH1003246	D5	SMH1003247	0.450	0.143	1.414	0.101	47.9	14.30	13.80	0.010	0.0006	1.94	0.277	Existing Site + Catchment A + B + C	50	0.000	1.538	554%
D5	SMH1003247	D6	SMH1003249	0.450	0.143	1.414	0.101	47.7	13.80	13.30	0.010	0.0006	1.94	0.278	Existing Site + Catchment A + B + C	50	0.000	1.538	553%
D6	SMH1003249	D7	SMH1003248	0.450	0.143	1.414	0.101	49.5	13.30	12.80	0.010	0.0006	1.91	0.273	Existing Site + Catchment A + B + C	50	0.000	1.538	564%
D7	SMH1003248	D8	SMH1003250	0.450	0.143	1.414	0.101	45.7	12.10	11.78	0.007	0.0006	1.59	0.227	Existing Site + Catchment A + B + C	50	0.000	1.538	678%
D8	SMH1003250	D9	SMH1003252	0.450	0.143	1.414	0.101	9.0	11.60	11.50	0.011	0.0006	2.01	0.287	Existing Site + Catchment A + B + C	50	0.000	1.538	536%
D9	SMH1003252	D10	SMH1003253	0.525	0.195	1.649	0.118	30.2	11.50	11.34	0.005	0.0006	1.52	0.296	Existing Site + Catchment A + B + C	50	0.000	1.538	520%
D10	SMH1003253	D11	SMH1003254	0.525	0.195	1.649	0.118	56.7	11.34	11.05	0.005	0.0006	1.49	0.291	Existing Site + Catchment A + B + C	50	0.000	1.538	529%
D11	SMH1003254	D12	SMH1003255	0.600	0.254	1.885	0.135	48.3	11.05	10.80	0.005	0.0006	1.63	0.415	Existing Site + Catchment A + B + C	50	0.000	1.538	370%
D12	SMH1003255	D13	Outlet to Ping Yuen River	0.600	0.254	1.885	0.135	16.6	10.80	10.64	0.010	0.0006	2.23	0.568	Existing Site + Catchment A + B + C	50	0.000	1.538	271%

[1] With reference to the Drainage Plan and Geoinfo Map.
[2] According to Section 9.3 in DSD Stormwater Drainage Manual (Fifth Edition), 5% / 10% reduction in flow area based on channel gradient is taken into account for the effects to flow capacity due to materials deposited on the bed.
[3] Hydraulic Radius = Cross-section Area / Wetted Perimeter
[4] Slope = (Inlet Invert Level - Outlet Invert Level) / Length of Pipe
[5] Surface roughness is assumed to be 6.0mm for slimed concrete pipe with poor condition as worst case scenario, with reference to Table 14 in DSD Stormwater Drainage Manual (Fifth Edition).
Treated effluent discharged from reprovided sewage treatment plant
[6] Velocity is calculated based on Colebrook-White equations.

$$\bar{V} = -\sqrt{32gRS_f}\,\log\left[\frac{k_s}{14.8R} + \frac{1.255\nu}{R\sqrt{32gRS_f}}\right]$$ n Section 7.5.2 in DSD Stormwater Drainage Manual (Fifth Edition).

Where
$\bar{V}$ = cross-sectional mean velocity (m/s)
R = hydraulic radius (m)
S_f = friction gradient (dimensionless)
C = Chézy coefficient ($m^{1/2}/s$)
n = Manning coefficient ($s/m^{1/3}$)
f = Darcy-Weisbach friction factor (dimensionless)
k_s = surface roughness (m)
ν = kinematic viscosity (m^2/s)
g = acceleration due to gravity (m/s^2)
C_{HW} = Hazen-William coefficient (dimensionless)

With Reference to Table 14 in DSD Stromwater Drainage Manual (Fifth Edition),
Kinematic viscosity is 0.000001306 m/s.
Gravitational acceleration is 9.8m/s^2.
[7] Capacity = Length of Pipe × Velocity
[8] Bold and underlined subcatchment ID stands for stormwater in those subcatchments flowing into the corresponding pipe.
[9] With reference to Table 3 of Section 6.6.2 in DSD Stormwater Drainage Manual (Fifth Edition), 50 years of return period has been adopted.

Peak Runoff Estimation of Subcatchments and Subject Site **after** the completion of Proposed Development

ID	From	ID	To	Diameter, D (m) [1]	Cross-section Area, A (m^2) [2]	Wetted Perimeter, P (m) [2]	Hydraulic Radius, R (m) [3]	Length of Pipe, L (m) [1]	Inlet Invert Level (mPD) [1]	Outlet Invert Level (mPD) [1]	Slope, s [4]	Pipe Roughess, k (m) [5]	Velocity, V (m/s) [6]	Full Capacity, Q (m^3/s) [7]	Contributing Catchment Area [8]	Return Periods (Year) [9]	Additional Peak Flow, Q (m^3/s)	Total Flow from All Catch-ment Area (m^3/s)	Occupancy (%)
P2	STMH-02	D1	SMH1003241	0.375	0.099	1.178	0.084	6.7	15.82	15.58	0.036	0.0006	3.20	0.318	Catchment A	50	0.270	0.270	85%
D1	SMH1003241	D2	SMH1003242	0.375	0.099	1.178	0.084	14.2	15.58	15.52	0.004	0.0006	1.09	0.108	Catchment A + B	50	0.279	0.548	505%
D2	SMH1003242	D3	SMH1003243	0.375	0.099	1.178	0.084	50.0	15.52	15.25	0.005	0.0006	1.24	0.123	Catchment A + B	50	0.000	0.548	446%
P1	STMH-01	D3	SMH1003243	0.600	0.269	1.885	0.143	4.5	15.20	14.75	0.100	0.0006	7.48	2.009	Application Site + STP	50	1.124	1.124	56%
D3	SMH1003243	D4	SMH1003246	0.450	0.143	1.414	0.101	35.3	14.75	14.30	0.013	0.0006	2.14	0.307	Application Site + STP + Catchment A + B + C	50	0.271	1.943	633%
D4	SMH1003246	D5	SMH1003247	0.450	0.143	1.414	0.101	47.9	14.30	13.80	0.010	0.0006	1.94	0.277	Application Site + STP + Catchment A + B + C	50	0.000	1.943	700%
D5	SMH1003247	D6	SMH1003249	0.450	0.143	1.414	0.101	47.7	13.80	13.30	0.010	0.0006	1.94	0.278	Application Site + STP + Catchment A + B + C	50	0.000	1.943	699%
D6	SMH1003249	D7	SMH1003248	0.450	0.143	1.414	0.101	49.5	13.30	12.80	0.010	0.0006	1.91	0.273	Application Site + STP + Catchment A + B + C	50	0.000	1.943	712%
D7	SMH1003248	D8	SMH1003250	0.450	0.143	1.414	0.101	45.7	12.10	11.78	0.007	0.0006	1.59	0.227	Application Site + STP + Catchment A + B + C	50	0.000	1.943	857%
D8	SMH1003250	D9	SMH1003252	0.450	0.143	1.414	0.101	9.0	11.60	11.50	0.011	0.0006	2.01	0.287	Application Site + STP + Catchment A + B + C	50	0.000	1.943	677%
D9	SMH1003252	D10	SMH1003253	0.525	0.195	1.649	0.118	30.2	11.50	11.34	0.005	0.0006	1.52	0.296	Application Site + STP + Catchment A + B + C	50	0.000	1.943	657%
D10	SMH1003253	D11	SMH1003254	0.525	0.195	1.649	0.118	56.7	11.34	11.05	0.005	0.0006	1.49	0.291	Application Site + STP + Catchment A + B + C	50	0.000	1.943	669%
D11	SMH1003254	D12	SMH1003255	0.600	0.254	1.885	0.135	48.3	11.05	10.80	0.005	0.0006	1.63	0.415	Application Site + STP + Catchment A + B + C	50	0.000	1.943	468%
D12	SMH1003255	D13	Outlet to Ping Yuen River	0.600	0.254	1.885	0.135	16.6	10.80	10.64	0.010	0.0006	2.23	0.568	Application Site + STP + Catchment A + B + C	50	0.000	1.943	342%

[1] With reference to the Drainage Plan and Geoinfo Map.
[2] According to Section 9.3 in DSD Stormwater Drainage Manual (Fifth Edition), 5% / 10% reduction in flow area based on channel gradient is taken into account for the effects to flow capacity due to materials deposited on the bed.
[3] Hydraulic Radius = Cross-section Area / Wetted Perimeter
[4] Slope = (Inlet Invert Level - Outlet Invert Level) / Length of Pipe
[5] Surface roughness is assumed to be 6.0mm for slimed concrete pipe with poor condition as worst case scenario, with reference to Table 14 in DSD Stormwater Drainage Manual (Fifth Edition).
Treated effluent discharged from reprovided sewage treatment plant
[6] Velocity is calculated based on Colebrook-White equations.

$$\bar{V} = -\sqrt{32gRS_f}\,\log\left[\frac{k_s}{14.8R} + \frac{1.255\nu}{R\sqrt{32gRS_f}}\right]$$

n Section 7.5.2 in DSD Stormwater Drainage Manual (Fifth Edition).

$\bar{V}$ = cross-sectional mean velocity (m/s)
R = hydraulic radius (m)
S_f = friction gradient (dimensionless)
C = Chézy coefficient ($m^{½}/s$)
n = Manning coefficient ($s/m^{1/3}$)
f = Darcy-Weisbach friction factor (dimensionless)
k_s = surface roughness (m)
ν = kinematic viscosity (m^2/s)
g = acceleration due to gravity (m/s^2)
C_{HW} = Hazen-William coefficient (dimensionless)

With Reference to Table 14 in DSD Stromwater Drainage Manual (Fifth Edition),
Kinematic viscosity is 0.000001306 m/s.
Gravitational acceleration is 9.8m/s^2.
[7] Capacity = Length of Pipe × Velocity
[8] Bold and underlined subcatchment ID stands for stormwater in those subcatchments flowing into the corresponding pipe.
[9] With reference to Table 3 of Section 6.6.2 in DSD Stormwater Drainage Manual (Fifth Edition), 50 years of return period has been adopted.

Appendix D

Estimation of Drainage Flow from Proposed Development and Detailed Hydraulic Calculation (After Considering Upgrading Works)

Peak Runoff Estimation of Subcatchments and Subject Site **after** the completion of Proposed Development

ID	From	ID	To	Diameter, D (m) [1]	Cross-section Area, A (m^2) [2]	Wetted Perimeter, P (m) [2]	Hydraulic Radius, R (m) [3]	Length of Pipe, L (m) [1]	Inlet Invert Level (mPD) [1]	Outlet Invert Level (mPD) [1]	Slope, s [4]	Pipe Roughess, k (m) [5]	Velocity, V (m/s) [6]	Full Capacity, Q (m^3/s) [7]	Contributing Catchment Area [8]	Return Periods (Year) [9]	Additional Peak Flow, Q (m^3/s)	Total Flow from All Catch-ment Area (m^3/s)	Occupancy (%)
P2	STMH-02	D1	SMH1003241	0.375	0.099	1.178	0.084	6.7	15.82	15.58	0.036	0.0006	3.20	0.318	Catchment A	50	0.270	0.270	85%
D1	SMH1003241	D2	SMH1003242	0.750	0.398	2.356	0.169	14.2	15.58	15.52	0.004	0.0006	1.69	0.673	Catchment A + B	50	0.279	0.548	81%
D2	SMH1003242	D3	SMH1003243	0.750	0.398	2.356	0.169	50.0	15.52	15.25	0.005	0.0006	1.92	0.763	Catchment A + B	50	0.000	0.548	72%
P1	STMH-01	D3	SMH1003243	0.600	0.269	1.885	0.143	4.5	15.20	14.75	0.100	0.0006	7.48	2.009	Application Site + STP	50	1.124	1.124	56%
D3	SMH1003243	D4	SMH1003246	1.050	0.779	3.299	0.236	35.3	14.75	14.30	0.013	0.0006	3.64	2.838	Application Site + STP + Catchment A + B + C	50	0.271	1.943	68%
D4	SMH1003246	D5	SMH1003247	1.050	0.779	3.299	0.236	47.9	14.30	13.80	0.010	0.0006	3.29	2.566	Application Site + STP + Catchment A + B + C	50	0.000	1.943	76%
D5	SMH1003247	D6	SMH1003249	1.050	0.779	3.299	0.236	47.7	13.80	13.30	0.010	0.0006	3.30	2.572	Application Site + STP + Catchment A + B + C	50	0.000	1.943	76%
D6	SMH1003249	D7	SMH1003248	1.050	0.779	3.299	0.236	49.5	13.30	12.80	0.010	0.0006	3.24	2.525	Application Site + STP + Catchment A + B + C	50	0.000	1.943	77%
D7	SMH1003248	D8	SMH1003250	1.050	0.779	3.299	0.236	45.7	12.10	11.78	0.007	0.0006	2.70	2.100	Application Site + STP + Catchment A + B + C	50	0.000	1.943	93%
D8	SMH1003250	D9	SMH1003252	1.050	0.779	3.299	0.236	9.0	11.60	11.50	0.011	0.0006	3.41	2.655	Application Site + STP + Catchment A + B + C	50	0.000	1.943	73%
D9	SMH1003252	D10	SMH1003253	1.200	1.018	3.770	0.270	30.2	11.50	11.34	0.005	0.0006	2.54	2.588	Application Site + STP + Catchment A + B + C	50	0.000	1.943	75%
D10	SMH1003253	D11	SMH1003254	1.200	1.018	3.770	0.270	56.7	11.34	11.05	0.005	0.0006	2.50	2.544	Application Site + STP + Catchment A + B + C	50	0.000	1.943	76%
D11	SMH1003254	D12	SMH1003255	1.200	1.018	3.770	0.270	48.3	11.05	10.80	0.005	0.0006	2.51	2.560	Application Site + STP + Catchment A + B + C	50	0.000	1.943	76%
D12	SMH1003255	D13	Outlet to Ping Yuen River	1.200	1.018	3.770	0.270	16.6	10.80	10.64	0.010	0.0006	3.43	3.494	Application Site + STP + Catchment A + B + C	50	0.000	1.943	56%

[1] With reference to the Drainage Plan and Geoinfo Map.
[2] According to Section 9.3 in DSD Stormwater Drainage Manual (Fifth Edition), 5% / 10% reduction in flow area based on channel gradient is taken into account for the effects to flow capacity due to materials deposited on the bed.
[3] Hydraulic Radius = Cross-section Area / Wetted Perimeter
[4] Slope = (Inlet Invert Level - Outlet Invert Level) / Length of Pipe
[5] Surface roughness is assumed to be 6.0mm for slimed concrete pipe with poor condition as worst case scenario, with reference to Table 14 in DSD Stormwater Drainage Manual (Fifth Edition).

Treated ef Surface roughness is assumed to be 6.0mm for slimed concrete pipe with poor condition as worst case scenario, with reference to Table 14 in DSD Stormwater Drainage Manual (Fifth Edition).

[6] Velocity is calculated based on Colebrook-White equations.

$$\bar{V} = -\sqrt{32gRS_f}\,\log\left[\frac{k_s}{14.8R} + \frac{1.255\nu}{R\sqrt{32gRS_f}}\right]$$

) Section 7.5.2 in DSD Stormwater Drainage Manual (Fifth Edition).

Where
$\bar{V}$ = cross-sectional mean velocity (m/s)
R = hydraulic radius (m)
S_f = friction gradient (dimensionless)
C = Chézy coefficient ($m^{1/2}/s$)
n = Manning coefficient ($s/m^{1/3}$)
f = Darcy-Weisbach friction factor (dimensionless)
k_s = surface roughness (m)
v = kinematic viscosity (m^2/s)
g = acceleration due to gravity (m/s^2)
C_{HW} = Hazen-William coefficient (dimensionless)

With Reference to Table 14 in DSD Stormwater Drainage Manual (Fifth Edition),
Kinematic viscosity is 0.000001306 m/s.
Gravitational acceleration is 9.8m/s^2.
[7] Capacity = Length of Pipe × Velocity
[8] Bold and underlined subcatchment ID stands for stormwater in those subcatchments flowing into the corresponding pipe.
[9] With reference to Table 3 of Section 6.6.2 in DSD Stormwater Drainage Manual (Fifth Edition), 50 years of return period has been adopted.

Annex B Replacement Pages of Revised Environmental Assessment

Issue No. : 5
Issue Date : June 2024
Project No. : 2127

ENVIRONMENTAL ASSESSMENT

FOR

APPLICATION FOR AMENDMENT OF PLAN UNDER SECTION 12A FOR THE TOWN PLANNING ORDINANCE (CAP. 131) FOR MIXED USE DEVELOPMENT AT LOT 796 AND 1008RP IN D.D. 77 AND ADJOINING GOVERNMENT LAND IN PING CHE, TA KWU LING, NEW TERRITORIES

Prepared by

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Document Verification

Project Title	APPLICATION FOR AMENDMENT OF PLAN UNDER SECTION 12A FOR THE TOWN PLANNING ORDINANCE (CAP. 131) FOR MIXED USE DEVELOPMENT AT LOT 796 AND 1008RP IN D.D. 77 AND ADJOINING GOVERNMENT LAND IN PING CHE, TA KWU LING, NEW TERRITORIES	**Project No.** 2127
Document Title	ENVIRONMENTAL ASSESSMENT	

Issue No.	Issue Date	Description	Prepared by	Checked by	Approved by
1	December 2023	1st Submission	Various	Cathy Man	Grace Kwok
2	December 2023	2nd Submission	Various	Cathy Man	Grace Kwok
3	February 2024	3rd Submission	Various	Cathy Man	Grace Kwok
4	April 2024	4 th Submission	Various	Cathy Man	Grace Kwok
5	June 2024	5 th Submission	Various	Cathy Man	Grace Kwok

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List of Tables

List of Figures

List of Appendices

Polluting Uses	Parameters	Permitted Uses	Buffer Distance
	20- 30m	(a) Active and passive recreational uses (b) Passive recreational uses	>100m 5- 100m
	30- 40m	(a) Active and passive recreational uses (b) Passive recreational uses	>50m 5 - 50m
	> 40m	Active and passive recreational uses	>10m
Construction and earth moving Activities	-	(a) Passive recreational uses (b) Active and passive recreational uses	>50m

Air Pollution Control (Construction Dust) Regulation

5.2.3. The Air Pollution Control (Construction Dust) Regulation specifies processes that require special dust control. The Contractors are required to inform the 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.

Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation

5.2.4. The Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation comes into operation on 1 June 2015. Under the Regulation, Non-road mobile machinery (NRMMs), except those exempted, are required to comply with the prescribed emission standards. From 1 September 2015, all regulated machines sold or leased for use in Hong Kong must be approved or exempted with a proper label in a prescribed format issued by EPD. Starting from 1 December 2015, only approved or exempted NRMMs with a proper label are allowed to be used in specified activities and locations including construction sites. The Contractor is required to ensure the adopted machines or non-road vehicle under the Project could meet the prescribed emission standards and requirement.

Air Pollution Control (Fuel Restriction) Regulations

5.2.5. The Air Pollution Control (Fuel Restriction) Regulations were enacted in 1990 to impose legal control on the type of fuels allowed for use and their sulphur contents in commercial and industrial processes to reduce sulphur dioxide (SO_2) emissions. In June 2008, the Regulation was amended to tighten the control requirements of liquid fuels. The Regulation does not apply to any fuel-using equipment that is used or operated in premises used solely as a dwelling, or is used or operated in or on a vessel, motor vehicle, railway locomotive or aircraft.

Recommended Pollution Control Clauses for Construction Contracts

5.2.6. The Recommended Pollution Control Clauses (RPCC) are generally good engineering practice to minimize inconvenience and environmental nuisance to nearby residents and other sensitive receivers. Guidelines as stipulated under RPCC should be incorporated in the contract documents to abate dust impact.

5.3. Background Air Quality

Existing Air Quality in North and Tai Po District

5.3.1. The air quality data of the nearest general air quality monitoring station (AQMS) at North (Year 2020-2022) and Tai Po (Year 2018-2019) are adopted to represent the ambient air quality of the area. Latest available 5 years of air quality data, i.e. 2018 to 2022, are summarised in

5.3.2. ***Table 5-3*** to depict the trend of the localised air quality.

Table 5-3 Background Air Quality at North and Tai Po Monitoring Station

Pollutant	Averaging Time	Concentration 2018-2022 (μg/m³)[1][2]					Annual AQO (μg/m³)
		2018	2019	2020	2021	2022	
CO	1st highest 1-hour	N.A. [3]	N.A. [3]	1,830	2,150	1,710	30,000
	1st highest 8-hour	N.A. [3]	N.A. [3]	1,238	1,550	1,304	10,000
FSP/ $PM_{2.5}$	36th highest 24-hour	33	35	28	27	25	50
	Annual	19	20	N.A. [4]	15	14	25
NO_2	19th highest 1-hour	125	142	112	135	115	200
	Annual	36	36	N.A. [4]	36	31	40
O_3	10th highest 8-hour	**167**	**197**	**166**	**187**	**197**	160
RSP / PM_{10}	10th highest 24-hour	69	65	55	62	50	100
	Annual	31	31	N.A. [4]	25	23	50
SO_2	4th highest 10-min	24	20	19	18	27	500
	4th highest 24-hour	8	10	8	7	7	50

Notes:
[1] Monitoring result(s) exceeding the AQO is/are underlined.
[2] All air quality data were extracted from EPD's Environmental Protection Interactive Centre.
[3] CO concentration from 2018-2019 is not available at Tai Po Monitoring Station.
[4] North General Air Quality Monitoring Stations commissioned on 10 July 2020. Annuel $PM_{2.5}$,

NO_2 and PM_{10} concentration is not available in 2020 .

5.3.3. Exceedance of concentration of O_3 in the AQO has been recorded at North and Tai Po Monitoring Station. The exceedance of O_3 is mainly caused by regional air pollution problem and it is not directly emitted from man-made sources.

Future Ambient Air Quality Condition

5.3.4. Background air quality concentrations were extracted from PATH v3.0 (Pollutants in the Atmosphere and their Transport over Hong Kong), which is a regional air quality model has been developed by the Environmental Protection Department (EPD) for simulating air quality over Hong Kong against Pearl River Delta region. Application Site falls within Grid (39, 55).

5.3.5. In view of the operation year of 2032, the PATH v3 data at (39, 55) in Year 2030 is considered representative to represent background air quality concentrations at the Application Site area. A summary of background air quality concentration in Year 2030 is shown in ***Table 5-4***. These data have demonstrated that the concentrations of pollutants are below the AQO, except for ozone (O_3). Ozone is not directly emitted from an emission source. It is formed by the chemical reactions of NOx and VOCs under the presence of sunlight and a regional pollution problem. Ozone is therefore not considered as a key parameter in this assessment.

Table 5-4 *Background Air Quality Concentration of Pollutants*

Pollutant	Averaging time	AQOs Concentration limit (µg/m³) (exceedance)	Background (39,55)
SO_2	4th peak 10-min	500 (0)	32.93
	4th peak 24-hr	50 (0)	7.35
RSP/PM_{10}	10th peak 24-hr	100 (0)	54.18
	Annual Average	50	20.44
FSP/ **$PM_{2.5}$**	36th peak 24-hr	50 (0)	26.98
	Annual Average	25	12.64
NO_2	19th peak 1-hr	200 (0)	46.23
	Annual Average	40	9.58
O_3	10th peak 8-hr	160 (22)	**174.77**
CO	1st peak 1-hr	30,000 (0)	529.05
	1st peak 8-hr	10,000 (0)	488.86

Notes:
[1] Prediction result(s) exceeding the AQO is/are underlined.

5.4. Assessment Area and Representative Air Sensitive Receivers (ASRs)

5.4.1. In general, the assessment area for an air quality impact assessment (AQIA) is defined by a distance of 500m from the site boundary which is presented in ***Figure 3.1***.

5.4.2. Representative planned and existing air quality sensitive receivers (ASRs) were identified and the separation distance between ASRs and Application Site are shown in ***Figure 5.1*** and summarized in ***Table 5-5*** below.

Table 5-5 Representative Air Sensitive Receivers

ASR ID	Description	Approx. Horizontal Distance to Project Site (m)	Maximum Building Height (mPD)	Land Use
ASR01	8 Ng Chau Road	32	21	Residential
ASR02	Hong Kong Baptist Assembly	111	19	Educational
ASR03	29 Ping Che New Village	76	24	Residential
ASR04	Lots 750 DD77, Ping Che Road	66	11	Residential
ASR05	50C Ping Che	219	23	Residential
ASR06	Ta Kwu Ling Rural Centre Government Offices	150	21.5	Government, Institution, Community
ASR07	Ping Che Nursing Home Limited	159	26.1	Residential care home for the elderly
ASR08	Proposed Residential Development Phase 1* (Tentative Completion Year:2028)	177	120	Residential
ASR09	Ha Shan Kai Wat Village Houses	76	21.5	Residential

Note: * Reference to Y/NE-TKL/4

5.4.3. The existing ASRs were identified with reference to the latest best available information at the time of preparation of this report, including those earmarked on relevant OZP (approved Ping Che and Ta Kwu Ling OZP No. S/NE-TKL/14), Development Permission Area Plans, Outline Development Plans, Layout Plans and other relevant published land used plans, including plans and drawings published by the Lands Department and any land use and development applications approved by the Town Planning Board. Various site surveys were conducted to verify the sensitive receivers and confirm with the desktop studies.

5.4.4. For concurrent project and planned ASRs, as mentioned in Section 4, the proposed project is located within the proposed tentative boundary of NTN development, which is a designated project and EIA is required. The Project Profile for the NTN development (PP-622/2021) has been made referenced to, yet no detailed programme and development are available. The Project Proponent of the NTN (i.e. CEDD) has been approached for programme and development plan for the NTN development during the course of study. However, the requested information is not available for our study. Besides, the Proposed Residential Development Phase 1 will be completed tentatively by 2028. As such, ASR08 of the concurrent project will be assessed.

from the use of chemicals, such as solvents, cleaning agents and fuels, for the maintenance and servicing of construction plants and vehicles during construction phase. Considering that the quantities of chemicals to be used would be limited, the amount of VOC generated would be small. The works areas would be aboveground and in outdoor setting, such that the VOC would be able to disperse and would not accumulate at the works areas. With proper handling of the chemicals, environmental and health impacts associated with TAPs are anticipated to be insignificant.

5.5.7. Fuel combustion from the use of powered mechanical equipment (PMEs) during construction works could be a potential source of air pollutants such as NO_2, SO_2 and CO. To reduce SO_2 emission, Air Pollution Control (Fuel Restriction) Regulation was enacted in 1990 to impose legal control on the types of fuel allowed for use and their sulphur contents in commercial and industrial processes. To improve air quality and protect public health, EPD has introduced the Air Pollution control (Non-road Mobile Machinery) (Emission) Regulation since 1 December 2015, under which only approved or exempted NRMMs are allowed to be used in construction sites. In addition, all construction plants are required to use ULSD (defined as diesel fuel containing not more than 0.005% sulphur by weight) as stipulated in Environment, Transport and Works Bureau Technical Circular (ETWB-TC(W)) No. 19/2005 on Environmental Management on Construction Sites. Furthermore, given the localized and small scale of the Project, as well as the small number of PMEs involved, adverse air quality impacts due to emissions from the use of PMEs would be unlikely.

5.5.8. With the implementation of sufficient dust suppression measures as stipulated under the Air Pollution Control (Construction Dust) Regulation and good site practices, significant adverse dust generated from the construction of the planned residential developments is not anticipated. Mitigation measures to control construction dust/ gaseous emission listed below are recommended to be incorporated into the future contractor specifications for contractor's implementation:

- Wetting by water spraying or dust suppression chemical on dusty material before loading and unloading, stockpile of dusty materials, area where breaking, excavation or earth moving activities works is carried out, and unpaved main haul road.
- Providing hoarding of not less than 2.4m high from ground level along the site boundary which is next to a road or other public area.
- Providing effective dust screens, sheeting or netting to enclose any scaffolding built around the perimeter of a building.
- Covering or sheltering any stockpile of dusty materials.
- Disposing of any dusty materials collected by fabric filters or other pollution control system in totally enclosed containers.

- Properly treating any exposed earth, such as by compacting or hydroseeding, within 6 months after the last construction activity.
- Providing vehicle washing facilities at all site exits to wash away any dusty materials from vehicles body and wheels before they leave the site.
- Covering of dust load on vehicles before they leave the site.
- Use of ultra-low sulphur content for on-site generators to minimize black smoke emission.
- Providing water spraying system where available and applicable.
- Restricting heights from which materials are to be dropped, as far as practicable, to minimise the fugitive dust arising from unloading / loading.
- Where the public can be affected by exhaust fumes or smoke emission from any construction plants or activities, shielding the related activities by an incombustible screen such as corrugated sheet of at least 2m in width and 1.8m in height.
- Using enclosed chutes for dropping construction materials to ground level and the chutes are dampened regularly, if applicable.
- The foundation work can be carried out either by percussive piling method or non–percussive pilling method. For this project, adoption of non–percussive piling method is anticipated which helps generating lower dust emissions.
- The area where vehicle washing takes place and the section of the road between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcore.
- Vehicles within the site are restricted to a maximum speed of 10 kph.
- Vehicles are inspected regularly and well maintained to ensure that they are operating efficiently and that exhaust emissions are not causing nuisance.
- Vehicle engines are turned off when they are not in use.
- Haul road of the subject site is located as far as possible from nearby ASRs.

5.6. Potential Air Quality Impact – Operation Phase

5.6.1. An environmental survey was conducted and records of specified license were reviewed in August 2023. There is a register of zinc galvanizing works under “Wader Engineering Company Limited” in the 1990s, it is situated in D.D. 77, Lot 1501 approximately 240m to the southeast of Application Site.

Vehicular Emissions from Open Road Traffic

5.6.2. The major air pollution source in the vicinity of the Subject Site during operational phase would be tailpipe emission generated from road traffic along open road.

potential air quality impact associated with the underground carpark to the nearby environment is minimal.

Table 5-7 Air Quality Guidelines of Carpark

Air pollutants	Maximum Concentration Not to be exceeded
	5 Minutes Average (¦Ìg/m3)
Carbon monoxide	115,000
Nitrogen dioxide	1,800

* Expressed at the reference condition of 25°C and 101.325 kPa (one atmosphere)

Industrial Chimney Emissions

5.6.7. For chimney emission, an environmental surveys ,including daytime and nighttime, were conducted and records of specified license were reviewed in June , August and September 2023. There is a register of zinc galvanizing works under "Wader Engineering Company Limited" in the 1990s, it is situated in D.D. 77, Lot 1501 approximately 240m to the southeast of Application Site. The results of the environmental survey have confirmed that no chimney is located within 200m radius of the Subject Site. Due to the project nature of the proposed development (i.e. residential, commercial, hotel, elderly day care centre), no chimney emission from the proposed development. The buffer distance requirement of 200m from pollution source of industrial area stipulated in table 3.1 of the Ch 9 of HKPSG is well satisfied. Thus, no significant adverse air quality impact on the Proposed Amendment is anticipated.

5.7. Odour Emission

5.7.1. For odour emissions, the results of environmental survey and site visits show that the Subject Site falls within 200m buffer of a pigsty located toward the southwest. As referred to the reply from EPD regarding the compliant record of the pigsty showed in Appendix 5.1, the pigsty has ceased business. No odour impact concerning the pigsty is expected. No slaughterhouses, sewage treatment works facilities, village incinerator and duty uses are not found within 500m radius of the Subject Site.

5.7.2. As no existing public sewerage system is located in the vicinity of the Project Site, an on-site sewage treatment plant (STP) is proposed within the Project as shown in ***Appendix 3.1***. The potential odour nuisance to the nearby ASRs (including proposed residential units) would result. Nonetheless, the "Guidelines for the Design of Small Sewage Treatment Plants"

been incorporated.

- The air gap of 100mm and overlapping lengths of not less than 253mm and 275mm will be provided in the bedrooms and living rooms respectively.

- The areas of outer openings would not be larger than 0.7m^2 and 3.2m^2 will be provided in the bedrooms and living rooms respectively.

Table 6-3 *Baffle type acoustic window / acoustic door design criteria*

Design Parameter	Configuration 1	Configuration 2
Type of Room	Bedroom	Living Room
Air gap	100mm	100mm
Overlapping length	253mm	275mm
Area of outer openings	0.7m^2	3.2m^2

6.3.17. Given the room areas of bedrooms and living rooms in the Proposed Amendment with traffic noise exceedance are comparable to the reference cases in NPE, the noise attenuation benefited from BAW in both NPE cases and the Proposed Amendment is evaluated. It is considered that the amount of sound energy entering the indoor environment should be proportional to the area of the window opening and the room area. Thus, the adjustments have accounted for the room size difference between the NPE case and the Proposed Amendment as shown in ***Appendix 6.5***. By adjusting the room size correction, the noise reductions of the BAWs could be up to 6.4 dB(A) and 8.7 dB(A) in living rooms and bedrooms respectively. As a conservative approach, it is anticipated that a noise reduction of 6.0 dB as stated in EPD's "Practice Note on Application of Innovative Noise Mitigation Designs in Planning Private Residential Developments against Road Traffic Noise Impact", is achievable and adopted in the assessment.

6.3.18. Future occupants shall be informed through Deed of Mutual Covenant (DMC) and sales brochures the provision of acoustic window/acoustic door (Baffle type) to let them be well aware of the intended purpose, appropriate use and correct setting.

Table 6-4 *BAW (Configuration 1) and the Proposed Amendment*

Parameters	NPE (Bedroom Room)	Proposed Amendment
Size of Room (m^2)	6.8	4.8 to 10.2
Maximum relative noise reduction required (dB)	-	5.4
Noise reduction adopted (dB)	6.9	5.4 to Maximum 6.0

Table 8-2 *Potential Off-site contamination sources*

	Uses	Location	Shortest Distance from Project Site (m)	Condition
OLC-1	Open storage (from 1990); Warehouse (i.e. Metal) (from 1992 onwards)	West of proposed Site	13	Warehouse: for storage of metal, enclosed, paved land
OLC-2	Warehouse (i.e. Bamboo) (from 1990 onwards)	Northeast of proposed Site	47	Warehouse: for storage of bamboo, enclosed, paved land
OLC-3	Open storage (from 2000)	Southeast of proposed Site	38	Open storage of building material, no maintenance, no machinery, paved

8.4.5. As summarized in ***Table 8-1*** and ***Table* 8-2**, OLC-1 was a warehouse at the west, operated by Fat Lee Company Limited, a paper merchant. Based on the aerial photos, it was farmland from 1949 until 1986.The Site was first used as Open Storage in 1990, served as warehouses since 2000 with a further extension of the warehouse in 2005. The warehouse is an enclosed warehouse, with pavement. Only storage of stack pallets and paper rolls was observed on site, without operation of machinery and maintenance as observed in several site inspections (Photo 71 in Appendix 8.5). Land contamination issues due to its operation is unlikely.

8.4.6. For OLC-2, Hong Kong Bamboo Trading Company Limited is situated towards the northeast of the Site. The site of the existing Bamboo Trading Company remained vegetated since 1949 and it was a vacant land since 1986. Based on site observation in 2023, the warehouses are enclosed. Due to the storage of bamboo, without other operation of powered machinery and maintenance works, land contamination issues due to its operation are unlikely. During the site inspection conducted in 2024, concrete, soil and sand was observed to be stored within the site (Photo 73 in Appendix 8.5). Only trucks were observed, no operation of PME was identified. The area is enclosed with barriers and there is a road in between OLC-2 and the Project Site (Photo 74 in Appendix 8.5). Given the physical separation found between OLC-2 and the Project Site, impact of offsite land contamination should be insignificant.

8.4.7. For the land towards southeast (OLC-3), it was farmland until 1986. It became vacant at 1986 and was again vegetated in 1990. It served as storage afterwards in 2000. Based on aerial photos and site observation, only storage of building equipment is observed, without other operation of powered machinery and maintenance works. Thus no polluting and hazardous industrial uses are anticipated. Similar to OLC-2, it is a road apart from the Project Site (Photo 61 in Appendix 8.5). Hence, potential contamination issue is not anticipated from these historical surrounding uses.

The rubbish fire on 21 Jan 2021 was happened outside site boundary, no land contamination potential upon the rubbish fire outside the site. There was No.1 fire alarm happened near lamppost EA3379 of Ha Shan Kai Wat, and since it was on the access road outside the east boundary of the application site, storage of chemical along access road is unlikely. It is thus expected that there was no dangerous goods or chemicals in the fire incident area, therefore it is anticipated that no potential land contamination upon the fire incident.

8.6. Site Visit and Observation

8.6.1. Site Visit was conducted on 20 June 2023 to identify potential source of contamination. A Site Walkover Checklist has been completed with the Tenant's representative as required in the EPD's Practice Guide and attached in ***Appendix 8.4***. Photo records of the Application Site taken during the site visit are presented in ***Appendix 8.5.*** Indicative air drone diagrams are shown in ***Figure 8.1***.

Entrance, Temporary Office and Village House

8.6.2. The entrance and the container storage area are paved with concrete in good condition (photo 12 – Photo 16, Photo 67, 69), there is no sign of chemical spillage, pollutant nor potential source of contamination observed. There are also some village houses located within the site, no anticipated land contamination around the residential area (Photo 17).

8.6.3. For the temporary storage structures near the site entrance (Photo 55-60), as confirmed by current user, they are used for temporary office, store room for small maintenance equipment and parts. Potential land contamination is unlikely.

Construction Material, Machinery Storage Area, Vehicle Access

8.6.4. The Application Site is used as open storage area for construction materials and machinery. Equipment such as excavators, welding machines, maintenance tools at the machinery storage area. The machinery storage area is not paved. Yet no chemical and oil drums were identified at the material and machinery storage site The construction materials stored on site are mostly concrete blocks. They are kept at southwest area of the Application Site (Photo 34), which is paved in good condition. As verified on site and confirmed by the current users, no maintenance and refilling of chemical would be carried out at the machinery Storage Area at strip of area along the site boundary. Stains were observed along vehicle access between the construction material and machinery storage area (Photo 44-46), where the respective ground is paved in good condition. Stains were also spotted at the edge of building material storage area (Photo 39) where the ground is unpaved.

Machinery Maintenance/Chemical, Oil Drums Storage Area

8.6.5. Given the nature of the site usage, it may involve use and refilling of the chemical (e.g. Lubricant oil) for maintenance of machinery occasionally as confirmed by current user. Two separated machinery maintenance areas are designated at middle portion of the Application Site as shown in ***Figure 8.1a*** and ***Figure 8.1b.*** Onsite maintenance works of machinery resulting in potential land contamination at this area.

8.6.6. The Chemical, oil drums storage area is identified towards the north of the machinery maintenance area. The chemical found within the site includes a temporary oil drum to transport the oil on-site, and acetylene cylinders.

8.6.7. Additionally, waste oil was generated in the daily operation. The oil tanks/oil drum were observed to be placed on the ground (Photo 18, Photo 21 – Photo 23, Photo 26 – Photo 28), where the ground is paved and cracks identified, while some of the acetylene cylinders were placed on the tray with a lock (Photo 29). It was found that the improper storage of chemicals resulted in potential for oil spillage within the site at the machinery area. The stained surfaces were found on the paved ground and were not found on the unpaved ground towards the boundary of the site (Photo 21), the stained surfaces was only limited in the machinery maintenance area of the site. They are considered as potential hotspots of land contamination.

Vegetated Area

8.6.8. Vegetated area is identified at the south portion of the proposed site which is outside the main working area of the site. Only unnamed village houses identified, without any industrial activities. Land contamination is unlikely.

8.6.9. Works area, including Construction Material, Machinery Storage Area, Vehicle Access and Construction Material, Machinery Storage Area are considered to have potential land contaminations while non-works area like Entrance, Temporary Office and Village House and vegetated area are unlikely to have potential land contamination.

8.7. Potential Land Contamination Appraisal

8.7.1. According to the desktop study and site appraisal presented in ***Section 8.3*** to ***8.5***, the current usage of the Application Site is used as open storage area.

8.7.2. According to the government's response, no chemical spillage accidents were recorded at the Application Site within the past 5 years. There are two chemical waste producer registration and no illegal land use identified found at the Application Site. The record of chemical waste producers' registration is given in ***Appendix 8.2***. There were two fire incidents near the Application Site, the rubbish fire happened outside the site boundary, while it is

expected that there is no dangerous goods and chemicals involved in the No.1 fire alarm incidents as it was happened on the access road outside the site boundary. Therefore, it is anticipated that no potential land contamination upon fire incidents. As refer to PlanD's response, part of the site was approved to be used as warehouse for building equipment and materials in 1992.

8.7.3. Upon the site visits, no signs of as abnormal odour and/or distressed vegetation within the Application Site were observed. The dangerous good found (i.e. Acetylene), is gaseous compound where contamination on land is not expected. Given that the acetylene cylinder was kept in a locked tray, and no incident record associated with chemicals is recorded, land contamination due to storage/incidents of dangerous goods are not anticipated.

8.7.4. However, stained surfaces were found on the ground within Application Site within the machinery maintenance area and other works area. Based on the nature of current site usage, with machinery maintenance, there is a potential for chemical spillage and considered as potential polluting evidence under the Practice Guide for Investigation and Remediation of Contaminated Land.

Review on "Hotspots"

8.7.5. As per the Practice Guide, it recommends to investigate the potential contaminated land in regular grid pattern to have a comprehensive study on the potential land contamination site. Apart from the regular grid pattern, Practice Guide also required attention should be paid to those locations where potential land contamination could occur. These are regarded as "hotspots" for investigation.

8.7.6. The site investigation for land contamination can therefore be focused on hotspots that have the potential for land contamination due to various previous site activities, locations of any leakage events, stains observed and former storage locations for chemicals and chemical wastes.

8.7.7. Improper storage of chemicals on paved ground, maintenance workshop, and stained surface were identified on site, in particular, including at Machinery Maintenance/Chemical, Oil Drums Storage Area, Construction Material, Machinery Storage Area and Vehicle Access, are considered as hotpots as shown in **Appendix 8.5**. A detailed site investigation is proposed for the above mentioned area and shall be carried out to investigate the potential land contamination issues of the Site following the "Practice Guide for Investigation and Remediation of Contamination Land" published by EPD in later stage. The proposed sampling location is shown in **Figure 8.2**. Should contamination levels exceed allowable limits for post-restoration land use scenario (i.e. Urban Residential) in the Guidance Manual for Use of Risk-

Based Remediation Goals (RBRGs) for Contaminated Land Management, a Remediation Action Plan (RAP) will be carried out, if needed.

8.7.8. Other than the hotspots mentioned above, upon the site visit of the Subject Site, no signs of obvious/ suspected contamination such as abnormal odour and/or distressed vegetation within the Subject Site were observed and there is no potential source of contamination listed below identified in the Subject Site, including:

- Entrance, Temporary Office and Village House Area and
- Vegetated Area

Further Site Investigation

8.7.9. In view of some of the activities carried out within the Application Site are considered as potential polluting activities under the Practice Guide for Investigation and Remediation of Contaminated Land. A site investigation and remediation works, if required, shall be carried out before the commencement of construction of the project within the machinery maintenance area as shown in ***Figure 8.1***. A Contamination Assessment Plan (CAP) will be prepared and submitted to EPD for approval at later stage before the Site Investigation.

8.7.10. Further Site Investigation is proposed at

- Construction Material, Machinery Storage Area, Vehicle Access; and
- Machinery Maintenance/Chemical, Oil Drums Storage Area

8.7.11. Upon availability of the site investigation results, including field observation and laboratory analytical results, the Consultant will complete the land contamination assessment to ascertain the nature and extent of contamination, if any. All the site investigation results will be presented in the Contamination Assessment Report (CAR), for the submission to EPD for agreement. If land contamination is confirmed, a combined CAR and Remedial Action Plan (CAR-RAP) shall also be submitted to EPD for agreement to formulate necessary remedial measures. Moreover, the land contamination assessment and remediation works (if necessary) should be completed prior to the development of the Project according to the Practice Guide.

8.8. Conclusion

8.8.1. The Site Appraisal has been conducted to identify the potential land contamination impact at the Application Site. Based on the aerial photographs and responses from HKSAR Government Departments, the Application Site is currently used as open storage area for

Table 9-1 Summary of Quantities of Waste Generated

Type of Waste	Quantity	Handling Arrangement and Outlets	Remark
Inert C&D Materials Delivered to Public Fill Reception Facilities [1]	101,250 m^3	- Delivered to the public fill reception facilities	Area of Basement for carpark(6m): 3,375 m^2 Area of Basement for Carpark (10.5m): 10,125 m^2
Reused Inert C&D Materials (or Public Fills) For Onsite Reused	25,313 m^3	- Recycled as much as practicable for onsite re-usage	Assumed 20% reused onsite
Non-inert C&D Materials (or C&D waste) Generated [2]	28,690 m^3	- Recycled and reused as much as practicable (e.g. Timber and Woody material to Y-Park etc.) - Disposed of at the landfill	GFA: 124,748 m^2 Private Housing Projects 0.250m^3 /m^2 GFA Hong Kong-wide proportion of inert C&D materials in construction waste:0.92 (Hong Kong –Waste Statistics 2022) Waste Index*: 0.92x0.25 per m^2 GFA
Chemical Waste[3]	~ 0.1 m^3 (on a monthly basis)	- Collected by licensed chemical waste collector for the disposal of at licensed treatment facilities (e.g. Chemical Waste Treatment Centre (CWTC) at Tsing Yi)	/
General Refuse from Workforce[4]	227 kg/day	- Recycled as much as Practicable - Disposed of at the Landfill (i.e. NENT)	Assumed maximum of 350 workers working simultaneously at the Project Site - Assumed waste generation rate is 0.65 kg/person/day (per Monitoring Solid Waste in Hong Kong –Waste Statistics 2022)

Note:
[1] Includes, but not limited to excavated soil, broken concrete, granular materials etc.
[2] Includes, but not limited to, bamboo, timber, paper and plastic, etc.
[3] Includes, but not limited to, scrap batteries or acid/alkali from construction plant maintenance activities; used paints, engine oils, hydraulic fluids and waste fuel, etc.
[4] Includes, but not limited to, food waste, aluminum cans, waste paper, etc.
**Waste Index referenced to Section 3.2 of A Guide for Managing and Minimizing Building and Demolition Waste published by the Hong Kong Polytechnic University in May 2001*

human contact, provision of adequate washing facilities and the use of licensed chemical waste collectors to ensure legal disposal of waste, etc.

General Refuse

9.4.8. Recycling bins should also be placed to encourage recycling. Enclosed and covered areas should be provided for general refuse collection to prevent waste materials from being blown around by the wind, flushed or leached into nearby waters, or creating an odour nuisance or pest and vermin problem. Also, routine cleaning for these areas should be implemented to keep areas clean, so that intentional or accidental release into the surrounding environment does not occur without proper management.

9.4.9. Particularly, food waste is the main source of generating unpleasant odour and causing environmental hygiene concerns. Team will explore the feasibility for providing separate recycling bins will be provided for food waste to facilitate the recycling of food waste on-site or off-site in a hygienic manner in detailed design stage.

9.4.10. With the implementation of good waste management practices at the Site, and the abovementioned mitigation measures at the Project Site, adverse environmental impacts are not expected to arise from the storage, handling and transportation of C&D materials, chemical waste and general refuse generated during construction phase.

9.5. Potential Impacts and Mitigation Measures during Operation Phase

9.5.1. The major type of waste generated from the operation phase is general refuse. Insignificant amount of Chemical wastes are anticipated to be produced during operations and maintenance of the proposed project. With reference to Monitoring of Solid Waste in Hong Kong - Waste Statistics for 2022 by EPD, the disposal rate of domestic waste and non-domestic waste were 0.93 kg/person/day and 0.59 kg/person/day. The estimated quantities of general refuse anticipated for domestics uses will be 4,630 kg/day, assuming a residential population of 4,978. The estimated general refuse generated by commercial uses will be 388 kg/day with an estimated population of 658 person.

9.5.2. General refuse will be removed on regular basis to minimize odour, pest and litter impacts. To promote the recycling of waste paper, aluminium cans and plastic bottles, the 3-coloured waste separation bins for the collection of recyclable municipal waste will be clearly labelled and placed at convenient locations. The recyclable materials will then be collected by reliable waste recycling agents on a regular basis. Refuse bins for Food waste will be provided to be collected by contracted collectors from site will be sent to the O-Park2 in Sha Ling (scheduled for commissioning in 2024). Waste generated will be disposed of at government waste disposal facilities such as NENT Landfill or refuse transfer station. The Property Management

will register with EPD as a chemical waste producer and handle and dispose of chemical waste in accordance with the Waste Disposal (Chemical Waste) (General) Regulation if any chemical waste produced. Hence, adverse waste management implication is not anticipated during the operation phase.

9.6. Conclusion

9.6.1. During the construction phase, the major waste types generated by the construction activities for this project will include C&D materials from the excavation and foundation works, substructure and superstructures work; chemical waste from maintenance and servicing of construction site and equipment; general refuse from the workforce. Provided that all these identified wastes are reused and recycled if appropriate, handled, transported and disposed of in strict accordance with the relevant legislative and recommended requirements and that the recommended good site practices and mitigation measures are properly implemented, no adverse environmental impact is expected during the construction phase.

9.6.2. During the operation phase, the key waste types generated will be general refuse. Provided that all these wastes are reused and recycled if appropriate, handled, transported and disposed of in strict accordance with the relevant legislative requirements and the recommended mitigation measures are properly implemented, no adverse environmental impact is expected during the operation phase.

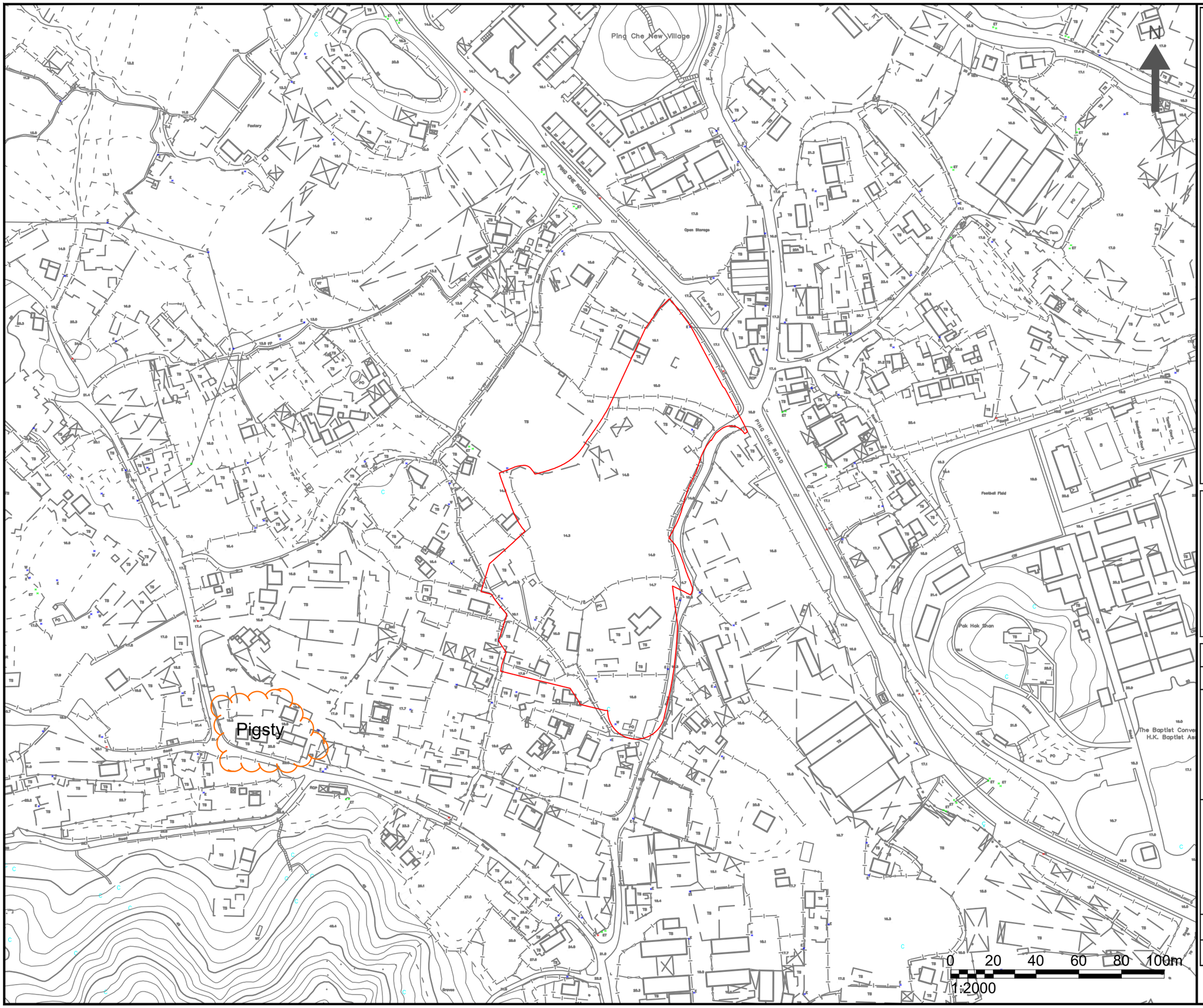
10. Overall Conclusion

10.1.1. Air quality impact (including vehicular and chimney emission), traffic noise, fixed plant noise water quality, and land contamination are evaluated in this Environmental Assessment Report for the Application Site.

10.1.2. There is no active chimneys and SP License record identified within 200m from the Proposed Amendment. The setback from the proposed commercial tower and residential towers to the nearby roads, future fresh air intake location of the air conditioning system and openable windows for ventilation would comply with the recommended buffer distance in Table 3.1, Chapter 9 of the HKPSG regarding vehicular emission for air sensitive use. Therefore, it is anticipated that the Proposed Amendment would not subject to unacceptable air quality impact.

10.1.3. The potential environmental noise impacts from nearby road traffic and fixed noise sources on the Proposed Amendment have been evaluated.

Figures



NOTES :

APPLICATION SITE

Consultant

Allied Environmental Consultants Limited

Project No. : 2127

Drawing By : CS

Project :

APPLICATION FOR AMENDMENT OF PLAN UNDER SECTION 12A FOR THE TOWN PLANNING ORDINANCE (CAP. 131) FOR MIXED USE DEVELOPMENT AT LOT 796 AND 1008RP IN D.D. 77 AND ADJOINING GOVERNMENT LAND IN PING CHE, TA KWU LING, NEW TERRITORIES

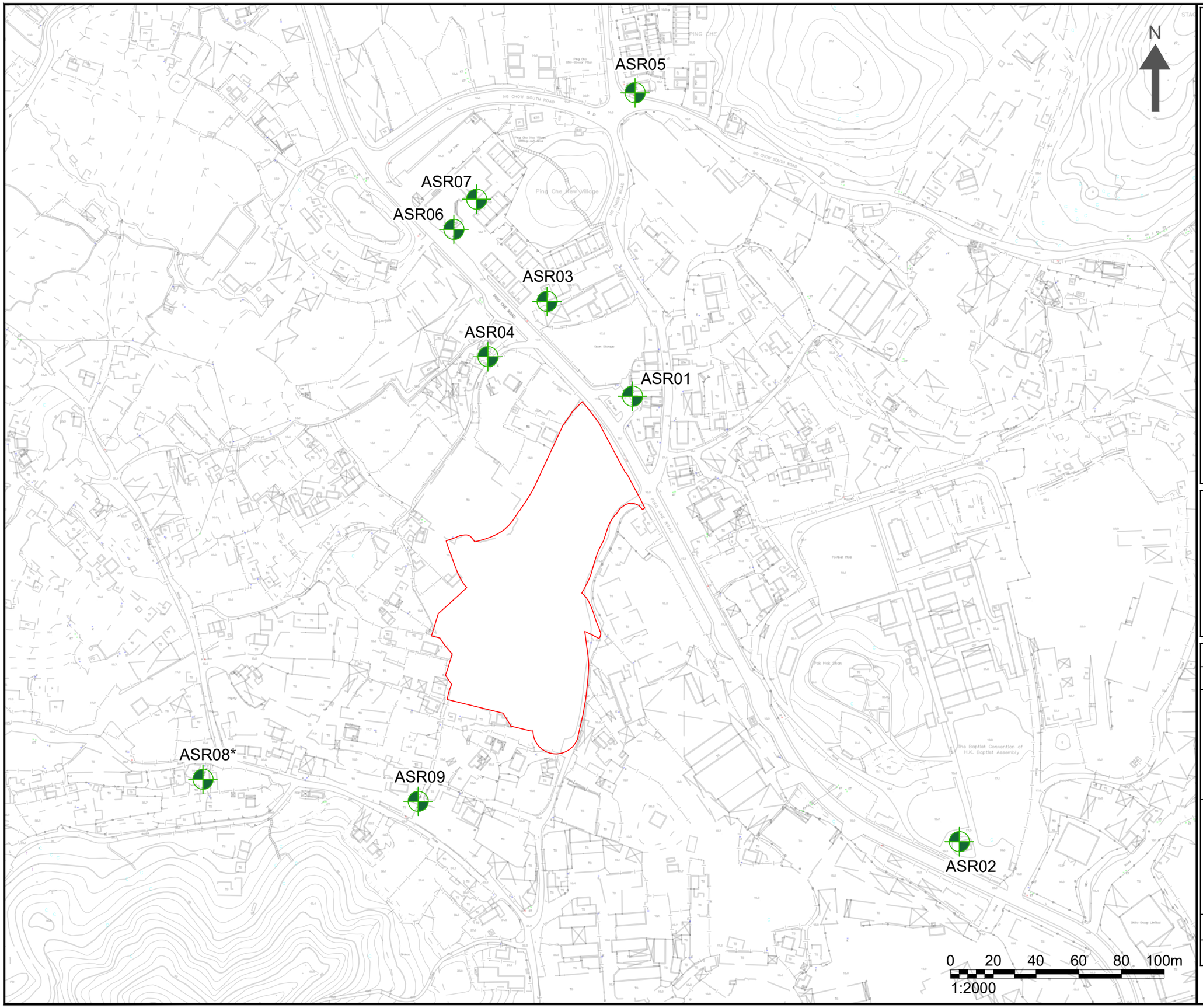
Drawing Title :

APPLICATION SITE LOCATION & ITS ENVIRONS

Drawing No :	Revision :
FIGURE 3.1	1
Scale :	Date :
AS SHOWN	OCT 2023

A3 420 x 297

C:\USERS\USER\SYNOLOGYDRIVE\2127 PING CHE DD77\05 REPORT\01 AEC REPORT\01 EA (AIR+NOISE+LANDCON)\DRAFT 2\FIG\FIG 3.1 SITE LOCATION_ISSUE 2.DWG



NOTES :

APPLICATION SITE

REPRESENTATIVE AIR QUALITY SENSITIVE RECEIVERS

Consultant

Allied Environmental Consultants Limited

Project No. :	2127
Drawing By :	CS

Project :

APPLICATION FOR AMENDMENT OF PLAN UNDER SECTION 12A FOR THE TOWN PLANNING ORDINANCE (CAP. 131) FOR MIXED USE DEVELOPMENT AT LOT 796 AND 1008RP IN D.D. 77 AND ADJOINING GOVERNMENT LAND IN PING CHE, TA KWU LING, NEW TERRITORIES

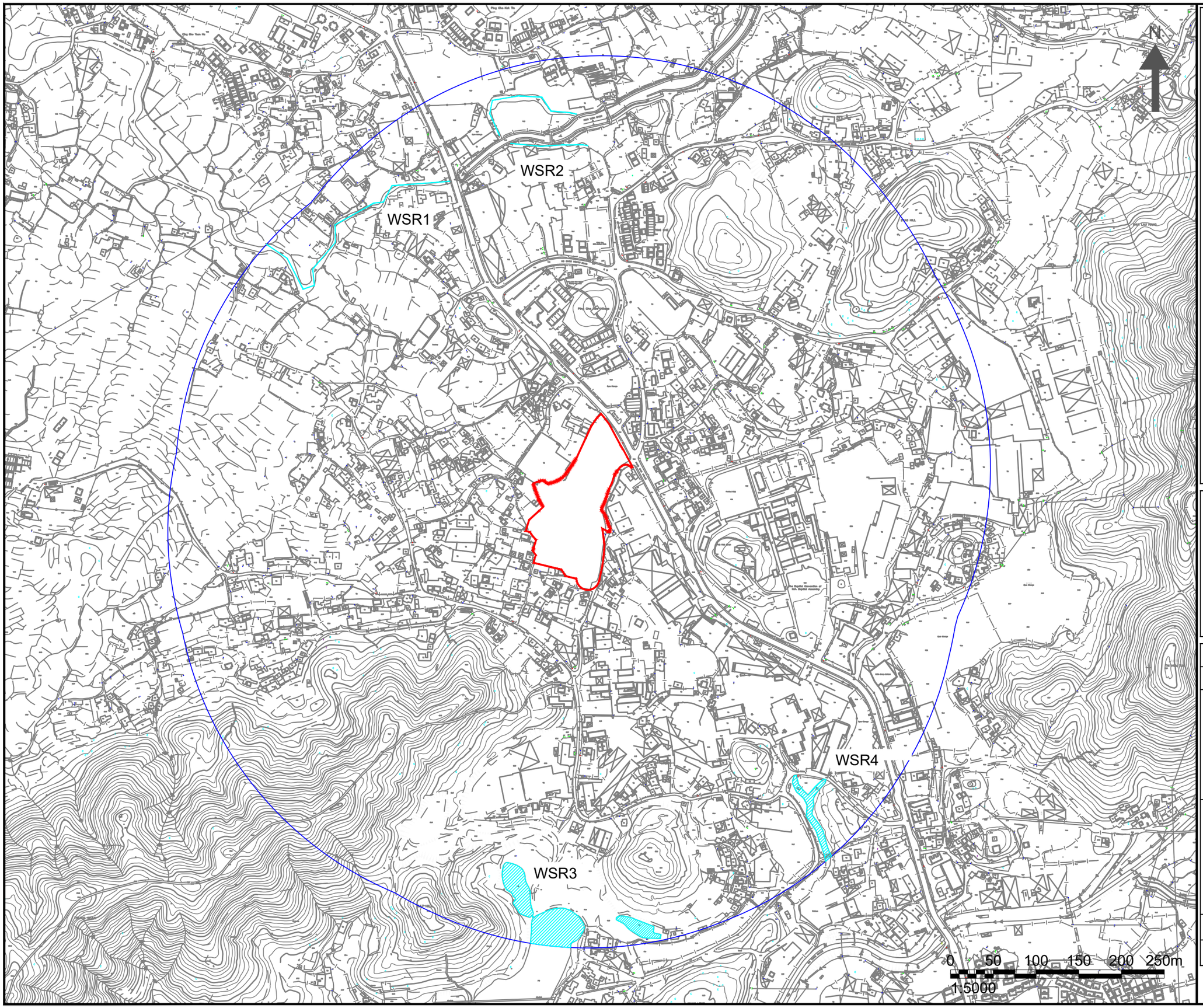
Drawing Title :

LOCATION OF REPRESENTATIVE AIR QUALITY SENSITIVE RECEIVERS

Drawing No :	Revision :
FIGURE 5.1	1
Scale :	Date :
AS SHOWN	JUN 2024

A3 420 x 297

G:\2127 PING CHE DD77\05 REPORT\01 AEC REPORT\01 EA (AIR+NOISE+LANDCON)\ISSUE 5\FIGURE\FIG 5.1 REPRESENTATIVE ASR_ISSUE 5.DWG



NOTES :

APPLICATION SITE

500M ASSESSMENT AREA

NATURAL WATERCOURSE

Consultant

Allied Environmental Consultants Limited

Project No. :	2127
Drawing By :	CS

Project :

APPLICATION FOR AMENDMENT OF PLAN UNDER SECTION 12A FOR THE TOWN PLANNING ORDINANCE (CAP. 131) FOR MIXED USE DEVELOPMENT AT LOT 796 AND 1008RP IN D.D. 77 AND ADJOINING GOVERNMENT LAND IN PING CHE, TA KWU LING, NEW TERRITORIES

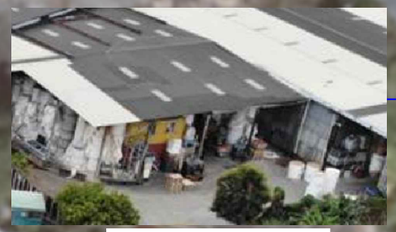
Drawing Title :

500M ASSESSMENT AREA AND WATER SENSITIVE RECEIVERS

Drawing No : FIGURE 7.1	Revision : 1
Scale : AS SHOWN	Date : APR 2024

A3 420 x 297

G:\2127 PING CHE DD77\03 DRAWING\01 AEC DRAWINGS\2127 FIG 1.1 SITE LOCATION_ISSUE 2 - COPY.DWG

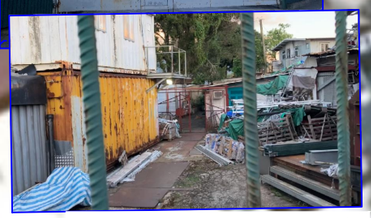


OLC-1Warehouse

Entrance

Temporary Office

OLC-2Warehouse



OLC-3
Open Storage

0 10 20 30 40 50m
1:1000

N

NOTES :

APPLICATION SITE

MACHINERY STORAGE AREA

MACHINERY MAINTENANCE AREA

BUILDING MATERIAL STORAGE AREA

POTENTIAL OFFSITE LAND CONTAMINATION SOURCE

Consultant

AEC

Allied Environmental Consultants Limited

Project No. :	2127
Drawing By :	LL

Project :

APPLICATION FOR AMENDMENT OF PLAN UNDER SECTION 12A FOR THE TOWN PLANNING ORDINANCE (CAP. 131) FOR MIXED USE DEVELOPMENT AT LOT 796 AND 1008RP IN D.D. 77 AND ADJOINING GOVERNMENT LAND IN PING CHE, TA KWU LING, NEW TERRITORIES

Drawing Title :

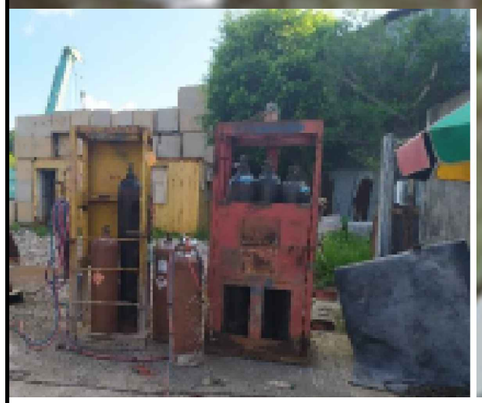
INDICATIVE AIR DRONE DIAGRAM (ON SITE AND IMMEDIATE SURROUNDING)

Drawing No : FIGURE 8.1a	Revision : 1
Scale : AS SHOWN	Date : Apr 2024

A3 420 x 297

G:\2127 PING CHE DD77\05 REPORT\01 AEC REPORT\01 EA (AIR+NOISE+LANDCON)\ISSUE 4\LANDCON_FIG&APP\AIRDRONE.DWG

Waste oil container found
(improper storage)



acetylene cylinders found
(improper storage)

NOTES :

APPLICATION SITE

UNPAVED

STAINED SURFACE

Consultant

Allied Environmental Consultants Limited

Project No. :	2127
Drawing By :	LL

Project :

APPLICATION FOR AMENDMENT OF PLAN UNDER SECTION 12A FOR THE TOWN PLANNING ORDINANCE (CAP. 131) FOR MIXED USE DEVELOPMENT AT LOT 796 AND 1008RP IN D.D. 77 AND ADJOINING GOVERNMENT LAND IN PING CHE, TA KWU LING, NEW TERRITORIES

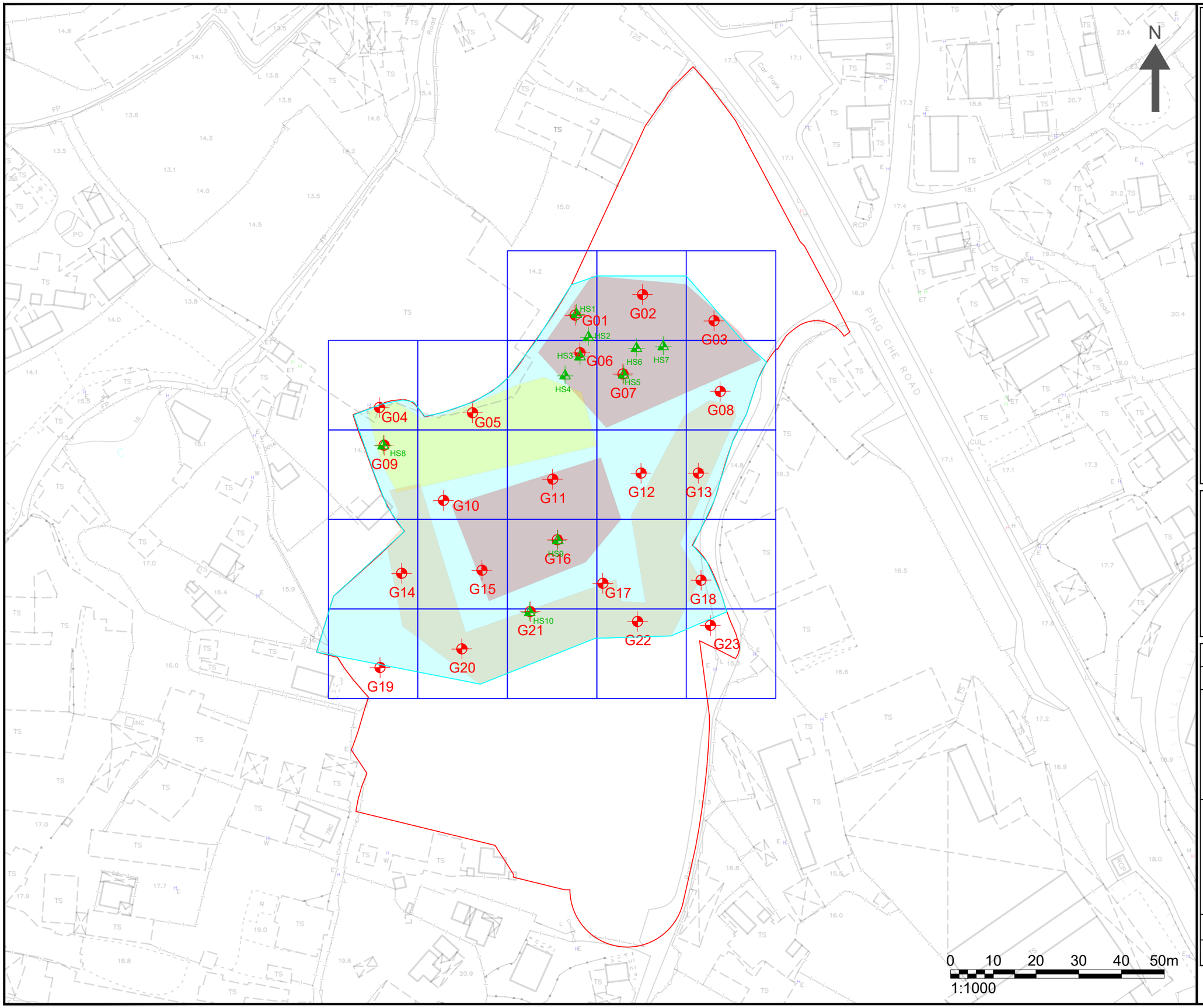
Drawing Title :

INDICATIVE AIR DRONE DIAGRAM (PAVING CONDITION OF OPEN STORAGE AREA)

Drawing No : FIGURE 8.1b	Revision : 1
Scale : AS SHOWN	Date : FEB 2024

A3 420 x 297

G:\2127 PING CHE DD77\05 REPORT\01 AEC REPORT\01 EA (AIR+NOISE+LANDCON)\ISSUE 5\LANDCON_FIG&APP\AIRDRONE.DWG



NOTES :

- APPLICATION SITE
- 25M X 25M SAMPLING GRID
- PROPOSED SAMPLING LOCATION (REGULAR GRID)
- PROPOSED SAMPLING LOCATION (HOT SPOT)
- WORKS AREA
- MACHINERY STORAGE AREA
- MACHINERY MAINTENANCE AREA
- BUILDING MATERIAL STORAGE AREA

Consultant

Allied Environmental Consultants Limited

Project No. :	2127
Drawing By :	CS

Project :

APPLICATION FOR AMENDMENT OF PLAN UNDER SECTION 12A FOR THE TOWN PLANNING ORDINANCE (CAP. 131) FOR MIXED USE DEVELOPMENT AT LOT 796 AND 1008RP IN D.D. 77 AND ADJOINING GOVERNMENT LAND IN PING CHE, TA KWU LING, NEW TERRITORIES

Drawing Title :

LAND CONTAMINATION ASSESSMENT
PROPOSED SAMPLING LOCATION

Drawing No :	Revision :
FIGURE 8.2	1
Scale :	Date :
AS SHOWN	JUN 2024

A3 420 x 297

G:\2127 PING CHE DD77\05 REPORT\01 AEC REPORT\01 EA (AIR+NOISE+LANDCON)\ISSUE 5\FIGURE\FIG 5.1 REPRESENTATIVE ASR_ISSUE 5 - COPY.DWG

Appendix 2.1

Tentative Programme of the Project

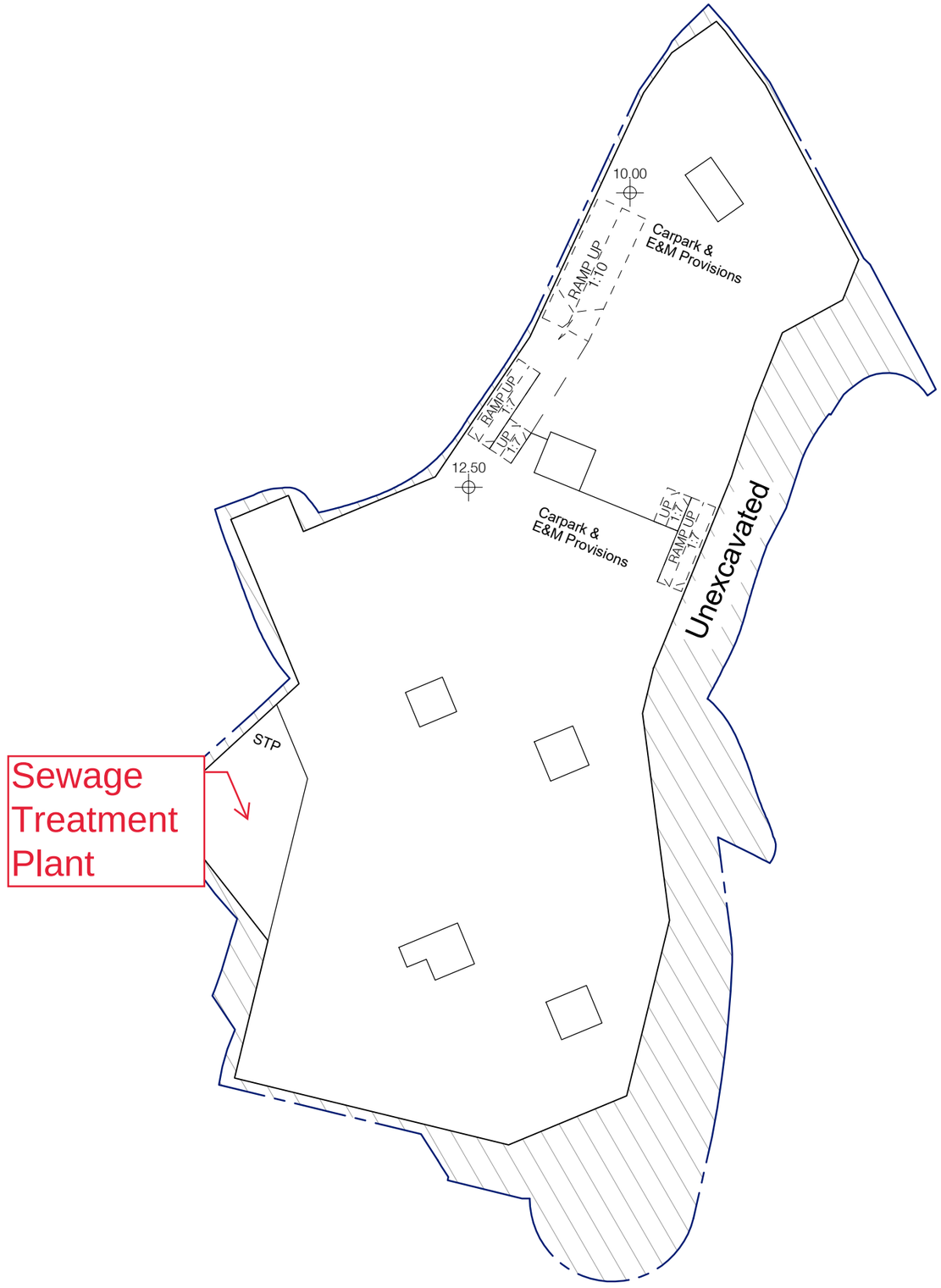
Project: Proposed Mixed Use Development(Residential and Commercial), Lot 796 and 1008 RP and AdjoiningGovernment Land in Ping Che, Ta Kwu Leng , New Territories

Appendix 2.1 Tentative Programme of the Project(Indicative)

Work Stage / Month / Year	2028												2029												2030												2031												2032											
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Site Clearance and Mobilisation							■	■	■	■	■	■																																															
Excavation and Lateral Support work													■	■	■	■	■	■	■	■	■																																							
Foundation, Piling and Pile cap work																						■	■	■	■	■	■	■	■	■																													
Superstructure and Filting-out work																														■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Appendix 3.1

Master Layout Plan of the Proposed Amendment



BASEMENT LEVEL 1 PLAN SK-10
PROPOSED DEVELOPMENT AT PING CHE DD77, N.T.

0 10 20 50m

SINGULAR STUDIO LTD
11 DECEMBER 2023

Appendix 5.1

Replies from Government Department on Concerned Pigsty

Leanna Lei

From: astonccheung@epd.gov.hk
Sent: Monday, May 27, 2024 5:47 PM
To: Leanna Lei
Cc: whhui@epd.gov.hk
Subject: Fw: [2127/819.4463 Ping Che Land Contamination] Request for Information for Air Impact Assessment

Follow Up Flag: Follow up
Flag Status: Flagged

Dear Leanna,

According to our records, the concerned pig farm has ceased business for many years. Therefore, I believed there are no odour complaints record against the pig farm for your concerned time frame.

Please let me know if there any questions. Thanks.

Best Regards,

Aston CHEUNG / E(RN)74

Regional Office (North)
Environmental Compliance Division
Environmental Protection Department

Tel: 3162 8396

----- Forwarded by Aston CC CHEUNG/EPD/HKSARG on 27/05/2024 17:36 -----

From: Alice WY TANG/EPD/HKSARGE[RN]34
To: Aston CC CHEUNG/EPD/HKSARG@EPD
Date: 27/05/2024 14:32
Subject: Fw: [2127/819.4463 Ping Che Land Contamination] Request for Information for Air Impact Assessment

---

Dear Aston,

Re the request of complaint info of pigsty in the preceding email. Grateful for your follow up and reply to the consultant. Many thanks!

Regards,

Alice TANG
E(RN)34 / EPD
2158 5842

----- Forwarded by Alice WY TANG/EPD/HKSARG on 27/05/2024 14:26 -----

From: Leanna Lei <leannalei@aechk.com>
To: "alicewytang@epd.gov.hk" <alicewytang@epd.gov.hk>
Cc: Cathy Man <cm@aechk.com>, NGAN Chun Sang <nganchunsang@aecasia.io>
Date: 27/05/2024 12:22
Subject: RE: [2127/819.4463 Ping Che Land Contamination] Request for Information for Air Impact Assessment

Dear Alice,

S16 Application for A/DPA/NE-TKL/31 Ping Che DD77 Lot 796 & 1008RP,
Ta Kwu Ling, North District, Hong Kong
Request for Information for Air Impact Assessment

We are conducting an S16 Application for A/DPA/NE-TKL/31 Ping Che DD77 Lot 796 & 1008RP, Ta Kwu Ling, North District, Hong Kong which is shown in the enclosed Site Location Plan. As refer to EPD comments, information pertaining to odour emission of a nearby pigsty is required. Of particular interest we would like to check on the odour complaint records of the mentioned odour source and any information you could provide which might be useful for our study. We enclosed herewith a site map showing the location of the Project Site for your reference.

Due to the tight schedule, it is highly appreciated if the above information could be available and returned to us via either fax (Fax No. 2815 5399) or email **by 10 June 2024**. Thank you very much for your kind attention and assistance.

Yours Sincerely,

Leanna

Leanna Lei – Assistant Consultant
Environmental Consultancy | Green & Healthy Building
T: (852) 2815 7028 | **D:** (852) 3915 7178 | **F:** (852) 2815 5399 | **E:** leannalei@aechk.com

Allied Environmental Consultants Limited *Member of AEC Group (HKEX Stock Code: 8320.HK)*

27/F, Overseas Trust Bank Building, 160 Gloucester Road, Wan Chai, Hong Kong
Follow us www.asecg.com

[attachment "Fig 3.1 Site Location_Issue 2.pdf" deleted by Aston CC CHEUNG/EPD/HKSARG] [attachment "20240521_Y_NE_TKL_5_FI_ RtC table _extract.docx" deleted by Aston CC CHEUNG/EPD/HKSARG]

Appendix 6.7

Fixed Plant Noise Impact Assessment Calculation

Fixed Plant Noise Impact Assessment Calculation

Project No.: 2127

Project: Application for Amendment of Plan Under Section 12A of the Town Planning Ordinance (Cap. 131) for Mix Use Development (Residential & Commercial) at Lot 796 & 1008 RP and Adjoining Government land in Ping Che, Ta Kwu Ling, New Territories

NSR ID T5-E-1

Daytime Criterion: 70 dB(A)

Fixed Plant Noise Source					SWL	Remark	Quantity	NSR Location			Horizontal Distance	Vertical Distance	Slant Distance	% on time over 30mins	Correction								Resultant Noise Level
															Distance	Quantity	Façade	Tonality	Impulsive	Intermittency	Barrier	% on time	
ID	Name	X-coordinate	Y-coordinate	Height of FPN (mPD)	dB(A)		(nos.)	X-coordinate	Y-coordinate	Height of NSR (mPD)	(m)	(m)	(m)	%	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
S01	Tin Wing Vehicle Services	834558.207	842842.2468	16	99	[4]	3	834620.5	842435.5	24.58	411.5	8.6	411.6	100%	60	5	3	0	0	0	10	0	20.9
S02	Ho Cheung Scrap metal recycling	834573.2434	842849.3084	16	100.3	[1]	1	834620.5	842435.5	24.58	416.5	8.6	416.6	100%	60	0	3	0	0	0	10	0	26.9
S03	Chewy Logistics	834696.614	842687.133	16	99	[4]	4	834620.5	842435.5	24.58	262.9	8.6	263.0	100%	56	6	3	0	0	0	10	0	23.6
S04	Open storage	834710.5102	842659.2478	16	99	[4]	1	834620.5	842435.5	24.58	241.2	8.6	241.3	100%	56	0	3	0	0	0	10	0	30.3
S04	Open storage	834710.5102	842659.2478	16	112	[6]	1	834620.5	842435.5	24.58	241.2	8.6	241.3	100%	56	0	3	0	0	0	10	0	43.3
S05	Laundry Workshop	834873.8386	842704.2574	16	98.7	[1]	1	834620.5	842435.5	24.58	369.3	8.6	369.4	100%	59	0	3	0	0	0	10	0	26.3
S09	Fat Lee Company Limited	834773.0303	842407.9832	16	91	[3]	1	834620.5	842435.5	24.58	155.0	8.6	155.2	100%	52	0	3	0	0	0	10	0	26.2
S11	Wo Lee Steel logistic & distribution centre	834850.7133	842332.2819	16	91	[3]	1	834620.5	842435.5	24.58	252.3	8.6	252.4	100%	56	0	3	0	0	0	10	0	22.0
S12	Hong Kong United Recycling Company Limited	834692.2714	842332.7136	16	83.8	[2]	1	834620.5	842435.5	24.58	125.4	8.6	125.7	100%	50	0	3	0	0	0	10	0	20.8
S13	Bosa Technology (Manufacturing & warehouse)	834686.2596	842227.8035	16	88	[1]	1	834620.5	842435.5	24.58	217.9	8.6	218.0	100%	55	0	3	0	0	0	0	0	30.2
S14	Shun Cheong Warehouse	834715.3179	842277.4956	16	91	[3]	1	834620.5	842435.5	24.58	184.3	8.6	184.5	10%	53	0	3	0	0	0	10	10	14.7
S15	Chewy warehouse	834640.7939	842303.5789	16	73	[1]	1	834620.5	842435.5	24.58	133.5	8.6	133.7	100%	51	0	3	0	0	0	10	0	9.5
S17	Vehicle repair shop	834567.9762	842335.0342	16	100	[5]	1	834620.5	842435.5	24.58	113.4	8.6	113.7	16%	49	0	3	0	0	0	10	8	29.9
S18	Castco Warehouse	834480.9689	842425.8793	16	94.1	[2]	1	834620.5	842435.5	24.58	139.9	8.6	140.1	100%	51	0	3	0	0	0	0	0	40.2
S19	Wei Cheng Bus Engineering Company	834415.9141	842407.886	16	100	[5]	2	834620.5	842435.5	24.58	206.4	8.6	206.6	16%	54	3	3	0	0	0	0	8	31.7
S20	Swire Motors repair and maintenance workshop	834566.5368	842643.8691	16	99	[4]	2	834620.5	842435.5	24.58	215.2	8.6	215.4	20%	55	3	3	0	0	0	10	7	21.3
S21	Bang Jie Company (Warehouse / Logistics)	834593.6443	842693.2713	16	91	[3]	1	834620.5	842435.5	24.58	259.2	8.6	259.3	100%	56	0	3	0	0	0	0	0	31.7
																						Overall	46

Night-time Criterion: 60 dB(A)

Fixed Plant Noise Source					SWL	Remark	Quantity	NSR Location			Horizontal Distance	Vertical Distance	Slant Distance	% on time over 30mins	Correction								Resultant Noise Level
															Distance	Quantity	Façade	Tonality	Impulsive	Intermittency	Barrier	% on time	
ID	Name	X-coordinate	Y-coordinate	Height of Noise Source (mPD)	dB(A)		(nos.)	X-coordinate	Y-coordinate	Height of NSR (mPD)	(m)	(m)	(m)	%	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
S15	Chewy warehouse	834640.7939	842303.5789	16	73	[1]	1	834620.5	842435.5	24.58	133.4729149	8.58	133.7484034	100%	51	0	3	0	0	0	10	0	9.5
S21	Bang Jie Company (Warehouse / Logistics)	834593.6443	842693.2713	16	91	[3]	1	834620.5	842435.5	24.58	259.1664942	8.58	259.3084806	100%	56	0	3	0	0	0	0	0	31.7
																						Overall	31.7

Remarks for SWLs:

[1] SWLs of S02, S05, S13 and S15 are based on site measurement, as refer to Appendix 6.6.

[2] SWLs of S12 and S19 are referred to the S12A Planning Application for Proposed Amendments to the Ping Che and Ta Kwu Ling Outline Zoning Plan from "ARG" and "GB" Zones to "R(A)", "R(A)1" and "G/IC" Zones at Various Lots in D.D. 77 and 84 and Adjoining Government Land in Ping Che, Fanling

[3] SWL of loading and unloading using forklift (91 dB(A)) is referred to the approved EIA report "AEIAR-182/2014 - Proposed Residential Cum Passive Recreation Development within "Recreation" Zone and "Residential (Group C)" Zone at Various Lots in DD 104, Yuen Long, N.T." (website: https://www.epd.gov.hk/eia/register/report/eiareport/eia_2202014/EIA%20Report/Html/Appendices/App%204-7.pdf)

[4] SWL of movement of lorry (99 dB(A)) is referred to the approved EIA report "AEIAR-182/2014 - Proposed Residential Cum Passive Recreation Development within "Recreation" Zone and "Residential (Group C)" Zone at Various Lots in DD 104, Yuen Long, N.T." (website: https://www.epd.gov.hk/eia/register/report/eiareport/eia_2202014/EIA%20Report/Html/Appendices/App%204-7.pdf)

[5] SWL of hand-held pneumatic tool (100dB(A)) is referred to the approved EIA report "AEIAR-191/2015 - Chai Wan Government Complex and Vehicle Depot" (website: https://www.epd.gov.hk/eia/register/report/eiareport/eia_2302015/Web/PDF/EIA%20Report%20-%20Appendices.pdf)

[6] SWL of CNP 048 Crane, mobile/barge mounted (diesel) (112dB(A)) is referred to Technical Memorandum on Noise from Construction Work Other Than Percussive Piling

[7] Correction factor for quantity = 10 log (quantity)

[8] Distance correction for SWL = 20 log (distance) + 8

[9] Correction for percentage on-time over 30 mins = 10 log (on-time %)

[10] Barrier correction: While NSR with no direct line of sight to the source/opening, a 10dB(A) attenuation would be applied. While NSR is partially screened, a 5dB(A) attenuation would be applied.

[11] The following formula was used for calculating the SPLs at NSRs =

SPL = SWL+QC+DC+FC+BC+OC+TC+IMC+INTC

SPL Sound Pressure Level (dB(A))

SWL Sound Power Level (dB(A))

QC Correction factor for quantity (dB(A))

DC Distance Attenuation (dB(A))

FC Façade Correction (dB(A))

BC Barrier Correction (dB(A))

OC Percentage on-time Correction (dB(A))

TC Correction for Tonality (dB(A))

IMC Correction for Impulsiveness (dB(A))

INTC Correction for Intermittency (dB(A))

Fixed Plant Noise Impact Assessment Calculation

Project No.: 2127

Project: Application for Amendment of Plan Under Section 12A of the Town Planning Ordinance (Cap. 131) for Mix Use Development (Residential & Commercial) at Lot 796 & 1008 RP and Adjoining Government land in Ping Che, Ta Kwu Ling, New Territories

NSR ID T6-F-5

Daytime Criterion: 70 dB(A)

Fixed Plant Noise Source								NSR Location						% on time over 30mins	Correction								Resultant Noise Level
					SWL	Remark	Quantity				Horizontal Distance	Vertical Distance	Slant Distance		Distance	Quantity	Façade	Tonality	Impulsive	Intermittency	Barrier	% on time	
ID	Name	X-coordinate	Y-coordinate	Height of FPN (mPD)	dB(A)		(nos.)	X-coordinate	Y-coordinate	Height of NSR (mPD)	(m)	(m)	(m)	%	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
S01	Tin Wing Vehicle Services	834558.207	842842.2468	16	99	[4]	3	834682.2	842413.5	24.58	446.3	8.6	446.4	100%	61	5	3	0	0	0	10	0	20.2
S02	Ho Cheung Scrap metal recycling	834573.2434	842849.3084	16	100.3	[1]	1	834682.2	842413.5	24.58	449.2	8.6	449.3	100%	61	0	3	0	0	0	10	0	26.2
S03	Chewy Logistics	834696.614	842687.133	16	99	[4]	4	834682.2	842413.5	24.58	274.0	8.6	274.1	100%	57	6	3	0	0	0	10	0	23.2
S04	Open storage	834710.5102	842659.2478	16	99	[4]	1	834682.2	842413.5	24.58	247.4	8.6	247.5	100%	56	0	3	0	0	0	10	0	30.1
S04	Open storage	834710.5102	842659.2478	16	112	[6]	1	834682.2	842413.5	24.58	247.4	8.6	247.5	100%	56	0	3	0	0	0	10	0	43.1
S05	Laundry Workshop	834873.8386	842704.2574	16	98.7	[1]	1	834682.2	842413.5	24.58	348.2	8.6	348.3	100%	59	0	3	0	0	0	10	0	26.9
S09	Fat Lee Company Limited	834773.0303	842407.9832	16	91	[3]	1	834682.2	842413.5	24.58	91.0	8.6	91.4	100%	47	0	3	0	0	0	0	0	40.8
S11	Wo Lee Steel logistic & distribution centre	834850.7133	842332.2819	16	91	[3]	1	834682.2	842413.5	24.58	187.1	8.6	187.3	100%	53	0	3	0	0	0	0	0	34.6
S12	Hong Kong United Recycling Company Limited	834692.2714	842332.7136	16	83.8	[2]	1	834682.2	842413.5	24.58	81.4	8.6	81.9	100%	46	0	3	0	0	0	0	0	34.5
S13	Bosa Technology (Manufacturing & warehouse)	834686.2596	842227.8035	16	88	[1]	1	834682.2	842413.5	24.58	185.7	8.6	185.9	100%	53	0	3	0	0	0	0	0	31.6
S14	Shun Cheong Warehouse	834715.3179	842277.4956	16	91	[3]	1	834682.2	842413.5	24.58	140.0	8.6	140.2	10%	51	0	3	0	0	0	10	10	17.1
S15	Chewy warehouse	834640.7939	842303.5789	16	73	[1]	1	834682.2	842413.5	24.58	117.5	8.6	117.8	100%	49	0	3	0	0	0	10	0	10.6
S17	Vehicle repair shop	834567.9762	842335.0342	16	100	[5]	1	834682.2	842413.5	24.58	138.6	8.6	138.8	16%	51	0	3	0	0	0	10	8	28.1
S18	Castco Warehouse	834480.9689	842425.8793	16	94.1	[2]	1	834682.2	842413.5	24.58	201.6	8.6	201.8	100%	54	0	3	0	0	0	10	0	27.0
S19	Wei Cheng Bus Engineering Company	834415.9141	842407.886	16	100	[5]	2	834682.2	842413.5	24.58	266.3	8.6	266.5	16%	57	3	3	0	0	0	10	8	19.5
S20	Swire Motors repair and maintenance workshop	834566.5368	842643.8691	16	99	[4]	2	834682.2	842413.5	24.58	257.8	8.6	257.9	20%	56	3	3	0	0	0	10	7	19.8
S21	Bang Jie Company (Warehouse / Logistics)	834593.6443	842693.2713	16	91	[3]	1	834682.2	842413.5	24.58	293.5	8.6	293.6	100%	57	0	3	0	0	0	10	0	20.6
																						Overall	46.4

Night-time Criterion: 60 dB(A)

Fixed Plant Noise Source								NSR Location						% on time over 30mins	Correction								Resultant Noise Level
					SWL	Remark	Quantity				Horizontal Distance	Vertical Distance	Slant Distance		Distance	Quantity	Façade	Tonality	Impulsive	Intermittency	Barrier	% on time	
ID	Name	X-coordinate	Y-coordinate	Height of Noise Source (mPD)	dB(A)		(nos.)	X-coordinate	Y-coordinate	Height of NSR (mPD)	(m)	(m)	(m)	%	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
S15	Chewy warehouse	834640.7939	842303.5789	16	73	[1]	1	834682.2	842413.5	24.58	117.4611142	8.58	117.7740623	100%	49	0	3	0	0	0	10	0	10.6
S21	Bang Jie Company (Warehouse / Logistics)	834593.6443	842693.2713	16	91	[3]	1	834682.2	842413.5	24.58	293.4520273	8.58	293.5774322	100%	57	0	3	0	0	0	10	0	20.6
																						Overall	21

Remarks for SWLs:

[1] SWLs of S02, S05, S13 and S15 are based on site measurement, as refer to Appendix 6.6.

[2] SWLs of S12 and S19 are referred to the S12A Planning Application for Proposed Amendments to the Ping Che and Ta Kwu Ling Outline Zoning Plan from "ARG" and "GB" Zones to "R(A)", "R(A)1" and "G/IC" Zones at Various Lots in D.D. 77 and 84 and Adjoining Government Land in Ping Che, Fanling

[3] SWL of loading and unloading using forklift (91 dB(A)) is referred to the approved EIA report "AEIAR-182/2014 - Proposed Residential Cum Passive Recreation Development within "Recreation" Zone and "Residential (Group C)" Zone at Various Lots in DD 104, Yuen Long, N.T." (website: https://www.epd.gov.hk/eia/register/report/eiareport/eia_2202014/EIA%20Report/Html/Appendices/App%204-7.pdf)

[4] SWL of movement of lorry (99 dB(A)) is referred to the approved EIA report "AEIAR-182/2014 - Proposed Residential Cum Passive Recreation Development within "Recreation" Zone and "Residential (Group C)" Zone at Various Lots in DD 104, Yuen Long, N.T." (website: https://www.epd.gov.hk/eia/register/report/eiareport/eia_2202014/EIA%20Report/Html/Appendices/App%204-7.pdf)

[5] SWL of hand-held pneumatic tool (100dB(A)) is referred to the approved EIA report "AEIAR-191/2015 - Chai Wan Government Complex and Vehicle Depot" (website: https://www.epd.gov.hk/eia/register/report/eiareport/eia_2302015/Web/PDF/EIA%20Report%20-%20Appendices.pdf)

[6] SWL of CNP 048 Crane, mobile/barge mounted (diesel) (112dB(A)) is referred to Technical Memorandum on Noise from Construction Work Other Than Percussive Piling

[7] Correction factor for quantity = 10 log (quantity)

[8] Distance correction for SWL = 20 log (distance) + 8

[9] Correction for percentage on-time over 30 mins = 10 log (on-time %)

[10] Barrier correction: While NSR with no direct line of sight to the source/opening, a 10dB(A) attenuation would be applied. While NSR is partially screened, a 5dB(A) attenuation would be applied.

[11] The following formula was used for calculating the SPLs at NSRs =

SPL = SWL+QC+DC+FC+BC+OC+TC+IMC+INTC

SPL Sound Pressure Level (dB(A))

SWL Sound Power Level (dB(A))

QC Correction factor for quantity (dB(A))

DC Distance Attenuation (dB(A))

FC Façade Correction (dB(A))

BC Barrier Correction (dB(A))

OC Percentage on-time Correction (dB(A))

TC Correction for Tonality (dB(A))

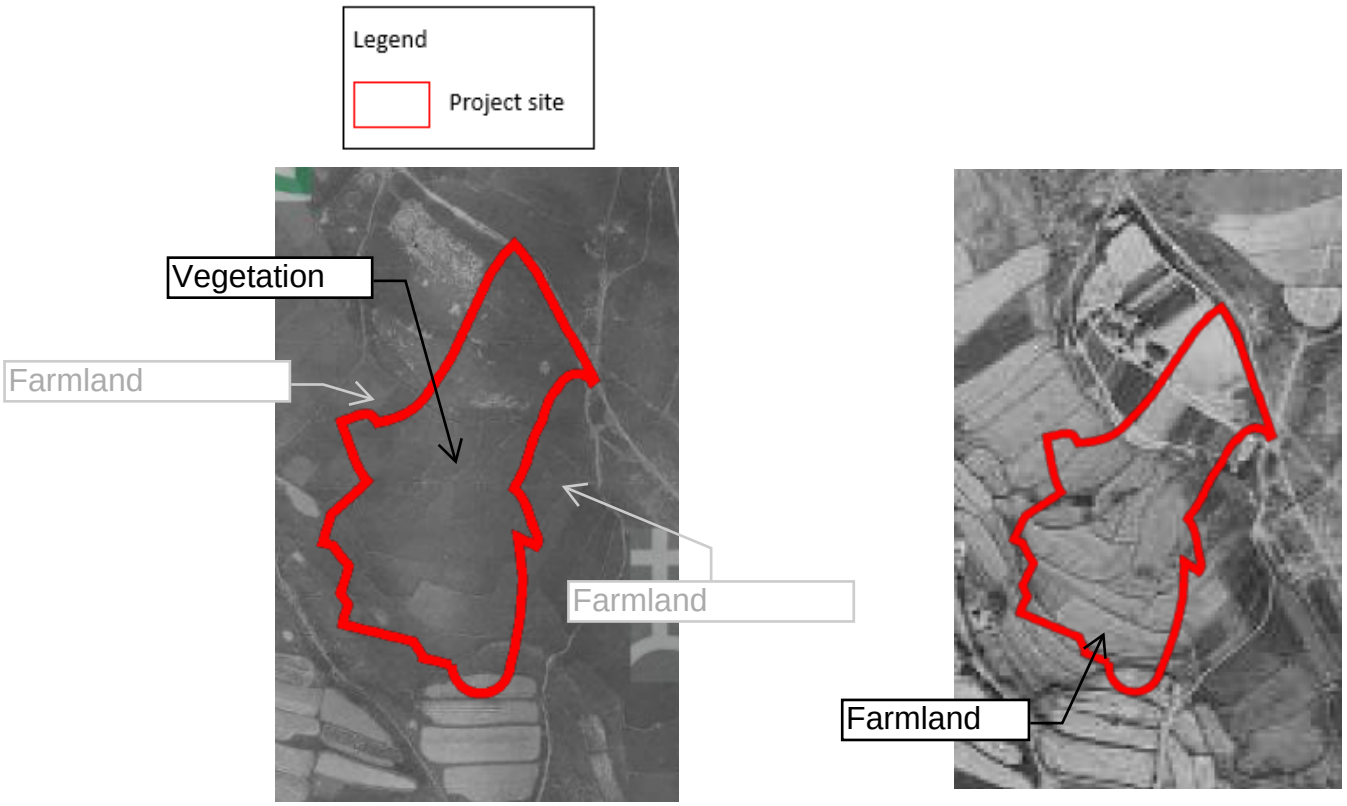
IMC Correction for Impulsiveness (dB(A))

INTC Correction for Intermittency (dB(A))

Appendix 8.1

Aerial Photo

Appendix 8.1



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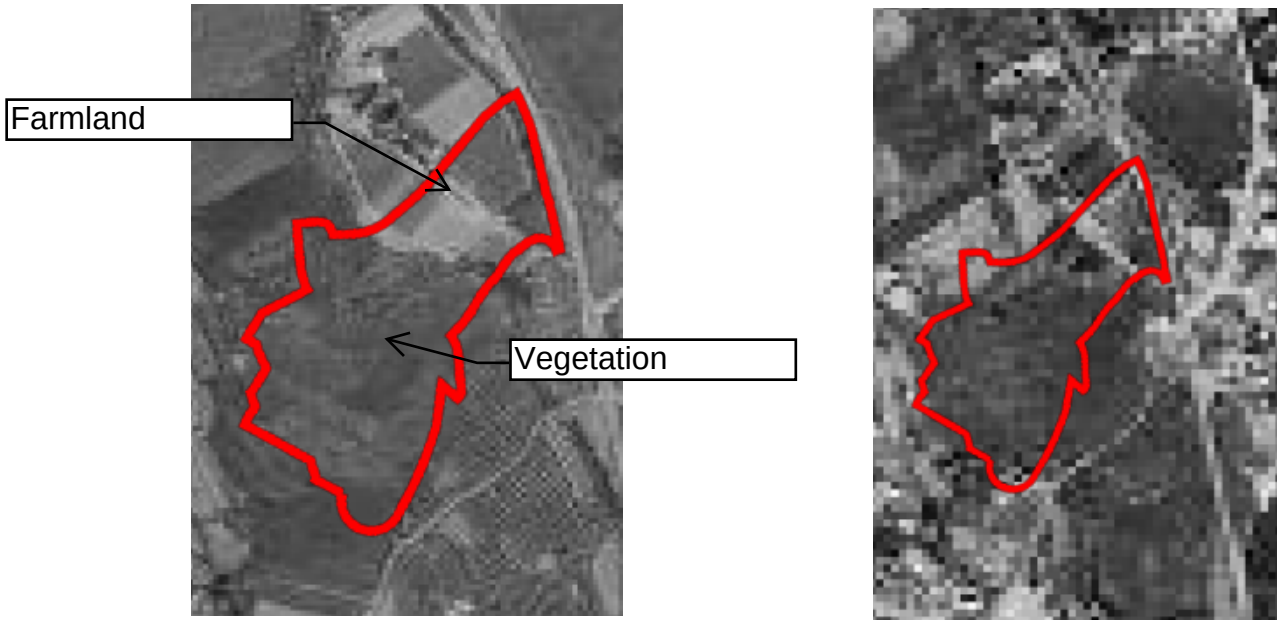
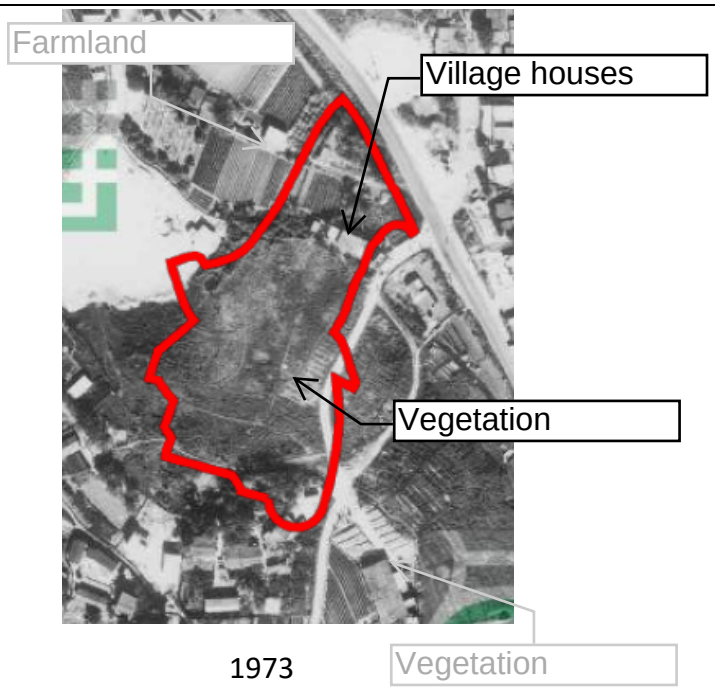


1961 1964

Appendix 8.1



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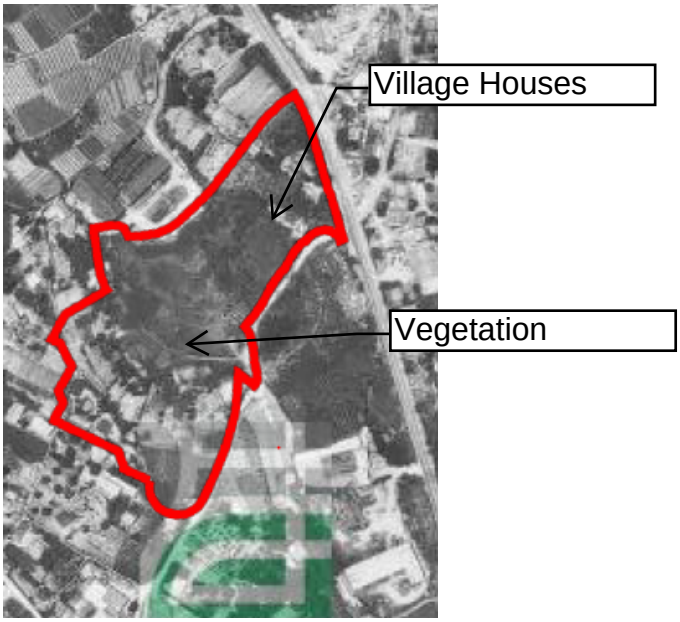

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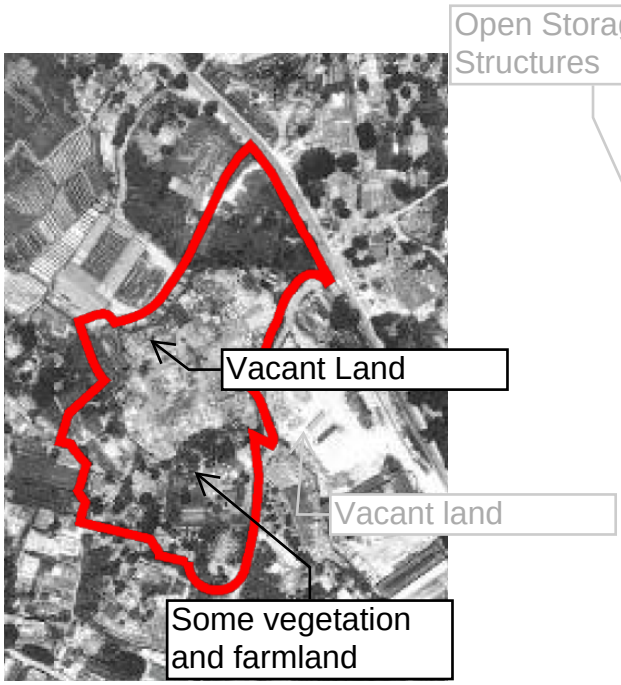

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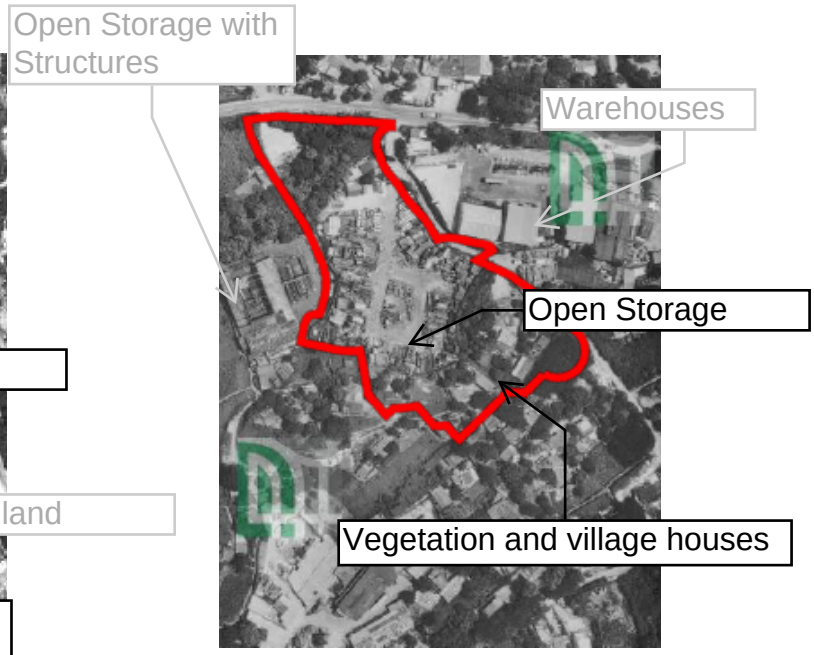


1990

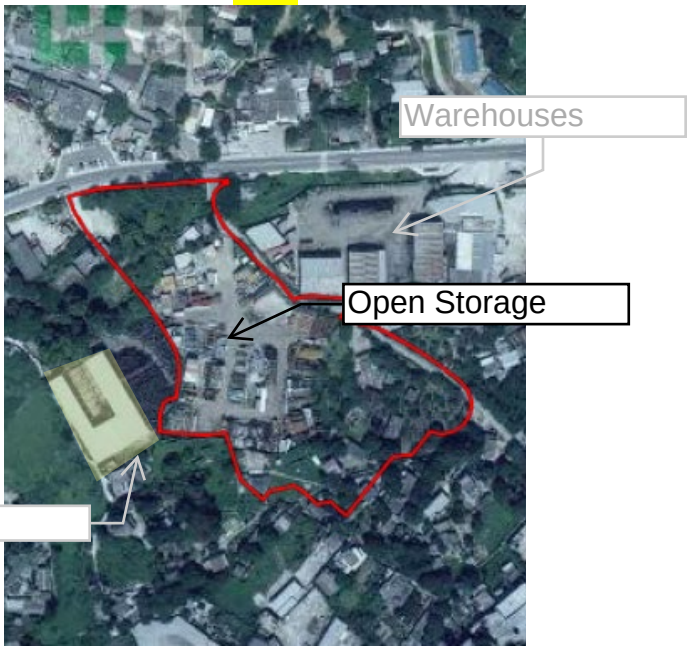
Project No. 2127
Application for Amendment of Plan Under Section 12A of the Town Planning Ordinance (Cap. 131) for Mix Use Development (Residential & Commercial) at Lot 796 & 1008 RP and Adjoining Government land in Ping Che, Ta Kwu Ling, New Territories

Appendix 8.1

1992

1994

1996



1998

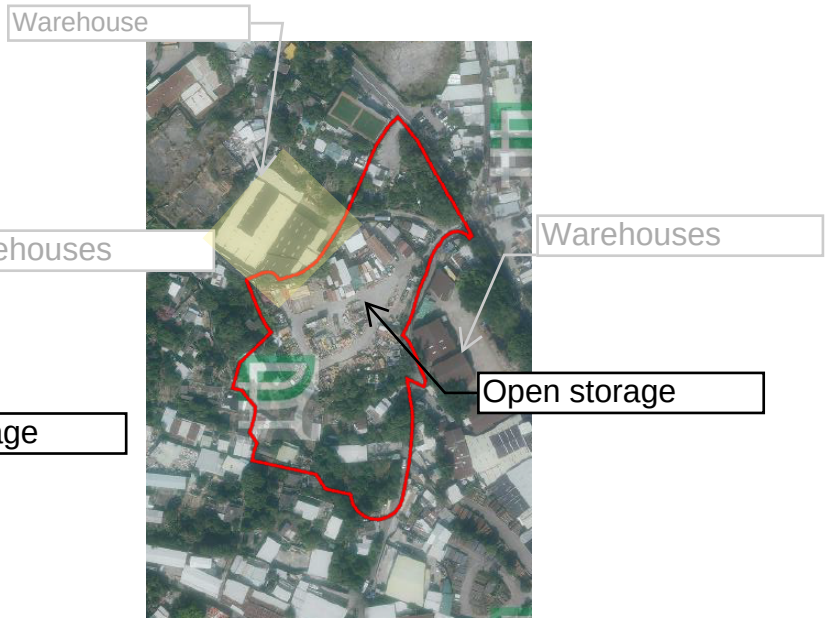
Project No. 2127
Application for Amendment of Plan Under Section 12A of the Town Planning Ordinance (Cap. 131) for Mix Use Development (Residential & Commercial) at Lot 796 & 1008 RP and Adjoining Government land in Ping Che, Ta Kwu Ling, New Territories

Appendix 8.1

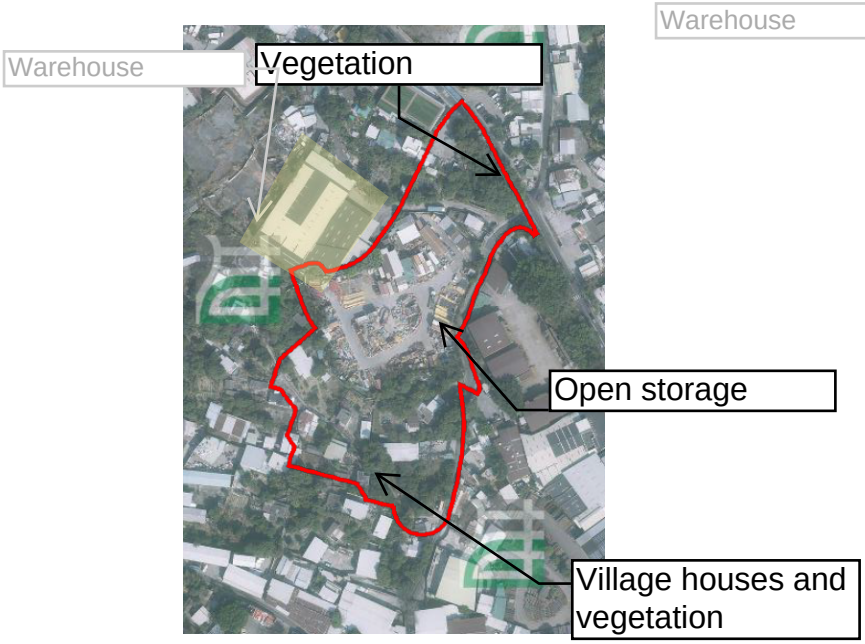
Project No. 2127
Application for Amendment of Plan Under Section 12A of the Town Planning Ordinance (Cap. 131) for Mix Use Development (Residential & Commercial) at Lot 796 & 1008 RP and Adjoining Government land in Ping Che, Ta Kwu Ling, New Territories

Appendix 8.1

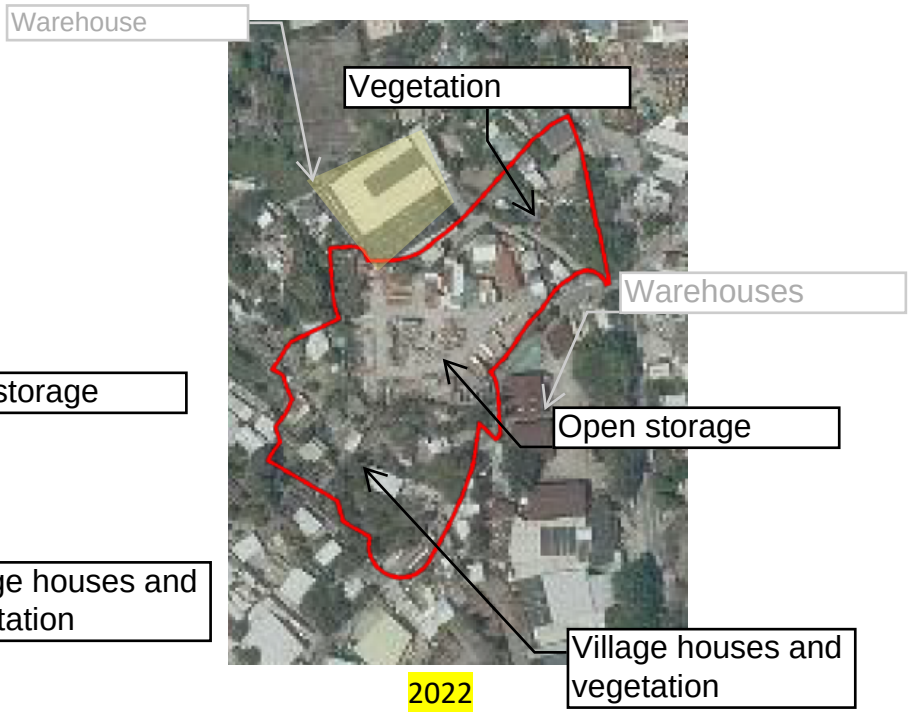
2017



2020



2021



2022

Appendix 8.4

Site Walkover Checklist

Annex C1 – Site Walkover Checklist (Page 43)

Describe the topography of the area (flat terrain, rolling hills, mountains, by a large body of water, vegetation, etc.).

Flat land

State the size and location of the nearest residential communities.

One village house in the north with approximately 30m, one tin house in the east with approximately 18m and around three tin houses in the south with approximately 17m.

Are there any sensitive habitats nearby, such as nature reserves, parks, wetlands or sites of special scientific interest?

No

Questionnaire with Existing/Previous Site Owner or Occupier

Ref.		Yes/No	Notes
1.	What are the main activities/operations at the above address?	Yes	Open storage area for construction material (e.g. noise barriers, water barriers, construction brick) and machinery, temporary storage for containers.
2.	How long have you been occupying the site?	Since April 2023 - present	Before the entrance, the land was vacant and mostly paved with concrete. (Air drone photo provided by the existing site occupier)
3.	Were you the first occupant on site? (If yes, what was the usage of the site prior to occupancy?)	No	The land has been occupied since 1982. It used as open storage from 1990 onwards.
4.	Prior to your occupancy, who occupied the site?	Yes	Unknown
5.	What were the main activities/operations during their occupancy?	Yes	The open storage area for construction materials and some machinery.
6.	Have there been any major changes in operations carried out at the site in the last 10 years?	No	-
7.	Have any polluting activities been carried out in the vicinity of the site in the past?	No	-
8.	To the best of your knowledge, has the site ever been used as a petrol filling station/car service garage?	No	-
9.	Are there any boreholes/wells or natural springs either on the site or in the surrounding area?	No	-

Appendix 8.5

Site Visit Photo Records

NOTES :

- APPLICATION SITE
- MACHINERY STORAGE AREA
- MACHINERY MAINTENANCE AREA
- BUILDING MATERIAL STORAGE AREA
- PHOTOLOG TAKEN DIRECTION
- PHOTOLOG TAKEN DIRECTION (WITH CONTAMINATION POTENTIAL)
- STAINED SURFACE

Consultant

Allied Environmental Consultants Limited

Project No. : 2127	
Drawing By : LL	
Project : APPLICATION FOR AMENDMENT OF PLAN UNDER SECTION 12A FOR THE TOWN PLANNING ORDINANCE (CAP. 131) FOR MIXED USE DEVELOPMENT AT LOT 796 AND 1008RP IN D.D. 77 AND ADJOINING GOVERNMENT LAND IN PING CHE, TA KWU LING, NEW TERRITORIES	
Drawing Title : PHOTOLOG MAP INDICATION	
Drawing No : FIGURE 8.5a	Revision : 1
Scale : AS SHOWN	Date : FEB 2024

A3 420 x 297

G:\2127 PING CHE DD77\05 REPORT\01 AEC REPORT\01 EA (AIR+NOISE+LANDCON)\ISSUE 5\LANDCON_FIG&APP\AIRDRONE.DWG

Photo1

Photo2

Photo3

Photo4

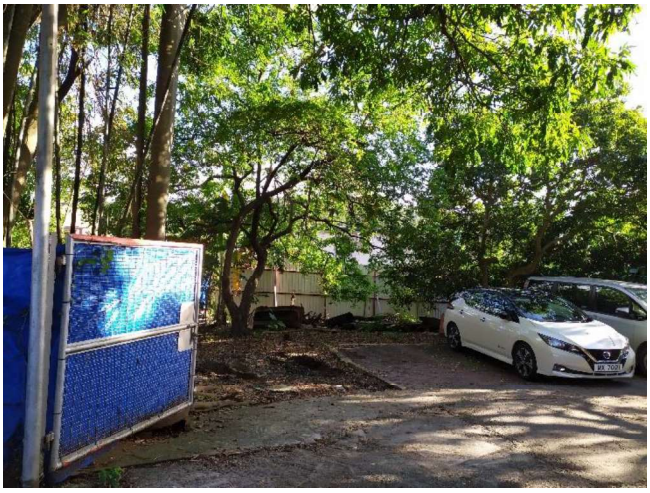


Photo5

Photo6

Photo7

Photo8

Photo9

Photo10

Photo11

Photo12

Photo13

Photo14

Photo15

Photo16

Photo17

Photo18

Photo19

Photo20

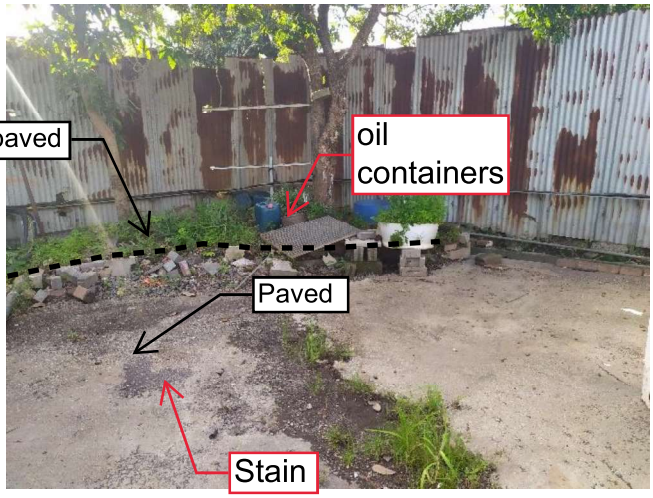


Photo21

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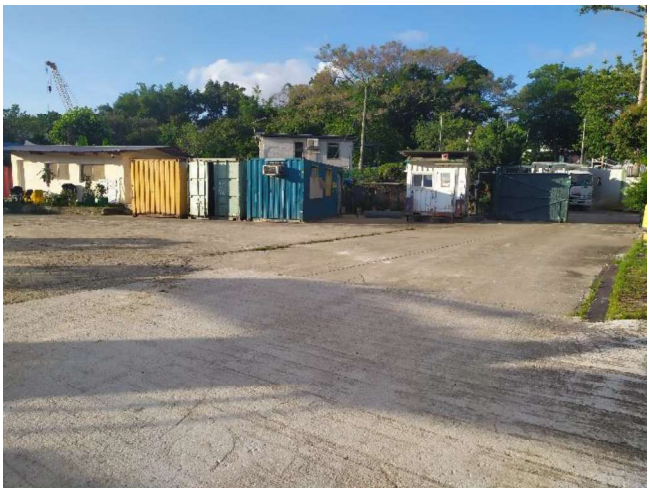

Photo59

Photo60

OLC-3

Photo61

Photo62

Photo63

Photo64

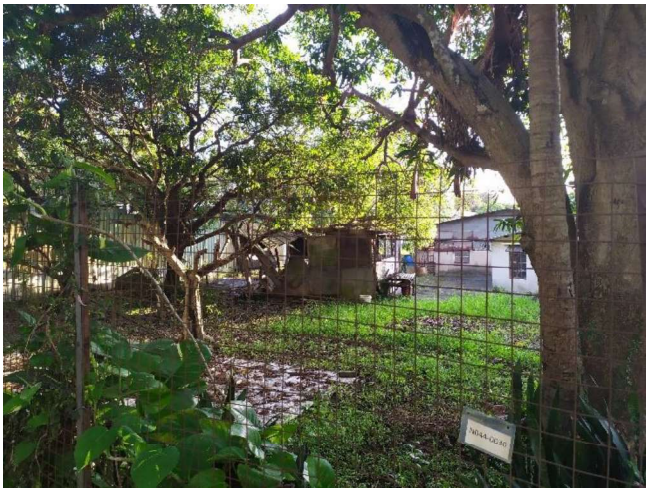

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Photo 67

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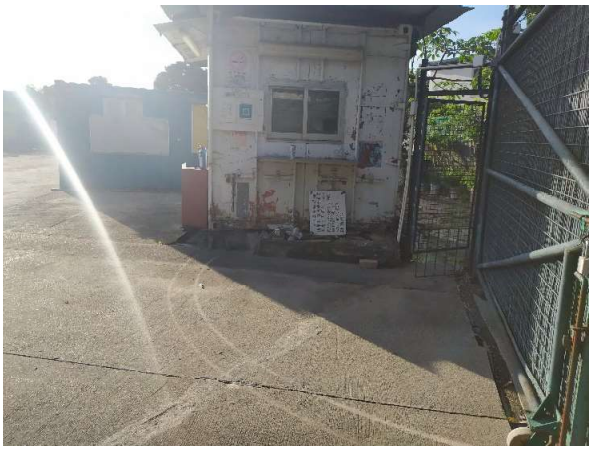

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Photo70

Photo 71

Photo 72

Photo 73

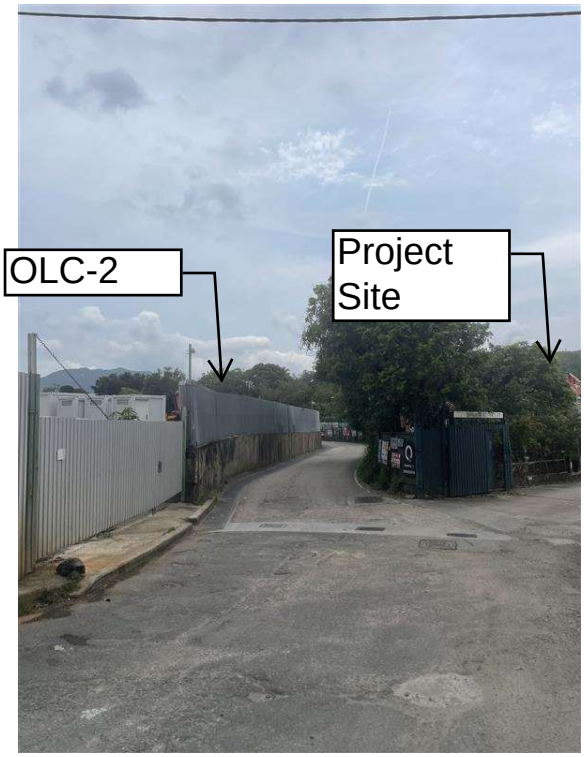

Photo 74

Appendix 9.1

Extract of Reference for Waste Index

- Practice Guide for Investigation and Remediation of Contaminated Land

5.2 Potential Impacts

Construction Phase

5.2.1 The key potential waste sources during the construction phase are:

- Inert Construction and Demolition ("C&D") materials (e.g. waste concrete, surplus soil, waste asphalt etc.)
- Non-inert C&D Waste (e.g. wood and plastics)
- Chemical wastes such as waste battery and waste lubricating oil from vehicles/plant maintenance
- General refuse generated by site workers

Inert C&D Materials

5.2.2 Inert C&D materials are those which do not decompose, such as debris, rubble, earth and concrete, and which are suitable for land reclamation and site formation.

5.2.3 The major source of inert C&D materials during construction includes excavation for removal of paving. The Site area is approx. 9,705m^2 and approx. 20% of the Site area with concrete paving will be removed, i.e., 1,941m^2. Assuming the paving density is 2 tonnes/m^3 and the thickness of paving is 100mm, approx. 194 tonnes waste paving will be generated from the removal of paving.

5.2.4 As advised by the Applicant, excavation will be minimal and the amount of C&D material due to excavation is therefore assumed to be negligible.

5.2.5 Construction waste will also be generated during construction of the Proposed Development. This will comprise inert C&D materials, such as concrete waste, waste from blockwork and brickwork; and non-inert C&D materials (or C&D waste) from timber formwork, packaging waste and other non-inert wastes.

5.2.6 In accordance with Section 3.2 of *A Guide for Managing and Minimizing Building and Demolition Waste* published by the Hong Kong Polytechnic University in May 2001 ("the Guide"), it provides a "waste index" for building waste generation in Hong Kong based on the Gross Floor Area ("GFA") of three different building types as follows:

- Private Housing Projects 0.250m^3/m^2 GFA
- Government Housing Projects 0.174m^3/m^2 GFA
- Commercial Office Projects 0.200m^3/m^2 GFA

5.2.7 In order to properly estimate building waste from the Proposed Development, the "waste index" also include C&D wastes such as timber formwork, packaging waste and other wastes. On the other hand, the Guide does not identify what proportion of building waste is inert C&D materials and what proportion is C&D wastes.

5.2.8 With reference to Plate 2.12 of EPD's *Monitoring of Solid Waste in Hong Kong – Waste Statistics for 2021*, in 2021 94% of construction wastes was either reused on-site or sent to

the public fill reception facilities, implying that such construction wastes should be inert C&D materials. The proportion of inert C&D materials in the "waste index" can therefore be estimated by applying the Hong Kong-wide proportion of inert C&D materials in construction waste, i.e. 94%, to the "waste index" as follows:

$$\text{Waste Index}_{\text{Inert C\&D materials (Commercial Office Projects)}} = 0.94 \times 0.200 m^3/m^2 \text{ GFA}$$

$$= 0.188 m^3/m^2 \text{ GFA}$$

5.2.9 The inert C&D materials component of building waste from the Proposed Development with a total floor area of approx. 2,025m^2 has therefore been estimated below:

$$\text{Building Waste} = \text{Waste Index}_{\text{Inert C\&D materials (Commercial Office Projects)}} \times \text{GFA}$$

$$= 0.188 \times 2,025$$

$$= 381 m^3$$

5.2.10 Assuming the density of inert C&D materials is 1.8 tonnes/m^3, approx. 686 tonnes of building waste would be generated by the Proposed Development.

Table 5-1 Total Estimated Inert C&D Materials Generated During Construction

INERT C&D MATERIAL TYPE	ESTIMATED NON-INERT C&D MATERIAL GENERATION (TONNES)
STAGE: SITE CLEARANCE AND FORMATION	
Paving	194
Excavated Material	Negligible
STAGE: INFRASTRUCTURE CONSTRUCTION	
Building Waste	686
Total	**880**

5.2.11 In total, approx. 880 tonnes of inert C&D materials may be generated throughout the construction period. Assuming the construction period to be nine months with six working days a week and four weeks a month, the daily inert C&D material generation rate will be approx. 4 tonnes/day (i.e. 880 tonnes/(6 x 4) x 9 months)).

5.2.12 Inert C&D materials should be reused on-site as far as practicable. Good site practice and mitigation measures recommended in **Section 5.3** should be provided and implemented. Surplus inert C&D materials, if any, should be reused or recycled off-site as far as practicable. If there will still be any remaining materials, they should be delivered to public fill reception facilities such as Fill Bank at Tuen Mun Area 38.

5.2.13 With the provision and implementation of the recommended mitigation measures, no adverse waste impact from the handling, transportation or disposal of inert C&D materials during construction of the Proposed Development is anticipated.

Non-Inert C&D Materials (or C&D Waste)

5.2.14 Non-inert C&D materials (or C&D waste), are those which can decompose such as bamboo, timber, vegetation, packaging waste and other organic material, and which are therefore unsuitable for land reclamation.

5.2.15 The major source of non-inert C&D materials during construction will be building waste including non-inert C&D materials such as timber formwork, packaging waste.

5.2.16 The building waste are included in the "waste index" provided in the Guide, discussed above, however, this also includes inert C&D materials.

5.2.17 As shown in Plate 2.12 of Waste Statistics for 2021, in 2021 6% of C&D waste was disposed of at landfills. The proportion of non-inert C&D materials (or C&D waste) in the "waste index" can therefore be estimated by applying the Hong Kong-wide proportion of non-inert C&D materials (or C&D waste) in construction waste, i.e. 6%, to the "waste index" as follows:

$$\text{Waste Index}_{\text{Non-Inert C\&D materials (Commercial Office Projects)}} = 0.06 \times 0.200 m^3/m^2 \text{ GFA}$$

$$= 0.012 m^3/m^2 \text{ GFA}$$

5.2.18 Hence, the non-inert C&D materials (or C&D waste) components in building waste can therefore be estimated as follows:

$$\text{Building Waste} = \text{Waste Index}_{\text{Non-Inert C\&D materials (Commercial Office Projects)}} \times \text{GFA}$$

$$= 0.012 \times 2{,}025$$

$$= 24.3 m^3$$

5.2.19 Assuming the density of non-inert C&D materials is 1.0 tonnes/m^3, approx. 24.3 tonnes of C&D waste will be arising from the Proposed Development. Assuming the construction period to be nine months with six working days a week and four weeks a month, the daily C&D waste generation rate will be approx. 0.11 tonnes/day (i.e. 24.3 tonnes/(6 x 4) x 9 months)).

5.2.20 The non-insert C&D waste is summarised in **Table 5-2**.

Table 5-2 Total Estimated Non-Inert C&D Materials Generated During Construction

NON-INERT C&D MATERIAL TYPE	ESTIMATED NON-INERT C&D MATERIAL GENERATION (TONNES)
STAGE: INFRASTRUCTURE CONSTRUCTION	
Building Waste	24.3
Total	**24.3 or 24**

5.2.21 On-site sorting should be carried out for non-inert C&D materials generated from the works. Recyclable materials, such as metal, paper product, timber and plastics, should be collected by local recyclers for recycling. All non-inert C&D materials should be recycled as far as possible and landfill disposal should be adopted as the last resort.

5.2.22 The quantity of the generated non-inert building waste could be recycled/reused is expected to be no more than 10% of the generated amount in view of the scale of the Proposed Development. Therefore, no more than 2 tonnes C&D waste may be reused or recycled on-site.

5.2.23 If 10% C&D waste can be reused/recycled on-site, the surplus C&D waste mainly comprising building waste will be approx. 22 tonnes in total. Assuming the construction

Annex C Revised Sewerage Impact Assessment

Issue No. : 5

Issue Date : Jun 2024

Project No. : 2127

SEWERAGE IMPACT ASSESSMENT

FOR

APPLICATION FOR AMENDMENT OF PLAN UNDER SECTION 12A FOR THE TOWN PLANNING ORDINANCE (CAP. 131) FOR MIXED USE DEVELOPMENT AT LOTS 796 AND 1008RP IN D.D. 77 AND ADJOINING GOVERNMENT LAND IN PING CHE, TA KWU LING, NEW TERRITORIES

Prepared by

Allied Environmental Consultants Limited

COMMERCIAL-IN-CONFIDENCE

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香港灣仔告士打道 160 號海外信託銀行大廈 27 樓

Document Verification

Project Title	APPLICATION FOR AMENDMENT OF PLAN UNDER SECTION 12A FOR THE TOWN PLANNING ORDINANCE (CAP. 131) FOR MIXED USE DEVELOPMENT AT LOTS 796 AND 1008RP IN D.D. 77 AND ADJOINING GOVERNMENT LAND IN PING CHE, TA KWU LING, NEW TERRITORIES	**Project No.**	2127
Document Title	SEWERAGE IMPACT ASSESSMENT		

Issue No.	Issue Date	Description	Prepared by	Checked by	Approved by
1	Oct 2023	1st Submission	Various	Cathy Man	Grace Kwok
2	Dec 2023	2nd Submission	NGAN Chun Sang	Cathy Man	Grace Kwok
3	Feb 2024	3rd Submission	NGAN Chun Sang	Cathy Man	Grace Kwok
4	Apr 2024	4th Submission	NGAN Chun Sang	Cathy Man	Grace Kwok
5	Jun 2024	4th Submission	NGAN Chun Sang	Cathy Man	Grace Kwok

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Table of Contents

List of Tables

List of Figures

List of Appendices

1. INTRODUCTION

1.1. Background

1.1.1. Allied Environmental Consultants Limited ("AEC") has been appointed to conduct a Sewerage Impact Assessment ("SIA") to support of a Section 12A application for the mixed use development at Lot 796 & 1008RP at D.D. 77 and adjoining government land in Ping Che, Ta Kwu Ling, New territories (hereinafter referred to as "Application Site").

1.1.2. According to the approved Ping Che and Ta Kwu Ling Outline Zoning Plan (OZP No.: S/NE-TKL/14) gazette on 12/03/2010, the Application Site is currently zoned as "Open Storage" ("OS") Zone, the southern part of the Application Site is zoned as "Agriculture" ("AGR") and a minor portion of the Application Site is shown as "Road".

1.2. Objectives

1.2.1. The objectives of this SIA are to assess whether the capacity of the existing sewerage networking to the Application Site is sufficient to cope with the sewage flow from proposed development.

1.3. Report Structure

1.3.1. The remaining chapters of this report are shown below:

Chapter 2 – Site Context
Chapter 3 – Relevant Guidelines & Standards
Chapter 4 – Sewerage Impact Assessment
Chapter 5 – Conclusion

2. SITE CONTEXT

2.1. Site Location

2.1.1. The proposed development is located at Ping Che Road from the north to northeast, the unnamed village road to the east, village, agricultural land and open storage area to the south and west.

2.2. Proposed Development Scheme and Existing Environment

2.2.1. The proposed site area of the subject site is 17,822m^2, with a plot ratio of 5.9 for domestic use and 1.1 for non-domestic use. The total GFA for domestic use is 105,145 m^2, and the 19,603 m^2 for non-domestic use. The proposed development will consist of 5 blocks of residential tower ranging from 47 to 48-storey (excluding basement) in height, provided 2,205 residential unit, and 1 block of commercial tower with 35-storey (excluding basement) in height. The non-domestic use consisted of retail, office, hotel or service apartment, clubhouse, day care centre for the elderly and child care centre.

2.2.2. Drainage information was obtained from the GeoInfo Map services of the Lands Department in Aug 2023 to gather the background information on sewerage infrastructure in the vicinity of the Application Site. A series of rising main public sewers with diameters of 200 mm were found along Ping Che Road, towards Southeast direction and further downstream. Furthermore, there are 2 pumping stations around the Application Site, which are Ng Chow South Road Sewage Pumping Station and Hung Leng Sewage Pumping Station are located 250 m and 1 km away from Application Site respectively.

2.2.3. However, there is no public foul sewer identified along Ping Che Road and around Application Site. Therefore, on-site Sewerage Treatment Plant (STP) are proposed for the proposed development.

2.2.4. The expected completion year and operation year of the Proposed Project is in 2032. ***Figure 2.1*** shows the Site location and its environs. The Master Layout Plan and sectional drawings proposed development are shown in ***Appendix A.***

2.3. Planned Sewerage Facilities in the vicinity

2.3.1. With reference to Project Profile prepared for "Remaining Phase Development of the New Territories North (NTN) – NTN New Town and Man Kam To" (NTN Development) in May 2021,

(ESB-341/2021), the application site fall within the NTN development. The NTN includes the following individual works items.

- Item F.1, Part I, Schedule 2 - Sewage treatment works with an installed capacity of more than 15,000 m3 per day

- Item F.2, Part I, Schedule 2 - Sewage treatment works- (a) with an installed capacity of more than 5,000 m3 per day

- Item F.3, Part I, Schedule 2 - A sewage pumping station- with an installed capacity of more than 300,000 m3 per day

2.3.2. In December 2017, Planning Department (PlanD) and Civil Engineering and Development Department (CEDD) completed Preliminary Feasibility Study on Developing the New Territories North (NTN) (the Preliminary NTN Study). It is noted that a proposed sewerage treatment works and a Sewerage Master Layout Plan have been formulated.

2.3.3. After having conversation with CEDD officer (Engr/40(N)) of project team of CE21/2021 Remaining Phase Development of the NTN, no relevant available details and construction programme cannot be obtained from North Development Office (NDO) of CEDD.

3. RELEVANT GUIDELINES & STANDARDS

3.1. Legislation, Standards and Guidelines

3.1.1. Water quality in Hong Kong is legislated by the provisions of Water Pollution Control Ordinance (Cap 358), 1980 ("WPCO"). Territorial Water has been subdivided into ten Water Control Zones ("WCZ") and four supplementary water control zones. The study area lies within the Deep Bay WCZ. A Technical Memorandum on Standards for Effluents discharged into Drainage and Sewerage Systems, Inland and Coastal Water (TMES) has been issued, which requires licensing of all discharges into all public sewers and drains. The water quality standards will have to be met during the construction and operation stages.

3.1.2. With reference to Table 7 of the Technical Memorandum, as the Proposed Development is located within Deep Bay WCZ, the pollutant loading for effluents discharged into coastal waters of the respective WCZ shall be considered. The standards of effluents discharge of Biochemical Oxygen Demand (BOD) and Suspended Solids (SS) are extracted below.

Table 3-1 Standards for Effluents Discharge under TM

Load Type	Standards for Effluents Discharge (mg/L)	
	Flow rate <=1000 m^3/day	**Flow rate >1000 m^3/day and <=6000 m^3/day**
BODs	20	10
SS	50	25

3.1.3. With reference to ProPECC PN 1/23 Drainage Plans Subject to Comment by the Environmental Protection Department ("EPD"), domestic sewage should be discharged to a foul water sewer, whilst commercial and industrial wastewater should be pretreated before being discharged to foul water sewer, under the Building (Standards of Sanitary Fitments, Plumbing, Drainage Works and Latrines) Regulations 40(1), 40(2), 41(1) and 90.

3.1.4. The following standards and guidelines are adopted for estimation, assessment and evaluation of sewerage implication of the proposed development:

- "Water Pollution Control Ordinance" ("WPCO")
- "Hong Kong Planning Standards and Guidelines" issued by the Planning Department;
- "Technical Memorandum on Standards for Effluents Discharged into Drainage and

Sewerage Systems, Inland and Coastal Waters (TM-DSS)";

- "Sewerage Manual Part 1" published by DSD;
- "Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning Version 1.0 (Report No.: EPD/TP1/05)" ("GESF") published by Environmental Protection Department ("EPD");
- Water Supplies Department (WSD) Water Quality Criteria; and
- Guidelines for the Design of Small Sewage Treatment Plants issued by EPD.

4. SEWERAGE IMPACT ASSESSMENT

4.1. Methodology for Estimation of Average Dry Weather Flow

4.1.1. The global unit flow factors as recommended in the *Guideline for Estimating Sewage Flows for Sewage Infrastructure Planning* (hereafter as "GESF") published by EPD in 2005 has been adopted in the assessment to estimate sewage flow. Relative unit flow factors applied for the sewage generation estimation are tabulated in ***Table 4-1*** below.

Table 4-1 Unit Flow factors Adopted for the Assessment

Type of People	**Unit Flow Factors [2]**	**Category [1]**
Within Proposed Development [3]		
Residents of the Residential Development R2	0.270 m^3/person/day	Domestic (housing type specific) – R2
Residents of Elderly Day Care Centre	0.190 m^3/person/day	Domestic: Institutional and Special class
Students of Childcare Centre	0.040 m^3/person/day	School Student
Staff of Clubhouse	0.280 m^3/person/day	Commercial Employee + Commercial activities (J11 Community, Social & Personal Services)
Staff of Office	0.080 m^3/person/day	Commercial Employee
Staff of Retail	0.280 m^3/person/day	Commercial Employee + Commercial activities (J4 Wholesale & Retail)
Staff of Hotel/Service apartment	1.580 m^3/person/day	Commercial Employee + Commercial activities (J10 Restaurants & Hotels)
Staff of Elderly Day Care Centre	0.280 m^3/person/day	Commercial Employee + Commercial activities (J11 Community, Social & Personal Services)
Staff of Childcare Centre	0.280 m^3/person/day	Commercial Employee + Commercial activities (J11 Community, Social & Personal Services)

Notes:
[1] Environmental Protection Department, HKSARG [EPD] (2005). Guidelines for estimating sewage flows for sewage infrastructure planning (EPD/TP 1/05). Hong Kong
[2] UFF for various occupancy types are adopted according to Table T-1 and Table T-2 of the GESF.
[3] Type of Residential Development is determined by the average area per flat of the residential development and referred to Table 8 of The Hong Kong Planning Standards and Guidelines (HKPSG) Ch.2 Residential Densities. For Hong Kong & Kowloon area, flat with GFA less than 50 m^2 will be categorized as R1; GFA between 50-110 m^2 will be categorized as R2; GFA between 110-210 m^2 will be categorized as R3; GFA greater than 210 m^2 will be categorized as R4.

4.2. Estimation of Sewage Flow from Proposed Developments

4.2.1. The proposed project comprises of 5 blocks of residential tower ranging from 46 to 47-storey in height, provided 2,205 residential unit, 1 block of commercial tower with 35-storey in height, clubhouse, day care centre for elderly and child care centre. The estimated sewerage flow for proposed developments is given in ***Table 4-2*** and ***Appendix B.***

Table 4-2 Sewage Flow Estimation for the Proposed Development and Existing

Proposed Development		
Generation from operation		**Remark**
Generation from Residential – R2		
Total Number of Residents	6174 persons	Referred to submitted GBP.
Unit Flow Factor	0.27 m^3/person/day	Domestic (housing type specific) – R2 in Table T-1 of GESF.
Average Sewage Discharge	1667.0m^3/day	
Generation from Residential – Day Care Centre for the Elderly		
Total Number of Residents	60 persons	Referred to submitted GBP.
Unit Flow Factor	0.19 m^3/person/day	Domestic (housing type specific) – Temporary and non-domestic in Table T-1 of GESF.
Average Sewage Discharge	11.4 m^3/day	
Generation from Residential – Child Care Centre		
Total Number of Residents	100 persons	Referred to submitted GBP.
Unit Flow Factor	0.04 m^3/person/day	School Students in Table T-2 of GESF.
Average Sewage Discharge	4.0 m^3/day	
Generation from staff (Retail)		
Floor Area	2400.0 m^2	Referred to submitted GBP.
Worker Density	3.5 person/100m^2	Retail Trade (All Types) in Table 8 of CIFSUS.
Total Number of Persons	84 persons	
Unit Flow Factor	0.28 m^3/person/day	Commercial Employee + Wholesale & Retail – J4 in Table T-2 of GESF.
Average Sewage Discharge	23.5 m^3/day	
Generation from staff (Office)		
Floor Area	11500.0 m^2	Referred to submitted GBP.
Worker Density	3.4 person/100m^2	All Economic Activities (All Types) in Table 8 of CIFSUS.
Total Number of Persons	391 persons	
Unit Flow Factor	0.08 m^3/person/day	Commercial Employee in Table T-2 of GESF.
Average Sewage Discharge	31.3 m^3/day	
Generation from staff (Hotel/Service Apartment)		
Floor Area	5703.0 m^2	Referred to submitted GBP.
Worker Density	3.2 person/100m^2	Hotels & Boarding Houses (All Types) in Table 8 of CIFSUS.
Total Number of Persons	183 persons	
Unit Flow Factor	1.58 m^3/person/day	Commercial Employee + Restaurants & Hotels - J10 in Table T-2 of GESF.
Average Sewage Discharge	289.1 m^3/day	
Generation from staff (Clubhouse)		
Floor Area	3500.0 m^2	Referred to submitted GBP.

Worker Density	3.3 person/100m^2	Community, Social & Personal Services (All Types) in Table 8 of CIFSUS.
Total Number of Persons	116 persons	
Unit Flow Factor	0.28 m^3/person/day	Commercial Employee + Community, Social & Personal Services - J11 in Table T-2 of GESF.
Average Sewage Discharge	32.5 m^3/day	
Generation from staff (Day Care Centre for the Elderly)		
Floor Area	787.6 m^2	Referred to submitted GBP.
Worker Density	3.3 person/100m^2	Community, Social & Personal Services (All Types) in Table 8 of CIFSUS.
Total Number of Persons	26 persons	
Unit Flow Factor	0.28 m^3/person/day	Commercial Employee + Community, Social & Personal Services - J11 in Table T-2 of GESF.
Average Sewage Discharge	7.3 m^3/day	
Generation from staff (Child Care Centre)		
Floor Area	1166.0 m^2	Referred to submitted GBP.
Worker Density	3.3 person/100m^2	Community, Social & Personal Services (All Types) in Table 8 of CIFSUS.
Total Number of Persons	39 persons	
Unit Flow Factor	0.28 m^3/person/day	Commercial Employee + Community, Social & Personal Services - J11 in Table T-2 of GESF.
Average Sewage Discharge	10.9 m^3/day	
Generation from Swimming Pool Backflow		
Swimming Pool Volume	511 m^3	
Maximum Backwash Volume	6 m^3/day	
Sewerage Discharge Rate from residents and services	**2077.0 m^3/day**	
Catchment Inflow Factor	**1.0**	
Revised Total Average dry weather flow of the Proposed Development	**2077.0 m^3/day**	
Generation from Swimming Pool Backflow	**6 m^3/day**	
Total Average dry weather flow of the Proposed Development (residents + services + swimming pool)	**2083.0 m^3/day**	
Peak Flow	**72.1 L/s**	

4.3. Evaluation of Sewerage Impact

4.3.1. With reference to ***Table 4-2***, the sewerage discharge rate from residents and services is 2077.0 m^3/day, and additional 6 m^3/day from the backflow of swimming pool. Thus, total estimated Average Dry Weather Flow ("ADWF") from the proposed development is 2083.0 m^3/day. The population estimated ADWF of proposed development is summarized in ***Appendix B.*** As mentioned in ***Section 2.2.3***, there is no public sewer identified along Ping Che

Road and around Application Site. Therefore, on-site STP are proposed for the proposed development. The sewage generated onsite will be treated by the STP and discharged to the public drainage system at the end. Hence, no sewage generated will be discharged to the public sewerage system and impact is not envisaged.

4.4. On-site Sewage Treatment Plant

4.4.1. "Guidelines for the Design of Small Sewage Treatment Plants" (The STP Guidelines) and WPCO should be followed in designing the on-site STPs in the later detail design stage. The exact treatment process would be subject to later detailed design. It will be necessary for the STP to achieve adequate treatment capacity and the necessary discharge standards, as set out in EPD's Technical Memorandum – Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters.

4.4.2. With reference to clause 2.1.2 of Annex 6 of the Technical Memorandum on Environmental Impact Assessment Process, the acceptable sewage treatment level for Deep Bay WCZ is given in ***Table 4-3***. The proposed STP will be designed to meet the acceptable treatment levels. Detailed design of the proposed STP is not yet available subject to feasibility investigation and water quality assessment. Tentatively, the proposed STP will be provided with Membrane Bioreactor (MBR) technology with ultra-filtration to achieve the acceptable sewage treatment level, with following conditions:

- For nitrogen removal, the target is 75% total inorganic nitrogen reduction with respect to the annual average influent nitrogen loads or concentrations;
- For phosphorus removal, the target is 80% phosphorus reduction with respect to the annual average influent phosphorus loads or concentrations; and
- Disinfection may not be required if membrane filtration is provided which can meet the relevant discharge standards for bacteria.

Table 4-3 Acceptable Sewage Treatment Level of Water Control Zone

Water Control Zone/ Waters Receiving the discharge	Acceptable Sewage Treatment Level
Tolo Harbour and Channel, Deep bay	Secondary treatment, nitrogen removal, phosphorus removal, and disinfection
Other Water Control Zones	Secondary treatment, nitrogen removal, and disinfection

4.4.3. The capacity of the STP shall be designed to cater for the design flow rate from the Proposed Development, the design flow factor of 3 times of the ADWF is adopted for the Proposed Development, with provision of equalization tank. Two duty and one standby pumps will be provided in equalization tanks as far as practicable to limit the flow through the treatment units to within 1.5 times the daily average flow rate during off-peak periods.

4.4.4. The on-site STP will be constructed to cater for the design peak flow of 6237 m^3/d (6231 m^3/d +6 m^3/d), with the provision of an equalization tank with minimum capacity of 519.75 m3 to ensure it fulfills the Guidelines for the Design of Small Sewage Treatment Plant. The calculation is given in ***Table 4-4*** and ***Appendix C***. The preliminary layout plan for the on-site STP is given in ***Figure 4.1***.

Table 4-4 Estimation of the Required Volume for the Sewage Treatment Plant

ADWF (Residents + Services) (m^3/day)	Peaking Factor [1]	Design Peak Flow Rate (Residents + Services) (m^3/day)	Swimming Pool Backwash (m^3/day)	Total Design Peak Flow Rate (m^3/day)	Design Flow Rate from Proposed Project (m^3/hr)
2077.0	3	6231	6	6237	260

Note:
[1] The design peak flow factor is reference from EPD's '"Guidelines for the Design of Small Sewage Treatment Plants". For the Proposed Development, 3 times Average Dry Weather Flow (ADWF) is adopted, with equalization tank provided to equalize excess flow.

4.4.5. Sludge storage tank with deodorization facilities will be provided in the STP. The sludge after having been dewatered and thickened will be tanked away to the landfill for disposal, subject to confirmation with future licensed collector/contractor. All wastewater, if any, generated from the sludge dewatering process should be treated properly by the proposed on-site STP.

4.4.6. As for good practice for STP, measures will be incorporated into the design to minimize the risk of emergency overflow from STP. As the STP is designed to cater for a peak flow of 3 times the daily average flow rate, 2 duty and 1 standby pump should be provided in equalization tanks as far as practicable to limit the flow through the treatment units within 1.5 times the daily average flow rate during off-peak periods. This is to even out the flow as much as possible. Other measures include secure power supplies and appropriate alarms, as well as comprehensive Operation and Maintenance procedures, to keep the facilities in good working order. Holding tank for emergency storage/retention will be included with adequate

capacity (e.g. to store 6-hour of ADWF discharge) to minimize need of emergency discharge. In the event of any emergency overflow, on-call crews will follow the overflow emergency response plan and proceed with the best response to correct the problem at once. For example, the alarm system will be activated once overflow occurs. The on-call crews will provide instant response by acknowledging the alarm, to investigate the cause of overflow and correct the problem. The alarm system will be repeated until it is acknowledged. In addition, the on-call crews will ensure the standby pump is switched on and contains the overflow sewage using temporary weirs or vacuum trucks, where applicable.

4.4.7. The STP will also be subject to regular maintenance to ensure it functions in designed condition and optimal performance and can minimize any emergency situation. Property Management will be responsible for the construction and maintenance of the STP. In addition, regular self-monitoring will be conducted to ensure the quality of the treated effluent shall meet the applicable standard before discharge. Monitoring program will be devised for Terms & Conditions of the system. A discharge license will be applied prior to the development commencement and monitoring requirements under the license would be strictly followed as per WPCO. Necessary discharge standards, as set out in EPD's Technical Memorandum – Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters will be adopted.

4.5. Estimation of Pollutants Loading from Proposed Project

4.5.1. With reference to the EPD's Guidelines, the following unit load factors ("ULFs") for different types of pollutant generated from the Proposed Development as shown in ***Table 4-5*** have been used in calculation of total pollutant loads from the Proposed Development.

Table 4-5 Unit Load Factors

Load Type	Unit Load Factor		
	Residents	Office [1]	Services [2]
BODs (kg/day/person)	0.055	0.023	0.004
SS (kg/day/person)	0.055	0.023	0.004

Noted:
[1]: The recommended loadings for BOD and SS for Office (not including canteen) refer to Appendix 2 in "Guidelines for the Design of Small Sewage Treatment Plants" by EPD are adopted for the calculation for worst case scenario for pollutant loadings generated from the Application Site.
[2]: The recommended loadings for BOD and SS for Services shall be pro-rata to equivalent residential population refer to Appendix 2 in "Guidelines for the Design of Small Sewage Treatment Plants" by EPD.

4.5.2. The loadings of pollutants generated from the raw sewage from the proposed project is summarized in ***Table 4-6***.

Table 4-6 Estimated Pollutant Loadings from Proposed Project

Population		Unit Load Factor (kg/day/person)		Pollutant Loadings (kg/day)	
		BODs	SS	BODs	SS
Residents	6334	0.055	0.055	348.37	348.37
Office	391	0.023	0.023	8.99	8.99
Services	448	0.004	0.004	1.74	1.74
			Total	359.11	359.11

4.6. Pollutant Loads Removal Requirements

4.6.1. According to WPCO-TM, sewage shall be treated to acceptable standards prior discharge to stormwater drainage, before discharging to the Deep Bay WCZ. The STP shall be designed to remove sufficient BOD and SS in the sewage generated from proposed project to the effluent standards set out, for Group II Coastal Waters, in the Technical Memorandum before discharging into the drainage network. The pollutants loading generated from the proposed project, and the standards for effluents discharge are illustrated in ***Table 4-7***.

Table 4-7 Loading from the Proposed Project

Load Type	Loading from the Proposed Project (kg/day)	Sewage Flow Rate (m^3/day)	Loading from the Proposed Project (mg/L) / (CFU/100ml)	Standards for Effluent discharge (mg/L) [1]
BOD	359.11	2082.96	172.40	10
SS	359.11	2082.96	172.40	25

Noted:
[1] Reference to Table 8, Standards for effluents discharged into the coastal waters of Deep Bay Water Control Zones, Technical Memorandum - Standards of Effluent Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters

4.6.2. The treated effluent from STP will be discharged to the terminal stormwater manhole onsite (STMH-01) and meet the acceptable standards prior to the discharge to the proposed storm water manhole (SMH1003243) along North side of the Application Site. The proposed drainage connection between Subject Site, proposed storm water drainage and existing

storm water manhole is illustrated in Drainage Impact Assessment ("DIA").

4.7. Liability

4.7.1. The project proponent will be responsible for the construction and maintenance works for the proposed sewage treatment plant. The STP will be designed in accordance to "Guidelines for the Design of Small Sewage Treatment Plants".

4.7.2. During the operational phase, regular inspections of the STP within the Application Site should be conducted by the property management to ensure proper performance. Regular maintenance should also be carried out in accordance with standard practices stated in the EPD's Guidance Notes and Guidelines.

5. CONCLUSION

5.1.1. A Sewerage Impact Assessment (SIA) has been conducted to evaluate the possible impacts on the public sewerage network due to the proposed development. Since there is no public foul sewer identified at the surrounding of Application Site. Therefore, on-site Sewerage Treatment Plant are proposed for the proposed development. The sewage generated from the proposed development will be collected and treated on-site by STP and discharged into the stormwater manhole (STMH-01). The result showed that total ADWF of 2083.0 m^3/day including sewage discharge from residents, services and backflow from swimming pool are expected to be generated from the proposed development and treated by STP.

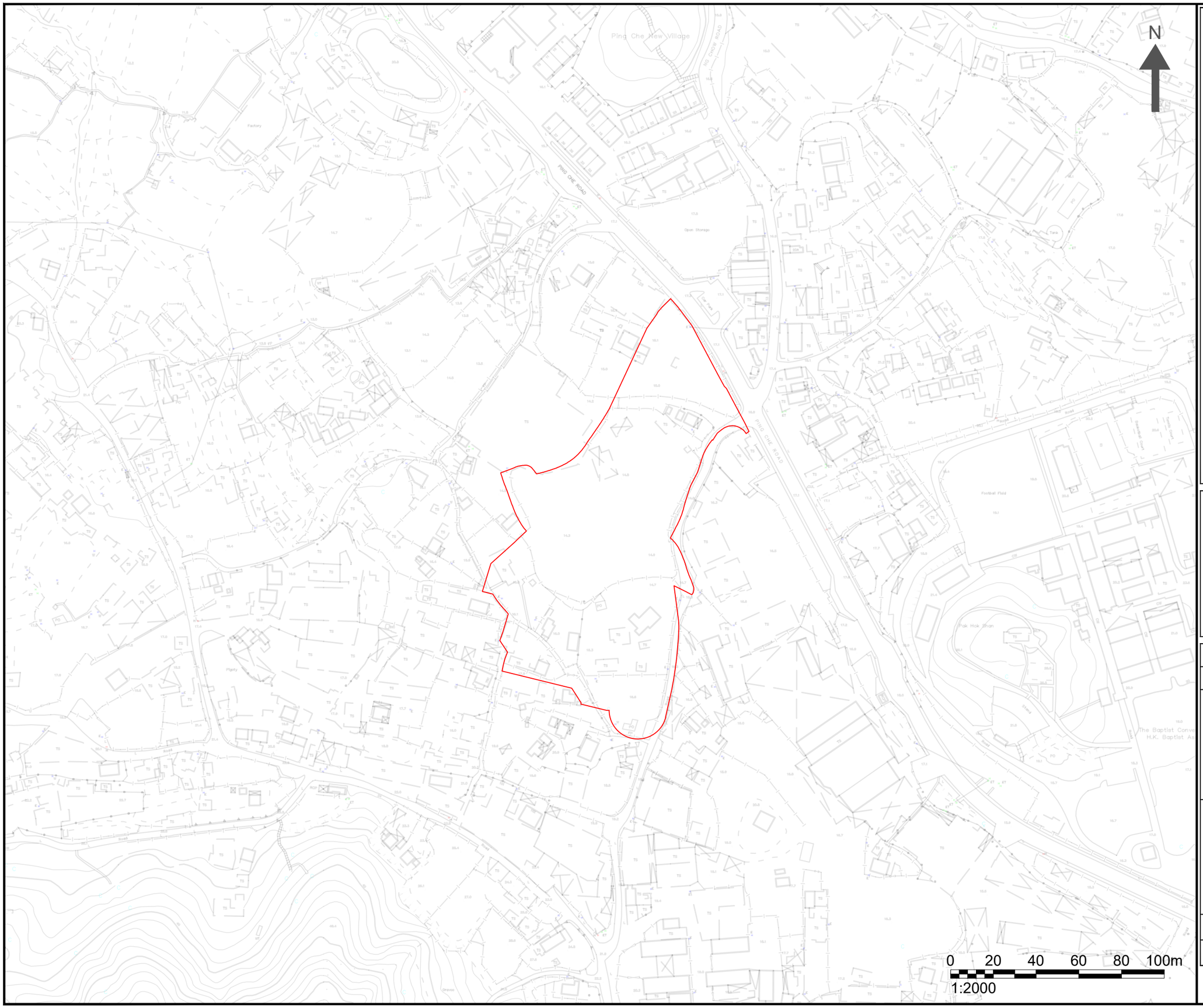
5.1.2. The on-site STP provided with the provision of an equalization tank cater for the design peak flow of 260 m^3/hr is proposed to treat the effluent from daily operation. Details of the proposed STP design and exact treatment process, including emergency discharge, emergency storage/retention arrangement and the sludge disposal arrangement would be subject to later detailed design.

5.1.3. The project proponent will be responsible for the implementation, operation and maintenance of the proposed STP.

5.1.4. The treated effluent will be collected in the storm water terminal manhole on site and then diverted to the proposed public stormwater drainage system via proper connections. Therefore, adverse sewerage impact due to the proposed project is not anticipated.

Figure 2.1

Application Site Location and Its Environs



NOTES :

APPLICATION SITE

Consultant

Allied Environmental Consultants Limited

Project No. :	2127
Drawing By :	CS

Project :

APPLICATION FOR AMENDMENT OF PLAN UNDER SECTION 12A FOR THE TOWN PLANNING ORDINANCE (CAP. 131) FOR MIXED USE DEVELOPMENT AT LOT 796 AND 1008RP IN D.D. 77 AND ADJOINING GOVERNMENT LAND IN PING CHE, TA KWU LING, NEW TERRITORIES

Drawing Title :

APPLICATION SITE LOCATION & ITS ENVIRONS

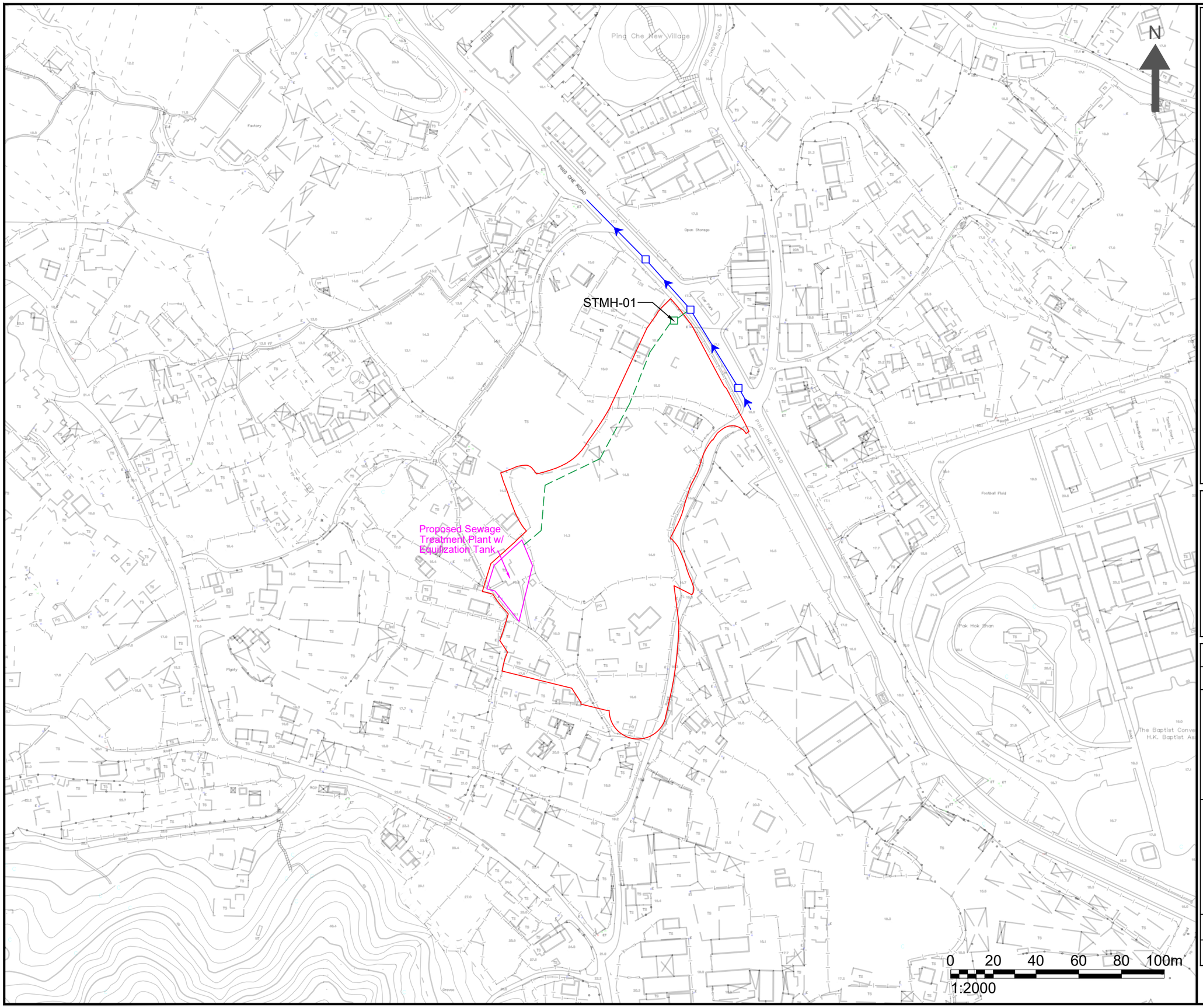
Drawing No : FIGURE 2.1	Revision : 1
Scale : AS SHOWN	Date : OCT 2023

A3 420 x 297

G:\2127 PING CHE DD77\05 REPORT\01 AEC REPORT\02 SIA\ISSUE 2\FIG\[2127] SIA FIG 2.1_SITE LOCATION_DRAFT 2.DWG

Figure 4.1

Preliminary Design of On-site Sewage Treatment Plant



NOTES :

APPLICATION SITE

PROPOSED STP

PROPOSED DRAINAGE

EXISTING DRAINAGE & MANHOLE

Consultant

Allied Environmental Consultants Limited

Project No. : 2127

Drawing By : CS

Project :

APPLICATION FOR AMENDMENT OF PLAN UNDER SECTION 12A FOR THE TOWN PLANNING ORDINANCE (CAP. 131) FOR MIXED USE DEVELOPMENT AT LOT 796 AND 1008RP IN D.D. 77 AND ADJOINING GOVERNMENT LAND IN PING CHE, TA KWU LING, NEW TERRITORIES

Drawing Title :

OVERVIEW OF PROPOSED SEWAGE TREATMENT PLANT, PROPOSED DRAINAGE & EXISTING DRAINAGE

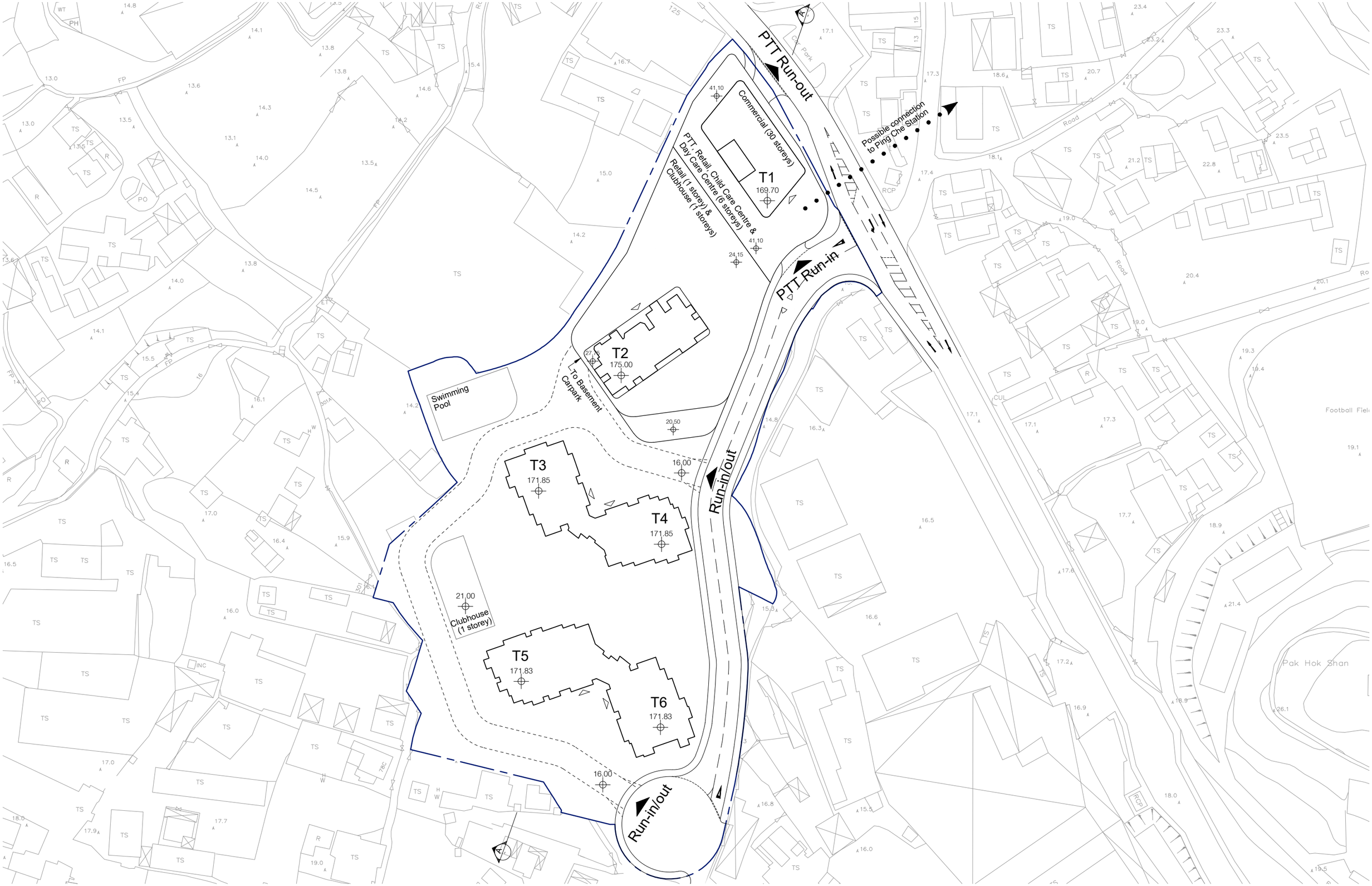
Drawing No :	Revision :
FIGURE 4.1	1
Scale :	Date :
AS SHOWN	DEC 2023

A3 420 x 297

G:\2127 PING CHE DD77\05 REPORT\01 AEC REPORT\02 SIA\DRAFT 2\FIG & APP\[2127] SIA FIG 4.1_SEWERAGE OVERVIEW_ISSUE 2.DWG

Appendix A

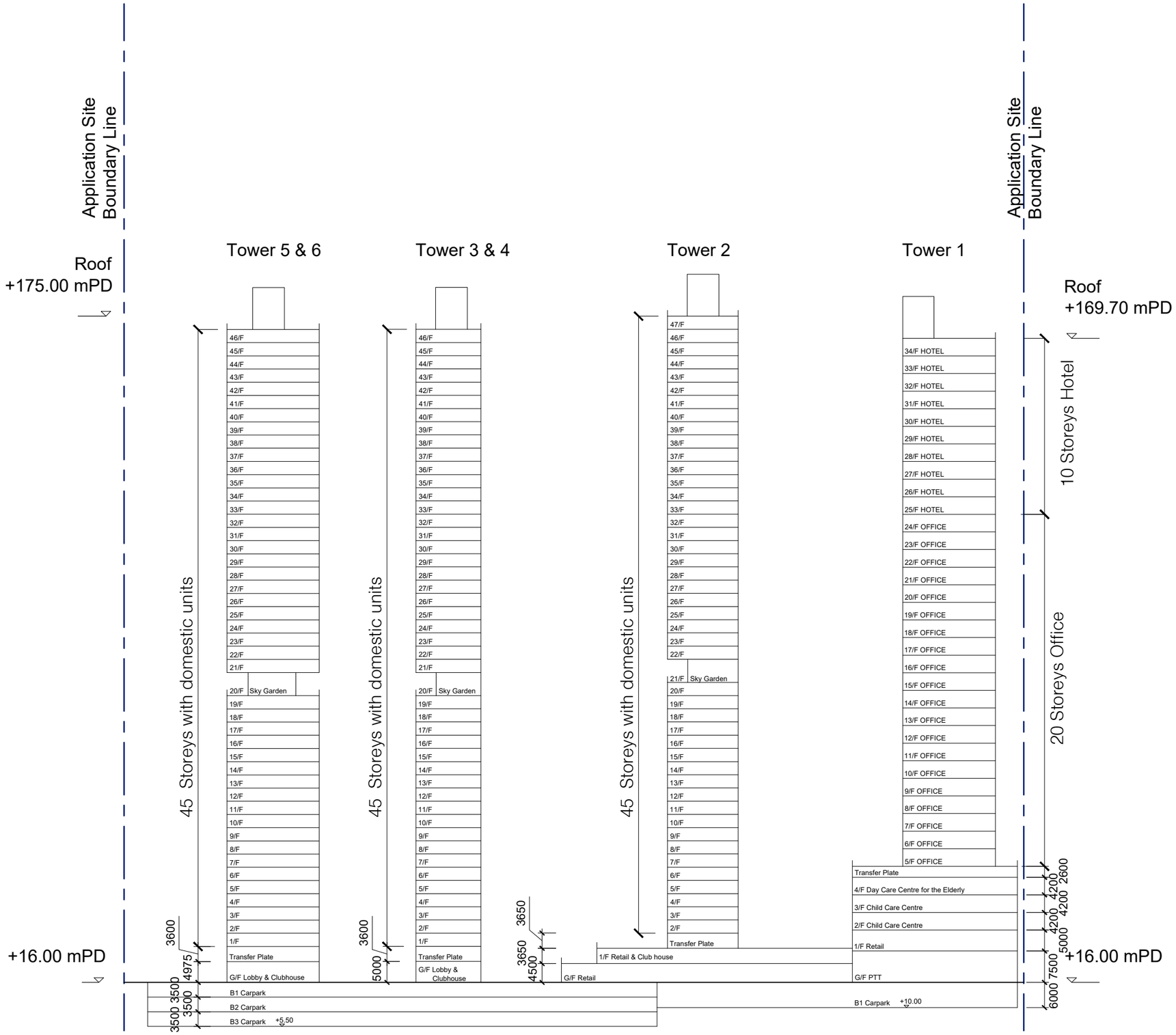
Master Layout Plan and Sectional Drawings



BLOCK PLAN SK-1
PROPOSED DEVELOPMENT AT PING CHE DD77, N.T.

0 10 20 50m

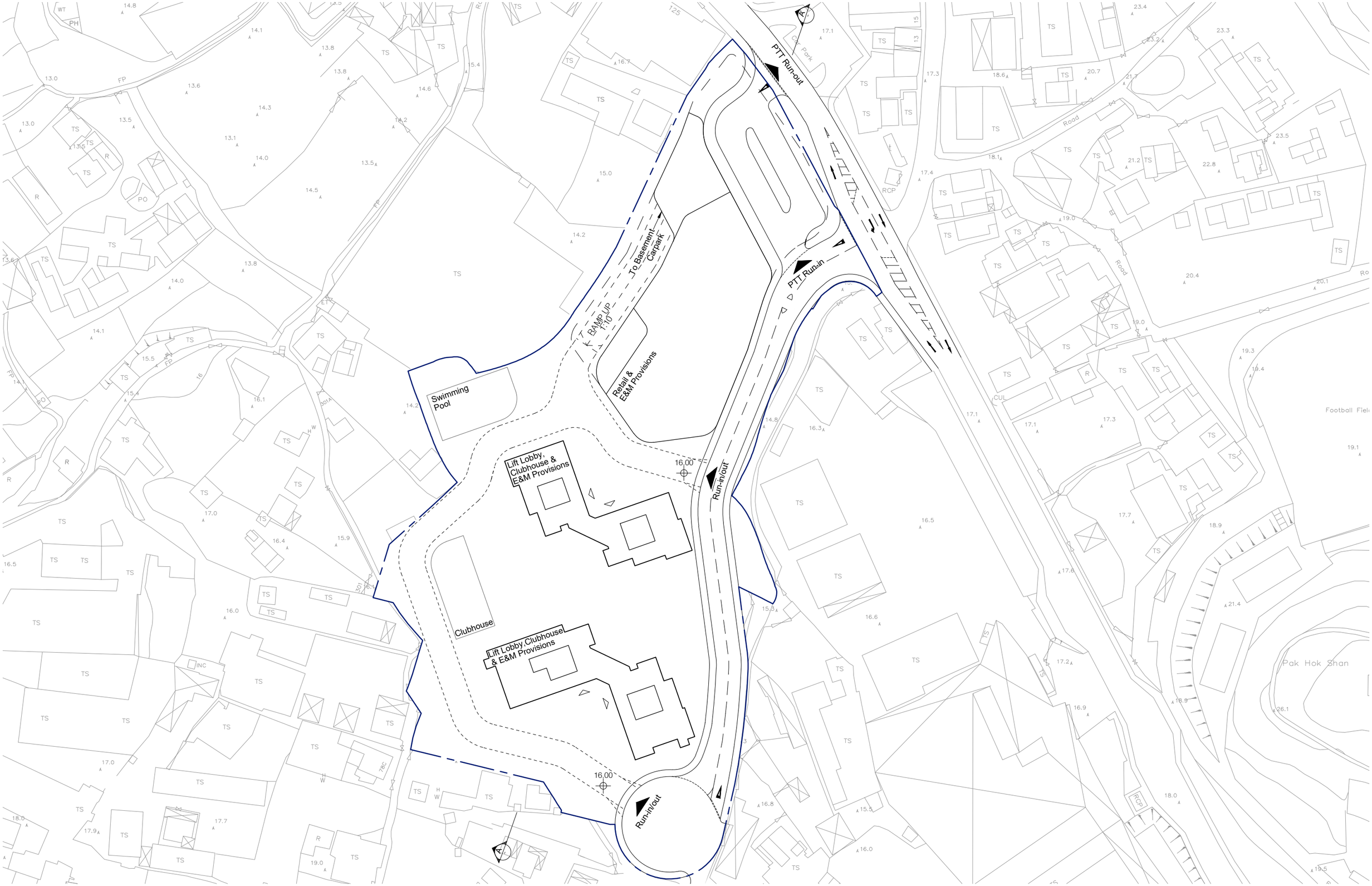
SINGULAR STUDIO LTD
6 OCTOBER 2023



SCHEMATIC SECTION AA' SK-2
PROPOSED DEVELOPMENT AT PING CHE DD77, N.T.

0 10 20 50m

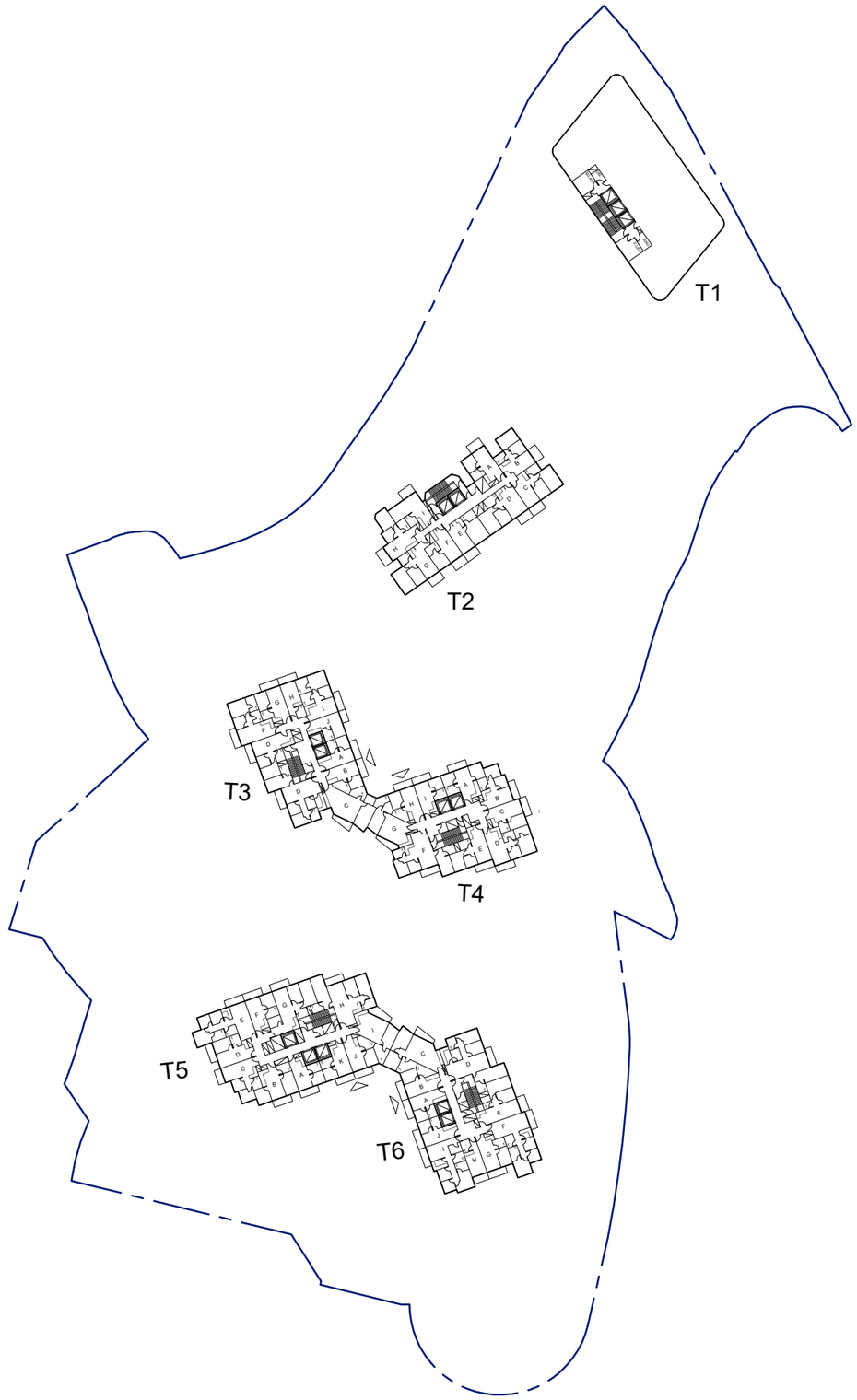
SINGULAR STUDIO LTD
6 OCTOBER 2023



GROUND FLOOR PLAN SK-3
PROPOSED DEVELOPMENT AT PING CHE DD77, N.T.

0 10 20 50m

SINGULAR STUDIO LTD
6 OCTOBER 2023



TYPICAL FLOOR PLAN SK-4
PROPOSED DEVELOPMENT AT PING CHE DD77, N.T.

0 10 20 50m

SINGULAR STUDIO LTD
3 OCTOBER 2023

Appendix B

Sewage Flow Calculation

Table 1 Total Average Sewage Discharge from Proposed Development

Proposed Development			
Residential			
Total Number of Unit	2205	units	Referred to submitted GBP.
Average Household [1]	2.8	persons	Refer to Average Domestic Household Size of North District Council in 2021 Population Census: Summary Result, published by Census and Statistics Department
Total Number of Residents	6174	persons	Referred to submitted GBP.
Unit Flow Factor [2]	0.27	m3/person/day	Referred to the planning unit flow for Domestic (Private - R2) in Table T-1 of GESF.
Average Sewage Discharge	1667.0	m^3/dav	
Retail			
Total Floor Area	2400.0	m2	Referred to submitted GBP.
Worker Density per GFA (in 100m2)	3.5	person/100 m2	Referred to the worker density of Retail Trade (All Types) in Table 8 of CIFSUS
Total number of person	84	persons	
Unit flow	0.28	m^3/person/day	Commercial Employee + Wholesale & Retail - J4 in Table T-2 of GESF.
Average Sewage Discharge	23.5	m^3/dav	
Office			
Total Floor Area	11500.0	m2	Referred to submitted GBP.
Worker Density per GFA (in 100m2)	3.4	person/100 m2	Referred to the worker density of All Economic Activities (All Types) in Table 8 of CIFSUS
Total number of person	391	persons	
Unit flow	0.08	m^3/person/dav	Commercial Employee in Table T-2 of GESF.
Average Sewage Discharge	31.3	m^3/dav	
Hotel/Service Apartment			
Total Floor Area	5703.3	m2	Referred to submitted GBP.
Worker Density per GFA (in 100m2)	3.2	person/100 m2	Referred to the worker density of Hotels and Boarding Houses (All Types) in Table 8 of CIFSUS
Total number of person	183	persons	
Unit flow	1.58	m^3/person/dav	Commercial Employee + Restaurants & Hotels - J10 in Table T-2 of GESF.
Average Sewage Discharge	289.1	m^3/dav	
Clubhouse			
Total Floor Area	3500.0	m2	Referred to submitted GBP.
Worker Density per GFA (in 100m2)	3.3	person/100 m2	Referred to the worker density of Community, Social & Personal Services (All Types) in Table 8 of CIFSUS
Total number of person	116	persons	
Unit flow	0.28	m^3/person/dav	Commercial Employee + Community, Social & Personal Services - J11 in Table T-2 of GESF.
Average Sewage Discharge	32.5	m^3/dav	
Day Care Centre for the Elderly			
Number of Residential Places	60	units	Referred to submitted GBP.
Unit flow	0.19	persons	Referred to the planning unit flow for Domestic: Institutional and Special Class
Total Floor Area	787.6	m2	Referred to submitted GBP.
Worker Density per GFA (in 100m2)	3.3	person/100 m2	Referred to the worker density of Community, Social & Personal Services (All Types) in Table 8 of CIFSUS
Total number of person	26	persons	
Unit flow	0.28	m^3/person/dav	Commercial Employee + Community, Social & Personal Services - J11 in Table T-2 of GESF.
Average Sewage Discharge	18.7	m^3/dav	
Child Care Centre			
Number of Residential Places	100	units	Referred to submitted GBP.
Unit flow	0.04	persons	Referred to the planning unit flow for School Student in Table T-2 of GESF.
Total Floor Area	1166	m2	Referred to submitted GBP.
Worker Density per GFA (in 100m2)	3.3	person/100 m2	Referred to the worker density of Community, Social & Personal Services (All Types) in Table 8 of CIFSUS
Total number of person	39	persons	
Unit flow	0.28	m^3/person/day	Commercial Employee + Community, Social & Personal Services - J11 in Table T-2 of GESF.
Average Sewage Discharge	14.9	m^3/dav	
Swimming Pool			
Swimming pool area	340.7	m^2	Refer to MLP
Height of swimming pool	1.5	m	Assumed height of swimming pool is 1.5m
Estimated volume of the swimming pool	511.0	m^3	
Turnover rate	6.0	hour	General Specification for Swimming Pool Water Treatment Installation in Government Buildings of the Hong Kong Specail Administrative Region (6hr for outdoor swimming pool)
Surface loading rate of filter	50.0	$m^3/m^2/hr$	Swimming Pools: Design and Construction, Fourth Edition By Philip H. Perkins (50 m3/m2/hr adopted)
Required filter area	1.7	m^2	
Backwash duration	7.0	mins/day	With reference to Section B8.5.5 of General Specification for Swimming Pool Water Treatment Installation in Government Buildings of the HKSAR
Backwash flowrate	30.0	$m^3/m^2/hr$	Technical Paper - Domestic Swimming Pool Filtration by European Union of Swimmingpool and Spa Associations
Maximum backwash volume	5.96	m^3/day	
	0.000069	m^3/s	
	0.069	L/s	
Total			
Sewage Generation Rate (residents +	**2077.0**	**m^3/dav**	
Catchment Inflow Factor	**1.0**		
Revised Total Sewage Generation Rate	**2077.0**	**m^3/dav**	
Swimming Pool Backwash	**6.0**	**m^3/dav**	
Peaking Factor	**3**		Refer to Section 3.3 of Guidelines for the Design of Small Sewerage Treatment Plant
Peak Flow	**0.07219**	**m^3/s**	
	72.187	**L/s**	

Notes:

[1] The average household size is made reference to "*2021 Population Census Summary Results*", published by C&SD.

[2] The unit flow factor is made reference to "*Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning (Version 1.0)*", published by EPD.

[3] The worker density is made reference to Table 8 of CIFSUS, published by PlanD.

Average Dry Weather Flow Estimation for Proposed Development

PROJECT SITE

Population Description	Type of Development	Estimated Residential Units / Service GFA [1]		Estimated Population [2]		Recommeded Design Flow Rate	Dry Weather Flow
						(m3/persons/day) [b]	(m3/day)
Residential	R2 (45-60m2)	Units	2205	Population	6174	0.27	1667.0
	Elderly care	Person	60	Population	60	0.19	11.4
	Child care	Person	100	Population	100	0.04	4.0
Services	Clubhouse	m2	3500	Population	116	0.28	32.5
	Office	m2	11500	Population	391	0.08	31.3
	Retail	m2	2400	Population	84	0.28	23.5
	Hotel	m2	5703	Population	183	1.58	289.1
	Elderly care	m2	788	Population	26	0.28	7.3
	Child care	m2	1166	Population	39	0.28	10.9
Swimming Pool	Swimming Pool	m2	-	Population	-	-	6.0
				SUM	7,173	**SUM (Residential + Services)**	2077.0
						SUM (Total)	2083.0

Notes:

[1] Information referred to development schedule_20230802

[2] Avg household size 2.7 (Refer to Average Domestic Household Size of North District Council in 2021 Population Census: Summary Result, published by Census and Statistics Department)
Worker Density per GFA (person/100 m2) for Commercial/office (3.4); for retail (3.5); for Hotels and Boarding Houses (3.2); for Community, Social & Personal Services (3.3) referred to the worker density of (All Types) in Table 8 of CIFSUS.

[2] The Recommended Design Flow Rate of the Proposed House reference to Appendix 3 of Guidelines for the Design of Small Sewage Treatment Plants by EPD.

Table 8 Initial Flat Size Assumptions

GFA per flat (m^2)

	Hong Kong & Kowloon	Tsuen Wan, Kwai Chung & Tsing Yi	Other New Towns
R1	50	45	45
R2	110	60	60
R3	210	130	130

Appendix C

Pollutants Load and Required Volume for Proposed STP

Proposal for Sewage Treatment Plant with Equalisation Tank

Estimation of the Required Volume for the Sewage Treatment Plant

Dry Weather Flow (DWF) (m3/day) Sewage generated (Residents and Service)	Peaking Factor[1]	Swimming Pool Backwash (m3/day)	Minimum Sewage Treatment Plant Capacity Required (m3)
2077	3	6	6237

Estimation of the Required Volume for the Equalisation Tank

Dry Weather Flow (DWF) (m3/day) Sewage (Residents and Service)	Peaking Factor [1]	Swimming Pool Backwash (m3/day)	Time Required to Hold Excess Flow (hrs) [3]	Minimum Equalisation Tank Capacity Required (m3)
2077	3	6	2	519.75

Remarks:

[1]: With reference from EPD's "Guidelines for the Design of Small Sewage Treatment Plants". For the Proposed Development, the factor of 3 x DWF is adopted for development with the use of equalisation tank.

[2]: This is reference from section 12 of the Guidance Notes on Discharges from Village Houses from the EPD. A maximum of 30 cm of sludge, or 1/4 of the sewage holding tank's volume of sludge is allowed, before desludging is required.

[3]: With reference to EPD's "Guidelines for the Design of Small Sewage Treatment Plants", if an equalisation tank is used, the equalisation tank shall be designed to hold excess flow for a period of 2 hours.

3.3 The design peak flow arriving at the STP as a proportion of dry weather flow (DWF) shall be taken as:

- 6 DWF for population equal to or under 1 000
- 4 DWF for population over 1 000 but not less than that based on 1 000 population.

Either the STP can be designed for the above peak flow rate or it can be designed to cater for a peak flow of 3 DWF, excess flow over 3 DWF being equalized in an equalization tank. In the latter case the feed pumps must be sized accurately to avoid excessive peak flow rate production.

Equalization tanks should be designed to hold the excess flow for a period of two hours. Only the tank volume above the duty pump cut-in level should be considered as effective equalization volume. Air ejectors should be provided to prevent septicity of sewage.

Estimation of the Loading Requirements for the Sewage Treatment Plant

BODs

Population Description	Estimated Population		Recommeded Loading Rate for BODs [4]	Loading Rate for BODs
			(g/persons/day) [b]	(kg/day)
Residential	Person	6334	55.00	348.37
Office	Person	391	23.00	8.99
Services	Person	448	3.89	1.74
	SUM	7,173	**SUM**	359.11

SS

Population Description	Estimated Population		Recommeded Loading Rate for SS [4]	Loading Rate for SS
			(g/persons/day) [b]	(kg/day)
Residential	Person	6334	55.00	348.37
Office	Person	391	23.00	8.99
Services	Person	448	3.89	1.74
	SUM	7,173	**SUM**	359.11

Remarks:

[4]: With reference to Appendix 2 of EPD's "Guidelines for the Design of Small Sewage Treatment Plants", the BODs and SS loads for Services shall be pro-rata to equivalent residential population