Appendix 7

Sewerage Impact Assessment

MOTT MACDONALD

Proposed ‘Social Welfare Facility’ (Residential Care Home for Persons with Disabilities) (“RCHD”) and Proposed Excavation of Land associated with the Proposed RCHD in “Village Type Development” Zone, at portion of Former Wa Fung School (華封學校) and adjoining Government Land, Lam Hau Tsuen, Yuen Long, New Territories

Sewerage Impact Assessment Report

August 2025

Mott MacDonald
3/F Manulife Place
348 Kwun Tong Road
Kwun Tong
Kowloon
Hong Kong

T +852 2828 5757
F +852 2827 1823
mottmac.hk

Proposed 'Social Welfare Facility' (Residential Care Home for Persons with Disabilities) ("RCHD") and Proposed Excavation of Land associated with the Proposed RCHD in "Village Type Development" Zone, at portion of Former Wa Fung School (華封學校) and adjoining Government Land, Lam Hau Tsuen, Yuen Long, New Territories

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1 INTRODUCTION

1.1 Background

1.1.1 The Applicant intends to convert the former Wa Fung School (part) in Lam Hau Tsuen (the Site) and adjoining Government land into a **'Social Welfare Facility' (Residential Care Homes for Persons with Disabilities) (RCHD)** under the Town Planning Ordinance.

1.2 Site Description and Major Scope of Works

1.2.1 The Application Site covers a total land area of about 2,945 m^2, is located in Lam Hau Tsuen surrounded by some existing village houses, open storage and vehicle repair workshops in its vicinity. It is bounded by Yuen Long Highway to its north and Shan Ha Road to its south and the Site is currently with an area zoned "Village Type Development" on the Approved Tong Yan San Tsuen Outline Zoning Plan (OZP) No. S/YL-TYST/14. The location of the Site is shown in **Appendix A**. This report is prepared to support the present planning application.

1.3 Scope and Structure of this Report

1.3.1 This Sewerage Impact Assessment (SIA) focuses on the potential sewerage impacts to be caused by the implementation of the proposed RCHD in comparison with the development capacity of the former school at the same site. The objectives of this SIA aim to identify, assess and mitigate potential adverse sewerage impacts which may arise from the proposed RCHD development in the area.

1.3.2 This report contains the following sections in addition to this introduction (Section 1): -

- **Section 2:** Methodology and Design Parameters for Sewerage Impact
- **Section 3:** Estimate of Sewerage Flow for Existing Condition and Planned Condition
- **Section 4:** Sewerage Impact Assessment and Proposal for Sewage Disposal Arrangements
- **Section 5:** Conclusion

2 METHODOLOGY AND DESIGN PARAMETERS FOR SEWERAGE IMPACT ASSESSMENT

2.1 Methodology

Assessment Approach

2.1.1 The following approach and methodology have been adopted in this sewerage impact assessment: -

- Carry out desktop study to collect the relevant information for the assessment, relevant information for the assessment to be collected included sewerage record plans as mentioned in **Section 2.1.2**;
- Determine the potential sewage generated from the proposed RCHD development; and
- Propose option(s) to mitigate the potential sewerage impacts.

Design Standards, Guidelines and Reference

2.1.2 The sewage flow generated from the proposed RCHD development is estimated based on the following standards, guidelines, and reference:-

- ProPECC PN1/23 Building (Standards of Sanitary Fitments, Plumbing, Drainage Works and Latrines) Regulations (Cap. 123I); and
- Guidelines for Estimating Sewage Flows (GESF) for Sewerage Infrastructure (EPD).

2.2 Design Parameters and Assumptions

Design Population

2.2.1 The design population for the RCHD is shown in **Table 2.1**. Detailed estimation of the design population is provided in **Appendix B.**

Table 2.1 - Population Data for the RCHD

Category	Type	Design Population (persons)	Design Population with 10% allowance (persons)
RCHD Resident	Institutional and special class	90	99
Staff (i)	J11 + Commercial Employee	13	15

Remark: -

(i) According to CoP for Residential Care Homes (Persons with Disabilities) Cl. 9.1.1, the minimum staff members is estimated at 15 nos. including Nurse/Health Workers, Care Workers, Ancillary Workers, Additional Foreign workers and other Staff Members.

Unit Flow Factor

2.2.2 The sewage flow under Existing Condition and Proposed Condition will be estimated based on the following Unit Flow Factor (UFF) from GESF as indicated in **Table 2.2**:-

Table 2.2 - UFF

Category / Use	Unit	UFF
Institutional and special class	m^3/d per person	0.19
J11 Community, Social & Personal Service	m^3/d per employee	0.28 (i)
School Student	m^3/d per person	0.04

Remark: -

(i) the unit flow factor of commercial employee 0.08 m^3/person/day has been included for J11

3 ESTIMATION OF SEWAGE FLOW UNDER THE EXISTING AND PLANNED CONDITIONS

3.1 Design Population Estimation

3.1.1 The design population of the Development is presented in **Table 2.1** in **Section 2.2.1**.

3.2 Estimated Sewage Flow for Existing and Proposed Scenario

Existing Scenario – Former Wa Fung School

3.2.1 According to desk study and information gathered in site visit, the site is currently vacant and was formerly used as a primary school for more than 47 years up to 2008. The previous school was known as Wa Fung School with 5 classrooms. It is assumed that each classroom had 30 pupils, and total of 15 nos. of staffs including teaching staff and other staffs. The population of former Wa Fung School and the estimated sewage flow from the school are shown in **Table 3.1**. According to DSD's record plan, there is no record information on the existing public sewerage system serving the former Wa Fung School. It is expected that the sewage flow from the former Wa Fung School was likely handled by a primary treatment such as soakaway pit septic tank system or tanker away system.

Table 3.1 - Estimation of Sewage Flow for the Former Wa Fung School

	Design Population (persons)[(i)]	**UFF (m^3/person/d)[(ii)]**	**Average Dry Weather Flow (ADWF) (m^3/d)**
School Student	150	0.04	6.00
Staff	15	0.28	4.20
		Total	**10.20**

Remark:
(i) The estimation of population refers to **Section 3.2.1**.
(ii) The unit flow factor refers to **Table 2.2**.

Proposed Scenario – RCHD

3.2.2 The ADWF from the proposed RCHD is estimated to be about 23.01m^3/d. The estimation of the sewage flow is presented in **Table 3.2**:

Table 3.2 - Estimation of Sewage Flow for the proposed RCHD

	Design Population (persons)[(i)]	UFF (m^3/employee/d)[(ii)]	ADWF (m^3/d)
RCHD Resident	99	0.19	18.81
Staff	15	0.28	4.20
		Total	**23.01**

Remark:
(i) The estimation of population refers to **Table 2.1** and **Appendix B**.
(ii) The unit flow factor refers to **Table 2.2**.

3.2.3 Based on the parameters, a total ADWF estimated from the proposed RCHD would be approximately 23.01 m^3/day (i.e. 0.27 l/s) with detailed calculations provided in **Appendix B**.

3.2.4 As there is no existing public sewerage system in the vicinity of the Site, a proper sewage disposal scheme is required for the proposed RCHD. The potential sewage disposal scheme for the proposed RCHD is discussed in **Section 4**.

4 SEWERAGE IMPACT ASSESSMENT AND PROPOSAL FOR SEWAGE DISPOSAL ARRANGEMENTS

4.1 Proposed Sewage Disposal Scheme

4.1.1 As discussed in **Section 3.2.4**, there is no existing public sewerage system in the vicinity of the proposed Site. To handle the sewage generated from the proposed RCHD of around 23.01m^3/d, the following two options are considered:

a) Option A – On-site storage tank for disposal to nearby Sewage Treatment Works (STW) via tanker away; or

b) Option B – Septic Tank/Soakaway Pit System.

Option A – On-site storage tank for disposal to nearby Sewage Treatment Works (STW) via tanker away

4.1.2 For tanker away system, it is preliminary designed that the sewage from the proposed RCHD will be removed daily. Sewerage storage tank with volume of 70.71m^3 (23.01 m^3 for storage of 1 day sewage storage plus emergency storage of 2 days) is proposed and the tentative location of the storage tank is shown in **Appendix C**. Consider that underground storage tank would take up roughly 60 m^2 of area, 1.8m depth below ground level is required. Given that the capacity of a vacuum pumping vehicle is 12 m^3. 2 trips are required to tanker away sewage generated daily from the proposed RCHD.

4.1.3 Level sensors connected with alarm signalizing system will also be installed to monitor the storage volume of sewage storage tank to avoid overflow of effluent. Details are referred to EAS.

4.1.4 For maintenance and operation of the tanker away method, tanker service by licensed operating companies will be arranged to deliver the stored sewage to government STW. Further liaison with the relevant government parties for such arrangement will be carried out in later stage.

Option B – Septic Tank/Soakaway Pit System

4.1.5 For Option B, the design and construction of the Septic Tank/Soakaway Pit System should fulfil the requirements of the Building (Standards of Sanitary Fitments, Plumbing, Drainage Works and Latrines) Regulations (Cap.123I) ProPECC PN1/23 and other relevant government guidelines.

4.1.6 In accordance with Cap. 123I, the septic tank capacity shall be of such capacity to be capable of storing quantity of soil and waste discharged thereto during any one day provided that no septic tank shall have a capacity of less than 2.3m^3 or more than 41m^3. As mentioned in paragraph 3.2.1, the estimated overall sewage generated during operation of the proposed RCHD will be 23.01m3 /day. Thus, the septic tank capacity shall be approximately 24m^3.

The dimension requirements of the septic tank are in Appendix D of ProPECC PN1/23. The proposed effective length L, breadth B and depth D of the septic tank are 6.6m, 2.2m and 1.8m respectively producing a tank capacity of 25.4m^3. Hence, the proposed bulk size of the tank required is 12.9m(L) x 3.6m(W) x 3.2m(D). The septic tank separates solids from liquids through sedimentation and anaerobic digestion, while the soakaway pit disperses the partially treated effluent into the soil for further natural filtration and purification. 4 manhole covers are proposed for the septic tank. A ventilation pipe would be carried to above roof near the transformer room. The tentative location of the proposed septic tank and soakaway pit for the proposed RCHD is shown in **Appendix D**.

4.1.7 Regular desludging works should be carried out on the proposed septic tank every 6 months as specified in Appendix D of ProPECC PN1/23. Sufficient separation distance should be provided between the Septic Tank/Soakaway Pit System as well as the waterbodies and structures. The minimum clearance requirements are specified in Appendix D of ProPECC PN1/23 as summarised in below table:

Table 4.3 – Minimum Clearance Requirements for Soakaway Systems

	Distance from Soakaway Systems (m)	Remarks
Water Bodies		
Wells	50	
Stream (where the bed is lower than invert of soakaway system)	15 (30)*	*These distances should be increased to distances shown in brackets if the water from the stream or pool is used or likely to be used for drinking or domestic purposes
Pools	7.5 (30)*	
Beaches	100	(From boundaries of gazetted beaches or bathing beach subzones of Water Control Zones)
	30	(From H.W.M. and from nearest watercourses for other cases)
Ground water table	0.6	(Below invert) This Study has also carried out a broad geotechnical review, the preliminary findings of which has revealed that groundwater table is below 0.6m underneath the proposed invert and septic tank system.
Structures		
Building	3	
Retaining walls	6	
Cuts or embankments	30	
Paths	1.5	

4.2 Maintenance Responsibility

4.2.1 The internal sewerage system and associated sewers including sewage storage tank shall be maintained by the operator of the proposed RCHD.

4.3 Recommended Option – Option B

4.3.1 Having considered the following factual factors, it is recommended to adopt Option B as the sewage disposal method for the proposed RCHD which only makes the best of existing

buildings within the former single-storey Wa Fung School involving largely internal building conversion works:-

a) the scale of the proposed RCHD development is small;

b) the financial resources of the operator are very limited;

c) the prime objective of the project aims to provide an urgent replacement as early as possible to rehouse persons in mental recovery at two existing RCHD (one in Pak Sha Tsuen – under land resumption process; and one in Hung Shui Kiu – awaiting for removal) and to expand the number of bed spaces to meet the extreme demand presence on this social welfare facility in the community;

d) the availability of usable land area within the existing school compound is very limited, taking account of the need to provide a proper on-site EVA, stringent site level differences, provision of new open space for future users of the proposed RCHD, and the need to provide adequate set back from the nearby existing graves; and

e) the need to speed up the commencement of the operation.

5 CONCLUSION

5.1.1 The estimated ADWF for the proposed RCHD development is approximately 23.01 m^3/d (0.27 l/s).

5.1.2 As no public sewerage infrastructure in the vicinity of the development site, two sewage disposal options have been discussed in **Section 4**.

5.1.3 The Operator of the development site will be responsible for maintaining the internal sewerage system and associated sewers. In view of the considerations outlined in **Section 4.3**, the Applicant is recommended to adopt Option B (Septic Tank/Soakaway Pit System) for this proposed RCHD. The septic tank provides initial treatment, while the soakaway pit disperses the partially treated effluent into the soil for further natural filtration and purification. The location of the septic tank/soakaway pit system is proposed underground near the site entrance. A ventilation pipe would be carried to above roof of the adjacent building structure which is located outside transformer room.

A. Location Plan

KEYPLAN (1:30000)

櫃口村
LAM HAU TSUEN

SHAN HA ROAD

LEGENDS:

SITE BOUNDARY

0 10 20 30 40 50
METRES
1 : 500 @ A1

Job Title
PROPOSED SOCIAL WELFARE FACILITY (RESIDENTIAL CARE HOME FOR DISABLED) AT FORMER WA FUNG SCHOOL

APPENDIX A

Date	Scale	Drawing Title
MAR 2025	1 : 500 @ A1	LOCATION PLAN OF THE DEVELOPMENT SITE
Drawn	Job No.	
WTL	601100775	

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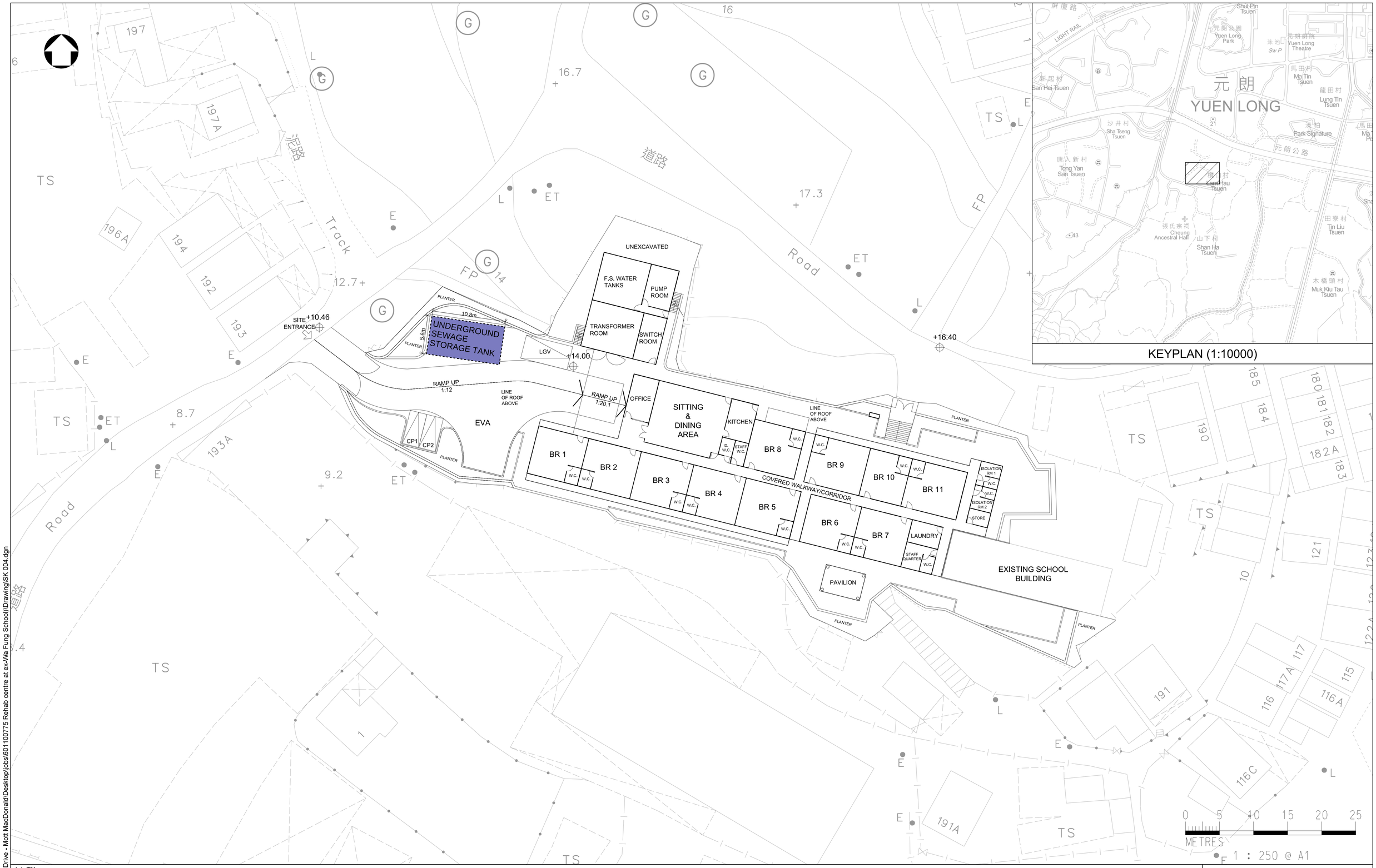
B. Estimation of Sewage Flow

Appendix B - Design Population and Sewage Flow from the Residential Care Homes for Persons with Disabilities (RCHD)

Category	Population (head)	Unit Flow Factor (UFF) (m3/head/day)	Activity Type	ADWF (m3/day)	Remarks
RCHD Resident	99	0.19	Institutional and special class	18.81	Design population = 90 heads, 10% allowance is adopted for conservative design purpose.
Staff	15	0.28	J11 + Commercial Employee	4.20	- According to CoP for Residential Care Homes (Persons with Disabilities) Cl. 9.1.1, the minimum staff members is estimated at 15 nos. including Nurse/Health Workers, Care Workers, Ancillary Workers, additional foreign workers and other Staff Members. 10% allowance is adopted for conservative design purpose. - According to note (2) of Table T-2 in GESF, sewage flow estimation for visitors had been included under "per-employee" unit flow factor of job type J11.
			Total (m3/day)	**23.01**	
			Total (l/s)	**0.27**	

C. Proposed Sewerage System – Option A



KEYPLAN (1:10000)

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Job Title
PROPOSED SOCIAL WELFARE FACILITY (RESIDENTIAL CARE HOME FOR DISABLED) AT FORMER WA FUNG SCHOOL

APPENDIX C

Date	Scale	Drawing Title
MAR 2025	1 : 250 @ A1	LOCATION OF PROPOSED SEWAGE STORAGE TANK (OPTION A)
Drawn	Job No.	
WTL	601100775	

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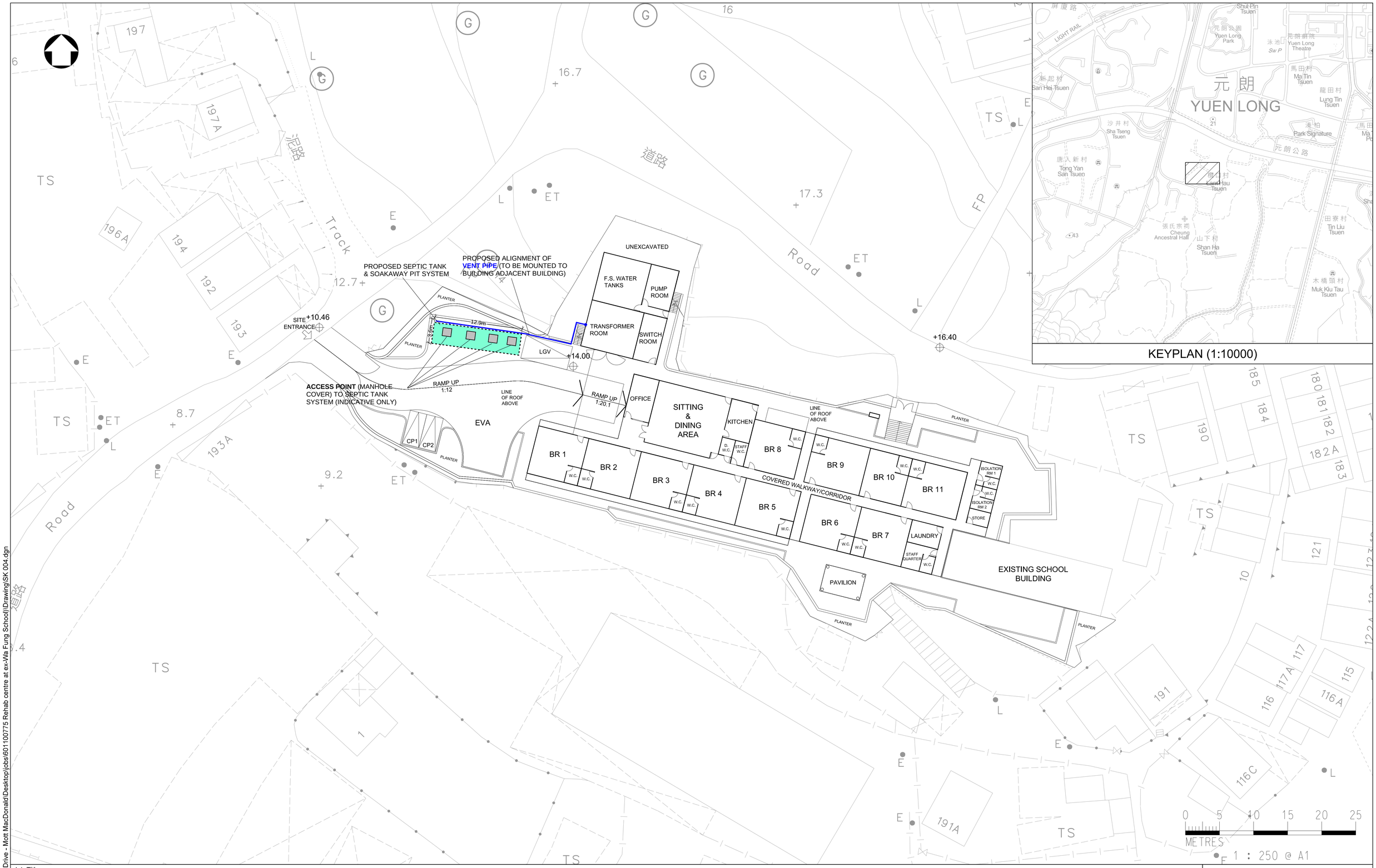
D. Proposed Sewerage System – Option B



KEYPLAN (1:10000)

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Job Title
PROPOSED SOCIAL WELFARE FACILITY (RESIDENTIAL CARE HOME FOR DISABLED) AT FORMER WA FUNG SCHOOL

APPENDIX D

Date	Scale	Drawing Title
MAR 2025	1 : 250 @ A1	LOCATION OF PROPOSED SEPTIC TANK AND SOAKAWAY PIT SYSTEM (OPTION B)
Drawn	Job No.	
WTL	601100775	

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