
Appendix IV

Sewerage Review Report



Temporary Storage for MiC Components and Construction Materials with Ancillary Workshops, Office, Staff Car Park and Machinery at Various Lots in DD 107, Sha Po

Sewerage Review Report

Prepared for:

Sanfield (Management) Ltd

14 December 2023

Temporary Storage for MiC Components and Construction Materials with Ancillary Workshops, Office, Staff Car Park and Machinery at Various Lots in DD 107, Sha Po Sewerage Review Report

Prepared for
Sanfield (Management) Ltd

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1 INTRODUCTION

1.1 Background

- 1.1.1 Aligning with Government directives to enhance the quantity, speed, efficiency, and quality of housing, the construction industry is spearheading the development of highly productive construction methods, including the widespread adoption of Modular Integrated Construction (“MiC”). MiC, an innovative construction method, involves assembling building components off-site in a controlled environment before transporting and seamlessly integrating them into the construction site.
- 1.1.2 In order to support in adopting MiC, a temporary storage for MiC Components and Construction Materials with Ancillary Workshops, Office, Staff Car Park and Machinery for a period of three years (“the Proposed Development” or “Proposed Use”) at various lots in DD 107, Sha Po, Yuen Long, New Territories (“the Site”) is proposed.
- 1.1.3 The Site is zoned Comprehensive Development Area (1) (“CDA(1)”) under the Approved Kam Tin North Outline Zoning Plan (“OZP”) No. S/YL-KTN/10. In accordance with Note (11) of the OZP, temporary use of development of any land or building exceeding a period of three years will require permission from the Town Planning Board (“TPB”). Therefore, a planning application pursuant to Section 16 of the *Town Planning Ordinance* (“TPO”) is required.
- 1.1.4 In order to support the planning application for the Proposed Development, EnviroSolutions & Consulting Ltd (“ESC”) has been appointed to prepare this Sewerage Review Report.

1.2 Site Description

- 1.2.1 The Site location and its environs are shown in **Figure 1-1** which the uses surrounding the Site include:
- To the North: Park Yoho
 - To the East: temporary structures
 - To the South: nullah and open storage
 - To the West: Park Yoho

1.3 Project Description

- 1.3.1 The Site area will be approx. 9,705m². The indicative layout of the Proposed Development can be referred to the Planning Statement.
- 1.3.2 The Proposed Use aims to serve as a transshipment depot for MiC components, with the objective of meeting the growing demand for MiC applications while ensuring efficient logistics and seamless implementation of MiC in housing projects. MiC components intended for temporary storage will weigh about 10 to 20 tonnes, with maximum length and width of approx. 8m and 2.5m respectively. The Proposed Use also serves as a hub for modular construction materials being used for housing project sites in order to promote more Green Construction Methodology. The Proposed Development comprises an open storage area, providing a secure location for the temporary storage of MiC components

and modular construction materials, along with ancillary facilities, including three workshops, an office, a staff car park, a guardhouse and machinery (i.e. tower crane and hoisting crane etc.) to support its operation needs. The proposed ancillary office is a two-storey structure designed to accommodate about 50 staff members. The office is intended to provide administrative/supporting services to facilitate the seamless transshipment of MiC components. The proposed ancillary single-storey workshops, equipped with lifting machinery, will be enclosed, primarily serving for internal quality control and quality assurance checks of MiC components, as well as any necessary final touching-up works before their delivery to construction sites. Additionally, solar panels will be installed on the workshop and office roofs for self-sufficiency purpose, contributing to environmental protection through renewable energy generation.

1.3.3 The operating hours of the Proposed Use will be from 8:00 a.m. to 7:00 p.m. from Monday to Saturday and without operation on Sunday and public holidays.

1.4 Objectives of this Report

1.4.1 The objectives of this Sewerage Review Report are to:

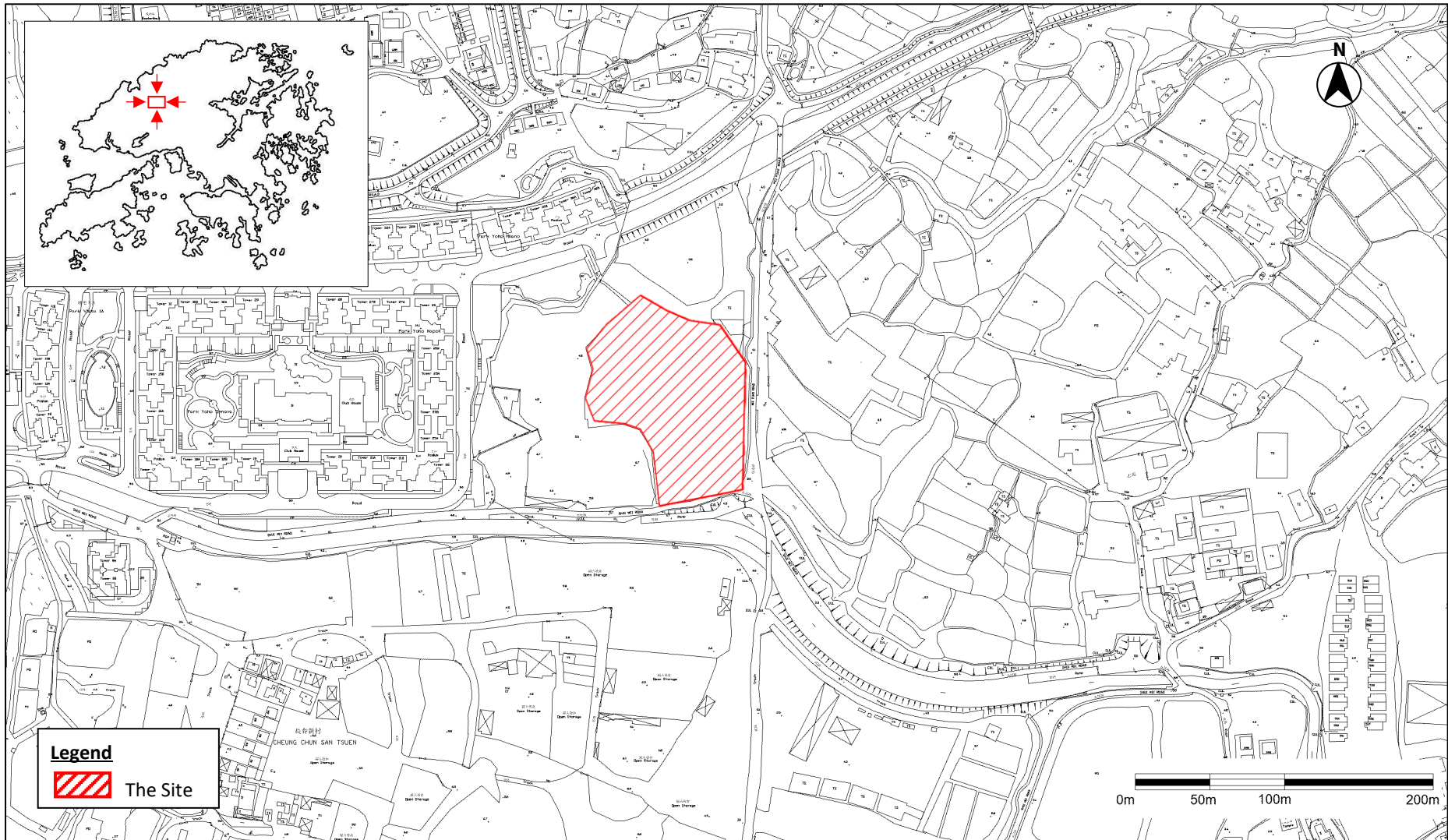
- Estimate the quantity of wastewater arising from the Proposed Development and the nearby uses
- Recommend the necessary mitigation measures to handle the associated wastewater.

1.5 Reference Materials

1.5.1 In evaluating the sewerage impacts arising from the Proposed Development, the following sources have been specifically referred to:

- Drainage Services Department (“DSD”) publication *Sewerage Manual (with Eurocodes incorporated) (Part 1) Key Planning Issues and Gravity Collection System, 3rd Edition, May 2013*
- Environmental Protection Department (“EPD”) publication *Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning Version 1.0, March 2005 (“GESF”)*
- Building (Standards of Sanitary Fitments, Plumbing, Drainage Works and Latrines) Regulations (Cap.123I)
- Practice Note for Professional Persons Drainage Plans subject to Comment by the Environmental Protection Department –Building (Standards of Sanitary Fitments, Plumbing, Drainage Works and Latrines) Regulations (ProPECC PN1/23)
- Sewerage data of GeoInfo Map checked on 16 November 2023

Figure 1-1 Site Location and its Environs



2 EVALUATION OF SEWERAGE IMPACT

2.1 Existing Baseline Conditions

2.1.1 According to the sewerage data of GeoInfo Map checked on 16 November 2023, there is no municipal sewerage system near the Site.

2.2 Sewage Impact During the Operation Phase

2.2.1 During the operation of the Proposed Development, the major source of wastewater will be sewage from the toilets and bathrooms used by on-site staff.

2.2.2 Since there is no existing municipal sewerage system near the Site, disposal of sewage by connection to municipal sewerage system is not practicable. Thus, two options are commended for handling the wastewater from the Proposed Development:

- Option 1 On-Site Treatment – treated by on-site Septic Tank/Soakaway Pit System
- Option 2 Off-Site Disposal – temporarily stored in sewage storage tanks and then tankered-away for off-site disposal in a Sewage Treatment Facility.

2.2.3 The estimated total daily sewage generation from the Proposed Development and recommendations regarding Option 1 and Option 2 are discussed in the subsequent sections.

3 SEWERAGE CALCULATIONS

3.1 Assumptions

3.1.1 In order to review whether Option 1 or Option 2 mentioned in **paragraph 2.2.2** is practicable to handle the sewage arising from the Proposed Development, the maximum sewage generated has been estimated based on the assumptions listed in **Table 3-1**, below. The Average Dry Weather Flows (“ADWFs”) of the Proposed Development have been estimated based on the Unit Flow Factors (“UFFs”) recommended in GESF.

Table 3-1 Parameters for Estimating Wastewater Generation from the Proposed Development

PARAMETER	VALUE	UNIT	REMARK
GENERATION FROM STAFF			
Max. No. of Site Staff	50	staff	Information provided by the applicant
Max. No. of Site Staff not having showering	42	staff	Information provided by the applicant
Max. No. of Site Staff having showering	8	Staff	Max. No. of Site Staff not using bathroom
UFF of staff without showering	0.230	m ³ /day-staff	Unit flow factor for “Commercial Employee + J9 Construction” given in Table T-2 of GESF
UFF of staff with showering	0.350	m ³ /day-staff	<p>a) With reference to Section (4) of Appendix III of GESF, average non-flushing fresh water consumption of R1 Residents and Public Housing Residents is 0.120m³/person/day. While non-flushing fresh water consumption of R1 is not described in detail in GESF, it should comprise having bath, other uses of non-flushing fresh water such as plate washing. Therefore, the UFF of showering is assumed to be 0.120m³/day-staff for the worst-case scenario</p> <p>b) The UFF of staff with showering = UFF of staff without showering + UFF of staff without showering = 0.230 + 0.120 = 0.350 m³/day-staff</p>

3.2 Result and Discussion

3.2.1 Detailed sewage generation calculations are provided in **Appendix A**. As can be seen, the total estimated ADWF from the Proposed Development is calculated to be 12.460m³/day during operation.

3.2.2 As mentioned in **paragraph 2.2.2**, sewage arising from the Proposed Development is recommended to either be treated by Option 1 Septic Tank/Soakaway Pit System or Option 2 Offsite Disposal. The options are discussed below.

Option 1 Septic Tank/Soakaway Pit System

3.2.3 For Option 1, 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, other relevant regulations and other relevant government guidelines.

- 3.2.4 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 2.3m³ or more than 41m³. As mentioned in **paragraph 3.2.1**, the estimated overall sewage generated during operation of the Proposed Development will be 12.460m³/day. Thus, the septic tank capacity shall be approx. 13m³.
- 3.2.5 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 **Table 3-2**.

Table 3-2 Minimum Clearance Requirements for Soakaway Systems

WATERBODIES / STRUCTURES	DISTANCE FROM SOAKAWAY SYSTEM, m	REMARK
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 High Water Mark ("H.W.M.") and from nearest watercourses for other cases
Groundwater Table	0.6	Below Invert
Building	3	-
Retaining Walls	6	-
Cuts or Embankments	30	-
Paths	1.5	-

- 3.2.6 The details of the Septic Tank/Soakaway Pit System will be subject to the detailed design in the future.

Option 2 Offsite Disposal

- 3.2.7 For Option 2, sewage will be temporarily stored in Sewage Storage Tanks within the Site. The stored sewage will be delivered off the Site by tankers, which will deliver them to a Sewage Treatment Plant. The sewage generated from the Proposed Development operation will be approx. 12.460m³/day as discussed in **paragraph 3.2.1**. As advised by a supplier, the typical size of a sewage holding tank for container toilet is approx. 3,000L. Therefore, at least five sewage holding tanks should be provided to temporarily stored sewage for tankering away every day. The details of sewage holding tanks will be subject to the detailed design in the future.
- 3.2.8 With the provision of either Option 1 or Option 2, no adverse impact due to sewage generation from the Proposed Development is anticipated.

4 CONCLUSION AND RECOMMENDATIONS

- 4.1.1 It is proposed to develop a temporary storage for MiC Components and Construction Materials with Ancillary Workshops, Office, Staff Car Park and Machinery for a period of three years at various lots in D.D. 107 in Sha Po, Yuen Long, New Territories. The Site is zoned Comprehensive Development Area (1) (“CDA(1)”) under the Approved Kam Tin North Outline Zoning Plan (“OZP”) No. S/YL-KTN/10. This Sewerage Review is carried out in order to support the Section 16 planning application for the Proposed Development.
- 4.1.2 During operation, detailed sewage generation calculations demonstrate that total estimated ADWF from the Proposed Development will be approx. 12.460m³/day. The sewage is proposed to be either treated by Septic Tank/Soakaway Pit System (Option 1) or Off-Site Disposal by temporarily stored in sewage storage tanks and then tankered-away to a Sewage Treatment Plant (Option 2).
- 4.1.3 For Option 1, the septic tank capacity shall be approx. 13m³. For Option 2, at least five sewage holding tanks with a size of approx. 3,000L each should be provided to temporarily stored sewage for tankering away every day. The details of either Option 1 or Option 2 will be subject to the detailed design in the future.
- 4.1.4 Overall, with the provision of Option 1 or Option 2, no unacceptable impact is anticipated for sewage generation from the Proposed Development.

Appendix A Calculation of Sewage Generation

Sewage Calculations for the Proposed Development	Notes
A. Sewage generated by the Site	
1) Sewage generated by Staff without Showering	
Max No of Site Staff without Showering = 42 staff	As advised by the Applicant
Unit Flow Factor (UFF) per staff = 0.230 m ³ /day-staff	Refer to "Commercial Employee" and "J9 Construction" of Table T-2 of Reference 1.
Total Average Dry Weather Flow (without showering) = 9.660 m ³ /day	Average Dry Weather Flow (a)
2) Wastewater generated by Staff with Showering	
Max No of Site Staff with Showering = 8 staff	As advised by the Applicant
UFF of Showering = 0.120 m ³ /day-staff	With reference to Section (4) of Appendix III of Reference 1, average non-flushing fresh water consumption of R1 Residents and Public Housing Residents is 0.120m ³ /person/day. While non-flushing fresh water consumption of R1 is not described in detail in reference 1, it should comprise having bath, other uses of non-flushing fresh water such as plate washing. Therefore, the UFF of showering is assumed to be 0.120m ³ /day-staff for the worst-case scenario.
UFF per Staff without Showering = 0.230 m ³ /day-staff	Refer to "Commercial Employee" and "J9 Construction" of Table T-2 of Reference 1.
Total UFF per Staff with Showering = 0.350 m ³ /day-staff	Average Dry Weather Flow (b)
Total Average Dry Weather Flow (with showering) = 2.800 m ³ /day	
Overall Average Daily Dry Weather Flow of Proposed Development = 12.460 m³/day	(a) + (b)
<u>Sewage Handling Options</u>	
Option 1 Septic Tank/Soakaway Pit System	
The Minimum Capacity of Septic Tank = 12.460 m ³	In accordance with Section 65 of Reference 2, the capacity of septic tank shall be: (1) not less than 2.3m ³ or more than 41m ³ . (2) capable of storing the quantity of soil and waste discharged thereto during any one day.
Option 2 Container Toilets	
Size of a Sewage Storage Tank = 3,000 L/ toilet	According to a supplier, the typical size of a sewage holding tank for container toilet is approx. 3,000L each.
Min. No. of containers required (3,000L each) = 5 tanks	

Reference:

- 1 Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning ("GESF") Version 1.0, Environmental Protection Department of HK Government, March 2005
- 2 Building (Standards of Sanitary Fittings, Plumbing, Drainage Works and Latrines) Regulations (Cap.123I)



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Passion

We are completely passionate about providing practical solutions and outcomes that deliver for our clients.



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