Appendix III

Environmental Assessment

Prepared by

Ramboll Hong Kong Limited

PROPOSED COLUMBARIUM USE AT G/F OF TWO EXISTING BUILDINGS AT LUNG NGAM MONASTERY, 47 WANG HANG VILLAGE, TAI O, NEW TERRITORIES

ENVIRONMENTAL ASSESSMENT

Date	**July 2024**
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Signed	
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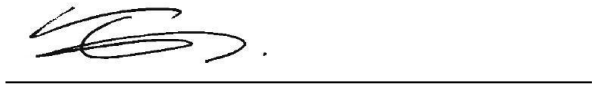
Signed	
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CHAPTERS

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1. INTRODUCTION

1.1 Project Background

1.1.1 The Application Site is located at Wang Hang Village, Tai O, Lantau Island, New Territories. The Applicant is seeking permission from the Town Planning Board (TPB) to use G/F of two existing 2-storey building (Building 1 and Building 2) for columbarium use at the application site (the Site). The Site falls within an area zoned "Government, Institution or Community" (GIC) on the approved Tai O Fringe Outline Zoning Plan No. S/I-TOF/2 where "columbarium" use is included in under Column II of the Schedule of Use. Extract of Outline Zoning Plan is depicted in **Appendix 1**.

1.1.2 The site area of application site, which is an existing 2-storey columbarium (Building 1) and a vacant 2-stroey building (Building 2), is around 123 sq.m. Building 1 is currently accommodating total 901 niches at its G/F and 1/F. In this planning application, the applicant would like to propose relocating all the niches at '1/F of Building 1' to 'G/F of Building 1' and 'G/F of Building 2' as follows:-

	Existing Columbarium Use	Proposed Columbarium Use
Location of Niches	**G/F & 1/F of Building 1** 901 nos. of niches	**G/F of Building 1** 385 nos. of niches **G/F of Building 2** 516 nos. of niches
Total No. of Niches	901 nos. of niches	901 nos. of niches

1.1.3 Location of the buildings is depicted in **Figure 1.**

1.2 Objectives

1.2.1 Ramboll Hong Kong Limited (the Consultant) has been commissioned by the Applicant to conduct the Environmental Assessment (EA) for the proposed development. Architectural drawings and technical information of the Application Site were provided by the Applicant.

1.2.2 This report is to support the planning application from an environmental ground. The aims of this environmental assessment are to identify the potential environmental concerns and constraints related to the proposed development as well as during the operation of the proposed columbarium, and to recommend likely practical pollution control and mitigation measures that will be required with respect to the Hong Kong Planning Standards and Guidelines (HKPSG) and other relevant legislation.

1.2.3 This EA has identified and addressed the following major environmental issues:

- Air Quality Impact
- Noise Impact
- Water Quality Impact
- Waste Management

1.3 Site Location and its Environ

1.3.1 The Application Site is located at Wang Hang Village, Tai O. The location of the Application Site and its surrounding environs are also depicted in **Figure 1**.

1.3.2 The Application Site falls within Lung Ngam Monastery, and surrounded by natural terrain on its East, several village houses on its South and Northwest, and river channel on its West. Photo record for the vicinity of Application Site is shown in **Appendix 2**.

Table 1.1 Distance from Existing Residential Uses to Application Site

Sensitive Receivers	Distance from Application Site (m)
No. 1B Wang Hang Village House (SR1)	50
No. 2C Wang Hang Village House (SR2)	37
No. 3 Wang Hang Village House (SR3)	61

1.4 Proposed Columbarium

1.4.1 The proposed columbarium consists of 901 niches. The site area of Application Site (Building 1 and Building 2) is around 123 sq.m.

1.4.2 The opening hours are assumed to be 9am to 5pm, whilst the details of management plan are subject to review and approval by the Private Columbarium Licensing Board.

1.4.3 For the proposed 901 niches in the Application Site, the number of visitors during peak hour is estimated to be 1,500, whilst the details of management plan are subject to review and approval by the Private Columbarium Licensing Board.

1.4.4 During normal periods, it is anticipated that there is not much people visiting the proposed columbarium as the proposed columbarium is served for local Tai O residents.

2. AIR QUALITY IMPACT ASSESSMENT

2.1 Construction Phase

2.1.1 As mentioned in Section 1.1.1, the applicant would like to relocate all the niches at '1/F of Building 1' to 'G/F of Building 1' and 'G/F of Building 2'. As advised by the applicant, construction and demolition of buildings within the Application Site will not be required, only minor upgrading work/redecoration of the existing buildings may take place. Therefore, adverse air quality impact is not anticipated during the construction stage.

2.2 Operational Phase

Vehicular Emission Impact Assessment

2.2.1 Air pollutants related to vehicular emissions are resulted from nearby traffic emissions. Concentration levels of these pollutants are related to dispersion distance of the pollutants. The air quality impacts due to traffic emissions from surrounding roads of the proposed columbarium was assessed based on the criteria of Hong Kong Planning Standards and Guidelines (HKPSG), which stated the minimum buffer distance requirement from different road types to different open space uses in Table 3.1 of Chapter 9 of the Guideline. The table is also provided in **Table 2.1** below:

Table 2.1 Guidelines on Usage of Open Space Site (HKPSG Chapter 9: Environment)

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

2.2.2 **Table 2.2** shows the distance between the Application Site and the roads around the site. The access roads surrounding the application site are pedestrian walkway, and vehicle access is not available. It is concluded that the closest distance between the nearby traffic roads and the proposed columbarium are considered to be sufficient when compared with the required buffer distance listed in the HKPSG between roads and permitted usage of open space development and no significant vehicular emission impacts will be imposed to the proposed columbarium.

Table 2.2 Distance between the Application Site and the Roads in the Vicinity

Road / Street	Distance from the Application Site	Road Type	Buffer distance as stated under HKPSG	Compliance with HKPSG
Lung Shing Street	~211m	Local Distributor	>5m	Yes
Tai O Road	~226m	Local Distributor	>5m	Yes

Potential Air Quality Impact Due to Operation of the Proposed Columbarium

2.2.3 Potential air quality impact during the operation of the columbarium could be related to burning of ritual papers and joss sticks. However, it must be noted that there is no furnace proposed within the Application Site under the current application. Only niches are proposed, and no burning of ritual paper will be carried out within the Application Site. Therefore, adverse air quality impact is unlikely anticipated during the operation stage.

3. NOISE IMPACT ASSESSMENT

3.1 Construction Phase

3.1.1 As mentioned in Section 1.1.1, the applicant would like to relocate all the niches at '1/F of Building 1' to 'G/F of Building 1' and 'G/F of Building 2'. As advised by the applicant, construction and demolition of buildings within the Application Site will not be required, only minor upgrading work/redecoration of the existing buildings may take place. Therefore, adverse noise impact is not anticipated during the construction stage.

3.2 Operational Phase

Noise Sources from the Surrounding

3.2.1 The Application Site falls within Lung Ngam Monastery, and surrounded by natural terrain on its East, several village houses on its South and Northwest, and river channel on its West. Potential fixed noise sources and railway noise sources are not identified within 300m radius of the Application Site.

3.2.2 The major noise sources which may affect the Application Site are considered as the roads at the vicinity. However, Lung Shing Street and Tai O Road are located >200m away from the Application Site. In view of low traffic volume and long separation distance, the traffic noise generated by Lung Shing Street and Tai O Road is insignificant.

Potential Noise Impact Due to the Proposed Columbarium

3.2.3 **Appendix 2** shows the photos of the existing conditions of the proposed columbarium. The proposed columbarium consists of niches only. Since no accommodation facilities will be provided by the columbarium and it is not designed for noise sensitive use, the columbarium is not considered as noise sensitive receiver.

3.2.4 The Application Site is surrounded by several village houses on its South and Northwest, **Table 1.1** shows the approximate distance between the Proposed Columbarium and the village houses.

3.2.5 It is clarified that the proposed columbarium is not designed for conducting any funeral ceremony, there will be only quiet operation activities (i.e. worships/praying) to be carried out at the proposed columbarium. For the building at the southern proposed columbarium (Building 2), its opening is facing towards west while the existing noise sensitive receivers are located to the Northwest and South of the building; therefore, there is no opening facing towards the noise sensitive receivers. In view of above, it is considered that the operation of the proposed columbarium would not have any adverse noise impact to the surrounding areas and nearby noise sensitive receivers.

3.2.6 Also, outdoor activities and celebration activities will not be arranged during these traditional major festivals so as to maintain the quiet nature of the proposed columbarium.

4. WATER QUALITY IMPACT

4.1 Construction Phase

4.1.1 As mentioned in Section 1.1.1, the applicant would like to relocate all the niches at '1/F of Building 1' to 'G/F of Building 1' and 'G/F of Building 2'. As advised by the applicant, construction and demolition of buildings within the Application Site will not be required, only minor upgrading work/redecoration of the existing buildings may take place. Therefore, adverse water quality impact is not anticipated during the construction stage.

4.2 Operation Phase – Surface Runoff

Runoff from Road Surface and Paved Areas

4.2.1 To avoid any adverse water quality impacts, surface runoff shall be conveyed and collected by appropriate facilities, such as road gullies and u-channels to the main drainage system, and surface runoff will be discharged to the adjacent river channel finally.

4.3 Operation Phase – Sewerage

Assessment Criteria and Methodology

4.3.1 For the estimation of the sewage generation from the proposed columbarium and the existing development contribute sewage to the existing sewer system, recommendation in the "Guidelines for Estimating Sewage Flows for Sewage infrastructure Planning" (the GESF) published by EPD in 2005 have been adopted in this assessment.

4.3.2 Based on the designed use, the sewage flow from the proposed columbarium is determined and compared with the capacity of the existing sewerage system in order to investigate the necessity of sewerage system upgrading work.

4.3.3 The operation hours of the Proposed Columbarium during the normal days and festival days is from 9:00am to 5:00pm (8 operation hours).

4.3.4 According to Table 2 of GESF, the unit flow rate of employee is 0.280m^3 per day per person.

4.3.5 With reference to the approved Final Drainage, Sewerage and Utilities Impact Assessment (DSUIA) Study Report of the Agreement No. CE55/2011 (CE) Potential Sites for Columbarium Developments – Group B – Feasibility Study, a unit flow rate of 0.010m^3 per day per person is adopted for estimating the sewage flow generated from visitors.

Assessment

4.3.6 According to the site visit conducted in February 2024, septic tank and soakaway system has been provided for the toilet that is accessible to Lung Ngam Tse and columbarium visitors. Design of the existing septic tank has followed the minimum clearance requirements as stipulated in ProPECC PN 1/23 and location of septic tank and toilet are shown in **Figure 2**. In addition, the public sewerage network is located near Alighting Stop, such as Tao Ping Street Public Toilet (~450m from Subject Site) and Tai O Road Public Toilet (~750m from Subject Site) are located near the Tai O Lung Shing Street Parking Lot and Tai O Bus Terminus Car Park respectively.

4.3.7 All employees (currently there are 5 employees) would keep using the existing accessible toilets, which are connected to a septic tank and soakaway system. Refer to **Appendix 3**, the total amount of sewage generated from 5 employees are about 1400L per day.

4.3.8 All visitors would use the portable toilets during the festival periods. Vacuum tanker with capacity of 3000L will be arranged to empty the toilets 4 times a day and transfer the additional sewage to public sewage treatment works.

Number of Visitors during the Festival Periods

4.3.9 Based on the information from Traffic Consultant, it is estimated that there would be 150 visitors during the peak hour (maximum of 1,500 visitors/day). It is assumed in this assessment that about 1,050 visitors (70% of visitors) will use toilet. It must be note that not all visitors will use the toilet and they normally stay within the columbarium for about hour only.

4.3.10 With reference to the EIA Report, Agreement No. CE 1/2013 (CE) Site Formation and Associated Infrastructural Works for Development of Columbarium, Crematorium and Related Facilities at Sandy Ridge Cemetery – Design and Construction (ref. AEIAR-198/2016, hereinafter refers to "the EIA Report"), it is assumed that 70% of the total number of visitors will use toilet and contribute to sewage flow generation.

4.3.11 The sewage flow calculations in the EIA Report refer to the Tai Po Tsz Shan Monastery project, in which 50% of the total number visitors were assumed to contribute sewage flow generation. Due to the remoteness of the reference EIA report, a more conservative assumption has been made that 70% of the total visitors will use toilet and contribute to sewage flow generation. Due to the remoteness, the "70% assumption" should be appropriate to be applied in this assessment.

Sewerage Generation from the Proposed Columbarium during Festival Periods

4.3.12 Refer to **Appendix 3**, the total amount of sewage generated from 1,050 visitors during peak periods is about 10,500L per day.

4.3.13 8 nos. portable toilets with 400 litres sewage capacity (**Appendix 4 for the example**) will be rent to handle the sewerage generation from the visitors. Vacuum tanker will be arranged to empty the toilets 4 times a day and transfer the additional sewage to public sewage treatment works. With such arrangement, the portable toilets are able to handle sewage generation of 12,800L per day, which is larger than the sewerage generation from the visitors.

Recommendations

4.3.14 The applicant has an administrative measure to manually control the number of visitors to use the portable toilets only.

4.3.15 To prevent portable toilets from being overused causing sewage overflow and malodour problem, the portable toilets shall be kept monitoring by the staffs.

4.3.16 The number of the portable toilets and tankers can be increased to suit the demand, if and when necessary.

5. WASTE MANAGEMENT

5.1 Construction Phase

5.1.1 As mentioned in Section 1.1.1, the applicant would like to relocate all the niches at '1/F of Building 1' to 'G/F of Building 1' and 'G/F of Building 2'. As advised by the applicant, construction and demolition of buildings within the Application Site will not be required, only minor upgrading work/redecoration of the existing buildings may take place. Therefore, adverse waste management impact is not anticipated during the construction stage.

5.2 Operation Phase Waste Management

5.2.1 Under normal circumstance, general refuse (such as food scraps, waste paper, empty containers and packaging, etc.) from operation of the columbarium will mainly be generated from future visitors. Such refuse will be properly managed by suitable waste collectors so that intentional or accidental release to the surrounding environment will not occur.

There will be 5 employees (4 management office staff and 1 security guard) working in the proposed columbarium and maximum 1,500 visitors during festival periods including Ching Ming Festival and Chung Yeung Festival. The estimated general refuse generation is shown in Table 1.2 below.

Table 5.1 Estimation of General Refuse Generation during operation phase (Festival Periods)

Item	Population Intake Estimate	Waste Classification	Per Capita Disposal Rate (1)	Estimated Waste Generation
Total No. of Staff	5	Commercial & Industrial Waste	0.59kg/ person/ day	2.95kg/day
Total No. of Visitors	1,500	Commercial & Industrial Waste	0.59kg/ person/ day	885kg/day

Note:
(1) Plate 2.7 in Monitoring of Solid Waste in Hong Kong – Waste Statistic for 2022

5.2.2 The visitors will not stay in the site for a whole day and not all visitors will generate waste, it is anticipated that the actual waste generation will be smaller than the estimation.

5.2.3 On the other hand, the visitors are encouraged to take their garbage home. The applicant has an administrative measure to manually control the number of visitors to use the rubbish bins by the site staff to avoid excessive use.

5.2.4 With proper implementation of waste management practices, the environmental impact from handling and disposal of general refuse would not be anticipated.

6. CONCLUSION

6.1.1 The Application Site is located at Wang Hang Village, Tai O, Lantau Island, New Territories. The Applicant is seeking permission from the Town Planning Board (TPB) to use two existing 2-stroey buildings (Building 1 and Building 2) for columbarium use at the application site (the Site).

6.1.2 To assess the environmental impact of the proposed columbarium, air quality, noise impact, water quality and waste management assessment have been conducted accordingly.

6.1.3 For air quality assessment, criteria stated in HKPSG is being considered, where the guideline stated the minimum buffer distance requirement between the Application Site and the nearby traffic roads are found sufficient and adverse impact due to traffic emission is found insignificant.

6.1.4 According to the advice from the applicant, the operation of the Proposed columbarium will not involve any burning ritual papers and joss sticks in order to minimize any adverse impact in air quality from the proposed development. As such, no adverse air quality impact is anticipated during the operation stage.

6.1.5 For noise impact assessment, the major noise sources which may affect the Application Site are considered as the roads at the vicinity as no fixed and railway noise sources are identified within the 300m assessment area. Lung Shing Street and Tai O Road are located >200m away from the Application Site. As the traffic volume is less, the traffic noise generated by Lung Shing Street and Tai O Road is insignificant.

6.1.6 For water quality impact assessment, surface runoff during the operation stage will be collected by road gullies and channels on the side of the access road. For sewerage impact, portable toilets and vacuum tanker will be provided for visitors to help handling the sewage during the festival days as contingency measures. Therefore, unacceptable adverse water quality impact due to sewage is not anticipated.

6.1.7 Construction and demolition of buildings within the Application Site will not be required, only minor upgrading work/redecoration of the existing buildings may take place. Therefore, adverse waste management impact is not anticipated during the construction stage.

6.1.8 To this end, it can be concluded that the proposed columbarium is considered environmentally acceptable.

Figure

Figure: 1

Title: Location of Application Site and its Environ

Project: Proposed Columbarium Use at G/F of Two Existing Buildings at Lung Ngam Monastery, 47 Wang Hang Village, Tai O, New Territories

RAMBOLL

Drawn by:	TL
Checked by:	TC
Rev.:	1.0
Date:	Apr 2024

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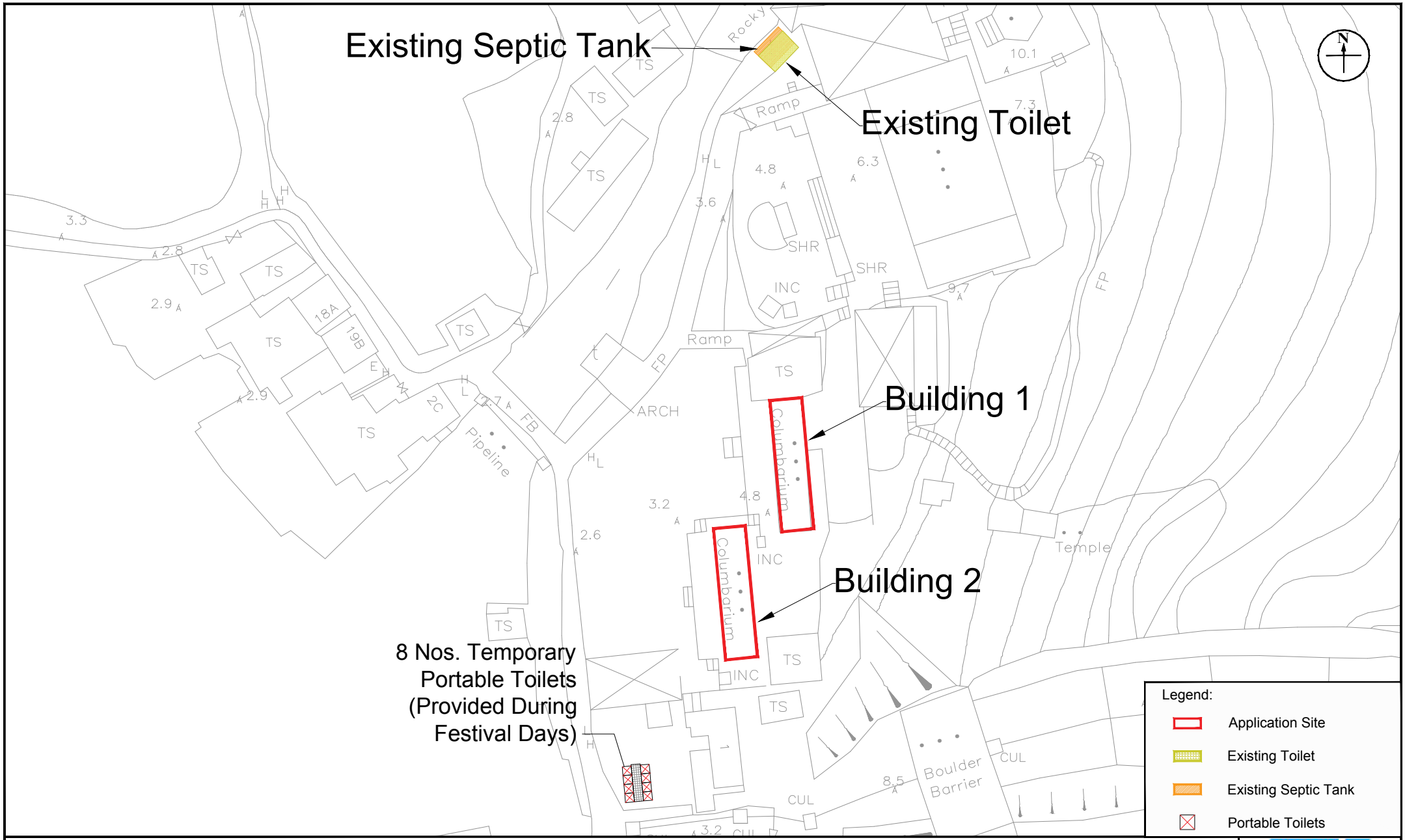

Figure: 2

Title: Location of Existing Toilet, Septic Tank and Portable Toilets

Project: Proposed Columbarium Use at G/F of Two Existing Buildings at Lung Ngam Monastery, 47 Wang Hang Village, Tai O, New Territories

RAMBOLL

Drawn by:	TL
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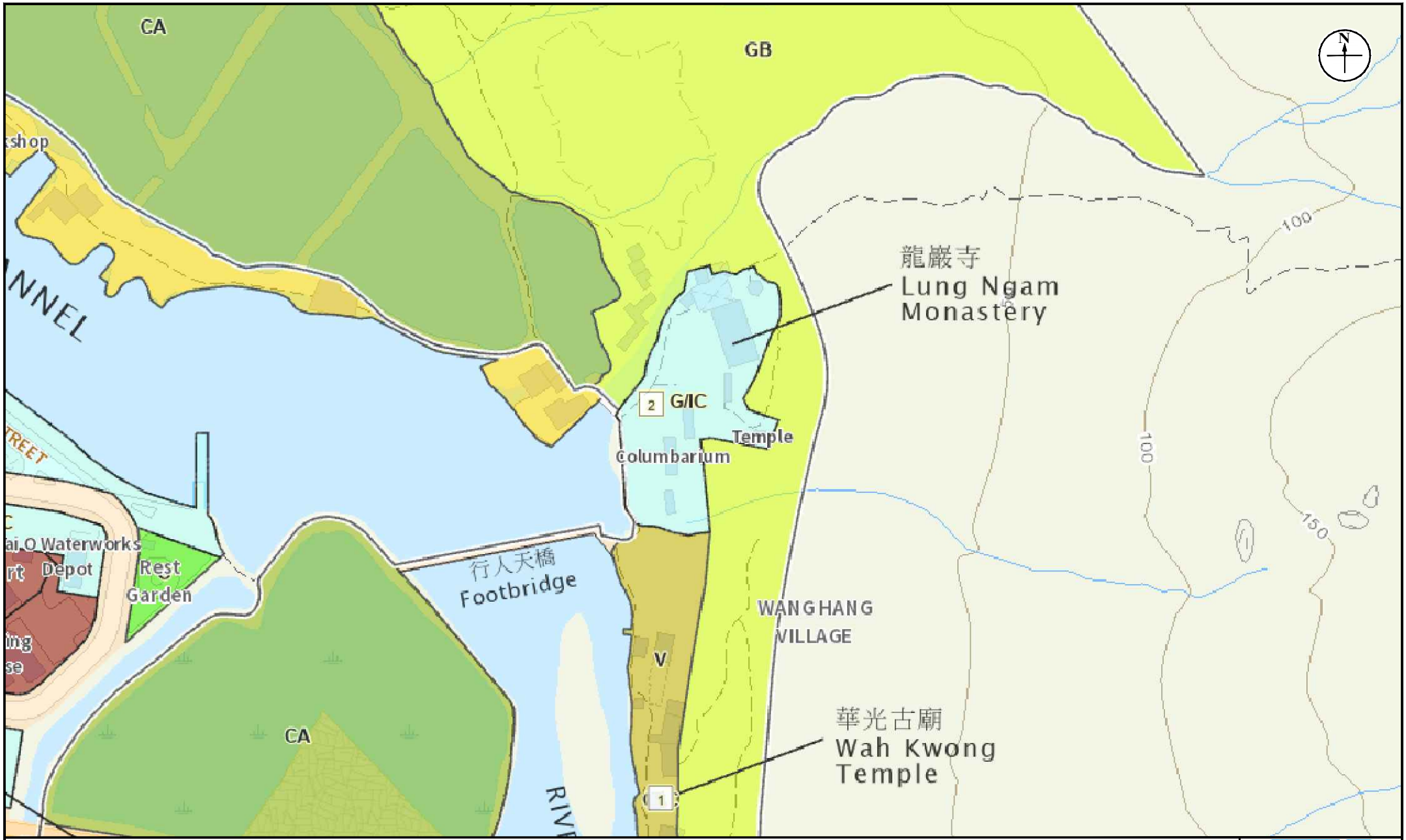
Appendix 1

Extract of Outline Zoning Plan



Appendix: 1	RAMBOLL
Title: Extract of Outline Zoning Plan	Drawn by: TL Checked by: TC
Project: Proposed Columbarium Use at G/F of Two Existing Buildings at Lung Ngam Monastery, 47 Wang Hang Village, Tai O, New Territories	Rev.: 1.0 Date: Apr 2024

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Appendix 2

Photo Record for the Vicinity of the Application Site

No.1B Wang Hang Village House

Main Building of Lung Ngam Monastery

No.2C Wang Hang Village House

Proposed Columbarium Building 1

River Channel

Proposed Columbarium Building 2

No.3 Wang Hang Village House

Legend:

Application Site

Sensitive Receivers

Appendix: 2

Title: Photo Record for the Vicinity of the Application Site

Project: Proposed Columbarium Use at G/F of Two Existing Buildings at Lung Ngam Monastery, 47 Wang Hang Village, Tai O, New Territories

RAMBOLL

Drawn by:	TL
Checked by:	TC
Rev.:	1.0
Date:	Apr 2024

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Appendix 3

Calculation for Sewage Generation Rate of the Proposed Columbarium during Festival Period

Table 1: Calculation for Sewage Generation Rate of the Proposed Columbarium during Festival Period

During the festival periods, all employees will keep using the accessible toilets.
All visitors will use the portable toilets. Vacuum tankers will be arranged to empty the toilets.

A. Sewage Generation Rate from Employees (using existing accessible toilets)

Assumed number of employees	=	5	employees, advised by the Applicant (Management Office Staff)
Design flow for commercial employee	=	0.08	m3/person/day, refer to Table T-2 of GESF
Design flow for commercial activities	=	0.20	m3/person/day, refer to J11 of Table T-2 of GESF
Sewage generation rate of employees	=	1.40	m^3/day (24 * 0.28)
	=	1400	Litres/day

B. Sewage Generation Rate from visitors (using temporary portable toilets)

Assumed number of visitors	=	1050	visitors/day, advised by the Project Traffic Consultant ---- assume 70% of visitor will use toilet
Design flow for visitors	=	0.010	m3/person/day
Sewage generation rate of visitors	=	10.500	m^3/day
	=	10500	Litres/day

Sewage to be collected by portable toilets

Capacity of portable toilets	=	400	Litres per unit
Number of portable toilets provided	=	8	Nos.
No. of time to empty the toilets by tankers	=	4	Times/day
Total Amount of Sewage collected by the portable toilets	=	12800	Litres/day
	>	Sewage generation from visitors	

Appendix 4

Example of Portable Toilet Available in Hong Kong

美國製造500升清水沖水式蹲廁

美國製造500升清水沖水式蹲廁 (U.S. made Tufway 500L Sqatting Style)
- 規格尺寸：高2.38米, 寬1.12米, 深1.22米
- 淨重：240磅 (109千克)
- 蓄水箱容量：約500公升 (400公升污水，100公升清水)
- 每次清洗後可使用人次：640次
- 便糟具活葉，可隱蔽污水
- 獨立小便斗
- 高密度聚乙烯材料製造，耐用性高

本地製造式沖水蹲廁

本地製造式沖水蹲廁 (Local make Flushed Squatting Style)
- 規格尺寸：高2.25米, 寬1.12米, 深1.22米
- 淨重：200磅 (91千克)
- 蓄污水箱容量：265公升 (70加侖)
- 每次清洗後可使用人次：380次
- 蹲式蓄污水箱，沖水式
- 獨立小便斗
- 高密度聚乙烯材料製造，耐用性高
- 裝有洗手臺

德國製造沖洗式坐廁

德國製造沖洗式坐廁 (Germany make Thai Sitting Style)
- 規格尺寸：高2.29米, 寬1.12米, 深1.22米
- 淨重：200磅 (91千克)
- 蓄污水箱容量：265公升 (70加侖)
- 每次清洗後可使用人次：380次 (使用直下式或循環沖水系統)
  每次清洗後可使用人次：380次 (使用清水沖水系統)
- 蓄污水箱：坐廁式，循環式沖水系統或清水沖水系統
- 獨立清水箱供清水沖水用，清水箱容量：80公升 (20加侖)
- 坐廁式獨特無接觸設計
- 裝有洗水臺
- 高密度聚乙烯材料製造，耐用性高