

Prepared for

Buddhist Cheung Ha Temple (佛教長霞淨院)

Prepared by

Ramboll Hong Kong Limited

REZONING REQUEST FROM “V” TO “G/IC(3)” FOR
BUDDHIST CHEUNG HA TEMPLE, AT LOTS NO. 1087 AND
1130 IN DD6 AND ADJOINING GOVERNMENT LAND, TAI PO

SEWERAGE IMPACT ASSESSMENT

In association with

Toco Planning Consultants Ltd

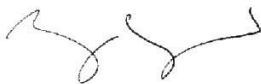
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1. INTRODUCTION

1.1 Background and Objectives

- 1.1.1 The Applicant operates the Buddhist Cheung Ha Temple (佛教長霞淨院), hereinafter referred to as the “Temple”, at the present location at Nos. 43 - 45, Kam Shan Tsuen since 1928. The Temple has been in existence before the first Tai Po Outline Zoning Plan No. LTP/47 gazetted on 12 December 1980. The Application Site (or “the Site”) falls within an area zoned “Village Type Development” (“V”) on the approved Tai Po Outline Zoning Plan No. S/TP/30 (“OZP”). The Application Site includes two buildings that contain religious and columbarium uses, namely Religious Block A and Block B (i.e: Lot 1087 and 1130 in D.D.6.).
- 1.1.2 Buddhist Cheung Ha Temple is located in the suburban area of Tai Po at Kam Shan and is about 300 m south of Tai Wo MTR Station. See Figure 1.1 for the site location, its boundary and the environ is presented in Figure 1.2, showing the general layout of the Temple.
- 1.1.3 This Section 12A Rezoning Application intends to facilitate regularisation of the Columbarium as part of Buddhist Cheung Ha Temple based on the existing site boundary.

1.2 Purpose of this Submission

- 1.2.1 This Sewerage Impact Assessment (“SIA”) examines the potential sewage discharge impacts that would be associated with operations at the Application Site, particularly during the peak seasons of visitors (i.e. Ching Ming and Chung Yeung Festivals, and their shadow periods), so as to identify the appropriate mitigation measures and sewerage upgrade/ improvement, where necessary, to alleviate the impact.
- 1.2.2 Ramboll Hong Kong Ltd. has been commissioned by the Applicant to conduct this SIA, and to provide technical justifications on environmental fronts in the rezoning application.

1.3 Project Location and the Environ

- 1.3.1 The Application Site is located at Lots No. 1087 and 1130 in D.D. 6 and their adjoining Government land at Kam Shan, Tai Po. It can be accessed from Kam Shan Road via staircases which connect the Temple to Kam Shan Road. The Temple abuts village-typed residential developments along Kam Shan Road.
- 1.3.2 Buddhist Cheung Ha Temple operates between 09:00 and 17:30 in non-festival periods and between 07:00 and 19:00 during peak periods (i.e. one weekend before and after Ching Ming and Chung Yeung Festival).

1.4 Project Description

- 1.4.1 The ancillary columbarium has been in use since 1970s. It is expected that the columbarium will have 11,726 niches, all of which could be sold once the temple acquired a licence under the *Private Columbaria Ordinance (Cap. 630)* from the FEHD.

2. SEWERAGE IMPACT ASSESSMENT

2.1 Introduction

- 2.1.1 This section summarises an assessment of the sewerage impact during the operation phase. It also recommends measures to mitigate such impact where necessary.

2.2 Sources of Wastewater and Sewerage Infrastructure

Sewage Sources on-site

- 2.2.1 Buddhist Cheung Ha Temple (佛教長霞淨院) has toilets and hand-washing basins provided on-site for use by visitors. Each toilet is equipped with hand-washing basins inside.
- 2.2.2 Existing facilities within the application site that produce effluents include:
1. Washroom (1 male and 1 female)
 2. Hand-washing basins (a total of 4 nos. including 3 nos. in the women's washroom and 1 no. in the men's washroom).
- 2.2.3 Figure 2.1 shows the location of these sources of wastewater and effluent discharge network on-site. Figure 2.2 presents photos of the facilities mentioned above. Discharges from toilets and hand-washing basins are diverted to the public sewers connecting to the Application Site (Figure 2.1).

Sewerage Infrastructure in the Vicinity

- 2.2.4 According to drainage record plans published by the Drainage Services Department (DSD), public sewers are available along Kam Shan Road as shown in Figure 2.3 and Figure 2.4. DSD's drainage record plans are provided in Appendix 2.2.
- 2.2.5 Sewage from the Application Site is currently discharged to existing manhole G1 (FMH1001408) to the east of the Application Site, which then connects to manhole FMH1001060 along Kam Shan Road.
- 2.2.6 The current planning application is to regularise the columbarium as part of the Buddhist Cheung Ha Temple and there are no changes to the existing toilet facilities at the temple. There is no change in the existing site layout or drainage system in this Application, the existing manholes will be kept as is.
- 2.2.7 A CCTV survey was conducted on 7 January 2025 to verify the connection from the Application Site to the public sewerage system. Detailed findings of CCTV survey are provided in Appendix 2.3. Wastewater including effluents from washroom and hand-washing basins, are discharged from the terminal manhole FTH1000399 to existing public manhole G1 (FMH1001408) via a PVC pipe of 150mm diameter. The measured size of pipe connecting manhole G1 (FMH1001408) and G2 (FMH1001409) is 150mm and the measured length of such pipe is 6.5m.
- 2.2.8 The measured invert level of the existing terminal manhole at the Application Site is 19.585mPD, which is higher than the measured invert level of 13.63 mPD at the existing manhole G1 (FMH1001408). The measured invert level of the downstream pipe at G1 is 13.625 mPD, which is lower than the invert level of the upstream pipe. Thus, sewage can be discharged via the existing sewers from the terminal manhole to G1 and then G2 under gravity.

2.3 Assessment of Sewage Impact

Sewage Catchment

- 2.3.1 As the existing sewerage network north of Kam Shan is connected with the downstream catchment system along Pak Shing Street (Figure 2.4 and Figure 2.5), the relevant sewerage network upstream and downstream of the Application Site have been analysed in this SIA to confirm if there are adequate spare capacities in the relevant sewerage sections receiving flows from the Application Site. The sewage catchments involved in the SIA are given in Table 2.1 below and shown in Figure 2.5 and Figure 2.6, with details of the SIA appended in Appendix 2.1. Discharge from the Application Site is included as Catchment B2.

Table 2.1 Sewage Catchments Involved in this SIA

Catchment	ID	Constituent Population	Population
A	1	Kam Shan Tsuen Nos. 69 - 75, 77 - 81	101
	2	Kam Shan Tsuen Nos. 82 - 86	12
	3	Ye Yuen Estate (Kam Shan Tsuen Nos. 88 - 111)	202
	4	Kam Shek New Village Nos. 1 - 36	303
	5	Kam Shek New Village Nos. 37 - 110	619
	5.1	105 Café and Proposed Extension (Kam Shek New Village No. 105)	5
	6	Kam Shan Tsuen Nos. 27B, 81D, 87	26
	7	Kam Shan Tsuen Nos. 112 - 169	488
	8	Kam Shan village houses	42
	9	Norwegian International School	220
	10	School of Everyday Life (former Buddhist Tai Kwong Middle School)	481
	11	Yat Wing Garden Phase 1 (201 - 239 Kam Shan)	328
	12	Yat Wing Garden Phase 2 (152 - 166 Shek Kwu Lung)	126
	13	Yat Wing Garden Phase 3 (168 - 173 Shek Kwu Lung) and 24A Shek Kwu Lung	51
	14	Shek Kwu Lung village houses	773
	15	Kam Shek Tsuen 130 - 138, 141	84
	16	Kam Shan 171A 171B, 172 - 175, 179 - 182 and Temporary Structures at Kam Yu Road	90
	17	Cypress (Block 1 to Block 10) at Shek Lin Road	84
	43	Pun Chun Yuen	-
B1	18	Kam Shan Tsuen No. 76 (Cheung Ha Temple office)	20
	19	Kam Shan Tsuen No. 65 - 66	12
	20	Kam Shan Tsuen Nos. 63 - 64	17

Catchment	ID	Constituent Population	Population
	21	Kam Shan Tsuen Nos. 61 - 62	17
	22	Kam Shan Tsuen Nos. 57 - 60	17
B2	23	Kam Shan Tsuen Nos. 43, 44 and 45 (Cheung Ha Temple)	36
C1	24	Kam Shan Tsuen Nos. 54, 54A, 55	23
C2	25	Kam Shan Tsuen Nos. 12 - 27 (Greenwich Garden)	90
	26	Kam Shan Tsuen Nos. 28 - 29 and nearby temporary structures	42
	27	Kam Shan Tsuen Nos. 30 - 33, 33A, 33B, 35 - 36	51
	28	Kam Shan Tsuen Nos. 37 - 42	51
C3	29	Kam Shan Tsuen Nos. 52, 52A, 52B	12
	30	Kam Shan Tsuen Nos. 1, 2, 3A and 3B	34
	31	Kam Shan Tsuen Nos. 5 - 11, 8A and 8B	76
	32	Kam Shan Tsuen Nos. 46 - 51	17
	33	Temporary structures near the junction of Hon Ka Road and Kam Shan Road	9
	34	Retail shops at the junction of Hon Ka Road and Kam Shan Road	6
D1	35	Pak Shing Street Public Toilet and Bathhouse	-
D2	36	Shui On Building (1/F - 5/F)	56
	37	Bong Hing Building (2/F - 10/F)	224
	38	Fu Shin Home for the Aged (1/F, Bong Hing Building)	71
	39	Retail shops at the G/F of Shui On Building	4
	40	Restaurants at the G/F of Shui On Building	5
	41	Retail shops at the G/F of Bong Hing Building	24
	42	Restaurants at the G/F of Bong Hing Building	5

Notes:

1. The population in the village type development was estimated based on the number of household within each house block multiplied by the average domestic household size acquired from 2023 General Household Survey (2.8 for Tai Po).
2. The contribution population from retail shops is estimated with reference to Table 2 in Chapter 5 of the Hong Kong Planning Standards and Guidelines (HKPSG).
3. The contribution population from restaurants is estimated with reference to Figure 9 of the Commercial and Industrial Floor Space Utilization Survey.

Sewage Generated by the Application Site

- 2.3.2 The current planning application is to regularise the columbarium as part of the Buddhist Cheung Ha Temple and there are no changes to the existing facilities or operation at the temple. Sewage arising from the Application Site is mainly contributed by the washroom facilities in the temple, as listed out in Figure 2.2, generated by employees and visitors. The sewage flow rate of the employee of the site is estimated to be 2.5 m³/day, where the peak flow (with toilet flow) is expected to be 3.6 litre/sec.

- 2.3.3 Given a high transient population and limited toilets/ hand-washing facilities, the peak sewage flow was estimated using a facilities-constrained approach elaborated in Appendix 2.1 instead of the conventional approach outlined in the “*Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning, v1*” published by EPD [ref: Report No: EPD/TP 1/05 dated March 2005].

Estimation of Average Dry-weather Flow (“ADWF”) from Catchments

- 2.3.4 As per the EPD/TP 1/05, the average flow from each sewage catchment was estimated and presented in Appendix 2.1 based on:

$$Q_{AVERAGE} = (Q_{DOMESTIC} + Q_{COMMERCIAL} + Q_{INSTITUTIONAL} + Q_{INDUSTRIAL}) \times P_{CIF}$$

where

$Q_{DOMESTIC}$	=	Average dry weather domestic flow
$Q_{COMMERCIAL}$	=	Average dry weather commercial flow
$Q_{INSTITUTIONAL}$	=	Average dry weather institutional flow
$Q_{INDUSTRIAL}$	=	Average dry weather industrial flow
P_{CIF}	=	Catchment inflow factor to account for overall ingress of water or wastewater to the sewerage system (1.00 for Tai Po)

- 2.3.5 The individual ADWF in each catchment are calculated by multiplying the population with the relevant unit flow factors given in Table T-1 and Table T-2 in EPD/TP 1/05 (Appendix 2.1).

Peak Flow Estimation for the Catchments

- 2.3.6 To account for diurnal and seasonal flow variation with stormwater allowance, the average dry weather flows from each catchment have been scaled up by the population dependent peaking factor given in Table T-5 in EPD/TP 1/05 (Appendix 2.1).

$$Q_{PEAK} = Q_{AVERAGE} \times P$$

where

Q_{PEAK}	=	Peak flow
$Q_{AVERAGE}$	=	Average dry weather flow, ADWF
P	=	Peaking factor to account for the diurnal and seasonal flow variation with stormwater allowance

Overall Peak Flows from the Catchments

- 2.3.7 The estimated sewage generated from upstream and downstream catchments have been included in the calculations in Appendix 2.1.

Results of SIA

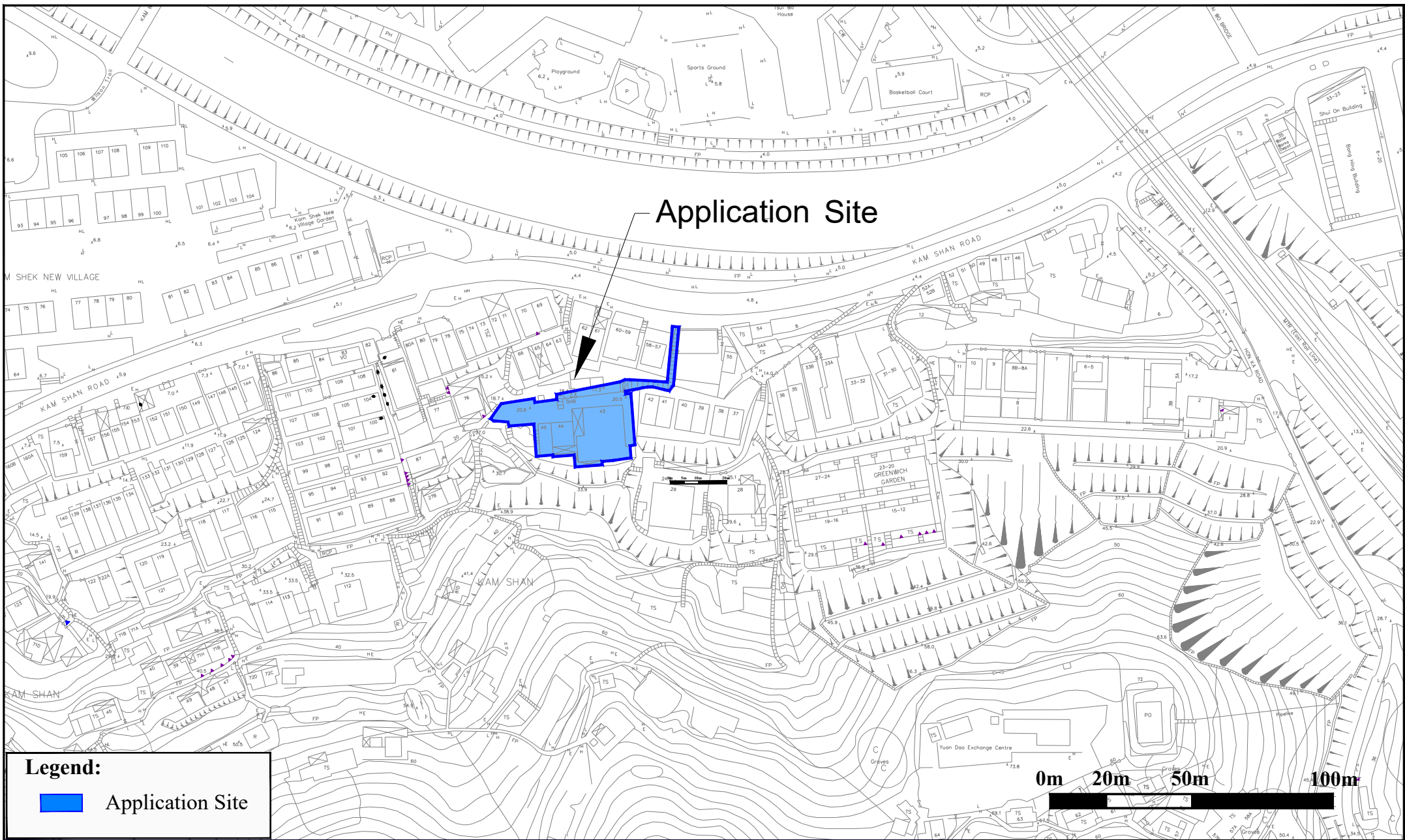
- 2.3.8 Results given in Table 4 of Appendix 2.1 indicate that sewage contribution from the Application Site and catchment areas would be well within the capacities of the existing sewers along Kam Shan Road.
- 2.3.9 As such, no new sewerage network nor upgrading works are required. As all sewage will eventually be conveyed to Tai Po Sewage Treatment Works for treatment prior to marine disposal, no unacceptable local water quality impact is anticipated.

3. CONCLUSION

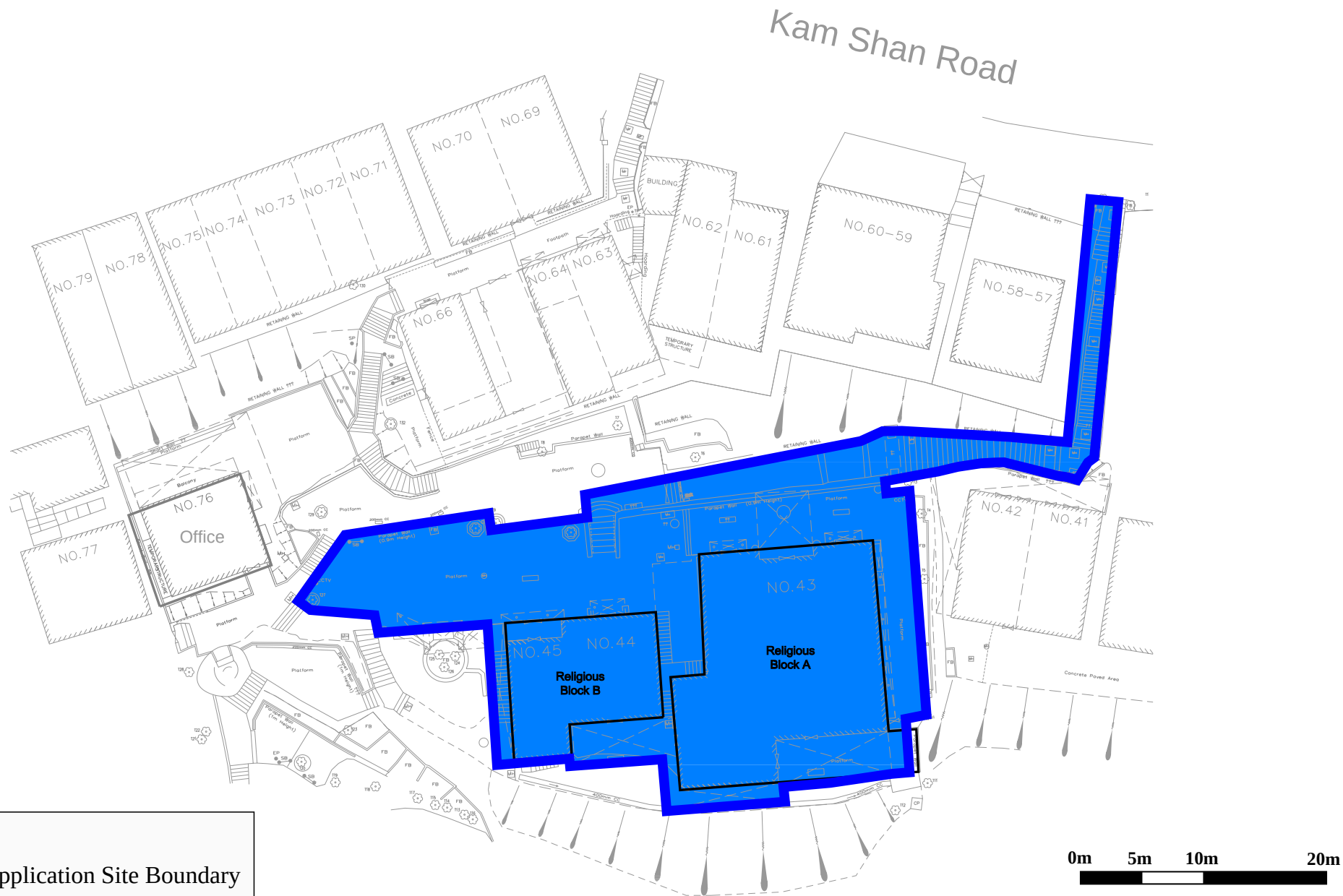
3.1 Overall Conclusion

- 3.1.1 A Section 12A Rezoning Application is necessary to facilitate regularisation of the present Columbarium, which has been in use since 1970s.
- 3.1.2 As the Columbarium has been established and in operation within the existing structures, no construction, addition or alteration works will be required. The Columbarium is projected to have a total of 11,726 sold niches after the temple has acquired the licence under the *Private Columbaria Ordinance (Cap. 630)* from the FEHD.
- 3.1.3 Public sewers have already been installed to discharge sewage generated from the Application Site. Given limited toilet facilities, and observed short stay of visitors, a surge in sewage generation during the peak seasons is not envisaged.
- 3.1.4 Results of this sewerage impact assessment confirm that the existing sewerage catchment would have enough capacity to handle peak flows from the Application Site during peak seasons (Ching Ming or Chung Yeung Festivals) as well as peak flows from other relevant catchments based on the existing toilet facilities in the temple. The sewage flow in the receiving public sewers contributed by the Application Site would be within the capacities of the downstream pipes. Sewage generated from the Application Site will be conveyed to Tai Po Sewage Treatment Works for treatment.

Figure



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Checked by:	KY
Rev.:	1.3
Date:	Sep 2024



Legend:



Application Site Boundary

Figure: 1.2

Title: Layout of Application Site

Project: Rezoning Request from “V” to “G/IC (3)” for Buddhist Cheung Ha Temple, at Lot Nos. 1087 and 1130 in DD6 and adjoining Government land, Tai Po

RAMBOLL

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Rev.: 1.0

Date: Aug 2024



Women's Toilet with washing basins (3 nos.) and water closets (4 nos.)



Men's Toilet with washing basin (1 no.), urinals (3 nos.) and water closet (1 no.)

Figure: 2.2

Title: Sources of Wastewater on site

Project: Rezoning Request from "V" to "G/IC (3)" for Buddhist Cheung Ha Temple, at Lot Nos. 1087 and 1130 in DD6 and adjoining Government land, Tai Po

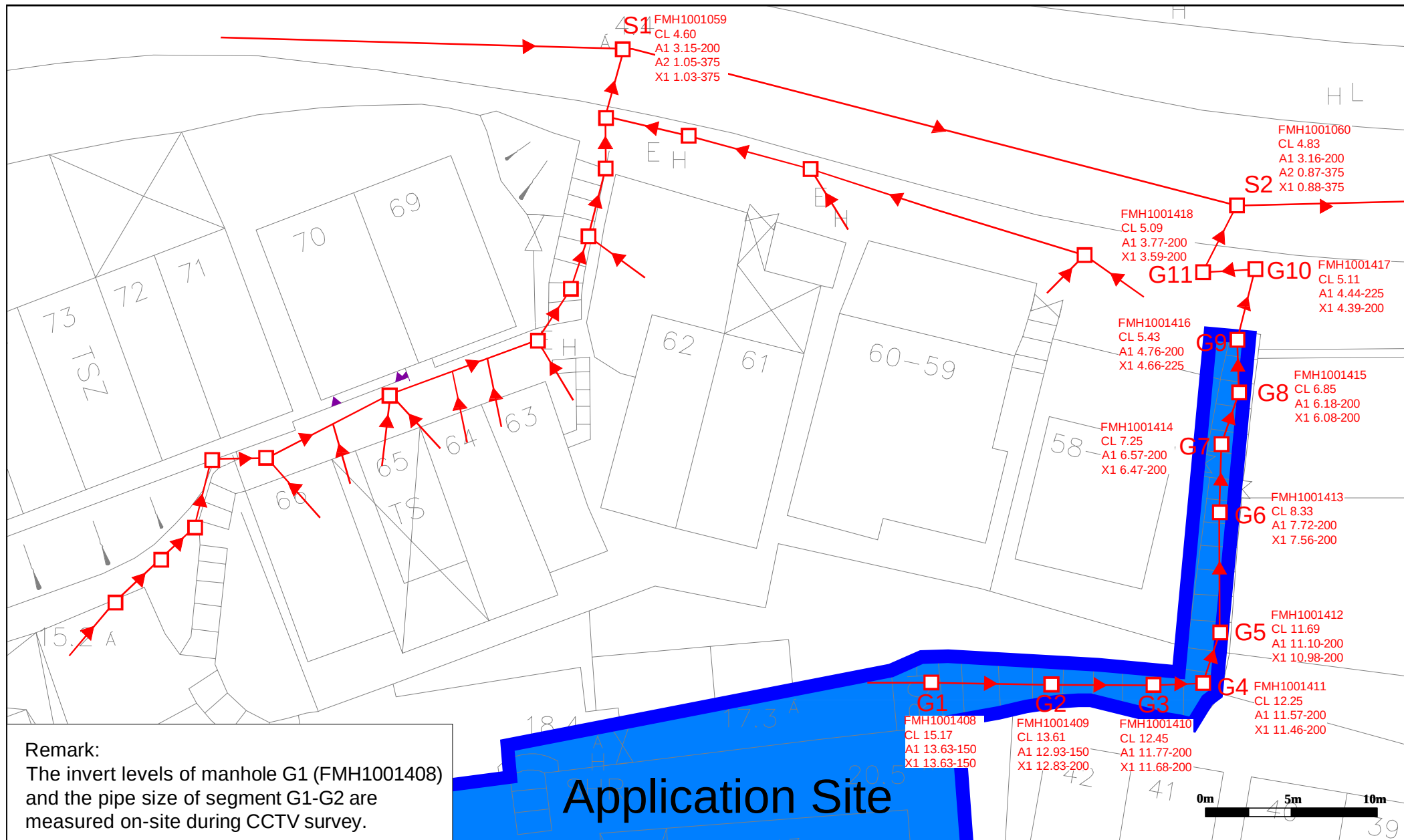
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Date: May 2024



Remark:
The invert levels of manhole G1 (FMH1001408) and the pipe size of segment G1-G2 are measured on-site during CCTV survey.

Figure: 2.3

Title: Existing Sewerage Infrastructure in the Vicinity of the Application Site

Project: Rezoning Request from "V" to "G/IC (3)" for Buddhist Cheung Ha Temple, at Lot Nos. 1087 and 1130 in DD6 and adjoining Government land, Tai Po

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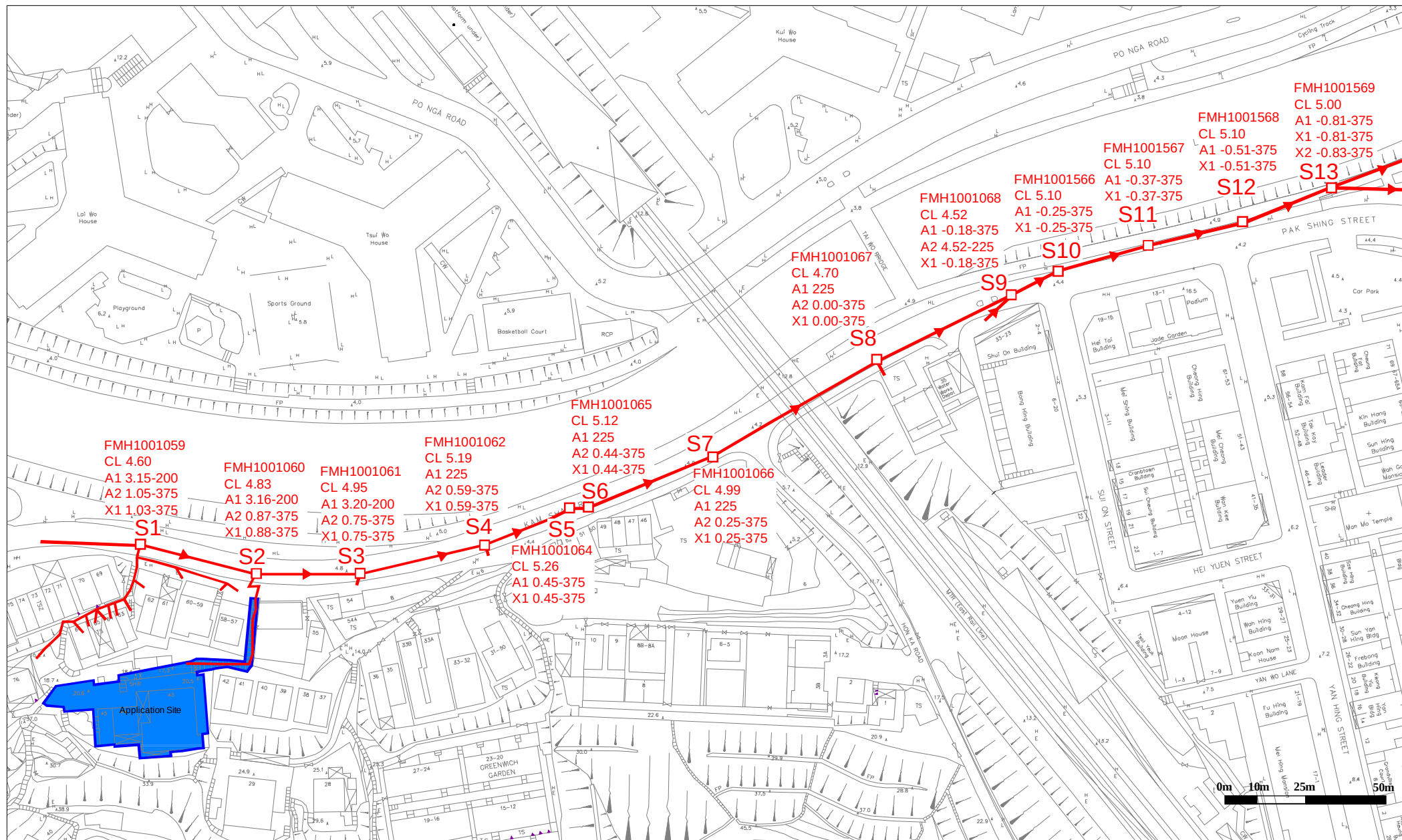


Figure: 2.4

Title: Existing Sewerage Infrastructure North of Kam Shan

Project: Rezoning Request from "V" to "G/IC (3)" for Buddhist Cheung Ha Temple, at Lot Nos. 1087 and 1130 in DD6 and adjoining Government land, Tai Po

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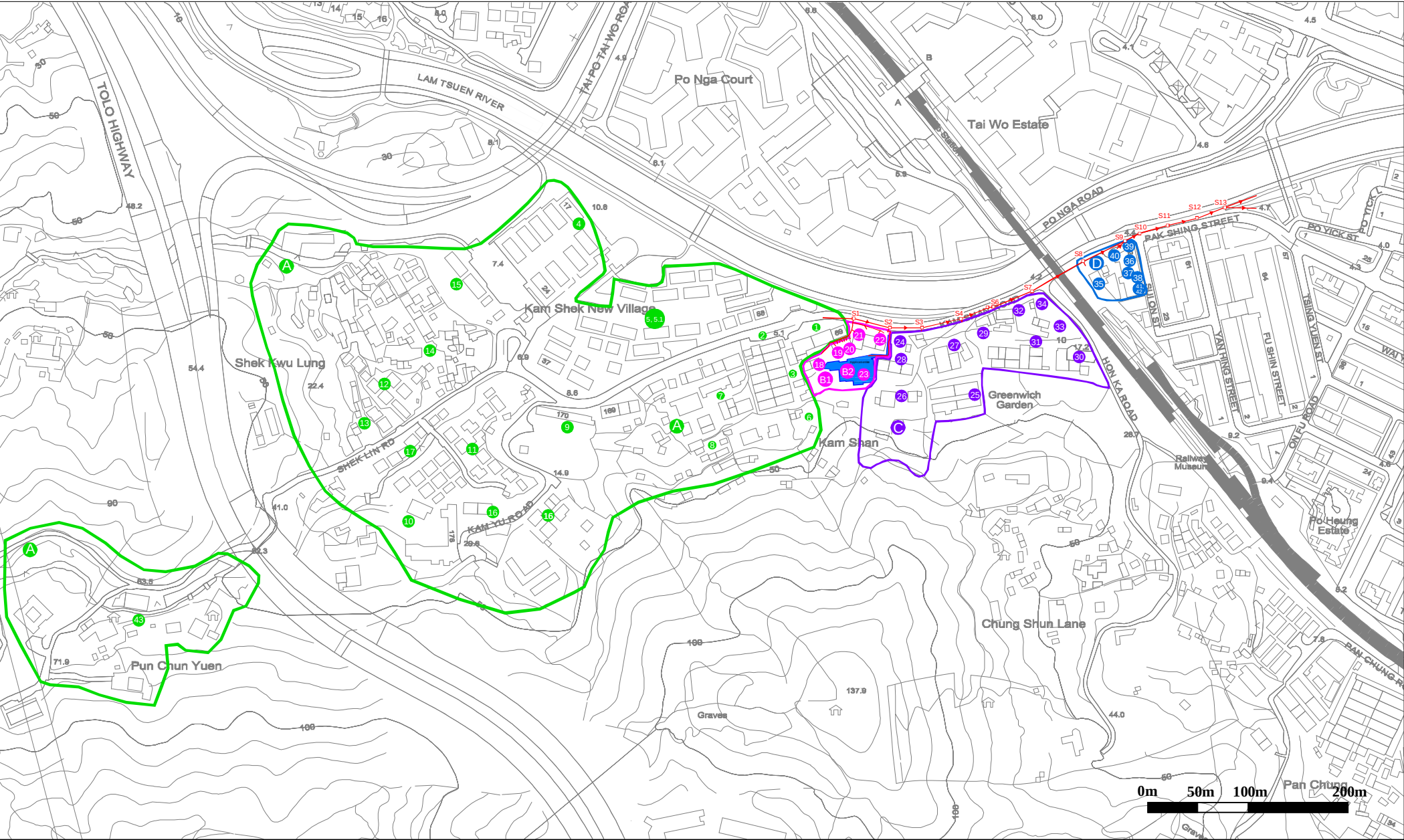


Figure: 2.5	RAMBOLL
Title: Catchments Identified in the Sewerage Network Assessed under SIA for the Adequacy of Capacity (1 of 2)	Drawn by: JW
Project: Rezoning Request from "V" to "G/IC (3)" for Buddhist Cheung Ha Temple, at Lot Nos. 1087 and 1130 in DD6 and adjoining Government land, Tai Po	Checked by: KY
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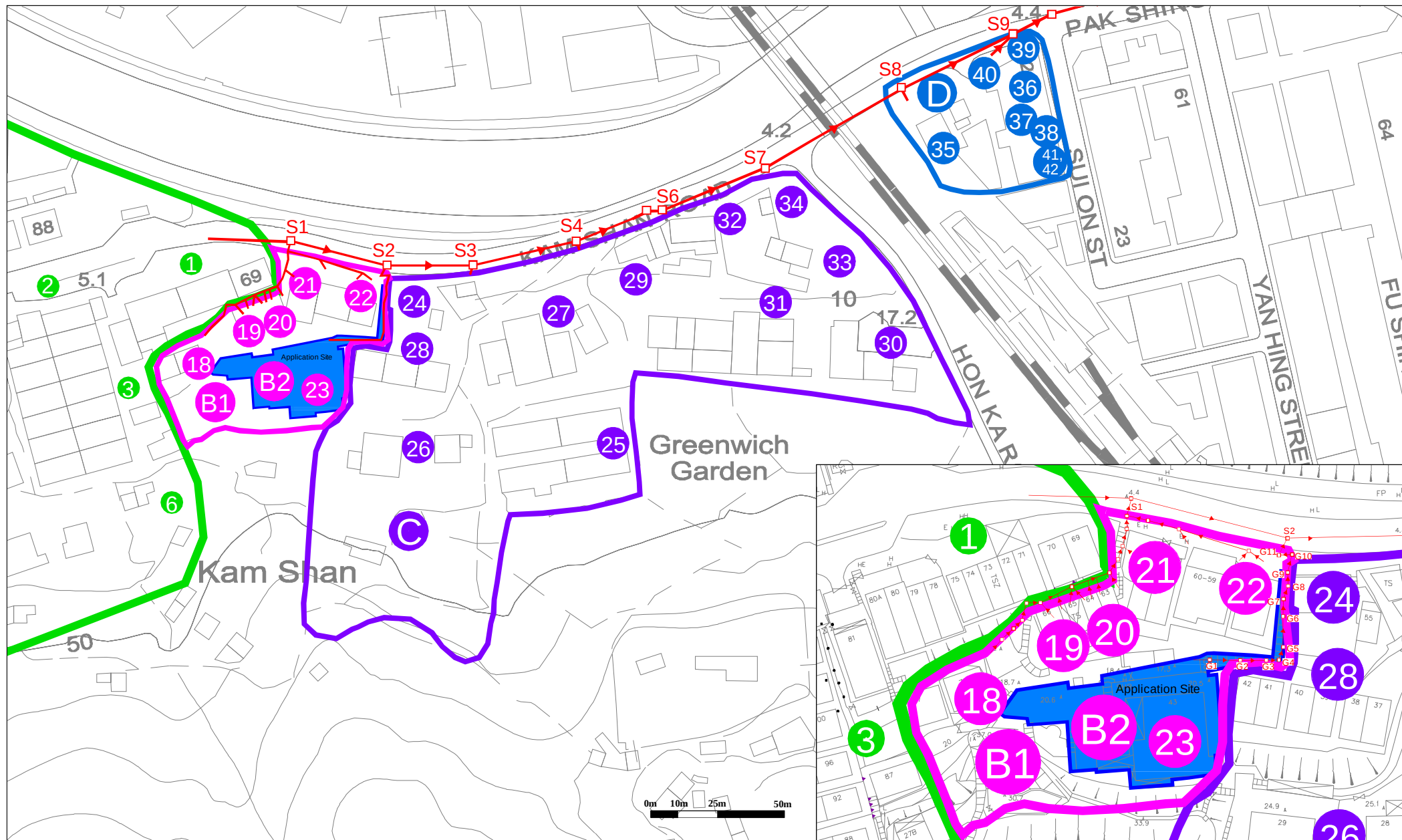


Figure: 2.6

Title: Catchments Identified in the Sewerage Network assessed under SIA for the Adequacy of Capacity (2 of 2)

Project: Rezoning Request from "V" to "G/IC (3)" for Buddhist Cheung Ha Temple, at Lot Nos. 1087 and 1130 in DD6 and adjoining Government land, Tai Po

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Rev.: 1.0

Date: May-2024

Appendix 2.1 Details of Sewerage Impact Assessment

Table 1 Estimated Sewage Generated from the Application Site

Application Site: Kam Shan Tsuen Nos. 43, 44 and 45 (Cheung Ha Temple)

2a. Number of employees	=	36 people (provided by Buddhist Cheung Ha Temple)
2b. Design flow	=	0.28 m ³ /person/day -- (refer to Table T-2 of GESF - J11 Community, Social & Personal Services)
2c. Sewage Generation rate	=	10.1 m ³ /day
2d. Wash Basin (1 in Male toilet + 3 in Female toilet)	=	1.2 litre/sec (DU of 0.3 L/s per basin) ⁽¹⁾
2e. Single Urinals with cistern (3 in Male toilet)	=	1.2 litre/sec (DU of 0.4 L/s per urinal) ⁽¹⁾
2f. WC with cistern (1 in Male toilet + 4 in Female toilet)	=	9.0 litre/sec (DU of 1.8 L/s per WC) ⁽¹⁾
2g. Frequency of use (K) ⁽²⁾	=	1.0
2h. Wastewater Flow Rate ⁽³⁾	=	3.4 litre/sec

Sub-total Application Site (Temple) discharged to Manhole G1 (FMH1001408) (Catchment B2)

Flow Rate	=	10.1 m ³ /day
Contributing Population	=	37 people
Peaking factor	=	8 Refer to Table T-5 of GESF for population <1,000 including stormwater allowance
Peak Flow	=	0.9 litre/sec
Peak Flow with Toilet Flow	=	<u>4.3</u> litre/sec

Note:

(1) Institution of Plumbing – Table 5 (which gives the discharge unit values (DU), in litres per second, for common appliances) under "Sanitary plumbing and drainage" on page 112 in *Plumbing Engineering Services Design Guide* (IoP Guide)

(2) Frequency of use (K) = 1.0 (congested use, e.g. toilets and/ or showers open to the public) for assessment of peak design flow, Institution of Plumbing – Table 6 under "Sanitary plumbing and drainage" on page 112 in IoP Guide

(3) Wastewater flow rate = $K \cdot \sqrt{\sum DU}$ (for assessment of peak design flow presented under "Sanitary plumbing and drainage" on page 112 in IoP Guide)

Table 2 Hydraulic Capacity of Existing Sewers at Kam Shan Road, Tai Po

Segment	Manhole Reference	Manhole Reference	Pipe Dia.	Pipe Length	Invert Level 1	Invert Level 2	g	k _s	s	v	V	Area	Q	Estimated Capacity
			mm	m	mPD	mPD	m/s ²	m		m ² /s	m/s	m ²	m ³ /s	L/s
S1-S2	FMH1001059	FMH1001060	375	36.5	1.03	0.87	9.81	0.0006	0.004	0.000001	1.20	0.11	0.13	132
G1-G2	FMH1001408	FMH1001409	150	6.5	13.63	12.93	9.81	0.0006	0.107	0.000001	3.31	0.02	0.06	59
G2-G3	FMH1001409	FMH1001410	200	5.4	12.83	11.77	9.81	0.0006	0.197	0.000001	5.42	0.03	0.17	170
G3-G4	FMH1001410	FMH1001411	200	2.4	11.68	11.57	9.81	0.0006	0.046	0.000001	2.62	0.03	0.08	82
G4-G5	FMH1001411	FMH1001412	200	2.5	11.46	11.10	9.81	0.0006	0.142	0.000001	4.60	0.03	0.14	144
G5-G6	FMH1001412	FMH1001413	200	6.4	10.98	7.72	9.81	0.0006	0.511	0.000001	8.74	0.03	0.27	275
G6-G7	FMH1001413	FMH1001414	200	3.4	7.56	6.57	9.81	0.0006	0.293	0.000001	6.61	0.03	0.21	208
G7-G8	FMH1001414	FMH1001415	200	2.5	6.47	6.18	9.81	0.0006	0.114	0.000001	4.12	0.03	0.13	130
G8-G9	FMH1001415	FMH1001416	200	2.4	6.08	4.76	9.81	0.0006	0.555	0.000001	9.11	0.03	0.29	286
G9-G10	FMH1001416	FMH1001417	225	3.5	4.66	4.44	9.81	0.0006	0.063	0.000001	3.30	0.04	0.13	131
G10-G11	FMH1001417	FMH1001418	200	2.4	4.39	3.77	9.81	0.0006	0.261	0.000001	6.24	0.03	0.20	196
G11-S2	FMH1001418	FMH1001060	200	3.9	3.59	3.16	9.81	0.0006	0.112	0.000001	4.08	0.03	0.13	128
S2-S3	FMH1001060	FMH1001061	375	31.4	0.88	0.75	9.81	0.0006	0.004	0.000001	1.16	0.11	0.13	128
S3-S4	FMH1001061	FMH1001062	375	39.4	0.75	0.59	9.81	0.0006	0.004	0.000001	1.15	0.11	0.13	127
S4-S5	FMH1001062	FMH1001064	375	28.5	0.59	0.45	9.81	0.0006	0.005	0.000001	1.27	0.11	0.14	140
S5-S6	FMH1001064	FMH1001065	375	4.4	0.45	0.44	9.81	0.0006	0.002	0.000001	0.86	0.11	0.09	95
S6-S7	FMH1001065	FMH1001066	375	41.5	0.44	0.25	9.81	0.0006	0.005	0.000001	1.22	0.11	0.13	135
S7-S8	FMH1001066	FMH1001067	375	58.6	0.25	0.00	9.81	0.0006	0.004	0.000001	1.18	0.11	0.13	130
S8-S9	FMH1001067	FMH1001068	375	45.0	0.00	-0.18	9.81	0.0006	0.004	0.000001	1.14	0.11	0.13	126
S9-S10	FMH1001068	FMH1001566	375	16.4	-0.18	-0.25	9.81	0.0006	0.004	0.000001	1.18	0.11	0.13	130
S10-S11	FMH1001566	FMH1001567	375	28.5	-0.25	-0.37	9.81	0.0006	0.004	0.000001	1.17	0.11	0.13	129
S11-S12	FMH1001567	FMH1001568	375	30.2	-0.37	-0.51	9.81	0.0006	0.005	0.000001	1.23	0.11	0.14	136
S12-S13	FMH1001568	FMH1001569	375	28.5	-0.51	-0.81	9.81	0.0006	0.011	0.000001	1.86	0.11	0.21	205

Remarks: (1) g=gravitational acceleration; k_s=equivalent sand roughness; s=gradient; v=kinematic viscosity of water; V=mean velocity

(2) The value of k_s = 0.6mm is used for the calculation of slimed clayware sewer, poor condition with velocity of approximately 1.2 m/s (based on Table 5: Recommended roughness values in Sewerage Manual)

(3) The value of velocity (V) is referred to the Tables for the hydraulic design of pipes, sewers and channels (8th edition)

(4) Equation used:
$$V = -\sqrt{(8gDs)} \log\left(\frac{k_s}{3.7D} + \frac{2.51v}{D\sqrt{(2gDs)}}\right)$$

(5) The invert level of FMH1001408 is measured to be 16.625mPD during CCTV survey, which is rounded to 2 d.p. for calculation.

(6) The pipe length and pipe diameter of segment G1-G2 are measured to be 6.5m and 150mm respectively during CCTV survey.

Table 3a Calculation for Sewage Generation Rate of the Existing Surrounding (Catchment A)

Catchment A

1. Kam Shan Tsuen Nos. 69 - 75, 77 - 81

1a. Assumed number of residents	=	101 people (Estimated from the no. of households and avg domestic household size of 2.8 in Tai Po)
1b. Design flow	=	0.27 m ³ /person/day -- (Modern Village in Table T-1 of GESF)
1c. Sewage Generation rate	=	27.3 m ³ /day

2. Kam Shan Tsuen Nos. 82-86

2a. Assumed number of residents	=	12 people (Estimated from the no. of households and avg domestic household size of 2.8 in Tai Po)
2b. Design flow	=	0.27 m ³ /person/day -- (Modern Village in Table T-1 of GESF)
2c. Sewage Generation rate	=	3.2 m ³ /day

3. Ye Yuen Estate (Kam Shan Tsuen Nos. 88-111)

3a. Assumed number of residents	=	202 people (Estimated from the no. of households and avg domestic household size of 2.8 in Tai Po)
3b. Design flow	=	0.27 m ³ /person/day -- (Modern Village in Table T-1 of GESF)
3c. Sewage Generation rate	=	54.5 m ³ /day

4. Kam Shek New Village Nos. 1-36

4a. Assumed number of residents	=	303 people (Estimated from the no. of households and avg domestic household size of 2.8 in Tai Po)
4b. Design flow	=	0.27 m ³ /person/day -- (Modern Village in Table T-1 of GESF)
4c. Sewage Generation rate	=	81.8 m ³ /day

5. Kam Shek New Village Nos. 37-110

5a. Assumed number of residents	=	619 people (Estimated from the no. of households and avg domestic household size of 2.8 in Tai Po)
5b. Design flow	=	0.27 m ³ /person/day -- (Modern Village in Table T-1 of GESF)
5c. Sewage Generation rate	=	167.1 m ³ /day

5.1. 105 Café and Proposed Extension (Kam Shek New Village No. 105)

Reference: Planning application A/TP/679 (<https://www.ozp.tpb.gov.hk/api/Perm/Gist?caseNo=A%2fTP%2f679&lang=EN&ext=pdf&dType=in>)

5ia. Assumed Floor Area	=	99.4 m ²
5ib. Assumed floor area per employee	=	19.6 m ² per employee -- (refer to Table 8 of CIFSUS - Restaurants)
5ic. Total number of employees	=	5 employees
5id. Design flow for commercial employee	=	1.58 m ³ /employee/day -- (refer to Table T-2 of GESF - J10 Restaurants & Hotels)
5ie. Sewage Generation rate	=	8 m ³ /day

6. Kam Shan Tsuen Nos. 27B, 81D, 87

6a. Assumed number of residents	=	26 people (Estimated from the no. of households and avg domestic household size of 2.8 in Tai Po)
6b. Design flow	=	0.27 m ³ /person/day -- (Modern Village in Table T-1 of GESF)
6c. Sewage Generation rate	=	7.0 m ³ /day

7. Kam Shan Tsuen Nos. 112-169

7a. Assumed number of residents	=	488 people (Estimated from the no. of households and avg domestic household size of 2.8 in Tai Po)
7b. Design flow	=	0.27 m ³ /person/day -- (Modern Village in Table T-1 of GESF)
7c. Sewage Generation rate	=	131.8 m ³ /day

8. Kam Shan Village Houses

8a. Assumed number of residents	=	42 people (Estimated from the no. of households and avg domestic household size of 2.8 in Tai Po)
8b. Design flow	=	0.27 m ³ /person/day -- (Modern Village in Table T-1 of GESF)
8c. Sewage Generation rate	=	11.3 m ³ /day

9. Norwegian International School

Reference: https://en.wikipedia.org/wiki/Norwegian_International_School

9a. Total number of teachers & staff	=	20 teachers & staff
9c. Design flow for teachers & staff	=	0.28 m ³ /person/day -- (refer to Table T-2 of GESF - J11 Community, Social & Personal Services)
9b. Total number of students	=	200 students
9d. Design flow for students	=	0.04 m ³ /person/day -- (School Student in Table T-2 of GESF)
9e. Sewage Generation rate	=	13.6 m ³ /day

10. School of Everyday Life (former Buddhist Tai Kwong Middle School)

Reference:

<https://www.schooland.hk/ss/btkchc#:~:text=%E8%B7%9F%E5%85%B6%E4%BB%96440%20%E9%96%93%E5%AD%B8%E6%A0%A1,2021%2F2022%20%E5%AD%B8%E5%B9%B4%E7%9A%84%E6%95%B8%E6%93%9A%E3%80%82>
https://www.btkchc.edu.hk/image/catalog/school_plan/Report/2122_school_report.pdf

10a. Total number of teachers & staff	=	53 teachers & staff
10c. Design flow for teachers & staff	=	0.28 m ³ /person/day -- (refer to Table T-2 of GESF - J11 Community, Social & Personal Services)
10b. Total number of students	=	428 students
10d. Design flow for students	=	0.04 m ³ /person/day -- (School Student in Table T-2 of GESF)
10e. Sewage Generation rate	=	32.0 m ³ /day

11. Yat Wing Garden Phase 1 (201-239 Kam Shan)

11a. Assumed number of residents	=	328 people (Estimated from the no. of households and avg domestic household size of 2.8 in Tai Po)
11b. Design flow	=	0.27 m ³ /person/day -- (Modern Village in Table T-1 of GESF)
11c. Sewage Generation rate	=	88.6 m ³ /day

12. Yat Wing Garden Phase 2 (152-166 Shek Kwu Lung)

12a. Assumed number of residents	=	126 people (Estimated from the no. of households and avg domestic household size of 2.8 in Tai Po)
12b. Design flow	=	0.27 m ³ /person/day -- (Modern Village in Table T-1 of GESF)
12c. Sewage Generation rate	=	34.0 m ³ /day

Table 3a Calculation for Sewage Generation Rate of the Existing Surrounding (Catchment A)

13. Yat Wing Garden Phase 3 (168-173 Shek Kwu Lung) and 24A Shek Kwu Lung

13a. Assumed number of residents	=	51 people (Estimated from the no. of households and avg domestic household size of 2.8 in Tai Po)
13b. Design flow	=	0.27 m ³ /person/day -- (Modern Village in Table T-1 of GESF)
13c. Sewage Generation rate	=	13.8 m ³ /day

14. Shek Kwu Lung Village Houses

14a. Assumed number of residents	=	773 people (Estimated from the no. of households and avg domestic household size of 2.8 in Tai Po)
14b. Design flow	=	0.27 m ³ /person/day -- (Modern Village in Table T-1 of GESF)
14c. Sewage Generation rate	=	208.7 m ³ /day

15. Kam Shek Tsuen 130-138, 141

15a. Assumed number of residents	=	84 people (Estimated from the no. of households and avg domestic household size of 2.8 in Tai Po)
15b. Design flow	=	0.27 m ³ /person/day -- (Modern Village in Table T-1 of GESF)
15c. Sewage Generation rate	=	22.7 m ³ /day

16. Kam Shan 171A 171B, 172 - 175, 179 - 182 and Temporary Structures at Kam Yu Road

16a. Assumed number of residents	=	90 people (Estimated from the no. of households and avg domestic household size of 2.8 in Tai Po)
16b. Design flow	=	0.27 m ³ /person/day -- (Modern Village in Table T-1 of GESF)
16c. Sewage Generation rate	=	24.3 m ³ /day

17. Cypress (Blocks 1 to 10) at Shek Lin Road

17a. Assumed number of residents	=	84 people (Estimated from the no. of households and avg domestic household size of 2.8 in Tai Po)
17b. Design flow	=	0.27 m ³ /person/day -- (Modern Village in Table T-1 of GESF)
17c. Sewage Generation rate	=	22.7 m ³ /day

43. Pun Chun Yuen

Reference: Planning Application A/TP/681 (<https://www.ozp.tpb.gov.hk/api/Perm/Gist?caseNo=A%2fTP%2f681&lang=EN&ext=pdf&dType=in>)

43a. Sewage Generation rate	=	17.6 m ³ /day
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Sub-total Catchment A discharged to Manhole S1 (FMH1001059)

Flow Rate	=	969.9 m ³ /day
Contributing Population	=	3592 people
Peaking factor	=	6 Refer to Table T-5 of GESF for population 1,000-5,000 including stormwater allowance
Peak Flow	=	<u>67.4</u> litre/sec

Table 3b Calculation for Sewage Generation Rate of the Existing Surrounding (Catchment B)

Catchment B1

18. Kam Shan Tsuen No. 76 (Cheung Ha Temple Office)

18a. Assumed number of employees	=	20 (as advised by Cheung Ha Temple)
18b. Design flow	=	0.28 m ³ /person/day -- (refer to Table T-2 of GESF - J11 Community, Social & Personal Services)
18c. Sewage Generation rate	=	5.6 m ³ /day

19. Kam Shan Tsuen No. 65-66

19a. Assumed number of residents	=	12 people (Estimated from the no. of households and avg domestic household size of 2.8 in Tai Po)
19b. Design flow	=	0.27 m ³ /person/day -- (Modern Village in Table T-1 of GESF)
19c. Sewage Generation rate	=	3.2 m ³ /day

20. Kam Shan Tsuen Nos. 63-64

20a. Assumed number of residents	=	17 people (Estimated from the no. of households and avg domestic household size of 2.8 in Tai Po)
20b. Design flow	=	0.27 m ³ /person/day -- (Modern Village in Table T-1 of GESF)
20c. Sewage Generation rate	=	4.6 m ³ /day

21. Kam Shan Tsuen Nos. 61-62

21a. Assumed number of residents	=	17 people (Estimated from the no. of households and avg domestic household size of 2.8 in Tai Po)
21b. Design flow	=	0.27 m ³ /person/day -- (Modern Village in Table T-1 of GESF)
21c. Sewage Generation rate	=	4.6 m ³ /day

22. Kam Shan Tsuen Nos. 57-60

22a. Assumed number of residents	=	17 people (Estimated from the no. of households and avg domestic household size of 2.8 in Tai Po)
22b. Design flow	=	0.27 m ³ /person/day -- (Modern Village in Table T-1 of GESF)
22c. Sewage Generation rate	=	4.6 m ³ /day

Sub-total Catchment B1 discharged to Manhole S1 (FMH1001059)

Flow Rate	=	22.6 m ³ /day
Contributing Population	=	84 people
Peaking factor	=	8 Refer to Table T-5 of GESF for population <1,000 including stormwater allowance
Peak Flow	=	2.1 litre/sec
Peak Flow with Basin	=	<u>2.1</u> litre/sec

Sub-total Catchment A + B1 discharged to Manhole S1 (FMH1001059)

Flow Rate	=	992.5 m ³ /day
Contributing Population	=	3676 people
Peaking factor	=	6 Refer to Table T-5 of GESF for population 1,000-5,000 including stormwater allowance
Peak Flow	=	68.9 litre/sec
Peak Flow with Basin	=	<u>68.9</u> litre/sec

Catchment B2 (Application Site)

23. Kam Shan Tsuen Nos. 43, 44 and 45 (Cheung Ha Temple)

23a. Assumed number of employees	=	36 people (provided by Buddhist Cheung Ha Temple)
23b. Design flow	=	0.28 m ³ /person/day -- (refer to Table T-2 of GESF - J11 Community, Social & Personal Services)
23c. Sewage Generation rate	=	10.1 m ³ /day
23d. Wash Basin (1 Male + 3 Female)	=	1.2 litre/sec (DU of 0.3 L/s per basin)
23e. Single Urinals with cistern (3 Male)	=	1.2 litre/sec (DU of 0.4 L/s per urinal)
23f. WC with cistern (1 Male + 4 Female)	=	9.0 litre/sec (DU of 1.8 L/s per WC)
23g. Frequency of use (K)	=	1.0
23h. Wastewater Flow Rate	=	3.4 litre/sec

Sub-total Catchment A + B1 + B2 discharged to Manhole S2 (FMH1001060)

Flow Rate	=	1002.5 m ³ /day
Contributing Population	=	3713 people
Peaking factor	=	6 Refer to Table T-5 of GESF for population 1,000-5,000 including stormwater allowance
Peak Flow	=	69.6 litre/sec
Peak Flow with Basin	=	<u>73.0</u> litre/sec

Table 3c Calculation for Sewage Generation Rate of the Existing Surrounding (Catchment C)

Catchment C1

24. Kam Shan Tsuen Nos. 54, 54A, 55

24a. Assumed number of residents	=	23 people (Estimated from the no. of households and avg domestic household size of 2.8 in Tai Po)
24b. Design flow	=	0.27 m ³ /person/day -- (Modern Village in Table T-1 of GESF)
24c. Sewage Generation rate	=	6.2 m³/day

Sub-total Catchment A + B1 + B2 + C1 discharged to Manhole S3 (FMH1001061)

Flow Rate	=	1008.7 m ³ /day
Contributing Population	=	3736 people
Peaking factor	=	6 Refer to Table T-5 of GESF for population 1,000-5,000 including stormwater allowance
Peak Flow	=	70.0 litre/sec
Peak Flow with Basin and Toilet Flow	=	<u>73.4 litre/sec</u>

Catchment C2

25. Kam Shan Tsuen Nos. 12 - 27 (Greenwich Garden)

25a. Assumed number of residents	=	90 people (Estimated from the no. of households and avg domestic household size of 2.8 in Tai Po)
25b. Design flow	=	0.27 m ³ /person/day -- (Modern Village in Table T-1 of GESF)
25c. Sewage Generation rate	=	24.3 m³/day

26. Kam Shan Tsuen Nos. 28 - 29 and nearby temporary structures

26a. Assumed number of residents	=	42 people (Estimated from the no. of households and avg domestic household size of 2.8 in Tai Po)
26b. Design flow	=	0.27 m ³ /person/day -- (Modern Village in Table T-1 of GESF)
26c. Sewage Generation rate	=	11.3 m³/day

27. Kam Shan Tsuen Nos. 30 - 33, 33A, 33B, 35 - 36

26a. Assumed number of residents	=	51 people (Estimated from the no. of households and avg domestic household size of 2.8 in Tai Po)
26b. Design flow	=	0.27 m ³ /person/day -- (Modern Village in Table T-1 of GESF)
26c. Sewage Generation rate	=	13.8 m³/day

28. Kam Shan Tsuen Nos. 37 - 42

26a. Assumed number of residents	=	51 people (Estimated from the no. of households and avg domestic household size of 2.8 in Tai Po)
26b. Design flow	=	0.27 m ³ /person/day -- (Modern Village in Table T-1 of GESF)
26c. Sewage Generation rate	=	13.8 m³/day

Sub-total Catchment A + B1 + B2 + C1 + C2 discharged to Manhole S4 (FMH1001062)

Flow Rate	=	1071.9 m ³ /day
Contributing Population	=	3970 people
Peaking factor	=	6 Refer to Table T-5 of GESF for population 1,000-5,000 including stormwater allowance
Peak Flow	=	74.4 litre/sec
Peak Flow with Basin and Toilet Flow	=	<u>77.9 litre/sec</u>

Catchment C3

29. Kam Shan Tsuen Nos. 52, 52A, 52B

26a. Assumed number of residents	=	12 people (Estimated from the no. of households and avg domestic household size of 2.8 in Tai Po)
26b. Design flow	=	0.27 m ³ /person/day -- (Modern Village in Table T-1 of GESF)
26c. Sewage Generation rate	=	3.2 m³/day

30. Kam Shan Tsuen Nos. 1, 2, 3A and 3B

30a. Assumed number of residents	=	34 people (Estimated from the no. of households and avg domestic household size of 2.8 in Tai Po)
30b. Design flow	=	0.27 m ³ /person/day -- (Modern Village in Table T-1 of GESF)
30c. Sewage Generation rate	=	9.2 m³/day

31. Kam Shan Tsuen Nos. 5 - 11, 8A and 8B

31a. Assumed number of residents	=	76 people (Estimated from the no. of households and avg domestic household size of 2.8 in Tai Po)
31b. Design flow	=	0.27 m ³ /person/day -- (Modern Village in Table T-1 of GESF)
31c. Sewage Generation rate	=	20.5 m³/day

32. Kam Shan Tsuen Nos. 46 - 51

32a. Assumed number of residents	=	17 people (Estimated from the no. of households and avg domestic household size of 2.8 in Tai Po)
32b. Design flow	=	0.27 m ³ /person/day -- (Modern Village in Table T-1 of GESF)
32c. Sewage Generation rate	=	4.6 m³/day

33. Temporary structures near the junction of Hon Ka Road and Kam Shan Road

33a. Assumed number of residents	=	9 people (Estimated from the no. of households and avg domestic household size of 2.8 in Tai Po)
33b. Design flow	=	0.27 m ³ /person/day -- (Modern Village in Table T-1 of GESF)
33c. Sewage Generation rate	=	2.4 m³/day

34. Retail shops at the junction of Hon Ka Road and Kam Shan Road

34a. Assumed Floor Area	=	150 m ²
34b. Assumed floor area per employee	=	28.6 m ² per employee -- (refer to Table 8 of CIFSUS - Retail Trade)
34c. Total number of employees	=	6 employees
34d. Design flow for commercial employee	=	0.28 m ³ /person/day -- (refer to Table T-2 of GESF - J4 Wholesale & Retail)
34e. Sewage Generation rate	=	1.7 m³/day

Sub-total Catchment A + B1 + B2 + C1 + C2 + C3 discharged to Manhole S7 (FMH1001066)

Flow Rate	=	1113.5 m ³ /day
Contributing Population	=	4124 people
Peaking factor	=	6 Refer to Table T-5 of GESF for population 5,000-10,000 including stormwater allowance
Peak Flow	=	77.3 litre/sec
Peak Flow with Basin and Toilet Flow	=	<u>80.7 litre/sec</u>

Table 3d Calculation for Sewage Generation Rate of the Existing Surrounding (Catchment D)

Catchment D1

35. Pak Shing Street Public Toilet cum Bathhouse

35a. Wash Basin (Male + 5 Female)	=	2.4 litre/sec (DU of 0.3 L/s per basin)
35b. Single Urinals with cistern (6 Male)	=	2.4 litre/sec (DU of 0.4 L/s per urinal)
35c. WC with cistern (5 Male + 10 Female)	=	27.0 litre/sec (DU of 1.8 L/s per WC)
35d. Shower without plug (6 Male + 4 Female)	=	18.0 litre/sec (DU of 1.8 L/s per shower)
35d. Frequency of use (K)	=	1.0
35e. Wastewater Flow Rate	=	7.1 litre/sec

Sub-total Catchment A + B1 + B2 + C1 to C3 + D1 discharged to Manhole S8 (FMH1001067)

Flow Rate	=	1113.5 m ³ /day
Contributing Population	=	4124 people
Peaking factor	=	6 Refer to Table T-5 of GESF for population 5,000-10,000 including stormwater allowance
Peak Flow	=	77.3 litre/sec
Peak Flow with Basin and Toilet Flow	=	<u>87.8</u> litre/sec

Catchment D2

9.0

36. Shui On Building (1/F - 5/F)

36a. Assumed number of residents	=	56 people (Estimated from the no. of households and avg domestic household size of 2.8 in Tai Po)
36b. Design flow	=	0.27 m ³ /person/day -- (Private R2 in Table T-1 of GESF)
36c. Sewage Generation rate	=	15.1 m ³ /day

37. Bong Hing Building (2/F - 10/F)

37a. Assumed number of residents	=	224 people (Estimated from the no. of households and avg domestic household size of 2.8 in Tai Po)
37b. Design flow	=	0.27 m ³ /person/day -- (Private R2 in Table T-1 of GESF)
37c. Sewage Generation rate	=	60.5 m ³ /day

38. Fu Shin Home for the Aged (1/F, Bong Hing Building)

38a. Assumed number of residents	=	71 residents
38b. Design flow for residents	=	0.19 m ³ resident/day -- (refer to Table T-1 of GESF - Domestic - Institutional and Special Class)
38a. Assumed number of employees	=	9 people
38b. Design flow for employees	=	0.28 m ³ /person/day -- (refer to Table T-2 of GESF - J11 Community, Social & Personal Services)
38c. Sewage Generation rate	=	16.0 m ³ /day

39. Retail shops at the G/F of Shui On Building

39a. Assumed Floor Area	=	100 m ²
39b. Assumed floor area per employee	=	28.6 m ² per employee -- (refer to Table 8 of CIFSUS - Retail Trade)
39c. Total number of employees	=	4 employees
39d. Design flow for commercial employee	=	0.28 m ³ /person/day -- (refer to Table T-2 of GESF - J4 Wholesale & Retail)
39e. Sewage Generation rate	=	1.0 m ³ /day

40. Restaurants at the G/F of Shui On Building

40a. Assumed Floor Area	=	100 m ²
40b. Assumed floor area per employee	=	19.6 m ² per employee -- (refer to Table 8 of CIFSUS - Restaurant)
40c. Total number of employees	=	5 employees
40d. Design flow for commercial employee	=	1.58 m ³ /person/day -- (refer to Table T-2 of GESF - J10 Restaurants & Hotels)
40e. Sewage Generation rate	=	7.9 m ³ /day

41. Retail shops at the G/F of Bong Hing Building

41a. Assumed Floor Area	=	681 m ²
41b. Assumed floor area per employee	=	28.6 m ² per employee -- (refer to Table 8 of CIFSUS - Retail Trade)
41c. Total number of employees	=	24 employees
41d. Design flow for commercial employee	=	0.28 m ³ /person/day -- (refer to Table T-2 of GESF - J4 Wholesale & Retail)
41e. Sewage Generation rate	=	6.7 m ³ /day

42. Restaurants at the G/F of Bong Hing Building

42a. Assumed Floor Area	=	99 m ²
42b. Assumed floor area per employee	=	19.6 m ² per employee -- (refer to Table 8 of CIFSUS - Restaurant)
42c. Total number of employees	=	5 employees
42d. Design flow for commercial employee	=	1.58 m ³ /employee/day -- (refer to Table T-2 of GESF - J10 Restaurants & Hotels)
42e. Sewage Generation rate	=	8.0 m ³ /day

Sub-total Catchment A + B1 + B2 + C1 to C3 + D1 + D2 discharged to Manhole S9 (FMH1001068)

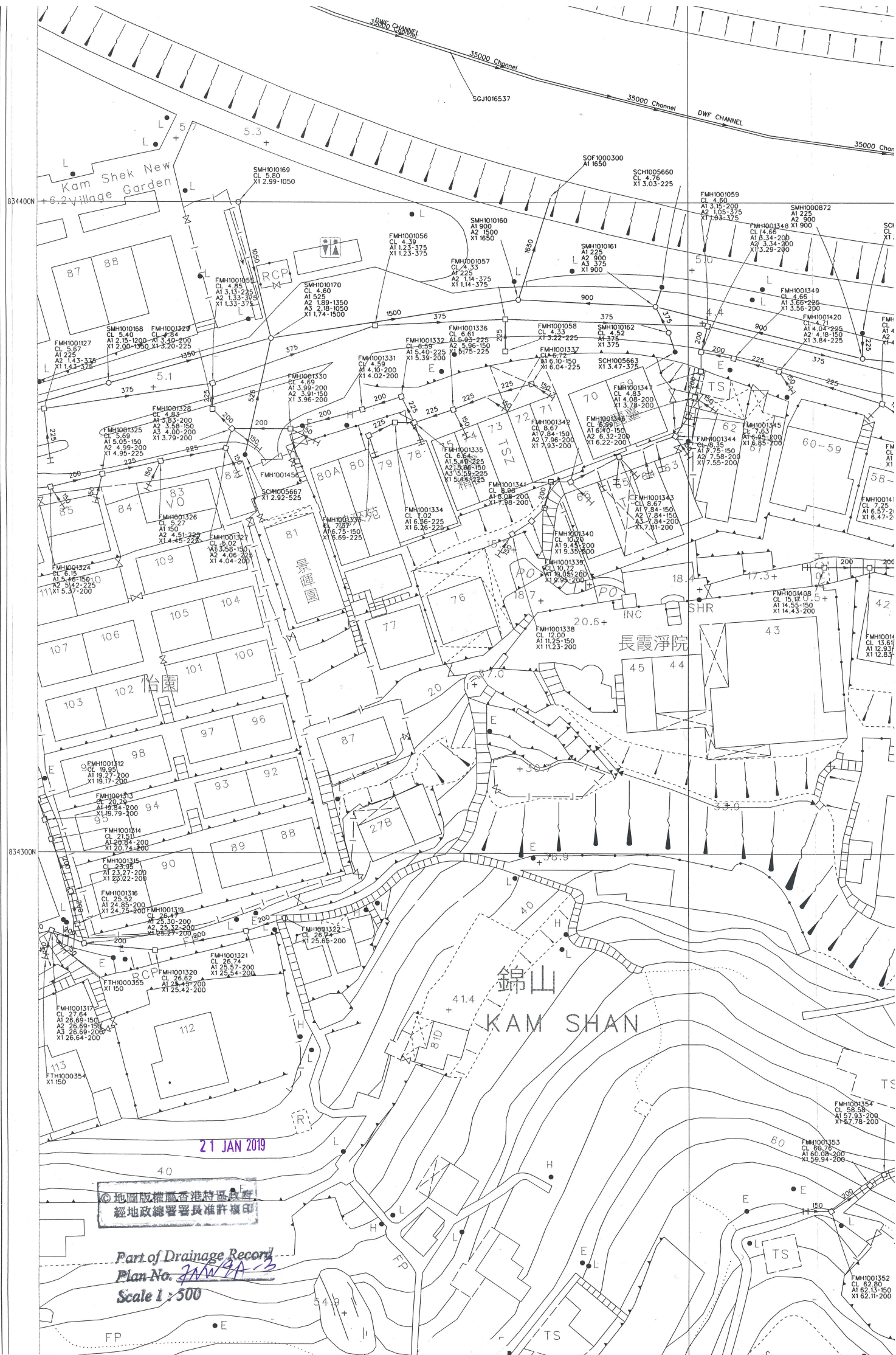
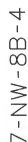
Flow Rate	=	1228.7 m ³ /day
Contributing Population	=	4551 people
Peaking factor	=	6 Refer to Table T-5 of GESF for population 1,000-5,000 including stormwater allowance
Peak Flow	=	85.3 litre/sec
Peak Flow with Basin and Toilet Flow	=	<u>95.8</u> litre/sec

Table 4 Comparison of the Hydraulic Capacity of Existing Sewers for Sewage generated from the Application Site and Surrounding Catchment Areas

Segment	Pipe Dia. (mm)	Pipe Length (m)	Gradient	Estimated Capacity (L/s)	Included Catchment	Peak Flow from the Application Site and Catchment Areas (L/s)	Contribution from the Application Site and the Surrounding Catchment Areas (%)	Status
S1-S2	375	36.5	0.004	132	A + B1	68.9	52.2%	OK
G1-G2	150	6.5	0.107	59	Application Site (B2)	4.3	7.4%	OK
G2-G3	200	5.4	0.197	170	Application Site (B2)	4.3	2.5%	OK
G3-G4	200	2.4	0.046	82	Application Site (B2)	4.3	5.2%	OK
G4-G5	200	9.0	0.142	144	Application Site (B2)	4.3	3.0%	OK
G5-G6	200	6.4	0.511	275	Application Site (B2)	4.3	1.6%	OK
G6-G7	200	3.4	0.293	208	Application Site (B2)	4.3	2.1%	OK
G7-G8	200	2.5	0.114	130	Application Site (B2)	4.3	3.3%	OK
G8-G9	200	2.4	0.555	286	Application Site (B2)	4.3	1.5%	OK
G9-G10	225	3.5	0.063	131	Application Site (B2)	4.3	3.3%	OK
G10-G11	200	2.4	0.261	196	Application Site (B2)	4.3	2.2%	OK
G11-S2	200	3.9	0.112	128	Application Site (B2)	4.3	3.4%	OK
S2-S3	375	31.4	0.004	128	A + B1 + B2	73.0	56.9%	OK
S3-S4	375	39.4	0.004	127	A + B1 + B2 + C1	73.4	57.8%	OK
S4-S5	375	28.5	0.005	140	A + B1 + B2 + C1 + C2	77.9	55.7%	OK
S5-S6	375	4.4	0.002	95	A + B1 + B2 + C1 + C2	77.9	82.1%	OK
S6-S7	375	41.5	0.005	135	A + B1 + B2 + C1 + C2	77.9	57.7%	OK
S7-S8	375	58.6	0.004	130	A + B1 + B2 + C1 + C2 + C3	80.7	61.9%	OK
S8-S9	375	45.0	0.004	126	A + B1+ B2 + C1 to C3 + D1	87.8	69.6%	OK
S9-S10	375	16.4	0.004	130	A + B1 + B2 + C1 to C3 + D1 + D2	95.8	73.5%	OK
S10-S11	375	28.5	0.004	129	A + B1 + B2 + C1 to C3 + D1 + D2	95.8	74.1%	OK
S11-S12	375	30.2	0.005	136	A + B1 + B2 + C1 to C3 + D1 + D2	95.8	70.5%	OK
S12-S13	375	28.5	0.011	205	A + B1 + B2 + C1 to C3 + D1 + D2	95.8	46.7%	OK

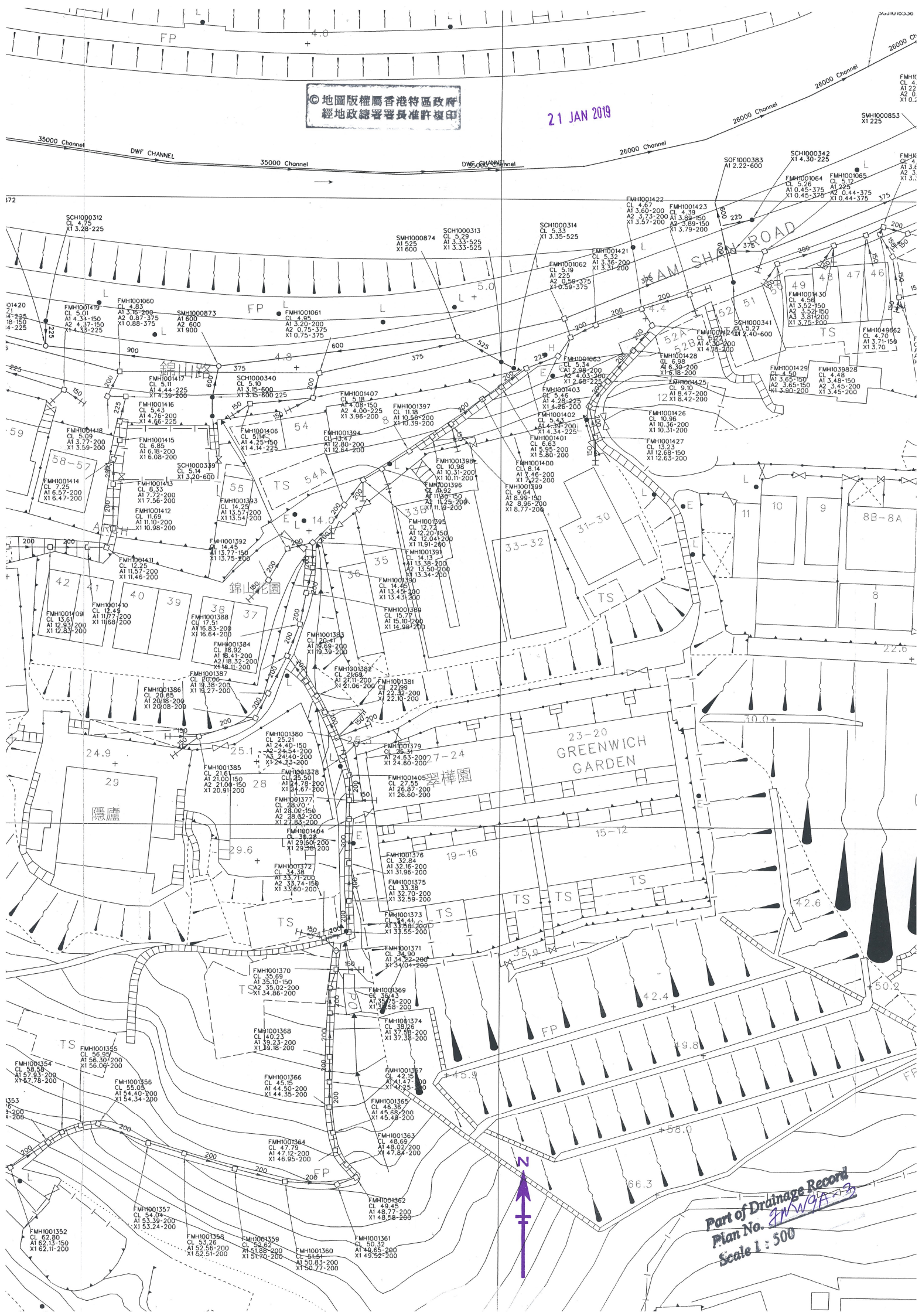
Remarks: The Application Site forms Catchment B2

Appendix 2.2 DSD’s Drainage Record Plan



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21 JAN 2019



Part of Drainage Record
Plan No. *21/19/2019*
Scale 1 : 500



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Appendix 2.3 CCTV Survey Report



高寶渠務工程有限公司 Pipeline Drainage Ltd.

CCTV SURVEY REPORT

Work Location: Kam Shan Road, Taipo, N.T.

CCTV Survey Date: 07 January 2025

Work Description: CCTV Survey for underground pipelines





井編號： FTH1001408

主筒大小： Ø 150

主筒物料： VC

路面到入水行水： mm 1540

路面到出水行水： mm 1545

路面到天頂： mm 600

井內長(L)： mm 5500

井內闊(W)： mm 230

井蓋大小： mm x mm 300X510

井頸大小： mm x mm 290X410

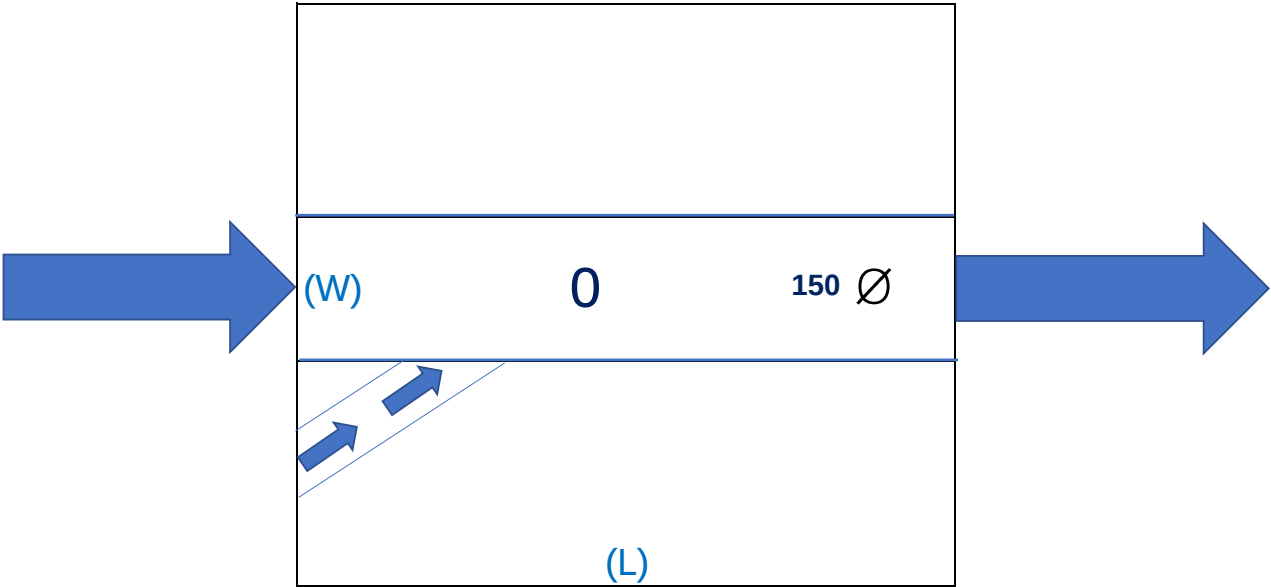
1. 叉筒行水： mm /

叉筒大小： Ø /

叉筒物料： /

叉筒方向，位置

井口位置





Summary of Defects

Works Order No.				Colour CCTV Drainage Survey																			
				Pipe									Service Condition							MISC			
Item No.	Manhole		Meters (m)	Urgent	Cracked	Fractured	Broken	Deformed	Collapsed	Hole	Surface Spalling/Wear	Joint Displaced	Open Joint	Roots	Infiltration	Encrustation	Silt	Grease	Obstruction	Water Line	Line	Survey Abandoned	camera Under Water
	From	To																					
001	FMH1001408	FMH1001409	006.5																	1			
002	FTH1000399	FMH1001408	027.0																	1			
		Total	33.5																	2			



Summary of Pipelines

Project/Contract/Wo No. Slope Reference No.

Date :

Location :

Drain / Sewer use :

Item	Manhole		Pipe			Manhole(From)			Grades			Remarks
	From	To	Lengths(m)	Size(mm)	Material	I.L.	C.L.	Depths(m)	SCG	ICG	SPG	
1	FMH1001408	FMH1001409	006.5	150	VC				1	1	1	
2	FTH1000399	FMH1001408	027.0	150	PVC				1	1	1	

CCTV SURVEY

Works Order No. :

Summary of CCTV Survey Results:

ID	Pipe Length Ref.	Start MH	Finish MH	Survey Area	Function	Size	Grade	Length	Clean	Remarks
1	FMH1001408X	FMH1001408	FMH1001409	NT	F	150	1	6.5m	N	FH
2	FTH1000399X	FTH1000399	FMH1001408	NT	F	150	1	27.0m	N	FH



CCTV Survey Report



Heading

Contract No. Purpose	Structural defects	Operator Job No.	RICHARD@02	Date Time	07.01.25	ID PLR	001 FMH1001408X
Start MH Depth Cover Level Invert Level	FMH1001408	Finish MH Depth Cover Level Invert Level	FMH1001409	Weather Cleaned Score Grade	Dry No 0 1	Use Direction Pipe Length Total Length	Foul Downstream 6.5
Road Location Loc. Code Area Code District Division Category	KAM SHAN ROAD TAIPO Light road NT Z			Size Shape Material Lining Comment Loc. Details Tape	150 mm Circular Vitrified clay Nil 0001		

Coding

Video No.	1:50	Chainage	Code	Observation	Photo	Grade
FMH1001408 0:00:00 0:00:20 0:00:41 0:00:56 0:00:56 0:00:56 0.0 0.0 0.0 0.0 6.5 6.5 6.5 ST MH WL GP GP MH FH Start Of Survey Manhole Remark : FMH1001408 Water Level, 5 % height/diameter General Photograph General Photograph General Photograph Manhole Remark : FMH1001409 Finished Survey 001 002 003 0 0 0 0 0 0 0						

● Structural Defects

● Service Defects

● Structural Defects with Grade 4 or 5

● Service Defects with Grade 4 or 5

● Constructional Features

● Miscellaneous Features

CCTV Photographs



Road **KAM SHAN ROAD**
Location **TAIPO**

Start MH **FMH1001408**
Finish Pt. **FMH1001409**

Size **150 mm**
Shape **Circular**
Material **Vitrified clay**

ID **001**
PLR **FMH1001408X**



Photo Ref. : 001
Video Tape : 0001, 0:00:20
Observation : General Photograph



Photo Ref. : 002
Video Tape : 0001, 0:00:41
Observation : General Photograph



Photo Ref. : 003
Video Tape : 0001, 0:00:56
Observation : General Photograph

● Structural Defects
● Service Defects

● Structural Defects with Grade 4 or 5
● Service Defects with Grade 4 or 5

● Constructional Features
● Miscellaneous Features

Video No.	1:200	Chainage	Code	Observation	Photo	Grade
0:00:00		0.0	ST	Start Of Survey		0
		0.0	MH	Manhole Remark : FTH1000399		0
		0.0	WL	Water Level, 0 % height/diameter		0
0:00:27		0.0	GP	General Photograph	004	0
0:01:02		5.5	GP	General Photograph	005	0
0:01:44		12.9	GP	General Photograph	006	0
0:02:24		18.5	GP	General Photograph	007	0
0:03:14		24.2	GP	General Photograph	008	0
0:05:13		27.0	GP	General Photograph	009	0
0:05:13		27.0	MH	Manhole Remark : FMH1001408		0
0:05:14		27.0	FH	Finished Survey		0

CCTV Photographs



Road **KAM SHAN ROAD**
Location **TAIPO**

Start MH **FTH1000399**
Finish Pt. **FMH1001408**

Size **150 mm**
Shape **Circular**
Material **Polyvinyl chloride**

ID **002**
PLR **FTH1000399X**



Photo Ref. : 004
Video Tape : 0001, 0:00:27
Observation : General Photograph



Photo Ref. : 005
Video Tape : 0001, 0:01:02
Observation : General Photograph



Photo Ref. : 006
Video Tape : 0001, 0:01:44
Observation : General Photograph



Photo Ref. : 007
Video Tape : 0001, 0:02:24
Observation : General Photograph

- Structural Defects
- Service Defects

- Structural Defects with Grade 4 or 5
- Service Defects with Grade 4 or 5

- Constructional Features
- Miscellaneous Features

CCTV Photographs



Road	KAM SHAN ROAD	Start MH	FTH1000399	Size	150 mm	ID	002
Location	TAIPO	Finish Pt.	FMH1001408	Shape	Circular	PLR	FTH1000399X
				Material	Polyvinyl chloride		



Photo Ref. : 008
Video Tape : 0001, 0:03:14
Observation : General Photograph



Photo Ref. : 009
Video Tape : 0001, 0:05:13
Observation : General Photograph

- Structural Defects
- Service Defects

- Structural Defects with Grade 4 or 5
- Service Defects with Grade 4 or 5

- Constructional Features
- Miscellaneous Features

Codes for Internal (Structural) Condition Grade (ICG) 結構評分

Type	Code	Description	註解	Grade
Structure	B	Broken Pipework	管道破裂	4
	C L	Crack Longitudinal	直裂紋	1
	C C	Crack Circumferential	環形裂紋	1
	C M	Crack Multiple	複合裂紋	2
	D V	Deformation Vertical (more than 25% as Collapse)	管道變形垂直 (多於 25% 給予 Collapse)	#3
	D H	Deformation Horizontal (more than 25% as Collapse)	管道變形水平 (多於 25% 給予 Collapse)	#3
	D B	Displaced Bricks	磚塊移位	3
	D I	Dropped Invert	行水沉降	3
	F L	Fracture Longitudinal	直裂縫	3
	F C	Fracture Circumferential	環形裂縫	3
	F M	Fracture Multiple	複合裂縫	4
	H	Hole	管道穿孔	4
	JD (M)	Joint Displaced Medium (1-1.5 pipe thickness)	接口移位中型 (1-1.5t)	2
	JD (L)	Joint Displaced Large (>1.5 Pipe thickness)	接口移位大型 (>1.5t)	3
	M S	Mortar missing Surface	表面沙漿丟失輕度	1
	M M	Mortar missing Medium	表面沙漿丟失中度	2
	M T	Mortar missing Total	表面沙漿丟失深度	3
	OJ (M)	Open Joint Medium (1-1.5 Pipe thickness)	接口離位中型 (1-1.5t)	1
	OJ (L)	Open Joint Large (>1.5 Pipe thickness)	接口離位大型 (>1.5t)	2
	SS S	Surface Spalling Slight	表面剝落輕度	1
	SS M	Surface Spalling Medium	表面剝落中度	2
	SS L	Surface Spalling Large	表面剝落深度	3
	SW S	Surface Wear Slight	表面磨損輕度	1
	SW M	Surface Wear Medium	表面磨損中度	2
	SW L	Surface Wear Large	表面磨損深度	3
	X	Collapse Pipe	管道倒塌	5
Junction & Connection	CN	Connection	分支連接 (後加)	0
	CX	Collection Defective	分支連接	3
	CX I	Collection Defective Pipe Intruding	分支連接插入	4
	JN	Junction	分支連駁 (預製)	0
	JX	Junction Defective	分支連駁損壞	4
Repair DF	LN	Lining Defect	管道內套缺損	4

#3 The grade for DV and DH follows the % deformation: $\leq 5\%$: Grade 3 $>5\%$ and $<25\%$: Grade 4

Codes for Service Condition Grade (SCG) 流水評分

Type	Code	Description	註解	Grade
Service	DE G	Deposits Attached Grease	依附物- 油脂	#1
	DE S	Deposits Settled Debris / silt	依附物- 垃圾碎 / 淤泥	#1
	DE	Deposits Settled Others	依附物- 硬物 及 其他	#1
	E L (J)	Encrustation Light (<5%) (at joint)	輕微凝結物 (<5%)	2
	E M (J)	Encrustation Medium (5% - 20%) (at joint)	中度凝結物 (5% - 20%)	4
	E H (J)	Encrustation Heavy (>20%) (at joint)	嚴重凝結物 (>20%)	5
	I S (J)	Infiltration Seeping (at joint)	滲漏	2
	I D (J)	Infiltration Dripping (at joint)	滴漏	2
	I R (J)	Infiltration Running (at joint)	湧漏	4
	I G (J)	Infiltration Gushing (at joint)	噴漏	5
	CU	Loss of Vision Camera Under Water	失去影像	0
	OB	Obstacles	阻塞	5
	R F (J)	Roots Fine (at joint)	根鬚	2
	R T (J)	Roots Tap (>10mm) (at joint)	根枝 (>10mm)	3
	R M (J)	Roots Mass (at joint)	根堆	#2
#1 The grade for the these defects follows the % cross section loss: $\leq 5\%$: Grade 1 $>5\%$ and $<25\%$: Grade 2 $\geq 25\%$ and $\leq 100\%$: Grade 3				
#2 The grade for Roots Mass follows the % of cross section loss: $\leq 5\%$: Grade 3 $>5\%$ and $<25\%$: Grade 4 $\geq 25\%$ and $\leq 100\%$: Grade 5				

Structural Performance Grade (SPG) 結構評核		
Grade	Appropriate response in normal circumstances	Mean Score
1	Normal condition	<5
2	Acceptable condition	5 to 19.9
3	Need to consider the area surrounding the sewer and the probability of environmental impact if no action taken	20 to 39.9
4	Fairly urgent, look at the sewer briefly, engineering and environmental improvement are needed	40 to 82
5	Urgent, look at the sewer, and add engineering and environmental improvements immediately	>82

Others Codes 其他代碼				
Type	Code	Description	註解	Grade
Nodes	MH	Manhole	沙井	0
	BR	Major Branch (Without Cover)	主要分支 (暗井)	0
	GY	Gully	集水沟	0
	CP	Catchpit	截留井	0
	OS	Oil Separator	隔油井	0
Miscellaneous	SC	Shape Change	形狀改變	0
	DC	Dimension Change	尺寸改變	0
	MC	Material Change	物料改變	0
	PC	Pipe Unit Length Change	管道基本長度改變	0
	FH	Finish Survey	完成查勘	0
	GP	General Photograph	一般影相位	0
	L L	Line Deviates Left	管道轉向左	0
	L R	Line Deviates Right	管道轉向右	0
	L U	Line Deviates Up	管道轉向上	0
	L D	Line Deviates Down	管道轉向下	0
	WL	Water Level	水位	0
	V	Vermin	害蟲	0
	ST	Start Survey / Inspection	開始查勘	0
	SA	Survey Abandoned	放棄查勘	0
	UTS	Unable To Survey	沙井滿水/滿料/渠道已經作廢	0
	UTR	Unable To Raise Manhole Cover	沙井蓋不能提起	0
	UTL	Unable To Locate Manhole	找不到沙井	0