URBAN GREEN

Section 12A Rezoning Application for Proposed Columbarium on Various Lots in D.D.41, Sha Tau Kok, New Territories

Sewerage Impact Assessment Report

Reference: P036/03 Issue 1
Date: 11 November 2025
Confidential

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Issue	Prepared By	Date	Checked by	Date	Approved By	Date
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1 Introduction

1.1 Background

The Applicant intends to develop a columbarium located on various Lots in D.D. 41, Sha Tau Kok, New Territories (hereafter as “the Site”).

The Applicant proposes to rezone the Site to "Other Specified Uses" annotated "Columbarium" (“OU (Columbarium)”) under Section 12A of Town Planning Ordinance (TPO).

Owing to the anticipated change in sewage generation arising from the change of uses, Urban Green Consultants Ltd. (UGC) has been commissioned to conduct a Sewerage Impact Assessment (SIA) to support the S12A rezoning application.

1.2 Objectives of the SIA

The objectives of this SIA are to assess the potential sewerage impact arising from the Proposed Development and recommend the mitigation measures, if necessary, to alleviate the impacts.

1.3 Report Structure

The remaining chapters of this report are shown below:

Chapter 2 – Site Context

Chapter 3 – Evaluation of Sewerage Impact

Chapter 4 – Results and Discussion

Chapter 5 – Conclusion

2 Site Context

2.1 Site Location and Its Environs

The Site is located in Sha Tau Kok and to the north of Sha Tau Kok Road (Shek Chung Au). Currently, to the north and northwest of the Site are village houses. Ma Tseuk Leng and Agong Point are located to the west and northwest of the Site. The Site area is approximately 13,382 m^2. Figure 2.1 shows the site location and its environs.

2.2 Proposed Development

The Site is intended for the development of columbarium. The proposed development will include area for columbarium, office, multi-function rooms and toilets. Proper landscape and tree planting areas are planned at the remaining area of the Site.

The proposed columbarium will provide a maximum of 6,495 niches. The proposed columbarium is used for columbarium chamber only. There will be no burners / furnace provided for the proposed columbarium as there will be no burning of ritual papers and joss sticks. During Ching Ming and Chung Yeung Festivals, there will be a significant increase of visitor numbers to the Site. The operation year is year 2030. The general layout plans of the Proposed Development are presented in Appendix A.

2.3 Existing Sewerage Condition

The drainage plans (plan no.: 3-NE-17A-2, 3-NE-17A-4, 3-NE-17B-1, 3-NE-12D-2, 3-NE-12D-3, 3-NE-12D-4, 3-NE-13C-1, 3-NE-13A-1 and 3-NE-13A-3) were obtained from the Drainage Services Department (DSD) in July 2023 and May 2025 to gather the background information on sewerage infrastructure in the vicinity of the Site. The relevant drainage plans are presented in Figure 3.1 for the ease of reference.

3 Evaluation of Sewerage Impact

3.1 Assumptions and Methodology

The adequacy in capacities of the existing sewers along Sha Tau Kok (Shek Chung Au) has been checked based on the existing flow estimate and the estimation of future sewage generation from the Proposed Development. Figure 3.1 shows the existing and proposed sewerage system.

The discharges from the site will be collected in the proposed terminal manhole T1 and discharges into the existing 600 mm diameter sewer at the nearest manhole A1 (Manhole No.: FMH1054813).

According to drainage layout plans from DSD, existing manhole U1 is utilized to collect sewage from Shek Chung Au Sewage Pumping Station at the upstream.

Furthermore, the sewage generated from the villages at the downstream including Tong To, San Tsuen, Ng Yiu Tau, Muk Min Tau, Tsiu Hang, Ha Tam Shui Hang, Sheung Tam Shui Hang and Shan Tsui are included in the assessment.

Under Contract No. DC/2018/03, new sewers are being constructed at the downstream of the proposed development (i.e. Sha Tau Kok Town). The capacity of the sewers up to segment between the planned manhole STKSTW1102 and STKSTW1106 is assessed.

3.2 Sewage Generation

For the sewage flow estimation from the Proposed Development, the planning unit flow factors as stated in the GESF have been adopted. The unit flow factors adopted for the assessment are summarized in Table 3.1.

Table 3.1 Unit Flow Factors Adopted for the Assessment

Source of Sewerage	Reference of Flow rate	Unit Flow Factors
Visitors	"Visitor" of Table 3-4 of "Wastewater Engineering Treatment and Reuse (Fourth Edition)" published by Metcalf & Eddy Inc.	0.015 m^3/person/day
Employees Activities	Commercial Employee + Commercial Activities - J11 Community, Social & Personal Services	0.280 m^3/person/day
	Domestic (catchment specific) - General - Other Housing"	0.175 m^3/person/day

Source of Sewerage	Reference of Flow rate	Unit Flow Factors
Canteen & Kitchen	Commercial Employee + Commercial Activities - J10 Restaurants & Hotels	1.580 m^3/person/day
Villages	Domestics - Modern Village	0.270 m^3/person/day

Based on the information provided by the Project Proponent, the estimated maximum number of visitors and employees of the Proposed Development are summarised in Table 3.2.

Table 3.2 Estimation of Maximum Population of the Proposed Development

Type of People	Maximum Number of People per Day	
	Normal days	Festival Days
Visitors	240	4,660
Employees	7	20

The calculations of sewage generation from the Proposed Development during normal days and festival days are provided in Appendix C.

3.3 Sewerage Capacity

According to the "*Sewerage Manual – Key Planning Issues and Gravity Collection System*" (Sewerage Manual) published by DSD in 2013, the capacities of respective sewers have been calculated based on Manning's equation, assuming full bore flow with no surcharge as below:

$$Q = A_w V$$

$$V = \frac{R^{2/3} S^{1/2}}{n}$$

where A_w = Wetted Area (Cross-sectional area of water body, m^2)
P_w = Wetted perimeter, m
V = Velocity of flow, m/s
R = Hydraulic radius (m) = A_w/P_w
S = Slope of the total energy line
n = Manning's roughness coefficient

The sewerage impacts on various segments of the sewer are evaluated by comparing the estimated peak flow against the capacity of the respective sewer segment. The detailed calculations are provided in Appendix C.

4 Results and Discussion

Based on the worst-case scenario, the total estimated daily flow and peak flow of the Proposed Development will be approximately 123.00 m^3/day and 0.011 m^3/s, respectively. Sewerage generated from the Proposed Development would be discharged into an existing 600 mm diameter sewer at the manhole A1 (Manhole No.: FMH1054813, as shown in Figure 3.1) via the proposed terminal manhole T1 in the Site.

The capacities of each segment for the proposed sewer (segment T1 to A1) and the concerned upstream sewers and downstream sewers between each manhole have been evaluated. The percentage of used capacity for the proposed sewer (i.e. segment T1 – A1) is 12%, while the percentages of capacities for the existing sewers (i.e. U1-A1 and A1-P3) range from 10% to 93%. Estimation of the flows and capacities are detailed in Appendix B and Appendix C, respectively.

Table 4.1 Estimation of Proposed and Existing Pipe Capacities

Pipe Segment	Diameter, mm	Manning's roughness coefficient, m-1/3s	Flow Capacity, m^3/s	Estimated Peak Flow, m^3/s	Used Capacity, %
Existing Upstream Pipe Segments					
U1 - U2	600	0.015	0.228	0.093	41%
U2 - U3	600	0.015	0.525	0.093	18%
U3 - U4	600	0.015	0.101	0.093	93%
U4 - U5	600	0.015	0.919	0.093	10%
U5 - A1	600	0.015	0.954	0.093	10%
Proposed Pipe Segment					
T1 - A1	300	0.015	0.091	0.011	12%
Existing Downstream Pipe Segments					
A1 - A2	600	0.015	0.618	0.101	16%
A2 - A3	600	0.015	0.584	0.101	17%
A3 - A4	600	0.015	0.590	0.101	17%
A4- A5	600	0.015	0.701	0.101	14%
A5 - A6	600	0.015	0.805	0.101	12%
A6 - A7	600	0.015	0.438	0.101	23%

Pipe Segment	Diameter, mm	Manning's roughness coefficient, m-1/3s	Flow Capacity, m^3/s	Estimated Peak Flow, m^3/s	Used Capacity, %
A7 - A8	600	0.015	0.781	0.101	13%
A8 - A9	600	0.015	0.626	0.101	16%
A9 - A10	600	0.015	0.548	0.101	18%
A10 - A11	600	0.015	0.860	0.101	12%
A11 - A12	600	0.015	0.368	0.101	27%
A12 - A13	600	0.015	0.174	0.101	58%
A13 - A14	600	0.015	0.316	0.101	32%
A14 - A15	600	0.015	0.201	0.101	50%
A15 - A16	600	0.015	0.172	0.101	58%
A16 - A17	600	0.015	0.215	0.121	56%
A17 - A18	600	0.015	0.339	0.121	36%
A18 - A19	600	0.015	0.506	0.121	24%
A19 - A20	600	0.015	0.194	0.121	62%
A20 - A21	600	0.015	0.256	0.131	51%
A21 - A22	600	0.015	0.271	0.131	48%
A22 - A23	600	0.015	0.796	0.131	16%
A23 - A24	600	0.015	0.147	0.131	89%
A24 - A25	600	0.015	0.206	0.131	64%
A25 - A26	600	0.015	0.220	0.131	59%
A26 - P1	600	0.015	0.512	0.131	26%
P1 - P2	490	0.0123	0.220	0.156	71%
P2 - P3	490	0.0123	0.210	0.156	74%
A5 - A6	490	0.0123	0.618	0.101	16%

Based on the assessment results presented in Table 4.1, the flow capacities of all concerned sewers along Sha Tau Kok Road and the proposed sewer are capable to cater for peak flow under worst-case scenario from the Proposed Development, existing upstream and downstream development. As such, there will be no adverse

sewerage impact arising from the Proposed Development and no upgrading works on the existing sewage network will be required.

5 Conclusion

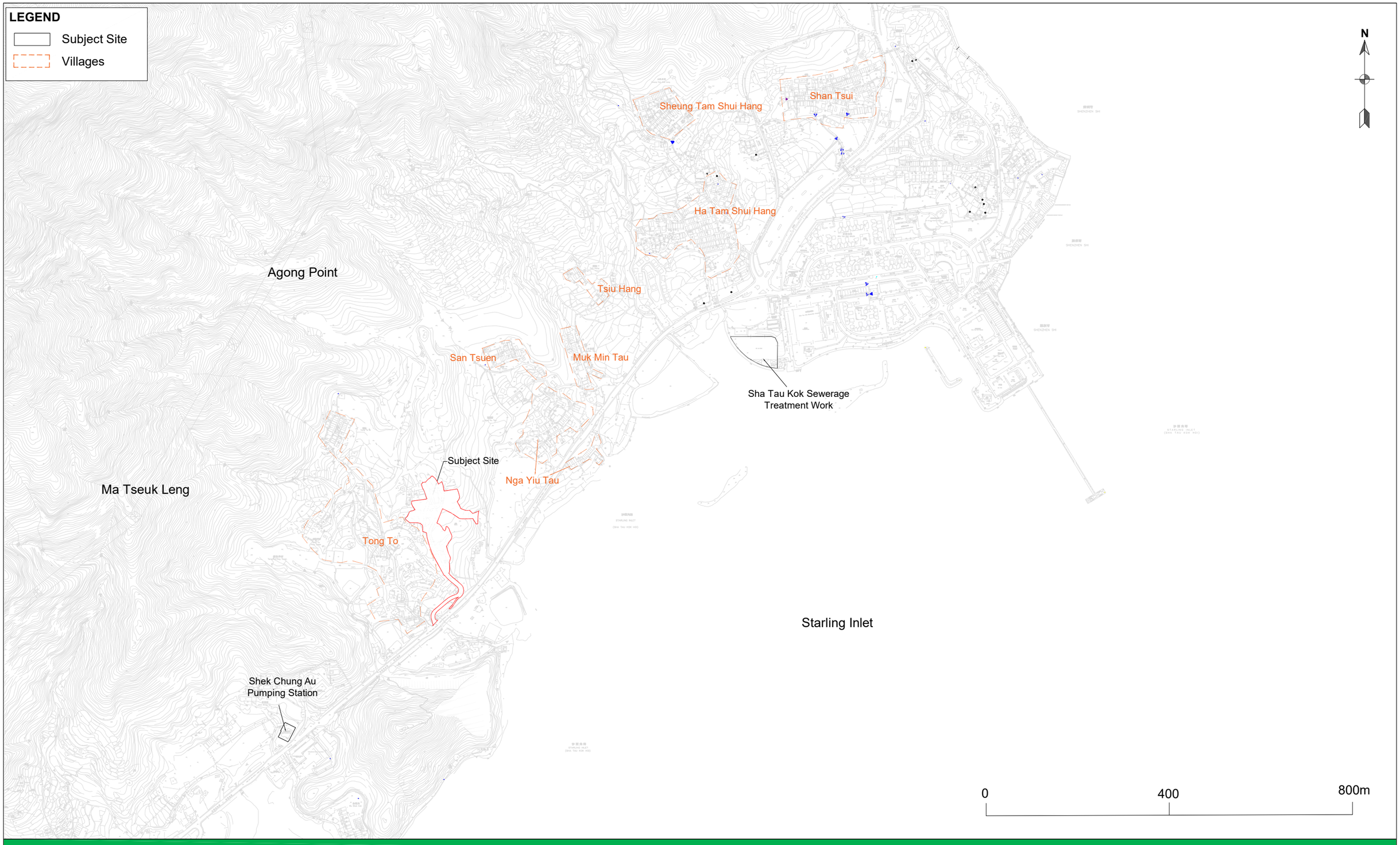
A Sewerage Impact Assessment (SIA) has been conducted to evaluate the possible impacts on the local sewerage network due to the operation of the Proposed Development.

The assessment findings demonstrated and confirmed that there should be sufficient sewage capacity for the public sewers along Sha Tau Kok Road – Shek Chung Au even though there is a change of sewage generation due to the Proposed Development.

The Project Proponent will be responsible for the design and construction of the proposed sewer at the detailed design stage of the project. The detailed study will be submitted to relevant Government departments for further approval. Upon completion, the sewerage pipe will be handed over to DSD for regular maintenance.

Based on the above, it is concluded that the sewerage impact arising from the Proposed Development should be acceptable.

Figures



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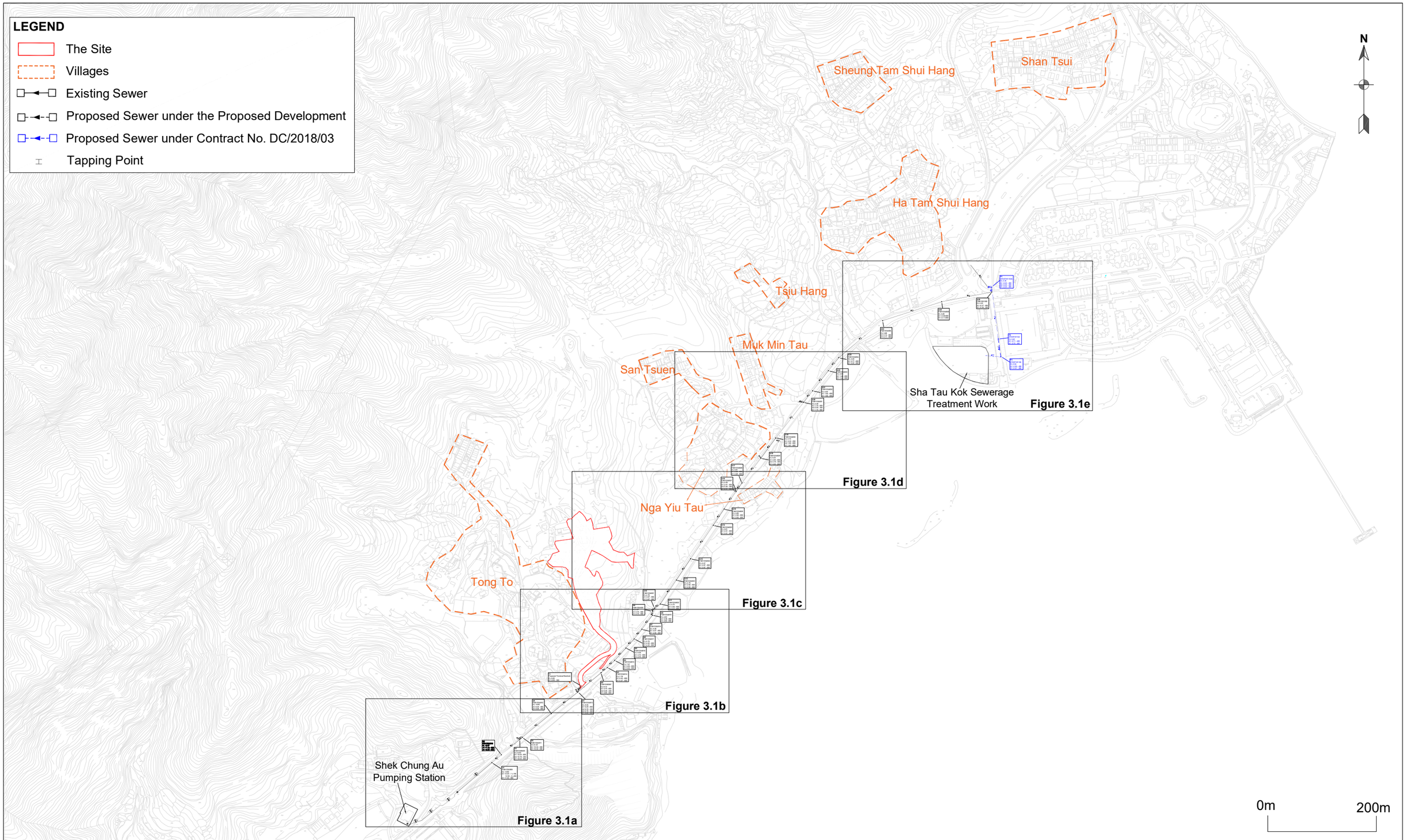
Site Location and Its Envrions

Figure 2.1

Rev. 0



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Section 12A Rezoning Application for Proposed Columbarium on Various Lots in D.D.41, Sha Tau Kok, New Territories

Existing and Proposed Sewerage System

Figure 3.1

Rev. 0

LEGEND

- The Site
- Villages
- Existing Sewer
- Proposed Sewer under the Proposed Development
- Proposed Sewer under Contract No. DC/2018/03
- Tapping Point

Shek Chung Au Pumping Station

U5
FMH1054812
CL 10.83
A1 8.49 - 600
X1 8.48 - 600

U4
FMH1054811
CL12.42
A1 10.53 - 600
X1 10.52 - 600

U3
FMH1068405
CL12.62
A1 10.54 - 600
A2 10.78 - 250
X1 10.53 - 600

U2
FMH1054810
CL 13.67
A1 11.46 - 600
X1 10.96 - 600

U1
FMH1054809
CL 13.90
A1 12.55 - 1 x 150
12.55 - 2 x 250
X1 11.50 - 600

ø600
ø600
ø600
ø600
ø600
ø600
ø150
ø150
1 x ø150
2 x ø250
1 x ø150
2 x ø250
1 x ø150
2 x ø250
1 x ø150
2 x ø250

N

0m 50m

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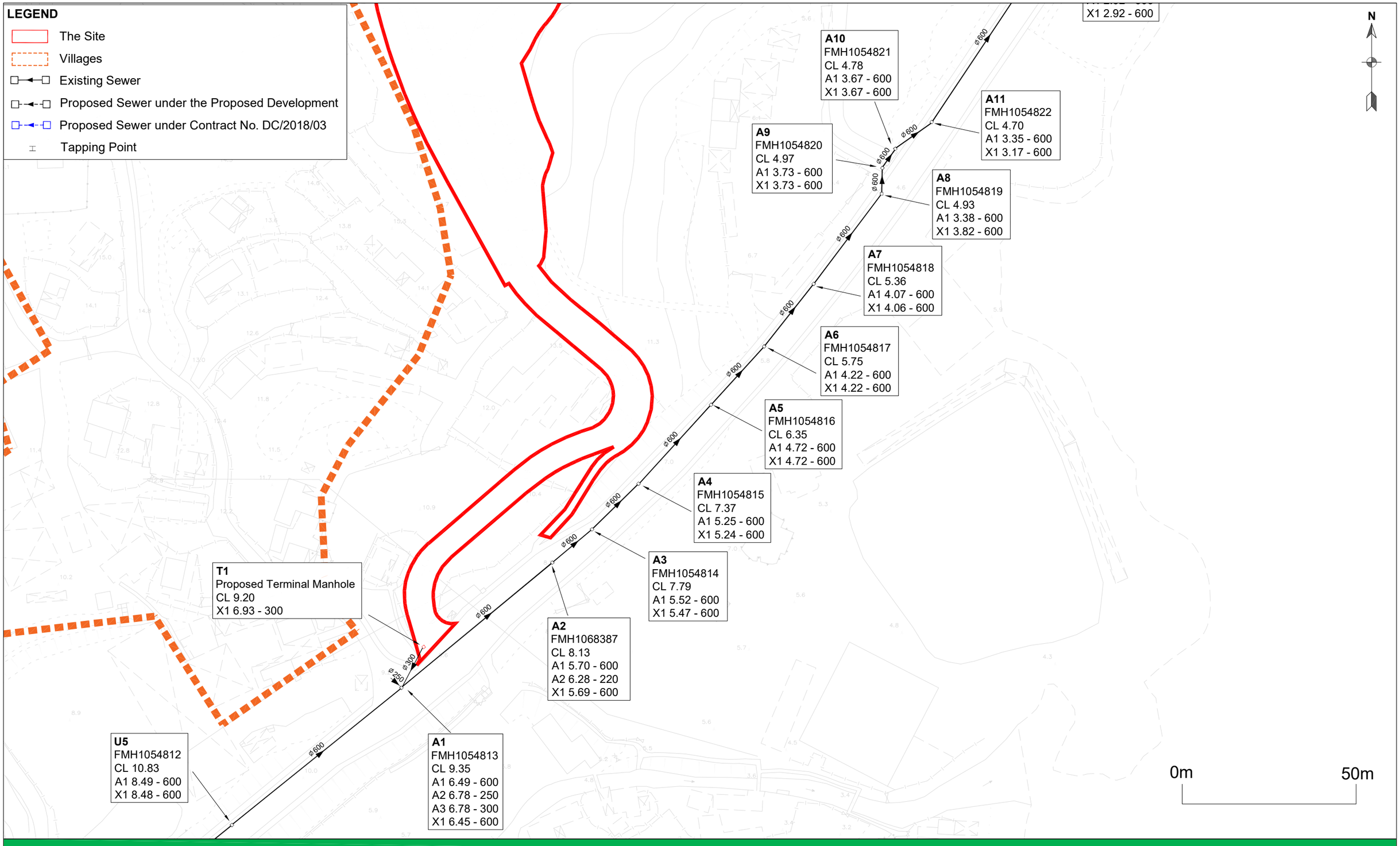
Sewers U1 - U5

Figure 3.1a

Rev. 0



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Section 12A Rezoning Application for Proposed Columbarium on Various Lots in D.D.41, Sha Tau Kok, New Territories

Sewers A1 - A10

Figure 3.1b

Rev. 0

LEGEND

- The Site
- Villages
- Existing Sewer
- Proposed Sewer under the Proposed Development
- Proposed Sewer under Contract No. DC/2018/03
- Tapping Point

Nga Yiu Tau

N

A16
FMH1054827
CL 5.93
A1 2.51 - 600
A2 3.45 - 250
X1 2.51 - 600

CL 5.81
A1 2.48 - 600
X1 2.48 - 600

A15
FMH1054826
CL 5.85
A1 2.56 - 600
X1 2.55 - 600

A14
FMH1054825
CL 5.61
A1 2.61 - 600
X1 2.61 - 600

A13
FMH1054824
CL 5.07
A1 2.87 - 600
X1 2.87 - 600

A12
FMH1054823
CL 4.70
A1 2.92 - 600
X1 2.92 - 600

A11
FMH1054822
CL 4.70
A1 3.35 - 600
X1 3.17 - 600

A10
FMH1054821
CL 4.78
A1 3.67 - 600
X1 3.67 - 600

A9
FMH1054820
CL 4.97

ø600
ø250

0m 50m

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Sewers A11 - A16

Figure 3.1c

Rev. 0

LEGEND

- The Site
- Villages
- Existing Sewer
- Proposed Sewer under the Proposed Development
- Proposed Sewer under Contract No. DC/2018/03
- Tapping Point

N

A23
FMH1054834
CL 4.40
A1 0.77 - 600
X1 0.22 - 600

A22
FMH1054833
CL 4.53
A1 1.48 - 600
X1 1.44 - 600

A21
FMH1054832
CL 4.44
A1 1.64 - 600
X1 1.60 - 600

A20
FMH1054831
CL 4.49
A1 1.70 - 600
A2 2.00 - 300
X1 1.70 - 600

A19
FMH1054830
CL 5.10
A1 2.22 - 250
A2 1.82 - 600
X1 1.81 - 600

A18
FMH1054829
CL 5.23
A1 2.25 - 600
A2 4.19 - 300
X1 2.23 - 600

A17
FMH1054828
CL 5.81
A1 2.48 - 600
X1 2.48 - 600

A16
FMH1054827
CL 5.93
A1 2.51 - 600
A2 3.45 - 250
X1 2.51 - 600

ø600 ø600 ø600 ø300 ø600 ø250 ø600 ø300 ø600 ø600

0m 50m

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Section 12A Rezoning Application for Proposed Columbarium on Various Lots in D.D.41, Sha Tau Kok, New Territories

Sewers A17 - A23

Figure 3.1d

Rev. 0

LEGEND

- The Site
- Villages
- Existing Sewer
- Proposed Sewer under the Proposed Development
- Proposed Sewer under Contract No. DC/2018/03
- Tapping Point

N

ø450

ø490

P1
STKSTW1100A
CL 3.35
A1 -0.50 - 490
A2 -0.20 - 490
X1 -2.23 - 490

ø600

A26
FMH1051502
CL 3.22
A1 -0.27 - 600
X1 -0.28 - 525

A25
FMH1054836
CL 3.29
A1 -0.06-600
X1 -0.11-600

ø600

A24
FMH1054835
CL 3.68
A1 0.14 - 600
X1 0.11 - 600

ø600

A23
FMH1054834
CL 4.40
A1 0.77 - 600
X1 0.22 - 600

054833
53
48 - 600
44 - 600

ø490

P2
STKSTW1102
CL 3.42
A1 -2.71 - 490
X1 -2.75 - 490

ø490

ø490

P3
STKSTW1106
CL 3.04
A1 -2.90 - 490
X1 -2.91 - 490

Sha Tau Kok Sewerage Treatment Work

0m 50m

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Section 12A Rezoning Application for Proposed Columbarium on Various Lots in D.D.41, Sha Tau Kok, New Territories

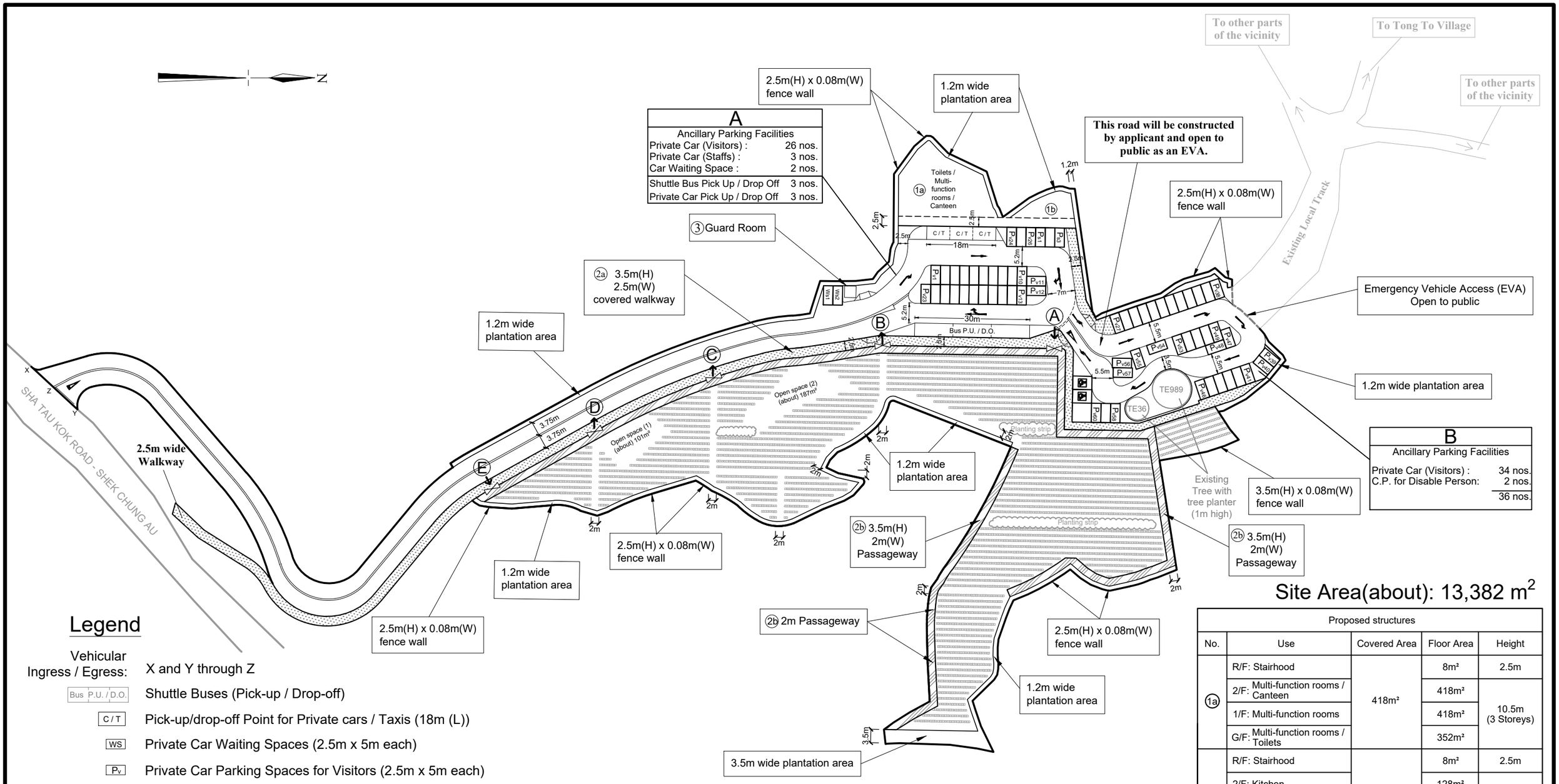
Sewers A24 - P3

Figure 3.1e

Rev. 0

Appendix A

Proposed Layout Plan



Legend

Vehicular Ingress / Egress:	X and Y through Z
Bus P.U. / D.O.	Shuttle Buses (Pick-up / Drop-off)
C / T	Pick-up/drop-off Point for Private cars / Taxis (18m (L))
WS	Private Car Waiting Spaces (2.5m x 5m each)
P_V	Private Car Parking Spaces for Visitors (2.5m x 5m each)
P_S	Private Car Parking Spaces for Staffs (2.5m x 5m each)
♿	Private Car Parking Spaces for Visitors (Disabled Persons) (3.5m x 5m each)
	Pedestrian access
	Canopy over walk-way
	Canopy over passageway
	Planting Strip

Site Area(about): 13,382 m²

Ancillary Parking Facilities	Private Car Parking Spaces for Visitors	Private Car Parking Spaces for Visitors (Disabled Persons)	Total Private Car Parking Space for Visitors	Private Car Parking Spaces for staffs	Private Car Waiting Spaces	Pick-up/drop-off Point for Private cars / Taxis	Lay-by for Shuttle Buses
Car park A	26	-		3	2	3	3
Car park B	34	2		-	-	-	-
Total	60	2	62	3	2	3	3

Niche count	
	No. of niches
At-grade niche blocks	6,495 nos. x 1 = 6,495

Proposed structures				
No.	Use	Covered Area	Floor Area	Height
1a	R/F: Stairhood	418m²	8m²	2.5m
	2/F: Multi-function rooms / Canteen		418m²	10.5m (3 Storeys)
	1/F: Multi-function rooms		418m²	
	G/F: Multi-function rooms / Toilets		352m²	
1b	R/F: Stairhood	128m²	8m²	2.5m
	2/F: Kitchen		128m²	10.5m (3 Storeys)
	1/F: Multi-function rooms		128m²	
	G/F: Office / Storeroom		78m²	
2a	Canopy over walk-way	832m²	832m²	3.5m (1 Storey)
2b	Canopy over passageway	748m²	748m²	3.5m (1 Storey)
3	1/F: Guard room	9m²	9m²	6m (2 Storeys)
	G/F: Guard room		9m²	
Total		2,135m²	3,136m²	

1 : 1000 (A3)	Master Layout Plan	Goldrich Planners & Surveyors Ltd.
October 2025	Rezoning Application from “AGR” and “GB” to “OU (Columbarium)” on various Lots in D. D. 41 and Adjoining Government Land, Tong To, Sha Tau Kok, N.T.	Plan 4 (P 17106)

Appendix B

Calculation of Peak Flow

	Estimation of Peak Flow from the Proposed Columbarium (Normal Days)			**Remark**
A1	**Generation from Visitors**			
	Total number of visitors	240	persons	Provided by Project Proponent.
	Unit flow	0.015	m^3/person/day	Referred to the unit flow factor for "Visitor" of Table 3-4 of "Wastewater Engineering Treatment and Reuse (Fourth Edition)" published by Metcalf & Eddy Inc.
	Estimated daily flow	3.60	m^3/day	
A2	**Generation from Employees Activities**			
	Total number of employees	7	persons	Provided by Project Proponent.
	Unit flow - Commercial employee + Activities	0.280	m^3/person/day	Referred to the planning unit flow for "Commercial Employee" + Commercial Activities - J11 Community, Social & Personal Services" in Table T-2 of GESF[(a)].
	Unit flow - Domestic (Laundry)	0.175	m^3/person/day	Referred to the planning unit flow for "Domestic (catchment specific) - General - Other Housing" in Table T-1 of GESF[(a)].
	Estimated daily flow	3.19	m^3/day	
B1	**Generation from Canteen & Kitchen**			
	Total Gross Floor Area	546	m2	Provided by Project Proponent.
	Estimated floor area per worker density	5.1	workers per 100m2 GFA	Referred to worker density for Restaurants in Table 8 of CIFSUS(a).
	Total number of people	28	persons	
	Unit Flow	1.58	m^3/person/day	Referred to the planning unit flow for "Commercial Employee" + Commercial Activities - J10 Restaurants & Hotels" in Table T-2 of GESF[(a)].
	Estimated daily flow	44.00	m^3/day	
	Total estimated daily flow	**50.78**	**m^3/day**	
	Peaking factor	**8**		As the contributing population of the flow is <1000 people, peaking factor of 8 is adopted based on Table T-5 (including stormwater allowance) of GESF[(a)].
	Estimated peak flow	**0.005**	**m^3/s**	

	Estimation of Peak Flow from the Proposed Columbarium (Festival Days)			**Remark**
A1	**Generation from Visitors**			
	Total number of visitors	4660	persons	Provided by Project Proponent.
	Unit flow	0.015	m^3/person/day	Referred to the unit flow factor for "Visitor" of Table 3-4 of "Wastewater Engineering Treatment and Reuse (Fourth Edition)" published by Metcalf & Eddy Inc.
	Estimated daily flow	69.90	m^3/day	
A2	**Generation from Employees Activities**			
	Total number of employees	20	persons	Provided by Project Proponent.
	Unit flow - Commercial employee + Activities	0.280	m^3/person/day	Referred to the planning unit flow for "Commercial Employee" + Commercial Activities - J11 Community, Social & Personal Services" in Table T-2 of GESF[(a)].
	Unit flow - Domestic (Laundry)	0.175	m^3/person/day	Referred to the planning unit flow for "Domestic (catchment specific) - General - Other Housing" in Table T-1 of GESF[(a)].
	Estimated daily flow	9.10	m^3/day	
B1	**Generation from Canteen & Kitchen**			
	Total Gross Floor Area	546	m2	Provided by Project Proponent.
	Estimated floor area per worker density	5.1	workers per 100m2 GFA	Referred to worker density for Restaurants in Table 8 of CIFSUS(a).
	Total number of people	28	persons	
	Unit Flow	1.580	m^3/person/day	Referred to the planning unit flow for "Commercial Employee" + Commercial Activities - J10 Restaurants & Hotels" in Table T-2 of GESF[(a)].
	Estimated daily flow	44.00	m^3/day	
	Total estimated daily flow	**123.00**	**m^3/day**	
	Peaking factor	**8**		As the contributing population of the flow is <1000 people, peaking factor of 8 is adopted based on Table T-5 (including stormwater allowance) of GESF[(a)].
	Estimated peak flow	**0.011**	**m^3/s**	

Estimation of Sewage Generation from Surrounding Villages

1	**Generation from Tong To**			
	Number of persons	1000	persons	Advised by EPD on 4 Jul 2023
	Unit flow	0.27	m^3/person/day	Referred to the planning unit flow for "Domestics - Modern Village" in Table T-1 of GESF[(a)].
	Estimated daily flow	270.0	m^3/day	
2	**Generation from San Tsuen**			
	Number of persons	430	persons	Advised by EPD on 4 Jul 2023
	Unit flow	0.27	m^3/person/day	Referred to the planning unit flow for "Domestics - Modern Village" in Table T-1 of GESF[(a)].
	Estimated daily flow	116.10	m^3/day	
3	**Generation from Ng Yiu Tau**			
	Number of persons	860	persons	Advised by EPD on 4 Jul 2023
	Unit flow	0.27	m^3/person/day	Referred to the planning unit flow for "Domestics - Modern Village" in Table T-1 of GESF[(a)].
	Estimated daily flow	232.20	m^3/day	
4	**Generation from Muk Min Tau**			
	Number of persons	500	persons	Advised by EPD on 4 Jul 2023
	Unit flow	0.27	m^3/person/day	Referred to the planning unit flow for "Domestics - Modern Village" in Table T-1 of GESF[(a)].
	Estimated daily flow	135.00	m^3/day	
5	**Generation from Tsiu Hang**			
	Number of persons	170	persons	Advised by EPD on 4 Jul 2023
	Unit flow	0.27	m^3/person/day	Referred to the planning unit flow for "Domestics - Modern Village" in Table T-1 of GESF[(a)].
	Estimated daily flow	45.90	m^3/day	
6	**Generation from Ha Tam Shui Hang**			
	Number of persons	1560	persons	Advised by EPD on 4 Jul 2023
	Unit flow	0.27	m^3/person/day	Referred to the planning unit flow for "Domestics - Modern Village" in Table T-1 of GESF[(a)].
	Estimated daily flow	421.20	m^3/day	
7	**Generation from Sheung Tam Shui Hang**			
	Number of persons	1330	persons	Advised by EPD on 4 Jul 2023
	Unit flow	0.27	m^3/person/day	Referred to the planning unit flow for "Domestics - Modern Village" in Table T-1 of GESF[(a)].
	Estimated daily flow	359.10	m^3/day	
8	**Generation from Shan Tsui**			
	Number of persons	1220	persons	Advised by EPD on 4 Jul 2023
	Unit flow	0.27	m^3/person/day	Referred to the planning unit flow for "Domestics - Modern Village" in Table T-1 of GESF[(a)].
	Estimated daily flow	329.40	m^3/day	

Note:
(a) GESF – "*Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning*" published by Environmental Protection Department (EPD) in 2005.

Appendix C

Flow Capacity Calculation

A. Estimated Pipe Capacity and Adequacy Check for Proposed and Existing Sewerage System

Pipe Segment	Length	Level (out)	Level (in)	d	A_w	P_w	R	s	n [1][2]	V	Q_c	Q_d	PF	Q_p	Is $Q_c > Q_p$?	% of capacity	Remark
	m	mPD	mPD	m	m^2	m	m	-	$m^{-1/3}$ s	m/s	m^3/s	m^3/day		m^3/s	Y/N	%	
Existing Upstream Pipe Segments																	
U1 - U2	21.8	11.50	11.46	0.600	0.283	1.885	0.150	0.002	0.015	0.806	0.228	1344.00	6	0.093	Y	41%	The peak daily flow of Shek Chung Au Pumping Station is provided by DSD.
U2 - U3	43.2	10.96	10.54	0.600	0.283	1.885	0.150	0.010	0.015	1.856	0.525	1344.00	6	0.093	Y	18%	Q_p = flow of former segment U1 - U2.
U3 - U4	5.6	10.53	10.53	0.600	0.283	1.885	0.150	0.000	0.015	0.357	0.101	1344.00	6	0.093	Y	93%	Q_p = flow of former segment U2 - U3.
U4 - U5	68.1	10.52	8.49	0.600	0.283	1.885	0.150	0.030	0.015	3.250	0.919	1344.00	6	0.093	Y	10%	Q_p = flow of former segment U3 - U4.
U5 - A1	61.9	8.48	6.49	0.600	0.283	1.885	0.150	0.032	0.015	3.373	0.954	1344.00	6	0.093	Y	10%	Q_p = flow of former segment U4 - U5.
Proposed Pipe Segment																	
T1 - A1	12.6	6.93	6.78	0.300	0.071	0.942	0.075	0.012	0.015	1.294	0.091	123.00	8	0.011	Y	12%	Assume Q_p = the estimated peak flow from the proposed development (worst-case scenario).
Existing Downstream Pipe Segments																	
A1 - A2	55.5	6.45	5.70	0.600	0.283	1.885	0.150	0.014	0.015	2.187	0.618	1737.00	5	0.101	Y	16%	Q_p = flow of the Proposed Development, former segment U5-U6 and the flow from Tong To.
A2 - A3	14.1	5.69	5.52	0.600	0.283	1.885	0.150	0.012	0.015	2.067	0.584	1737.00	5	0.101	Y	17%	Q_p = flow of former segment A1 - A2.
A3 - A4	17.9	5.47	5.25	0.600	0.283	1.885	0.150	0.012	0.015	2.088	0.590	1737.00	5	0.101	Y	17%	Q_p = flow of former segment A2 - A3.
A4- A5	30.0	5.24	4.72	0.600	0.283	1.885	0.150	0.017	0.015	2.478	0.701	1737.00	5	0.101	Y	14%	Q_p = flow of former segment A3 - A4.
A5 - A6	21.9	4.72	4.22	0.600	0.283	1.885	0.150	0.023	0.015	2.846	0.805	1737.00	5	0.101	Y	12%	Q_p = flow of former segment A4 - A5.
A6 - A7	22.1	4.22	4.07	0.600	0.283	1.885	0.150	0.007	0.015	1.549	0.438	1737.00	5	0.101	Y	23%	Q_p = flow of former segment A5 - A6.
A7 - A8	31.6	4.06	3.38	0.600	0.283	1.885	0.150	0.022	0.015	2.761	0.781	1737.00	5	0.101	Y	13%	Q_p = flow of former segment A6 - A7.
A8 - A9	6.5	3.82	3.73	0.600	0.283	1.885	0.150	0.014	0.015	2.213	0.626	1737.00	5	0.101	Y	16%	Q_p = flow of former segment A7 - A8.
A9 - A10	5.7	3.73	3.67	0.600	0.283	1.885	0.150	0.011	0.015	1.937	0.548	1737.00	5	0.101	Y	18%	Q_p = flow of former segment A8 - A9.
A10 - A11	12.2	3.67	3.35	0.600	0.283	1.885	0.150	0.026	0.015	3.042	0.860	1737.00	5	0.101	Y	12%	Q_p = flow of former segment A9 - A10.
A11 - A12	52.3	3.17	2.92	0.600	0.283	1.885	0.150	0.005	0.015	1.302	0.368	1737.00	5	0.101	Y	27%	Q_p = flow of former segment A10 - A11.
A12 - A13	46.5	2.92	2.87	0.600	0.283	1.885	0.150	0.001	0.015	0.617	0.174	1737.00	5	0.101	Y	58%	Q_p = flow of former segment A11 - A12.
A13 - A14	73.7	2.87	2.61	0.600	0.283	1.885	0.150	0.004	0.015	1.118	0.316	1737.00	5	0.101	Y	32%	Q_p = flow of former segment A12 - A13.
A14 - A15	35.2	2.61	2.56	0.600	0.283	1.885	0.150	0.001	0.015	0.709	0.201	1737.00	5	0.101	Y	50%	Q_p = flow of former segment A13 - A14.
A15 - A16	38.1	2.55	2.51	0.600	0.283	1.885	0.150	0.001	0.015	0.610	0.172	1737.00	5	0.101	Y	58%	Q_p = flow of former segment A14 - A15.
A16 - A17	18.4	2.51	2.48	0.600	0.283	1.885	0.150	0.002	0.015	0.760	0.215	2085.30	5	0.121	Y	56%	Q_p = flow of former segment A15 - A16 and the flow from San Tsuen & Ng Yiu Tau.
A17 - A18	56.7	2.48	2.25	0.600	0.283	1.885	0.150	0.004	0.015	1.199	0.339	2085.30	5	0.121	Y	36%	Q_p = flow of former segment A16 - A17.
A18 - A19	45.3	2.23	1.82	0.600	0.283	1.885	0.150	0.009	0.015	1.790	0.506	2085.30	5	0.121	Y	24%	Q_p = flow of former segment A17 - A18.
A19 - A20	82.8	1.81	1.70	0.600	0.283	1.885	0.150	0.001	0.015	0.686	0.194	2085.30	5	0.121	Y	62%	Q_p = flow of former segment A18 - A19.
A20 - A21	26.0	1.70	1.64	0.600	0.283	1.885	0.150	0.002	0.015	0.904	0.256	2266.20	5	0.131	Y	51%	Q_p = flow of former segment A19 - A20 and the flow from Muk Min Tau & Tsiu Hang.
A21 - A22	46.4	1.60	1.48	0.600	0.283	1.885	0.150	0.003	0.015	0.957	0.271	2266.20	5	0.131	Y	48%	Q_p = flow of former segment A20 - A21.
A22 - A23	29.9	1.44	0.77	0.600	0.283	1.885	0.150	0.022	0.015	2.815	0.796	2266.20	5	0.131	Y	16%	Q_p = flow of former segment A21 - A22.
A23 - A24	105.0	0.22	0.14	0.600	0.283	1.885	0.150	0.001	0.015	0.520	0.147	2266.20	5	0.131	Y	89%	Q_p = flow of former segment A22 - A23.
A24 - A25	113.4	0.11	-0.06	0.600	0.283	1.885	0.150	0.001	0.015	0.729	0.206	2266.20	5	0.131	Y	64%	Q_p = flow of former segment A23 - A24.
A25 - A26	93.2	-0.11	-0.27	0.600	0.283	1.885	0.150	0.002	0.015	0.780	0.220	2266.20	5	0.131	Y	59%	Q_p = flow of former segment A24 - A25.
A26 - P1	8.1	-0.28	-0.5	0.490	0.189	1.539	0.123	0.027	0.015	2.715	0.512	2266.20	5	0.131	Y	26%	Q_p = flow of former segment A25 - A26.
P1 - P2	95.0	-2.23	-2.71	0.490	0.189	1.539	0.123	0.005	0.015	1.169	0.220	3375.90	4	0.156	Y	71%	Q_p = flow of former segment A26 - P1 and the flow from Sheung Tam Shui Hang, Ha Tam Shui Hang & Shan Tsui.
P2 - P3	32.8	-2.75	-2.9	0.490	0.189	1.539	0.123	0.005	0.015	1.113	0.210	3375.90	4	0.156	Y	74%	Q_p = flow of former segment P2 - P3.

Note

[1] Foul sewer material of concrete in fair condition is assumed for existing public sewers. Manning's roughness coefficient of 0.015 is adopted.

[2] Foul sewer material of vitrified clay in fair condition is assumed for proposed sewers. Manning's roughness coefficient of 0.015 is adopted.

Legend

A_w = Wetted Area, m^2
P_w = wetted perimeter, m
R = hydraulic radius (m) = A_w/P_w
s = slope of the total energy line
n = Manning's roughness coefficient, $m^{-1/3}s$
V = Velocity of flow calculated based on Manning's Equation, m/s

Q_c = Flow Capacity, m^3/s
Q_d = Estimated cumulative daily flow, m3/s
PF = Peaking Factor
Q_p = Estimated cumulative peak flow, m3/s

Appendix D

Information of Nominal Diameter at Pipe Segment A26 to P3 from DSD

Cheryl Chan

From: thlam@dsd.gov.hk
Sent: Wednesday, January 3, 2024 10:18 AM
To: Cheryl Chan
Cc: Joan Choi
Subject: Re: [Internet]RE: [Internet]RE: [Internet]Request for new sewers information under Contract No. DC/2018/03 in Sha Tau Kok [Filed 08 Jan 2024 09:22]

Follow Up Flag: Follow up
Flag Status: Completed

Dear Cheryl,

The nominal diameter of the concerned section of sewers is 490mm.

Regards,
Alex Lam
E/CM15, DSD
Tel: 2594 7262

From: Cheryl Chan <cheryl.chan@urbangreen.hk>
To: "thlam@dsd.gov.hk" <thlam@dsd.gov.hk>
Cc: Joan Choi <joan.choi@urbangreen.hk>
Date: 29/12/2023 05:48 PM
Subject: [Internet]RE: [Internet]RE: [Internet]Request for new sewers information under Contract No. DC/2018/03 in Sha Tau Kok
Serial No.:

==========
This email was delivered via the Internet, which may not be trustworthy as it cl
You are advised not to click the URLs or open the attachment unless you know it

This email has been verified against its claimed domain but "FAILED". The identi
==========

Dear Alex,

Attached please find the comments from EPD and the plan with mark up . Thanks.

Regards,
Cheryl
3565 3317

From: thlam@dsd.gov.hk <thlam@dsd.gov.hk>
Sent: Friday, December 29, 2023 3:24 PM
To: Cheryl Chan <cheryl.chan@urbangreen.hk>
Cc: Joan Choi <joan.choi@urbangreen.hk>
Subject: Re: [Internet]RE: [Internet]Request for new sewers information under Contract No. DC/2018/03 in Sha Tau Kok

Dear Cheryl,

We have provided the layout plan and manhole schedule under DC/2018/03 to you in my email dated 25 July 2023. Would you please provide copy of the comments from EPD and specify on plan that which section of new sewers you are referring to in your email below. Thanks.

Regards,
Alex Lam
E/CM15, DSD
Tel: 2594 7262

From: Cheryl Chan <cheryl.chan@urbangreen.hk>
To: "thlam@dsd.gov.hk" <thlam@dsd.gov.hk>
Cc: Joan Choi <joan.choi@urbangreen.hk>
Date: 20/12/2023 16:55
Subject: [Internet]RE: [Internet]Request for new sewers information under Contract No. DC/2018/03 in Sha Tau Kok
Serial No.:

Dear Mr. Lam,

We refer to **Rezoning Application No. Y/NE-STK/4.**

As per the comment from EPD on Oct 2023 regarding the Sewerage Impact Assessment, we would like to know the nominal diameter (ND) for the new sewers from Sha Tau Kok Road – Shek Chung Au to Sha Tau Kok town under Contract No. DC/2018/03.

Regards,
Cheryl
3565 3317
Urban Green Consultants Ltd.

From: thlam@dsd.gov.hk <thlam@dsd.gov.hk>
Sent: Tuesday, July 25, 2023 5:37 PM
To: Cheryl Chan <cheryl.chan@urbangreen.hk>
Subject: Re: [Internet]Request for new sewers information under Contract No. DC/2018/03 in Sha Tau Kok [Filed 26 Jul 2023 16:22]

Dear Cheryl,

Please find attached for your information.

Regards,
Alex Lam
E/CM15, DSD
Tel: 2594 7262


From: Cheryl Chan <cheryl.chan@urbangreen.hk>
To: "thlam@dsd.gov.hk" <thlam@dsd.gov.hk>
Cc: Joan Choi <joan.choi@urbangreen.hk>
Date: 21/07/2023 10:46

Subject: [Internet]Request for new sewers information under Contract No. DC/2018/03 in Sha Tau Kok
Serial No.:

Dear Mr. Lam

We are the environmental consultant for the **Rezoning Application No. Y/NE-STK/4 .**

As requested by the Environmental Department to facilitate our sewerage impact assessment, please kindly advise the information of the new sewers from Sha Tau Kok Road – Shek Chung Au to Sha Tau Kok town under Contract No. DC/2018/03. Many Thanks.

You may contact Ms. YAM Ying Yu, Frances (3427 9856) from EPD regarding the SIA comments they have issued.

Best regards.
Cheryl
3565 3317
Urban Green Consultants Ltd.