
Appendix F
Sewerage Impact Assessment

**Section 16 Planning Application for
Submission of Layout Plan for
Permitted 'Flat' and 'Social Welfare
Facility' Uses at TWIL 5 and Lot No.
429 in D.D. 399, Ting Kau, Tsuen Wan**

Report on
Sewerage Impact Assessment

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January 2024

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1. INTRODUCTION

- 1.1 Binnies Hong Kong Limited (Binnies) has been commissioned to carry out sewerage impact assessment to support a Section 16 Planning Application for Submission of Layout Plan for Permitted 'Flat' and 'Social Welfare Facility' uses on the Approved Tsuen Wan West Outline Zoning Plan No. S/TWW/21 to facilitate a private residential development at TWIL 5 and Lot No. 429 in D.D. 399, Ting Kau, Tsuen Wan (the Application Site).
- 1.2 The Application Site covers an area of approximately 0.64 ha and currently fall within a "Residential (Group B) 2" ("R(B)2") zone under approved Tsuen Wan West Outline Zoning Plan (OZP) No. S/TWW/21.
- 1.3 The Application Site is proposed to be redeveloped from the existing hotel into a private residential development with social welfare facility. The previous S12A application no. Y/TWW/7 was approved by the Town Planning Board (TPB) on 2nd June 2022, which consists of a residential block with 661 nos. of units and a 760 m² 60-place Day Care Centre for the Elderly.
- 1.4 The Application Site is bounded by Castle Peak Road – Ting Kau to the north, Tsing Long Highway to the west, and Aztec Lodge to the east and south. Location of the Application Site is shown in **Figure TIK/GEN/001**.

Existing Development

- 1.5 The Application Site is currently occupied by a hotel development, namely Royal View Hotel, which has been present since 2007.

Proposed Redevelopment

- 1.6 The Proposed Redevelopment will redevelop the existing hotel into 2 nos. of residential block with 674 nos. of residential units, 60-place Day Care Centre for the Elderly (DE), car parking facilities and a club house. A summary of key information of the Proposed Redevelopment is shown below in **Table 1.1**.

Table 1.1 Indicative Redevelopment Schedule

Development Parameters	Proposed Redevelopment
Application Site Area ¹	About 6,431 m ²
Development Site Area ²	About 6,066 m ²
Gross Floor Area (GFA) ³ - Domestic portion - Non-Domestic portion ^{3 4 5}	Not more than 29,400 m ² Not less than 760 m ²
No. of Blocks	2
No. of Storeys ⁶	15 storeys (Tower 1) 14 storeys (Tower 2)
Maximum Building Height	Not more than 77mPD
No. of Units	Not more than 674
Anticipated Population ⁷	1,820

Notes:

¹ Application Site formulated based on the lot boundary of TWIL 5 and Lot No. 429 in D.D. 399 which are currently occupied by an existing hotel development.

² The development site area of about 6,066m² excludes the portion of an access road within TWIL 5 of about 365 m².

³ GFA of not less than 760 m² for the social welfare facility shall be provided in accordance with the OZP restriction.

⁴ Detailed NOFA to be agreed with Social Welfare Department.

⁵ The residents' clubhouse GFA is based on the maximum GFA concession for clubhouse according to Buildings Department's Practice Note APP-104.

⁶ Excluding basement levels.

⁷ The anticipated population is derived by assuming 2.7 persons per flat as per the average household size of Tsuen Wan District Council District in 2022 under General Household Survey by Census and Statistics Department.

1.7 This report presents the findings of a sewerage impact assessment to support the Proposed Redevelopment at the Application Site. The objectives of this sewerage impact assessment are to:

- examine the existing and planned sewerage facilities in the region;
- estimate the sewage flows to be generated from the Proposed Redevelopment; and
- formulate and evaluate options for sewage treatment and disposal for the Proposed Redevelopment.

2. EXISTING AND PLANNED SEWERAGE FACILITIES IN THE AREA

Existing Sewerage Facilities in the Area

- 2.1 The Application Site is currently connected to the public sewerage system. An existing tapping point is identified in the northern part of the Application Site. The sewerage system of the Existing Development (the hotel development) is connected to the tapping point. It is then connected to an existing 225 mm gravity diameter public sewer which was laid near the run-in of the Application Site and Castle Peak Road – Ting Kau, which subsequently discharges to a trunk sewer running along the Castle Peak Road between Ting Kau and Sham Tseng via Casam Sewage Pumping Station (SPS). This network connects to Sham Tseng Sewage Treatment Works (STW) located at the southern part of Sham Tseng.
- 2.2 Sham Tseng STW is a chemically enhanced primary treatment works with effluent discharged to Ma Wan Channel. The designed capacity of Sham Tseng STW is 17,000 m³/d, serving the area from Approach Bay to Tsing Lung Tau along Castle Peak Road. Based on information from DSD, the design capacity of Casam SPS is 10,368 m³/d and drainage records indicate it serves the area between Approach Beach to Vista De Mar along Castle Peak Road. The 2023/24 yearly average daily flow is 750 m³.
- 2.3 The layout of the existing sewerage is shown on **Figure TIK/SIA/001** and the sewerage catchment plan for Casam SPS is shown on **Figure TIK/SIA/002**.

Other Planned Sewerage Facilities in the Area

- 2.4 A planning study for the relocation of Sham Tseng STW to Cavern had been carried out by Government's consultants. According to the stage 2 public engagement leaflet of "Relocation of Sham Tseng Sewage Treatment Works to Caverns – Feasibility Study" published by DSD in 2017, the relocation of Sham Tseng STW to nearby cavern has been proposed to release the land for other uses.
- 2.5 According to the leaflet mention above, the design capacity of the relocated STW will be upgraded from 17,000 m³/d to 24,000 m³/d. It is also noticed that the effluent discharge standard of relocated STW will be upgraded to secondary level.

3. ESTIMATED SEWAGE TO BE GENERATED FROM THE PROPOSED REDEVELOPMENT

- 3.1 The Layout Plan of the Proposed Redevelopment is shown in **Annex A**. The volume of sewage that will be generated by the Proposed Redevelopment is approximately 527.4 m³/d upon full occupation and an ADWF of 580.1 m³/d incorporating Catchment Inflow Factor. Detailed calculation of design flow of existing and proposed swimming pool is shown in **Annex B**. The design assumptions are presented below in **Table 3.1**.
- 3.2 The sewage generated by the Proposed Redevelopment is classified as domestic flows according to GESF. Hence, no industrial wastewater will be generated.

Table 3.1 Estimated Sewage Flow from the Proposed Redevelopment

	Before Redevelopment		After Redevelopment	
GFA (m ²)	- Non-Domestic	29,400	- Domestic - Clubhouse - Social Welfare Facilities	29,400 1,323 760
	- No. of Guest Rooms	691	- No. of Units	674
Design Population / Employee	- Non-domestic ¹	412 employees	- Domestic, R2 - Clubhouse ² - Social Welfare Facilities ² - Social Welfare Facilities (User)	1,820 persons 44 employees 25 employees 60 users
Global unit flow factor ³	- Restaurants and Hotels, J10	1.58 m ³ /d per employee	- Domestic, R2 - Clubhouse, J11 - Social Welfare Facilities, J11 - Social Welfare Facilities (User)	0.27 m ³ /d per person 0.28 m ³ /d per employee 0.28 m ³ /d per employee 0.28 m ³ /d per user
Predicted ADWF (m ³ /d)	- Restaurants and Hotels, J10	651.0	- Domestic, R2 - Clubhouse, J11 - Social Welfare Facilities, J11 - Social Welfare Facilities (User)	491.3 12.2 7.0 16.8
Total Predicted ADWF (m³/d)		<u>651.0</u>		<u>527.4</u>
Catchment Inflow Factor		1.1		1.1
Total Predicted ADWF with inflow factor (m³/d)		<u>716.1</u>		<u>580.1</u>
Change in ADWF (m³/d)		-		-136.0
Other Sewage Flow	Backwash of swimming pool (Instant Peak Flow)	17.50 m ³ /hr (i.e. 4.86 L/s)	Backwash of swimming pool (Instant Peak Flow)	20.00 m ³ /hr (i.e. 5.56 L/s)
Change in backwash (m³/hr)		-		+2.5

Notes:

¹ A density of 1.4 employees per 100m² GFA (Private Commercials Hotels and Boarding Houses) is adopted in accordance with Table 8 of "Commercial and Industrial Floor Space Utilization Survey" conducted by PlanD in 2004/05.

² A density of 3.3 employees per 100m² GFA (All Types Community, Social & Personal Services) is adopted in accordance with "Commercial and Industrial Floor Space Utilization Survey" conducted by PlanD in 2004/05.

³ Refer to Table T-1 and T-2 of Guidelines for Estimating Sewage Flows (GESF) published by EPD in March 2005.

4. PROPOSED SEWERAGE STRATEGY FOR THE PROPOSED REDEVELOPMENT

- 4.1 The Application Site lies within the catchment of Sham Tseng STW and is in the vicinity of the existing trunk sewer along Castle Peak Road – Ting Kau.
- 4.2 The sewage will be conveyed to Sham Tseng STW via Casam SPS for disposal to Ma Wan Channel.

Proposed Sewage Disposal Scheme

- 4.3 It is proposed that the sewage generated from the Proposed Redevelopment will be discharged to the existing 225mm diameter gravity sewer by the connection to the existing manhole FMH4052476 near the north of the Application Site for disposal at Sham Tseng STW via Casam SPS.
- 4.4 The calculation for the backwash sewage generated by the swimming pool of the Proposed Redevelopment is shown in **Annex B**. The capacity calculations for the existing sewers starting from the upstream to the Casam SPS are provided in **Annex C**.
- 4.5 The connection point is shown on **Figure TIK/SIA/003**.
- 4.6 As presented in **Table 3.1** above, the estimated sewage generated from the Proposed Redevelopment is an ADWF of 527.4 m³/d, which is anticipated there will be a decrease in sewage generation comparing with the current hotel development.
- 4.7 In considering potential cumulative impact, sewage flow generated by existing/planned developments in the catchment is estimated and shown in **Annex D** and the capacity calculations for the existing sewers starting from the upstream to Casam SPS are provided in **Annex C**. A detailed sewerage map is provided in **Figure TIK/SIA/002** and **Figure TIK/SIA/003**.
- 4.8 Based on the planning application records on Outline Zoning Plan (OZP) from Statutory Planning Portal, Application No. A/TWW/110 and A/TWW/124 in the area are considered active, since the other applications are dated many years ago, which would have been completed. Thus, A/TWW/110 and A/WTT/124 are considered as planned development in the sewage estimation.
- 4.9 Information from DSD indicates the design flow of Casam SPS is 10,368 m³/d. Detailed checking on the capacity of Casam SPS due to the planned development is shown in **Annex E**.
- 4.10 Based on the calculation in **Annex E**, including the Proposed Redevelopment, the total peak flow conveyed to Casam SPS is estimated to be 8177.1 m³/d (Equivalent to 78.9% utilization of Casam SPS), while the total peak flow with existing development is 8660.50 m³/d (Equivalent to 83.5% utilization of Casam SPS). The peak flow would be lower with the proposed residential development and the proposed sewage disposal scheme. Moreover, the utilization of existing sewer will be decreased after the Proposed Redevelopment as shown in **Annex C**. While the sewage generation of the Proposed Redevelopment are decreased, it is observed the estimated spare capacity of some segments of sewers is still expected to be less than 10% during peak flow, hence, upgrading works of the sewer is proposed. The project proponent proposes the existing sewer between FMH4052479 and FMH4052480 be upgraded from 225mm dia. pipe to 250mm dia. pipe to address the existing condition of less than ideal spare capacity. In view that the full flow velocity of TK.1 would be operated at high velocity as shown in **Annex C**, site verification will be conducted in later design stage to further confirm the modification works on TK.1 and associated manhole FMH4052476 and implement the works if necessary. The potential upgrading/modification works are indicated in **Figure TIK/SIA/003**. Thus, it is considered that the sewers, Casam SPS and Sham Tseng STW will have sufficient capacity to cater sewage generated from the Proposed Redevelopment.
- Lining works to the connection to the public sewerage system has been requested by DSD. Further liaison with DSD would be conducted in the later design stage to confirm detailed

requirement of the lining works. The lining works by the project proponent to the connection to the public sewerage system will be implemented if necessary.

5. EVALUATION OF THE STRATEGY AND RECOMMENDATIONS FOR THE PROPOSED REDEVELOPMENT

Regional sewerage strategy

- 5.1 The Proposed Redevelopment lies within the catchment of Sham Tseng STW. Discharge of sewage directly via existing sewers to Sham Tseng STW is a feasible option and is the Proposed Sewage Disposal Scheme.

Land matters

- 5.2 The proposed disposal scheme involves connection of terminal manhole and existing tapping point. Such works will be performed within the Application Site. No encroachment on government land or other private lots would be anticipated.

Environmental impact

- 5.3 The proposed disposal scheme involves discharge to Sham Tseng STW via gravity sewers, no adverse environmental impact is anticipated.

6. CONCLUSION

- 6.1 The Proposed Redevelopment lies within the catchment of Sham Tseng STW and is in the vicinity of the existing sewer near Castle Peak Road- Ting Kau. The estimated sewage to be generated from the Proposed Redevelopment is approximately 580.1 m³/day.

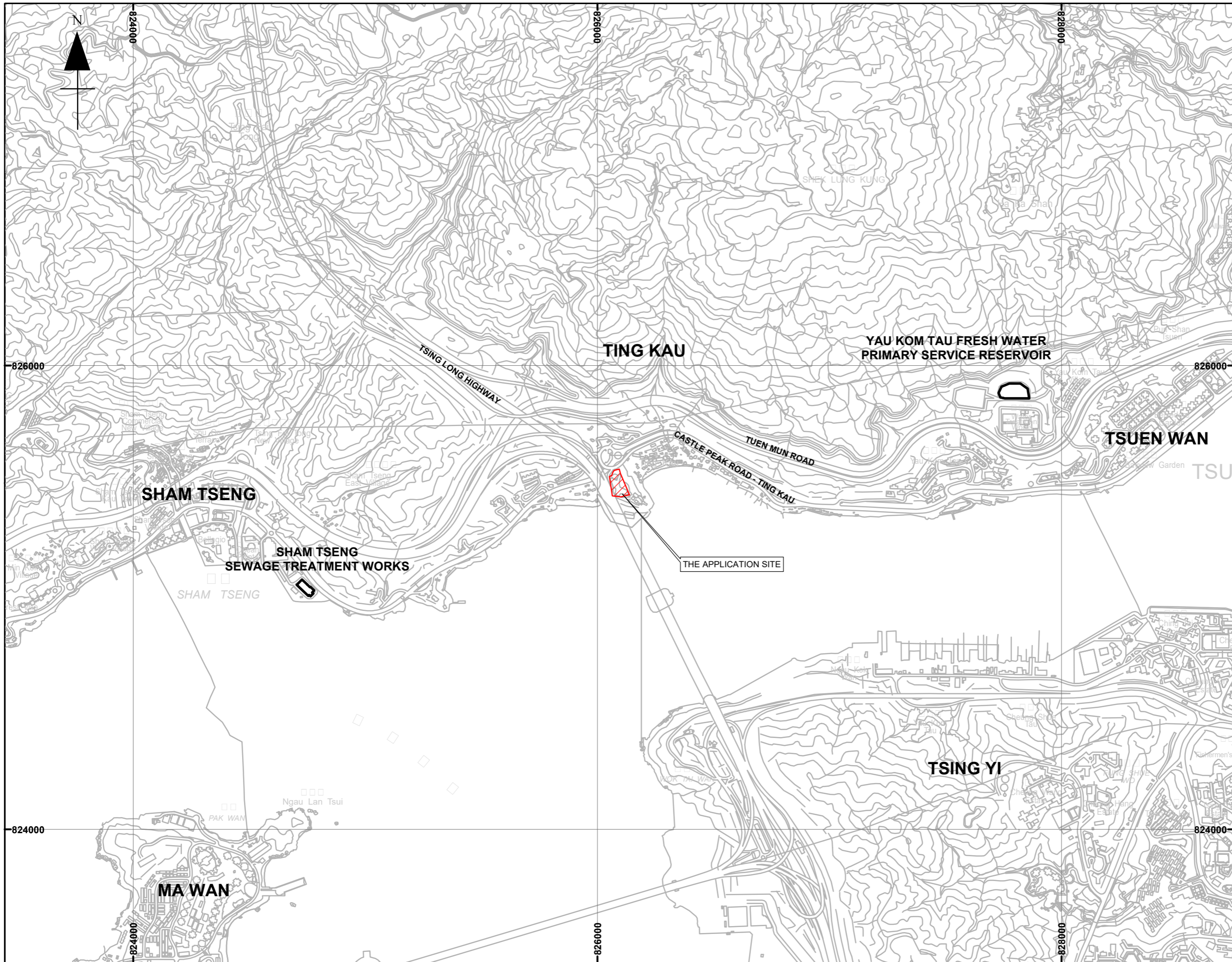
- 6.2 Based on the calculation, the sewage generated by the Proposed Redevelopment will be decreased when comparing with the sewage generated by current hotel development at the Application Site. The utilization of existing sewers will be decreased after the Proposed Redevelopment. However, despite the decrease in sewage flow, a segment of the public sewer would still operate close to its original capacity. Hence, pipe upgrading works have been proposed to address this existing condition. Additionally, another segment of sewer would operate with high velocity, potential modification works have been proposed while implementation is subject to further study. It is anticipated that no adverse impact or adverse cumulative impact would be induced on the existing sewerage. Lining works by the project proponent to the connection to the public sewerage system would be conducted as necessary with details to be further confirmed at detailed design stage. The Proposed Redevelopment is considered technically feasible from sewerage point of view.

END OF TEXT

FIGURES

Legend

 The Application Site



Initial	Date	Checked	Date
Kathy		KKL	




Project
 Section 16 Planning Application for Submission of Layout Plan for Permitted 'Flat' and 'Social Welfare Facility' Uses at TWIL 5 and Lot No. 429 in D.D. 399, Ting Kau, Tsuen Wan

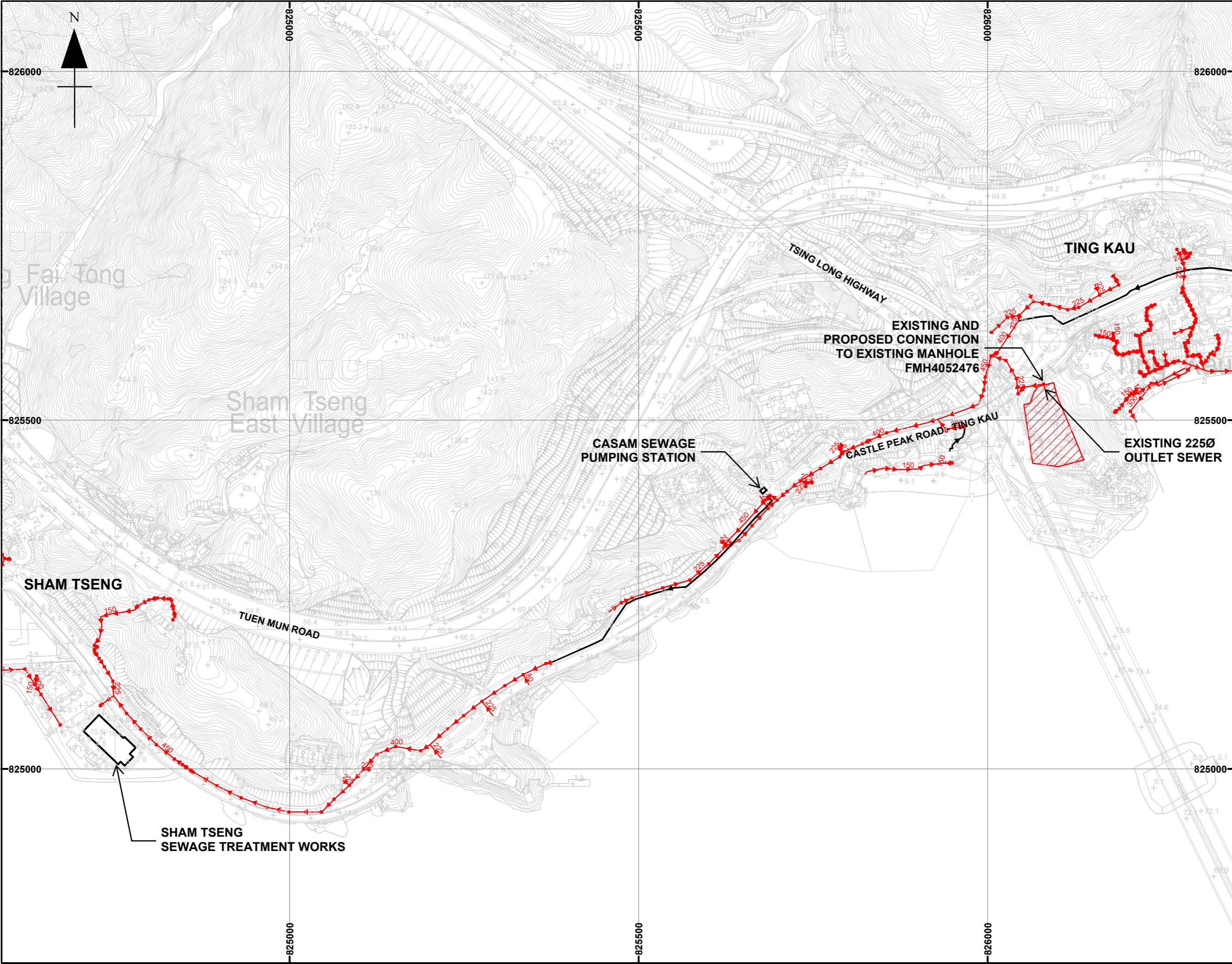
Title
 Site Location Plan


Figure No.	Scale
TIK/GEN/001	1:15,000 @ A3



Legend

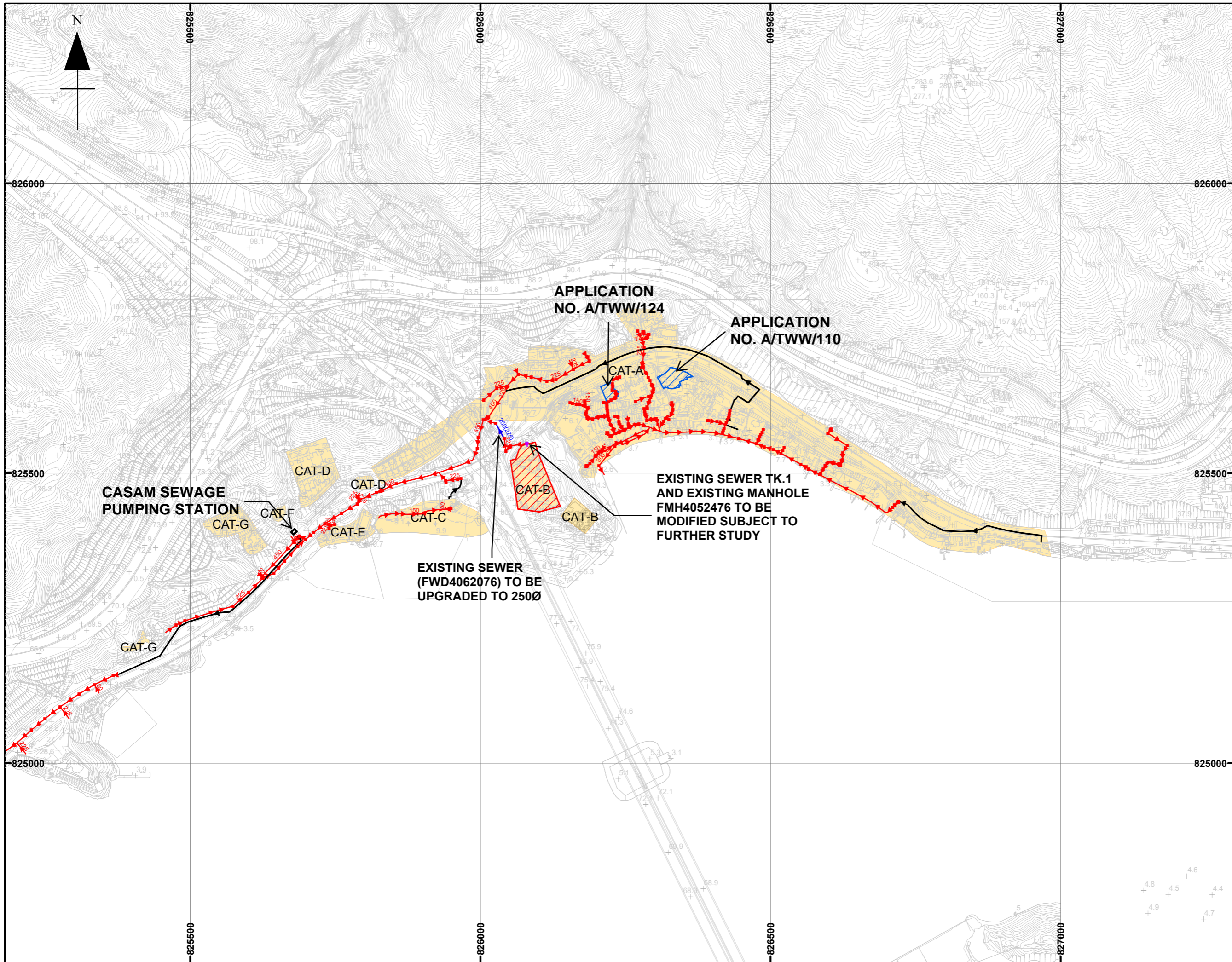
-  The Application Site
-  Existing Sewer
-  Existing Rising Main



Initial Kathy	Date	Checked KKL	Date
Project			
Section 16 Planning Application for Submission of Layout Plan for Permitted 'Flat' and 'Social Welfare Facility' Uses at TWIL 5 and Lot No. 429 in D.D. 399, Ting Kau, Tsuen Wan			
Title			
Existing Sewerage System			
Figure No. TIK/SIA/001	Scale 1:5,000 @ A3		
			

Legend

- The Application Site
- Existing Sewer
- Existing Rising Main
- Existing SPS
- Planned Development
- Catchment
- Existing Sewer to be Upgraded
- Existing Sewer to be Modified Subject to Further Study
- Existing Manhole to be Modified Subject to Further Study



Initial	Date	Checked	Date
Kathy		KKL	







Project
 Section 16 Planning Application for Submission of Layout Plan for Permitted 'Flat' and 'Social Welfare Facility' Uses at TWIL 5 and Lot No. 429 in D.D. 399, Ting Kau, Tsuen Wan

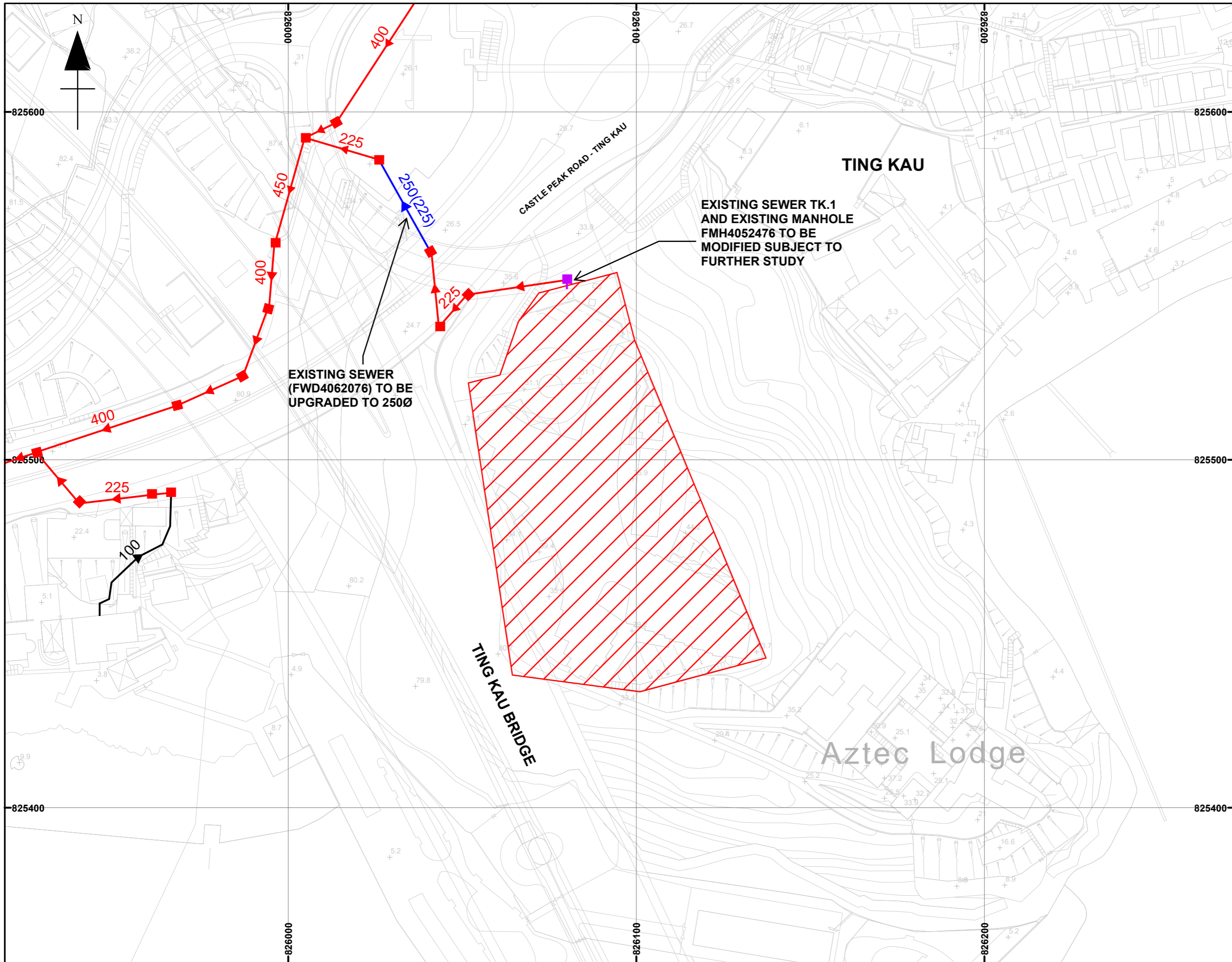
Title
Proposed Sewerage System and Catchment Plan

Figure No.	Scale
TIK/SIA/002	1:6,000 @ A3



Legend

-  The Application Site
-  Existing Sewer
-  Existing Rising Main
-  Existing Sewer to be Upgraded
-  Existing Sewer to be Modified Subject to Further Study
-  Existing Manhole to be Modified Subject to Further Study



EXISTING SEWER TK.1 AND EXISTING MANHOLE FMH4052476 TO BE MODIFIED SUBJECT TO FURTHER STUDY

EXISTING SEWER (FWD4062076) TO BE UPGRADED TO 250Ø

Initial	Date	Checked	Date
Kathy		KKL	

Project
 Section 16 Planning Application for Submission of Layout Plan for Permitted 'Flat' and 'Social Welfare Facility' Uses at TWIL 5 and Lot No. 429 in D.D. 399, Ting Kau, Tsuen Wan

Title
Proposed Sewerage System

Figure No.	Scale
TIK/SIA/003	1:1,000 @ A3



Annex A

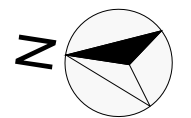
Layout Plan

LEGEND

- APPLICATION SITE BOUNDARY
- DEVELOPMENT SITE BOUNDARY
- FOOTPATH / COVERED AREA
- CARPARK / DRIVEWAY
- RESIDENTIAL USE
- LANDSCAPE AREA
- PRIVATE FLAT ROOF / PRIVATE GARDEN



ABBREVIATION:
 DE = DAY CARE CENTRE FOR THE ELDERLY
 LMR = LIFT MACHINE ROOM



INDICATIVE MASTER LAYOUT PLAN

PROPOSED REDEVELOPMENT AT ROYAL VIEW HOTEL AT TING KAU, N.T.

DATE : 03/07/2024
 1 : 400 (A3)

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Annex B

Backwash Calculation

Project Section 16 Planning Application for Submission of Layout Plan for Permitted 'Flat' and 'Social Welfare Facility' Uses at TWIL 5 and Lot No. 429 in D.D. 399, Ting Kau, Tsuen Wan

Subject Annex B Calculations of Existing Swimming Pool Backwash Discharge

Design Assumption

1. Discharge from backwash is assumed to be performed during off-peak hours.

Plan Area of Swimming Pool, A	=	175	m ²
Average Depth of Pool, D	=	1.5	m
Volume of Water in Swimming Pool, V	=	A x D	
	=	262.5	m ³
Turnover Period, T	=	6	hours
Surface Loading Rate of Filter, R _f	=	20.0	m ³ /m ² /hr
Filter Area Required, A _f	=	V ÷ T ÷ R _f	
	=	2.19	m ²
Backwash Duration, T _b	=	3	min
Backwash Flow Rate, Q _b	=	8.0	m ³ /m ² /hr
Volume of Backwash, V _b	=	A _f x (T _b ÷ 60) x Q _b	
	=	0.88	m ³
Instant Peak Flow, Q _{ip}	=	Q _b x A _f	
	=	17.50	m ³ /hr
	=	4.86	L/s

Thus, the instant peak flow is 17.5 m³/hr discharging 0.88 m³ of backwash within 3 minutes.

Remark:

6 hours of turnover period is adopted in accordance with the Clause 9 of Chapter 132CA Swimming Pools Regulation for a typical outdoor swimming pool.

Project Section 16 Planning Application for Submission of Layout Plan for Permitted 'Flat' and 'Social Welfare Facility' Uses at TWIL 5 and Lot No. 429 in D.D. 399, Ting Kau, Tsuen Wan

Subject Annex B Calculations of Proposed Swimming Pool Backwash Discharge

Design Assumption

1. Discharge from backwash is assumed to be performed during off-peak hours.

Plan Area of Swimming Pool, A	=	200	m ²
Average Depth of Pool, D	=	1.5	m
Volume of Water in Swimming Pool, V	=	A x D	
	=	300.0	m ³
Turnover Period, T	=	6	hours
Surface Loading Rate of Filter, R _f	=	20.0	m ³ /m ² /hr
Filter Area Required, A _f	=	V ÷ T ÷ R _f	
	=	2.50	m ²
Backwash Duration, T _b	=	3	min
Backwash Flow Rate, Q _b	=	8.0	m ³ /m ² /hr
Volume of Backwash, V _b	=	A _f x (T _b ÷ 60) x Q _b	
	=	1.00	m ³
Instant Peak Flow, Q _{ip}	=	Q _b x A _f	
	=	20.00	m ³ /hr
	=	5.56	L/s

Thus, the instant peak flow is 20 m³/hr discharging 1 m³ of backwash within 3 minutes.

Remark:

6 hours of turnover period is adopted in accordance with the Clause 9 of Chapter 132CA Swimming Pools Regulation for a typical outdoor swimming pool.

Annex C

Design Checking of Existing Sewer

Annex C Design Checking of Existing Sewer (Before Re-Development)

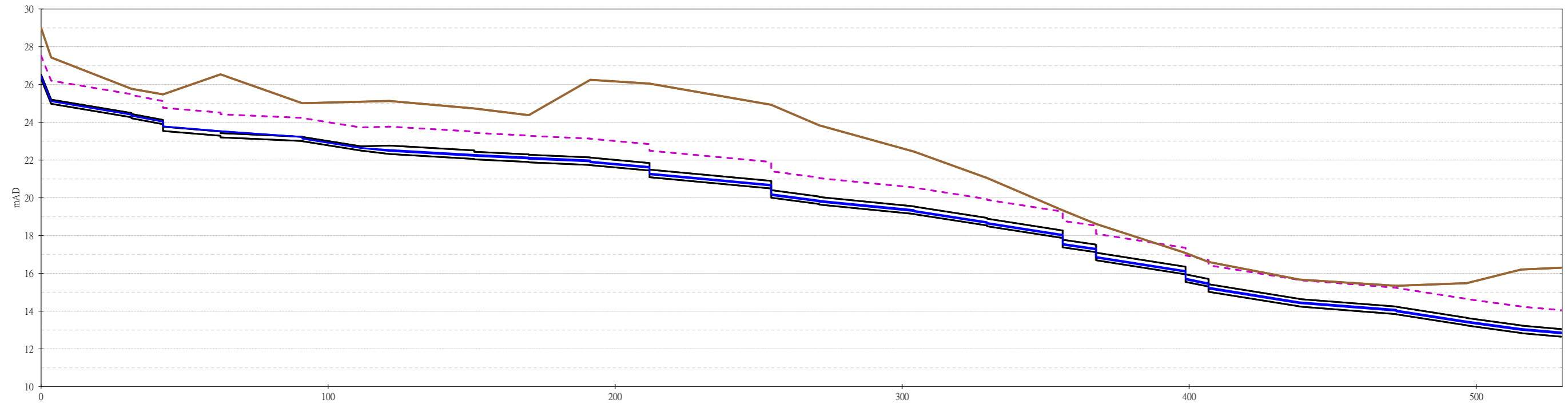
Note:

- 1) Colebrook-White's equation is adopted for full-bore pipe velocity calculation.
- 2) Backwash Flowrate generated by swimming pool from developments, if any, has been included in the Design Peak Flowrate.

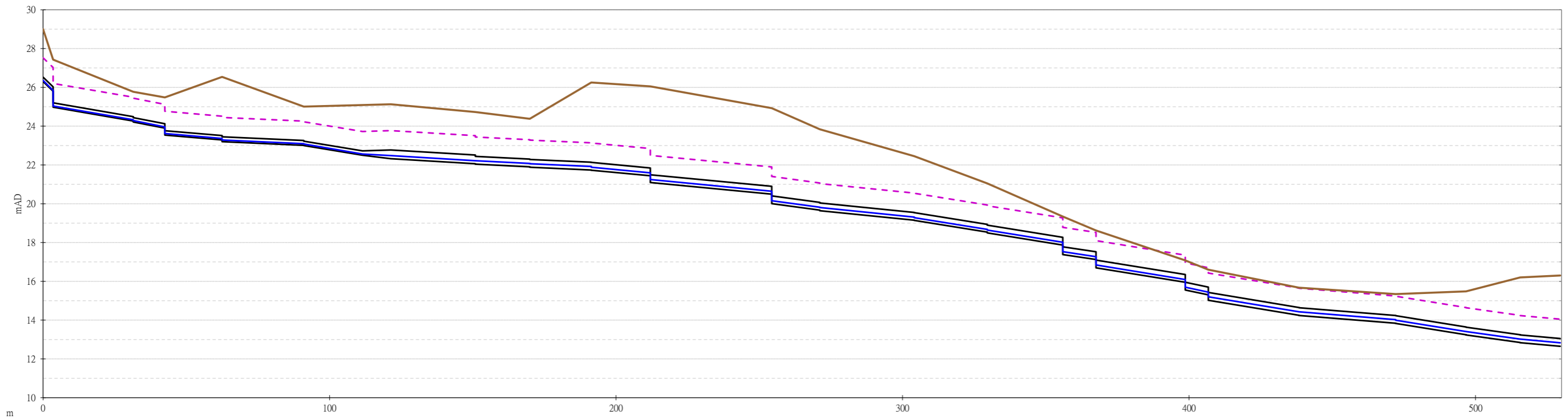
Existing Sewer Before Re-Development (With Existing Hotel in the Development Site)																				
Pipe	Feature Number	Diameter (mm)	Upstream Invert Level (mPD)	Downstream Invert Level (mPD)	Pipe Length (m)	Gradient (1 in)	Roughness (mm)	No. of Pipes	Catchment No.	ADWF (m ³ /d)	ADWF*Inflow factor (m ³ /d)	ADWF (m ³ /s)	Catchment Inflow Factor	ADWF*Inflow factor (m ³ /s)	Contributing Population	Peak Factor	Design Peak Flowrate (m ³ /s)	Full Bore Velocity (m/s)	Full Bore Capacity (m ³ /s)	Utilization (%)
Development to FMH4052476	TK.1	225	26.3	24.977	3.50	3	0.15	1	B (Existing)	664.32	730.752	0.007688889	1.1	0.008457778	2706	6	0.050994444	9.621035103	0.38253988	13%
FMH4052476 to FMH4052477	FWD4062073	225	24.977	24.265	28.00	39	0.6	1	B (Existing)	664.32	730.752	0.007688889	1.1	0.008457778	2706	6	0.050994444	2.092429116	0.083196618	61%
FMH4052477 to FMH4052478	FWD4062074	225	24.215	23.9	11.00	35	0.6	1	B (Existing)	664.32	730.752	0.007688889	1.1	0.008457778	2706	6	0.050994444	2.221276902	0.088319707	58%
FMH4052478 to FMH4052479	FWD4062075	225	23.542	23.29	20.00	79	0.6	1	B (Existing)	664.32	730.752	0.007688889	1.1	0.008457778	2706	6	0.050994444	1.469136156	0.058414002	87%
FMH4052479 to FMH4052480	FWD4062076	225	23.2	23.01	28.50	150	0.6	1	B (Existing)	664.32	730.752	0.007688889	1.1	0.008457778	2706	6	0.050994444	1.065239105	0.04235474	120%
FMH4052480 to FMH4052458	FWD4062077	225	23	22.5	20.50	41	0.6	1	B (Existing)	664.32	730.752	0.007688889	1.1	0.008457778	2706	6	0.050994444	2.048998713	0.081469791	63%
FMH4052457 to FMH4052458	FWD4062050	400	22.57	22.37	9.90	50	3	1	A	18.65	20.5128	0.00215833	1.1	0.002237417	76	8	0.060643333	2.142018308	0.269173959	23%
FMH4052458 to FMH4052459	FWD4062051	450	22.32	22.06	29.50	113	3	1	A, B (Existing)	819.32	901.252	0.00948287	1.1	0.010431157	3338	6	0.120675	1.528384837	0.243079105	50%
FMH4052459 to FMH4052460	FWD4062052	400	22.04	21.9	19.00	136	3	1	A, B (Existing)	819.32	901.252	0.00948287	1.1	0.010431157	3338	6	0.120675	1.292584603	0.162430972	74%
FMH4052460 to FSH4001720	FWD4062053	400	21.88	21.74	21.43	153	3	1	A, B (Existing)	819.32	901.252	0.00948287	1.1	0.010431157	3338	6	0.120675	1.216810482	0.152908915	79%
FSH4001720 to FSH4001721	FWD4062054	400	21.73	21.444	20.62	72	3	1	A, B (Existing)	819.32	901.252	0.00948287	1.1	0.010431157	3338	6	0.120675	1.774597239	0.223002466	54%
FSH4001721 to FSH4001722	FWD4062055	400	21.094	20.497	42.38	71	3	1	A, B (Existing)	819.32	901.252	0.00948287	1.1	0.010431157	3338	6	0.120675	1.78825551	0.224718815	54%
FSH4001722 to FSH4001723	FWD4062056	400	20.006	19.67	16.76	50	3	1	A, B (Existing), C	856.69	942.359	0.009915394	1.1	0.010906933	3490	6	0.138470139	2.133618211	0.268118372	52%
FSH4001723 to FSH4001724	FWD4062057	400	19.64	19.15	32.98	67	3	1	A, B (Existing), C	856.69	942.359	0.009915394	1.1	0.010906933	3490	6	0.138470139	1.836440063	0.230773864	60%
FSH4001724 to FMH4052466	FWD4062058	400	19.14	18.536	25.48	42	3	1	A, B (Existing), C	856.69	942.359	0.009915394	1.1	0.010906933	3490	6	0.138470139	3.20263275	0.291585449	47%
FMH4052466 to FMH4052467	FWD4062059	400	18.496	17.87	26.37	42	3	1	A, B (Existing), C	856.69	942.359	0.009915394	1.1	0.010906933	3490	6	0.138470139	2.322021942	0.291793883	47%
FMH4052467 to FMH4052468	FWD4062060	400	17.38	17.124	11.59	45	3	1	A, B (Existing), C	856.69	942.359	0.009915394	1.1	0.010906933	3490	6	0.138470139	2.240272019	0.281520885	49%
FMH4052468 to FMH4052469	FWD4062061	400	16.696	15.951	31.15	42	3	1	A, B (Existing), C	856.69	942.359	0.009915394	1.1	0.010906933	3490	6	0.138470139	2.330693348	0.292883564	47%
FMH4052469 to FMH4052470	FWD4062062	400	15.55	15.3	8.07	32	3	1	A, B (Existing), C, D	894.06	983.466	0.010347917	1.1	0.011382708	3642	6	0.152176389	2.65333488	0.333427895	46%
FMH4052470 to FMH4052471	FWD4062063	400	15.025	14.25	31.65	41	3	1	A, B (Existing), C, D	894.06	983.466	0.010347917	1.1	0.011382708	3642	6	0.152176389	2.358624384	0.296393481	51%
FMH4052471 to FMH4052472	FWD4062064	400	14.24	13.84	33.74	84	3	1	A, B (Existing), C, D	894.06	983.466	0.010347917	1.1	0.011382708	3642	6	0.152176389	1.640201513	0.20613801	74%
FMH4052472 to FMH4052541	FWD4062065	400	13.83	13.247	24.56	42	3	1	A, B (Existing), C, D, E	904.43	994.873	0.01046794	1.1	0.011514734	3685	6	0.152896528	2.32196478	0.2917867	52%
FMH4052541 to FMH4052473	FWD4062146	400	13.237	12.845	18.88	48	3	1	A, B (Existing), C, D, E	904.43	994.873	0.01046794	1.1	0.011514734	3685	6	0.152896528	2.171434741	0.272870537	56%
FMH4052473 to SPS	FWD4062086	400	12.835	12.65	13.97	76	3	1	A, B (Existing), C, D, E, F, G	915.90	1007.49	0.010600694	1.1	0.011660764	3731	6	0.153693056	1.733843529	0.217881204	71%

Annex C Design Checking of Existing Sewer

Existing



S16-Proposed



Annex C Design Checking of Existing Sewer

Node ID	Ground Level (mAD)	Existing		S16		Increase in Water Level (m)
		Max. Water Level (mAD)	Freeboard (m)	Max. Water Level (mAD)	Freeboard (m)	
Development	29	26.439	2.561	26.360	2.640	-0.079
FMH4052476	27.43	25.116	2.314	25.040	2.390	-0.076
FMH4052477	25.77	24.404	1.366	24.287	1.483	-0.117
FMH4052478	25.48	24.033	1.447	23.618	1.862	-0.416
FMH4052479	26.54	23.530	3.010	23.286	3.254	-0.244
FMH4052480	25.01	23.221	1.789	23.080	1.930	-0.141
FMH4052458	25.13	22.641	2.489	22.479	2.651	-0.161
FMH4052459	24.73	22.279	2.451	22.217	2.513	-0.061
FMH4052460	24.38	22.139	2.241	22.064	2.316	-0.074
FSH4001720	26.25	21.988	4.262	21.881	4.369	-0.107
FSH4001721	26.05	21.640	4.410	21.247	4.803	-0.393
FSH4001722	24.93	20.692	4.238	20.155	4.775	-0.538
FSH4001723	23.84	19.859	3.981	19.805	4.035	-0.054
FSH4001724	22.45	19.356	3.094	19.282	3.168	-0.074
FMH4052466	21.05	18.716	2.334	18.643	2.407	-0.073
FMH4052467	19.34	18.050	1.290	17.527	1.813	-0.523
FMH4052468	18.62	17.308	1.312	16.844	1.776	-0.464
FMH4052469	17.08	16.130	0.950	15.695	1.385	-0.436
FMH4052470	16.6	15.476	1.124	15.204	1.396	-0.272
FMH4052471	15.67	14.475	1.195	14.429	1.241	-0.046
FMH4052472	15.34	14.075	1.265	13.993	1.347	-0.082
FMH4052541	15.48	13.456	2.024	13.410	2.070	-0.045
FMH4052473	16.2	13.064	3.136	13.018	3.182	-0.045
SPS	16.3	12.879	3.421	12.832	3.468	-0.046

Annex D

Detailed Estimation of Sewerage of Catchments A to G

Project Section 16 Planning Application for Submission of Layout Plan for Permitted 'Flat' and 'Social Welfare Facility' Uses at TWIL 5 and Lot No. 429 in D.D. 399, Ting Kau, Tsuen Wan

Subject Annex D Estimated Sewerage generated by Catchment A

	<p><u>Design Assumptions</u></p> <ol style="list-style-type: none"> Unit flow factor is adopted in accordance with <i>Guideline Guidelines for Estimating Sewage Flows (GESF)</i> published by EPD in March 2005. Average Household Size of 2.7 in Tsuen Wan District is adopted in accordance with 2020 Population Census. 																				
	<p><u>Sewage Flow from Ting Kau Sewage Pumping Station</u></p> <table> <tr> <td>Provided by DSD</td> <td>Average Daily Flow</td> <td>=</td> <td>155.00</td> <td>m³/d</td> </tr> <tr> <td>Provided by DSD</td> <td>Designed Daily Flow</td> <td>=</td> <td>3974.00</td> <td>m³/d</td> </tr> <tr> <td>Provided by DSD</td> <td>Flow Rate of Pump</td> <td>=</td> <td>46.00</td> <td>L/s</td> </tr> <tr> <td></td> <td></td> <td>=</td> <td>0.0460</td> <td>m³/s</td> </tr> </table> <p>It is assumed that the pump will work at its design flow rate (as shown above) under peak flow condition, thus, the flow rate of pump has been adopted as peak flow from SPS in the design checking in Annex C.</p>	Provided by DSD	Average Daily Flow	=	155.00	m ³ /d	Provided by DSD	Designed Daily Flow	=	3974.00	m ³ /d	Provided by DSD	Flow Rate of Pump	=	46.00	L/s			=	0.0460	m ³ /s
Provided by DSD	Average Daily Flow	=	155.00	m ³ /d																	
Provided by DSD	Designed Daily Flow	=	3974.00	m ³ /d																	
Provided by DSD	Flow Rate of Pump	=	46.00	L/s																	
		=	0.0460	m ³ /s																	
GESF Table T-1	<p><u>Estimated Sewage generated by Lindo Green</u></p> <table> <tr> <td>Total number of Residential units</td> <td>=</td> <td>3</td> <td>unit(s)</td> </tr> <tr> <td>Total number of residents</td> <td>=</td> <td>9</td> <td>persons</td> </tr> <tr> <td>Unit Flow Factor</td> <td>=</td> <td>0.37</td> <td>m³/d per person</td> </tr> <tr> <td>Average Dry Weather Flow, ADWF</td> <td>=</td> <td>3.33</td> <td>m³/d</td> </tr> <tr> <td></td> <td>=</td> <td>0.00004</td> <td>m³/s</td> </tr> </table> <p><i>Number of residential units is extracted from: https://www.midland.com.hk/zh-hk/estate/%E6%96%B0%E7%95%8C-%E8%8D%83%E7%81%A3-Lindo-Green-E000013893</i></p>	Total number of Residential units	=	3	unit(s)	Total number of residents	=	9	persons	Unit Flow Factor	=	0.37	m ³ /d per person	Average Dry Weather Flow, ADWF	=	3.33	m ³ /d		=	0.00004	m ³ /s
Total number of Residential units	=	3	unit(s)																		
Total number of residents	=	9	persons																		
Unit Flow Factor	=	0.37	m ³ /d per person																		
Average Dry Weather Flow, ADWF	=	3.33	m ³ /d																		
	=	0.00004	m ³ /s																		
GESF Table T-1	<p><u>Estimated Sewage generated by Grand Riviera</u></p> <table> <tr> <td>Total number of Residential units</td> <td>=</td> <td>13</td> <td>unit(s)</td> </tr> <tr> <td>Total number of residents</td> <td>=</td> <td>36</td> <td>persons</td> </tr> <tr> <td>Unit Flow Factor</td> <td>=</td> <td>0.37</td> <td>m³/d per person</td> </tr> <tr> <td>Average Dry Weather Flow, ADWF</td> <td>=</td> <td>13.32</td> <td>m³/d</td> </tr> <tr> <td></td> <td>=</td> <td>0.0002</td> <td>m³/s</td> </tr> </table> <p><i>Number of residential units is extracted from: http://hk.centadata.com/TransactionHistory.aspx?type=1&code=AAPPWAPEPK</i></p>	Total number of Residential units	=	13	unit(s)	Total number of residents	=	36	persons	Unit Flow Factor	=	0.37	m ³ /d per person	Average Dry Weather Flow, ADWF	=	13.32	m ³ /d		=	0.0002	m ³ /s
Total number of Residential units	=	13	unit(s)																		
Total number of residents	=	36	persons																		
Unit Flow Factor	=	0.37	m ³ /d per person																		
Average Dry Weather Flow, ADWF	=	13.32	m ³ /d																		
	=	0.0002	m ³ /s																		
GESF Table T-1	<p><u>Estimated Sewage generated by Planned Development (A/TWW/110)</u></p> <table> <tr> <td>Total number of Residential units</td> <td>=</td> <td>2</td> <td>unit(s)</td> </tr> <tr> <td>Total number of residents</td> <td>=</td> <td>5</td> <td>persons</td> </tr> <tr> <td>Unit Flow Factor</td> <td>=</td> <td>0.37</td> <td>m³/d per person</td> </tr> <tr> <td>Average Dry Weather Flow, ADWF</td> <td>=</td> <td>2.00</td> <td>m³/d</td> </tr> <tr> <td></td> <td>=</td> <td>0.0000</td> <td>m³/s</td> </tr> </table> <p><i>Data for Planned Development as in A/TWW/110 received by TPB on 20 November, 2018.</i></p>	Total number of Residential units	=	2	unit(s)	Total number of residents	=	5	persons	Unit Flow Factor	=	0.37	m ³ /d per person	Average Dry Weather Flow, ADWF	=	2.00	m ³ /d		=	0.0000	m ³ /s
Total number of Residential units	=	2	unit(s)																		
Total number of residents	=	5	persons																		
Unit Flow Factor	=	0.37	m ³ /d per person																		
Average Dry Weather Flow, ADWF	=	2.00	m ³ /d																		
	=	0.0000	m ³ /s																		
GESF Table T-1	<p><u>Estimated Sewage generated by Planned Development (A/TWW/124)</u></p> <table> <tr> <td>Total number of Residential units</td> <td>=</td> <td>2</td> <td>unit(s)</td> </tr> <tr> <td>Total number of residents</td> <td>=</td> <td>5</td> <td>persons</td> </tr> <tr> <td>Unit Flow Factor</td> <td>=</td> <td>0.37</td> <td>m³/d per person</td> </tr> <tr> <td>Average Dry Weather Flow, ADWF</td> <td>=</td> <td>2.00</td> <td>m³/d</td> </tr> <tr> <td></td> <td>=</td> <td>0.0000</td> <td>m³/s</td> </tr> </table> <p><i>Data for Planned Development as in A/TWW/124 received by TPB on 20 January 2023.</i></p>	Total number of Residential units	=	2	unit(s)	Total number of residents	=	5	persons	Unit Flow Factor	=	0.37	m ³ /d per person	Average Dry Weather Flow, ADWF	=	2.00	m ³ /d		=	0.0000	m ³ /s
Total number of Residential units	=	2	unit(s)																		
Total number of residents	=	5	persons																		
Unit Flow Factor	=	0.37	m ³ /d per person																		
Average Dry Weather Flow, ADWF	=	2.00	m ³ /d																		
	=	0.0000	m ³ /s																		
	<p><u>Sub-total for Catchment A</u></p> <table> <tr> <td>Average Dry Weather Flow, ADWF</td> <td>=</td> <td>175.65</td> <td>m³/d</td> </tr> <tr> <td>Peak Flow from Ting Kau SPS</td> <td>=</td> <td>0.046</td> <td>m³/s</td> </tr> </table>	Average Dry Weather Flow, ADWF	=	175.65	m ³ /d	Peak Flow from Ting Kau SPS	=	0.046	m ³ /s												
Average Dry Weather Flow, ADWF	=	175.65	m ³ /d																		
Peak Flow from Ting Kau SPS	=	0.046	m ³ /s																		

Project Section 16 Planning Application for Submission of Layout Plan for Permitted 'Flat' and 'Social Welfare Facility' Uses at TWIL 5 and Lot No. 429 in D.D. 399, Ting Kau, Tsuen Wan

Subject Annex D Estimated Sewerage generated by Catchment B

<p>GESF Table T-1</p>	<p><u>Design Assumptions</u></p> <p>1. Unit flow factor is adopted in accordance with <i>Guideline Guidelines for Estimating Sewage Flows (GESF)</i> published by EPD in March 2005.</p> <p>2. Average Household Size of 2.7 in Tsuen Wan District is adopted in accordance with 2020 Population Census.</p> <p><u>Estimated Sewage generated by Sea-Cliff Lodge</u></p> <p>Total number of Residential units = 6 unit(s)</p> <p>Total number of residents = 17 persons</p> <p>Unit Flow Factor = 0.37 m³/d per person</p> <p>Average Dry Weather Flow, ADWF = 6.29 m³/d</p> <p>= 0.0001 m³/s</p> <p><i>Number of residential units is extracted from: https://hk.centanet.com/estate/%E6%B5%B7%E6%80%A1%E5%B1%85/1-QQRSFRDRRU</i></p>
<p>GESF Table T-1</p>	<p><u>Estimated Sewage generated by Aztec Lodge</u></p> <p>Total number of Residential units = 7 unit(s)</p> <p>Total number of residents = 19 persons</p> <p>Unit Flow Factor = 0.37 m³/d per person</p> <p>Average Dry Weather Flow, ADWF = 7.03 m³/d</p> <p>= 0.0001 m³/s</p> <p><i>Number of residential units is extracted from: https://hk.centanet.com/estate/en/Aztec-Lodge/2-AAPPWPPJPK</i></p>
	<p><u>Estimated Sewage generated by The Proposed Development</u></p> <p>Average Dry Weather Flow, ADWF = 527.39 m³/d</p> <p>= 0.0061 m³/s</p> <p><u>Sub-total for Catchment B</u></p> <p>Average Dry Weather Flow, ADWF = 540.71 m³/d</p>

Project Section 16 Planning Application for Submission of Layout Plan for Permitted 'Flat' and 'Social Welfare Facility' Uses at TWIL 5 and Lot No. 429 in D.D. 399, Ting Kau, Tsuen Wan

Subject Annex D Estimated Sewerage generated by Catchment C and D

<p>Provided by DSD Provided by DSD Provided by DSD</p>	<p><u>Design Assumptions</u></p> <p>1. Unit flow factor is adopted in accordance with <i>Guideline Guidelines for Estimating Sewage Flows (GESF)</i> published by EPD in March 2005.</p> <p>2. Average Household Size of 2.7 in Tsuen Wan District is adopted in accordance with 2020 Population Census.</p> <p><u>Sewage Flow from Lido Beach Sewage Pumping Station</u></p> <p>Average Daily Flow = 38.00 m³/d Designed Daily Flow = 1037.00 m³/d Flow Rate of Pump = 15.20 L/s = 0.0152 m³/s</p> <p>It is assumed that the pump will work at its design flow rate (as shown above) under peak flow condition, thus, the flow rate of pump has been adopted as peak flow from SPS in the design checking in Annex C.</p>
	<p><u>Sub-total for Catchment C</u></p> <p>Average Dry Weather Flow, ADWF = 38.00 m³/d Peak Flow from Lido Beach SPS = 0.0152 m³/s</p>
<p>GESF Table T-1</p>	<p><u>Estimated Sewage generated by Edinburgh Villa</u></p> <p>Total number of resident units = 4 unit(s) Total number of residents = 11 persons Unit Flow Factor = 0.37 m³/d per person Average Dry Weather Flow, ADWF = 4.07 m³/d = 0.0000 m³/s</p> <p><i>Number of resident units is extracted from: https://hk.centanet.com/estate/%E6%A1%82%E7%9B%A7/1-AABKWPYAPE</i></p>
<p>GESF Table T-1</p>	<p><u>Estimated Sewage generated by Deauville</u></p> <p>Total number of resident units = 33 unit(s) Total number of residents = 90 persons Unit Flow Factor = 0.37 m³/d per person Average Dry Weather Flow, ADWF = 33.30 m³/d = 0.0004 m³/s</p> <p>Number of resident units is extracted from: https://hk.centanet.com/estate/%E6%98%9F%E5%B2%B8/2-AAPPWPPHPK</p> <p><u>Sub-total for Catchment D</u></p> <p>Average Dry Weather Flow, ADWF = 37.37 m³/d</p>

Project Section 16 Planning Application for Submission of Layout Plan for Permitted 'Flat' and 'Social Welfare Facility' Uses at TWIL 5 and Lot No. 429 in D.D. 399, Ting Kau, Tsuen Wan

Subject Annex D Estimated Sewerage generated by Catchment E and F

<p>GESF Table T-1</p>	<p><u>Design Assumptions</u></p> <p>1. Unit flow factor is adopted in accordance with <i>Guideline Guidelines for Estimating Sewage Flows (GESF)</i> published by EPD in March 2005.</p> <p>2. Average Household Size of 2.7 in Tsuen Wan District is adopted in accordance with 2020 Population Census.</p> <p><u>Estimated Sewage generated by Riviera Apartment</u></p> <p>Total number of Residential units = 9 unit(s)</p> <p>Total number of residents = 25 persons</p> <p>Unit Flow Factor = 0.37 m³/d per person</p> <p>Average Dry Weather Flow, ADWF = 9.25 m³/d</p> <p>= 0.0001 m³/s</p> <p><i>Number of resident units is extracted from:</i> https://hk.centanet.com/estate/%E9%BA%97%E6%B5%B7%E5%88%A5%E5%A2%85/1-DDTLTHIAHM</p>
<p>GESF Table T-2</p>	<p><u>Estimated Sewage generated by Casam Beach</u></p> <p>Total number of staffs = 4 persons</p> <p>Unit Flow Factor = 0.28 m³/d per person</p> <p>Average Dry Weather Flow, ADWF = 1.12 m³/d</p> <p>= 0.0000 m³/s</p>
<p>GESF Table T-1</p>	<p><u>Sub-total for Catchment E</u></p> <p>Average Dry Weather Flow, ADWF = 10.37 m³/d</p> <p><u>Estimated Sewage generated by Villamar</u></p> <p>Total number of Residential units = 1 unit(s)</p> <p>Total number of residents = 3 persons</p> <p>Unit Flow Factor = 0.37 m³/d per person</p> <p>Average Dry Weather Flow, ADWF = 1.11 m³/d</p> <p>= 0.0000 m³/s</p> <p><i>Number of resident units is extracted from:</i> https://hk.centanet.com/estate/en/Villamar/1-QQDSQRCJRU</p>
	<p><u>Sub-total for Catchment F</u></p> <p>Average Dry Weather Flow, ADWF = 1.11 m³/d</p>

Project Section 16 Planning Application for Submission of Layout Plan for Permitted 'Flat' and 'Social Welfare Facility' Uses at TWIL 5 and Lot No. 429 in D.D. 399, Ting Kau, Tsuen Wan

Subject Annex D Estimated Sewerage generated by Catchment G

<p>GESF Table T-1</p>	<p><u>Design Assumptions</u></p> <ol style="list-style-type: none"> Unit flow factor is adopted in accordance with <i>Guideline Guidelines for Estimating Sewage Flows (GESF)</i> published by EPD in March 2005. Average Household Size of 2.7 in Tsuen Wan District is adopted in accordance with 2020 Population Census. <p><u>Estimated Sewage generated by Vista Del Mar</u></p> <table> <tr> <td>Total number of Residential units</td> <td>=</td> <td>9</td> <td>unit(s)</td> </tr> <tr> <td>Total number of residents</td> <td>=</td> <td>25</td> <td>persons</td> </tr> <tr> <td>Unit Flow Factor</td> <td>=</td> <td>0.37</td> <td>m³/d per person</td> </tr> <tr> <td>Average Dry Weather Flow, ADWF</td> <td>=</td> <td>9.25</td> <td>m³/d</td> </tr> <tr> <td></td> <td>=</td> <td>0.0001</td> <td>m³/s</td> </tr> </table> <p><i>Number of resident units is extracted from: https://hk.centanet.com/estate/%E8%A7%80%E6%B5%B7%E5%88%A5%E5%A2%85/2-AADKGPWXPE</i></p>	Total number of Residential units	=	9	unit(s)	Total number of residents	=	25	persons	Unit Flow Factor	=	0.37	m ³ /d per person	Average Dry Weather Flow, ADWF	=	9.25	m ³ /d		=	0.0001	m ³ /s
Total number of Residential units	=	9	unit(s)																		
Total number of residents	=	25	persons																		
Unit Flow Factor	=	0.37	m ³ /d per person																		
Average Dry Weather Flow, ADWF	=	9.25	m ³ /d																		
	=	0.0001	m ³ /s																		
<p>GESF Table T-1</p>	<p><u>Estimated Sewage generated by Fung Loi</u></p> <table> <tr> <td>Total number of Residential units</td> <td>=</td> <td>1</td> <td>unit(s)</td> </tr> <tr> <td>Total number of residents</td> <td>=</td> <td>3</td> <td>persons</td> </tr> <tr> <td>Unit Flow Factor</td> <td>=</td> <td>0.37</td> <td>m³/d per person</td> </tr> <tr> <td>Average Dry Weather Flow, ADWF</td> <td>=</td> <td>1.11</td> <td>m³/d</td> </tr> <tr> <td></td> <td>=</td> <td>0.0000</td> <td>m³/s</td> </tr> </table> <p><i>Number of resident units is extracted from: https://www.midland.com.hk/zh-hk/estate/%E6%96%B0%E7%95%8C-%E6%B7%B1%E4%BA%95-%E9%9D%92%E9%BE%8D%E9%A0%AD-%E8%93%AC%E8%90%8A-E000013895</i></p>	Total number of Residential units	=	1	unit(s)	Total number of residents	=	3	persons	Unit Flow Factor	=	0.37	m ³ /d per person	Average Dry Weather Flow, ADWF	=	1.11	m ³ /d		=	0.0000	m ³ /s
Total number of Residential units	=	1	unit(s)																		
Total number of residents	=	3	persons																		
Unit Flow Factor	=	0.37	m ³ /d per person																		
Average Dry Weather Flow, ADWF	=	1.11	m ³ /d																		
	=	0.0000	m ³ /s																		
	<p><u>Sub-total for Catchment G</u></p> <table> <tr> <td>Average Dry Weather Flow, ADWF</td> <td>=</td> <td>10.36</td> <td>m³/d</td> </tr> </table>	Average Dry Weather Flow, ADWF	=	10.36	m ³ /d																
Average Dry Weather Flow, ADWF	=	10.36	m ³ /d																		

Project Section 16 Planning Application for Submission of Layout Plan for Permitted 'Flat' and 'Social Welfare Facility' Uses at TWIL 5 and Lot No. 429 in D.D. 399, Ting Kau, Tsuen Wan

Subject Annex D Estimation of Swimming Pool Backwash Discharge of Existing Grand Riviera

Design Assumption

1. Discharge from backwash is assumed to be performed during off-peak hours.
2. In view that the actual backwash calculation of the existing buildings in the catchment is not available, the backwash operation is assumed to be same as the Proposed Development.

Area of Swimming Pool, A	=	465	m ²
Average Depth of Pool, D	=	1.5	m
Volume of Water in Swimming Pool, V	=	A x D	
	=	697.5	m ³
Turnover Period, T	=	6	hours
Surface Loading Rate of Filter, R _f	=	20.0	m ³ /m ² /hr
Filter Area Required, A _f	=	V ÷ T ÷ R _f	
	=	5.81	m ²
Backwash Duration, T _b	=	3	min
Backwash Flow Rate, Q _b	=	8.0	m ³ /m ² /hr
Volume of Backwash, V _b	=	A _f x (T _b ÷ 60) x Q _b	
	=	2.33	m ³
Instant Peak Flow, Q _{ip}	=	Q _b x A _f	
	=	46.50	m ³ /hr
	=	12.92	L/s

Thus, the instant peak flow is 46.5 m³/hr discharging 2.33 m³ of backwash within 3 minutes.

Remark:

6 hours of turnover period is adopted in accordance with the Clause 9 of Chapter 132CA Swimming Pools Regulation for a typical outdoor swimming pool.

Project Section 16 Planning Application for Submission of Layout Plan for Permitted 'Flat' and 'Social Welfare Facility' Uses at TWIL 5 and Lot No. 429 in D.D. 399, Ting Kau, Tsuen Wan

Subject Annex D Estimation of Swimming Pool Backwash Discharge of Existing Deauville

Design Assumption

- 1 Discharge from backwash is assumed to be performed during off-peak hours.
- 2 In view that the actual backwash calculation of the existing buildings in the catchment is not available, the backwash operation is assumed to be same as the Proposed Development.

Area of Swimming Pool, A	=	400	m ²
Average Depth of Pool, D	=	1.5	m
Volume of Water in Swimming Pool, V	=	A x D	
	=	600.0	m ³
Turnover Period, T	=	6	hours
Surface Loading Rate of Filter, R _f	=	20.0	m ³ /m ² /hr
Filter Area Required, A _f	=	V ÷ T ÷ R _f	
	=	5.00	m ²
Backwash Duration, T _b	=	3	min
Backwash Flow Rate, Q _b	=	8.0	m ³ /m ² /hr
Volume of Backwash, V _b	=	A _f x (T _b ÷ 60) x Q _b	
	=	2.00	m ³
Instant Peak Flow, Q _{ip}	=	Q _b x A _f	
	=	40.00	m ³ /hr
	=	11.11	L/s

Thus, the instant peak flow is 40 m³/hr discharging 2 m³ of backwash within 3 minutes.

Remark:

6 hours of turnover period is adopted in accordance with the Clause 9 of Chapter 132CA Swimming Pools Regulation for a typical outdoor swimming pool.

Annex E

Capacity Checking of Casam Sewage Pumping Station

Project Section 16 Planning Application for Submission of Layout Plan for Permitted 'Flat' and 'Social Welfare Facility' Uses at TWIL 5 and Lot No. 429 in D.D. 399, Ting Kau, Tsuen Wan

Subject Annex E Capacity Checking of Casam Sewage Pumping Station (with Existing Development)

<u>Information of Casam Sewage Pumping Station (SPS)</u>			
Design daily flow for Casam SPS, F_{cap}	=	10368.0	m ³ /d
<u>Existing Situation (From Historical Flow Record)</u>			
Average Daily Flow (2023/24)	=	750	m ³ /d
Average Daily Flow, F_1	=	750	m ³ /d
<u>Capacity Checking of Casam SPS</u>			
Existing Development, F_{pro}	=	651.0	m ³ /d
Total Sewage Generation, F_{est}	=	$F_1 + F_{pro}$	
	=	1401.0	m ³ /d
Catchment Inflow Factor	=	1.1	
Backwash from Swimming Pool (Instant Peak Flow), F_s	=	4.86	L/s
	=	419.904	m ³ /d
Backwash from Swimming Pool (Grand Riviera)	=	12.92	L/s
	=	1116.288	m ³ /d
Backwash from Swimming Pool (Deauville)	=	11.11	L/s
	=	959.904	m ³ /d
Total Flow to Casam SPS, F_{total}	=	$F_{est} * 1.1$	
	=	1541.1	m ³ /d
Contributing Population	=	5707.8	
Peak Factor	=	4	
Peak Flow to Casam SPS	=	8660.50	m ³ /d
	<	F_{cap}	
		83.5%	usage

OK

Project Section 16 Planning Application for Submission of Layout Plan for Permitted 'Flat' and 'Social Welfare Facility' Uses at TWIL 5 and Lot No. 429 in D.D. 399, Ting Kau, Tsuen Wan

Subject Annex E Capacity Checking of Casam Sewage Pumping Station (with Proposed Development)

<u>Information of Casam Sewage Pumping Station (SPS)</u>			
Design daily flow for Casam SPS, F_{cap}	=	10368.0	m ³ /d
<u>Existing Situation (From Historical Flow Record)</u>			
Average Daily Flow (2023/24)	=	750	m ³ /d
Average Daily Flow, F_1	=	750	m ³ /d
<u>Capacity Checking of Casam SPS</u>			
Proposed Development, F_{pro}	=	527.4	m ³ /d
Total Sewage Generation, F_{est}	=	$F_1 + F_{pro}$	
	=	1277.4	m ³ /d
Catchment Inflow Factor	=	1.1	
Backwash from Swimming Pool (Instant Peak Flow), F_s	=	5.56	L/s
	=	480.384	m ³ /d
Backwash from Swimming Pool (Grand Riviera)	=	12.92	L/s
	=	1116.288	m ³ /d
Backwash from Swimming Pool (Deauville)	=	11.11	L/s
	=	959.904	m ³ /d
Total Flow to Casam SPS, F_{total}	=	$F_{est} * 1.1$	
	=	1405.1	m ³ /d
Contributing Population	=	5204.2	
Peak Factor	=	4	
Peak Flow to Casam SPS	=	8177.10	m ³ /d
	<	F_{cap}	
		78.9%	usage
			<u>OK</u>

Annex F

Information from DSD regarding Sewage Pumping Stations

Cheong, Kathy

From: tkchan05@dsd.gov.hk
Sent: Monday, March 7, 2022 12:20 PM
To: Cheong, Kathy
Cc: Leung, Kar Kim; Lo, Edwin; mcchung@dsd.gov.hk; kwliu@dsd.gov.hk
Subject: Re: [Internet] RE: [Internet] RE: [Internet] Ting Kau Hotel - Request for data of Ting Kau SPS and Lido Beach SPS

Dear Kathy,

Please find below the further information of the pumps in the 2 SPSs.

Ting Kau SPS

Flow rate and head of each pump: 46l/s @ 35m, without motor speed control

Lido Beach SPS

Flow rate and head of each pump: 15.2l/s @ 27m, without motor speed control

Should you have any queries, please feel free to contact me.

Regards,
Ken CHAN
EME/ST1/3/5
Drainage Services Department
Tel : 2891 6591 / 6316 8663



From: "Cheong, Kathy" <CheongKy@binnies.com>
To: "tkchan05@dsd.gov.hk" <tkchan05@dsd.gov.hk>
Cc: "Leung, Kar Kim" <leungkk@binnies.com>, "Lo, Edwin" <LoCH@binnies.com>, "mcchung@dsd.gov.hk" <mcchung@dsd.gov.hk>, "kwliu@dsd.gov.hk" <kwliu@dsd.gov.hk>
Date: 21/02/2022 05:24 PM
Subject: [Internet] RE: [Internet] RE: [Internet] Ting Kau Hotel - Request for data of Ting Kau SPS and Lido Beach SPS
Serial No.:

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Dear Ken,

Please find our input below.

Should you have any queries, please feel free to contact me.

Regards,
Kathy

Kathy Cheong
Assistant Engineer



Tel: +852 26087305 | E-mail: cheongky@binnies.com

Binnies Hong Kong Limited | 43/F AIA Kowloon Tower, 100 How Ming Street, Kwun Tong, Kowloon, Hong Kong

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From: tkchan05@dsd.gov.hk <tkchan05@dsd.gov.hk>

Sent: Friday, February 11, 2022 6:42 PM

To: Cheong, Kathy <CheongKy@binnies.com>

Cc: Leung, Kar Kim <leungkk@binnies.com>; Lo, Edwin <LoCH@binnies.com>; mcchung@dsd.gov.hk;
kwliu@dsd.gov.hk

Subject: Re: [Internet] RE: [Internet] Ting Kau Hotel - Request for data of Ting Kau SPS and Lido Beach SPS

Dear Kathy,

While we are keep retrieving the data you have requested in the previous email.

For the concerned project of Ting Kau Hotel, could you please also disclose the following figures for our information.

(A) Site area and location map;

Input: The site area is about 0.64 ha. The location plan is enclosed for your reference.

(B) Location of public sewage drainage point;

Input: It is proposed to be connected and discharged to the existing manhole FMH4052476, which is same as the arrangement of the existing hotel.

(C) Estimated residential / tenant population;

Input: The anticipated population is about 1,785.

(D) Estimated effluents volume produced;

Input: The estimated ADWF is 509.8 m3/d.

(E) Estimated construction period; and

Input: Although the estimated construction period is to be confirmed, the construction of the Proposed Development mainly involves internal conversion, the construction period will not be long.

(F) Tentative date of opening .

Input: The Proposed Development is tentatively scheduled for opening in 2024.

Thank you.

Regards,
Ken CHAN
EME/ST1/3/5
Drainage Services Department
Tel : 2891 6591 / 6316 8663



From: Tsz Kin CHAN/ST1/DSD/HKSARG
To: "Cheong, Kathy" <CheongKy@binnies.com>
Cc: "Leung, Kar Kim" <leungkk@binnies.com>, "Lo, Edwin" <LoCH@binnies.com>
Date: 31/01/2022 14:16
Subject: Re: [Internet] RE: [Internet] Ting Kau Hotel - Request for data of Ting Kau SPS and Lido Beach SPS
Serial No.:

Dear Kathy,

As you enquired, the number of pumps in the two SPSs are as follows:-

Ting Kau SPS

Number of pump: 1 duty, 1 standby

Lido Beach SPS

Number of pump: 1 duty, 1 standby

For the capacity and pump flow rate, we will reply to you once the information is available.

Regards,
Ken CHAN
EME/ST1/3/5
Drainage Services Department
Tel : 2891 6591 / 6316 8663



From: "Cheong, Kathy" <CheongKy@binnies.com>
To: "tkchan05@dsd.gov.hk" <tkchan05@dsd.gov.hk>
Cc: "Leung, Kar Kim" <leungkk@binnies.com>, "Lo, Edwin" <LoCH@binnies.com>
Date: 31/01/2022 01:47 PM
Subject: [Internet] RE: [Internet] Ting Kau Hotel - Request for data of Ting Kau SPS and Lido Beach SPS
Serial No.:

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Dear Ken

Further to our phone discussion this morning, we would like to request for further information of the 2 SPSs as listed below:

1. Numbers of pumps and capacity of each pumps; and
2. Pump flow rate of each pump.

Thank you. Should you have any queries, please feel free to contact me.

Regards,
Kathy

Kathy Cheong
Assistant Engineer



Tel: +852 26087305 | E-mail: cheongky@binnies.com
Binnies Hong Kong Limited | 43/F AIA Kowloon Tower, 100 How Ming Street, Kwun Tong, Kowloon, Hong Kong

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From: tkchan05@dsd.gov.hk <tkchan05@dsd.gov.hk>
Sent: Thursday, January 27, 2022 1:58 PM
To: Cheong, Kathy <CheongKy@binnies.com>
Cc: Leung, Kar Kim <leungkk@binnies.com>; Lo, Edwin <LoCH@binnies.com>
Subject: Re: [Internet] Ting Kau Hotel - Request for data of Ting Kau SPS and Lido Beach SPS

Dear Kathy,

Please find below the figures of the 2 concerned sewage pumping stations in year 2021.

Ting Kau SPS

Designed daily flow: 3,974 cubic meter
Average daily flow: 141 cubic meter

Lido Beach SPS

Designed daily flow: 1,037 cubic meter

Average daily flow: 35 cubic meter

Regards,

Ken CHAN
Assistant Electrical and Mechanical Engineer
Sewage Treatment Division 1
Drainage Services Department
Tel : 2891 6591 / 6316 8663



From: "Cheong, Kathy" <CheongKy@binnies.com>
To: "tkchan05@dsd.gov.hk" <tkchan05@dsd.gov.hk>
Cc: "Lo, Edwin" <LoCH@binnies.com>, "Leung, Kar Kim" <leungkk@binnies.com>
Date: 26/01/2022 02:42 PM
Subject: [Internet] Ting Kau Hotel - Request for data of Ting Kau SPS and Lido Beach SPS
Serial No.:

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Dear Mr. Chan,

Tried to call you but in vain.

In response to comments received from EPD, we would like to request the pump rate and current/record sewage flow to the two pumping stations for our sewerage assessment. Thank you.

Should you have any queries, please feel free to contact me.

Regards,
Kathy

Kathy Cheong
Assistant Engineer



Tel: +852 26087305 | E-mail: cheongky@binnies.com
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[Attachment '1A) Location Plan.pdf' deleted by Tui Niu CHAN@ST1105@HONGKONG]