

Appendix F

Revised Sewerage Impact Assessment

Application for Amendment of Plan under Section 12A of the Town Planning Ordinance (Cap. 131) for Proposed Residential Development and Associated Infrastructure at Various Lots in D.D. 32 and Adjoining Government Land, Wong Yi Au, Tai Po, New Territories

Sewerage Impact Assessment Report

Issue 4 | September 2026

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Job number 292635

Ove Arup & Partners Hong Kong Limited



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1. Introduction

1.1 Project Background

- 1.1.1.1 This Sewerage Impact Assessment (“SIA”), appended to the Supporting Planning Statement, is prepared in support of the Planning Application under Section 12A of the Town Planning Ordinance (Cap. 131) for Proposed Residential Development and Associated Infrastructure (“Proposed Amendment”) at Various Lots in D.D. 32 and Adjoining Government Land, Wong Yi Au, Tai Po, New Territories (“the Application Site”).

1.2 Proposed Development

- 1.2.1.1 The Proposed Development is located at Wong Yi Au. There would be residential buildings and an access road (subject to detailed design) adjoining Yung Yi Road.
- 1.2.1.2 The Proposed Development comprises private housing and clubhouse. The total site area is approximately 19,876.89 m² and the design parameters are shown in **Table 1.1** below.

Table 1.1 Development Parameters

Description	Site Information
District Location	Tai Po
Site Location	Wong Yi Au
Application Site Area	About 19,876.89 m ²
GFA	Domestic: 35,710.44 m ² Clubhouse: 1606.97 m ²
No. of Units (About)	500
Anticipated Population	Domestic: 1400 Clubhouse ⁽¹⁾ : 53

⁽¹⁾ Community, Social & Personal Services = 3.3 employee per 100m² of GFA based on PlanD's Commercial and Industrial Floor Space Utilization Survey "CIFSUS" Table 8.

1.3 Purpose of this Report

- 1.3.1.1 The aim of this Sewerage Impact Assessment (SIA) Study is to review and update the sewerage network arising from proposed development to assess the impact of the Proposed Development to the existing sewerage network and to propose mitigation measures (if required).
- 1.3.1.2 The scope of the Project comprises comprehensive development private housing and a clubhouse in Wong Yi Au.
- 1.3.1.3 SIA Report shall be prepared, which should:

- (a) fully satisfy the requirements of this Scope in respect of the prediction and assessment of impacts, the identification of sewerage impact mitigation measures and the associated residual impacts;
- (b) provide assessment and evaluation of the sewerage impact and cumulative effects arising from the Project sufficient to identify those issues of key concern during the construction and operation of the Project;
- (c) define measurable sewerage parameters and features likely to be affected by the Project;
- (d) recommend optimum sewerage scheme for the Project;
- (e) prescribe the specification for detailed design, construction and operation requirements of the recommended sewerage scheme;
- (f) provide the assessment findings, conclusions, recommendations and a mechanism for implementation; and
- (g) include any revisions or supplements to the above as might be required by the EPD and DSD.

1.3.1.4 The SIA Report shall be submitted for approval by EPD and DSD on the methodologies, findings, proposals, recommendations and conclusions of the SIA.

1.3.1.5 This Sewerage Impact Assessment Report is structured as follows:

- Section 1 – Introduction**, introduces the Project Background, Objectives and Scope of the Project.
- Section 2 – Methodology and Design Criteria**, presents the Methodology and Design Criteria.
- Section 3 – Sewerage Impact Assessment**, presents the Sewerage Impact Assessment.
- Section 4 – Construction, Operation and Maintenance of New Sewerage Facilities**, presents Construction, Operation and Maintenance of New Sewerage Facilities.
- Section 5 – Conclusion**, summarises the Conclusions.

2. Methodology and Design Criteria

2.1 Methodology

2.1.1.1 The following methodology is adopted in carrying out the SIA:

- Identify the scope, parameters and programme of the development;
- Estimate the sewage flow generation of the development;
- Identify the existing and planned sewerage systems within and near the proposed development boundary;
- Examine the impact arising from new sewage generation from the proposed development on the existing sewerage network; and
- Identify new and upgrading sewerage works to support the proposed development.

- 2.1.1.2 The SIA has been carried out in accordance with the following guidelines set out in EPD Report No. EPD/TP1/05 Guidelines for Estimating Sewage Flows (GESF) for Sewerage Infrastructure Planning Version 1.0 and DSD's Sewerage Manual.

2.2 Parameters and Assumptions

- 2.2.1.1 The key parameters used for flow estimation in this SIA are unit flow factor, the population/employee density and flow from plumbing and drainage.

Unit Flow Factor – Domestic Flows

- 2.2.1.2 The Unit flow factors (UFF) for domestic sewage flow due to residential population of the proposed development and the existing sewerage catchment are shown in **Table 2.1** based on the Table T-1 of GESF.

Table 2.1 Unit Flow Factor for Domestic Flows

Residential Type	Unit Flow Factor (m ³ /person/day) ^[1]
Private R1	0.19
Private R3	0.37
Private R4	0.37
Modern Village	0.27
Institutional and special class	0.19

Unit Flow Factor – Commercial Flows

- 2.2.1.3 The UFFs for commercial sewage flows due to employed population of the proposed development and the existing sewerage catchment are shown in **Table 2.2** based on the Table T-2 of GESF.
- 2.2.1.4 The total unit flow generated from an employee in a particular trade is the sum of the UFF of the employee and the UFF of commercial activities of a particular trade under consideration.

Table 2.2 Unit Flow Factor for Commercial Flows

Commercial Type	UFF (m ³ /employee/day)
Commercial Employee	0.080
Commercial Activities	
(a) Specific trades:	
J11 – Community, Social & Personal Services	0.200
School student	0.040

Peaking Factors

2.2.1.5 The peaking factors to cater for seasonal/diurnal flow variations, and infiltration and inflow due to storm events are referenced to EPD's GESF and shown in

2.2.1.6 **Table 2.3 Peaking Factors for Various Population Ranges.**

Table 2.3 Peaking Factors for Various Population Ranges

Population Range	Peaking Factor (Including Stormwater Allowance) for Facility with Existing Upstream Sewerage	Peaking Factor (Excluding Stormwater Allowance) for Facility with Existing Upstream Sewerage
<i>Sewers</i>		
< 1,000	8	6
1,000 – 5,000	6	5
5,000 – 10,000	5	4
10,000 – 50,000	4	3
> 50,000	Max (7.3/N ^{0.15} , 2.4) ^[1]	Max (6/N ^{0.175} , 1.6) ^[1]
<i>Sewage Treatment Works, Preliminary Treatment Works and Pumping Stations</i>		
< 10,000	4	3
10,000 – 25,000	3.5	2.5
25,000 – 50,000	3	2
> 50,000	Max (3.9/N ^{0.065} , 2.4) ^[1]	Max (2.6/N ^{0.065} , 1.6) ^[1]
Note: [1] N = Contributing population in thousands		

2.2.1.7 With consideration of the reduced hydraulic performance due to the deterioration of sewer pipes with time, peaking factors (including stormwater allowance) is adopted in this Study.

Population Density

2.2.1.8 A person per flat (PPF) ratio of 2.8 is adopted based on the PPF in Tai Po District Council in 2021 Population Census.

2.2.1.9 The employment population density has been referenced to Table 8 of PlanD's Commercial and Industrial Floor Space Utilization Survey "CIFSUS":

- Community, Social & Personal Services: Assume 3.3 employee per 100m² of GFA

Hydraulic Analysis

- 2.2.1.10 Colebrook-White equation is applied for pipe hydraulic analysis. The design roughness coefficients (Ks) for existing pipeline system are assumed to be 0.6 mm (Slimed sewer slimed to about half depth; velocity when flowing half full approximately 1.2 m/s, clayware, under poor condition). The material adopted for proposed pipes is HDPE; a conservative roughness coefficient of 0.3 mm has been adopted in consideration of its reduced hydraulic performance in future due to degradation of material.
- 2.2.1.11 For small diameter sewers of diameter less than 300mm, the flow velocity of at least 0.7m/s shall occur daily, or that a gradient of at least 1:DN (i.e. Nominal diameter of the sewer in mm) is provided, provided that a flow of 2 times of Average Dry Weather Flow (ADWF) is assumed to occur at least once daily. For larger diameter sewers of diameter up to 900mm, a self-cleansing velocity of 1.0m/s in full pipe condition shall be achieved. The maximum flow velocity at peak flow shall be 3m/s.

3. Sewerage Impact Assessment

3.1 Existing and Planned Sewerage Infrastructure

Existing Sewerage System

- 3.1.1.1 Based on the DSD Drainage records, there is an existing sewerage network with sewers with 225mm dia. along Yung Yi Road and 375mm dia. along Tai Po Road which ultimately connects to the Tai Po Sewage Treatment Works (TPSTW) via Tai Po Kau Sewage Pumping Station (TPKSPS). The design daily flow of TPKSPS is 3,600 m³/day.
- 3.1.1.2 TPSTW is a primary treatment works facility for Tai Po District. The ADWF received at the facility is approximately 120,000 m³/day.

Planned Sewerage System

- 3.1.1.3 TPSTW is under plan for an upgrade in order to cater for the increased demand from projected ultimate population and planned developments in Tai Po and to achieve more stringent effluent quality standards.
- 3.1.1.4 Under PWP Item No. 4443DS, the followings are included as planned improvement:
- (i) The project will increase the treatment capacity of the Existing Tai Po STW from 120 000 m³/day to 160 000 m³/day.

3.2 Sewage Generation from the Existing and Ongoing Development

- 3.2.1.1 The sewage flow generated from the existing development (downstream of proposed development) is about 2005.6 m³/day (ADWF), while the peak flow is 116.1 L/s (peak factor = 5). The detailed calculations for sewage flow estimation are included in **Appendix A** and summarised in **Table 3.1**.

Table 3.1 Sewage Flow Estimation for the Existing Development

<i>Existing Development</i>	Estimated ADWF (m³/day) ⁽²⁾
Chateau Royale	84.1
Chateau De Mansion	25.2
Marvelous Villa	9.6
Village Houses (South)	68.0
Village Houses (Middle)	349.4
Village Houses (North)	41.0
Tai Po Ling Liang Church	5.6
Ling Liang Church MH Lau Secondary School	48.2
Care Village	249.5
Riverain Bayside	8.5
Tai Po Kau 3987 Tai Po Road - Yuen Chau Tsai	3.3

<i>Existing Development</i>	Estimated ADWF (m³/day) ⁽²⁾
Redland Garden	62.2
Trackside Villas	134.1
MTR Tai Po Kau Staff Clubhouse	52.9
Seaview Villas	18.9
Rural Estate Houses	6.3
Southview Villas	10.4
Emerald Palace	47.4
Daisyfield	6.3
Strafford House	55.8
The Kingston Hills	13.7
L'utopie	24.0
Savanna Garden	299.6
Tolo Ridge	30.3
Constellation Cove	344.4
Anchors International Nursery (Constellation Cove Campus)	6.8
Peak Catchment Inflow Factor	1.0 ⁽³⁾
Total ADWF (m³/day)	2005.6
Contributing population	7428
Peaking Factor ⁽¹⁾	5
Peak Flow (L/s)	116.1
Additional Flow from Swimming Pool Backwashes	33.6

Remarks:

- (1) Peaking Factor =5 for contributing population 5,000 – 10,000 based on EPD's GESF Table T-5.
- (2) Numbers are rounded to 1 decimal place.
- (3) GESF Table T-4 refer to Tai Po

- 3.2.1.2 According to the Drainage and Sewerage Impact Assessment carried out for Planning Application A/TP/694 (Proposed Minor Relaxation of Building Height Restriction for Proposed Social Welfare Facility (Residential Care Home for Persons with Disabilities) in “Government, Institution or Community” and “Green Belt” Zones at the “Former Fish Marketing Organization Tai Po Primary School”, Wong Yi Au, Tai Po), the sewage flow generated by this downstream facility is estimated to be 37.8 m³/day (ADWF). The peak flows are 3.5 L/s and 3.9 L/s when the backwash from the hydrotherapy pool is not in use and in use, respectively. The detailed calculations for sewage flow estimation are included in **Appendix A** and presented in **Table 3.2**.

Table 3.2 Sewage Flow Estimation for the Ongoing Development ⁽¹⁾

<i>Ongoing Development</i>	Estimated ADWF (m³/day)
Residential Care Home For Persons with Disabilities	37.8
Contributing Population	110
Peak Flow (L/s)	3.5
Peak Flow with backwash from Hydrotherapy Pool (L/s)	3.9

Remarks:

- (1) Refer to Table 3.1 of Drainage and Sewerage Impact Assessment of the Proposed Proposed Minor Relaxation of Building Height Restriction for Proposed Social Welfare Facility (Residential Care Home for Persons with Disabilities) in “Government, Institution or Community” and “Green Belt” Zones at the “Former Fish Marketing Organization Tai Po Primary School”, Wong Yi Au, Tai Po.

3.3 Sewage Generation from the Proposed Development

- 3.3.1.1 The sewage flow generated from the proposed development is about 532.8 m³/day (ADWF), while the peak flow is 37.0 L/s (peak factor = 6). The detailed calculations for sewage flow estimation are included in **Appendix A** and summarised in **Table 3.3**.

Table 3.3 Sewage Flow Estimation for the Proposed Development

<i>Proposed Development</i>	Estimated ADWF (m³/day) ⁽²⁾
Residential	518.0
Clubhouse	14.8
Peak Catchment Inflow Factor	1.0 ⁽³⁾
Total ADWF	532.8
Contributing population	1974
Peaking Factor ⁽¹⁾	6
Peak Flow (L/s)	37.0

Remarks:

- (1) Peaking Factor = 6 for contributing population = 1,000 – 5,000 based on EPD’s GESF Table T-5.
 (2) Numbers are rounded to 1 decimal place

3.4 Proposed Development Sewerage System

Sewerage Connection Proposal

- 3.4.1.1 To accommodate the sewage generation from Proposed Development, a new 225mm dia. HDPE sewage trunk main is proposed laying along the access road and connect to the existing manhole on Yung Yi Road. The proposed sewers are shown in **Table 3.4**, from the proposed terminal manhole (TMH) to the existing manhole ID (FMH1005820). Proposed connection drawing is in **Appendix B**.

Table 3.4 Proposed Sewage pipe connection from Terminal Manhole to Existing Sewerage Network

Location	Upstream MH	Downstream MH	Sewer size (mm)	Upstream Invert Level (mPD)	Downstream Invert Level (mPD)
Proposed Development	TMH	FMH1005820	225	58.50	24.30

Sewerage Capacity Checking

- 3.4.1.2 Hydraulic capacity check has been undertaken for the downstream sewerage system and results are presented in **Table 3.5**. The assessed sewers have sufficient capacity to convey the sewage flows under proposed conditions; the maximum utilisation rate is below 93%. No sewers require upgrading works due to the proposed development and the proposed development has no impact to the downstream sewers. Detailed calculations are included in **Appendix A**.

Table 3.5 Sewers Capacity Check

Location option	Upstream (MH)	Downstream (MH)	Sewer size (mm)	Upstream Invert Level (mPD)	Downstream Invert Level (mPD)	% of Max. Peak flow to sewer capacity
Existing Scheme	FMH1005820	FMH1005819	225	24.20	22.32	7%
	FMH1005819	FMH1005818	225	22.22	20.56	7%
	FMH1005818	FMH1005817	225	20.46	18.79	7%
	FMH1005817	FMH1005816	225	18.69	17.36	7%
	FMH1005816	FMH1005815	225	17.26	15.92	8%
	FMH1005815	FMH1005837	225	15.82	14.99	12%
	FMH1005837	FMH1005836	225	14.89	14.12	12%
	FMH1005836	FMH1005835	225	14.02	13.69	22%
	FMH1005835	FMH1005834	225	13.59	13.39	24%
	FMH1005834	FMH1005833	225	13.29	12.73	23%
	FMH1005833	FMH1005832	225	12.63	12.03	28%
	FMH1005832	FMH1005831	225	11.71	10.03	14%

Location option	Upstream (MH)	Downstream (MH)	Sewer size (mm)	Upstream Invert Level (mPD)	Downstream Invert Level (mPD)	% of Max. Peak flow to sewer capacity
	FMH1005831	FMH1005830	225	10.02	9.35	34%
	FMH1005830	FMH1005824	225	9.32	7.90	26%
	FMH1005824	FMH1005823	225	7.70	7.14	25%
	FMH1005823	FMH1005825	375	7.12	6.67	53%
	FMH1005825	FMH1005826	375	6.66	5.93	33%
	FMH1005826	FMH1005827	375	5.92	5.70	75%
	FMH1005827	FMH1068053	375	5.70	4.72	36%
	FMH1068053	FMH1005828	375	4.72	4.55	37%
	FMH1005828	FMH1005829	375	4.55	4.00	46%
	FMH1005829	FOH1000020	375	4.00	3.20	46%
Proposed Development	FMH1005820	FMH1005819	225	24.20	22.32	27%
	FMH1005819	FMH1005818	225	22.22	20.56	29%
	FMH1005818	FMH1005817	225	20.46	18.79	30%
	FMH1005817	FMH1005816	225	18.69	17.36	29%
	FMH1005816	FMH1005815	225	17.26	15.92	32%
	FMH1005815	FMH1005837	225	15.82	14.99	49%
	FMH1005837	FMH1005836	225	14.89	14.12	48%
	FMH1005836	FMH1005835	225	14.02	13.69	56%
	FMH1005835	FMH1005834	225	13.59	13.39	61%
	FMH1005834	FMH1005833	225	13.29	12.73	53%
	FMH1005833	FMH1005832	225	12.63	12.03	66%
	FMH1005832	FMH1005831	225	11.71	10.03	33%
	FMH1005831	FMH1005830	225	10.02	9.35	61%
	FMH1005830	FMH1005824	225	9.32	7.90	48%
	FMH1005824	FMH1005823	225	7.70	7.14	45%
	FMH1005823	FMH1005825	375	7.12	6.67	65%
	FMH1005825	FMH1005826	375	6.66	5.93	40%
	FMH1005826	FMH1005827	375	5.92	5.70	91%
	FMH1005827	FMH1068053	375	5.70	4.72	44%
	FMH1068053	FMH1005828	375	4.72	4.55	45%
	FMH1005828	FMH1005829	375	4.55	4.00	56%
	FMH1005829	FOH1000020	375	4.00	3.20	56%

3.5 Potential Sewerage Impact

- 3.5.1.1 Sewage flow will eventually be discharged into the TPSTW located at Dai Kwai Street via TPKSPS and downstream network. Based on the hydraulic analysis, the increase of sewage flow due Proposed Development is insignificant compared to the upgraded capacity of TPSTW (maximum ~0.36% increase at future capacity), it is expected there will be no adverse impact to the existing TPSTW due to the proposed development. No upgrade of the size of Sewage Treatment Works is required.

Table 3.6 TPSTW and TPKSPS Capacity Check

	ADWF (m ³ /day)	Peak Flow (L/s)	Existing/ Proposed Sewer Size (mm)	Max. Occupation at Downstream Pipeline	Occupancy of Upgraded TPSTW
Existing Sewage Flow	2,005.6	116.1	225	34.1%	1.25%
			375	74.6%	
Existing Sewage Flow + Ongoing Development Future Flow +Proposed Sewage Flow	2,576.3	157.0	225	65.7%	1.61%
			375	91.1%	

- 3.5.1.2 The TPSTW is deemed to be designed to cater for the regional sewage generation, thus it is not anticipated for any adverse impact to TPSTW due to the proposed development.
- 3.5.1.3 As advised in the emails dated 30th January 2026 and 5th February 2026, the existing TPKSPS has a design capacity of 3,086m³/day, while the average daily flow in January 2026 reached around 2,700m³/day. Taking into account the limited residual capacity, the TPKSPS is therefore insufficient to accommodate all the sewage flow arising from the proposed development. As an alternative, on-site sewage treatment facilities are proposed to treat greywater at this stage. The on-site treatment facility will treat the difference between the proposed flow (532.8 m³/day) and the existing spare capacity (3,086 – 2,700 – 37.8(on-going development) = 348.2 m³/day), giving an estimated treatment capacity of around 240m³/day; the treated effluent will be discharged to the existing watercourse. The remaining untreated sewage flow generated from the site will be discharged to the TPKSPS without any adverse sewerage impacts, as it matches the available spare capacity. The exact amount of greywater and blackwater to be treated on-site, the optimisation strategy and the detailed design of the proposed treatment facilities, including the extent of on-site treatment and utilisation of the existing TPKSPS, will be determined at the detailed design stage. The proposed treatment facilities shall make reference to the EPD's Guidelines for the Design of Small Sewage Treatment Plants. A licence shall be obtained under the Water Pollution Control Ordinance for the discharge from the on-site sewage treatment facilities, and the discharge of the treated effluent shall comply with the requirements of the WPCO and the relevant discharge standards.

4.

4. Construction, Operation and Maintenance of New Sewerage Facilities

- 4.1.1.1 The proposed sewerage works within the development boundary including the construction of new sewers connection and the proposed terminal manhole (TMH) will be constructed, operated and maintained by the future management agent.
- 4.1.1.2 The proposed sewerage connection mentioned in **Section 3.4** will be undertaken by the project proponent. The portion of sewers downstream of terminal manhole will be handed over to DSD upon completion of construction works for future maintenance as part of the public network.

5. Conclusion

- 5.1.1.1 A sewerage impact assessment has been carried out for the proposed development at Wong Yi Au.
- 5.1.1.2 Sewage generated from the existing development (i.e. ADWF 2005.6 m³/day or peak flow 116.1 L/s (peaking factor = 5)) whilst sewage from the Indicative Scheme (i.e. ADWF 532.8 m³/day or peak flow 37.0 L/s (peaking factor = 6)). To discharge sewage generated from the proposed location, a new sewerage main is proposed. Sewage from the Proposed Development will be discharged through a 225 mm dia. sewer from a new terminal manhole (i.e. TMH) into the existing sewerage network.
- 5.1.1.3 The TPSTW is deemed to be designed to cater for the regional sewage generation, thus it is not anticipated for any adverse impact to TPSTW due to the proposed development. Taking into account the limited residual capacity of the TPKSPS, an alternative solution has been proposed. The optimisation strategy and detailed design of the proposed treatment facilities, including the extent of on-site treatment and utilisation of the existing TPKSPS, will be determined at the detailed design stage.

Appendix A

Sewage Generation Estimation

ARUP Job Title Application for Amendment of Plan under Section 12A of the Town Planning Ordinance (Cap. 131) for Proposed Residential Development at Various Lots in D.D. 32 and Adjoining Government Land, Wong Yi Au, Tai Po, New Territories Calculation Estimation of Sewage Discharge from Existing Development		Job No.	Sheet No.	Rev.			
			1	2			
		Member/Location					
		Drg. Ref.					
		Made by	JP	Date	02/2026	Chd.	NP

Exisiting Development along Chuk Yeung Road		
Chateau Royale (Catchment D)		
Number of Houses/ Blocks	68	
Number of Flats	68	Flats
Size of household/flat ⁽¹⁾	2.8	Persons/flat
Population	191	Persons
Per Capita Flow ⁽²⁾ - R4	0.37	m ³ /day/person
Clubhouse Area (measured on GeoInfo Map)	1450	m ²
Employee per GFA (in 100 m ²) ⁽⁷⁾	3.3	Persons
Employee Population	48	Persons
Per Capita Flow ⁽⁴⁾ - J11	0.28	m ³ /day
Estimated Dry Weather Flow	84.1	m ³ /day
Assume: - Pool size = 315m ² with 1.5m water depth. - Pool volume = 315 x 1.5 = 472.5 m ³ . - Turnover rate = 6 hours. - Filter loading rate = 50 m ³ /m ² /hr. - Filter area required = 472.5 / 6 / 50 = 1.575 m ² . - Assume Filter Diameter = 600mm - Filter Area = 0.2827 m ² - No. of filter required = 6 ⁽¹²⁾ - Backwash flow rate = 0.5 m ³ /m ² /min. - Back wash flow = 0.2827 x 0.5 = 0.1414 m ³ /min =2.4 L/s	2.4	L/s
Chateau De Mansion (Catchment C)		
Number of Houses/ Blocks	8	
Number of Flats	24	Flats
Size of household/flat ⁽¹⁾	2.8	Persons/flat
Population	68	Persons
Per Capita Flow ⁽²⁾ - R4	0.37	m ³ /day/person
Estimated Dry Weather Flow	25.2	m ³ /day
Marvelous Villa (Catchment F)		
Number of Houses/ Blocks	7	
Number of Flats	9	Flats
Size of household/flat ⁽¹⁾	2.8	Persons/flat
Population	26	Persons
Per Capita Flow ⁽²⁾ - R4	0.37	m ³ /day/person
Estimated Dry Weather Flow	9.6	m ³ /day
Residential - Village Houses (South) (Catchment B)		
No. of Village Houses (By Counting)	30	
No. of Flats ⁽¹⁰⁾	90	
Size of household/flat ⁽¹⁾	2.8	Persons
Per Capita Flow ⁽³⁾ - Modern Village	0.27	m3/day
Total Population	252	Persons
Estimated Dry Weather Flow	68.0	m3/day
Residential - Village Houses (Middle) (Catchment E)		
No. of Village Houses (By Counting)	154	
No. of Flats ⁽¹⁰⁾	462	
Size of household/flat ⁽¹⁾	2.8	Persons
Per Capita Flow ⁽³⁾ - Modern Village	0.27	m3/day
Total Population	1294	Persons
Estimated Dry Weather Flow	349.4	m3/day
Residential - Village Houses (North) (Catchment F)		
No. of Village Houses (By Counting)	18	
No. of Flats ⁽¹⁰⁾	54	
Size of household/flat ⁽¹⁾	2.8	Persons
Per Capita Flow ⁽³⁾ - Modern Village	0.27	m3/day
Total Population	152	Persons
Estimated Dry Weather Flow	41.0	m3/day
Tai Po Ling Liang Church (Catchment A)		
Employee Population (Assume 20 extra Staffs for the Church)	20	Persons
Per Capita Flow ⁽⁴⁾ - J11 (commercial employees + J11)	0.28	m ³ /day
Estimated Dry Weather Flow	5.6	m ³ /day
Ling Liang Church MH Lau Secondary School (Catchment A)		
Class	24	
Students	667	Persons
Employee(only on-list teachers and workers)	77	Persons
Per Capita Flow ⁽⁵⁾ -Students	0.04	m ³ /day
Per Capita Flow ⁽⁴⁾ -Employee	0.28	m ³ /day
Total Population	744	Persons
Estimated Dry Weather Flow	48.2	m ³ /day
Total Estimate Dry Weather Flow	631.1	
Catchment Inflow Factor ⁽⁶⁾ - Tai Po	1.0	
Total Estimated Dry Weather Flow (including catchment inflow factor)	631.1	m3/day
Contributing Population	1016	
Peaking Factor ⁽⁷⁾	6	
Total Estimated Peak Flow	43.8	L/s
Care Village (Catchment G)		
No. of Village Houses (By Counting)	110	
No. of Flats ⁽¹⁰⁾	330	
Size of household/flat ⁽¹⁾	2.8	Persons
Per Capita Flow ⁽⁹⁾ - Modern Village	0.27	m3/day
Total Population	924	Persons
Estimated Dry Weather Flow	249.5	m3/day
Riverain Bayside(Catchment G)		
Number of Houses/ Blocks	8	
Number of Flats	8	Flats
Size of household/flat ⁽¹⁾	2.8	Persons/flat
Population	23	Persons
Per Capita Flow ⁽⁴⁾ - R4	0.37	m ³ /day/person
Estimated Dry Weather Flow	8.5	m ³ /day

Ref: <http://www.llcmhlau.edu.hk/tc/content.php?wid=37>

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Assume: - Pool size = 85m ² with 1.5m water depth. - Pool volume = 85 x 1.5 = 127.5 m ³ . - Turnover rate = 6 hours. - Filter loading rate = 50 m ³ /m ² /hr. - Filter area required = 127.5 / 6 / 50 = 0.425 m ² . - Assume Filter Diameter = 500 mm - Filter Area = 0.1963 m ² - No. of filter required = 3 ⁽¹²⁾ - Backwash flow rate = 0.5 m ³ /m ² /min. - Back wash flow = 0.1963 x 0.5 = 0.0982 m ³ /min = 1.6 L/s	1.6	L/s
Tai Po Kau 3987 Tai Po Road - Yuen Chau Tsai (Catchment G)		
Number of Flats (Assume)	3	Flats
Size of household/flat ⁽¹⁾	2.8	Persons/flat
Population	9	Persons
Per Capita Flow ⁽²⁾ - R4	0.37	m ³ /day/person
Estimated Dry Weather Flow	3.3	m ³ /day
Assume: - Pool size = 55m ² with 1.5m water depth. - Pool volume = 55 x 1.5 = 82.5 m ³ . - Turnover rate = 6 hours. - Filter loading rate = 50 m ³ /m ² /hr. - Filter area required = 82.5 / 6 / 50 = 0.275 m ² . - Assume Filter Diameter = 400mm - Filter Area = 0.1257 m ² - No. of filter required = 3 ⁽¹²⁾ - Backwash flow rate = 0.5 m ³ /m ² /min. - Back wash flow = 0.1257 *0.5 = 0.0628 m ³ /min = 1.0 L/s	1.0	L/s
Redland Garden (Catchment H)		
Number of Houses/ Blocks	5	
Number of Flats	60	Flats
Size of household/flat ⁽¹⁾	2.8	Persons/flat
Population	168	Persons
Per Capita Flow ⁽²⁾ - R4	0.37	m ³ /day/person
Estimated Dry Weather Flow	62.2	m ³ /day
Assume: - Pool size = 315m ² with 1.5m water depth. - Pool volume = 75 x 1.5 = 112.5 m ³ . - Turnover rate = 6 hours. - Filter loading rate = 50 m ³ /m ² /hr. - Filter area required = 112.5 / 6 / 50 = 0.375 m ² . - Assume Filter Diameter = 400 mm - Filter Area = 0.1257 m ² - No. of filter required = 3 ⁽¹²⁾ - Backwash flow rate = 0.5 m ³ /m ² /min. - Back wash flow = 0.1257 *0.5 = 0.0628 m ³ /min = 1.0 L/s	1.0	L/s
Trackside Villas (Catchment H)		
Number of Houses/ Blocks	/	
Number of Flats	252	Flats
Size of household/flat ⁽¹⁾	2.8	Persons/flat
Population	706	Persons
Per Capita Flow ⁽⁹⁾ - R1	0.19	m ³ /day/person
Estimated Dry Weather Flow	134.1	m ³ /day
MTR Tai Po Kau Staff Clubhouse (Catchment H)		
Building Area (measured on GeolInfo Map)	5700	m ²
Employee per GFA (in 100 m ²) ⁽⁷⁾	3	Persons
Employee Population - J11 (commercial employrrs + J11) ⁽⁴⁾	189	Persons
Per Capita Flow	0.28	m ³ /day/person
Estimated Dry Weather Flow	52.9	m ³ /day
Assume: - Pool size = 220 m ² with 1.5 m water depth. - Pool volume = 220 x 1.5 = 330 m ³ . - Turnover rate = 6 hours. - Filter loading rate = 50 m ³ /m ² /hr. - Filter area required = 330 / 6 / 50 = 1.100 m ² . - Assume Filter Diameter = 600 mm - Filter Area = 0.2827 m ² - No. of filter required = 4 ⁽¹²⁾ - Backwash flow rate = 0.5 m ³ /m ² /min. - Back wash flow = 0.2827 *0.5 = 0.1414 m ³ /min = 2.4 L/s	2.4	L/s
Seaview Villas (Catchment H)		
Number of Houses/ Blocks	18	
Number of Flats	18	Flats
Size of household/flat ⁽¹⁾	2.8	Persons/flat
Population	51	Persons
Per Capita Flow ⁽²⁾ - R4	0.37	m ³ /day/person
Estimated Dry Weather Flow	18.9	m ³ /day
Assume: - Pool size = 60 m ² with 1.5 m water depth. - Pool volume = 60 x 1.5 = 90 m ³ . - Turnover rate = 6 hours. - Filter loading rate = 50 m ³ /m ² /hr. - Filter area required = 90 / 6 / 50 = 0.300 m ² . - Assume Filter Diameter = 600 mm - Filter Area = 0.1257 m ² - No. of filter required = 3 ⁽¹²⁾ - Backwash flow rate = 0.5 m ³ /m ² /min. - Back wash flow = 0.1257 x 0.5 = 0.0628 m ³ /min = 1.0 L/s	2.4	L/s

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Rural Estate House (Catchment H)		
Number of Houses/ Blocks	6	
Number of Flats	6	Flats
Size of household/flat ⁽¹⁾	2.8	Persons/flat
Population	17	Persons
Per Capita Flow ⁽²⁾ - R4	0.37	m ³ /day/person
Estimated Dry Weather Flow	6.3	m ³ /day
Assume:		
- Pool size = 100 m ² with 1.5 m water depth.		
- Pool volume = 100 x 1.5 = 150 m ³ .		
- Turnover rate = 6 hours.		
- Filter loading rate = 50 m ³ /m ² /hr.		
- Filter area required = 150 / 6 / 50 = 0.5 m ² .		
- Assume Filter Diameter = 400 mm		
- Filter Area = 0.1257 m ²		
- No. of filter required = 4 ⁽¹²⁾		
- Backwash flow rate = 0.5 m ³ /m ² /min.		
- Back wash flow = 0.1257 x 0.5 = 0.0628 m ³ /min = 1.0 L/s	1.0	L/s
Southview Villas (Catchment H)		
Number of Houses/ Blocks	10	
Number of Flats	10	Flats
Size of household/flat ⁽¹⁾	2.8	Persons/flat
Population	28	Persons
Per Capita Flow ⁽²⁾ - R4	0.37	m ³ /day/person
Estimated Dry Weather Flow	10.4	m ³ /day
Assume:		
- Pool size = 150 m ² with 1.5 m water depth.		
- Pool volume = 150 x 1.5 = 225 m ³ .		
- Turnover rate = 6 hours.		
- Filter loading rate = 50 m ³ /m ² /hr.		
- Filter area required = 225 / 6 / 50 = 0.75 m ² .		
- Assume Filter Diameter = 500 mm		
- Filter Area = 0.1963 m ²		
- No. of filter required = 4 ⁽¹²⁾		
- Backwash flow rate = 0.5 m ³ /m ² /min.		
- Back wash flow = 0.1963 x 0.5 = 0.0982 m ³ /min = 1.6 L/s	1.6	L/s
Emerald Palace (Catchment H)		
Number of Houses/ Blocks	7	
Number of Flats	42	Flats
Size of household/flat ⁽¹⁾	2.8	Persons/flat
Population	118	Persons
Per Capita Flow ⁽²⁾ - R4	0.37	m ³ /day/person
Clubhouse Area (measured on GeoInfo Map) (Assume 2 Storeys)	404	m ²
Employee per GFA (in 100 m ²) ⁽⁷⁾	3.3	Persons
Employee Population	13	Persons
Per Capita Flow ⁽⁴⁾ - J11	0.28	m ³ /day
Estimated Dry Weather Flow	47.4	m ³ /day
Assume:		
- Pool size = 215 m ² with 1.5 m water depth.		
- Pool volume = 215 x 1.5 = 322.5 m ³ .		
- Turnover rate = 6 hours.		
- Filter loading rate = 50 m ³ /m ² /hr.		
- Filter area required = 322.5 / 6 / 50 = 1.075 m ² .		
- Assume Filter Diameter = 600 mm		
- Filter Area = 0.2827 m ²		
- No. of filter required = 4 ⁽¹²⁾		
- Backwash flow rate = 0.5 m ³ /m ² /min.		
- Back wash flow = 0.2827 x 0.5 = 0.1414 m ³ /min = 2.4 L/s	2.4	L/s
Daisyfield (Catchment H)		
Number of Houses/ Blocks	1	
Number of Flats	6	Flats
Size of household/flat ⁽¹⁾	2.8	Persons/flat
Population	17	Persons
Per Capita Flow ⁽²⁾ - R4	0.37	m ³ /day/person
Estimated Dry Weather Flow	6.3	m ³ /day
Assume:		
- Pool size = 120 m ² with 1.5 m water depth.		
- Pool volume = 120 x 1.5 = 180 m ³ .		
- Turnover rate = 6 hours.		
- Filter loading rate = 50 m ³ /m ² /hr.		
- Filter area required = 180 / 6 / 50 = 0.6 m ² .		
- Assume Filter Diameter = 500 mm		
- Filter Area = 0.1963 m ²		
- No. of filter required = 4 ⁽¹²⁾		
- Backwash flow rate = 0.5 m ³ /m ² /min.		
- Back wash flow = 0.1963 x 0.5 = 0.0982 m ³ /min = 1.6 L/s	1.6	L/s
Strafford House (Catchment H)		
Building Area (System Controll Centre and Management Training Centre) (measured on GeoInfo Map)	4950	m ²
Employee per GFA (in 100 m ²) ⁽¹¹⁾	3.4	Persons
Employee Population - J11 (commercial employees + J11) ⁽⁴⁾	169	Persons
Per Capita Flow	0.28	m ³ /day/person
Number of Flats (by estimation)	8	Flats
Size of household/flat ⁽¹⁾	2.8	Persons/flat
Population	23	Persons
Per Capita Flow ⁽²⁾ - R4	0.37	m ³ /day/person
Estimated Dry Weather Flow	55.8	m ³ /day

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Calculation	Estimation of Sewage Discharge from Existing Development				
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Assume: - Pool size = 105 m ² with 1.5 m water depth. - Pool volume = 105 x 1.5 = 157.5 m ³ . - Turnover rate = 6 hours. - Filter loading rate = 50 m ³ /m ² /hr. - Filter area required = 157.5 / 6 / 50 = 0.525 m ² . - Assume Filter Diameter = 500 mm - Filter Area = 0.1963 m ² - No. of filter required = 3 ⁽¹²⁾ - Backwash flow rate = 0.5 m ³ /m ² /min. - Back wash flow = 0.1963 x 0.5 = 0.0982 m ³ /min = 1.6 L/s		1.6 L/s
The Kingston Hills (Hampstead) (Catchment H)		
Number of Houses/ Blocks		13
Number of Flats		13 Flats
Size of household/flat ⁽¹⁾		2.8 Persons/flat
Population		37 Persons
Per Capita Flow ⁽²⁾ - R4		0.37 m ³ /day/person
Estimated Dry Weather Flow		13.7 m ³ /day
Assume: - Pool size = 540 m ² with 1.5 m water depth. - Pool volume = 540 x 1.5 = 810 m ³ . - Turnover rate = 6 hours. - Filter loading rate = 50 m ³ /m ² /hr. - Filter area required = 810 / 6 / 50 = 2.7 m ² . - Assume Filter Diameter = 700 mm - Filter Area = 0.3848 m ² - No. of filter required = 8 ⁽¹²⁾ - Backwash flow rate = 0.5 m ³ /m ² /min. - Back wash flow = 0.3848 x 0.5 = 0.1924 m ³ /min = 3.2 L/s		3.2 L/s
L'utopie (Catchment H)		
Number of Houses/ Blocks		16
Number of Flats		16 Flats
Size of household/flat ⁽¹⁾		2.8 Persons/flat
Population		45 Persons
Per Capita Flow ⁽²⁾ - R4		0.37 m ³ /day/person
Clubhouse Area (Assumed)		800 m ²
Employee per GFA (in 100 m ²) ⁽⁷⁾		3.3 Persons
Employee Population		26 Persons
Per Capita Flow ⁽⁴⁾ - J11		0.28 m ³ /day
Estimated Dry Weather Flow		24.0 m ³ /day
Assume: - Pool size = 450 m ² with 1.5 m water depth. - Pool volume = 450 x 1.5 = 675 m ³ . - Turnover rate = 6 hours. - Filter loading rate = 50 m ³ /m ² /hr. - Filter area required = 675 / 6 / 50 = 2.25 m ² . - Assume Filter Diameter = 700 mm - Filter Area = 0.3848 m ² - No. of filter required = 6 ⁽¹²⁾ - Backwash flow rate = 0.5 m ³ /m ² /min.		3.2 L/s
Savanna Garden (Catchment H)		
Number of Houses/ Blocks		49
Number of Flats		284 Flats
Size of household/flat ⁽¹⁾		2.8 Persons/flat
Population		796 Persons
Per Capita Flow ⁽²⁾ - R4		0.37 m ³ /day/person
Clubhouse Area (measured on GeoInfo Map)		550 m ²
Employee per GFA (in 100 m ²) ⁽⁷⁾		3.3 Persons
Employee Population		18 Persons
Per Capita Flow ⁽⁴⁾ - J11		0.28 m ³ /day
Estimated Dry Weather Flow		299.6 m ³ /day
Assume: - Pool size = 685 m ² with 1.5 m water depth. - Pool volume = 685 x 1.5 = 1027.5 m ³ . - Turnover rate = 6 hours. - Filter loading rate = 50 m ³ /m ² /hr. - Filter area required = 1027.5 / 6 / 50 = 3.425 m ² . - Assume Filter Diameter = 700 mm - Filter Area = 0.3848 m ² - No. of filter required = 9 ⁽¹²⁾ - Backwash flow rate = 0.5 m ³ /m ² /min. - Back wash flow = 0.3848 x 0.5 = 0.1924 m ³ /min = 3.2 L/s		3.2 L/s
Tolo Ridge (Catchment H)		
Number of Houses/ Blocks		2
Number of Flats		24 Flats
Size of household/flat ⁽¹⁾		2.8 Persons/flat
Population		68 Persons
Per Capita Flow ⁽²⁾ - R4		0.37 m ³ /day/person
Clubhouse Area (measured on GeoInfo Map)		560 m ²
Employee per GFA (in 100 m ²) ⁽⁷⁾		3.3 Persons
Employee Population		18 Persons
Per Capita Flow ⁽⁴⁾ - J11		0.28 m ³ /day
Estimated Dry Weather Flow		30.3 m ³ /day

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Drg. Ref.

Calculation

Estimation of Sewage Discharge from Existing Development

Made by

JP

Date

02/2026

Chd.

NP

Assume: - Pool size = 165 m ² with 1.5 m water depth. - Pool volume = 165 x 1.5 = 247.5 m ³ . - Turnover rate = 6 hours. - Filter loading rate = 50 m ³ /m ² /hr. - Filter area required = 247.5 / 6 / 50 = 0.825 m ² . - Assume Filter Diameter = 500 mm - Filter Area = 0.1963 m ² - No. of filter required = 5 ⁽¹²⁾ - Backwash flow rate = 0.5 m ³ /m ² /min. - Back wash flow = 0.1963 x 0.5 = 0.0982 m ³ /min = 1.6 L/s		
Constellation Cove (Catchment H)		
Number of Houses/ Blocks	90	
Number of Flats	286	Flats
Size of household/flat ⁽¹⁾	2.8	Persons/flat
Population	801	Persons
Per Capita Flow ⁽²⁾ - R4	0.37	m ³ /day/person
Clubhouse Area (measured on GeoInfo Map)	5200	m ²
Employee per GFA (in 100 m ²) ⁽⁷⁾	3.3	Persons
Employee Population	172	Persons
Per Capita Flow ⁽⁴⁾ - J11	0.28	m ³ /day
Estimated Dry Weather Flow	344.4	m ³ /day
Assume: - Pool size = 840 m ² with 1.5 m water depth. - Pool volume = 840 x 1.5 = 1260 m ³ . - Turnover rate = 6 hours. - Filter loading rate = 50 m ³ /m ² /hr. - Filter area required = 1260 / 6 / 50 = 4.2 m ² . - Assume Filter Diameter = 700 mm - Filter Area = 0.3848 m ² - No. of filter required = 11 ⁽¹²⁾ - Backwash flow rate = 0.5 m ³ /m ² /min. - Back wash flow = 0.3848 x 0.5 = 0.1924 m ³ /min = 3.2 L/s		
Anchors International Nursery (Constellation Cove Campus) (Catchment H)		
Class	7	
Students	94	Persons
Employee(only on-list teachers and workers)	11	Persons
Per Capita Flow ⁽⁹⁾ -Students	0.04	m3/day
Per Capita Flow ⁽⁹⁾ -Employee	0.28	m3/day
Total Population	105	Persons
Estimated Dry Weather Flow	6.8	m3/day
Total Estimate Dry Weather Flow	2005.6	
Catchment Inflow Factor ⁽⁶⁾ - Tai Po	1.0	
Total Estimated Dry Weather Flow (including catchment inflow factor)	2005.6	m3/day
Contributing Population	7428	
Peaking Factor ⁽⁸⁾	5	
Total Estimated Peak Flow	116.1	L/s
Additional Flow from Swimming Pool Backwashes	33.6	L/s

Ref: <https://www.schooland.hk/kg/anchors3>

1. A person per flat (PPF) ratio of 2.8 is adopted based on the PPF in Tai Po District Council in 2021 Population Census.

2. Unit flow factor per resident = 0.37 m3/day for domestic housing population R4 based on EPD's GESF Table T-1

3. Unit flow factor per resident = 0.27 m3/day for modern village based on EPD's GESF Table T-1.

4. Unit Flow Factor per employee = 0.28 m3/day (0.08m3/day for Commercial Employee + 0.20m3/day for J11 specific trades for community, social and personal services) based on EPD's GESF Table T-2

5. Unit Flow Factor per person = 0.04 m3/day for school students based on EPD's GESF Table T-2

6. Catchment Inflow Factor = 1.0, for Tai Po District based on EPD's GESF Table T-4

7. Community, Social & Personal Services = 3.3 employee per 100m2 of GFA based on PlanD's Commercial and Industrial Floor Space Utilization Survey "CIFSUS" Table 8.

8. Peaking Factor = 5, for contributing population >5000 and <10000 (including stormwater allowance) based on EPD's GESF Table T-5

9. Unit flow factor per resident = 0.19 m3/day for domestic housing population R1 based on EPD's GESF Table T-1

10. Village houses have been assumed of 3-floored with one apartment per floor.

11. All Economic Activities = 3.4 employee per 100m2 of GFA based on PlanD's Commercial and Industrial Floor Space Utilization Survey "CIFSUS" Table 8.

12. Assume 1 filter operates at a time. <https://www.wateropolis.com/wp-content/uploads/2018/05/Recirculation-and-Filtration-Design-Handout-1-1-2019.pdf>

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Calculation	Estimation of Sewerage Discharge from Proposed Development			

Proposed Site		
Residential - Block T1 and T2		
Domestic GFA	35710.4	m ²
Number of Flats	500	
Size of household/flat ⁽¹⁾	2.8	Persons
Per Capita Flow ⁽³⁾ - R3	0.37	m ³ /day
Total Population	1400	Persons
Estimated Dry Weather Flow	518.0	m ³ /day
Clubhouse		
GFA	1607.0	m ²
Employee per GFA (in 100 m ²) ⁽⁷⁾	3.3	Persons
Employee Population	53	Persons
Per Capita Flow ⁽⁵⁾ - J11	0.28	m ³ /day
Estimated Dry Weather Flow	14.8	m ³ /day
Total Estimate Dry Weather Flow	532.8	m ³ /day
Catchment Inflow Factor ⁽⁶⁾ - Tai Po	1.0	
Total Estimated Dry Weather Flow (including catchment inflow factor)	532.8	m ³ /day
Contributing Population	1974	
Peaking Factor ⁽⁹⁾	6	
Total Estimated Peak Flow	37.0	L/s
Note: 1. A person per flat (PPF) ratio of 2.8 is adopted based on the PPF in Tai Po District Council in 2021 Population Census. 2. Unit flow factor per resident = 0.19 m³/day for domestic housing population R1 based on EPD's GESF Table T-1. 3. Unit flow factor per resident = 0.37 m³/day for domestic housing population R3 based on EPD's GESF Table T-1. 4. Unit flow factor per resident = 0.19 m³/day for insitutional and special class based on EPD's GESF Table T-1. 5. Unit Flow Factor per employee = 0.28 m³/day (0.08m3/day for Commercial Employee + 0.20m³/day for J11 specific trades for community, social and personal services) based on EPD's GESF Table T-2. 6. Unit Flow Factor per employee = 0.28 m³/day (0.08m3/day for Commercial Employee + 0.20m³/day for J4) based on EPD's GESF Table T-2. 7. Community, Social & Personal Services = 3.3 employee per 100m² of GFA based on PlanD's Commercial and Industrial Floor Space Utilization Survey "CIFSUS" Table 8. 8. Catchment Inflow Factor = 1.0, for Tai Po District based on EPD's GESF Table T-4. 9. Peaking Factor = 6, for contributing population >1000 and <5000 (including stormwater allowance) based on EPD's GESF Table T-5.		

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Home of Loving Faithfulness (HOLF) (Catchment I - Working in Progress)		
Residential Care Home for Persons with Disabilities		
GFA ⁽¹⁾	3978.0	m ²
Catchment Inflow Factor ⁽²⁾ - Tai Po	1.0	
Total Estimated Dry Weather Flow (including catchment inflow factor) ⁽¹⁾	37.8	m ³ /day
Contibuting Population ⁽¹⁾	110	
Peak Flow ⁽¹⁾	3.5	L/s
Peak Flow with backwash from Hydrotherapy Pool ⁽¹⁾	3.9	L/s
Note: 1. Refer to Table 3.1 of Drainage and Sewerage Impact Assessment of the Proposed Proposed Minor Relaxation of Building Height Restriction for Proposed Social Welfare Facility (Residential Care Home for Persons with Disabilities) in "Government, Institution or Community" and "Green Belt" Zones at the "Former Fish Marketing Organization Tai Po Primary School", Wong Yi Au, Tai Po 2. Catchment Inflow Factor = 1.0, for Tai Po District based on EPD's GESF Table T-4.		

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Calculation	Hydraulic Assessment on Existing and Proposed Sewerage System After Proposed Development	Made by	JP	Date	02/2026	Chd	NP

Key Equations and Assumptions

Pipe Design Capacity
Pipe Full-bore Velocity

Q_p=VA

$$V = -\sqrt{32gRS_f} \log \left[\frac{k_s}{14.8R} + \frac{1.255v}{R\sqrt{32gRS_f}} \right]$$

Roughness Coeff.,
Acceleration due to gravity,
Kinematic Viscosity,

K_s=
K_s=
g=
ν=

3 mm
1.5 mm
9.81 m/s²
0.000001 m²/s

(By Colebrook-White Equation)
(for slined VC pipe material, poor condition)
(for slined HDPE pipe material, poor condition)

Key Notes

(*) Peaking factor is extracted from EPD's GESF Table T-5, under the scenario of "including stormwater allowance".
(**) Catchment Inflow Factor is extracted from EPD's GESF Table T-4, under Catchment Central.

USMH	DSMH	USGL(mPD)	DSGL(mPD)	USIL(mPD)	DSLIL(mPD)	US Cover (m)	DS Cover (m)	Length (m)	Gradient	Gradient (1 in)	Pipe size (mm)	Area (m ²)	Siltation	Reduced Area (m2)	sqr(32gRs)	Perimeter (m)	R (m)	Pipe Material	ks (mm)	Pipe Full-bore Velocity, V (m/s)	Pipe Design Capacity, Q _p (m ³ /s)	Additional ADWF (m ³ /day) ⁽¹⁾	Accumulated ADWF (m ³ /day)	Contributing Population	Peaking Factor ⁽²⁾	Catchment Inflow Factor ⁽³⁾	Peak Flow (m ³ /s)	Swimming Pool Flow (m ³ /s)	Capacity Check
Existing Sewerage System Checking																													
FMH1005820	FMH1005819	27.83	24.20	24.20	22.32	3.41	1.66	17.5	0.107	9.3	225	0.040	5%	0.038	1.377	0.707	0.056	Clayware	0.600	4.315	0.172	121.9	121.9	451.41	8	1.00	0.01	0.0000	7%
FMH1005819	FMH1005818	24.20	22.00	22.22	20.56	1.76	1.22	18.7	0.089	11.3	225	0.040	5%	0.038	1.252	0.707	0.056	Clayware	0.600	3.921	0.156	0.0	121.9	451.41	8	1.00	0.01	0.0000	7%
FMH1005818	FMH1005817	22.00	20.00	20.46	18.79	1.32	0.99	19.4	0.086	11.6	225	0.040	5%	0.038	1.233	0.707	0.056	Clayware	0.600	3.861	0.154	0.0	121.9	451.41	8	1.00	0.01	0.0000	7%
FMH1005817	FMH1005816	20.00	18.80	18.69	17.36	1.09	1.22	15.1	0.088	11.4	225	0.040	5%	0.038	1.247	0.707	0.056	Clayware	0.600	3.905	0.155	0.0	121.9	451.41	8	1.00	0.01	0.0000	7%
FMH1005816	FMH1005815	18.80	17.60	17.26	15.92	1.32	1.46	18.2	0.074	13.6	225	0.040	5%	0.038	1.140	0.707	0.056	Clayware	0.600	3.570	0.142	0.0	121.9	451.41	8	1.00	0.01	0.0000	8%
FMH1005815	FMH1005837	17.60	16.70	15.82	14.99	1.56	1.49	26.0	0.032	31.3	225	0.040	10%	0.036	0.751	0.707	0.056	Clayware	0.600	2.346	0.093	0.0	121.9	451.41	8	1.00	0.01	0.0000	12%
FMH1005837	FMH1005836	16.70	16.00	14.89	14.12	1.59	1.66	23.8	0.032	30.9	225	0.040	10%	0.036	0.756	0.707	0.056	Clayware	0.600	2.362	0.094	0.0	121.9	451.41	8	1.00	0.01	0.0000	12%
FMH1005836	FMH1005835	16.00	15.40	14.02	13.69	1.76	1.49	9.8	0.034	29.7	225	0.040	10%	0.036	0.771	0.707	0.056	Clayware	0.600	2.410	0.096	84.1	205.9	762.77	8	1.00	0.02	0.0024	22%
FMH1005835	FMH1005834	15.40	15.35	13.59	13.39	1.59	1.74	7.1	0.028	35.5	225	0.040	10%	0.036	0.705	0.707	0.056	Clayware	0.600	2.203	0.088	0.0	205.9	762.77	8	1.00	0.02	0.0024	24%
FMH1005834	FMH1005833	15.35	15.00	13.29	12.73	1.84	2.05	14.0	0.040	25.0	225	0.040	10%	0.036	0.840	0.707	0.056	Clayware	0.600	2.628	0.104	25.2	231.1	855.96	8	1.00	0.02	0.0024	23%
FMH1005833	FMH1005832	15.00	13.80	12.63	12.03	2.15	1.55	23.0	0.026	38.3	225	0.040	10%	0.036	0.679	0.707	0.056	Clayware	0.600	2.120	0.084	0.0	231.1	855.96	8	1.00	0.02	0.0024	28%
FMH1005832	FMH1005831	13.80	11.96	11.71	10.03	1.87	1.71	16.1	0.104	9.6	225	0.040	5%	0.038	1.357	0.707	0.056	Clayware	0.600	4.252	0.169	0.0	231.1	855.96	8	1.00	0.02	0.0024	14%
FMH1005831	FMH1005830	11.96	10.86	10.02	9.35	1.72	1.29	10.0	0.067	14.9	225	0.040	5%	0.038	1.088	0.707	0.056	Clayware	0.600	3.405	0.135	400.0	631.1	2,337.59	6	1.00	0.04	0.0024	34%
FMH1005830	FMH1005824	10.86	9.88	9.32	7.90	1.32	1.76	12.8	0.111	9.0	225	0.040	5%	0.038	1.400	0.707	0.056	Clayware	0.600	4.385	0.174	0.0	631.1	2,337.59	6	1.00	0.04	0.0024	26%
FMH1005824	FMH1005823	9.88	9.49	7.70	7.14	1.96	2.13	4.4	0.127	7.9	225	0.040	5%	0.038	1.499	0.707	0.056	Clayware	0.600	4.697	0.187	0.0	631.1	2,337.59	6	1.00	0.04	0.0024	25%
FMH1005823	FMH1005825	9.49	9.11	7.12	6.67	2.00	2.07	22.7	0.020	50.4	375	0.110	10%	0.099	0.764	1.178	0.094	Clayware	0.600	2.556	0.282	1374.5	2005.6	7,428.32	5	1.00	0.12	0.0336	53%
FMH1005825	FMH1005826	9.11	9.32	6.66	5.93	2.08	3.02	14.4	0.051	19.7	375	0.110	5%	0.105	1.221	1.178	0.094	Clayware	0.600	4.096	0.452	0.0	2005.6	7,428.32	5	1.00	0.12	0.0336	33%
FMH1005826	FMH1005827	9.32	7.54	5.92	5.70	3.03	1.47	21.9	0.010	99.5	375	0.110	10%	0.099	0.544	1.178	0.094	Clayware	0.600	1.816	0.201	0.0	2005.6	7,428.32	5	1.00	0.12	0.0336	75%
FMH1005827	FMH1068053	7.54	6.63	5.70	4.72	1.47	1.54	23.2	0.042	23.7	375	0.110	5%	0.105	1.115	1.178	0.094	Clayware	0.600	3.738	0.413	0.0	2005.6	7,428.32	5	1.00	0.12	0.0336	36%
FMH1068053	FMH1005828	6.63	6.59	4.72	4.55	1.54	1.67	4.1	0.041	24.1	375	0.110	5%	0.105	1.105	1.178	0.094	Clayware	0.600	3.703	0.409	0.0	2005.6	7,428.32	5	1.00	0.12	0.0336	37%
FMH1005828	FMH1005829	6.63	5.91	4.55	4.00	1.71	1.54	20.5	0.027	37.3	375	0.110	10%	0.099	0.889	1.178	0.094	Clayware	0.600	2.976	0.329	0.0	2005.6	7,428.32	5	1.00	0.12	0.0336	46%
FMH1005829	FOH1000020	5.91	5.38	4.00	3.20	1.54	1.81	30.6	0.026	38.3	375	0.110	10%	0.099	0.877	1.178	0.094	Clayware	0.600	2.938	0.324	0.0	2005.6	7,428.32	5	1.00	0.12	0.0336	46%
Proposed Sewerage System Checking																													
TMH	FMH1005820	60.00	27.83	58.50	24.30	1.28	3.31	365.0	0.094	10.7	225	0.040	5%	0.038	1.286	0.707	0.056	HDPE	0.300	4.403	0.175	532.8	532.8	1,973.51	6	1.00	0.037	0.0000	21%
FMH1005820	FMH1005819	27.83	24.20	24.20	22.32	3.41	1.66	17.5	0.107	9.3	225	0.040	5%	0.038	1.377	0.707	0.056	Clayware	0.600	4.315	0.172	121.9	654.7	2,424.92	6	1.00	0.045	0.0000	27%
FMH1005819	FMH1005818	24.20	22.00	22.22	20.56	1.76	1.22	18.7	0.089	11.3	225	0.040	5%	0.038	1.252	0.707	0.056	Clayware	0.600	3.921	0.156	0.0	654.7	2,424.92	6	1.00	0.045	0.0000	29%
FMH1005818	FMH1005817	22.00	20.00	20.46	18.79	1.32	0.99	19.4	0.086	11.6	225	0.040	5%	0.038	1.233	0.707	0.056	Clayware	0.600	3.861	0.154	0.0	654.7	2,424.92	6	1.00	0.045	0.0000	30%
FMH1005817	FMH1005816	20.00	18.80	18.69	17.36	1.09	1.22	15.1	0.088	11.4	225	0.040	5%	0.038	1.247	0.707	0.056	Clayware	0.600	3.905	0.155	0.0	654.7	2,424.92	6	1.00	0.045	0.0000	29%
FMH1005816	FMH1005815	18.80	17.60	17.26	15.92	1.32	1.46	18.2	0.074	13.6	225	0.040	5%	0.038	1.140	0.707	0.056	Clayware	0.600	3.570	0.142	0.0	654.7	2,424.92	6	1.00	0.045	0.0000	32%
FMH1005815	FMH1005837	17.60	16.70	15.82	14.99	1.56	1.49	26.0	0.032	31.3	225	0.040	10%	0.036	0.751	0.707	0.056	Clayware	0.600	2.346	0.093	0.0	654.7	2,424.92	6	1.00	0.045	0.0000	49%
FMH1005837	FMH1005836	16.70	16.00	14.89	14.12	1.59	1.66	23.8	0.032	30.9	225	0.040	10%	0.036	0.756	0.707	0.056	Clayware	0.600	2.362	0.094	0.0	654.7	2,424.92	6	1.00	0.045	0.0000	48%
FMH1005836	FMH1005835	16.00	15.40	14.02	13.69	1.76	1.49	9.8	0.034	29.7	225	0.040	10%	0.036	0.771	0.707	0.056	Clayware	0.600	2.410	0.096	84.1	738.8	2,736.28	6	1.00	0.051	0.0024	56%
FMH1005835	FMH1005834	15.40	15.35	13.59	13.39	1.59	1.74	7.1	0.028	35.5	225	0.040	10%	0.036	0.705	0.707	0.056	Clayware	0.600	2.203	0.088	0.0	738.8	2,736.28	6	1.00	0.051	0.0024	61%
FMH1005834	FMH1005833	15.35	15.00	13.29	12.73	1.84	2.05	14.0	0.040	25.0	225	0.040	10%	0.036	0.840	0.707	0.056	Clayware	0.600	2.628	0.104	25.2	764.0	2,829.47	6	1.00	0.053	0.0024	53%
FMH1005833	FMH1005832	15.00	13.80	12.63	12.03	2.15	1.55	23.0	0.026	38.3	225	0.040	10%	0.036	0.679	0.707	0.056	Clayware	0.600	2.120	0.084	0.0	764.0	2,829.47	6	1.00	0.053	0.0024	66%
FMH1005832	FMH1005831	13.80	11.96	11.71	10.03	1.87	1.71	16.1	0.104	9.6	225	0.040	5%	0.038	1.357	0.707	0.056	Clayware	0.600	4.252	0.169	0.0	764.0	2,829.47	6	1.00	0.053	0.0024	33%
FMH1005831	FMH1005830	11.96	10.86	10.02	9.35	1.72	1.29	10.0	0.067	14.9	225	0.040	5%	0.038	1.088	0.													

ARUP		Job No.		Sheet No.		Rev.			
				5		2			
		Member/Location							
Job Title	Application for Amendment of Plan under Section 12A of the Town Planning Ordinance (Cap. 131) for Proposed Residential Development at Various Lots in D.D. 32 and Adjoining Government Land, Wong Yi Au, Tai Po, New Territories					Drg. Ref.			
Calculation						Estimation of Sewerage Discharge from Proposed Development			Made by

Proposed downstream sewage facilities capacity check:

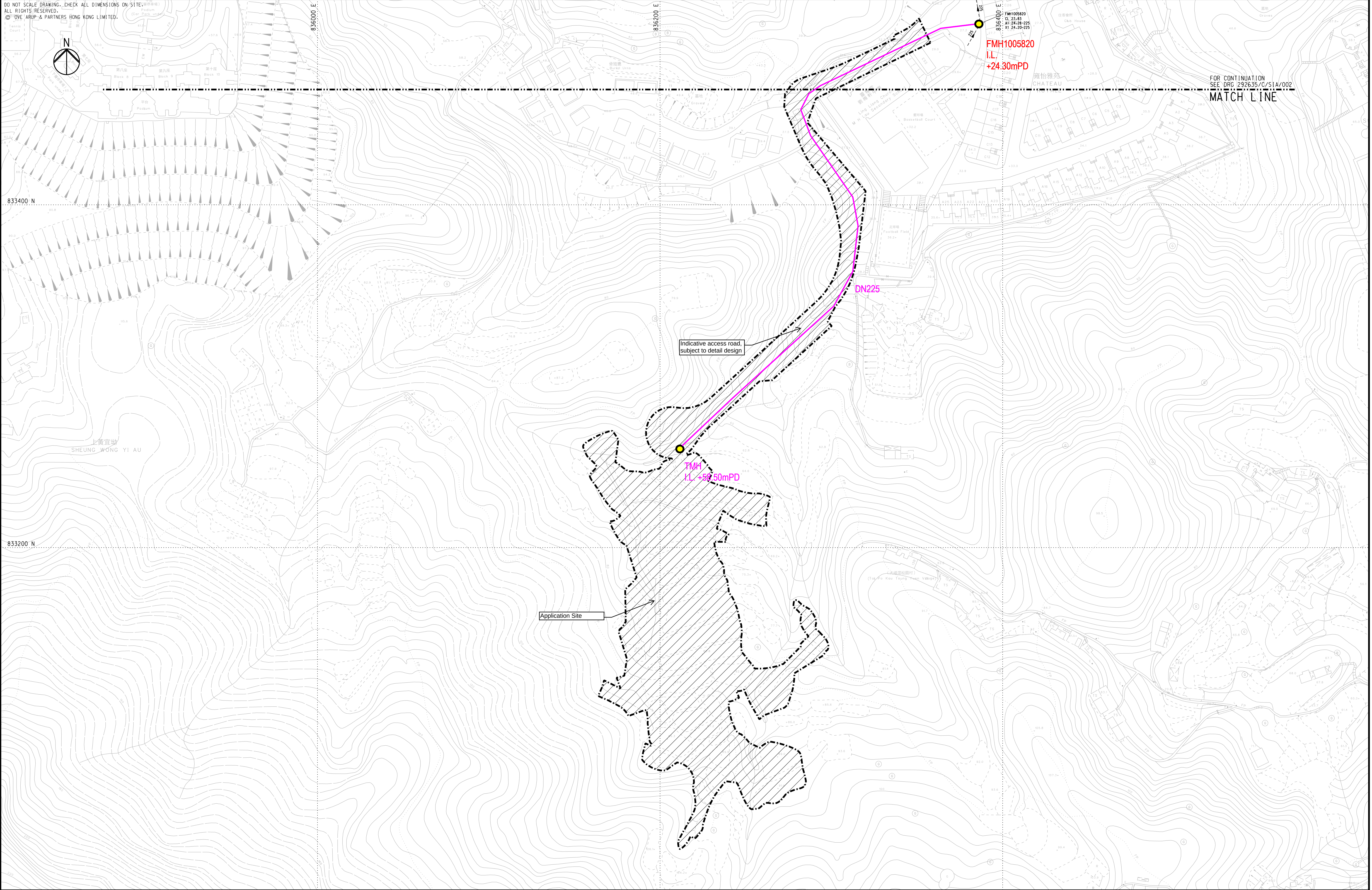
	ADWF (m ³ /day)	Peak Flow (L/s)	Peak Flow Increase (L/s)	Existing/Propo sed Sewer Size (mm)	Max. Occupation at Downstream Pipeline	Occupancy of TPKSPS	Increase of TPKSPS Occupancy	Occupancy of Upgraded TPSTW	Increase of Upgraded TPSTW
Existing Sewage Flow	2,005.6	116.1	-	225	34.1%	56%	-	1.25%	-
				375	74.6%				
Existing Sewage Flow + Ongoing Development Future Flow + Proposed Sewage Flow	2,576.3	157.0	40.9	225	65.7%	72%	16%	1.61%	0.36%
				375	91.1%				

TPKSPS	3600 m ³ /day
Upgraded TPSTW	160000 m ³ /day

Appendix B

Existing and Proposed Sewerage Network

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C	03/25	JP	THIRD ISSUE
B	04/24	JP	SECOND ISSUE
A	02/23	AH	FIRST ISSUE
Mark	Date	By	Rev.

LEGEND	
	PROPOSED DEVELOPMENT
	EXISTING SEWER AND MANHOLE
	PROPOSED SEWER

Job Title
APPLICATION FOR AMENDMENT OF PLAN UNDER SECTION 12A OF THE TOWN PLANNING ORDINANCE (CAP. 131) FOR PROPOSED RESIDENTIAL DEVELOPMENT AT VARIOUS LOTS IN D.D. 32 AND ADJOINING GOVERNMENT LAND, WONG YI AU, TAI PO, NEW TERRITORIES

Drawing Title
PROPOSED SEWERAGE NETWORK (SHEET 1 OF 2)
Drawing Status
SUBMISSION

ARUP		
Scale	1:1000 @ A1	
Drn.	RY	Date 02/23
Chd.	JW	Passed KK
Job No.	292635	Drawing No. C/SIA/001
Rev.	D	

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NEW TERRITORIES CIRCULAR ROAD

833800 N

833600 N

836000 E

836200 E

836400 E

MTR (EAST RAIL LINE)

TOLO HIGHWAY

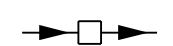
MATCH LINE

FOR CONTINUATION
SEE DRG 292635/C/SIA/001

LEGEND



PROPOSED DEVELOPMENT



EXISTING SEWER AND MANHOLE



PROPOSED SEWER

Job Title

APPLICATION FOR AMENDMENT OF PLAN UNDER SECTION 12A
OF THE TOWN PLANNING ORDINANCE (CAP. 131) FOR PROPOSED
RESIDENTIAL DEVELOPMENT AT VARIOUS LOTS IN D.D. 32 AND
ADJOINING GOVERNMENT LAND, WONG YI AU, TAI PO,
NEW TERRITORIES

Drawing Title

PROPOSED SEWERAGE
NETWORK
(SHEET 2 OF 2)

Drawing Status

SUBMISSION

ARUP

Scale 1:1000 @ A1

Drn. RY Date 02/23 Chd. JW Passed KK

Job No.

292635

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833400 N

836000 E

836200 E

836400 E

833200 N

FOR CONTINUATION
SEE DRG 292635/C/S1A/002
MATCH LINE

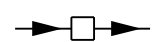
Indicative access road,
subject to detail design

Application Site

LEGEND



PROPOSED DEVELOPMENT



EXISTING SEWER AND MANHOLE

D	01/26	AL	FOURTH ISSUE
C	03/25	JP	THIRD ISSUE
B	04/24	JP	SECOND ISSUE
A	02/23	AH	FIRST ISSUE

Mark Date By Rev.

Job Title

APPLICATION FOR AMENDMENT OF PLAN UNDER SECTION 12A
OF THE TOWN PLANNING ORDINANCE (CAP. 131) FOR PROPOSED
RESIDENTIAL DEVELOPMENT AT VARIOUS LOTS IN D.D. 32 AND
ADJOINING GOVERNMENT LAND, WONG YI AU, TAI PO,
NEW TERRITORIES

Drawing Title

EXISTING SEWERAGE
NETWORK
(SHEET 1 OF 2)

Drawing Status

SUBMISSION

ARUP

Scale 1:1000 @ A1

Drn. RY Date 02/23 Chd. JW Passed KK

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NEW TERRITORIES CIRCULAR ROAD

833800 N

833600 N

836000 E

836200 E

836400 E

MTR (EAST RAIL LINE)

TOLO HIGHWAY

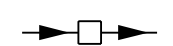
MATCH LINE

FOR CONTINUATION
SEE DRG 292635/C/SIA/001

LEGEND



PROPOSED DEVELOPMENT



EXISTING SEWER AND MANHOLE

Job Title

APPLICATION FOR AMENDMENT OF PLAN UNDER SECTION 12A
OF THE TOWN PLANNING ORDINANCE (CAP. 131) FOR PROPOSED
RESIDENTIAL DEVELOPMENT AT VARIOUS LOTS IN D.D. 32 AND
ADJOINING GOVERNMENT LAND, WONG YI AU, TAI PO,
NEW TERRITORIES

Drawing Title

EXISTING SEWERAGE
NETWORK
(SHEET 2 OF 2)

Drawing Status

SUBMISSION

ARUP

Scale 1:1000 @ A1

Drn. RY Date 02/23 Chd. JW Passed KK

Job No.

292635

Drawing No.

C/SIA/004

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Mark	Date	By	Rev.
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B	04/24	JP	SECOND ISSUE
A	02/23	AH	FIRST ISSUE

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NEW TERRITORIES CIRCULAR ROAD

SHAN YIN ROAD

CATCHMENT F

CATCHMENT E

CATCHMENT G

CATCHMENT D

CATCHMENT C

CATCHMENT I

CATCHMENT B

CATCHMENT A

TAI PO KAU

MTR (EAST RAIL LINE)

TOLO HIGHWAY

吐露港
TOLO HARBOUR

Indicative access road,
subject to detail design

Application Site

CATCHMENT H

Catchment ID	Manhole Discharge to
A,B	FMH1005820
C	FMH1005834
D	FMH1005836
E, F	FMH1005831
G,H	FMH1005823
I	FMH1005813

LEGEND



PROPOSED DEVELOPMENT



SEWERAGE CATCHMENT

Job Title

APPLICATION FOR AMENDMENT OF PLAN UNDER SECTION 12A
OF THE TOWN PLANNING ORDINANCE (CAP. 131) FOR PROPOSED
RESIDENTIAL DEVELOPMENT AT VARIOUS LOTS IN D.D. 32 AND
ADJOINING GOVERNMENT LAND, WONG YI AU, TAI PO,
NEW TERRITORIES

Drawing Title

SEWERAGE CATCHMENT PLAN

Scale 1:2500 @ A1

Drn. RY Date 02/23 Chd. JW Passed KK

Drawing Status

SUBMISSION

Job No.

292635

Drawing No.

C/S1A/005

Rev.

D

ARUP