
**Attachment 2 –
Revised Sewerage Impact Assessment**

**Section 16 Planning Application for Proposed
Amendments to an Approved Comprehensive Residential
Development Scheme and Minor Relaxation of Gross Floor
Area and Building Height Restrictions at Various Lots in
D.D. 385 and Adjoining Government Land,
Tai Lam Chung, Tuen Mun**

Sewerage Impact Assessment

(September 2025)

AECOM

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DRAWINGS

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| SIA/401 | Location Plan |
| SIA/402 | Master Layout Plan |
| SIA/403 | Proposed Sewage Treatment Plant Location Plan |

APPENDICES

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1 INTRODUCTION

1.1 Background

- 1.1.1 AECOM Asia Company Limited was commissioned to be the engineering consultant for Sewerage Impact Assessment (SIA) to support the proposed residential development at Tai Lam Chung, Tuen Mun.
- 1.1.2 The application site situates at the east of Tai Lam Chung Nullah, adjacent to Hong Kong Customs College. The location of the application site is shown in **Drawing No. SIA/401**.
- 1.1.3 The application site comprises the proposed development and site formation works for three village housing sites and provision of public facilities. The location of village housing sites is shown in Master Layout Plan in **Drawing No. SIA/402**.
- 1.1.4 This SIA report forms part of the technical supporting documents for the proposed development under Section 16 Application of the Town Planning Ordinance.

1.2 Purposes of this Submission

- 1.2.1 This report outlines the assessment results of the potential sewerage impacts caused by the proposed development. The main objectives of this assessment include the followings:
 - a) Identify any existing sewerage facilities.
 - b) Outline the methodology adopted in this assessment.
 - c) Estimate the planned sewage generation according to the development schedule of the application site.
 - d) Propose sewerage impact mitigation measures where appropriate to mitigate the potential sewerage impact.
 - e) Discuss the responsibility of the maintenance aspects of the proposed sewerage system and sewerage impact mitigation measures.

2 SEWERAGE SYSTEM CONDITION AT THE SITE

2.1 Existing Sewerage System

- 2.1.1 After consulting with the Drainage Services Department (DSD) and reviewing the GeoInfo Map, it has been confirmed that there are no existing sewerage networks in the vicinity of the application site. The nearest public sewer is approximately 500m away.
- 2.1.2 Details regarding the existing sewerage networks refer to **Appendix A**.

2.2 Planned Sewerage System

2.2.1 DSD advised that there are currently no planned sewerage networks near the application site. Additionally, according to the Town Planning Board Statutory Planning Portal, there are no planned private developments nearby. It is deemed that there are no planned sewerage networks in the area.

2.2.2 Details regarding no planned sewerage networks near the application site refer to **Appendix A**.

3 DEVELOPMENT PROPOSAL

3.1 Overview of Development Proposal

3.1.1 The proposed development can be broadly divided into an East Wing and a South Wing. The Master Layout Plan is shown in **Drawing No. SIA/402**.

3.1.2 The proposed development comprises 7 medium rise residential towers and 17 houses, two club houses, landscaped open spaces, commercial and retail areas, and covered transport layby. The development schedule is shown in **Table 3-1**.

Table 3-1 Development Schedule

| | |
|--|--------|
| Total Application Site Area (m ²) (about) ⁽¹⁾ | 61,127 |
| Development Site Area (m ²) (about) | 46,493 |
| No. of Residential Blocks | 24 |
| • Towers | 7 |
| • Houses | 17 |
| No. of Units | 2,670 |
| • Tower Units | 2,653 |
| • House Units | 17 |
| Retail / Commercial (m ²) (about) ⁽²⁾ | 2,000 |
| Clubhouse GFA (m ²) (about) | 3,500 |

Remarks:

(1) Application Site is formulated largely based on the Pink, Purple, Orange and part of Green Areas of the draft land grant plan under lot to be known as TMTL No. 417 currently under process

- Pink Area: Residential Portion (about 46,493m²)
- Purple Area: Formation Site for Village Housing; Orange Area: Site for Provision of Public Facilities; Green Area: Provision / Modification of Village Road, Pedestrian Access to Wong Uk Tsuen and Pedestrian

Route to Burial Ground (about 14,634m² in total)

- (2) Include retail / commercial uses for 'Shop and Services', 'Eating Place', 'School' (nursery / kindergarten / language, computer, commercial or tutorial schools / technical institutes / other types of schools providing interests and hobby related courses for subjects such as arts, ballet and etc.), 'Place of Entertainment' and 'Place of Recreation, Sports or Culture' uses at the retail / commercial portion

3.2 Village Housing Sites

- 3.2.1 There are also three village housing sites within the application site boundary. The location of the village housing sites is shown in **Drawing No. SIA/402**.
- 3.2.2 According to the lease conditions, the applicant is responsible for the site formation of the village housing sites.

4 ASSESSMENT METHODOLOGY AND ASSUMPTION

4.1 Overview of Methodology and Assumptions

- 4.1.1 Sewage is estimated in accordance with Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning ("GESF") published by EPD. The design assumption and basis are shown in **Table 4-1**.

Table 4-1 Design Assumption and Basis

| | |
|--|--|
| Unit Flow Factor | <u>GESF Table T-1 and T-2</u> 0.15 m ³ /day/head ("Traditional Village") 0.19 m ³ /day/head ("Domestic Private Housing (R1)") 0.27 m ³ /day/head ("Domestic Private Housing (R2)") 0.37 m ³ /day/head ("Domestic Public Housing (R3 & R4)") 0.28 m ³ /day/head ("Commercial Employee" plus "Wholesale & Retail" J4) 1.58 m ³ /day/head ("Commercial Employee" plus "Restaurant" J10) 0.28 m ³ /day/head ("Commercial Employee" plus "Community, Social & Personal Services" J11) |
| Catchment Inflow Factor | Not applicable in this new development area |
| Economic Activity and Planned Usage Type | 2.1 employees per 100 m ² ("Retail and Trade, "Private Commercials") 5.1 employees per 100 m ² ("Restaurant", "Private Commercials") 2.3 employees per 100 m ² ("Community, Social & Personal Service", "(Private Commercials)") |

4.2 Estimation of Sewage Generation from the Proposed Development

- 4.2.1 Development sewage is estimated based on residential type and commercial activities. Details of the sewage estimations of Development Site refer to **Appendix B1**. For sewage estimations of two swimming pools in south wing of development site refer to **Appendix B2**. The summary of sewage generation from proposed development is shown in **Table 4-2** below.

Table 4-2 Estimated Sewage Flow Generation from the Proposed Development

| | ADWF (m³/day) |
|---------------------------|---------------------------------|
| East Wing of Development | 881 |
| South Wing of Development | 1,408 |
| Total | <u>2,289</u> |

- 4.2.2 The daily average sewage flow generated from the proposed development is approximately 2,289 m³/day (ADWF).

4.3 Estimation of Sewage Generation from Village Housing Sites

- 4.3.1 Sewage from the village housing sites is estimated under **Appendix C**. The daily average sewage flow generated from the village housing sites is approximately 100.8 m³/day (ADWF).

5 POTENTIAL SEWERAGE IMPACTS AND MITIGATION MEASURES

5.1 Sewerage Impacts from the Proposed Development

- 5.1.1 As mentioned in **Section 2**, there is no existing and planned sewerage connection in the vicinity of the proposed development. The nearest public sewer is approximately 500m away. It is proposed to construct private Sewage Treatment Plants (STPs) in the development site to handle the development sewage.
- 5.1.2 Two STPs, namely STP – East and STP – South, have been proposed at the East Wing and South Wing of the development, respectively, to treat sewage collected from each portion of the development. The tentative location of the private STPs is shown in **Drawing No. SIA/403**.
- 5.1.3 The STPs shall be designed to cater for the daily average of sewage flow (ADWF) from each portion of site. The design capacity of each STP is summarized in **Table 5-1** below.

Table 5-1 Design Capacity of STPs

| | Design Capacity (m ³ /day) |
|-------------|---------------------------------------|
| STP - East | 881 |
| STP - South | 1,408 |

5.1.4 The design of STP will follow the “Guidelines for the Design of Small Sewage Treatment Plants published” by EPD.

5.1.5 The treated effluent will be designed in accordance with "Technical Memorandum on Effluent Standards" Table 10a, published by EPD (Cap. 358). STP – East corresponds to flow category “>800 and <= 1000”, while STP – South corresponds to flow category “>1000 and <= 1500”. The proposed STPs will adopt Membrane bioreactor (MBR) technology to achieve tertiary treatment level.

5.1.6 The treated effluent will be discharged to Tai Lam Chung Nullah via the proposed box culvert. The discharge points are shown in **Drawing No. SIA/403**.

5.1.7 The detailed designs will be further elaborated in the detailed design stage.

5.2 Sewerage Impacts from Village Housing Sites

5.2.1 As mentioned in **Section 2**, there is no existing and planned sewerage connection in the vicinity of the application site.

5.2.2 It is suggested to adopt a septic tank system (STS) for each village housing sites to handle the associated sewage collected.

5.2.3 The design and construction of septic tank systems shall follow “Guidance Notes on Discharges from Village Houses” published by EPD.

5.2.4 According to “Guidance Notes on Discharges from Village Houses” published by EPD, it is suggested to desludging STS with tanker lorry by specialist contractors to sewage treatment works for disposal, and the cost shall be borne by village housing owners.

6 MAINTENANCE RESPONSIBILITY

6.1 Sewerage System within the Proposed Development Site

6.1.1 The private STPs will exclusively treat sewage generated from the associated private development site.

6.1.2 The Applicant will be responsible for construction, maintenance and operation of all necessary sewers and any other private internal sewerage infrastructure within the development boundary.

6.2 Sewerage System within Village Housing Site

- 6.2.1 Septic tank system is suggested as sewerage mitigation for the village housing sites. The detail of the arrangements shall be designed by the owners of the village housing sites.
- 6.2.2 The owners of the Village Housing Sites will be responsible for the construction, maintenance and operation of all necessary sewers and any other sewerage facilities within the village housing sites.

7 CONCLUSION

- 7.1.1 Under the current development schedule, the East Wing of development will generate 881 m³/day of sewage, while the South Wing will generate 1,408 m³/day.
- 7.1.2 As there is no existing public sewerage system in the vicinity of the proposed development, it is proposed to construct two private STPs at the East Wing and South Wing of the development site, respectively, to treat sewage generated from each portion of the development site. The design capacity of each STP has summarized in **Table 5-1**.
- 7.1.3 Private sewage treatment plant will be adopted as sewerage mitigation for the proposed development, which include all associated internal sewers within the site.
- 7.1.4 Septic tank system is suggested as sewerage mitigation for the village housing sites. The detail of the arrangements shall be designed by the owner of the village housing sites.
- 7.1.5 After implementing the proposed sewerage mitigation measures for the development site, it is deemed that the impact will be minimal and negligible.

END OF TEXT

Drawings

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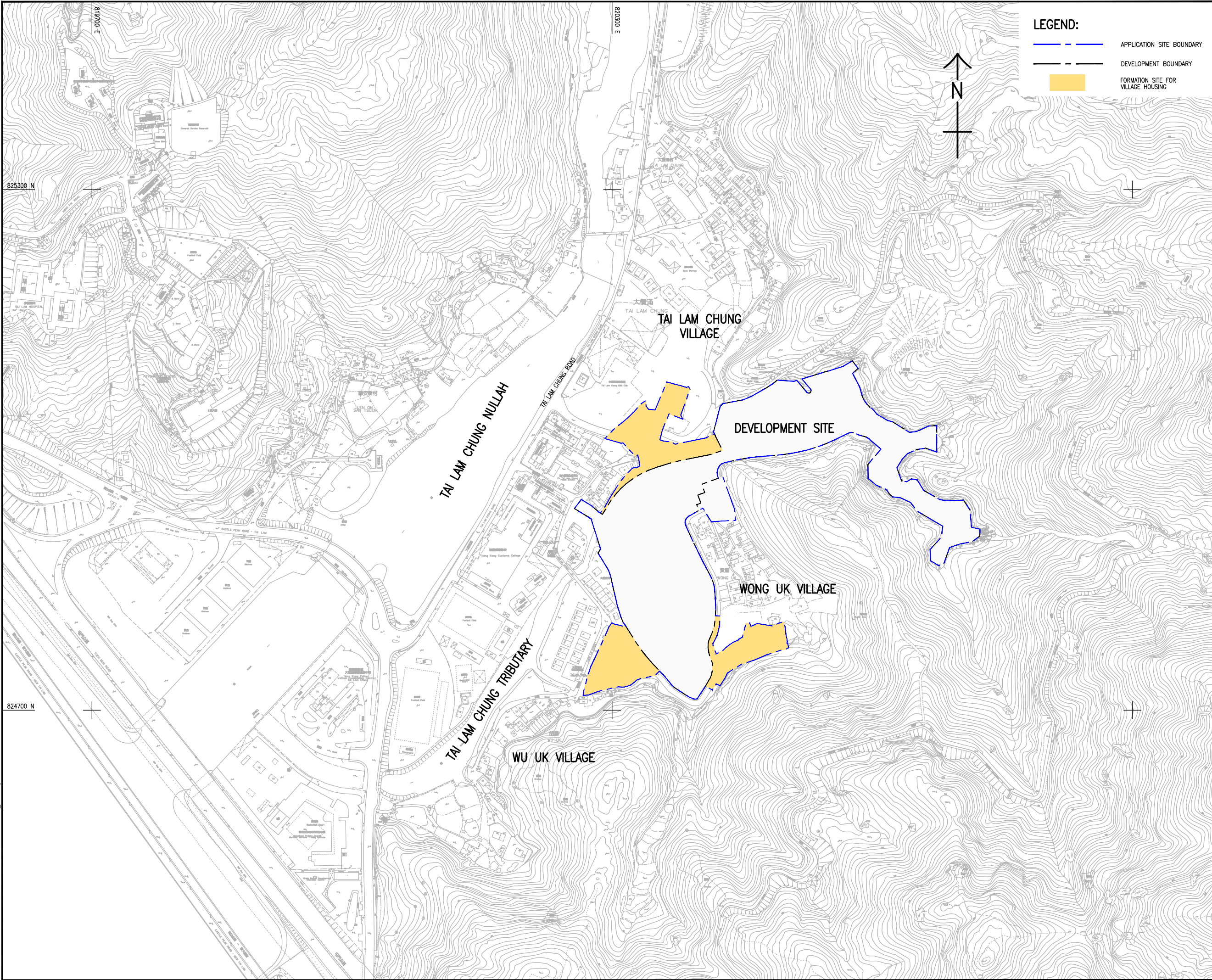
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Designer:

Project Management Initials:



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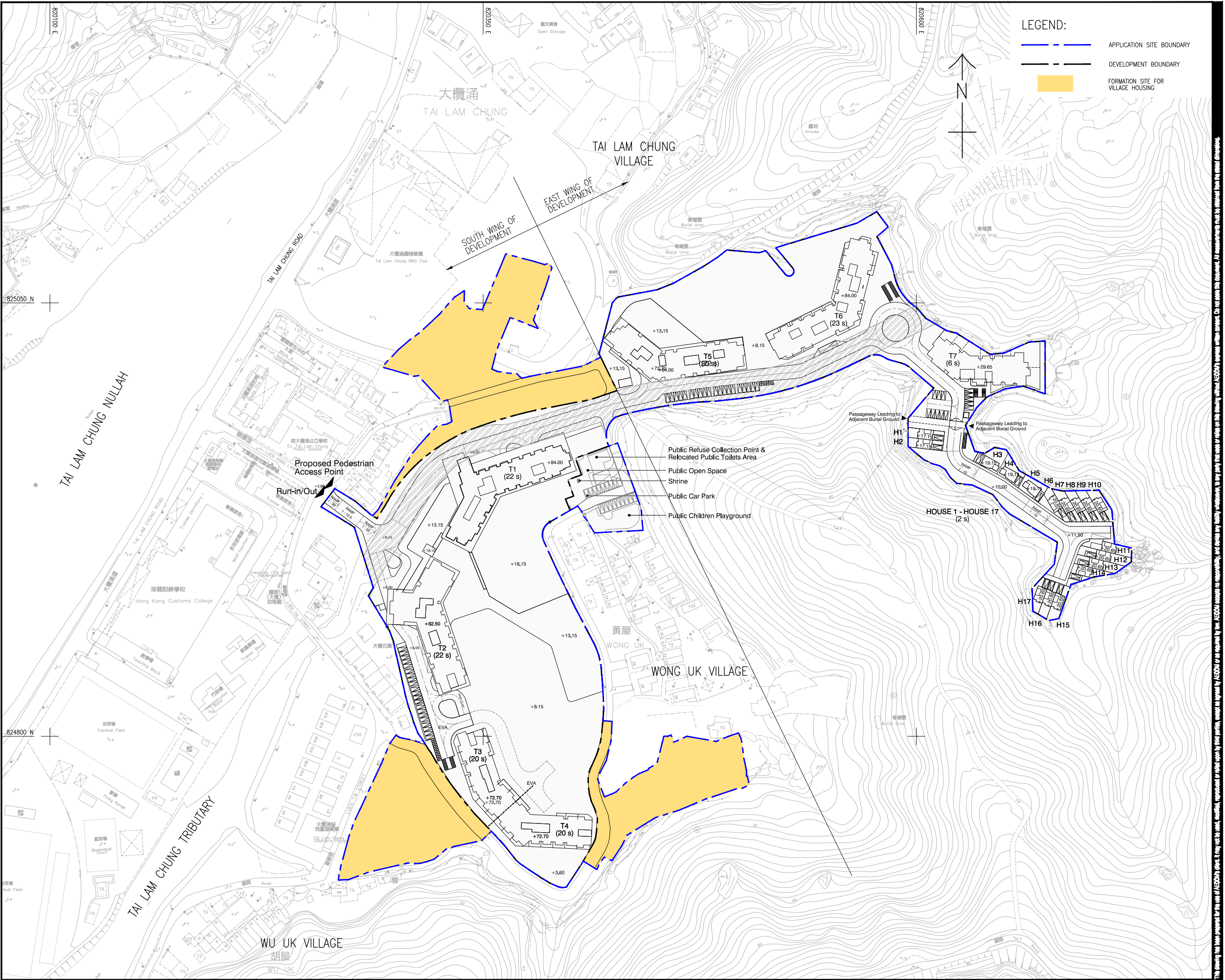
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LOCATION PLAN

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HEIGHT RESTRICTIONS AT
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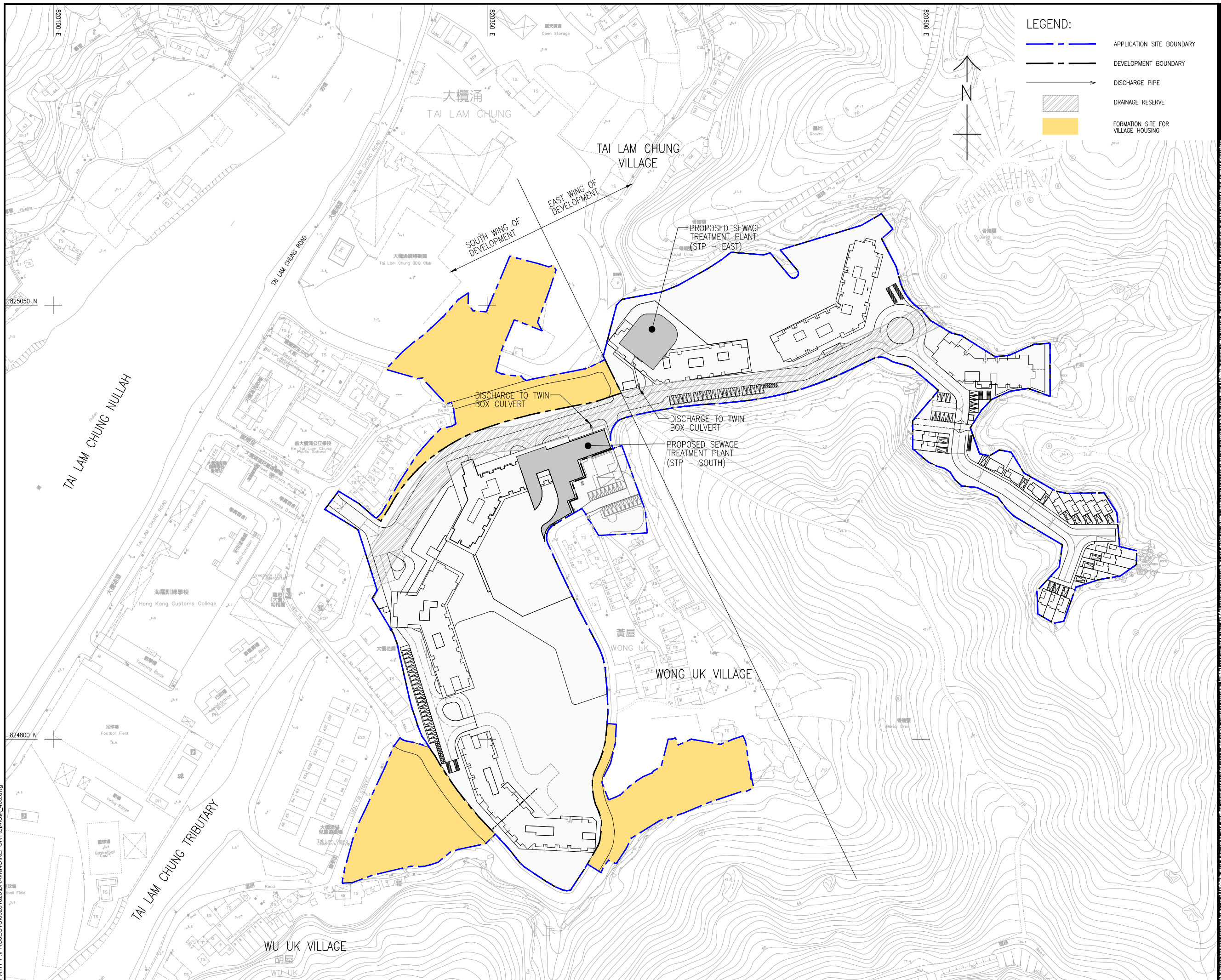
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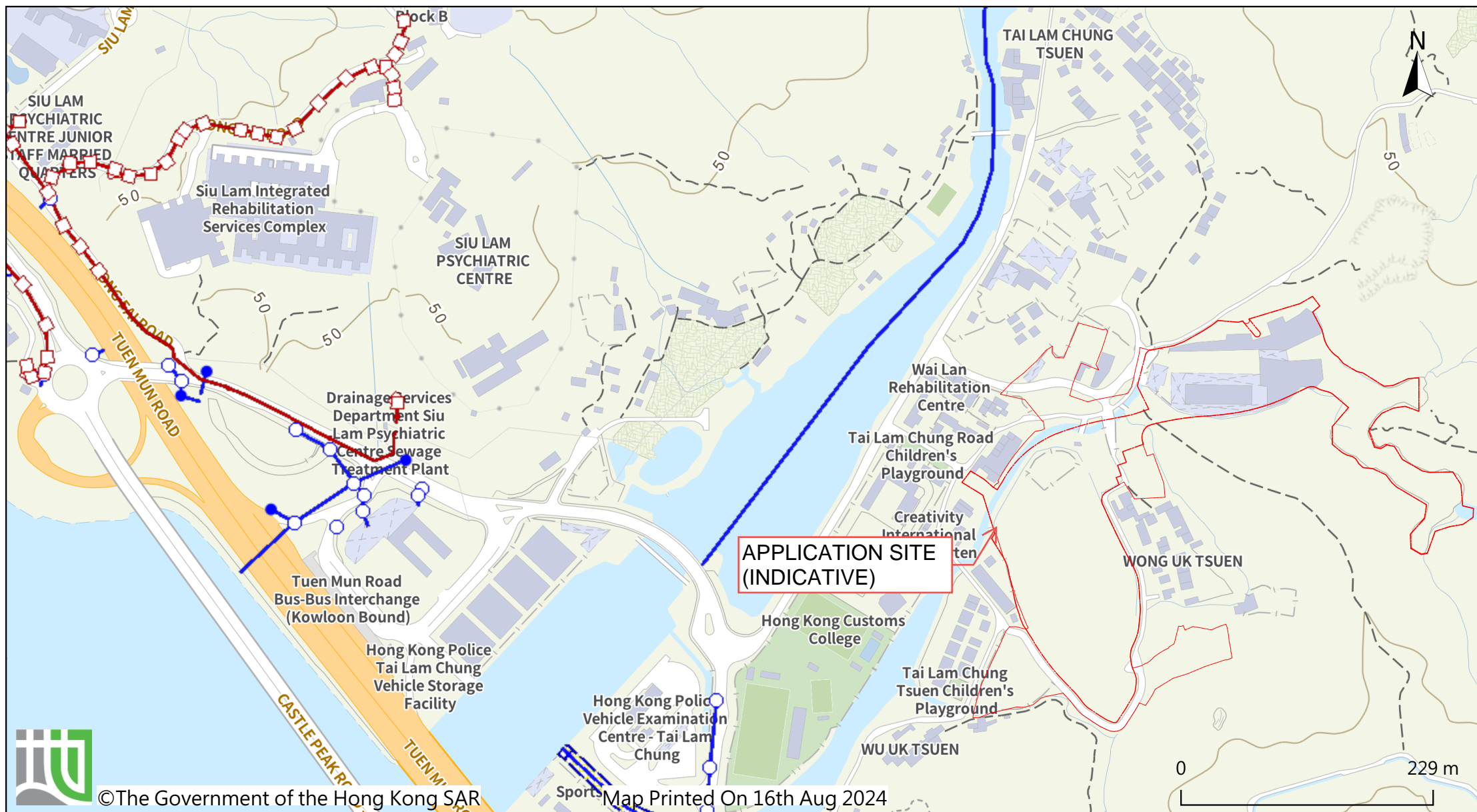
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Appendix A

Existing and Planned Sewerage Networks

Appendix A - Existing Sewerage Networks

Go to map: <https://www.map.gov.hk/gm/geo:22.3638,114.0171?z=4514>



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Map Printed On 16th Aug 2024

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Appendix A - Planned Sewerage Networks

KWOK, Winnie

From: hylee03@dsd.gov.hk
Sent: Tuesday, July 9, 2024 2:22 PM
To: KWOK, Winnie
Cc: Wan, Willie; khng06@dsd.gov.hk
Subject: Re: [Internet]RE: [Internet]Request for Existing Record Plans and As-built drawings
Attachments: 1. Drainage Pipe and Manhole Records.pdf

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Dear Winnie,

This division has no planned drainage or sewerage networks in the concerned area at this moment. But we cannot confirm or guarantee that there is no planned development by private developer or other department/division. Thanks.

Regards,
Ryco LEE
E/TM5 & Ag. E/TM1, MND, DSD
Tel.: 2300 1629

From: "KWOK, Winnie" <yungyi.kwok@aecom.com>
To: "hylee03@dsd.gov.hk" <hylee03@dsd.gov.hk>
Cc: "Wan, Willie" <Willie.Wan@aecom.com>
Date: 09/07/2024 11:41
Subject: [Internet]RE: [Internet]Request for Existing Record Plans and As-built drawings
Serial No.:

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Dear Mr. Lee,

Thank you for your prompt reply. It is noted that the record information is now accessible through the GeoInfo Map. According to GeoInfo Map, there is no existing drainage and sewerage network in the concerned area (as indicated in the attached record).

However, could you please help to confirm if there are any **planned drainage or sewerage networks** in the concerned area.

Thank you for your kind attention. Should you require any further information, please contact me at 3856 0051.

Best Regards,

Winnie Kwok

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From: hylee03@dsd.gov.hk <hylee03@dsd.gov.hk>

Sent: Monday, July 8, 2024 8:23 PM

To: KWOK, Winnie <yungyi.kwok@aecom.com>

Cc: Wan, Willie <Willie.Wan@aecom.com>

Subject: Re: [Internet]Request for Existing Record Plans and As-built drawings

Dear Winnie,

Attached please find our reply dated 23.5.2024 for your information. Thanks.

Regards,

Ryco LEE

E/TM5 & Ag. E/TM1, MND, DSD

Tel.: 2300 1629

From: "KWOK, Winnie" <yungyi.kwok@aecom.com>

To: "hylee03@dsd.gov.hk" <hylee03@dsd.gov.hk>

Cc: "Wan, Willie" <Willie.Wan@aecom.com>

Date: 28/06/2024 17:24

Subject: [Internet]Request for Existing Record Plans and As-built drawings

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Dear Mr. Lee,

As per our telephone conversation just now, please find attached the soft copy of our letter requesting existing record plans and as-built drawings.

Further to the requested drainage record plan mentioned in the letter, we would greatly appreciate it if you could also provide us with a set of your most updated record plans and as-built drawings, showing your existing and planned sewerage network for our information. The location plan is attached for your easy reference.

We appreciate your assistance in this matter and look forward to your reply. Should you require any further information, please contact me at 3856 0051. Thank you for your kind attention.

Best Regards,

Winnie Kwok

Land Supply / Municipal, GC - Hong Kong

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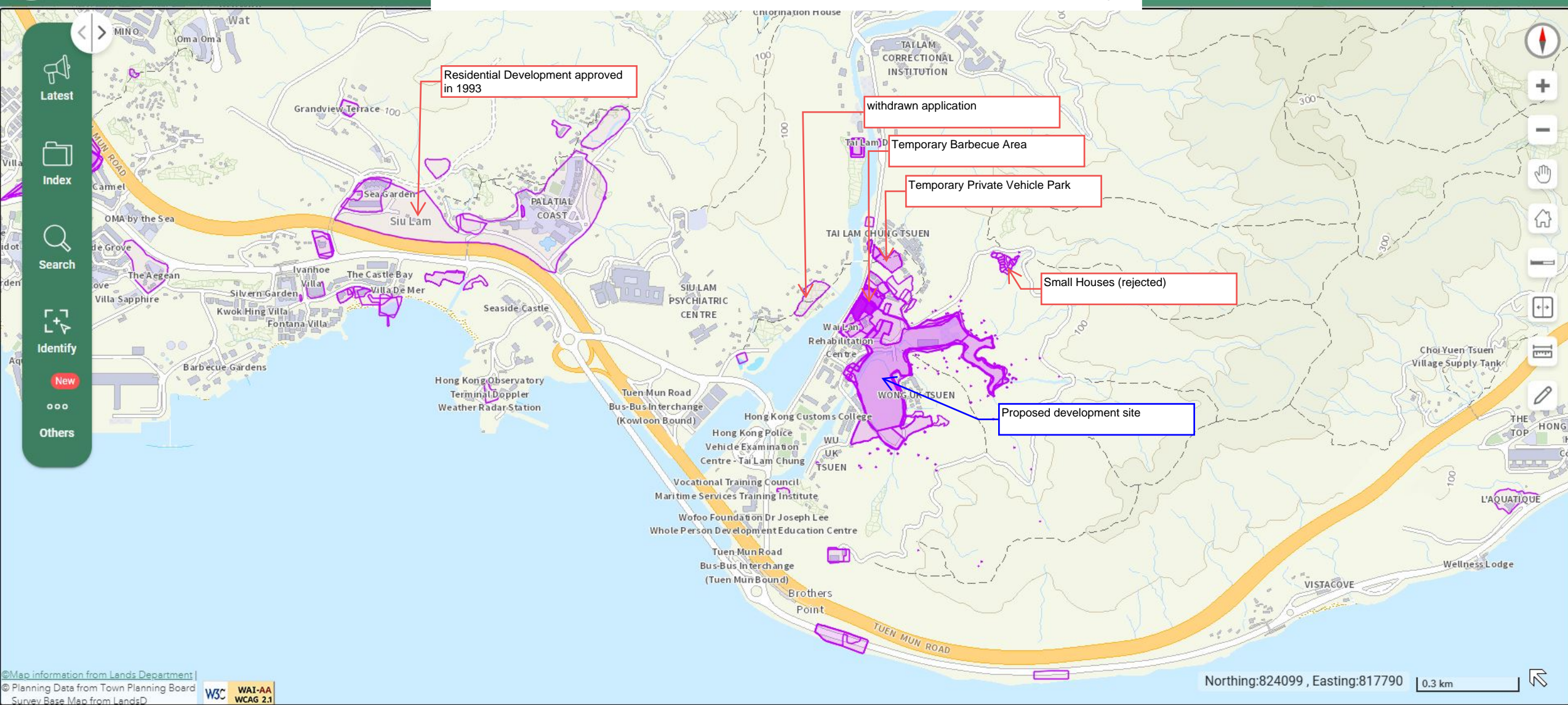
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Appendix B1

Estimated Sewage Flow Generation from Proposed Development

East Wing of Development Site

Development Schedule - East Wing of Development Site

| | | |
|-------------------------------------|-------|-----|
| No. of Tower Units | 1,096 | (2) |
| No. of House Units | 17 | |
| GFA for Clubhouse (m ²) | 615.0 | |
| GFA for Clubhouse F&B Area | 307.5 | |
| GFA for Clubhouse Non-F&B Area | 307.5 | |

Design Population

| Development Type | No. of Units | PPoF ⁽¹⁾ | Population |
|------------------|--------------|---------------------|------------|
| Tower Units | 1,096 | 2.8 | 3,069 |
| House Units | 17 | 4 | 68 |

| Development Type | Worker's Type | GFA (m ²) | Workers per GFA (in 100m ²) ⁽³⁾ | Employee |
|---------------------|------------------------------------|-----------------------|--|----------|
| Clubhouse (F&B) | Restaurants (Private Commercials) | 307.5 | 5.1 | 16 |
| Clubhouse (Non-F&B) | Retail Trade (Private Commercials) | 307.5 | 2.1 | 7 |

Sewage Estimation (Proposed)

| Type of Flow | Development Type | Population/Employee | Unit Flow Factor | Sewage | Remarks |
|---|---------------------|---------------------|------------------|------------------------------|---|
| Domestic | Tower Units | 3,069 | 0.27 | 828.58 (m ³ /d) | Domestic Residents, R2 Domestic Private |
| | House Units | 68 | 0.37 | 25.16 (m ³ /d) | Domestic Residents, R3/R4 Domestic Private |
| Commencial | Clubhouse (F&B) | 16 | 1.58 | 24.78 (m ³ /d) | Clubhouse F&B Employees, J10 Restaurants & Hotels |
| | Clubhouse (Non-F&B) | 7 | 0.28 | 1.96 (m ³ /d) | Clubhouse Non-F&B Employees, J4 Wholesale & Retail |
| <u>Total sewage generated from East Wing of Development Site</u> | | | | 881 (m³/d) | |
| <u>Contributing Population</u> | | | | 3,263 | |

Design Peak Flow

| | Peaking Factor | Peak Flow (m ³ /s) |
|-------|----------------|-------------------------------|
| Sewer | 5 | 0.051 |
| STP | 3 | 0.031 |

Note:

- (1) Assuming a Person-Per-Flat ratio of 2.8 for tower units as per the 2021 Population Census under District Council Constituency Areas; Assuming a Person-Per-Flat ratio of 4 for house units for conservative approach.
- (2) Assume 50% of Clubhouse area is for F&B and 50% of Clubhouse area is for Non-F&B for technical assessment purposes only.
- (3) In accordance with Commercial and Industrial Floor Space Utilization Survey published by Planning Department.
- (4) Since the proposed development area is a new catchment, the catchment inflow factor is deemed to be not applicable.

South Wing of Development Site

Development Schedule - South Wing of Development Site

| | | |
|-------------------------------------|---------|-----|
| No. of Tower Units | 1,557 | |
| GFA for Clubhouse (m ²) | 2,885 | (2) |
| GFA for Clubhouse F&B Area | 1,442.5 | |
| GFA for Clubhouse Non-F&B Area | 1,442.5 | |
| GFA for Retails (m ²) | 2,000 | (2) |
| GFA for Retails F&B Area | 1,000 | |
| GFA for Retails Non-F&B Area | 1,000 | |

Design Population

| Development Type | No. of Units | PPoF ⁽¹⁾ | Population |
|------------------|--------------|---------------------|------------|
| Tower Units | 1,557 | 2.8 | 4,360 |

| Development Type | Worker's Type | GFA (m ²) | Workers per GFA (in 100m ²) ⁽³⁾ | Employee |
|---------------------|------------------------------------|-----------------------|--|----------|
| Clubhouse (F&B) | Restaurants (Private Commercials) | 1,442.5 | 5.1 | 74 |
| Clubhouse (Non-F&B) | Retail Trade (Private Commercials) | 1,442.5 | 2.1 | 31 |
| Retails (F&B) | Restaurants (Private Commercials) | 1,000 | 5.1 | 51 |
| Retails (Non-F&B) | Retail Trade (Private Commercials) | 1,000 | 2.1 | 21 |

Sewage Estimation (Proposed)

| Type of Flow | Development Type | Population/Employee | Unit Flow Factor | Sewage | Remarks |
|---|---------------------|---------------------|------------------|----------------------------------|---|
| Domestic | Tower Units | 4,360 | 0.27 | 1,177.09 (m ³ /d) | Domestic Residents, R2 Domestic Private |
| Commercial | Clubhouse (F&B) | 74 | 1.58 | 116.24 (m ³ /d) | Clubhouse F&B Employees, J10 Restaurants & Hotels |
| | Clubhouse (Non-F&B) | 30 | 0.28 | 8.48 (m ³ /d) | Clubhouse Non-F&B Employees, J4 Wholesale & Retail |
| | Retails (F&B) | 51 | 1.58 | 80.58 (m ³ /d) | Retails F&B Employees, J10 Restaurants & Hotels |
| | Retails (Non-F&B) | 21 | 0.28 | 5.88 (m ³ /d) | Retails Non-F&B Employees, J4 Wholesale & Retail |
| Swimming Pool Backwash | | | | 18.75 (m ³ /d) | Swimming Pool Backwash ⁽⁴⁾ |
| Total sewage generated from South Wing of Development Site | | | | 1,408 (m ³ /d) | |
| Contributing Population | | | | 5,215 | |

Design Peak Flow


| | Peaking Factor | Peak Flow (m ³ /s) (without Swimming Pool Backwash) | Peak flow of Swimming Pool Backwash | Peak Flow (m ³ /s) |
|-------|----------------|--|-------------------------------------|-------------------------------|
| Sewer | 4 | 0.064 | 0.104 | 0.168 |
| STP | 3 | 0.049 | 0.104 | 0.153 |

Note:

- (1) Assuming a Person-Per-Flat ratio of 2.8 for tower units as per the 2021 Population Census under District Council Constituency Areas.
- (2) Assume 50% of Clubhouse area is for F&B and 50% of Clubhouse area is for Non-F&B for technical assessment purposes only.
- (3) In accordance with Commercial and Industrial Floor Space Utilization Survey published by Planning Department.
- (4) For estimated sewage flow from swimming pool backwash, please refer to "Swimming Pool - Backwash Calculation" in **Appendix B2**.
- (5) Since the proposed development area is a new catchment, the catchment inflow factor is deemed to be not applicable.

Appendix B2

Swimming Pool - Backwash Calculation

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|------------------------------------|------|-----------------------|-----------------------------|------|----------------|--|--|-----------------------------|-------|------------------------------------|--|--|-------------------|-------|----------------|--|--|------------------------------|------|-----|--|-----------------------|---|------|------------------------------------|--|--|------------------------|------------|-------------------|--|--|---|------|----------------|--|--|
|  | Section 16 Planning Application for Proposed Amendments to an Approved Comprehensive Residential Development Scheme and Minor Relaxation of Gross Floor Area and Building Height Restrictions at Various Lots in D.D. 385 and Adjoining Government Land,Tai Lam Chung, Tuen Mun | | No. | / | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Appendix B2 Swimming Pool - Backwash Calculation | | Date | 7/30/2025 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p><u>1. Outdoor Swimming Pool at South Wing:</u></p> <p><u>Backwash:</u></p> <table><tr><td>Plan Area of Pool =</td><td>625</td><td>m²</td><td></td><td></td></tr><tr><td>Assuming Depth of Pool =</td><td>1.5</td><td>m</td><td></td><td></td></tr><tr><td>Volume of Pool =</td><td>938</td><td>m³</td><td></td><td></td></tr><tr><td>Turnover Rate =</td><td>6</td><td>hr</td><td></td><td>Outdoor Swimming Pool</td></tr><tr><td>Assuming Surface Loading Rate of Filter =</td><td>20</td><td>m³/m²/hr</td><td></td><td></td></tr><tr><td>Filter Area Required =</td><td>937.5/6/20</td><td></td><td></td><td></td></tr><tr><td>=</td><td>7.81</td><td>m²</td><td></td><td></td></tr></table> | | | | | Plan Area of Pool = | 625 | m ² | | | Assuming Depth of Pool = | 1.5 | m | | | Volume of Pool = | 938 | m ³ | | | Turnover Rate = | 6 | hr | | Outdoor Swimming Pool | Assuming Surface Loading Rate of Filter = | 20 | m ³ /m ² /hr | | | Filter Area Required = | 937.5/6/20 | | | | = | 7.81 | m ² | | |
| Plan Area of Pool = | 625 | m ² | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Assuming Depth of Pool = | 1.5 | m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Volume of Pool = | 938 | m ³ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Turnover Rate = | 6 | hr | | Outdoor Swimming Pool | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Assuming Surface Loading Rate of Filter = | 20 | m ³ /m ² /hr | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Filter Area Required = | 937.5/6/20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| = | 7.81 | m ² | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p><u>Per portion:</u></p> <table><tr><td>Assumed Backwash Duration =</td><td>3.00</td><td>min/d</td><td></td><td></td></tr><tr><td>Assumed Backwash Flowrate =</td><td>30.00</td><td>m³/m²/hr</td><td></td><td></td></tr><tr><td>Backwash Volume =</td><td>11.72</td><td>m³</td><td></td><td></td></tr><tr><td>Assumed Discharge Duration =</td><td>3.00</td><td>min</td><td></td><td></td></tr><tr><td>Discharge Flow rate =</td><td>3.91</td><td>m³/min</td><td></td><td></td></tr><tr><td>=</td><td>0.0650</td><td>m³/s</td><td></td><td></td></tr></table> | | | | | Assumed Backwash Duration = | 3.00 | min/d | | | Assumed Backwash Flowrate = | 30.00 | m ³ /m ² /hr | | | Backwash Volume = | 11.72 | m ³ | | | Assumed Discharge Duration = | 3.00 | min | | | Discharge Flow rate = | 3.91 | m ³ /min | | | = | 0.0650 | m ³ /s | | | | | | | |
| Assumed Backwash Duration = | 3.00 | min/d | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Assumed Backwash Flowrate = | 30.00 | m ³ /m ² /hr | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Backwash Volume = | 11.72 | m ³ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Assumed Discharge Duration = | 3.00 | min | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Discharge Flow rate = | 3.91 | m ³ /min | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| = | 0.0650 | m ³ /s | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p><u>2. Indoor Swimming Pool at South Wing:</u></p> <p><u>Backwash:</u></p> <table><tr><td>Plan Area of Pool =</td><td>250</td><td>m²</td><td></td><td></td></tr><tr><td>Assuming Depth of Pool =</td><td>1.5</td><td>m</td><td></td><td></td></tr><tr><td>Volume of Pool =</td><td>375</td><td>m³</td><td></td><td></td></tr><tr><td>Turnover Rate =</td><td>4</td><td>hr</td><td></td><td>Indoor Swimming Pool</td></tr><tr><td>Assuming Surface Loading Rate of Filter =</td><td>20</td><td>m³/m²/hr</td><td></td><td></td></tr><tr><td>Filter Area Required =</td><td>375/4/20</td><td></td><td></td><td></td></tr><tr><td>=</td><td>4.69</td><td>m²</td><td></td><td></td></tr></table> | | | | | Plan Area of Pool = | 250 | m ² | | | Assuming Depth of Pool = | 1.5 | m | | | Volume of Pool = | 375 | m ³ | | | Turnover Rate = | 4 | hr | | Indoor Swimming Pool | Assuming Surface Loading Rate of Filter = | 20 | m ³ /m ² /hr | | | Filter Area Required = | 375/4/20 | | | | = | 4.69 | m ² | | |
| Plan Area of Pool = | 250 | m ² | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Assuming Depth of Pool = | 1.5 | m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Volume of Pool = | 375 | m ³ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Turnover Rate = | 4 | hr | | Indoor Swimming Pool | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Assuming Surface Loading Rate of Filter = | 20 | m ³ /m ² /hr | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Filter Area Required = | 375/4/20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| = | 4.69 | m ² | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p><u>Per portion:</u></p> <table><tr><td>Assumed Backwash Duration =</td><td>3.00</td><td>min/d</td><td></td><td></td></tr><tr><td>Assumed Backwash Flowrate =</td><td>30.00</td><td>m³/m²/hr</td><td></td><td></td></tr><tr><td>Backwash Volume =</td><td>7.04</td><td>m³</td><td></td><td></td></tr><tr><td>Assumed Discharge Duration =</td><td>3.00</td><td>min</td><td></td><td></td></tr><tr><td>Discharge Flow rate =</td><td>2.35</td><td>m³/min</td><td></td><td></td></tr><tr><td>=</td><td>0.0390</td><td>m³/s</td><td></td><td></td></tr></table> | | | | | Assumed Backwash Duration = | 3.00 | min/d | | | Assumed Backwash Flowrate = | 30.00 | m ³ /m ² /hr | | | Backwash Volume = | 7.04 | m ³ | | | Assumed Discharge Duration = | 3.00 | min | | | Discharge Flow rate = | 2.35 | m ³ /min | | | = | 0.0390 | m ³ /s | | | | | | | |
| Assumed Backwash Duration = | 3.00 | min/d | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Assumed Backwash Flowrate = | 30.00 | m ³ /m ² /hr | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Backwash Volume = | 7.04 | m ³ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Assumed Discharge Duration = | 3.00 | min | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Discharge Flow rate = | 2.35 | m ³ /min | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| = | 0.0390 | m ³ /s | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p><u>Reference:</u></p> <p>Cap 132CA Swimming Pools Regulation</p> <p>General Specifications for Swimming Pool Water Treatment Installation (ArchSD, 2012)</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Appendix C

Estimated Sewage Flow Generation from Village Housing Sites



3 Village Housing Sites

Development Schedule - 3 Village Housing Sites

No. of Village Houses = 80

Design Population

| Development Type | No. of Units ⁽¹⁾ | PPoF ⁽²⁾ | Population |
|------------------|-----------------------------|---------------------|------------|
| Village House | 240 | 2.8 | 672 |

Sewage Estimation

| Type of Flow | Development Type | Population | Unit Flow Factor | Sewage | Remarks |
|--------------|---------------------|------------|------------------|----------------------------|--|
| Domestic | Traditional Village | 672 | 0.15 | 100.80 (m ³ /d) | Domestic Residents, Traditional village |

Total sewage generated from 3 Village Housing Sites = 100.80 (m³/d)

Note:

- (1) Assume 3 units in each village house.
(2) Assuming a Person-Per-Flat ratio of 2.8 for village housing units as per the 2021 Population Census under District Council Constituency Areas.
(3) The design number of village houses at each site is not confirmed. The average sewage is calculated by dividing the total sewage by the total number of village housing sites.
(4) Catchment inflow factor (CIF) is not applicable in this new development area.

