

# Appendix H Sewerage Impact Assessment

# Application for Amendment of Plan under Section 12A of the Town Planning Ordinance (Cap. 131), to Rezone the Application Site from “Open Space” to “Residential (Group A) 11” at Sha Tin Town Lot 310 in D.D. 184, Sha Tin

## Sewerage Impact Assessment Report

Reference

Issue 1 | July 2026

This report takes into account the particular instructions and requirements of our client. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 299123

**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 the Proposed Residential Development with ‘Social Welfare Facility’, ‘Religious Institution’ and ‘Shop and Services’ (“Proposed Amendment”) at Sha Tin Town Lot (STTL) 310 in D.D. 184, Sha Tin, New Territories (“the Application Site”).

## 1.2 Proposed Development

- 1.2.1.1 The Application Site has a site area of about 5,225 m<sup>2</sup> and it is proposed with residential development with clubhouse, reprovision of Hong Kong Bible Research and Education Centre, Residential Care Home for the Elderly, Parents/Relative Resource Centre and Shop and Services, as shown in **Appendix A**. Key development parameters of the Application Site are shown in **Table 1.1** below.

**Table 1.1 Development Parameters**

| Description                    | Site Information                                                                                                                                                                                                                                                                                                                                           |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Site Location                  | Sha Tin Town Lot (STTL) 310 in D.D. 184, Sha Tin                                                                                                                                                                                                                                                                                                           |
| Application Site Area          | About 5,225 m <sup>2</sup>                                                                                                                                                                                                                                                                                                                                 |
| GFA                            | Domestic: 26,125 m <sup>2</sup><br>Clubhouse: 1,050 m <sup>2</sup><br>Reprovision of Hong Kong Bible Research and Education Centre: 2,900 m <sup>2</sup><br>Residential Care Home for the Elderly (RCHE) (including 100 beds): 2,980 m <sup>2</sup><br>Parents/Relative Resource Centre (PRC): 238 m <sup>2</sup><br>Shop and Services: 562 m <sup>2</sup> |
| No. of Units (About)           | 450                                                                                                                                                                                                                                                                                                                                                        |
| Anticipated Population (About) | Domestic: 1,125<br>Clubhouse <sup>(1)</sup> : 35<br>Reprovision of Hong Kong Bible Research and Education Centre <sup>(1)</sup> : 96<br>RCHE <sup>(1)</sup> : 199<br>PRC <sup>(1)</sup> : 8<br>Shop and Services <sup>(2)</sup> : 29                                                                                                                       |

- (1) Community, Social & Personal Services = 3.3 employee per 100m<sup>2</sup> of GFA based on PlanD's Commercial and Industrial Floor Space Utilization Survey "CIFSUS" Table 8.

- (2) Retail Trade Services = 3.5 employee per 100m<sup>2</sup> 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, social welfare facilities, a religious institution and shops in Sha Tin.
- 1.3.1.3 The 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<br>(m <sup>3</sup> /person/day) <sup>[1]</sup> |
|---------------------------------|-----------------------------------------------------------------|
| Private R3                      | 0.37                                                            |
| Institutional and Special Class | 0.19                                                            |
| Modern Village                  | 0.27                                                            |

#### 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<br>(m <sup>3</sup> /employee/day) |
|-----------------------|---------------------------------------|
| Commercial Employee   | 0.080                                 |
| Commercial Activities |                                       |

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| Commercial Type                             | UFF<br>(m <sup>3</sup> /employee/day) |
|---------------------------------------------|---------------------------------------|
| (a) Specific trades:                        |                                       |
| J4 – Wholesale & Retail                     | 0.200                                 |
| J7 – Agriculture & Fishing                  | -                                     |
| J10 – Restaurants & Hotels                  | 1.500                                 |
| J11 – Community, Social & Personal Services | 0.200                                 |

## 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 **Table 2.3**.

**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 |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| <b><i>Sewers</i></b>                                                                   |                                                                                              |                                                                                              |
| < 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 <sup>0.15</sup> , 2.4) <sup>[1]</sup>                                             | Max (6/N <sup>0.175</sup> , 1.6) <sup>[1]</sup>                                              |
| <b><i>Sewage Treatment Works, Preliminary Treatment Works and Pumping Stations</i></b> |                                                                                              |                                                                                              |
| < 10,000                                                                               | 4                                                                                            | 3                                                                                            |
| 10,000 – 25,000                                                                        | 3.5                                                                                          | 2.5                                                                                          |
| 25,000 – 50,000                                                                        | 3                                                                                            | 2                                                                                            |
| > 50,000                                                                               | Max (3.9/N <sup>0.065</sup> , 2.4) <sup>[1]</sup>                                            | Max (2.6/N <sup>0.065</sup> , 1.6) <sup>[1]</sup>                                            |
| Note:<br>[1] N = Contributing population in thousands                                  |                                                                                              |                                                                                              |

- 2.2.1.6 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

- 2.2.1.7 A person per flat (PPF) ratio of 2.5 is assumed with reference to the average domestic household size of the Tertiary Planning Unit 755.
- 2.2.1.8 The employment population density has been referenced to Table 8 of PlanD's Commercial and Industrial Floor Space Utilization Survey "CIFUSUS":
- Retail Trade: Assume 3.5 employee per 100m<sup>2</sup> of GFA
  - Restaurants: Assume 5.1 employee per 100m<sup>2</sup> of GFA
  - Community, Social & Personal Services: Assume 3.3 employee per 100m<sup>2</sup> of GFA

## Hydraulic Analysis

- 2.2.1.9 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.
- 2.2.1.10 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 The area of the Application Site is unsewered.
- 3.1.1.2 Based on the DSD records, there is an existing sewerage network with sewers with 225mm dia. and 1,800mm dia. along Tai Chung Kiu Road which ultimately connects to the Sha Tin Sewage Treatment Works (STSTW). The design capacity of STSTW is 340,000 m<sup>3</sup>/day.

#### Planned Sewerage System

- 3.1.1.3 With reference to the submitted S12A planning application (No. Y/ST/62) for rezoning the adjacent site at Ng Yuen from “Open Space (O)” Zone to “Other Specified Uses” annotated “Hotel Development” Zone for a proposed hotel development, a 450mm diameter sewer pipe is proposed to convey sewage generated from the proposed hotel development to the existing 1,800mm diameter trunk sewer (FWD4003788) along Tai Chung Kiu Road, which will not have cumulative effect in the discharge path from this development into FMH4039860, which is further described in **Section 3.4.1.1**.

### 3.2 Sewage Generation from the Existing Development

- 3.2.1.1 The sewage flow generated from the existing facilities discharging to FMH4039860 (downstream of the Application Site) is about 36.8 m<sup>3</sup>/day (ADWF), while the peak flow is 3.4 L/s (peak factor = 8). The detailed calculations for sewage flow estimation are included in **Appendix B** and summarised in **Table 3.1**.

**Table 3.1 Sewage Flow Estimation for the Existing Facilities discharging to FMH4039860**

| <i>Existing Development</i>                              | <b>Estimated ADWF (m<sup>3</sup>/day) <sup>(2)</sup></b> |
|----------------------------------------------------------|----------------------------------------------------------|
| Garden Villa A                                           | 2.4                                                      |
| Garden Villa B <sup>(4)</sup>                            | 2.4                                                      |
| NG Yuen (Oikos) <sup>(4)</sup>                           | 2.6                                                      |
| Shing Mun River Promenade Garden No. 1 Public Toilet     | 21.42                                                    |
| Shing Mun River Promenade Garden No. 1 Refreshment Kiosk | 3.2                                                      |
| Catchment Inflow Factor <sup>(3)</sup>                   | 1.15                                                     |
| <b>Total ADWF (m<sup>3</sup>/day)</b>                    | <b>36.8</b>                                              |
| Contributing population                                  | 136                                                      |
| Peaking Factor <sup>(1)</sup>                            | 8                                                        |
| <b>Peak Flow (L/s)</b>                                   | <b>3.4</b>                                               |

Remarks:

(1) Peaking Factor = 8 for contributing population <1000 (including stormwater allowance) based on EPD's GESF Table T-5.

(2) Numbers are rounded to 1 decimal place.

(3) GESF Table T-4 refer to Sha Tin

(4) Site to be redeveloped as a proposed hotel under planning application No. Y/ST/62. Sewage will not discharge to FMH4039860 after development.

### 3.3 Sewage Generation from the Proposed Development

3.3.1.1 The sewage flow generated from the Application Site with proposed development is about 627.3 m<sup>3</sup>/day (ADWF), while the peak flow is 43.6 L/s (peak factor = 6). The detailed calculations for sewage flow estimation are included in **Appendix B** and summarised in **Table 3.2**.

**Table 3.2 Sewage Flow Estimation for the Application Site with Proposed Development**

| <i>Proposed Development</i>                                  | <b>Estimated ADWF (m<sup>3</sup>/day) <sup>(2)</sup></b> |
|--------------------------------------------------------------|----------------------------------------------------------|
| Residential                                                  | 416.3                                                    |
| Clubhouse                                                    | 9.8                                                      |
| Reprovision of Hong Kong Bible Research and Education Centre | 26.9                                                     |
| RCHE                                                         | 46.7                                                     |
| PRC                                                          | 2.2                                                      |
| Shop and Services                                            | 45.8                                                     |
| Peak Catchment Inflow Factor <sup>(3)</sup>                  | 1.15 <sup>(3)</sup>                                      |
| <b>Total ADWF</b>                                            | <b>627.3</b>                                             |
| Contributing population                                      | 2,323                                                    |
| Peaking Factor <sup>(1)</sup>                                | 6                                                        |
| <b>Peak Flow (L/s)</b>                                       | <b>43.6</b>                                              |

Remarks:

(1) Peaking Factor =6 for contributing population = 1,000 – 5,000 (including stormwater allowance) based on EPD's GESF Table T-5.

(2) Numbers are rounded to 1 decimal place

(3) GESF Table T-4 refer to Sha Tin

### 3.4 Proposed Development Sewerage System

#### Sewerage Connection Proposal

3.4.1.1 To accommodate the sewage generation from Application Site with proposed development, a new 225mm dia. HDPE sewer is proposed laying along the side of Shing Mun Channel and connect to the existing manhole on the southwestern side of Shing Mun River Promenade Garden No.1. The proposed sewers are shown in **Table 3.3**, from the proposed terminal manhole (TMH) to the existing manhole ID (FMH4039860). Proposed connection drawing is in **Appendix C**.

**Table 3.3 Proposed Sewage pipe connection from Terminal Manhole to Existing Sewerage Network**

| Upstream MH | Downstream MH | Sewer size (mm) | Upstream Invert Level (mPD) | Downstream Invert Level (mPD) |
|-------------|---------------|-----------------|-----------------------------|-------------------------------|
| TMH         | MH1           | 225             | 3.80                        | 3.70                          |
| MH1         | MH2           | 225             | 3.70                        | 3.0                           |
| MH2         | FMH4039860    | 225             | 3.0                         | 2.5                           |

### Sewerage Capacity Checking

- 3.4.1.2 Hydraulic capacity check has been undertaken for the downstream sewerage system and results are presented in **Table 3.4**. The assessed sewers have sufficient capacity to convey the sewage flows under proposed conditions; the maximum utilisation rate is below 86%. No sewers upgrading works is required due to the proposed development and the proposed development has no impact to the downstream sewers. Detailed calculations are included in **Appendix B**.

**Table 3.4 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 Sewer            | FMH4039860    | FMH4038083      | 225             | 2.50                        | 1.37                          | 1%                                    |
|                           | FMH4038083    | FMH4038084      | 225             | 1.37                        | 0.98                          | 6%                                    |
|                           | FMH4038084    | FMH4038085      | 225             | 0.98                        | -3.13                         | 2%                                    |
| With Proposed Development | TMH           | MH1             | 225             | 3.80                        | 3.70                          | 77%                                   |
|                           | MH1           | MH2             | 225             | 3.70                        | 3.0                           | 86%                                   |
|                           | MH2           | FMH4039860      | 225             | 3.0                         | 2.5                           | 80%                                   |
|                           | FMH4039860    | FMH4038083      | 225             | 2.50                        | 1.37                          | 70%                                   |
|                           | FMH4038083    | FMH4038084      | 225             | 1.37                        | 0.98                          | 77%                                   |
|                           | FMH4038084    | FMH4038085      | 225             | 0.98                        | -3.13                         | 23%                                   |

## 3.5 Potential Sewerage Impact

- 3.5.1.1 Sewage flow will eventually be discharged into the STSTW . Based on the hydraulic analysis, the increase of sewage flow due the proposed development in the Application Site is insignificant compared to the capacity of STSTW (maximum ~0.2% increase at future capacity), it is expected there will be no adverse impact to the existing sewerage network due to the proposed development. No upgrade of the size of sewage facilities is required.

## 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 manholes 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 in the Application Site at Sha Tin.
- 5.1.1.2 Sewage generated from the existing facilities downstream of the Application Site is ADWF 36.8 m<sup>3</sup>/day or peak flow of 3.4 L/s (peaking factor = 8), whilst sewage from the Indicative Scheme is ADWF 627.3 m<sup>3</sup>/day or peak flow of 43.6 L/s (peaking factor = 6). To discharge sewage generated from the Application Site, a new sewerage main is proposed. Sewage from the Application Site 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 STSTW are deemed to be designed to cater for the regional sewage generation, thus it is not anticipated for any adverse impact to STSTW due to the proposed development.

# Appendix A

## Master Layout Plan





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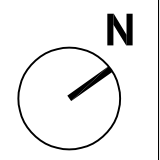
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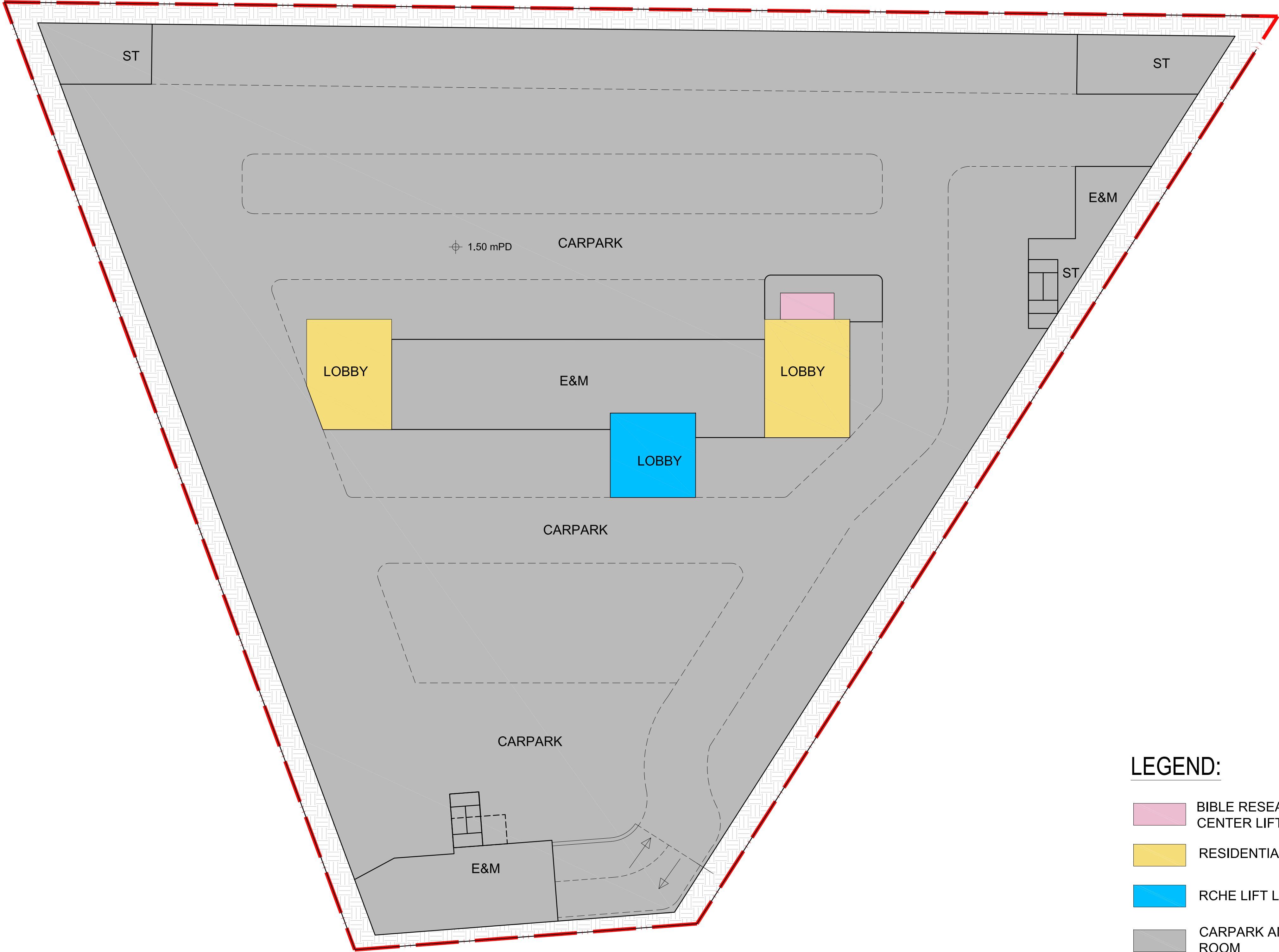
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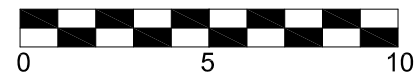




LEGEND:

- BIBLE RESEARCH AND EDUCATION CENTER LIFT LOBBY
- RESIDENTIAL LIFT LOBBY
- RCHE LIFT LOBBY
- CARPARK AND E&M PLANT ROOM

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Consultant

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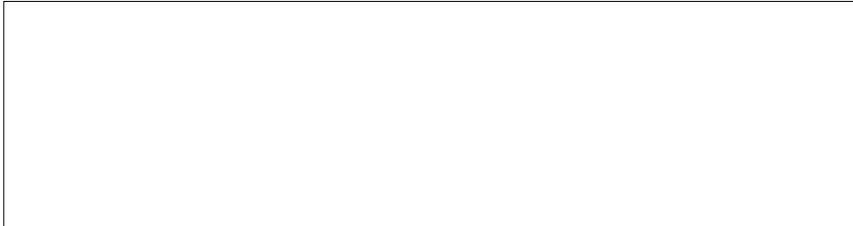
**SHATIN TOWN LOT 310**

Drawing Title

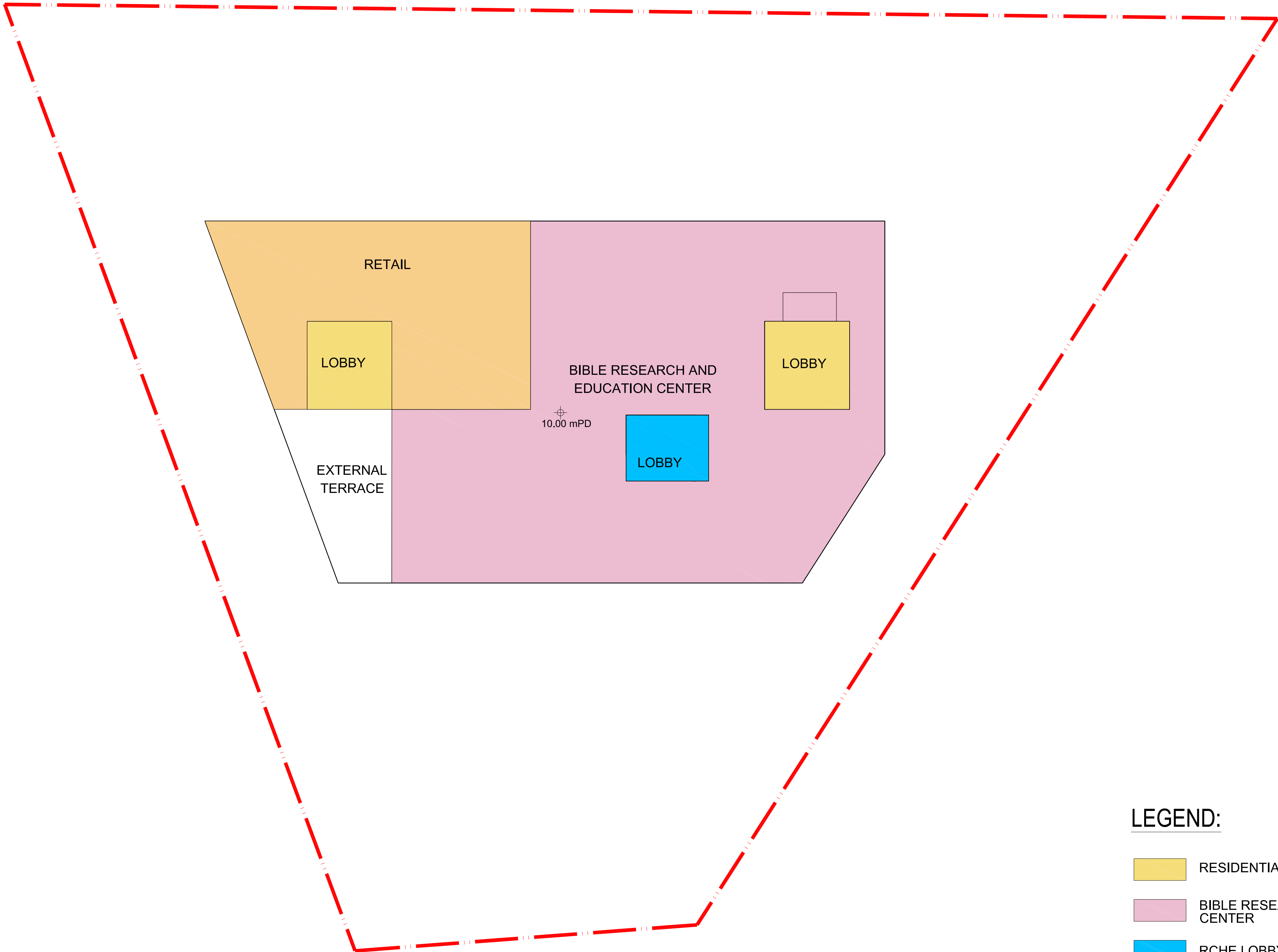
**BASEMENT FLOOR PLAN**

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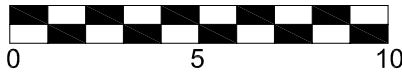




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| -   | FIRST SUBMISSION  | FH | 09/25 |
| Rev | Description       | By | Date  |

Consultant

**ARUP**

Contract No. and Title

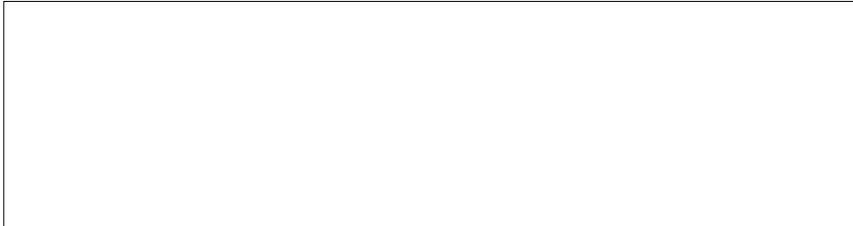
**SHATIN TOWN LOT 310**

Drawing Title

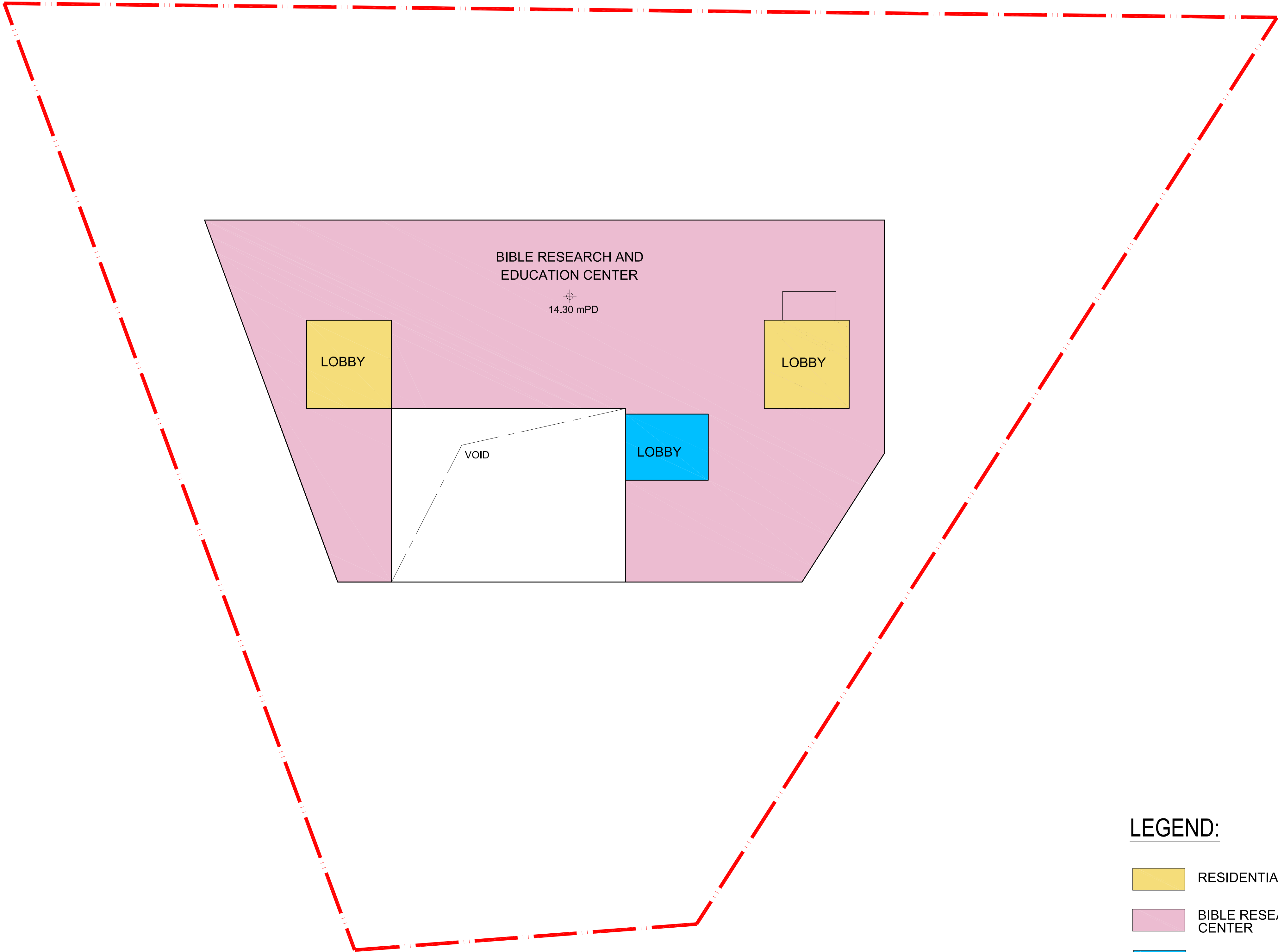
**1F PLAN - BIBLE RESEARCH CENTER**

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| Drawing no.<br>299123/22/S12A_1003 |               |               | Rev.<br>01     |
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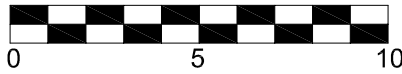




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- BIBLE RESEARCH AND EDUCATION CENTER
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Contract No. and Title

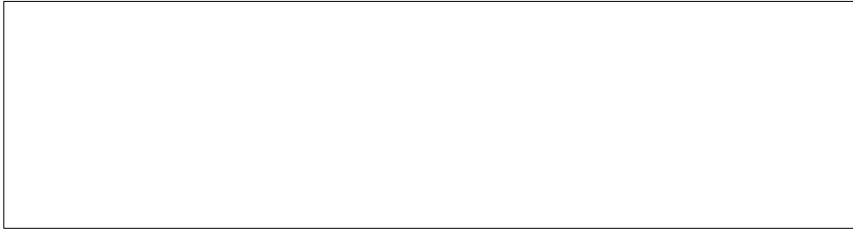
SHATIN TOWN LOT 310

Drawing Title

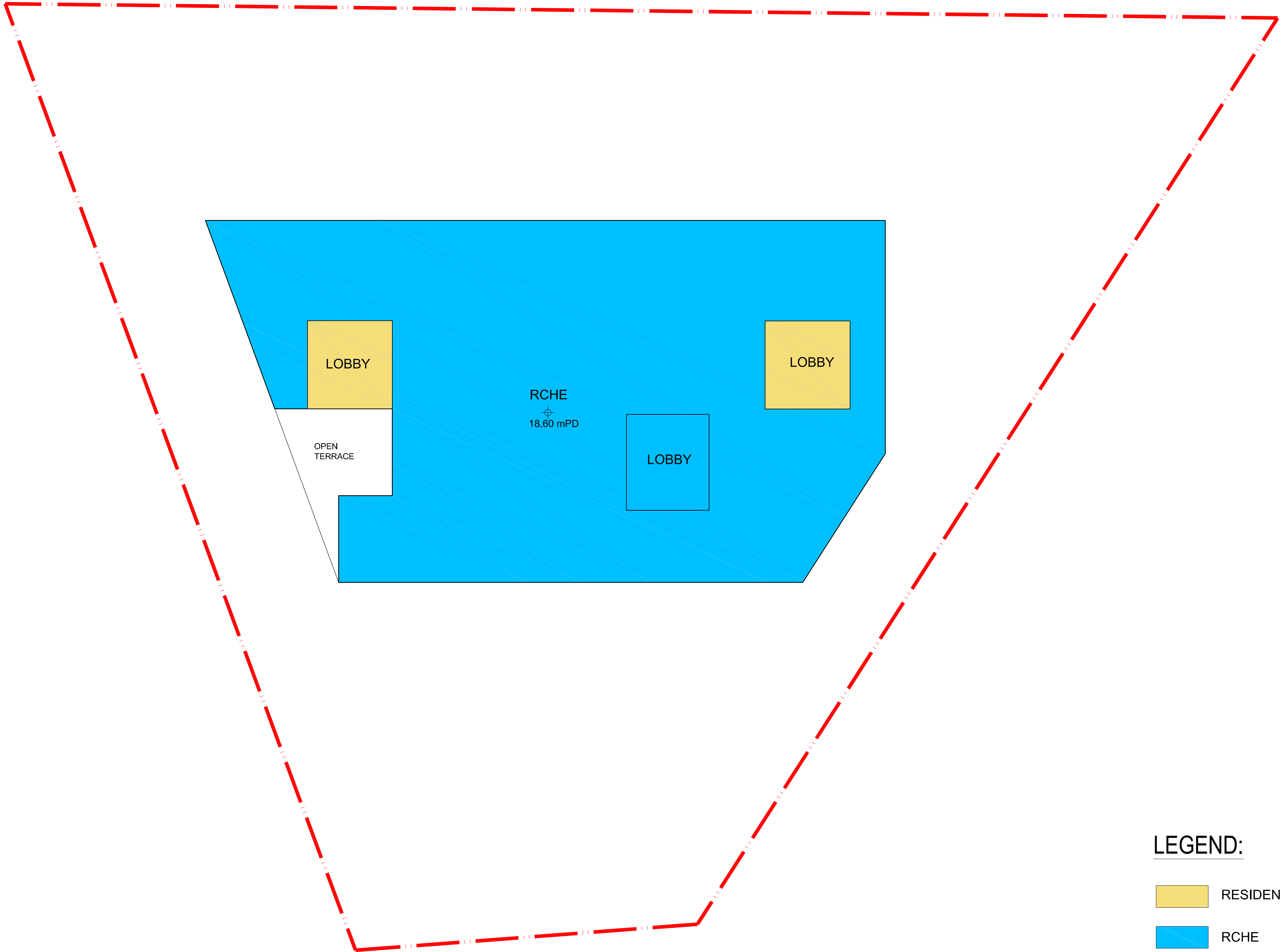
2F PLAN - BIBLE RESEARCH CENTER

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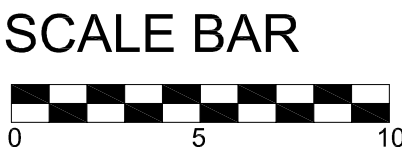
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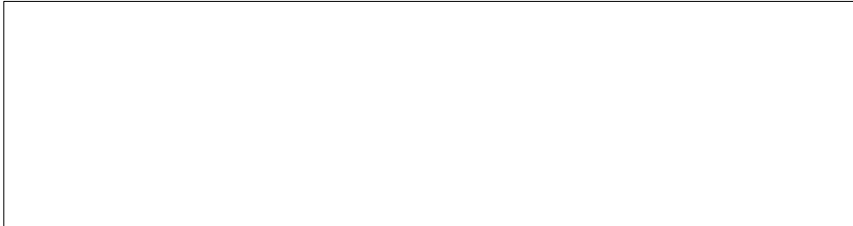
SHATIN TOWN LOT 310

Drawing Title

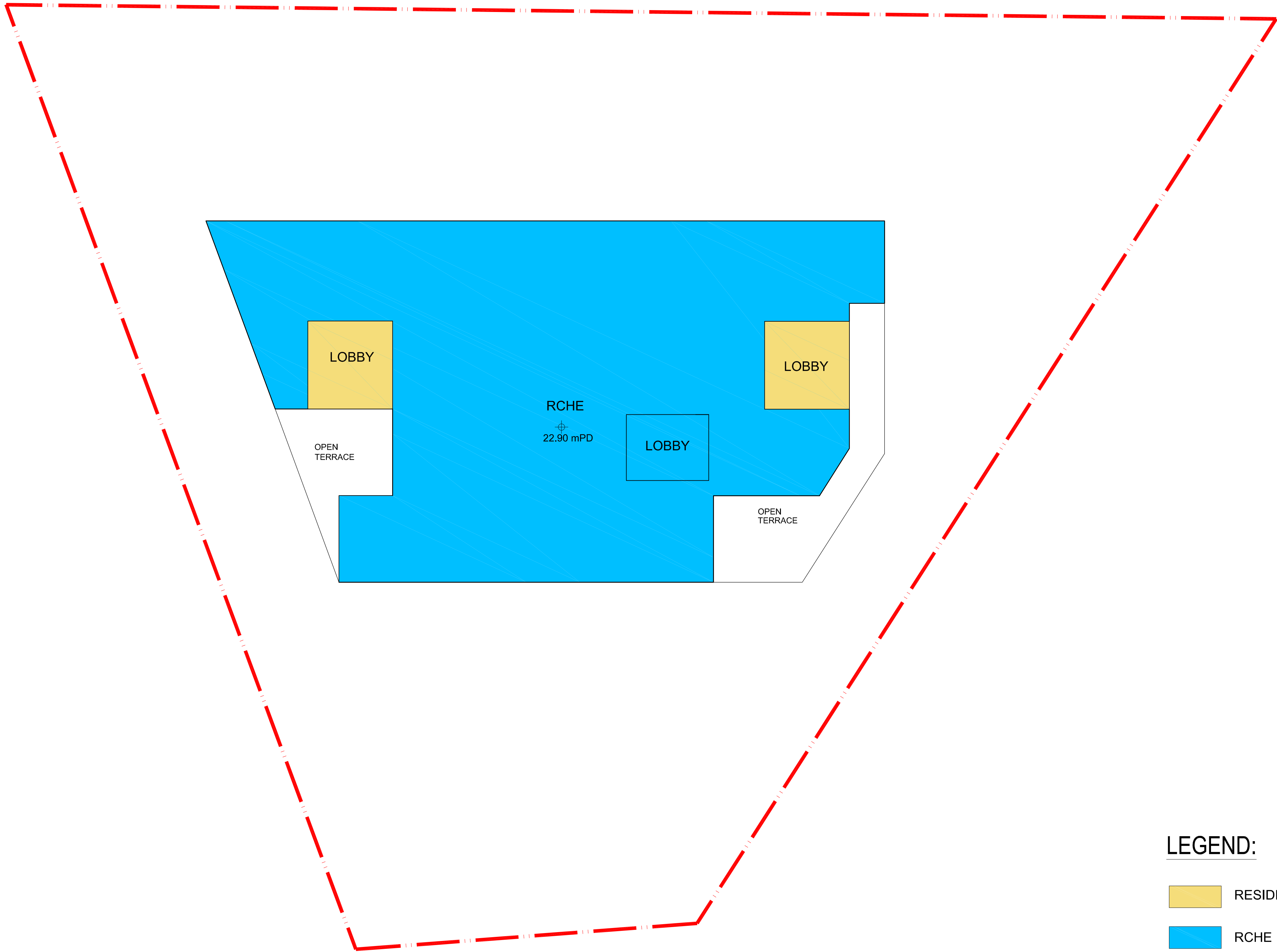
3F PLAN - RCHE

|                                    |               |               |                |
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| Drawing no.<br>299123/22/S12A_1005 |               |               | Rev.<br>01     |
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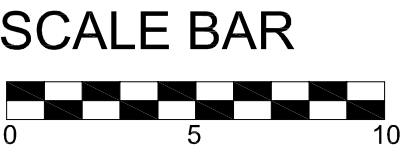
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| Rev | Description       | By | Date  |

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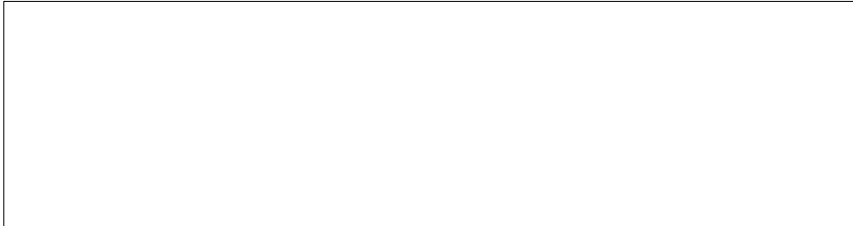
SHATIN TOWN LOT 310

Drawing Title

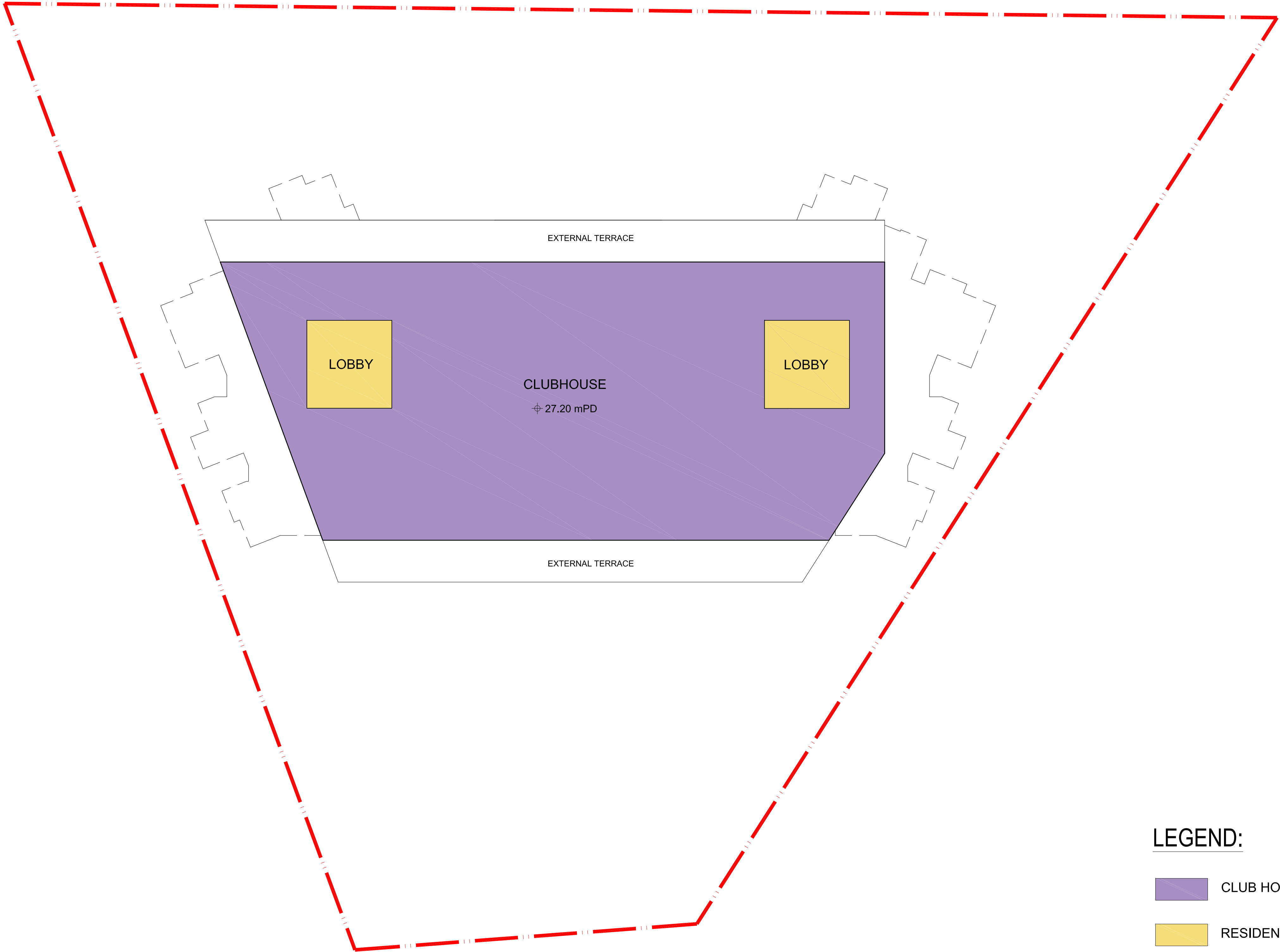
4F PLAN - RCHE

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| Drawing no.<br>299123/22/S12A_1006 |               |               | Rev.<br>01     |
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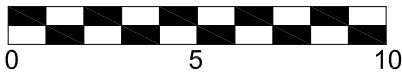






- CLUB HOUSE
- RESIDENTIAL LIFT LOBBY

SCALE BAR



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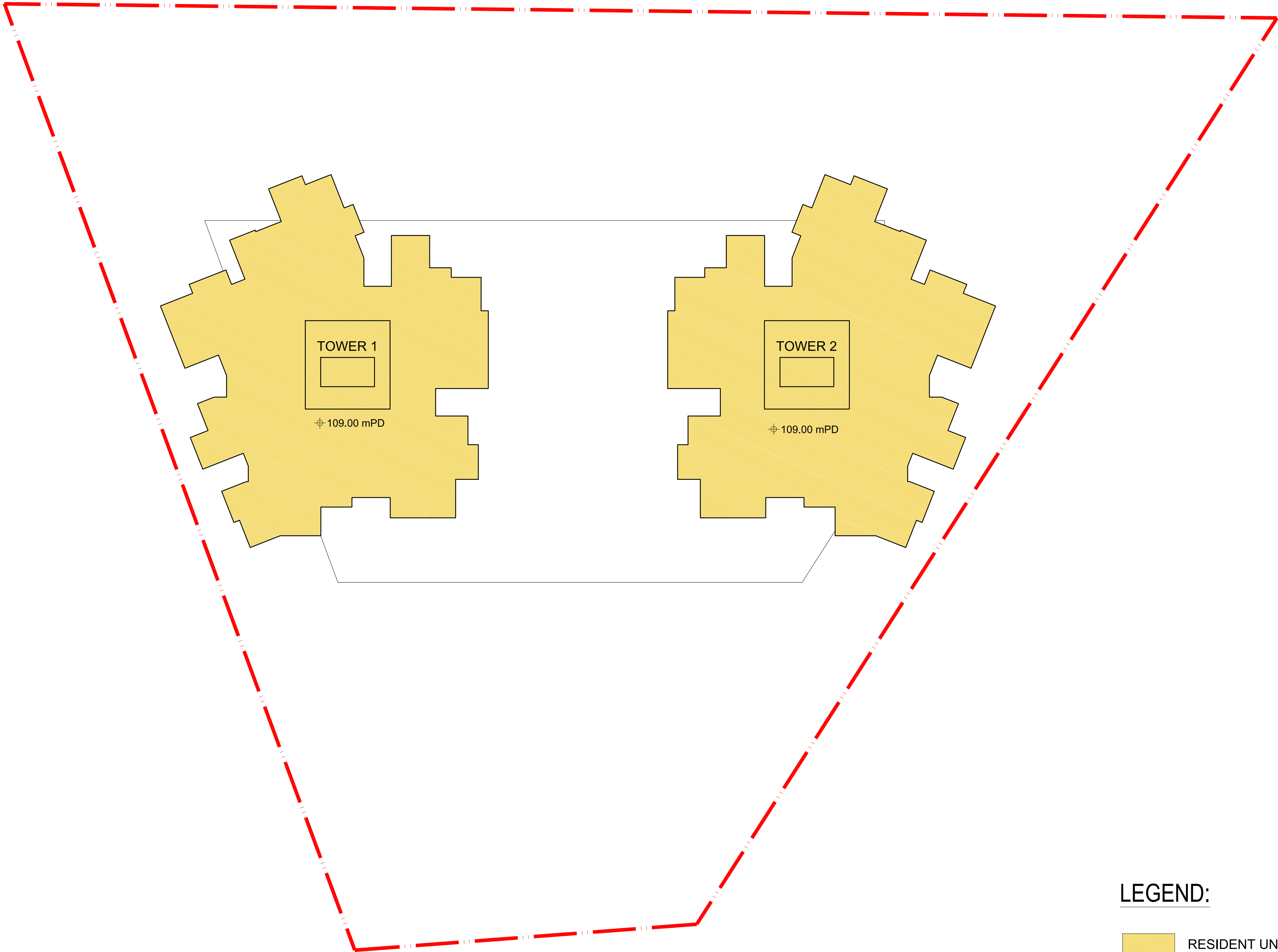


KEY PLAN SCALE 1:2000

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| Rev                        | Description       | By      | Date     |
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| ARUP                       |                   |         |          |
| Contract No. and Title     |                   |         |          |
| SHATIN TOWN LOT 310        |                   |         |          |
| Drawing Title              |                   |         |          |
| 5F PLAN - PODIUM CLUBHOUSE |                   |         |          |
| Drawing no.                |                   |         | Rev.     |
| 299123/22/S12A_1007        |                   |         | 01       |
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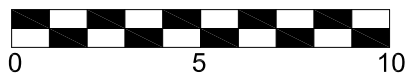




LEGEND:

RESIDENT UNIT FLAT

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Contract No. and Title  
**SHATIN TOWN LOT 310**

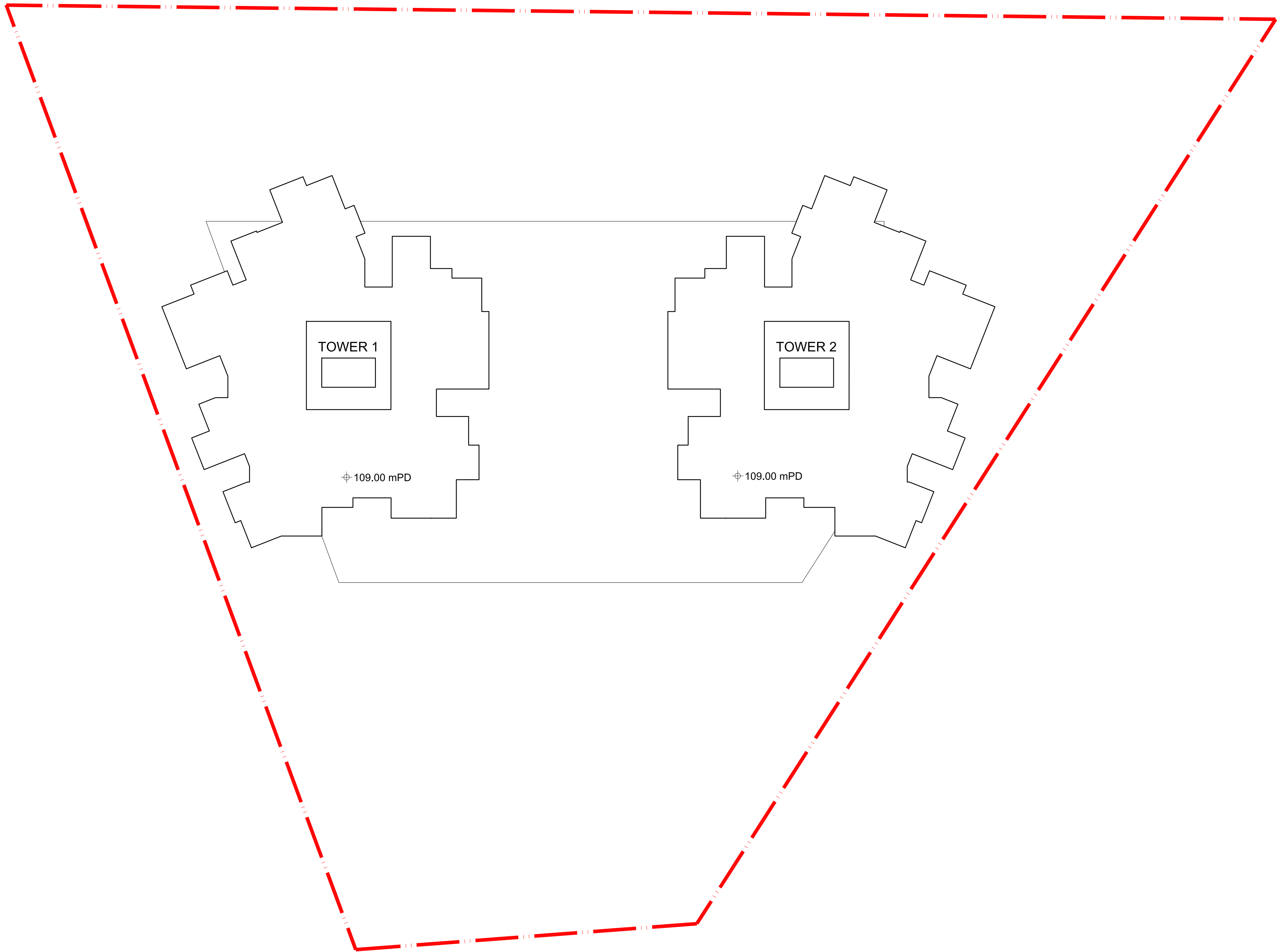
Drawing Title  
**TYPICAL FLOOR PLAN**

|                                    |               |               |                |
|------------------------------------|---------------|---------------|----------------|
| Drawing no.<br>299123/22/S12A_1008 |               |               | Rev.<br>01     |
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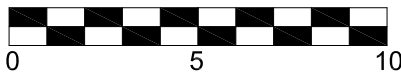
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**ARUP**

Contract No. and Title

**SHATIN TOWN LOT 310**

Drawing Title

**ROOF FLOOR PLAN**

|                                    |               |               |                |
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| Drawing no.<br>299123/22/S12A_1009 |               |               | Rev.<br>01     |
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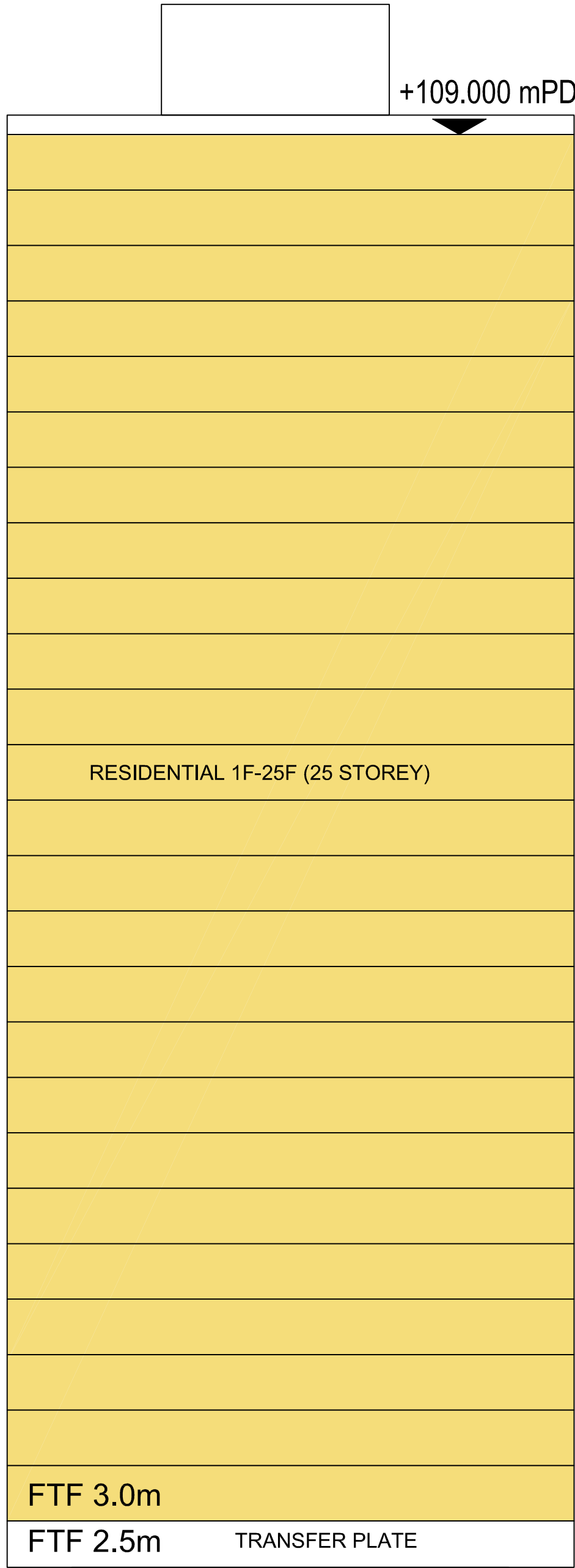




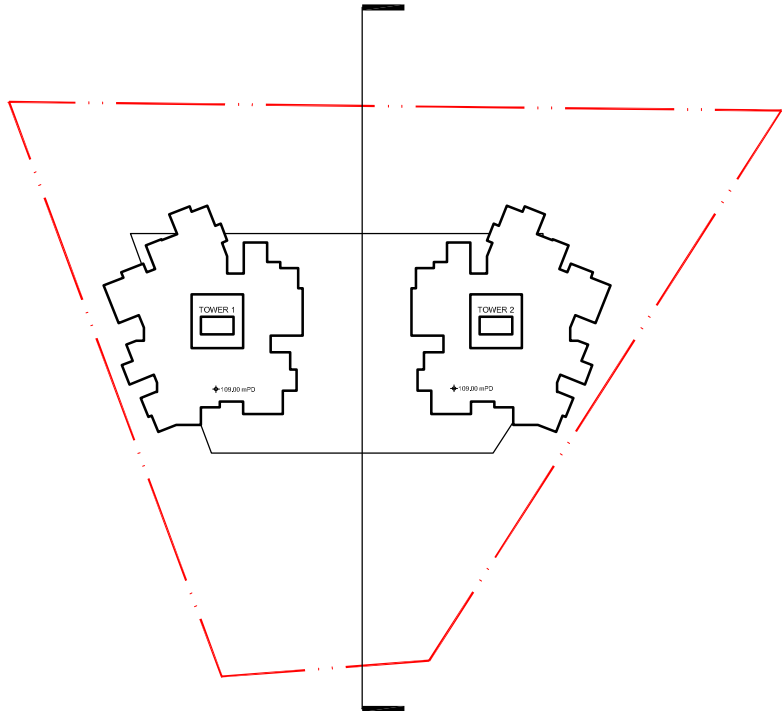
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- PLANT ROOM & CARPARK

B.L.



B.L.



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| Rev | Description       | By | Date  |

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ARUP

Contract No. and Title

SHATIN TOWN LOT 310

Drawing Title

SECTION A

|                     |       |         |          |
|---------------------|-------|---------|----------|
| Drawing no.         |       |         | Rev.     |
| 299123/22/S12A_2001 |       |         | 01       |
| Drawn               | Date  | Checked | Approved |
| RH                  | 07/26 | FY      | FH       |
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- PRC
- RCHE
- BIBLE RESEARCH AND  
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- RETAIL
- CARPARK

B.L.

+109,000 mPD

RESIDENTIAL 1F-25F (25 STOREY)

FTF 3.0m

FTF 2.5m

TRANSFER PLATE

+27.200 mPD

5/F

FTF 4.3m

CLUBHOUSE

+22.900 mPD

4/F

RCHE

+18.600 mPD

3/F

FTF 4.3m

RCHE

+14.300 mPD

2/F

BIBLE RESEARCH AND  
EDUCATION CENTER

+10.000 mPD

1/F

FTF 4.3m

BIBLE RESEARCH AND  
EDUCATION CENTER

G/F

RESIDENTIAL  
FTF 5.0m

RETAIL

PRC

LOBBY

RCHE

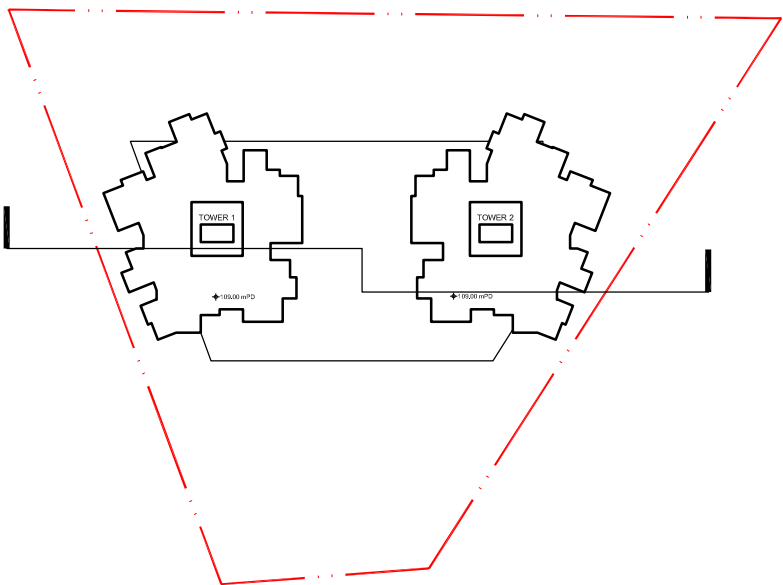
+5.000 mPD

+1.500 mPD

FTF 3.5m

CARPARK

B.L.



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Consultant

ARUP

Contract No. and Title

SHATIN TOWN LOT 310

Drawing Title

SECTION B

|                                    |               |               |                |
|------------------------------------|---------------|---------------|----------------|
| Drawing no.<br>299123/22/S12A_2002 |               |               | Rev.<br>01     |
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# Appendix B

## Sewage Generation Estimation

|                                                                                                                                                                                                                                                                                                                                                                 |            |              |         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------|---------|
| <div>ARUP</div> <div>Job Title: <b>Application for Amendment of Plan under Section 12A of the Town Planning Ordinance (Cap. 131), to Rezone the Application Site from “Open Space” to “Residential (Group A) 11” at Sha Tin Town Lot 310 in D.D. 184, Sha Tin</b></div> <div>Calculation: <b>Estimation of Sewage Discharge from Existing Development</b></div> | Job No.    | Sheet No.    | Rev.    |
|                                                                                                                                                                                                                                                                                                                                                                 | 299123     | 1            | 0       |
|                                                                                                                                                                                                                                                                                                                                                                 | Made by MP | Date 01/2026 | Chd. JW |

| Existing Development                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|----------------------------|
| Village Garden A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |             |                            |
| Number of Blocks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1           |                            |
| Number of Flats                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 3           | Flats                      |
| Size of household/flat <sup>(1)</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 2.9         | Persons/flat               |
| Population                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 9           | Persons                    |
| Per Capita Flow <sup>(2)</sup> - Modern Village                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0.27        | m <sup>3</sup> /day/person |
| Estimated Dry Weather Flow                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 2.4         | m <sup>3</sup> /day        |
| Village Garden B <sup>(7)</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |                            |
| Number of Blocks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1           |                            |
| Number of Flats                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 3           | Flats                      |
| Size of household/flat <sup>(1)</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 2.9         | Persons/flat               |
| Population                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 9           | Persons                    |
| Per Capita Flow <sup>(2)</sup> - Modern Village                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0.27        | m <sup>3</sup> /day/person |
| Estimated Dry Weather Flow                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 2.4         | m <sup>3</sup> /day        |
| Ng Yuen (Oikos) <sup>(7)</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                            |
| Area                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 970         | m <sup>3</sup>             |
| Employee per GFA (in 100m <sup>2</sup> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 3.3         | Persons                    |
| Employee Population                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 32.00       | Persons                    |
| Per Capita Flow <sup>(3)</sup> - J7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0.08        | m <sup>3</sup> /day/person |
| Estimated Dry Weather Flow                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 2.6         | m <sup>3</sup> /day        |
| Shing Mun River Promenade Garden No. 1 Public Toilet                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                            |
| Number of water closets = 11<br>9 litre/opertation<br>6 operations per hour<br>sewage discharge = 11 x 9 x 6 x 20 = 11,880 l/day = 11.88 m <sup>3</sup> /day<br><br>Number of urinals = 3<br>Water flush volume per cycle = 4.5 l/cycle<br>5 min. flushing interval = 4.5 x 60/5 = 54 l/hour<br>sewage discharge = 3 x 54 x 20 = 3,240 l/day = 3.24 m <sup>3</sup> /day<br><br>Number of Sink = 7<br>45 l/hour<br>Sewage Discharge = 7 x 45 x 20 = 6,300 l/day = 6.30 m <sup>3</sup> /day<br><br>Total Sewage Discharge = 21.42 m <sup>3</sup> /day | 21.42       | m <sup>3</sup> /day        |
| Shing Mun River Promenade Garden No. 1 Refreshment Kiosk                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |             |                            |
| Area                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 20          | m <sup>3</sup>             |
| Employee per GFA (in 100m <sup>2</sup> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 5           | Persons                    |
| Employee Population                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 2           | Persons                    |
| Per Capita Flow <sup>(4)</sup> - J10 Restaurants & Hotels                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1.58        | m <sup>3</sup> /day/person |
| Estimated Dry Weather Flow                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 3.2         | m <sup>3</sup> /day        |
| Catchment Inflow Factor P <sub>CIF</sub> <sup>(5)</sup> - Sha Tin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1.15        |                            |
| <b>Total Estimated Dry Weather Flow (including catchment inflow factor)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>36.8</b> | <b>m<sup>3</sup>/day</b>   |
| <b>Contributing Population</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>136</b>  | <b>Persons</b>             |
| Peaking Factor <sup>(6)</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 8           |                            |
| <b>Total Estimated Peak Flow</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>3.4</b>  | <b>L/s</b>                 |

1. A person per flat (PPF) ratio of 2.9 is adopted based on the average house hold size in Sha Tin District Council in Table 130-06806 : Average household size and median monthly household income of households by District Council district of 2023 General Household Survey.
2. Unit flow factor per resident = 0.27 m<sup>3</sup>/day for modern village based on EPD's GESF Table T-1.
3. Unit Flow Factor per employee = 0.08 m<sup>3</sup>/day (0.08m<sup>3</sup>/day for Commercial J7 specific trades for agriculture & Fishing) based on EPD's GESF Table T-2.
4. Unit Flow Factor per employee = 1.58 m<sup>3</sup>/day (0.08m<sup>3</sup>/day + 1.50m<sup>3</sup>/day for Commercial J10 specific trades for agRestaurants & Hotels) based on EPD's GESF Table T-2.
5. Catchment Inflow Factor = 1.15, for Sha Tin District based on EPD's GESF Table T-4.
6. Peaking Factor = 8, for contributing population <1,000 (including stormwater allowance) based on EPD's GESF Table T-5.
7. Site to be redeveloped as a proposed hotel under planning application No. Y/ST/62. Sewage will not discharge to FMH4039860 after development.

|                                                                                                                                                                                                                                                                         |                                                      |           |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-----------|------|
| <div>ARUP</div> <div>Job Title: <b>Application for Amendment of Plan under Section 12A of the Town Planning Ordinance (Cap. 131), to Rezone the Application Site from “Open Space” to “Residential (Group A) 11” at Sha Tin Town Lot 310 in D.D. 184, Sha Tin</b></div> | Job No.                                              | Sheet No. | Rev. |
|                                                                                                                                                                                                                                                                         | 299123                                               | 2         | 0    |
|                                                                                                                                                                                                                                                                         | <div>Made by MP      Date 01/2026      Chd. JW</div> |           |      |

Calculation: **Estimation of Sewage Discharge from Proposed Development**

| Proposed Site                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |              |                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|----------------------------|
| Residential                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |              |                            |
| Domestic GFA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 26,125       | m <sup>2</sup>             |
| Number of Units                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 450          |                            |
| Size of Unit <sup>(1)</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 2.5          | Persons/unit               |
| Per Capita Flow <sup>(2)</sup> - R3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.37         | m <sup>3</sup> /day/person |
| Total Population                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1,125        | Persons                    |
| Estimated Dry Weather Flow                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 416.3        | m <sup>3</sup> /day        |
| Reprovision of Hong Kong Bible Research and Education Centre                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |              |                            |
| GFA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 2,900        | m <sup>2</sup>             |
| Employee per GFA (in 100 m <sup>2</sup> ) <sup>(5)</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 3.3          | Persons/GFA                |
| Employee Population                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 96           | Persons                    |
| Per Capita Flow <sup>(3)</sup> - J11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0.28         | m <sup>3</sup> /day/person |
| Estimated Dry Weather Flow                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 26.9         | m <sup>3</sup> /day        |
| RCHE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |              |                            |
| GFA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 2,980        | m <sup>2</sup>             |
| Employee per GFA (in 100 m <sup>2</sup> ) <sup>(5)</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 3.3          | Persons/GFA                |
| Employee Population                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 99           | Persons                    |
| Per Capita Flow <sup>(3)</sup> - J11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0.28         | m <sup>3</sup> /day/person |
| Number of Elderly                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 100          |                            |
| Per Capita Flow <sup>(8)</sup> - Institutional and special class                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.19         | m <sup>3</sup> /day/person |
| Estimated Dry Weather Flow                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 46.7         | m <sup>3</sup> /day        |
| PRC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |              |                            |
| GFA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 238          | m <sup>2</sup>             |
| Employee per GFA (in 100 m <sup>2</sup> ) <sup>(5)</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 3.3          | Persons/GFA                |
| Employee Population                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 8            | Persons                    |
| Per Capita Flow <sup>(3)</sup> - J11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0.28         | m <sup>3</sup> /day/person |
| Estimated Dry Weather Flow                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 2.2          | m <sup>3</sup> /day        |
| Shop and Services                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |                            |
| GFA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 562          | m <sup>2</sup>             |
| Employee per GFA (in 100 m <sup>2</sup> ) <sup>(5)</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 5.1          | Persons/GFA                |
| Employee Population                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 29           | Persons                    |
| Per Capita Flow <sup>(4)</sup> - J10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1.58         | m <sup>3</sup> /day/person |
| Estimated Dry Weather Flow                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 45.8         | m <sup>3</sup> /day        |
| Clubhouse                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |              |                            |
| GFA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1,050        | m <sup>2</sup>             |
| Employee per GFA (in 100 m <sup>2</sup> ) <sup>(5)</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 3.3          | Persons/GFA                |
| Employee Population                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 35           | Persons                    |
| Per Capita Flow <sup>(3)</sup> - J11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0.28         | m <sup>3</sup> /day/person |
| Estimated Dry Weather Flow                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 9.8          | m <sup>3</sup> /day        |
| <b>Total Estimate Dry Weather Flow</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>545.5</b> | <b>m<sup>3</sup>/day</b>   |
| Catchment Inflow Factor <sup>(6)</sup> - Sha Tin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1.15         |                            |
| <b>Total Estimated Dry Weather Flow (including catchment inflow factor)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>627.3</b> | <b>m<sup>3</sup>/day</b>   |
| <b>Contributing Population</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>2,323</b> |                            |
| Peaking Factor <sup>(7)</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 6            |                            |
| <b>Total Estimated Peak Flow</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>43.6</b>  | <b>L/s</b>                 |
| <p>1. A person per flat (PPF) ratio of 2.5 is assumed, according to the average household size in 2021 Population Census.</p> <p>2. Unit flow factor per resident = 0.37 m<sup>3</sup>/day for domestic housing population R3 based on EPD's GESF Table T-1.</p> <p>3. Unit Flow Factor per employee = 0.28 m<sup>3</sup>/day (0.08m<sup>3</sup>/day for Commercial Employee + 0.20m<sup>3</sup>/day for J11 specific trades for community, social and personal services) based on EPD's GESF Table T-2.</p> <p>4. Unit Flow Factor per employee = 1.58 m<sup>3</sup>/day (0.08m<sup>3</sup>/day for Commercial Employee + 1.50m<sup>3</sup>/day for J10) based on EPD's GESF Table T-2.</p> <p>5. The Numbers of employee per 100m<sup>2</sup> of GFA are based on PlanD's Commercial and Industrial Floor Space Utilization Survey "CIFSUS" Table 8.</p> <p>6. Catchment Inflow Factor = 1.15, for Sha Tin District based on EPD's GESF Table T-4.</p> <p>7. Peaking Factor = 6, for contributing population &gt;1000 and &lt;5000 (including stormwater allowance) based on EPD's GESF Table T-5.</p> <p>8. Unit flow factor per resident = 0.19 m<sup>3</sup>/day for institutional and social class based on EPD's GESF Table T-1.</p> |              |                            |



ARUP

Job No.

Sheet No.

Rev.

299123

3

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Member/Location

Job Title

Application for Amendment of Plan under Section 12A of the Town Planning Ordinance (Cap. 131), to Rezone the Application Site from “Open Space” to “Residential (Group A) 11” at Sha Tin Town Lot 310 in D.D. 184, Sha Tin

Drg. Ref.

Calculation

Hydraulic Assessment on Existing and Proposed Sewerage System After Proposed Development

Made by

MP

Date

01/2026

Chd.

JW

Key Equations and Assumptions

Pipe Design Capacity  $Q_p=VA$

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

Roughness Coeff.,  $K_s = 0.15 \text{ mm}$   
 $K_s = 0.3 \text{ mm}$   
(for slimed uPVC pipe material, normal condition)  
(for slimed uPVC pipe material, poor condition)

Acceleration due to gravity,  $g = 9.81 \text{ m/s}^2$

Kinematic Viscosity,  $\nu = 0.000001 \text{ m}^2/\text{s}$

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 Sha Tin.

| USMH                              | DSMH       | USGL(mPD) | DSGL(mPD) | USIL(mPD) | DSIL(mPD) | US Cover (m) | DS Cover (m) | Length (m) | Gradient | Gradient (1 in) | Pipe size (mm) | Area (m²) | Siltation | Reduced Area (m2) | sqrt(32gRs) | Perimeter (m) | R (m) | ks (mm) | Pipe Full-bore Velocity, V (m/s) | Pipe Design Capacity, Q <sub>p</sub> (L/s) | Additional ADWF (m³/day) <sup>(1)</sup> | Accumulated ADWF (m³/day) | Contributing Population | Peaking Factor <sup>(2)</sup> | Peak Flow (L/s) | Additional Flow (L/s) | Capacity Check |
|-----------------------------------|------------|-----------|-----------|-----------|-----------|--------------|--------------|------------|----------|-----------------|----------------|-----------|-----------|-------------------|-------------|---------------|-------|---------|----------------------------------|--------------------------------------------|-----------------------------------------|---------------------------|-------------------------|-------------------------------|-----------------|-----------------------|----------------|
| Existing Sewerage System Checking |            |           |           |           |           |              |              |            |          |                 |                |           |           |                   |             |               |       |         |                                  |                                            |                                         |                           |                         |                               |                 |                       |                |
| FMH4039860                        | FMH4038083 | 4.90      | 5.60      | 2.50      | 1.37      | 2.18         | 4.01         | 91.6       | 0.012    | 81.1            | 225            | 0.040     | 10%       | 0.036             | 0.467       | 0.707         | 0.056 | 0.300   | 1.582                            | 62.89                                      | 8.5                                     | 8.5                       | 32                      | 8                             | 0.79            | 0.00                  | 1%             |
| FMH4038083                        | FMH4038084 | 5.60      | 6.10      | 1.37      | 0.98      | 4.01         | 4.90         | 35.7       | 0.011    | 91.5            | 225            | 0.040     | 10%       | 0.036             | 0.439       | 0.707         | 0.056 | 0.300   | 1.487                            | 59.13                                      | 28.3                                    | 36.8                      | 136                     | 8                             | 3.41            | 0.00                  | 6%             |
| FMH4038084                        | FMH4038085 | 6.10      | 5.60      | 0.98      | -3.13     | 4.90         | 8.51         | 33.9       | 0.121    | 8.2             | 225            | 0.040     | 5%        | 0.038             | 1.463       | 0.707         | 0.056 | 0.300   | 5.012                            | 199.27                                     | 0.0                                     | 36.8                      | 136                     | 8                             | 3.41            | 0.00                  | 2%             |
| Proposed Sewerage System Checking |            |           |           |           |           |              |              |            |          |                 |                |           |           |                   |             |               |       |         |                                  |                                            |                                         |                           |                         |                               |                 |                       |                |
| TMH                               | MH1        | 5.00      | 4.60      | 3.80      | 3.70      | 0.98         | 0.67         | 10.0       | 0.010    | 100.0           | 225            | 0.040     | 10%       | 0.036             | 0.420       | 0.707         | 0.056 | 0.300   | 1.422                            | 56.53                                      | 627.3                                   | 627.3                     | 2,323                   | 6                             | 43.56           | 0.00                  | 77%            |
| MH1                               | MH2        | 4.60      | 4.60      | 3.70      | 3.10      | 0.67         | 1.28         | 75.0       | 0.008    | 125.0           | 225            | 0.040     | 10%       | 0.036             | 0.376       | 0.707         | 0.056 | 0.300   | 1.269                            | 50.47                                      | 0.0                                     | 627.3                     | 2,323                   | 6                             | 43.56           | 0.00                  | 86%            |
| MH2                               | FMH4039860 | 4.60      | 4.90      | 3.10      | 2.50      | 1.28         | 2.18         | 65.0       | 0.009    | 108.3           | 225            | 0.040     | 10%       | 0.036             | 0.404       | 0.707         | 0.056 | 0.300   | 1.365                            | 54.28                                      | 0.0                                     | 627.3                     | 2,323                   | 6                             | 43.56           | 0.00                  | 80%            |
| FMH4039860                        | FMH4038083 | 4.90      | 5.60      | 2.50      | 1.37      | 2.18         | 4.01         | 91.6       | 0.012    | 81.1            | 225            | 0.040     | 10%       | 0.036             | 0.467       | 0.707         | 0.056 | 0.300   | 1.582                            | 62.89                                      | 2.8                                     | 630.1                     | 2,334                   | 6                             | 43.76           | 0.00                  | 70%            |
| FMH4038083                        | FMH4038084 | 5.60      | 6.10      | 1.37      | 0.98      | 4.01         | 4.90         | 35.7       | 0.011    | 91.5            | 225            | 0.040     | 10%       | 0.036             | 0.439       | 0.707         | 0.056 | 0.300   | 1.487                            | 59.13                                      | 28.3                                    | 658.4                     | 2,438                   | 6                             | 45.72           | 0.00                  | 77%            |
| FMH4038084                        | FMH4038085 | 6.10      | 5.60      | 0.98      | -3.13     | 4.90         | 8.51         | 33.9       | 0.121    | 8.2             | 225            | 0.040     | 5%        | 0.038             | 1.463       | 0.707         | 0.056 | 0.300   | 5.012                            | 199.27                                     | 0.0                                     | 658.4                     | 2,438                   | 6                             | 45.72           | 0.00                  | 23%            |

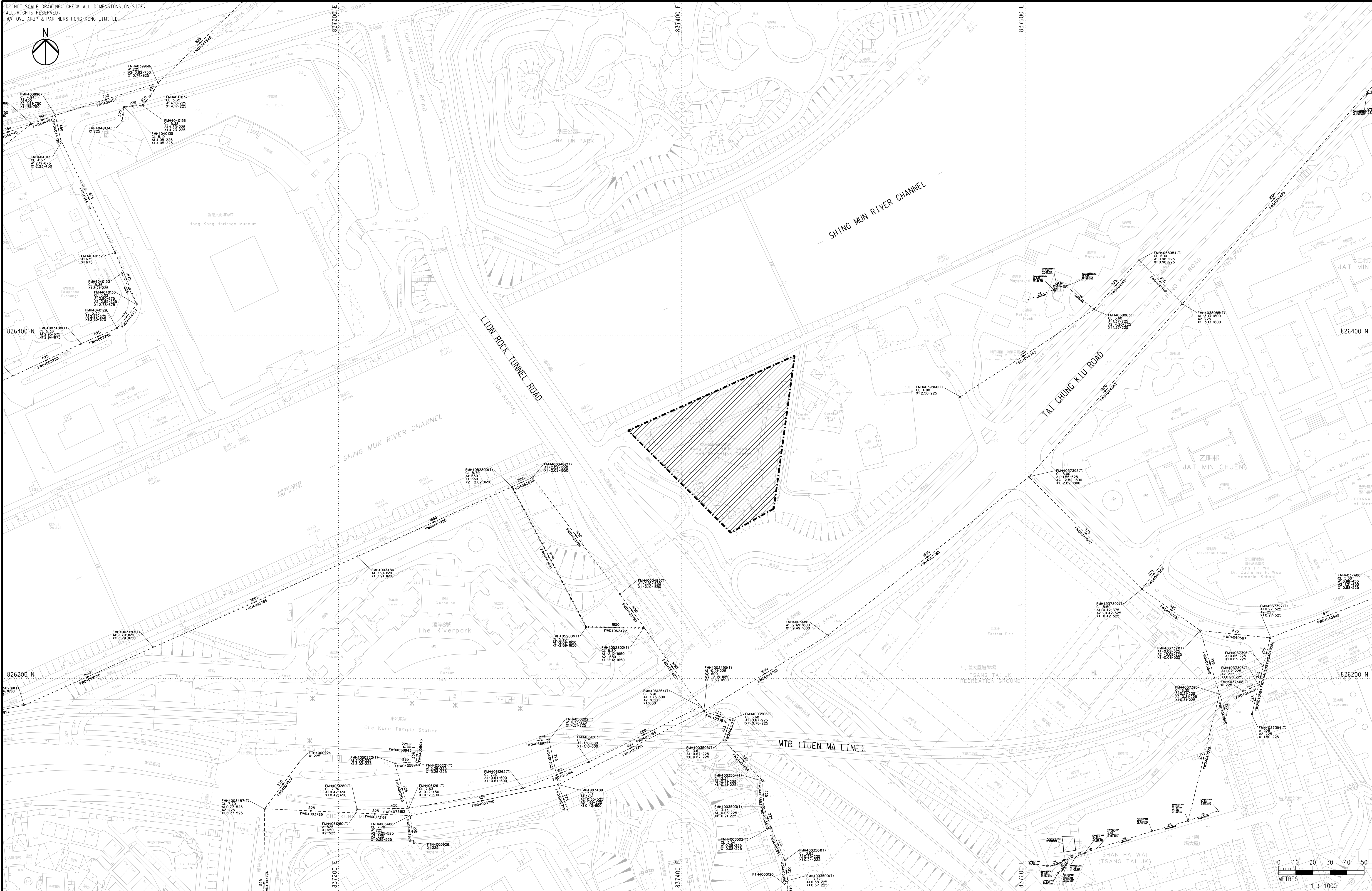
Notes:

(1) Refer to Catchment calculations.

# Appendix C

## Existing and Proposed Sewerage Network

DO NOT SCALE DRAWING. CHECK ALL DIMENSIONS ON SITE.  
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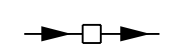


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| Mark | Date  | By | Rev.        |

### LEGEND



PROPOSED DEVELOPMENT



EXISTING SEWER AND MANHOLE

Job Title

Application for Amendment of Plan under Section 12A of the Town Planning Ordinance (Cap. 131), to Rezone the Application Site from “Open Space” to “Residential (Group A) 11” at Sha Tin Town Lot 310 in D.D. 184, Sha Tin

|               |
|---------------|
| Drawing Title |
|---------------|

## EXISTING SEWERAGE NETWORK

Drawing Status

SUBMISSION

ARUP

Scale 1:1000 @ A1

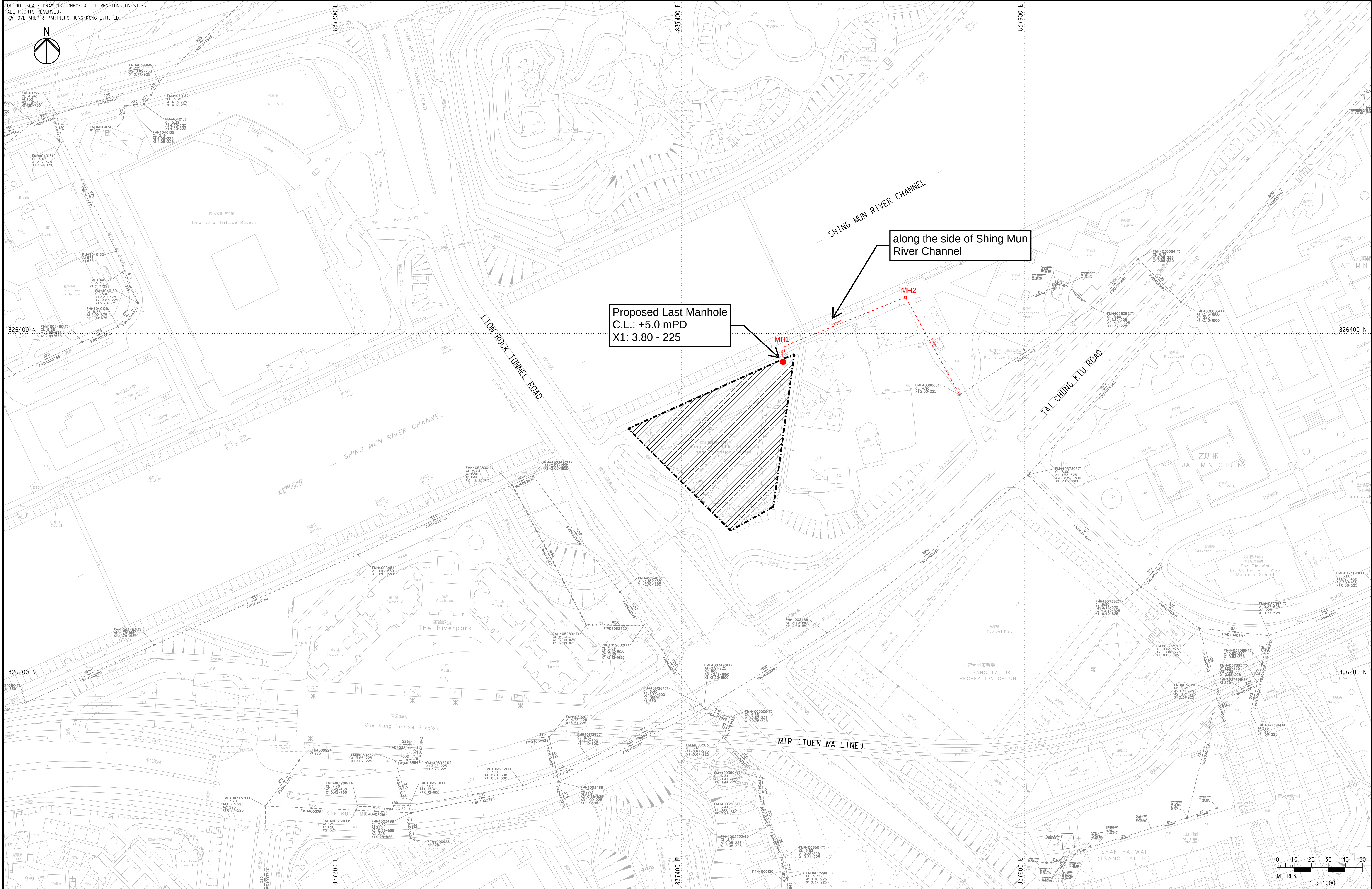
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| Drn. | RY | Date | 02/25 | Chd. | JW | Passed | KK |
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Job No. 299123

Drawing No.  
C/SIA/001

Rev.  
A





| Mark | Date  | By | Rev.        |
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| LEGEND |                            |
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|        | PROPOSED DEVELOPMENT       |
|        | EXISTING SEWER AND MANHOLE |
|        | PROPOSED SEWER AND MANHOLE |

|                                                                                                                                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Job Title                                                                                                                                                                                                                  |
| Application for Amendment of Plan under Section 12A of the Town Planning Ordinance (Cap. 131), to Rezone the Application Site from “Open Space” to “Residential (Group A) 11” at Sha Tin Town Lot 310 in D.D. 184, Sha Tin |

|                           |
|---------------------------|
| Drawing Title             |
| PROPOSED SEWERAGE NETWORK |
| Drawing Status            |
| SUBMISSION                |

|         |             |             |           |
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| ARUP    |             |             |           |
| Scale   | 1:1000 @ A1 |             |           |
| Drn.    | RY          | Date        | 02/25     |
| Chd.    | JW          | Passed      | KK        |
| Job No. | 299123      | Drawing No. | C/S1A/002 |
| Rev.    | A           |             |           |