Prepared by

Ramboll Hong Kong Limited

REDEVELOPMENT OF MIDDLETON TOWERS AT POK FU LAM

WATER SUPPLY IMPACT ASSESSMENT

Date	**May 2026**
Prepared by	**Sally Chiu** **Assistant Environmental Consultant**
Signed	
Approved by	**Tony Cheng** **Senior Manager**
Signed	
Project Reference	**AECHUMT_EI00**
Document No.	**R10050_v1.0_260505.docx**

Ramboll Hong Kong Limited

21/F, BEA Harbour View Centre
56 Gloucester Road, Wan Chai, Hong Kong

Tel: (852) 3465 2888
Fax: (852) 3465 2899
Email: hkinfo@ramboll.com

Q:\Projects\AECHUMT_EI00\04 Deliverables\03 WSIA Report\v1.0\R10050_v1.0_260505.docx

CHAPTERS

FIGURES

APPENDICES

1. INTRODUCTION

1.1 Project Background

1.1.1 The Subject Site is mainly zoned as "Residential (Group C)" ("R(C)") with minor portion zoned as "Green Belt" ("GB") under the Approved Pok Fu Lam Outline Zoning Plan (OZP) (No. S/H10/23). It is generally surrounded by University Hall to the southeast, Woodbury Court to the southwest, and Alberose to the northwest.

1.1.2 **Figure 1.1** shows the location of the Subject Site and its environment.

1.1.3 The Water Supply Impact Assessment (WSIA) is prepared as a technical supporting document to estimate the water demand arising from the Proposed use.

1.2 Proposed Use

1.2.1 It consists of student hostel. Development Parameters for the Proposed use is summarised below.

Table 1.1 Development Parameters for Proposed Use

	Parameters
Site Area (m^2)	8,900
No. of Student Hostel (Rooms)	900

1.2.2 The typical floor plans of the planning statement of the Proposed use are shown in **Appendix 1.1**

1.2.3 The tentative completion year for the Proposed use is 2028.

2. WATER SUPPLY IMPACT ASSESSMENT

2.1 Scope of Work

2.1.1 The aim of this study is to assess whether the capacity of the existing water supply facilities serving the Subject Site is sufficient to cope with the water demands from the Proposed use. Data and record plans from Water Supplies Department (WSD) were obtained to facilitate the WSIA.

2.2 Assessment Criteria and Methodology

2.2.1 The Proposed use will be served by Pokfulam No.1 Fresh Water Service Reservoir and Pok Fu Lam Salt Water Service Reservoir (PSL SWSR), which has a capacity of 1,184m^3 and 2,000m^3 respectively. There is existing water main in the vicinity of the sites. The existing water supply network is shown in **Appendix 2.1**.

2.2.2 Reference has been made to the Water Supplies Department's Departmental Instruction 1309 (WSD DI 1309), as well as Environmental Protection Department's (EPD's) Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning (GESF). In addition, Planning Department's (PlanD) Commercial and Industrial Floor Space Utilization Survey (CIFUS) have also been used.

2.2.3 WSD DI 1309 sets out the design criteria for water supplies in Hong Kong and includes unit water demands for various classes of consumer. Apart from the above, EPD's GESF includes unit sewage flow factors for various residential development.

2.2.4 For this WSIA, WSD's data from DI 1309 has been referenced to provide unit water demands for the various population categories with the relevant EPD GESF unit sewage flow factors to determine overall unit water demand factors. PlanD's CIFSUS has been also referenced for calculation of the population density where necessary.

2.2.5 The unit water demand has been combined with the relevant development parameters to assess the future water demands, from which the potential impacts have been assessed. Calculations for the water demands of the Proposed use are included in **Appendix 2.2**.

2.3 Assessment of Water Demand

2.3.1 The water demand from the Proposed use has been assessed in **Table 2.1** below and detailed calculation is shown in **Appendix 2.2**.

Table 2.1 Water Demand from the Proposed use

	Daily Water Demand (m^3/day)	Peaking Factor	Peak Water Demand (m^3/day)
Freshwater	225	3	675
Flushing Water	0.9	2	1.8

2.4 Fire-Fighting

2.4.1 Fire-fighting requirement for residential zone is 6,000m^3/day with discharge pressure of 17m head. The fire hydrant should be of standard pattern with minimum output pressure of not less than 25 psi. With multiple hydrants operating at the same time, total output of not less than 4,000L/min shall last for 60 minutes. summarizes the fire-fighting requirements. **Table 2.2** summarizes the fire-fighting requirements.

Table 2.2 Fire Fighting Requirements

Requirements	Minimum Values
Minimum fresh water supply	6,000 m^3 /day
Discharge pressure	17m
Minimum output not less than 25 psi	4,000 L/min (5,760m^3 /day) which lasts for an hour (i.e., 4,000x60 = 240,000L/hour/day or 240m^3 /hour/day)

2.5 Existing Water Supply System

2.5.1 **Appendix 2.1** shows the existing fresh water and flushing water supply scheme.

2.5.2 For freshwater supply, there is an existing 100mm freshwater main on the northwest of the Subject Site, which tee-off from an existing 200mm freshwater main. The freshwater main arrangement for the Proposed use remains unchanged as the existing development. 66% of the existing 100mm freshwater main will be occupied by the Proposed use.

2.5.3 For flushing water supply, there is an existing 100mm flushing water main on the west of the Subject Site. The saltwater main arrangement for the Proposed use remains unchanged as the existing development. 0.2% of the existing 100mm saltwater main will be occupied by the Proposed use.

2.6 Construction and Maintenance

2.6.1 The responsibility for operation and maintenance of the waterworks will be discussed and agreed with WSD and relevant departments during detailed design stage.

3. CONCLUSION

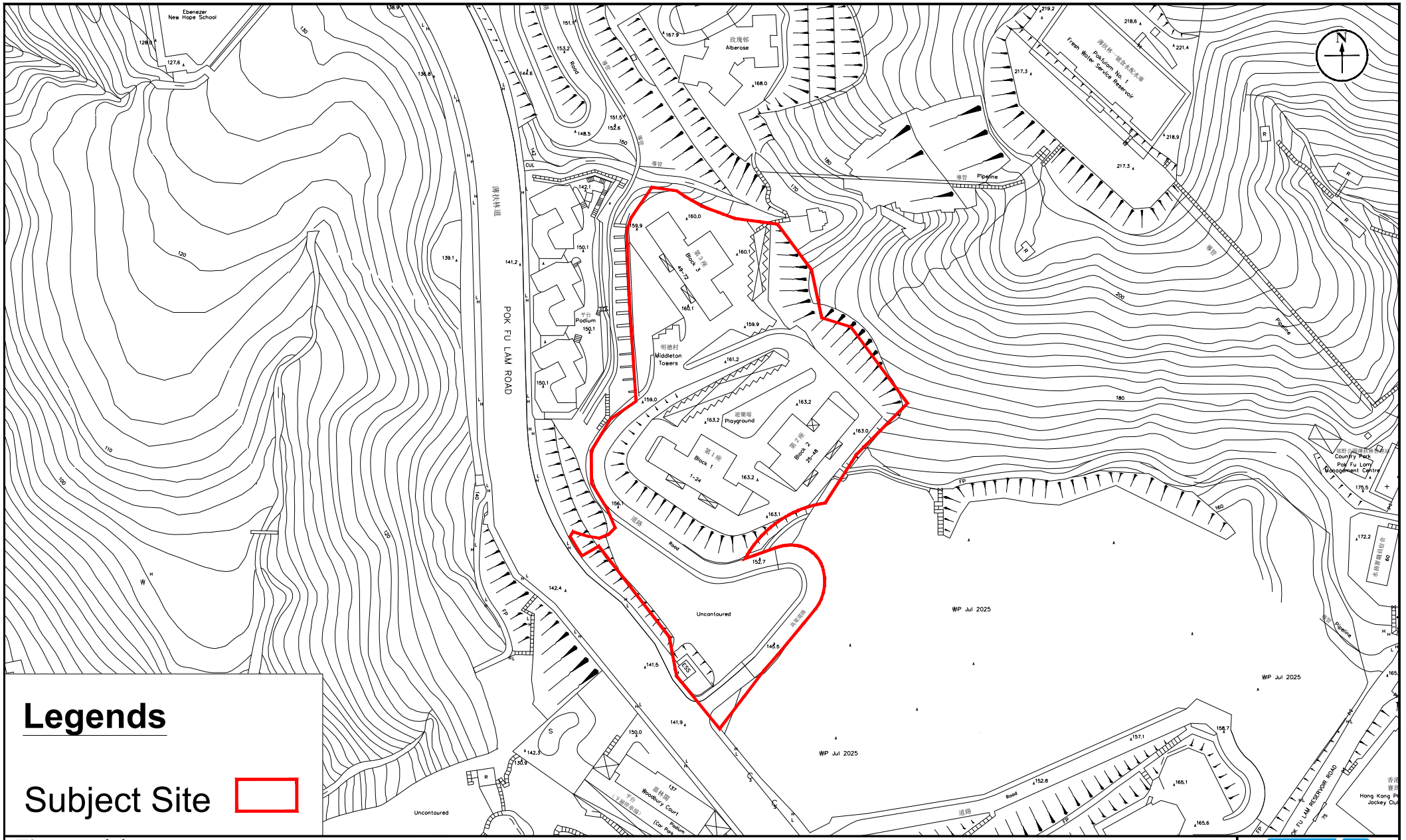
3.1.1 The water supply impact assessment has been carried out for the Proposed use. The assessment results show that the peak freshwater and flushing water demand for the Proposed use is 675 m^3/day and 0.9 m^3/day.

3.1.2 Connections of the existing water mains to serve the Proposed use will remain unchanged as the existing development. Based on the assessment, the existing water main are adequate to serve the Proposed use. No upgrading works of the existing pumping stations, service reservoirs and water mains are recommended.

3.1.3 The responsibility for operation and maintenance of the proposed waterworks will be discussed and agreed with WSD and relevant departments during detailed design stage.

3.1.4 It is concluded that the Proposed use can be implemented without insurmountable water supply impacts.

Figures



Legends

Subject Site

Figure: 1.1

Title: Location of Subject Site and its Environs

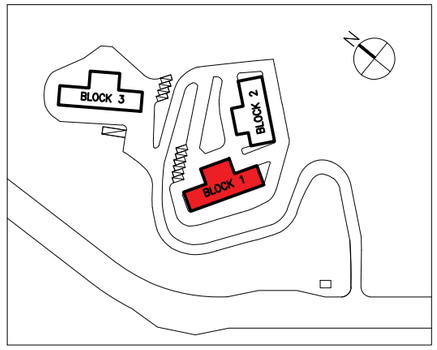
Project: Redevelopment of Middleton Towers at Pok Fu Lam

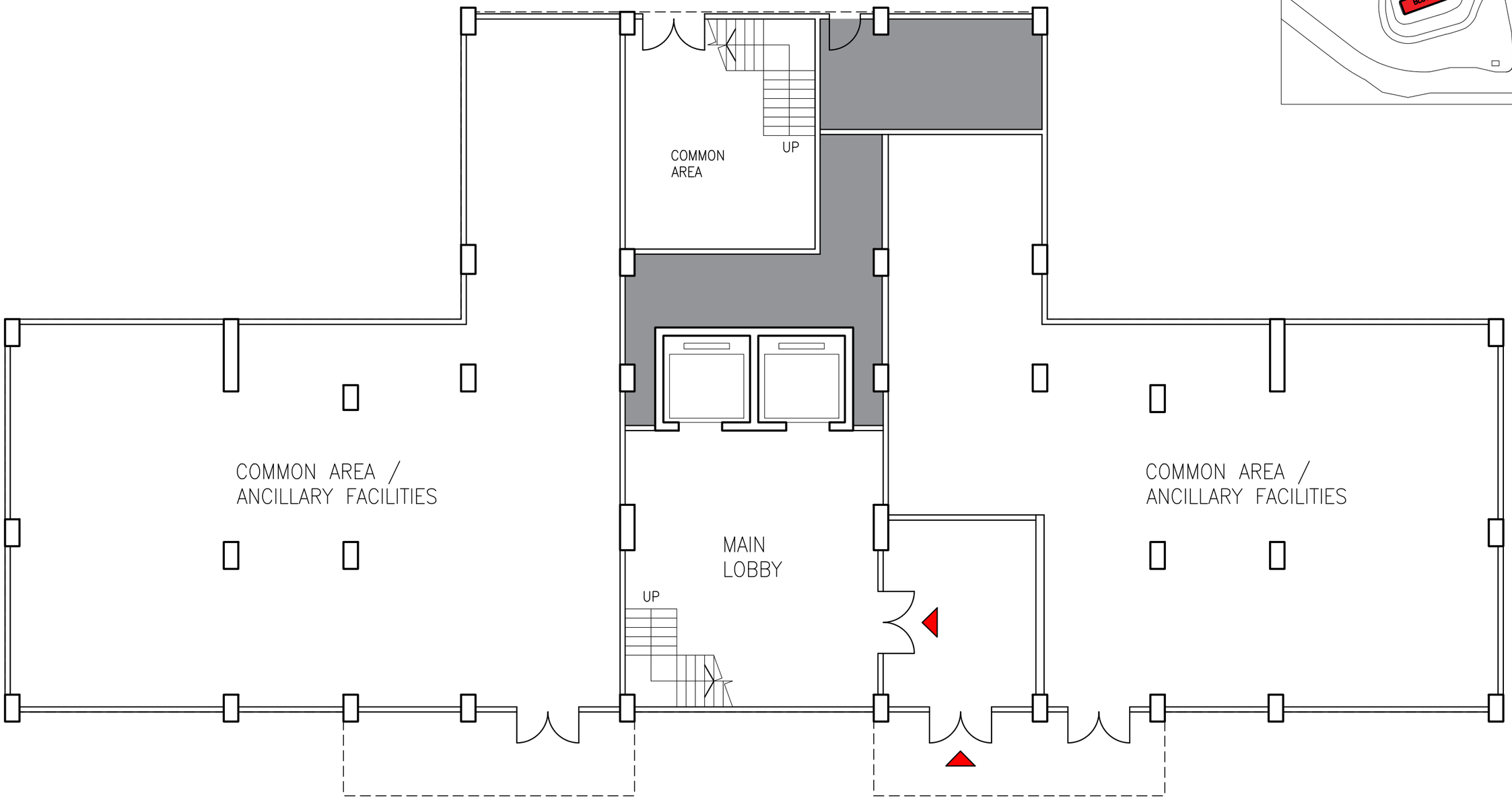
RAMBOLL

Drawn by:	SC
Checked by:	TC
Rev.:	1.0
Date:	Feb 2026

Q:\Projects\AECHUMT_EI00\05 Assessments\Subject Site.dwg

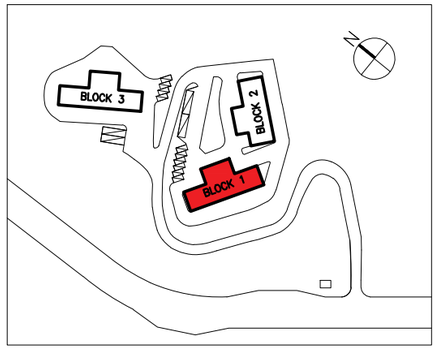
Appendix 1.1 The Typical Floor Plans of the Planning Statement

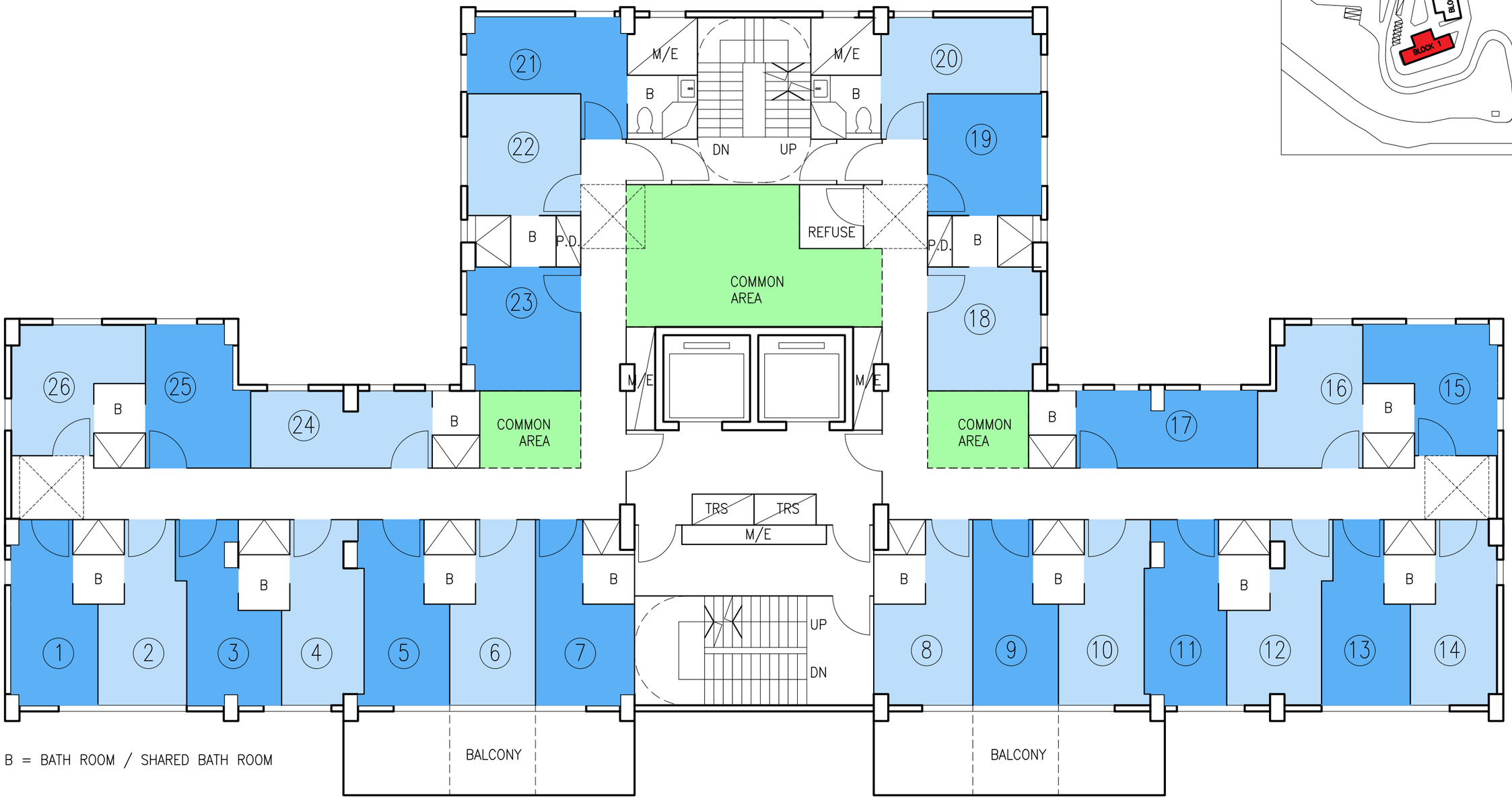




BLOCK 1 – G/F LAYOUT

SCALE 1:100





B = BATH ROOM / SHARED BATH ROOM

BLOCK 1 TYPICAL (1/F – 12/F ; 12 STOREYS)

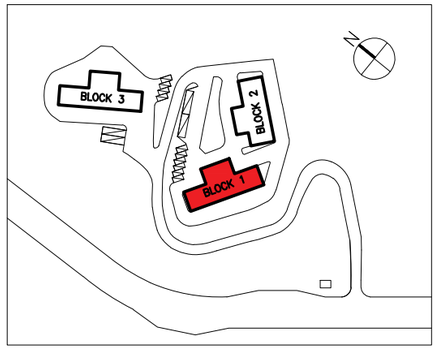
SCALE 1:100

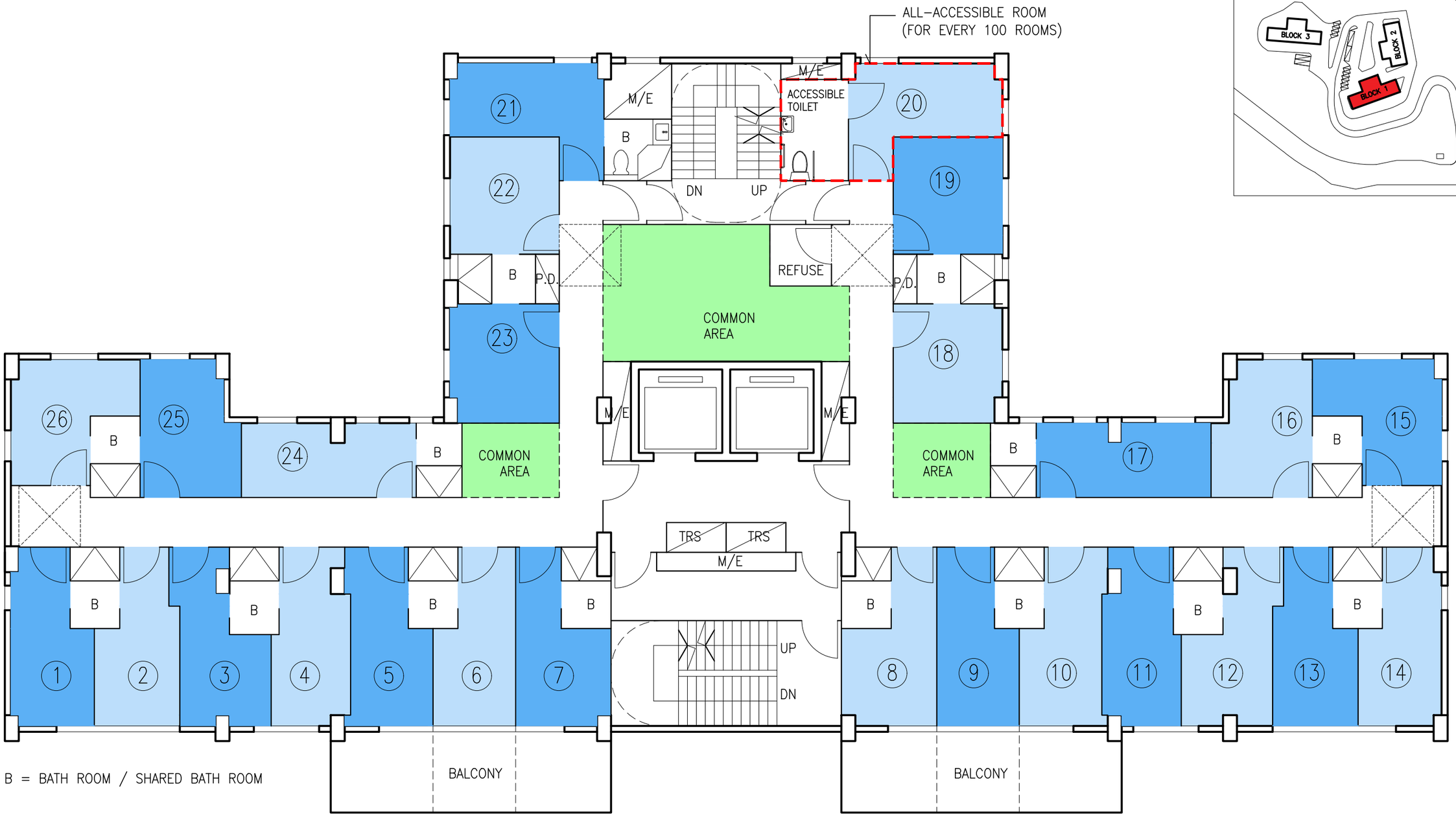
BLOCK A TYPICAL FLOOR = 26 UNITS APPROX.

BLOCK 1 TO 3

TOTAL PROPOSED UNITS	=	900 UNITS
BLOCK 1 TYP	=	26 APPROX.
BLOCK 2 TYP	=	23 APPROX.
BLOCK 3 TYP	=	26 APPROX.

SUBJECT TO FUTURE DETAIL DESIGN





B = BATH ROOM / SHARED BATH ROOM

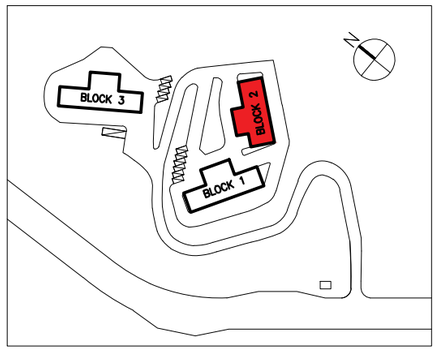
BLOCK 1 WITH ACCESSIBLE ROOM

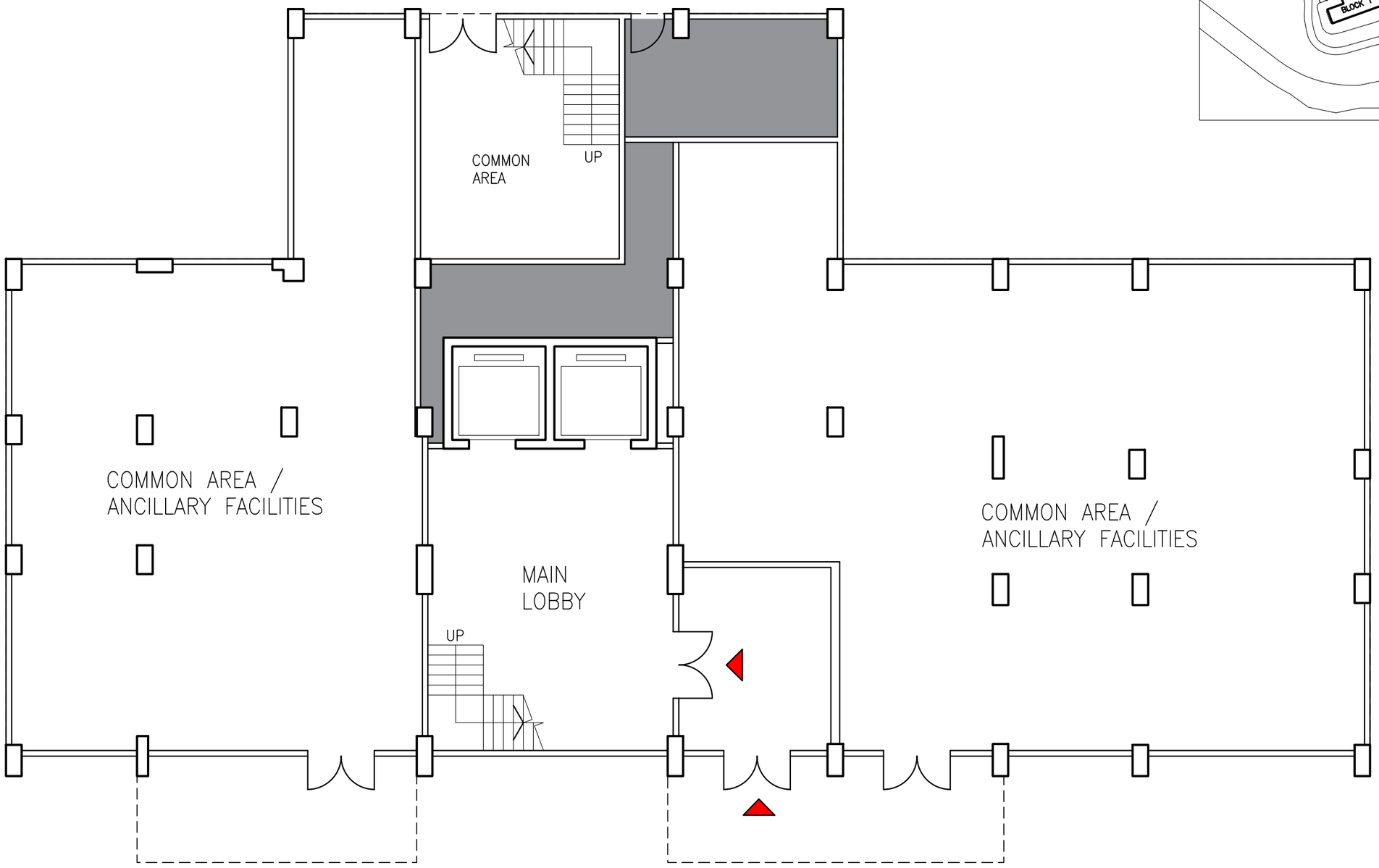
SCALE 1:100

BLOCK A TYPICAL FLOOR = 26 UNITS APPROX.

BLOCK 1 TO 3

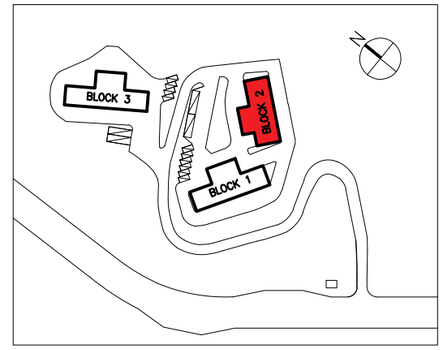
TOTAL PROPOSED UNITS = 900 UNITS
BLOCK 1 TYP = 26 APPROX.
BLOCK 2 TYP = 23 APPROX.
BLOCK 3 TYP = 26 APPROX.
SUBJECT TO FUTURE DETAIL DESIGN





BLOCK 2 – G/F LAYOUT

SCALE 1:100



BLOCK 2 TYPICAL (1/F – 12/F ; 12 STOREYS)

SCALE 1:100

BLOCK B TYPICAL FLOOR = 23 UNITS APPROX.

BLOCK 1 TO 3

TOTAL PROPOSED UNITS = 900 UNITS
BLOCK 1 TYP = 26 APPROX.
BLOCK 2 TYP = 23 APPROX.
BLOCK 3 TYP = 26 APPROX.
SUBJECT TO FUTURE DETAIL DESIGN

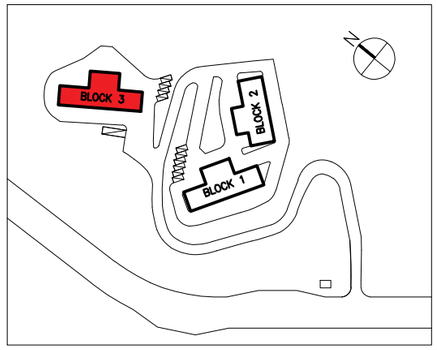
BLOCK 2 WITH ACCESSIBLE ROOM

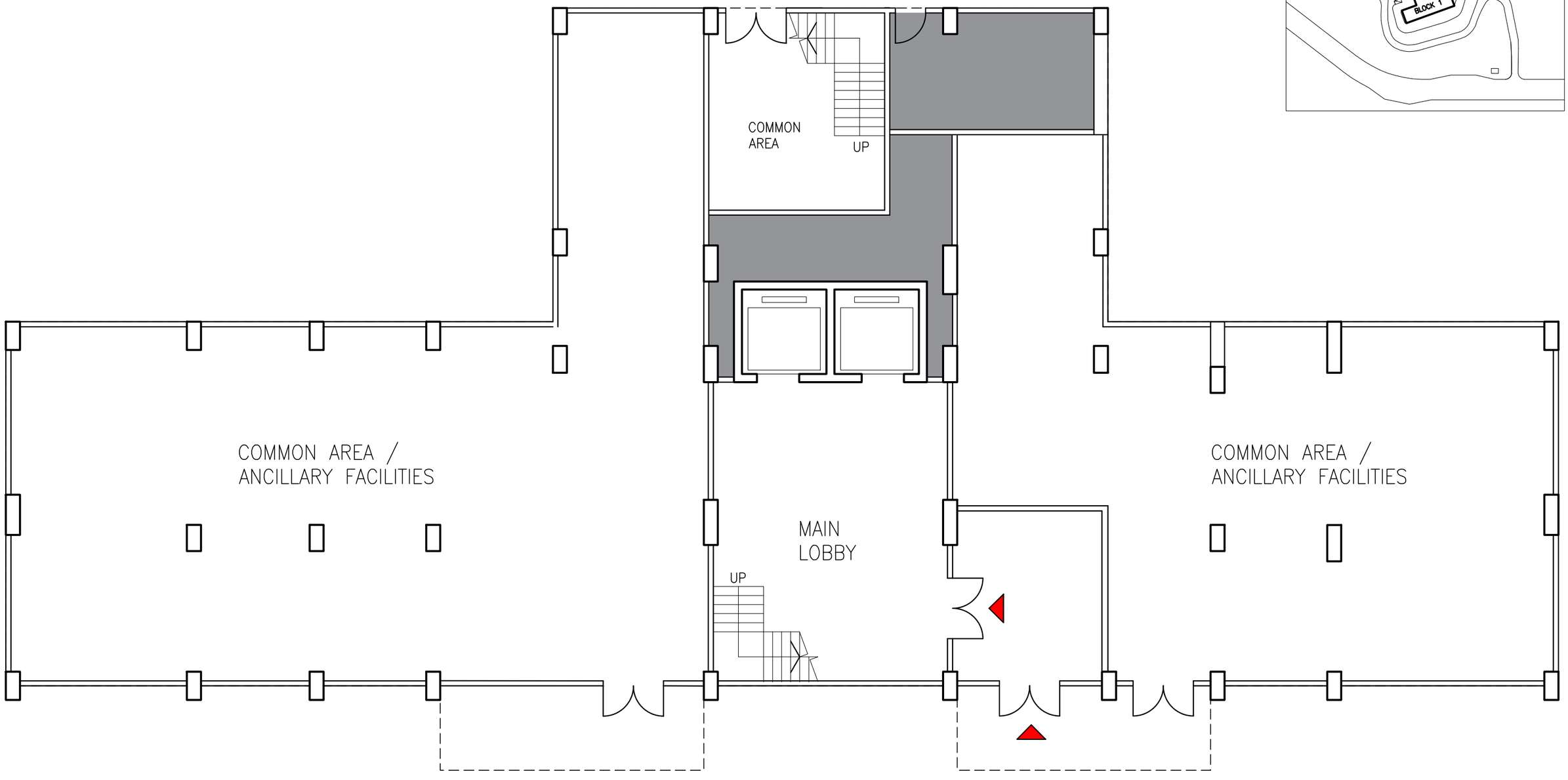
SCALE 1:100

BLOCK B TYPICAL FLOOR = 23 UNITS APPROX.

BLOCK 1 TO 3

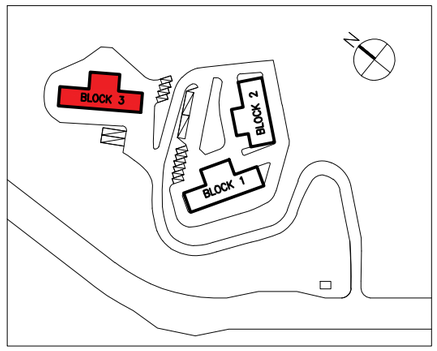
TOTAL PROPOSED UNITS = 900 UNITS
BLOCK 1 TYP = 26 APPROX.
BLOCK 2 TYP = 23 APPROX.
BLOCK 3 TYP = 26 APPROX.
SUBJECT TO FUTURE DETAIL DESIGN





BLOCK 3 – G/F LAYOUT

SCALE 1:100



B = BATH ROOM / SHARED BATH ROOM

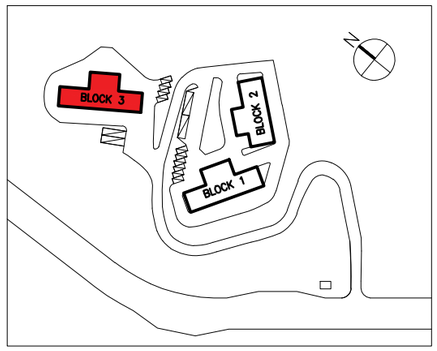
BLOCK 3 TYP (1/F – 12/F ; 12 STOREYS)

SCALE 1:100

BLOCK C TYPICAL FLOOR = 26 UNITS APPROX.

BLOCK 1 TO 3

TOTAL PROPOSED UNITS = 900 UNITS
BLOCK 1 TYP = 26 APPROX.
BLOCK 2 TYP = 23 APPROX.
BLOCK 3 TYP = 26 APPROX.
SUBJECT TO FUTURE DETAIL DESIGN



B = BATH ROOM / SHARED BATH ROOM

BLOCK 3 WITH ACCESSIBLE ROOM

SCALE 1:100

BLOCK C TYPICAL FLOOR = 26 UNITS APPROX.

BLOCK 1 TO 3

TOTAL PROPOSED UNITS = 900 UNITS
BLOCK 1 TYP = 26 APPROX.
BLOCK 2 TYP = 23 APPROX.
BLOCK 3 TYP = 26 APPROX.
SUBJECT TO FUTURE DETAIL DESIGN

Appendix 2.1 Water Main Records

831500E 831600E 831700E 831800E

814300N 814200N 814100N 814000N 813900N

100m NO BLASTING LIMIT FOR
WSD CONDUIT TUNNEL

3 m WWR FOR
POK FU LAM
F.W. TANK

PROPOSED 3m WWR BETWEEN
POK FU LAM RD AND BAGUIO VILLA

10ft WWR FOR WWR BETWEEN
POK FU LAM RD AND BAGUIO VILLA

WSD LAND ALLOCATION
FOR KIOSK BEHIND 138A
POK FU LAM ROAD

SUBJECT SITE

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.
2. ALL LEVELS ARE IN METRES ABOVE PRINCIPAL DATUM.
3. INFORMATION ON ALIGNMENT OF MAINS IS OF INDICATIVE VALUE ONLY. WHERE POSITIONAL ACCURACY MAY BE OF IMPORTANCE, DETAILS SHOULD BE SITE CHECKED.
4. FOR MAINS RECORDS SIGN CONVENTIONS AND DESIGNATIONS SEE SKETCH NO. 3988.
5. NO PROPOSED WATER MAINS IN THE VICINITY OF THE SITE.
6. THE SITE IS NOT WITHIN WSD GATHERING GROUNDS.

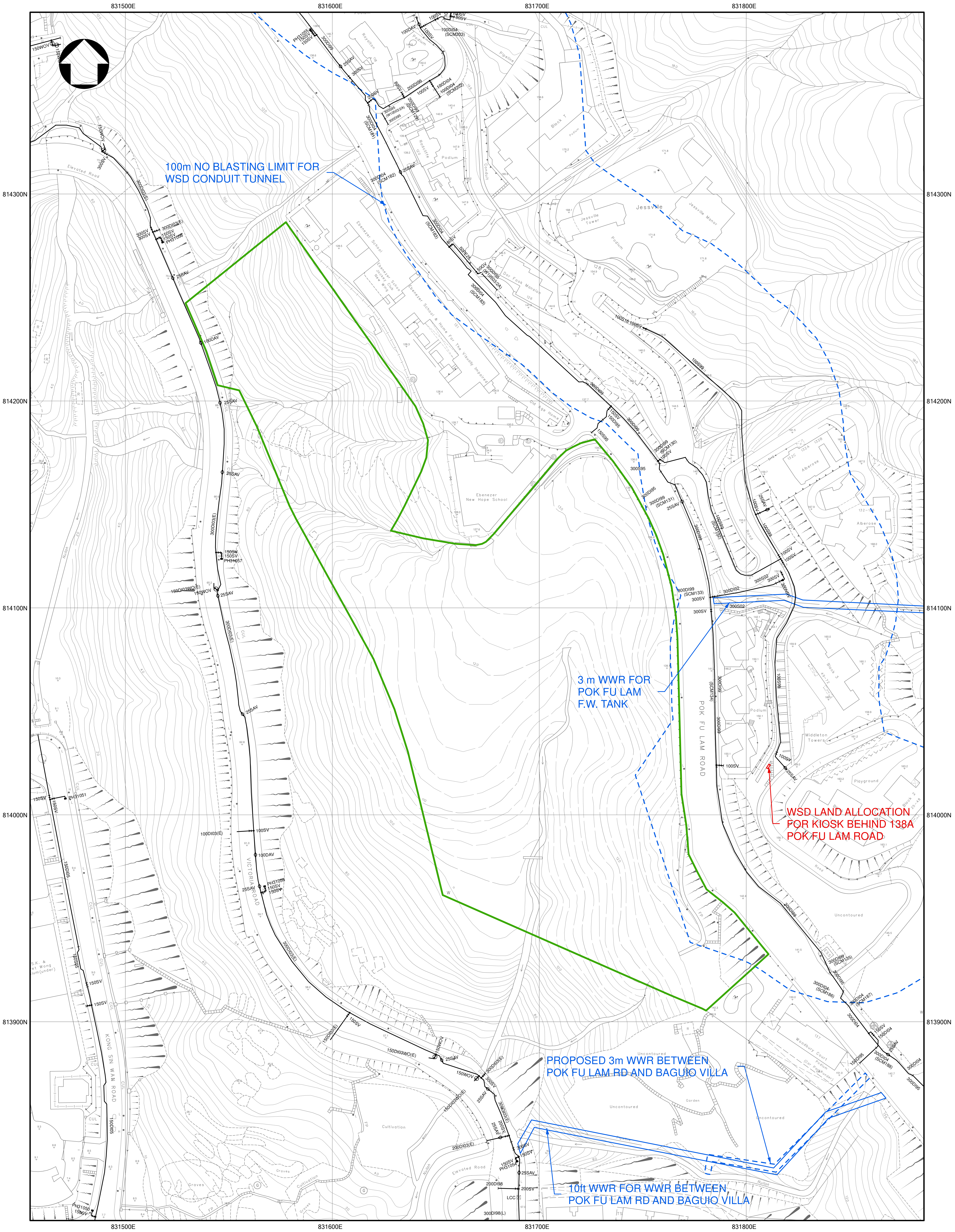
PART COPY OF FRESH WATER MAINS RECORD PLAN(S)

W67880/11-SW-16B & 17A

FILE REF: (3) IN WSD/M/SP 3055/41S/25 PT.1

REF. CODE: 02W26M	SHEET 1 OF 1	SCALE 1:1200

水 務 署
Water Supplies Department



NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.
2. ALL LEVELS ARE IN METRES ABOVE PRINCIPAL DATUM.
3. INFORMATION ON ALIGNMENT OF MAINS IS OF INDICATIVE VALUE ONLY. WHERE POSITIONAL ACCURACY MAY BE OF IMPORTANCE, DETAILS SHOULD BE SITE CHECKED.
4. FOR MAINS RECORDS SIGN CONVENTIONS AND DESIGNATIONS SEE SKETCH NO. 3988.
5. NO PROPOSED WATER MAINS IN THE VICINITY OF THE SITE.
6. THE SITE IS NOT WITHIN WSD GATHERING GROUNDS.

SUBJECT SITE

PART COPY OF SALT WATER MAINS RECORD PLAN(S)

W67881/11-SW-16B & 17A

FILE REF: (3) IN WSD/M/SP 3055/41S/25 PT.1

REF. CODE: 02W26M	SHEET 1 OF 1	SCALE 1:1200

水 務 署
Water Supplies Department

Appendix 2.2 Detailed Water Supply Impact Assessment Calculations

Table 1 - Population Estimation

Future Condition	**Student Hall (Block 1)** Total number of residents (students)	=	300 people
	Student Hostel (Block 2) Total number of residents (students)	=	300 people
	Student Hostel (Block 3) Total number of residents (students)	=	300 people
	Total A+B+C =		**900** people

Table 2a - Future Daily Water Demands Calculation

Type	Population (head)	Freshwater		Flushing Water	
		Daily Unit Demand (m^3/head/day)	Daily Demand (m^3/day)	Daily Unit Demand (m^3/head/day)	Daily Demand (m^3/day)
Housing R1 (Tower 1+2+3)	900	0.250	225.00	0.001	0.90
		TOTAL	**225.0**		**0.9**

Total Freshwater Demand (m^3/day)	=	**225.0**	**m^3/day**
Total Flushing water Demand (m^3/day)	=	**0.9**	**m^3/day**

Note:

1. For Domestic and Service Trade uses, the Daily Unit Demand Rate refer to WSD Departmental Instruction 1309 (DI 1309)

2. Service Trade (Pok Fu Lam Supply Zone) of 0.02 m^3/day is adopted for fresh water demand

Table 3b Hydraulic Capacity of Fresh Water Main for Future Condition

Type	Portion	Diameter (mm)	Peak factor [1]	Fresh Water Demand, Q (cu. m/day)	Area (m^2)	Factored Q (cu. m/s)	Velocity of Water Main (m/s) [2]	Flow Rate of Water Main (m^3/s)	% of water main occupied by the Proposed Site
Block 1+2+3	100 GIL	100	3	225.0	0.008	0.008	1.50	0.012	66%

[1] Peak factor for distribution mains refers to Departmental Instruction No. 1309 from WSD

[2] Velocity of 1.5m/s is assumed

Table 3c Hydraulic Capacity of the Flushing Water Main for Future Scanario

Type	Portion	Diameter (mm)	Peak factor [1]	Demand, Q (cu. m/day)	Area (m^2)	Factored Q (cu. m/s)	Velocity of Water Main (m/s) [2]	Flow Rate of Water Main (m^3/s)	% of water main occupied by the Proposed Site
Block 1+2+3	100SV	100	2	0.9	0.008	0.000	1.50	0.012	0.2%

[1] Peak factor for distribution mains refers to Departmental Instruction No. 1309 from WSD

[2] Velocity of 1.5m/s is assumed