
Appendix H
Water Supply Impact Assessment

Prepared for
Gotland Enterprises Limited

Prepared by
Ramboll Hong Kong Limited

S16 PLANNING APPLICATION (FROM 'VILLAGE TYPE
DEVELOPMENT' TO 'RESIDENTIAL INSTITUTION (ELDERLY
HOME)) FOR PROPOSED DEVELOPMENT AT LOT DD101 76 S.G &
76 S.H., SAN TIN

WATER SUPPLY IMPACT ASSESSMENT

Date September 2024

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Signed 

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Signed 

Project Reference GLLMAI POE100

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1. INTRODUCTION

1.1 Background and Objectives

- 1.1.1 The Application Site is located at Lot DD101 76 S.G & 76 S.H., San Tin. It is currently zoned as "Village Type Development" under the Gazetted Mai Po & Fairview Park Outline Zoning Plan (OZP) No. S/YL-MP/7.
- 1.1.2 The Applicant intends to convert the Application Site from "Village Type Development" zone to "Residential Institution (Elderly Home)" zone, for the development of a residential care home for the elderly (RCHE). This change requires a S16 Planning Application to the approval of Town Planning Board. The forecast occupation year is 2028.
- 1.1.3 Ramboll Hong Kong Limited is commissioned by the Client to conduct this Water Supply Impact Assessment (WSIA) for the said commercial development. Architectural drawings of the Proposed Commercial Development are provided by the project architect.

1.2 The Application Site and its Environs

- 1.2.1 The Application Site is located at the Junction of Castle Peak Road – San Tin and Tam Kon Chau Road. The Application Site is currently fenced off with no specific activity on-site. There are fishponds situated at the immediate north and west of the Application Site. Situated at the northeast and south of the Application Site are the village houses of Hop Shing Wai and Mai Po Lo Wai respectively. Beyond the village houses of Hop Shing Wai and outside the Application Site, there are open storage sites, vegetation and village houses in the surrounding area.
- 1.2.2 Figure 1.1 shows the location of the Application Site and its environs.

1.3 The Proposed Development

- 1.3.1 The Proposed Development will be a Residential Care Homes for the Elderly (RCHE) that covers an area of about 0.84 ha, consisting of three blocks, which are 10 storeys tall at maximum. The total GFA of the proposed development is about 16,506 m², and the maximum height is not higher than 42.75 mPD. There is no swimming pool or other alike for the Proposed Development.
- 1.3.2 The Master Layout Plan (MLP), floor plan and section of the Proposed Development are shown in Appendix 1.1. The details of the Proposed Development schedule are summarized in Table 1.1 below.

Table 1.1 Development Schedule

Major Development Parameters	Proposed Scheme
Application Site Area (ha)	~0.84 ⁽¹⁾
GFA (m ²) ⁽²⁾	~16,506
No. of Storeys	9 ⁽³⁾
No. of Blocks	3
No. of Beds	716
Completion Year	2028

Notes:

1. Subject to detailed land survey at subsequent detailed design and land grant stage.
2. Including ancillary uses, such as dormitory / quarters for watchmen and caretakers, ancillary store / mini-cafe, and health / wellness centre, kitchen, laundry, general office, nurse station, multi-purpose area serving the RCHE
3. Excluding level B1, upper roof and top roof.

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 Application Site are sufficient to cope with the water demands from the Proposed Development. Data and record plans from Water Supplies Department (WSD) were obtained to facilitate the Water Supply Impact Assessment (WSIA).

2.2 Existing Water Main

2.2.1 As shown in Appendix 2.2, there is currently one dia. 25mm freshwater main serving the Application Site. There are no saltwater mains in the vicinity of the Application Site.

2.3 Assessment Criteria and Methodology

2.3.1 The Application Site is within the fresh water supply zone of Ngau Tam Mei Fresh Water Primary Service Reservoir (NTM FWPSR), which has a capacity of about 40,750m³. There is no existing or planned saltwater reservoir serving the Application Site.

2.3.2 Reference has been made to the Water Service Department's Departmental Instruction 1309 (WSD DI 1309). WSD DI 1309 sets out the design criteria for water supplies in Hong Kong and includes unit water demands for various classes of consumers. Adopted water unit demand was summarized in Table 2.1.

Table 2.1 Adopted Freshwater and Flushing Water Demand

Population Type	Freshwater Daily Unit Demand (m ³ /head/day)	Flushing water Daily Unit Demand (m ³ /head/day)	Reference
G/IC	0.200	0.070	DI No. 1309
Residential R4	0.390	0.070	DI No. 1309

2.3.3 For this WSIA, WSD's data from DI 1309 has been referenced to provide unit water demands for the various population categories.

2.3.4 The demand of the Proposed Development will be mainly originated from the future residential population and staff. The future staff during operation is estimated based on the staff-elderly ratio stipulated in the Code of Practice for Residential Care Homes (Elderly Persons).

2.3.5 Calculations for the water demands of the Proposed Development, including estimation of population, are included in Appendix 2.1 and Appendix 2.2.

2.4 Assessment of Water Supply Impact

Fresh Water Supply System

2.4.1 The Application Site is currently connected with a dia. 25mm freshwater main. There are currently no saltwater mains in the vicinity of the Application Site for the use of flushing water on the site.

2.4.2 According to the submitted SIA, the proposed development would propose an on-site sewage treatment facility which can provide about 164.79m³ of treated effluent per day potentially for toilet flushing use. The exact capacity and detailed design of the on-site sewage treatment facility will be confirmed in later detailed design stage. For the purpose of this WSIA study and to be conservative in this early planning stage, assumption of using fresh water for toilet flushing is adopted as a conservative

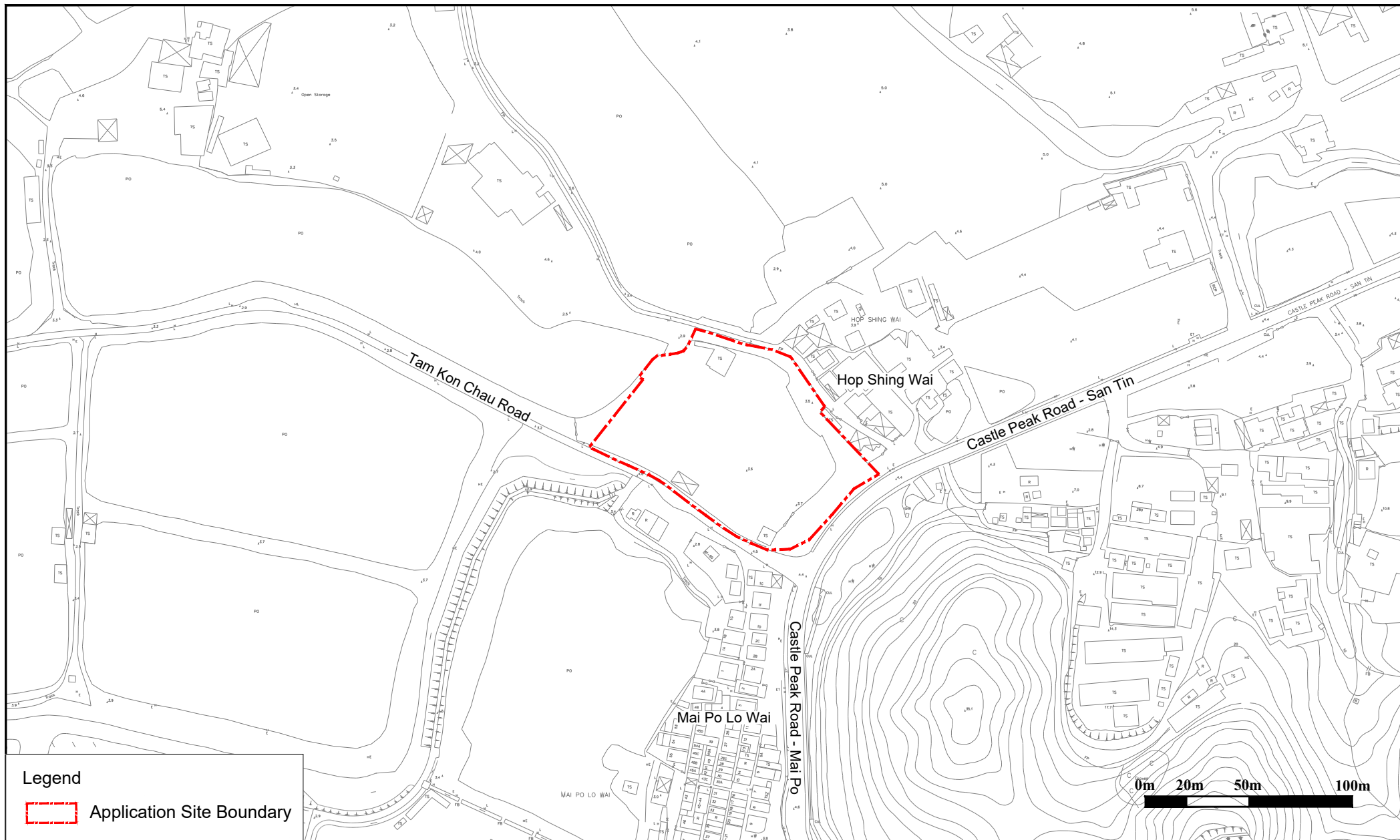
approach. Once details of the on-site sewage treatment facility are available in later detailed design stage, the fresh water demand of the Application Site should be reviewed and confirmed. The future freshwater (including flushing water) demand for the Proposed Development is estimated to be 350.7 m³/day (see Appendix 2.1). Since the existing 25mm dia. freshwater main does not have enough capacity to serve the proposed development, a dia. 80mm freshwater main is proposed for the future condition of the Application Site.

- 2.4.3 The proposed alignment is shown in Figure 2.1. The proposed freshwater main will be handed over to the HKSAR Government for maintenance.
- 2.4.4 The future daily freshwater demand is less than 1% of the NTM FWPSR's capacity. The demand is considered minor and therefore no adverse impact to the FWPSR is expected.

3. OVERALL CONCLUSION

- 3.1.1 An RCHE is proposed at Lot DD101 76 S.G & 76 S.H., San Tin. The potential water supply impact has been quantitatively addressed.
- 3.1.2 The Application Site is connected with fresh water supply only, where saltwater demand is currently met by using fresh water. In the future, on-site sewage treatment facility would be provided and with treated effluent reused for flushing water for the Proposed Development. For the purpose of this WSIA, fresh water supply for flushing use is considered as a conservative approach. It is recommended to review the WSIA study and the exact provision of on-site sewage treatment facility and demand of treated effluent available for flushing in later detailed design stage.
- 3.1.3 Based on the assessment result, the existing dia. 25mm freshwater main is inadequate to support the proposed RCHE operations in the future. A new dia. 80mm freshwater main is thus proposed to serve the proposed development. The newly proposed water main will be able to handle the water demand of the entire Application Site.
- 3.1.4 The future freshwater demand of the Proposed Development is estimated to be 350.7 m³/day, which is less than 1% of the NTM FWPSR capacity, which is considered minor. Therefore, no adverse impact to the FWPSR is expected.
- 3.1.5 It is concluded that the Proposed Development will not have adverse water supply impact.

Figures



Legend

 Application Site Boundary

Figure: 1.1

Title: Application Site and its Environs

Project: S16 Planning Application (from 'village type development' to 'residential institution (elderly home)) for Proposed Development at Lot DD101 76 S.G & 76 S.H., San Tin

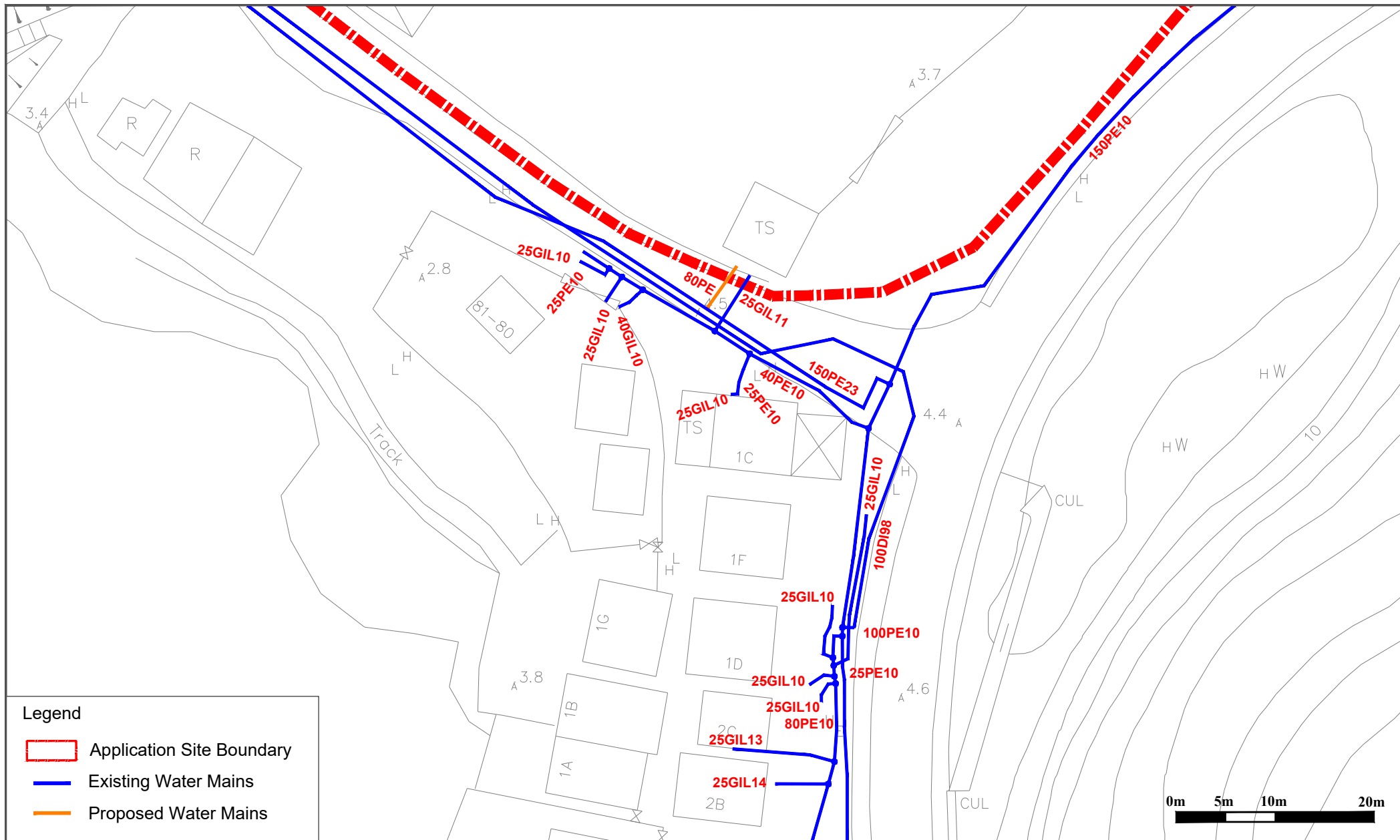
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Date: Sep 2024



Legend

- Application Site Boundary
- Existing Water Mains
- Proposed Water Mains

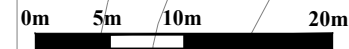


Figure: 2.1

Title: Existing and Proposed Fresh Water Main Arrangement

Project: S16 Planning Application (from 'village type development' to 'residential institution (elderly home)) for Proposed Development at Lot DD101 76 S.G & 76 S.H., San Tin



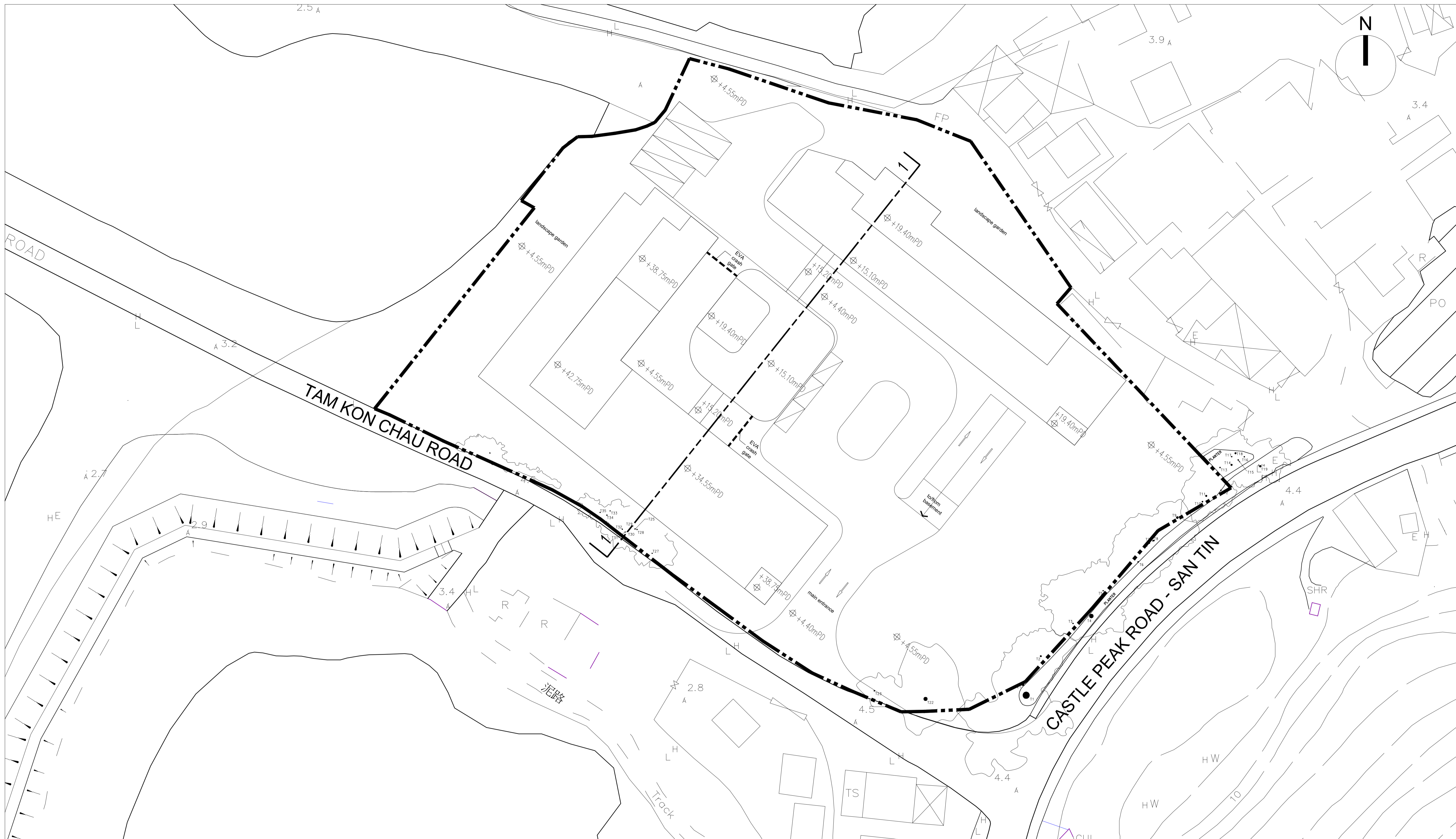
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Appendix 1.1 Indicative MLP of the Proposed Developments

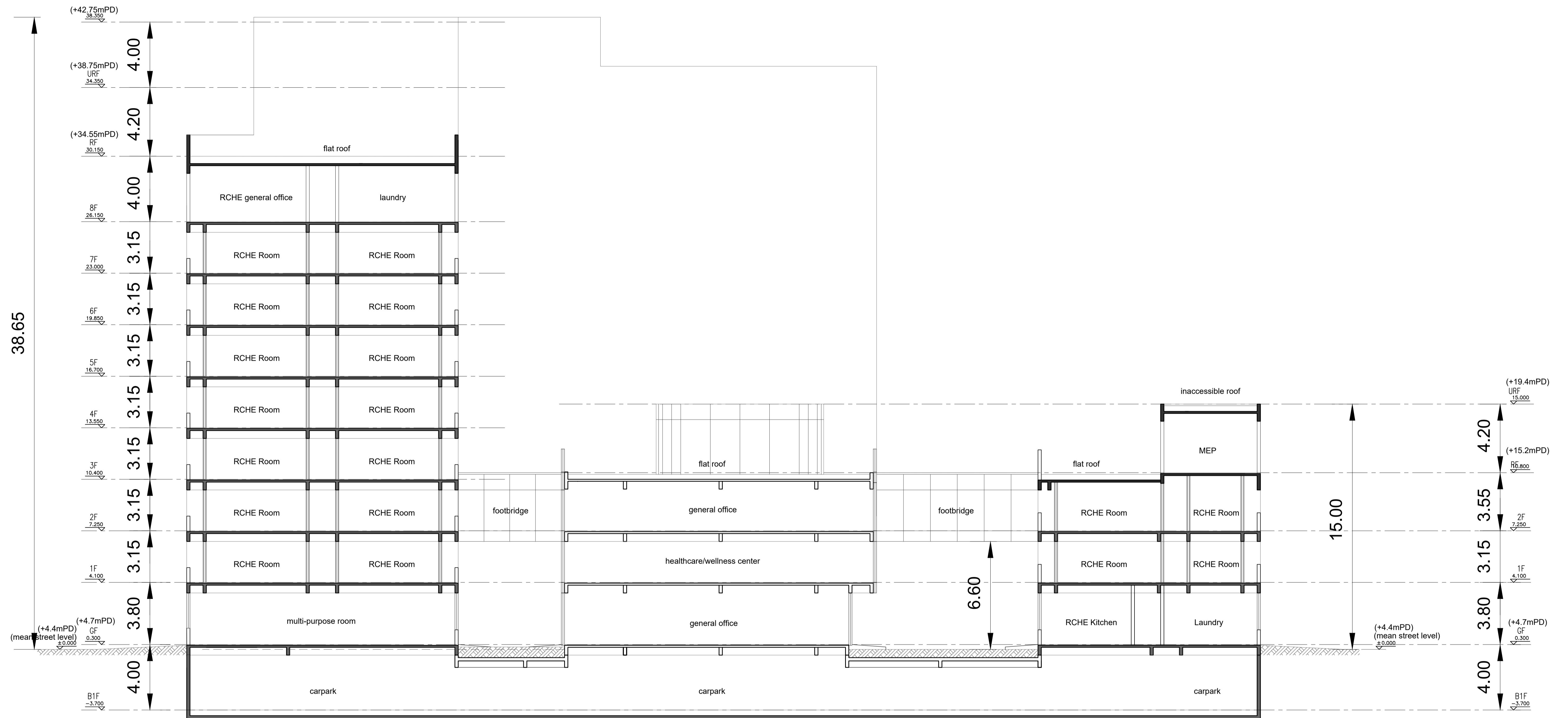


MASTER LAYOUT PLAN

- LEGEND**
- APPLICATION SITE
 - BASEMENT OUTLINE

**LWK
+PARTNERS**

参考編號 REFERENCE No.	繪圖 DRAWING A-1
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Section 1-1 1:125

SECTION 1-1

**LWK
+PARTNERS**

参考編號
REFERENCE No.

繪圖
DRAWING
A-13

Appendix 2.1 Water Demand Calculations

Table 1a - Staff Number Estimation

Type of Staff	Staff-Elderly Ratio	No. of Staff ^[1]
Home manager	-	1
Ancillary worker	1:40	18
Care worker ^[2]	1:20	36
Health worker ^[3]	1:30	24
Nurse ^[3]	1:60	12
Total no. of staff: ^[4]		79

Note:

1. Number of staff is estimated based on the Code of Practice for Residential Care Homes (Elderly Persons) - Section 9.1. The RCHE is assumed to be a "Care and attention home", as this type requires the most number staff and represents the worst case scenario in calculating water supply.
2. The highest staff-elderly ratio required throughout the day (during 7am-3pm) is taken for conservative measures.
3. Health workers are only required if nurses are absent, and vice versa.
4. As a conservative approach, health workers are included in the total instead of nurse, since they have a higher staff count.

Table 1b - Population Estimation

Future Condition	Residential Care Homes for the Elderly (RCHE)		
	Total number of residents (elderlies)	=	716 people
	Total number of staff	=	79 people
	Total Population	=	795 people

Note:

1. The existing operations within the Site will be cleared before the construction of the RCHE. Therefore, the existing condition of the Site is considered to be vacant, with 0 population.

Table 2a - Future Daily Water Demands Calculation (Proposed Development)

Type	Population	Freshwater		Flushing Water	
		Daily Unit Demand (m ³ /head/day) ^[1]	Daily Demand (m ³ /day)	Daily Unit Demand (m ³ /head/day)	Daily Demand (m ³ /day)
G/IC ^[2]	79	0.200	15.80	0.070	5.53
Residential R4 ^[3]	716	0.390	279.24	0.070	50.12
TOTAL			295.04		55.65

Total Freshwater Demand (including flushing water) (m³/day) = 350.7 m³/day

Note:

1. The daily unit demand rate is referenced to the WSD Departmental Instruction 1309 (DI 1309).
2. The G/IC type considers all staff working in the RCHE.
3. The Residential R4 type considers all elderlies living in the RCHE.
4. Since there are no salt water mains in the vicinity of the site, the water demand (both fresh and flushing) will be supported by the fresh water mains.

Water Main Assessment of the Proposed Water Supply Systems

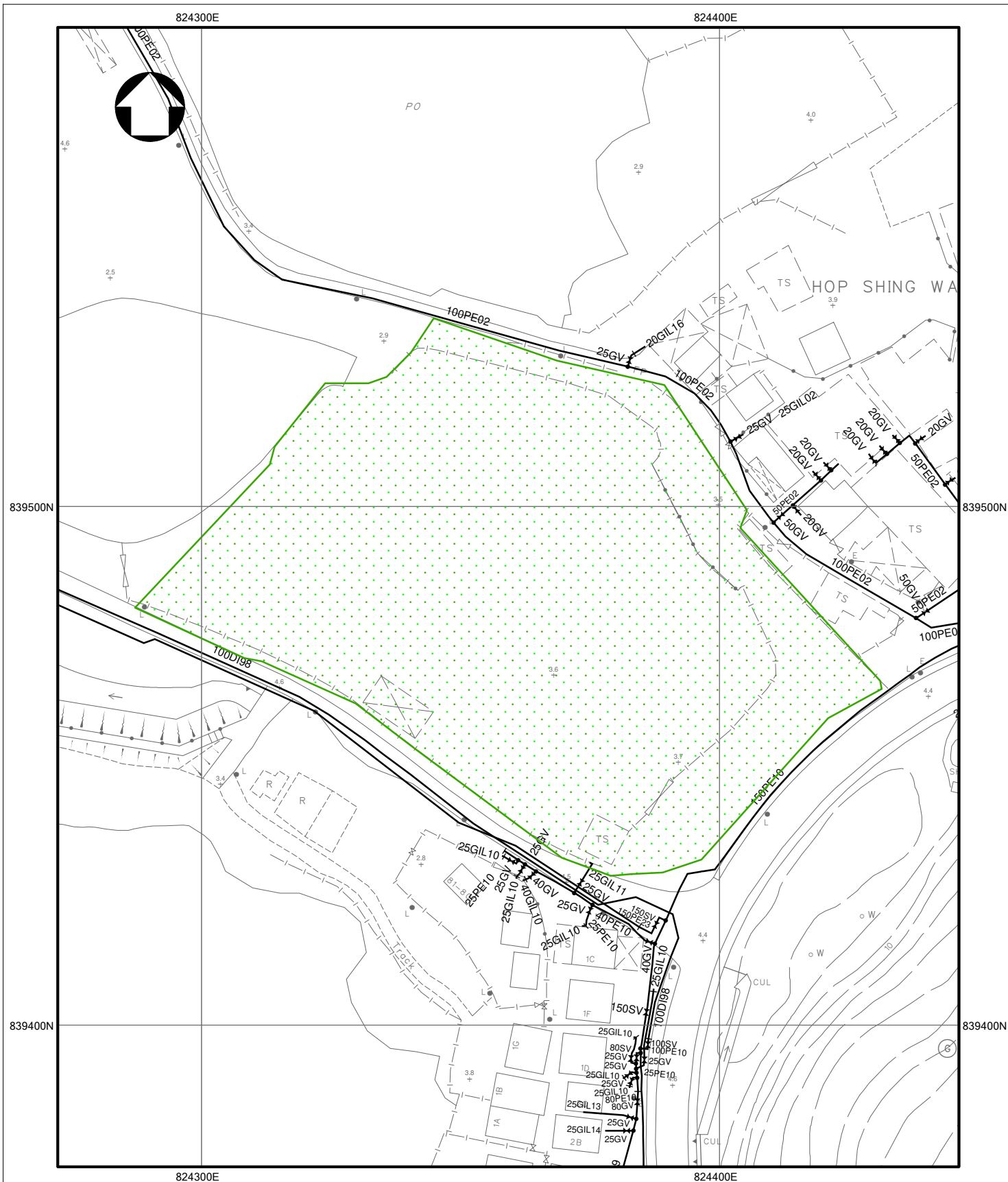
Table 3a Hydraulic Capacity of Fresh Water Main and Flushing Water Main for Future Condition

Portion	Diameter (mm)	Peak factor ^[1]	Demand, Q (cu. m/day)	Factored Q (cu. m/s)	Area (m ²)	Velocity of Water Main (m/s) ^[2]	Flow Rate of Water Main (m ³ /s)	% of water main occupied by the Proposed Site
Future Condition - Proposed RCHE								
Existing 25GIL11	25	3	0.0	0.000	0.0005	3.00	0.001	0%
Proposed 80PE	80	3	350.7	0.012	0.0050	3.00	0.015	81%

1. Peak factor for distribution mains is referenced to Departmental Instruction No. 1309 from WSD.

2. Velocity of 3.0m/s is assumed.

Appendix 2.2 Records Obtained from 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 EXISTING SALT WATER MAINS IN THE VICINITY OF THE SITE.
 6. NO PROPOSED WATER MAINS IN THE VICINITY OF THE SITE.
 7. NO EXISTING WSD CABLE IN THE VICINITY OF THE SITE.
 8. NO PROPOSED WSD CABLE IN THE VICINITY OF THE SITE.
 9. THE SITE IS NOT WITHIN WSD GATHERING GROUNDS.
 10. NO WSD LAND ALLOCATION / WWR WITHIN THE SITE AREA.
 11. NO WSD SLOPES ARE AFFECTED IN THE VICINITY OF THE SITE.
 12. NO ASBESTOS CEMENT / UNKNOWN MATERIALS MAINS ON THE VICINITY OF THE SITE.
 13. NO CATHODIC PROTECTION MAINS ON THE VICINITY OF THE SITE.

SUBJECT SITE


PART COPY OF FRESH WATER MAINS RECORD PLAN(S)

W67880/2-SE-12A

REF. CODE: 02W24M SHEET 1 OF 1 SCALE 1:1000



水務署
 Water Supplies Department

Jolene Wong

From: JOLWONG@ramboll.com
Subject: FW: Enquiry for Existing Water Supply Network - Water Supply Impact Assessment for S16 Planning Application for a Proposed Development at Lot DD101 76 S.G & 76 S.H. San Tin

From: henry_yh_tsui@wsd.gov.hk <henry_yh_tsui@wsd.gov.hk>
Sent: Thursday, February 1, 2024 10:21 AM
To: Jolene Wong <JOLWONG@ramboll.com>
Cc: borze_th_yan@wsd.gov.hk; hy_ho@wsd.gov.hk
Subject: RE: Enquiry for Existing Water Supply Network - Water Supply Impact Assessment for S16 Planning Application for a Proposed Development at Lot DD101 76 S.G & 76 S.H. San Tin

You don't often get email from henry_yh_tsui@wsd.gov.hk. [Learn why this is important](#)

Dear Jolene,

Please find our response in blue below for your reference:-

1. Fresh & Saltwater Service Reservoirs serving the Subject Site
The concerned site will fall outside the supply zone of the new STLMC FWSR and ReWSR and keep being fed mainly by NTMFWPSR (both fresh water and TMF).
2. Supply zone of Fresh & Saltwater Service Reservoirs serving the Subject Site
There is currently no saltwater service reservoir. The NTMFWPSR is serving mainly San Tin, Kam Tin and Yuen Long areas.
3. The designed capacity, average water demand (daily consumption) and the spare capacity of the Fresh & Saltwater Service Reservoirs

FWSR	Comp	Avg. Daily Consumption
牛潭尾食水配水庫 Ngau Tam Mei PSR	40,750m ³	176 MLD
丹桂北食水配水庫 Tan Kwai Tsuen North FWSR	81,516m ³	55 MLD
橫州食水配水庫 Wang Chau FWSR	58,790m ³	16 MLD

4. Any other planned development within the supply zone of Fresh & Saltwater Service Reservoirs serving the Subject Site that needs to be accounted in the future and their fresh & saltwater demand.
Nil

Regards,

Henry Tsui

E/NTW (Distribution 5)

Email: henry_yh_tsui@wsd.gov.hk

Tel: 3701 5016