

Appendix 9

Water Supply Impact Assessment

Prepared for

Alex Development Limited

Prepared by

Ramboll Hong Kong Limited

**PROPOSED RESIDENTIAL DEVELOPMENT AT VARIOUS
LOTS IN D.D. 107 AND ADJOINING GOVERNMENT LAND,
FUNG KAT HEUNG, YUEN LONG**

WATER SUPPLY IMPACT ASSESSMENT

Date **October 2025**

Prepared by **Miko Wan**
Environmental Consultant

Signed



Approved by **Calvin Chiu**
Technical Director



Signed

Project Reference **CKHYLFKHEI00**Document No. **R9349_v1.3**

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1. INTRODUCTION

1.1 Project Background

- 1.1.1 The Application Site is located within an area in Fung Kat Heung primarily zoned “Industrial (Group D)” (“I(D)”) with a minor portion of it falling within R(A) and “Agriculture” (“AGR”) zone on the Approved Kam Tin North Outline Zoning Plan No. S/YL-KTN/11 (OZP) near the Proposed Sha Po Public Housing Development (SPPHD).
- 1.1.2 A S12A application for rezoning of the site to enable a private residential development at the site is submitted to the Town Planning Board for consideration.
- 1.1.3 Ramboll Hong Kong Limited is commissioned to provide water supply impact assessment (WSIA) consultancy services for the Proposed Development.

1.2 Application Site and its Environs

- 1.2.1 The site area is about 7,290 sq.m. It is located in Fung Kat Heung, currently bounded by access roads on north and east sides. It is surrounded by Lam Tsuen Country Park to the north, and existing warehouse and industrial uses to the east and south.
- 1.2.2 A Public Housing Development at Sha Po (SPPHD) is proposed to the immediate west of the Application Site. An engineering feasibility study (EFS) of the SPPHD was submitted as one of the supporting documents for the OZP amendment (RNTPC Paper No. 9/22). Its findings have been referenced to where appropriate (hereafter referred as “EFS”).
- 1.2.3 The location of the Application Site and its surrounding environs are shown in Figure 1.

1.3 Proposed Development

- 1.3.1 The Proposed Development comprises 2 residential towers (Tower 1 and Tower 2) of 48 storeys and 50 storeys (including 1 refuge floor) respectively, which gives a total of 1439 units. A clubhouse (GFA of about 1,253m²) and an outdoor swimming pool is planned.
- 1.3.2 Proposed Developments is tentatively to be completed in 2035, after the completion of SPPHD.
- 1.3.3 The Proposed Development scheme is shown in Appendix 1.

2. WATER SUPPLY IMPACT ASSESSMENT

2.1 Scope of Work

- 2.1.1 The aim of this study is to assess whether the existing water supply facilities serving the Application Site are sufficient to cope with the water demands from the Proposed Development and, if appropriate, to identify necessary improvement works.

2.2 Existing and Planned Water Supply

- 2.2.1 Reference has been made to Water Supplies Department (WSD) Record Plans, which cover the vicinity of the Application Site (see **Appendix 3**).

Freshwater Supply

- 2.2.2 According to the EFS of the Proposed SPPHD (see **Appendix 4**), there is an existing Ø700mm freshwater main along San Tam Road and a new Ø450mm freshwater main was proposed to tee off from the existing Ø700mm freshwater main.
- 2.2.3 Based on the information given by WSD, the Application Site is within the supply zone of Au Tau No.1 Fresh Water Service Reservoir (AT No.1 FWSR) and Au Tau No.2 Fresh Water Service Reservoir (AT No.2 FWSR).

Flushing Water Supply

- 2.2.4 There is no saltwater main supplying the Application Site and its vicinity. Therefore, fresh water will be used for both potable and flushing purposes for the Proposed Development.

2.3 Water Demand from the Proposed Development

- 2.3.1 Reference has been made to WSD's DI 1309 for unit water demands and supply requirements. Referring to **Appendix 2** of the calculations of water demand from the Proposed Development (based on 3886 residents and 41 employees from the Clubhouse), the fresh and flushing water demand is 893.8 m³/day and 272.0 m³/day, respectively.
- 2.3.2 The total fresh water demand for the Proposed Development is 1,165.8 m³/day. The peak flow consumption contributed by the Proposed Development is 0.037m³/s (3 x average daily demand for freshwater and 2 x average daily demand for flushing water).

2.4 Assessment of Water Supply Impact

Watermains Impacts

- 2.4.1 According to Manual of Mainlaying Practice (2012 Edition) by WSD, pipelines should be of sufficient size such that the maximum flow velocity under peak flow for both pumping mains and distribution mains should be less than 3m/s. With an assumed maximum desirable velocity of 1.5m/s, the capacities of individual fresh watermains of different diameters have been determined.
- 2.4.2 New Ø200mm freshwater main is proposed to tee off from the Ø450mm freshwater mains proposed and constructed by SPPHD. If SPPHD is delayed, the new interim freshwater main will be proposed and connected to the existing Ø700mm freshwater main in San Tam Road. **Figure 4** show the proposed interim water supply scheme if SPPHD is delayed. The alignment, size and connections of the water mains for the Proposed Development will be finalized in the detailed design stage.

- 2.4.3 According to the WSD's record (**Appendix 3**), there are existing freshwater mains within the Application Site. Diversion works is therefore proposed and the most of existing water main located within the Application Site will be abandoned, and waterworks reserve will be provided for remaining existing watermain within application site. (see **Figure 3**).
- 2.4.4 Based on the calculations in Table 2 of **Appendix 2**, these water mains will have adequate capacity to cater the water demand of the Proposed Development.
- 2.4.5 With the proposed connection in place, no unacceptable impact on the watermain is anticipated.

3. OVERALL CONCLUSION

3.1 Conclusion

- 3.1.1 A residential development is proposed in DD107, Fung Kat Heung, Yuen Long. The potential water supply impact has been quantitatively addressed.
- 3.1.2 At the moment, only fresh water supply is available in the vicinity of the Application Site. Therefore, fresh water is assumed to be used for both potable and flushing purposes.
- 3.1.3 The total water demand (both potable and flushing) of the Proposed Development is estimated to be 1,165.8m³/day.
- 3.1.4 A new Ø200mm freshwater main is proposed to be connected to the Ø450mm freshwater mains (to be constructed by SPPHD). The Ø450mm water main would have adequate capacity to cater for the total water demand of the Proposed Development.
- 3.1.5 The most of existing water main located within the Application Site will be abandoned and diversion works is proposed. Waterworks reserve will be provided for the remaining existing watermain within application site.
- 3.1.6 It is concluded that the Proposed Development will have no adverse water supply impact.

Figures

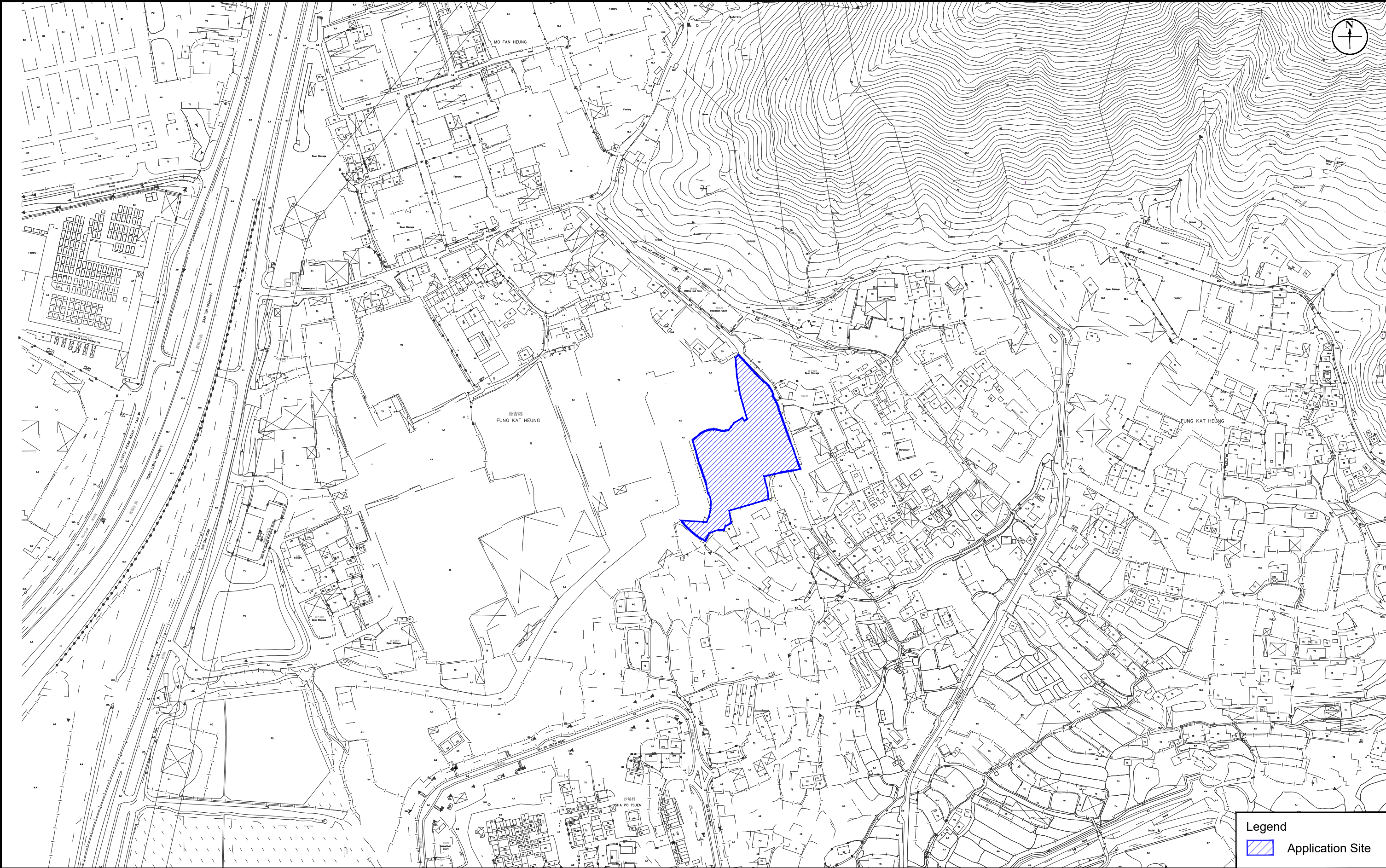


Figure: 1
Title: Location of the Application Site and its Environs

Project: Proposed Residential Development at Various Lots in D.D. 107 and Adjoining Government Land , Fung Kat Heung, Yuen Long

Legend

Application Site

RAMBOLL

Drawn by: MW

Checked by: CC

Rev.: 1.0

Date: Mar 2024

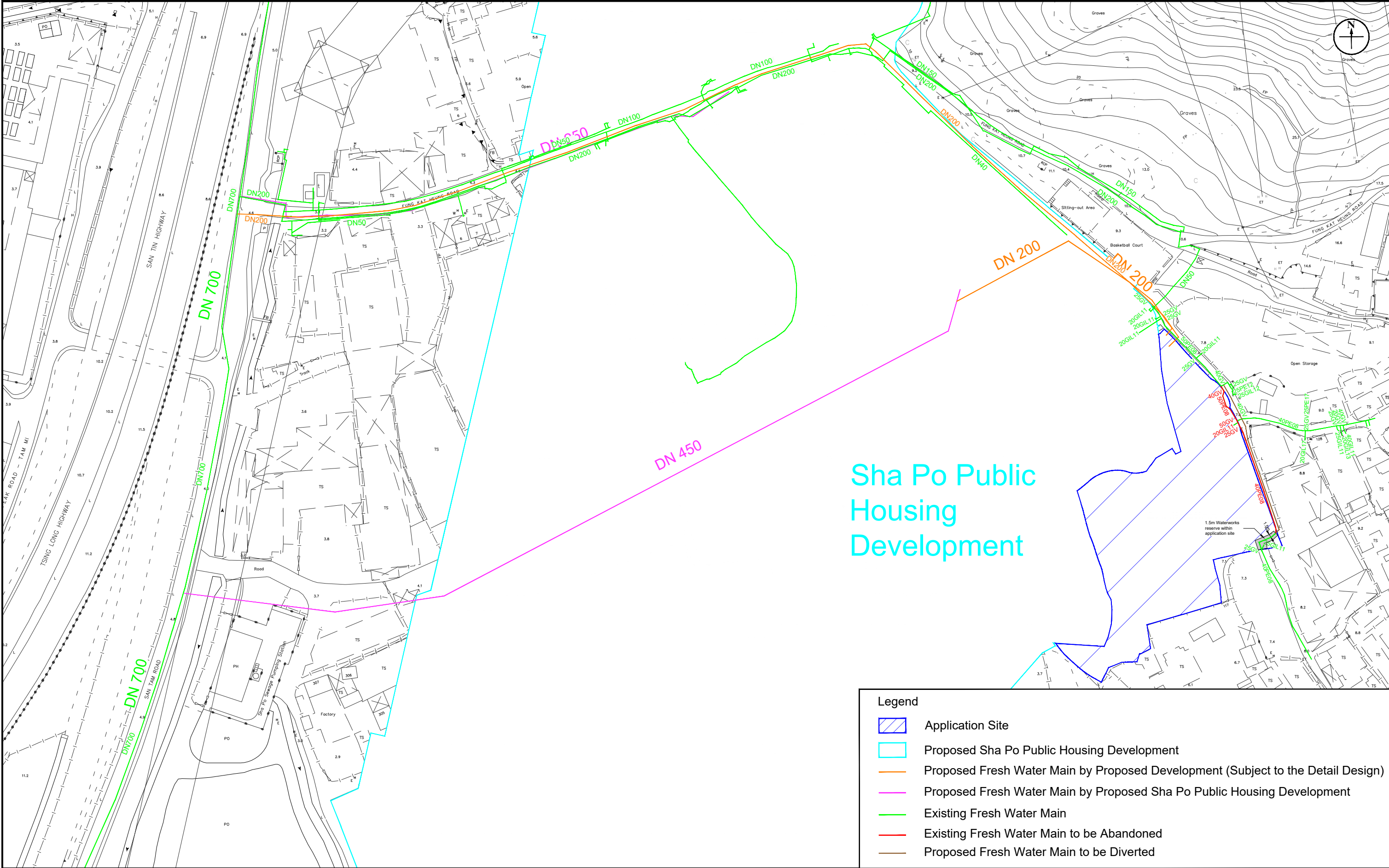


Figure: 2			
Title: Existing and Proposed Fresh Water Main Arrangement		Drawn by: GW	
		Checked by: CC	
Project: Proposed Residential Development at Various Lots in D.D. 107 and Adjoining Government Land , Fung Kat Heung, Yuen Long		Rev.: 1.2	
		Date: Apr 2025	

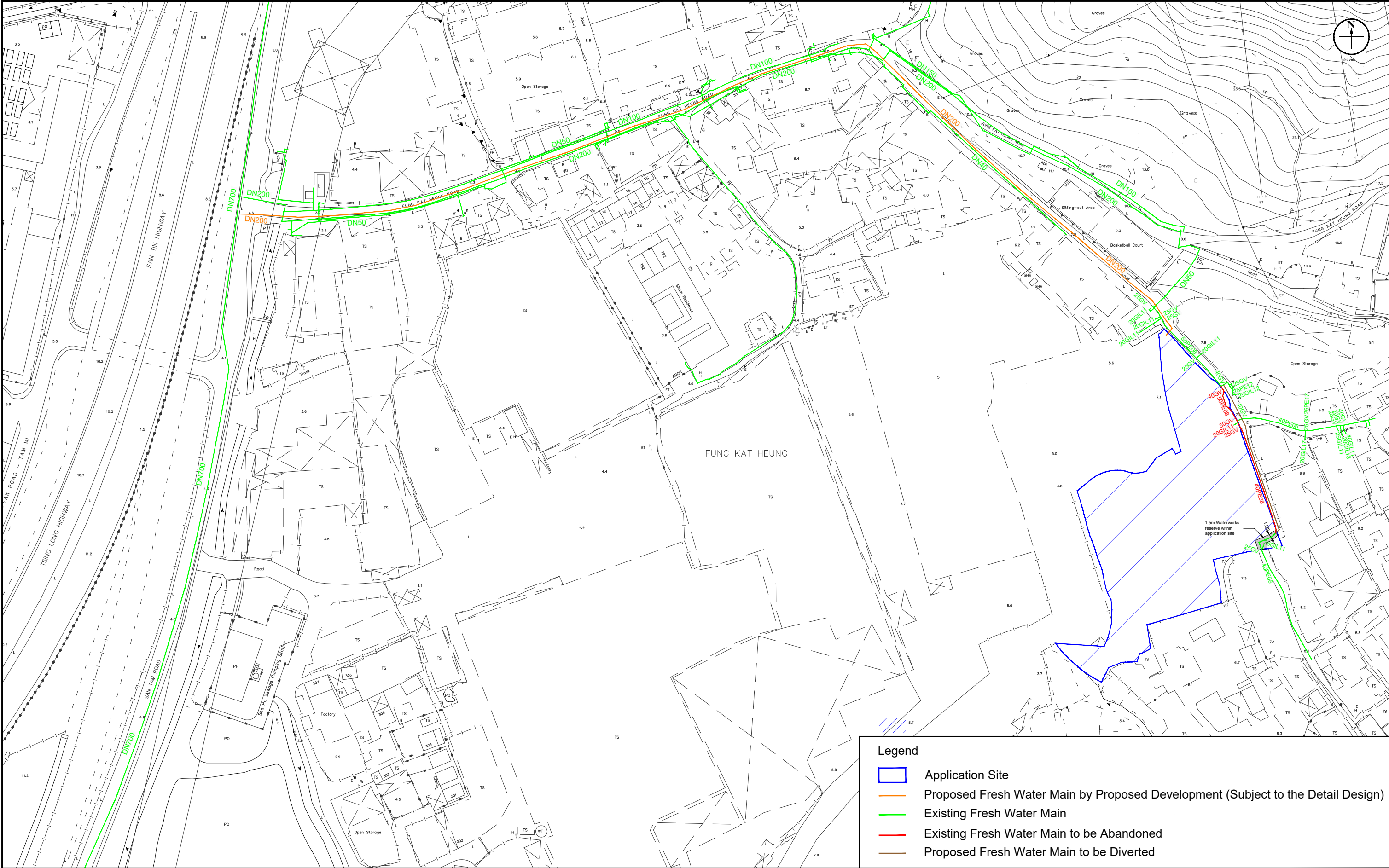
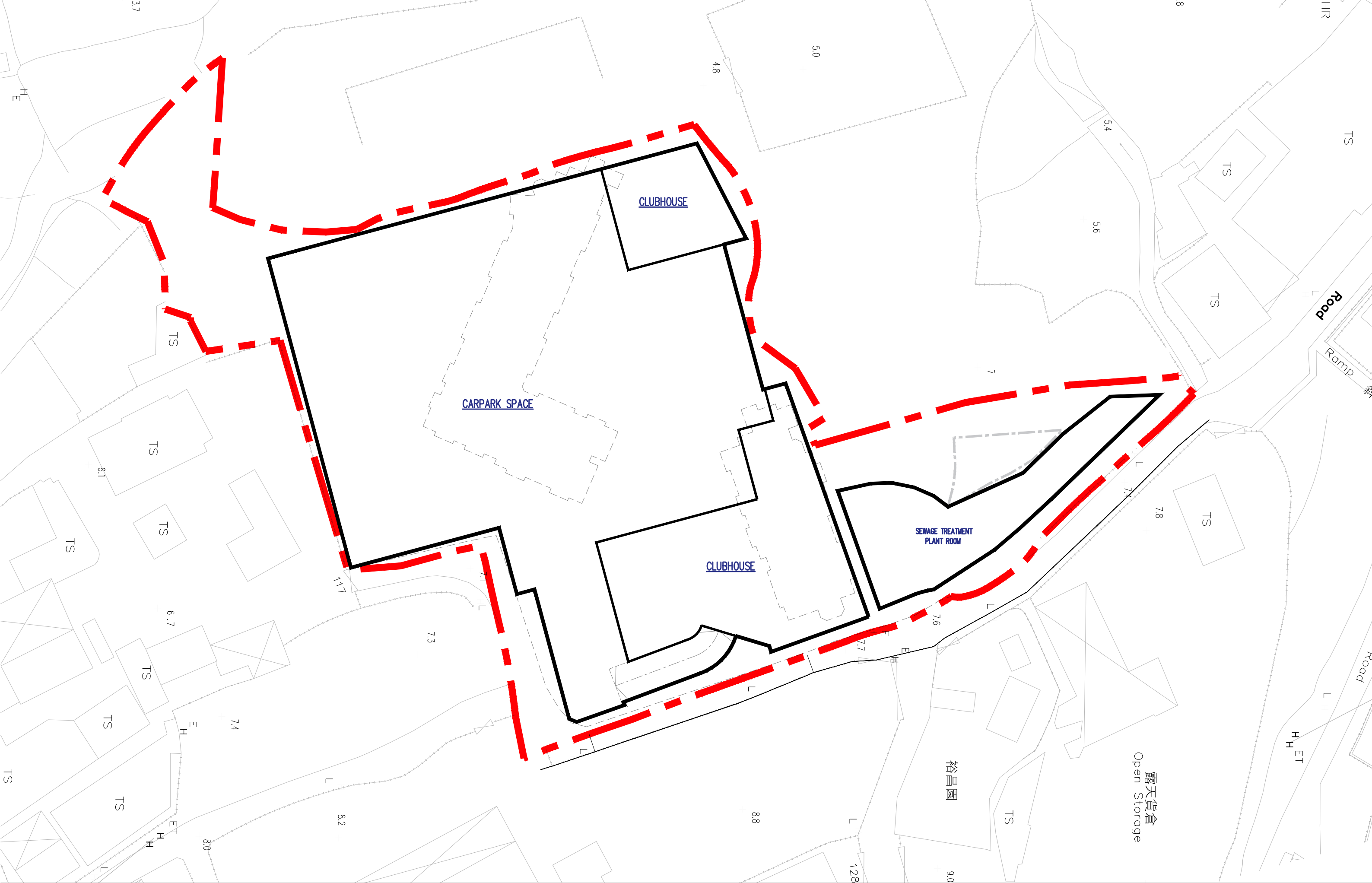


Figure: 4			
Title: Proposed Interim Water Supply Scheme		Drawn by:	GW
		Checked by:	CC
Project: Proposed Residential Development at Various Lots in D.D. 107 and Adjoining Government Land , Fung Kat Heung, Yuen Long		Rev.:	1.2
		Date:	Apr 2025

Appendix 1 Master Layout Plan



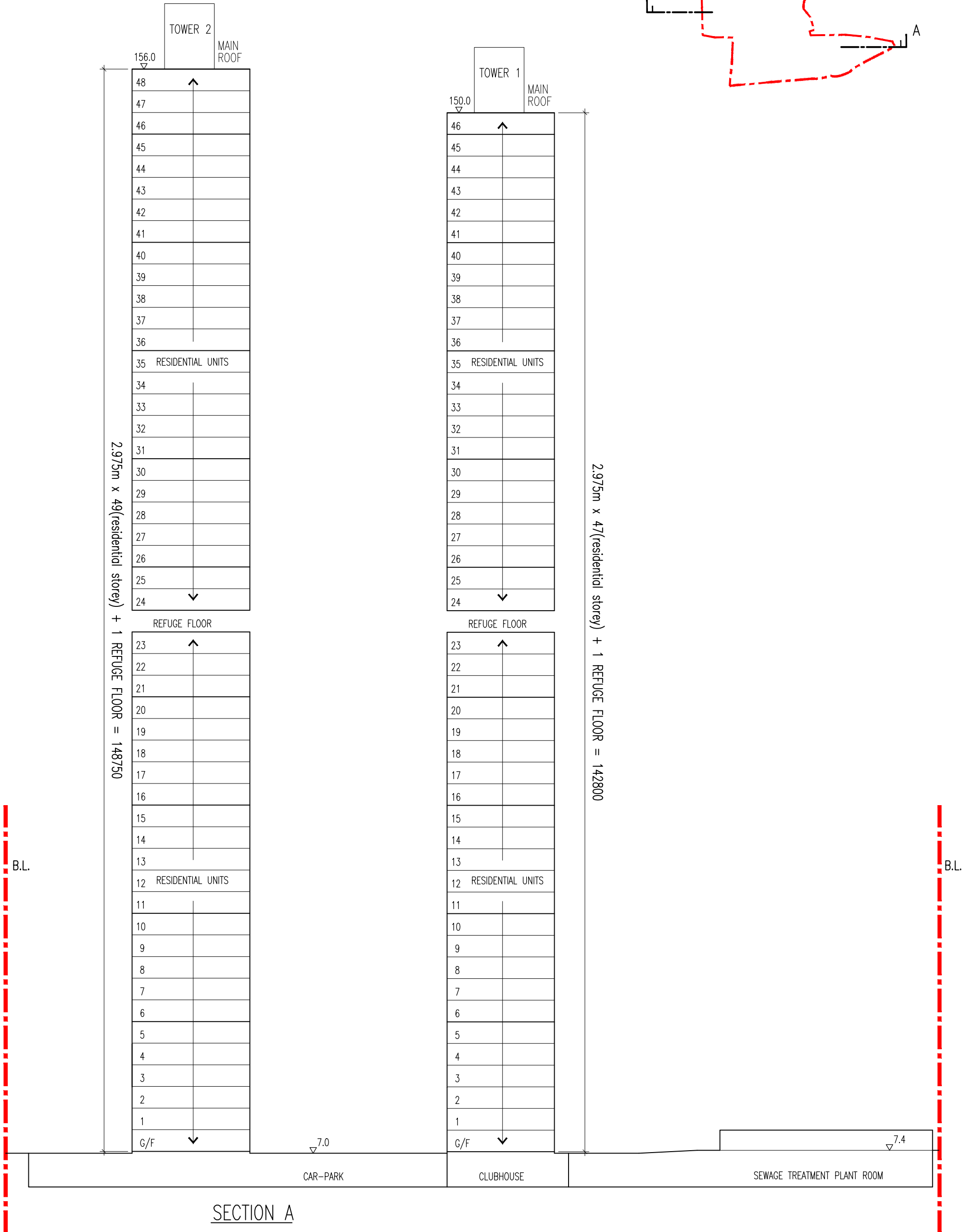
**Proposed Residential Development at Various Lots in D.D. 107
and Adjoining Government Land , Fung Kat Heung, Yuen Long.**

BASEMENT PLAN (1:500)

Proposed Residential Development at Various Lots in D.D. 107
and Adjoining Government Land , Fung Kat Heung, Yuen Long.

SCHEMATIC SECTION

(1:500)



Appendix 2 Water Demand Calculation

Table 1 - Future Water Demands of Proposed Development

					Freshwater		Flushing Water	
		Type of Use	Population (head)	Area (m ²)	Daily Unit Demand ⁽¹⁾ (m ³ /head/day)	Daily Demand (m ³ /day)	Daily Unit Demand ⁽¹⁾ (m ³ /head/day)	Daily Demand (m ³ /day)
Future (Proposed Development)	Residential Development	R1	3,886	-	0.230	893.78	0.070	272.0
Total Demand (m ³ /day)					893.8		272.0	

Total Freshwater Demand (m³/day) = 1165.8

Remarks:

(1) Water Supplies Department Departmental Instruction 1309. Service Trade of 0.040 m³/head/day (Yuen Long) adopted.

Table 2 - Capacity of the Proposed Water Supply Systems

Portion	Diameter (mm)	Area (m ²)	Peak factor (¹)	Freshwater Demand, Q (m ³ /day)	Peak factor (¹)	Saltwater Demand, Q (m ³ /day)	Factored Q (m ³ /s)	Velocity of Water Main (m/s) (²)	Flow Rate of Water Main (m ³ /s)	Capacity of water main occupied by the Proposed Development
Watermains proposed and constructed by Sha Po Public Housing Development (SPPHD)	450	0.159	3	893.8	2	272.0	0.037	1.50	0.239	15.6%
New watermains for Application Site, to be connected to SPPHD watermains	200	0.031	3	893.8	2	272.0	0.037	1.50	0.047	79.2%

Remarks:

(¹) Peak factor for distribution mains refers to Departmental Instruction No. 1309 from WSD

(²) Velocity of water mains refers to Departmental Instruction No. 1309 from WSD

Table 3 - Capacity of the Proposed Interim Water Supply Scheme

Portion	Diameter (mm)	Area (m²)	Peak factor (¹)	Freshwater Demand, Q (m³/day)	Peak factor (¹)	Saltwater Demand, Q (m³/day)	Factored Q (m³/s)	Velocity of Water Main (m/s) (²)	Flow Rate of Water Main (m³/s)	Capacity of water main occupied by the Proposed Development
Existing DN700 Water Main along San Tam Road	700	0.385	3	893.8	2	272.0	0.037	2.00	0.770	4.9%
New watermains for Application Site, to be connected to San Tam Road watermains	200	0.031	3	893.8	2	272.0	0.037	1.50	0.047	79.2%

Remarks:

(¹) Peak factor for distribution mains refers to Departmental Instruction No. 1309 from WSD

(²) Velocity of water mains refers to Departmental Instruction No. 1309 from WSD

**Appendix 3 Fresh Water Mains Record Plan obtained from Water Supplies
Department**

Miko Wan

From: hy_ho@wsd.gov.hk
Sent: Wednesday, 20 March 2024 12:21
To: Miko Wan
Cc: borze_th_yan@wsd.gov.hk; Calvin Chiu; henry_yh_tsui@wsd.gov.hk; Monique Wong
Subject: RE: Water Supply Impact Assessment for a Proposed Development at Various Lots in DD107, Fung Kat Heung, Yuen Long - Enquiry for Existing Water Supply Network

Dear Miko,

We spoke. I was informed that the it is intended to rezone the subject lot to R(A). Please use the water demand for R1 instead of R2 in your assessment.

Regarding your proposed connection to the distribution mains to be laid by Sha Po public housing development, please be advised that the serving service reservoir will be Au Tau No. 1 and No. 2 FWSR. You should be aware that any delay of the Sha Po Public Housing Development will affect the occupation of your development. Otherwise, you will need to extend your supply main to San Tam Road to connect with the DN700 FWM.

Would Henry and Borze please provide the information of Au Tau No.1 and No.2 FWSR. Thank you.

Regards,
H. Y. HO , Jeffrey
Engineer/Planning(6)
Water Supplies Department
Tel : 2152 5778

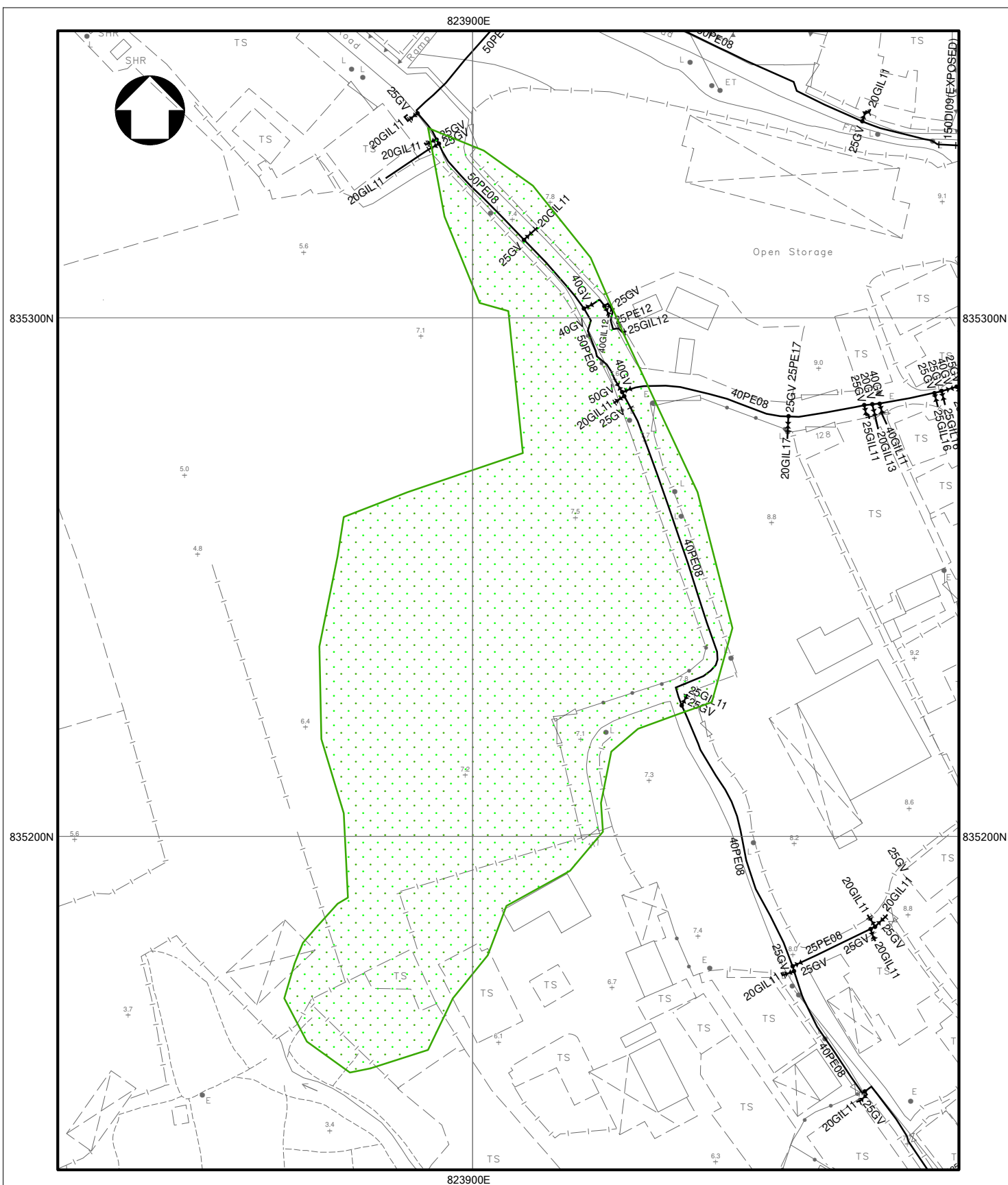
From: Miko Wan <MIKOWAN@ramboll.com>
To: "henry_yh_tsui@wsd.gov.hk" <henry_yh_tsui@wsd.gov.hk>
Cc: "borze_th_yan@wsd.gov.hk" <borze_th_yan@wsd.gov.hk>, "hy_ho@wsd.gov.hk" <hy_ho@wsd.gov.hk>, Calvin Chiu <cchiu@ramboll.com>, Monique Wong <MWSWONG@ramboll.com>
Date: 19/03/2024 15:34
Subject: RE: Water Supply Impact Assessment for a Proposed Development at Various Lots in DD107, Fung Kat Heung, Yuen Long - Enquiry for Existing Water Supply Network

Dear Henry,

As discussed, please find the proposed connection of our site. We would like to connect the proposed fresh water main by Proposed Sha Po Public Housing Development. Therefore, we would like to ask is there any update on the Fresh Water Service Reservoirs.

Thanks.

Kind regards



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.
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SUBJECT SITE



PART COPY OF FRESH WATER MAINS RECORD PLAN(S)

W67880/6-NE-1D

FILE REF: Various Lots in DD107

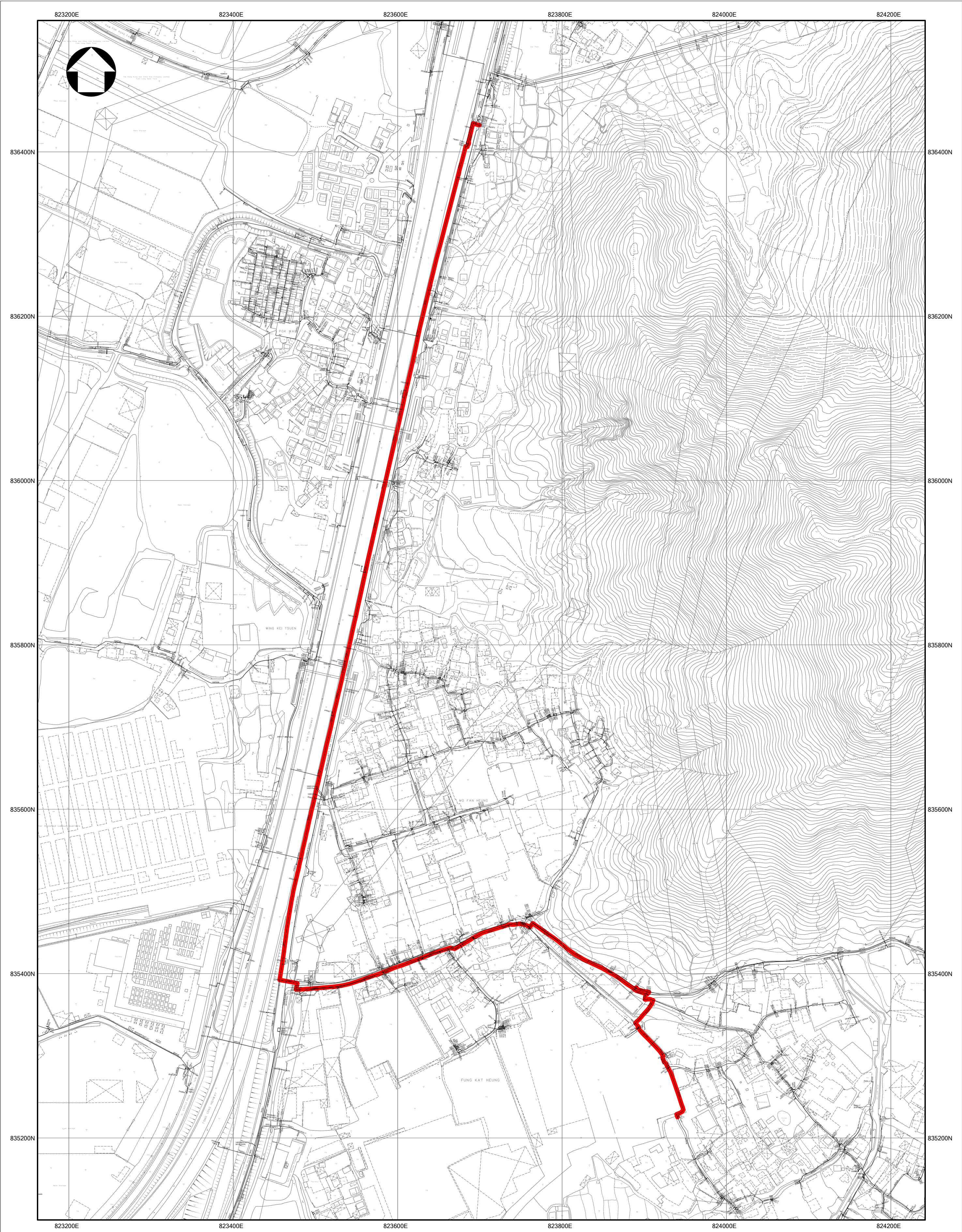
REF. CODE: 09W24M

SHEET 1 OF 1

SCALE 1:1000



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 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 SLOPES ARE AFFECTED IN THE VICINITY OF THE SITE.
 11. ASBESTOS CEMENT / UNKNOWN MATERIALS MAINS WAS FOUND IN THE VICINITY OF THE SITE.
 12. NO CATHODIC PROTECTION MAINS ON THE VICINITY OF THE SITE.

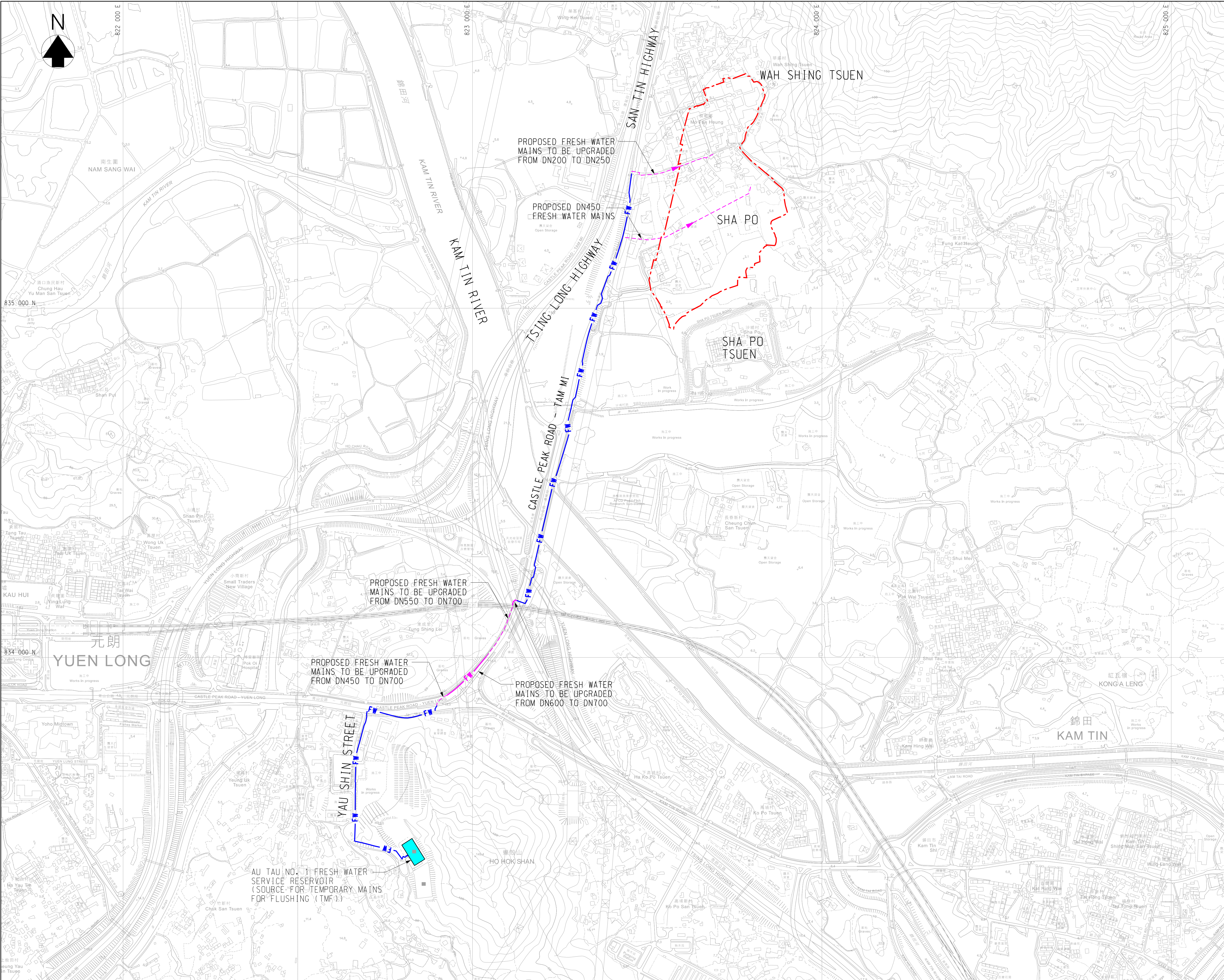
PART COPY OF FRESH WATER MAINS RECORD PLAN(S)

W67880/2-SE-21C, 21D, 22C, 6-NE-1A, 1B, 1C, 1D, 2A & 2C

REF. CODE: 02W25M	SHEET 1 OF 1	SCALE 1:3000
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**Appendix 4 Proposed Major Fresh Water System Layout extracted from
Engineering Feasibility Study of Proposed Public Housing
Developments at Sha Po**



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LEGEND:

- PROPOSED DEVELOPMENT BOUNDARY
- EXISTING FRESH WATERMAINS
- PROPOSED FRESH WATERMAINS TO BE UPGRADED (INDICATIVE)
- PROPOSED FRESH WATER SERVICE RESERVOIR RECONSTRUCTION (INDICATIVE) (SOURCE FOR TEMPORARY MAINS FOR FLUSHING (TMF))

Revision	Date	Description	Initial	
	Designed	Checked	Drawn	Checked
Initial	BW	YKL	SZ	LCH
Date	07/21	07/21	07/21	07/21
Approved				

Agreement no.

CE10/2020 (CE)

Project title

SITE FORMATION AND INFRASTRUCTURE WORKS FOR PROPOSED PUBLIC HOUSING DEVELOPMENTS AT SHA PO, SHAP PAT HEUNG AND TAI KEI LENG, YUEN LONG - FEASIBILITY STUDY

Drawing title

PROPOSED MAJOR FRESH WATER SYSTEM LAYOUT

Drawing no.	Revision
406041/SP/FR/0902	-

Scale

A1 1 : 5000
A3 1 : 10000

土木工程拓展署
CEDD Civil Engineering and Development Department

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