Appendix 14

Water Supply Impact Assessment

MOTT MACDONALD

Rezoning from “Residential (Group C)2” and “Open Space” zones to “Residential (Group C)4” zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.

Water Supply Impact Assessment (Rev. A1)

October 2025

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registered in Hong Kong no. 236497

Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
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Contents

1 Introduction

1.1 General

1.1.1 Mott MacDonald Hong Kong Limited (hereafter as “MMHK”) was commissioned by the Applicant to prepare a Water Supply Impact Assessment (WSIA) for supporting the proposed residential development at Shek Kong, Yuen Long (the Development). This WSIA Report forms part of the application document for supporting the Development of the proposed residential development at the Site by rezoning the Site from “Residential (Group C)2” and “Open Space” to “Residential (Group C)4” zone.

1.2 Key Development Parameters

1.2.1 The location of the Development and layout plan are shown in **Appendices A** and **B**. The proposed development parameters are listed below:-

Table 1.2.1: Development parameters for development

Item	Details
Development Site Area	About 8,580 m^2
Development Theme	Residential development
No. of Residential Unit	240

1.3 Objectives of the Assignment

1.3.1 This WSIA Report aims to identify the existing and planned water supply networks within the Development and to investigate the physical constraints on the Development due to the existing and planned water supply networks. This includes fresh water and flushing water where available.

1.4 Structure of the Report

1.4.1 This WSIA report contains the following sections in addition to this introduction (Section 1):-

Section 2 – Methodology and Design Parameters for Water Supply Impact Assessment

Covering the approach of the WSIA and the parameters for water consumption prediction.

Section 3 – Existing Water Supply System

Briefly discussing the existing water supply system in vicinity of the proposed residential development.

Section 4 – Estimation of Water Demand of the Proposed Residential Development

Identifying and estimating the water demand arising from the proposed residential development in respect to published guidelines.

Section 5 – Proposed Water Supply Arrangement

Discussing the potential water supply system for the proposed residential development.

Section 6 – Conclusion

Summarising the findings and concluding the water supply impact arising from the proposed residential development.

2 Methodology and Design Parameters for Water Supply Impact Assessment

2.1 General Approach

2.1.1 The WSIA is carried out to identify and assess if there are any potential adverse impacts arising from the proposed residential development.

2.2 Methodology

Assessment Approach

2.2.1 The following approach and methodology have been adopted in this water supply impact assessment:-

- Estimate the water demand of the proposed residential development;
- Identify the existing and planned water supply systems within the study area; and
- Propose the water supply arrangement for the proposed residential development

2.3 Design Parameters

Design Population and Employee Data

2.3.1 The design population of the proposed residential development is shown in **Table 2.1** below. The layout plan of the proposed residential development refers to **Appendix B**.

Table 2.1: Population data of the proposed residential development

Type	Unit	Household Size	Population (nos.)
Residential Use (R3)	240	2.7	648
Residential (Service Trade)	-	-	648
		Total =	648

Remark:-

i. According to 2021 Population Census, the average domestic household size of Kam Tin is 2.7.

Unit Demand Factor

2.3.2 The unit demands used in estimating the fresh water and flushing water consumption for the proposed residential development are presented in **Table 2.2**. The unit demands are based on the unit water demand in Water Supply Department Departmental Instruction (WSD DI) 1309.

Table 2.2: Unit demand for the proposed residential development

Type of Water Demand	Unit	Fresh Water Demand	Flushing Water Demand
Residential Use (R3) (i)	$m^3/h/d$	0.30	0.104
Residential (Service Trade) (ii)	$m^3/h/d$	0.04	-

Remark:-

i. As advised by WSD, the fresh water unit demand for multi-storey residential development is $0.3m^3$/head/day and flushing water demand is $0.104m^3$/head/day.
ii. The service trade are referenced on WSD DI 1309.

Peaking Factor

2.3.3 In accordance with WSD DI 1309, the minimum capacity of the distribution system should be sufficient for the following peak demands.

- Fresh Water Supply – 3 times mean daily demand
- Flushing Water Supply – 2 times mean daily demand

Peaking Flow Velocity

2.3.4 According to Section 1.2.1 of WSD's Manual of Main Laying Practice (2012 Edition), the maximum flow velocity under peak flow for both pumping mains and distribution mains should be less than 3m/s.

2.3.5 Minimum velocity of 1m/s under peak flow is also desirable to avoid water stagnant.

2.3.6 Design flow velocity is preferably to be ranged between 1m/s and 3m/s under peak flow.

3 Existing Water Supply System

3.1.1 According to the WSD’s water main record, salt water main is not available in the Kam Tin area.

3.1.2 Potable water of the proposed residential development as well as the surrounding area are served by nearby Au Tau / Ngau Tam Mei Fresh Water Primary Service Reservoirs which have a total capacity of 141,298 m^3.

3.1.3 Series of distribution mains ranging from DN1400 to DN450 convey the fresh water supply to the area respectively.

3.1.4 Fresh water main of 450mm diameter along Kam Tin Road is located at the South of the Site. Existing water supply system is shown in **Appendix C**.

4 Estimation of Water Demand of the Proposed Residential Development

4.1 Estimated Water Demand under the Proposed Residential Development

4.1.1 Based on the population data and unit demand factor listed in **Table 2.1** and **Table 2.2**, the total mean daily fresh water and flushing water demand for the proposed residential development is estimated to be about 306m^3/day. The details of the water demand estimation are shown in **Table 4.1**.

Table 4.1: Water demand estimation for the proposed residential development

Type of Water Demand	Population (nos.)	Fresh Water Demand (m^3/h/d)	Flushing Water Demand (m^3/h/d)	Total Mean Fresh Water Demand (m^3/d)	Total Mean Flushing Water Demand (m^3/d)
Residential Use (R3)	648	0.30	0.104	194.40	67.39
Residential (Service Trade)	648	0.04	-	25.92	-
Landscaping	-	-	-	18.02	-
			Total =	305.73 (says 306)	

Remark:-

i. Water demand for irrigation normally ranges from 6 to 10 L/m^2/day, as such irrigation water demand of 7 L/m^2/day is adopted. The landscape area of the Site is assumed to be 30% of the Site area (~2,574 m^2)

5 Proposed Water Supply Arrangement

5.1 Water Demand and Water Supply Arrangement

5.1.1 As discussed in **Section 4**, the estimated fresh and flushing water demands for the proposed residential development are approximately 306m^3/d in total. For supplying water to the proposed residential development under this planning application, it is proposed to branch off a DN100 fresh water main from the existing DN450 fresh water main at Kam Tin Road. The proposed water mains are shown in **Appendix D**.

6 Conclusion

6.1.1 Based on the unit water demand and the estimated population, the total fresh and flushing water demands required for the proposed residential development is approximately 306m^3/d. For supplying water to the proposed residential development under this planning application, it is proposed to branch off a DN100 fresh water main from the existing DN450 fresh water main at Kam Tin Road.

7 Appendices

Appendix A Location Plan of the Proposed Residential Development

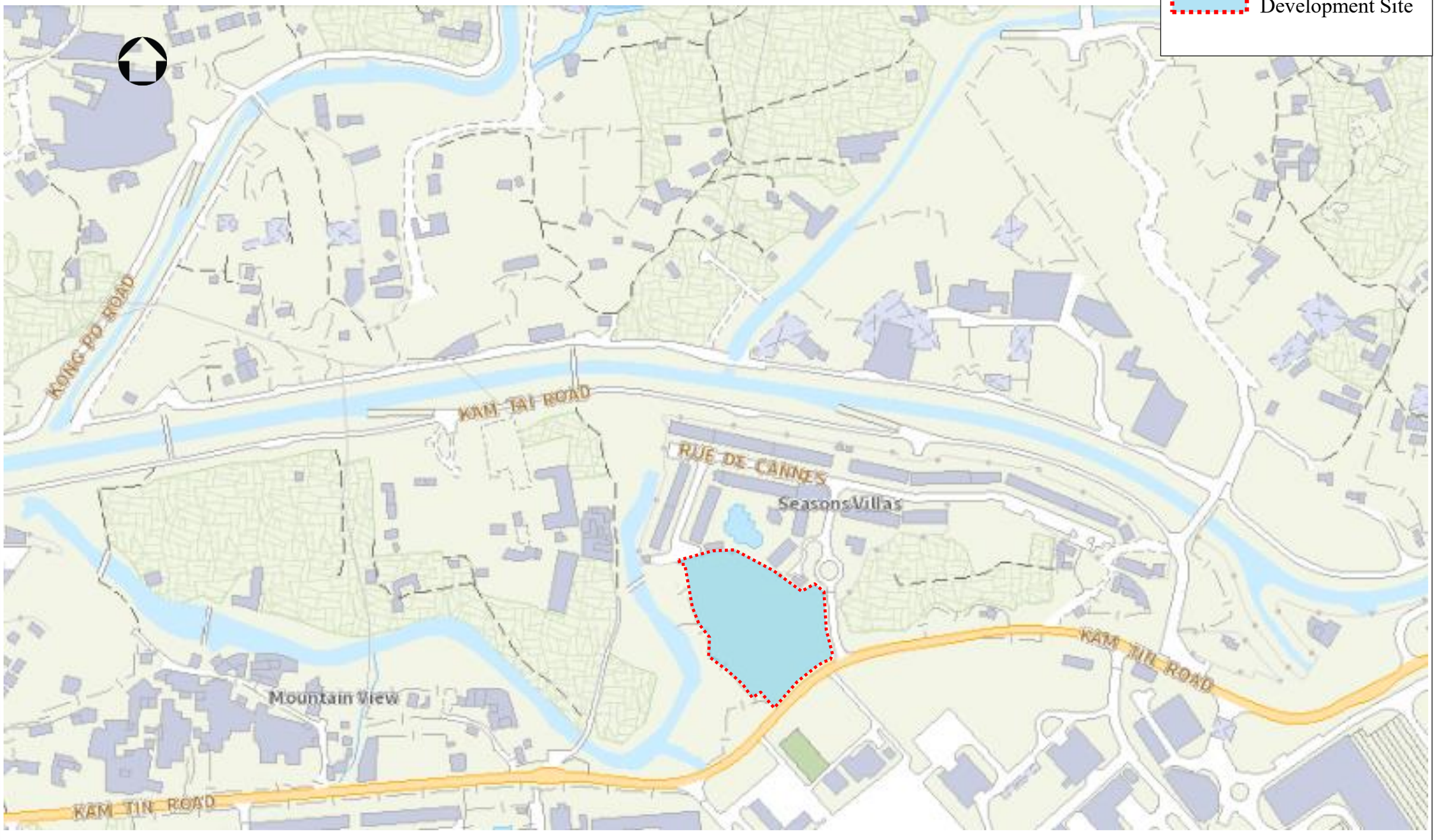
Appendix B Layout Plan for the Proposed Development

Appendix C Existing Water Main Layout Plan

Appendix D Proposed Water Main Layout Plan

Appendix A

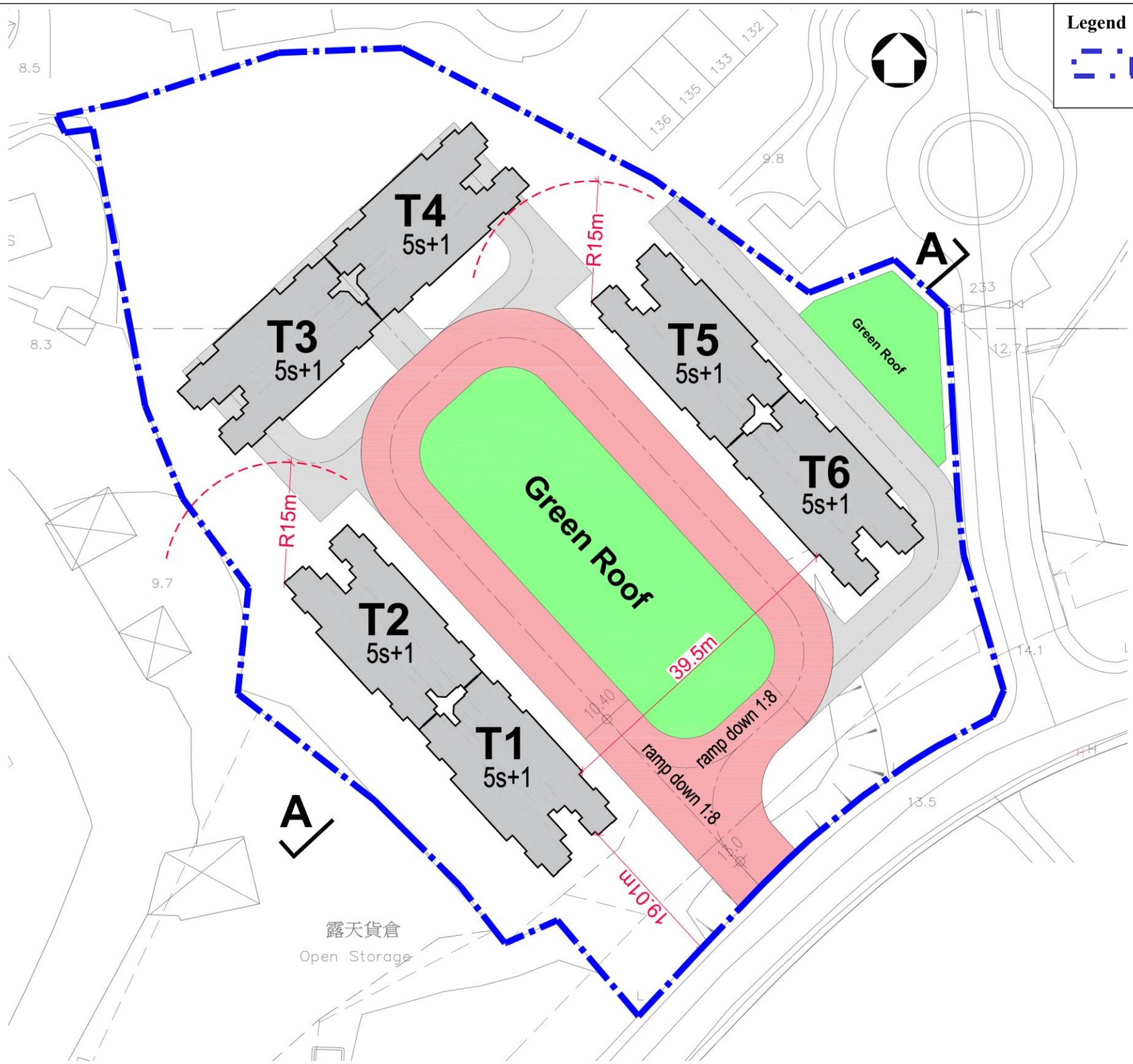
Location Plan of the Proposed Residential Development



Project	**Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.**	MOTT MACDONALD
Title	**Location Plan**	**Appendix A**
Date Jul 2025	**Scale** N.T.S.	**File**

Appendix B

Layout Plan for the Proposed Development



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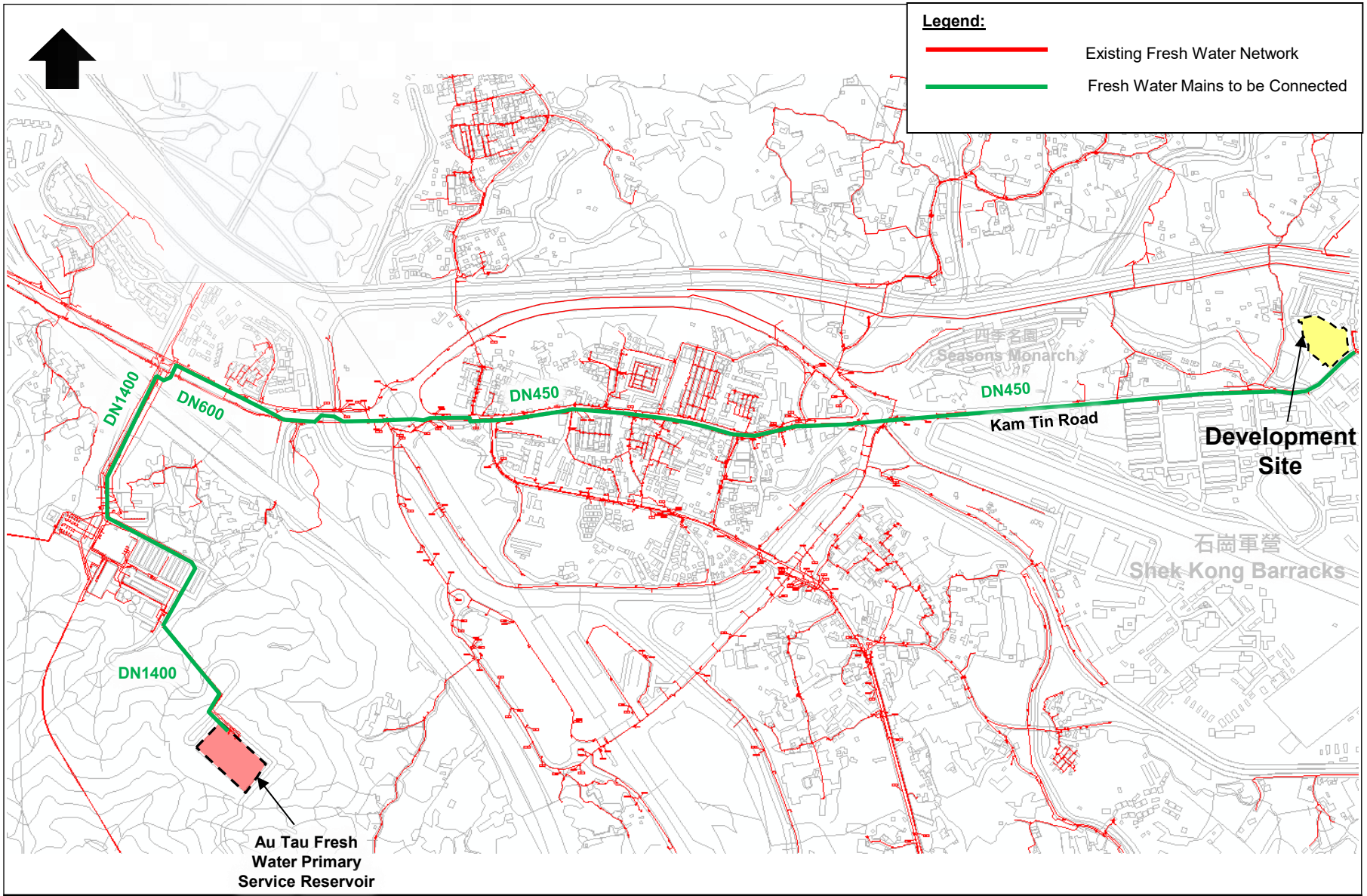
Title	**Layout Plan for the Proposed Development**	**Appendix B**
Date Jul 2025	**Scale** N.T.S.	**File**

Appendix C

Existing Water Main Layout Plan



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Title	**Existing Water Main Layout Plan**
Date Jul 2025	**Scale** N.T.S. **File**

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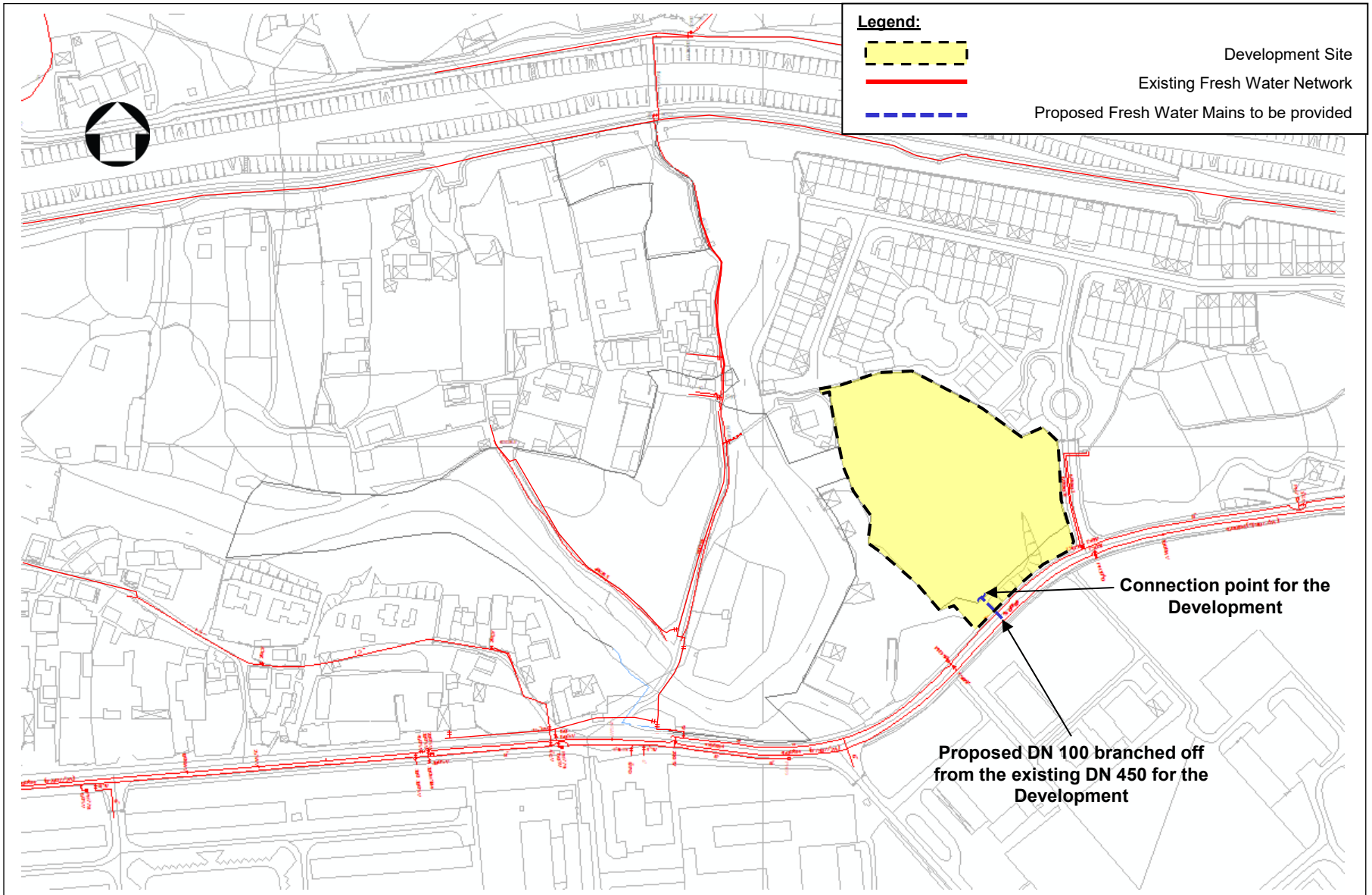
Appendix C

Appendix D

Proposed Water Main Layout Plan



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Date	Scale	File
Jul 2025	N.T.S.	

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Appendix D