KTA
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規劃顧問有限公司

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By Hand

Our Ref: S3046/DD112_LFT_YL/22/034Lg

7 March 2025

Secretary, Town Planning Board
15/F, North Point Government Offices
333 Java Road
North Point
Hong Kong

Dear Sir/ Madam,

Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

- Section 12A Amendment of Plan Application No. Y/YL-SK/1 -

(Submission of Consolidated Version)

We refer to the captioned S12A Amendment of Plan Application, which was submitted to the Town Planning Board ("TPB") on 28 April 2022.

On behalf of the Applicant, Tenox Development Limited, we hereby submit 15 copies of the Consolidated Supporting Planning Statement ("Consolidated SPS) to facilitate the consideration of the captioned Planning Application by the TPB. The Consolidated SPS contains the latest version of the development scheme and technical assessments that have been previously submitted to TPB under various Further Information ("FI") submissions.

Thank you for your kind attention.

Yours faithfully
For and on behalf of
KTA PLANNING LIMITED

Pauline Lam

cc. the Applicant & Team

PL/CL/EC/vy

S12A AMENDMENT OF PLAN APPLICATION
APPROVED SHEK KONG OUTLINE ZONING PLAN NO. S/YL-SK/9

Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

Supporting Planning Statement (Volume 1)

MARCH 2025

Applicant:

Tenox Development Limited

Consultancy Team:

KTA Planning Limited
China Hong Kong Ecology Consultants Limited
Stephen Lai Studio Limited
CTA Consultants Ltd.
Westwood Hong & Associates Ltd.
Mott MacDonald Hong Kong Ltd.

KTA PLANNING LIMITED
規劃顧問有限公司

S3046_PS_V09

Executive Summary

This Planning Statement is prepared and submitted on behalf of Tenox Development Limited (“the Applicant”) to seek approval from the Town Planning Board (“TPB”) under section 12A of the Town Planning Ordinance for proposed amendments to the Approved Shek Kong Outline Zoning Plan No. S/YL-SK/9 (the “Approved OZP”), to enable the Proposed Residential Development at Various Lots in D.D. 112 and adjoining Government Land, Kam Sheung Road, Shek Kong, New Territories (the “Rezoning Site/ Site”). The proposed amendment is to rezone/upzone the Rezoning Site from “Residential (Group D)” (“R(D)”) to “Residential (Group C)” (“R(C)”).

An indicative schematic development proposal for the proposed residential development is prepared to facilitate the TPB’s consideration of this rezoning application. Based on the site area of about 41,290m^2 and a domestic plot ratio 0.8, the total domestic Gross Floor Area (“GFA”) is about 33,032m^2. The Proposed Development will yield a total of 850 residential units with an average unit size of about 38.9m^2.

The Proposed Rezoning is fully justified for the following reasons:

(a) The Proposed Rezoning is in line with the Government’s Policy and Planning Strategy to increase land supply for Housing and unleash the development potential of underutilized land (in Shek Kong area);

(b) A “R(D)” zoning for the area without “high concentration of temporary structures”, yet intended for “improvement and upgrading of existing temporary structures”, is considered inappropriate for the Site and a waste of land resources;

(c) The Proposed Rezoning facilitates Earlier Implementation of Residential Development and meeting urgent Housing Demand;

(d) The Proposed Development demonstrates appropriate Development Quantum and in-line with the range of Plot Ratio proposed within the Kam Tin South and Pat Heung area;

(e) The Proposed Development has incorporated significant Planning and Design Merits, including Design and Disposition of building blocks with Adequate building setback; and

(f) Technical Assessments demonstrated that the Proposed Development will not result in insurmountable visual, traffic, landscape, noise, drainage, sewerage, water supply, water quality, land contamination, waste management, air quality and ecological impacts.

In consideration of the above, we sincerely request that the TPB to support this Rezoning Application from planning and technical perspectives.

行政摘要
（內文如有差異，應以英文版本為準）

申請人 Tenox Development Limited，擬就城市規劃條例第 12A 條向城市規劃委員會(下稱「城規會」) 申請修訂石崗分區計劃大綱圖核准圖編號 S/YL-SK/9(下稱「大綱圖」)。擬議修訂包括將位於元朗石崗丈量約份第 112 約多個地段及毗連政府土地(下稱「申請地點」)， 由「住宅(丁類)」地帶改劃為「住宅(丙類)」地帶。

擬議的指示性發展計劃是促進城規會考慮。申請地點面積約 41,290 平方米，擬議之住宅用地地積比率為 0.8。擬議的樓面面積約 33,032 平方米。擬議發展計劃將提供 850 住宅單位；平均單位面積為 38.9 平方米。

擬議之圖則修訂理據如下：

(a) 改劃方案完全配合政府現時推行的房屋政策，能在較短時間內提供房屋供應及釋放未被充分利用的土地發展潛力（如是次申請地點於石崗位置);

(b) 現時「住宅（丁類）」地帶的規劃意向乃鼓勵「把現有的臨時構築物重建作永久建築物， 以改善鄉郊地區現有的臨時構築物」，但申請地點內主要為閒置土地，並非存有高密度的臨時構築物，顯然此規劃用途及意向對於申請地點並不適用，並浪費土地資源;

(c) 擬議發展計劃能夠促進較早實現住宅發展並滿足急切的房屋需求;

(d) 擬議發展計劃展示合適的發展參數並參照元朗錦田南及八鄉發展的地積比率;

(e) 擬議發展計劃包含規劃及設計優點如建築位置後移及在建築物的設計和佈置周全考慮;

(f) 技術評估報告包括視覺、交通、景觀、噪音、排水、污水、供水、水質、土地污染、廢棄物管理和生態影響供水等均證明該指示性擬議發展計劃是技術可行，不會帶來無法克服／不可以接受的影響。

基於以上各項規劃及技術性上的理據，申請人懇請城規會是次修訂圖則申請。

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Approved Shek Kong OZP No. S/YL-SK/9

Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” For a Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

Supporting Planning Statement

1 INTRODUCTION

1.1 Purpose

1.1.1 This Planning Statement is prepared and submitted on behalf of Tenox Development Limited (“the Applicant”) to seek approval from the Town Planning Board (“TPB”) under section 12A of the Town Planning Ordinance for proposed amendments to the Approved Shek Kong Outline Zoning Plan No. S/YL-SK/9 (the “Approved OZP”), to enable the Proposed Residential Development at Various Lots in D.D. 112 and adjoining Government Land, Kam Sheung Road, Shek Kong, New Territories (the “Rezoning Site/ Site”). The proposed amendment is to rezone/ upzone the Rezoning Site from “Residential (Group D)” (“R(D)”) to “Residential (Group C)” (“R(C)”) zone

1.1.2 This Supporting Planning Statement is to provide TPB with the necessary information to facilitate consideration of the application.

1.2 Report Structure

1.2.1 Following this Introductory Section, the site and planning context will be briefly set out in Section 2. The strategic planning context is included in Section 3 followed by the review of “Residential (Group D)” zone in Section 4. The indicative development proposal will be set out in Section 5. The proposed amendment to the zoning of the Site will be set out in Section 6. Section 7 provides the justifications of the proposal and Section 8 concludes and summarizes this Supporting Planning Statement.

2 SITE AND PLANNING CONTEXT

2.1 Site Location

2.1.1 The Rezoning Site is located between Lin Fa Tei and Lai Uk Tsuen in Shek Kong. It is located to the south of Shek Kong Airfield and Shek Kong Stabling Sidings at about 1.3km. The Site is also situated about 3.5km southeast of Kam Sheung Road Station and about 2.4km east of the MTR Pat Heung Maintenance Centre (**Figure 2.1** refers). At the local level, the Site is bounded by Kam Sheung Road to the north (**Figure 2.4** refers).

2.1.2 The Site has a total area of about 41,290m^2. The existing site level varies slightly between 23.1mPD to 25.5mPD from the north to the south.

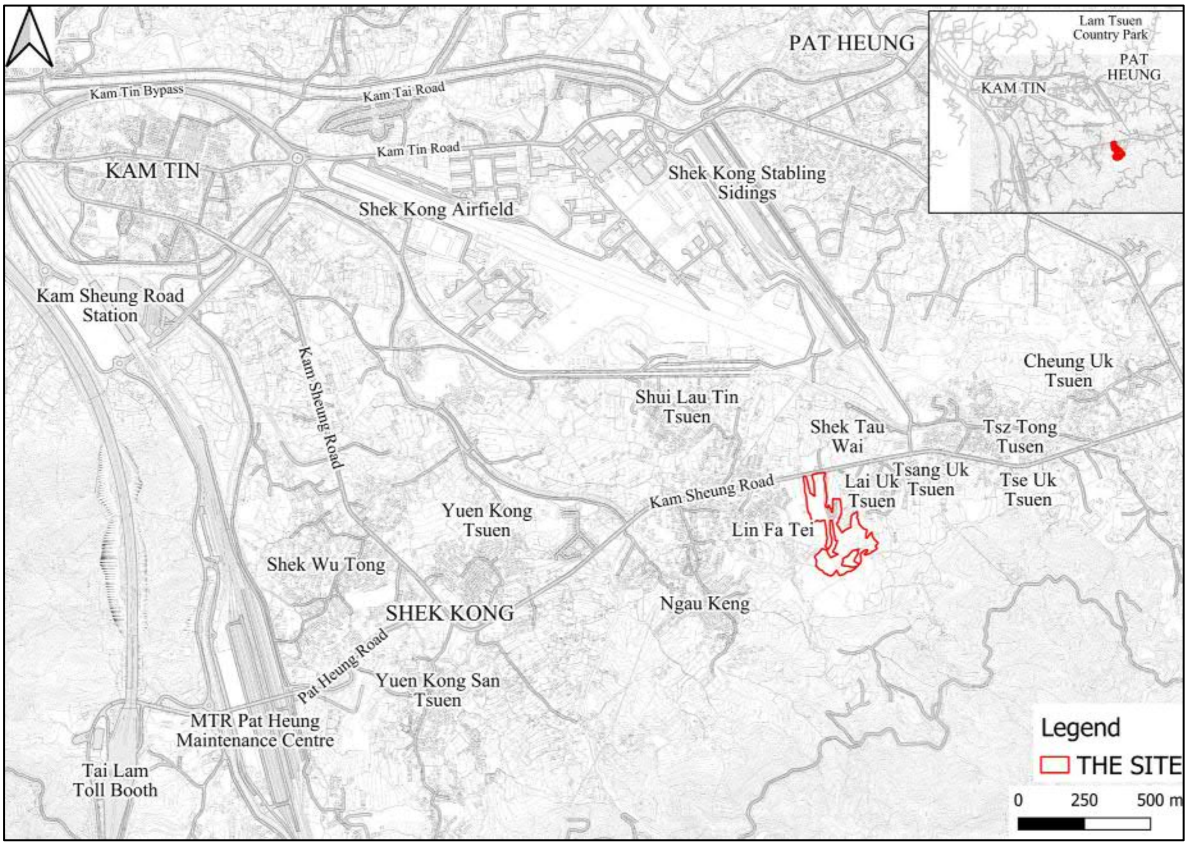


Figure 2.1: Site Location Plan

2.2 Existing Use and Site Condition

2.2.1 The Site is currently occupied by an open storage yard with a few numbers of temporary structures for storage of building materials in the north. The majority of the Site (about 75%) in the south is vacant and abandoned overgrown with vegetation.

Figure 2.2: Site Photo (Views to the north of Site)

Figure 2.3: Site Photo (Views to the south of Site)

2.3 Surrounding Context

2.3.1 The Site is located in areas with village settlements, temporary structures and agriculture land. The immediate surroundings of the Site have the following characteristics (see **Figure 2.4**):

(a) To the east of the Site, there are some villages (i.e. Lai Uk Tsuen, Tsang Uk Tsuen and Tse Uk Tsuen) as well as a declared monument - Chik Kwai Study Hall in Lai Uk Tsuen;

(b) Lin Fa Tei Village is located to west of the Site and other villages (i.e. Shui Tsan Tin and Ngau Keng) can also be found to the further southwest of the Site;

(c) An area zoned "Agriculture" with temporary structures is located to the north of Site across Kam Sheung Road; and

(d) The area to the south of the Site is mainly zoned "Agriculture", which is in general abandoned farmland.

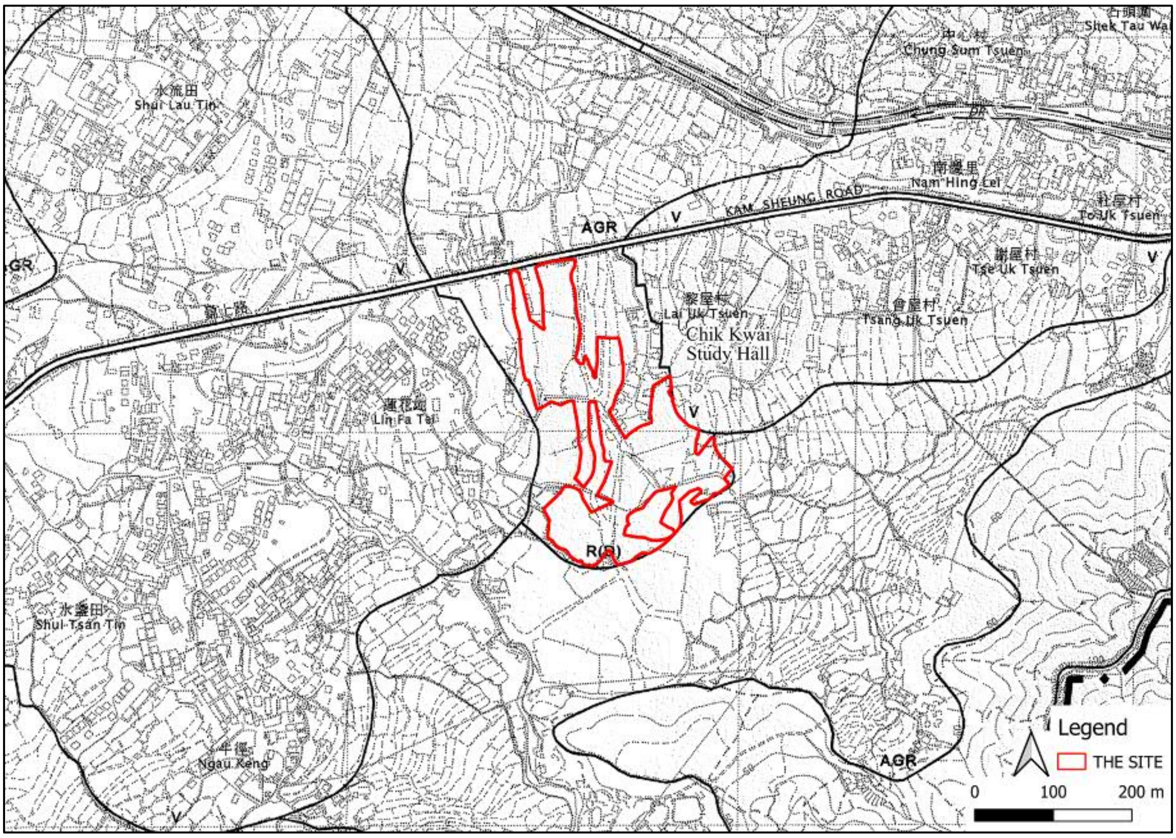


Figure 2.4: Surrounding Context

2.4 Accessibility

2.4.1 As shown in **Figure 2.5**, the Site can be accessed via the rural road- Kam Sheung Road. The Site is served by more than 7 routes of bus and green mini-bus (GMB) to other major transportation hubs such as Kam Sheung Road Station, Yuen Long New Town and Tai Po New Town. The nearest bus and GMB stops are within 5-minute walking distance. The Site is located only about 3.5km away from Kam Sheung Road Station.

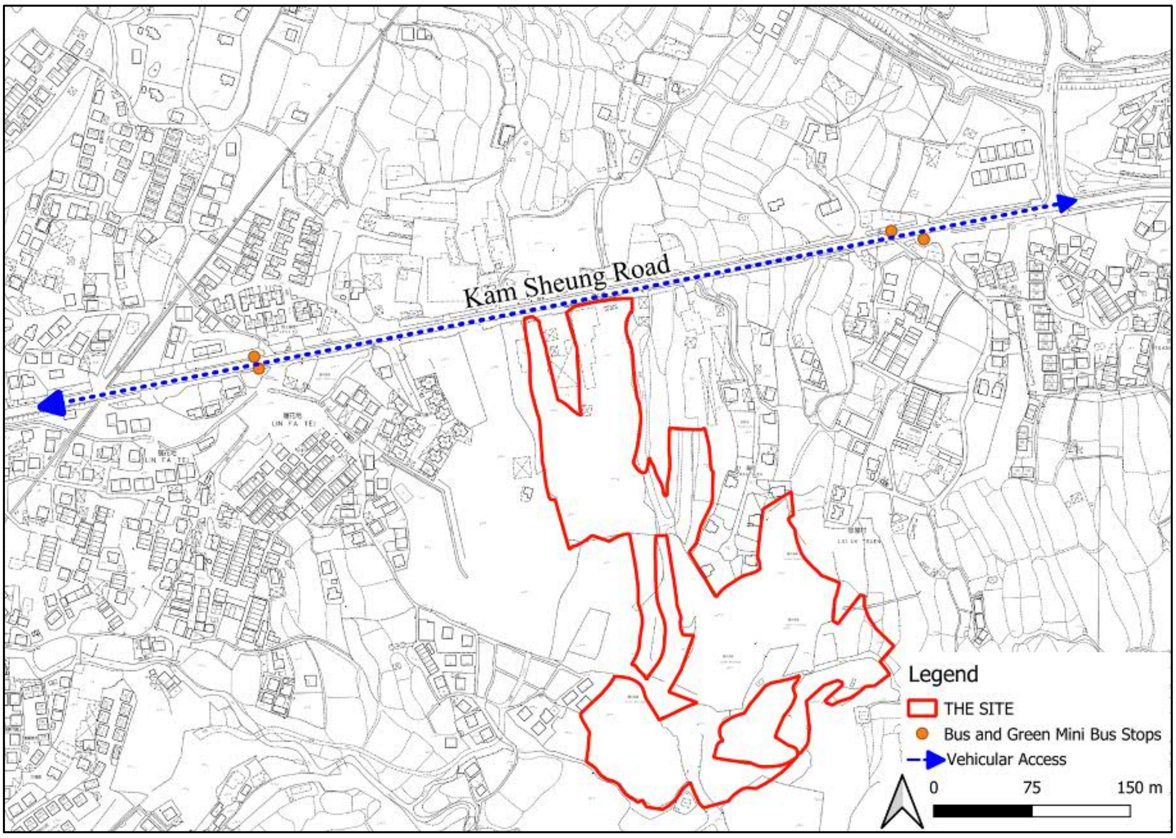


Figure 2.5: Accessibility of the Site

2.5 Statutory Planning Context

2.5.1 The Rezoning Site falls within the “Residential (Group D)” (“R(D)”) zone on the prevailing Approved Shek Kong Outline Zoning Plan (Approved OZP) No. S/YL-SK/9 (**Figure 2.6** refers). The planning intention of the “R(D)” zone is “*primarily for improvement and upgrading of existing temporary structures within the rural areas through redevelopment of existing temporary structures into permanent buildings.* It is also intended for *“low-rise, low-density residential developments subject to planning permission from the Town Planning Board*”.

2.5.2 According to the Remarks of the “R(D)” zone, any development including redevelopment for ‘Flat’ and ‘House’ shall not in excess of a maximum plot ratio of 0.2 and a maximum building height of 2 storeys (6m). Minor relaxation of the plot ratio and building height restrictions based on the individual merits of a development or redevelopment proposal may be considered by the Town Planning Board on application under section 16 of the Town Planning Ordinance. While it is proposed to develop residential development with domestic plot ratio of 0.8, S12A Application for proposed rezoning of the Site to an appropriate zoning such as “Residential (Group C)” is required.

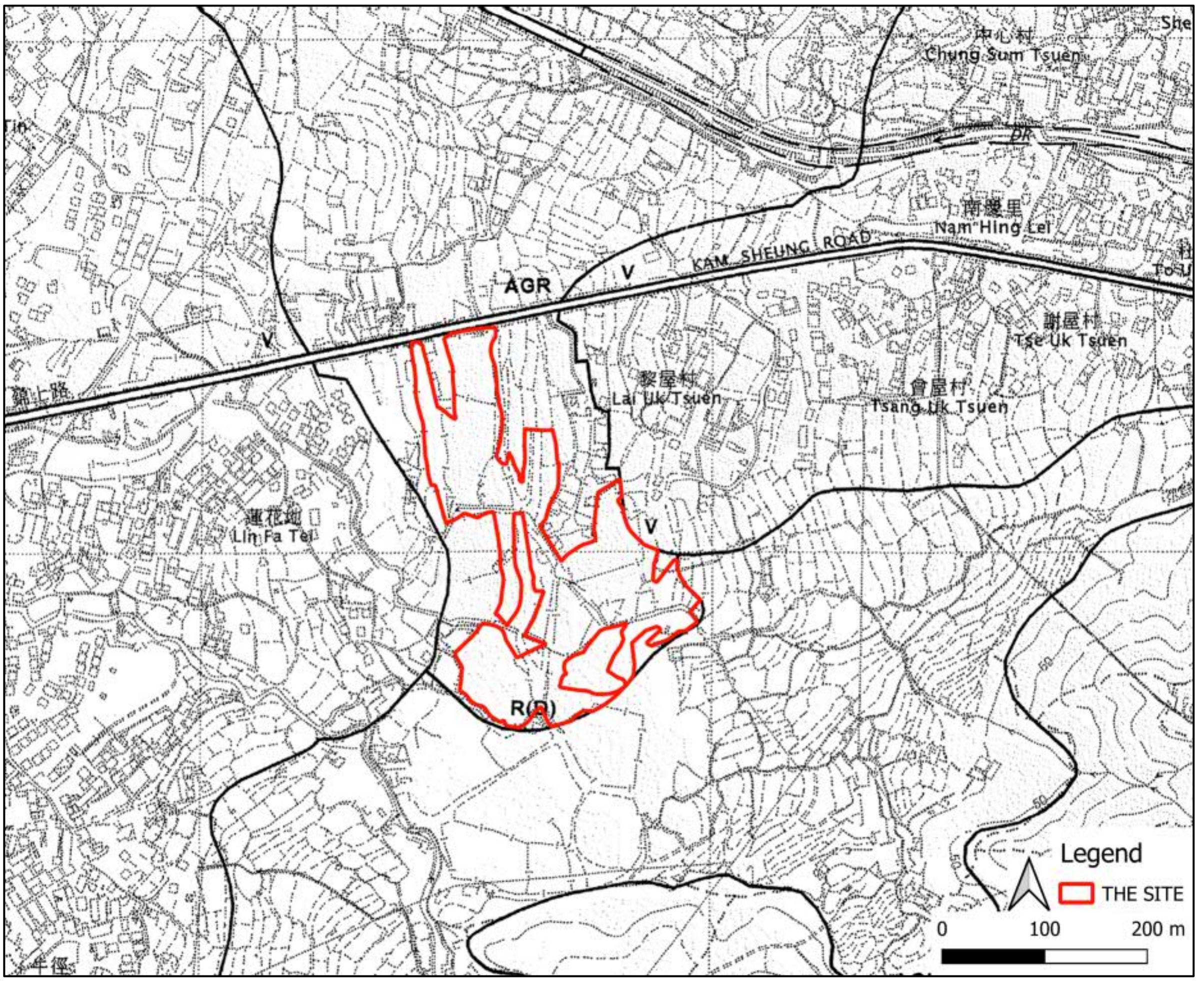


Figure 2.6: Zoning Context Plan (Extracted from Approved Shek Kong OZP No. A/YL-SK/9)

2.6 Land Status

2.6.1 The Rezoning Site is comprised of various private lots and some adjoining government land in D.D. 112. It covers a total area of 41,290m^2. The various private lots are currently possessed by the Applicant and its subsidiaries. The Applicant and its subsidiary companies own about 99.0 percent of the Rezoning Site. The remaining 1.0 percent of the Site is Government Land. **Figure 2.7** shows the land status of the site.

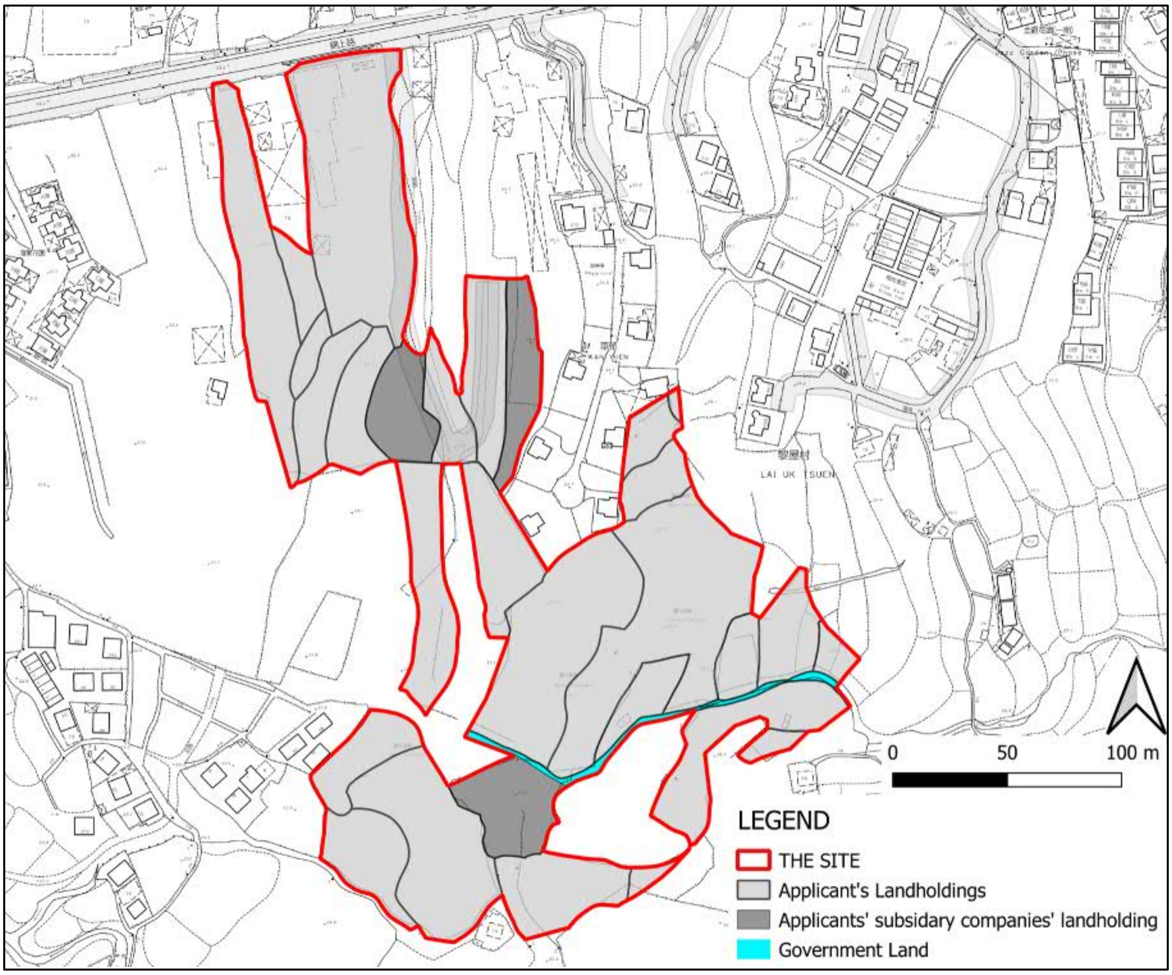


Figure 2.7: Land Status of the Site

3 STRATEGIC PLANNING CONTEXT

3.1 Government’s On-going Strategies on Increasing Housing Supply

Long Term Housing Strategy

3.1.1 Increasing Housing Supply is always the top priority of the Government. In response to the acute housing shortage, the Long-Term Housing Strategy (LTHS) Steering Committee was formed in September 2013 to tackle the imbalance in supply and demand for both public and private housing with the 10-year long term housing demand projection. This is to allow Government to continually plan ahead on developing land and housing, in order to meet the housing needs of the community over the long term. According to the LTHS Annual Progress Report 2021, the total housing supply target for the upcoming decade is 430,000 units, of which 301,000 units (70%) are public housing supply and the remaining 129,000 (30%) units are private housing supply.

Multi-pronged Approach to Increase Land Supply for Housing

3.1.2 It has been the Government’s policy direction since 2013 in adopting multi-pronged approach as the land creation strategy with various short-, medium- and long-term initiatives to increase land supply and meeting housing demand. **The short-to-medium term measures include optimizing the use of developed land as far as practicable through reviewing land uses and rezoning sites to untap the development potential of underutilised land and increasing development intensity wherever appropriate.** It is the Government’s policy direction to put forward initiatives with a view to tackling the issue of land supply to meet the community’s pressing demand for housing.

Task Force on Land Supply

3.1.3 The Task Force on Land Supply (the “Task Force”) was established in September 2017 with a view to making recommendations to the overall land supply strategy and prioritizing different land supply options for the Government. The Task Force submitted the final report to the administration on 31 December 2018 for consideration. The report opined that the actual land shortfall may be much higher than 1,200 ha and there will be an acute shortage of land for housing (about 108 ha) in the short term. As such, the Task Force suggests giving priority to studying and implementing 8 land supply options including short-to-medium term and long-term options. **Tapping into private agricultural land reserve in the New Territories is one of the three short-to-medium term land supply options** suggested by the Task Force after wide consultations with the public. On 20 February 2019, the Government announced that it fully endorses the recommendations rendered by the Task Force on land supply strategy.

3.2 Hong Kong 2030+: Towards a Planning Vision and Strategy and Northern Metropolis Development Strategy

3.2.1 The *Hong Kong 2030+: Towards a Planning Vision and Strategy Transcending 2030* ("the HK 2030+) published in 2021, is a comprehensive strategic study in revisiting the planning strategy and spatial development directions beyond 2030.

The HK 2030+ reinforces the adoption of a multi-pronged land supply strategy, setting out overall land supply of 7,300 hectares in the medium to long term, in order to address land supply shortfall.

3.2.2 The *Northern Metropolis Development Strategy* (“the Development Strategy”) is formulated on the basis of the HK 2030+, which was unveiled in the Policy Address 2021, to meet the medium to long term land demand. The Northern Metropolis encompasses an area of about 30,000 hectares, covering two district administration areas: Yuen Long and North Districts, which include the new towns in Yuen Long, Tin Shui Wai, Fanling / Sheung Shui, various NDAs and development nodes in different planning and construction stages as well as their neighboring rural areas. The Northern Metropolis is aimed to provide multi-functional land uses with highly concentrated residential and working population to drive the economic development in Hong Kong for the next 20 years. It would also be the most important area in Hong Kong that facilitates Hong Kong’s development integration with Shenzhen and connection with the Greater Bay Area.

3.2.3 As highlighted in **Figure 3.1**, the area of Northern Metropolis would cover the areas including the Kam Tin South and Pat Heung area and the Site.

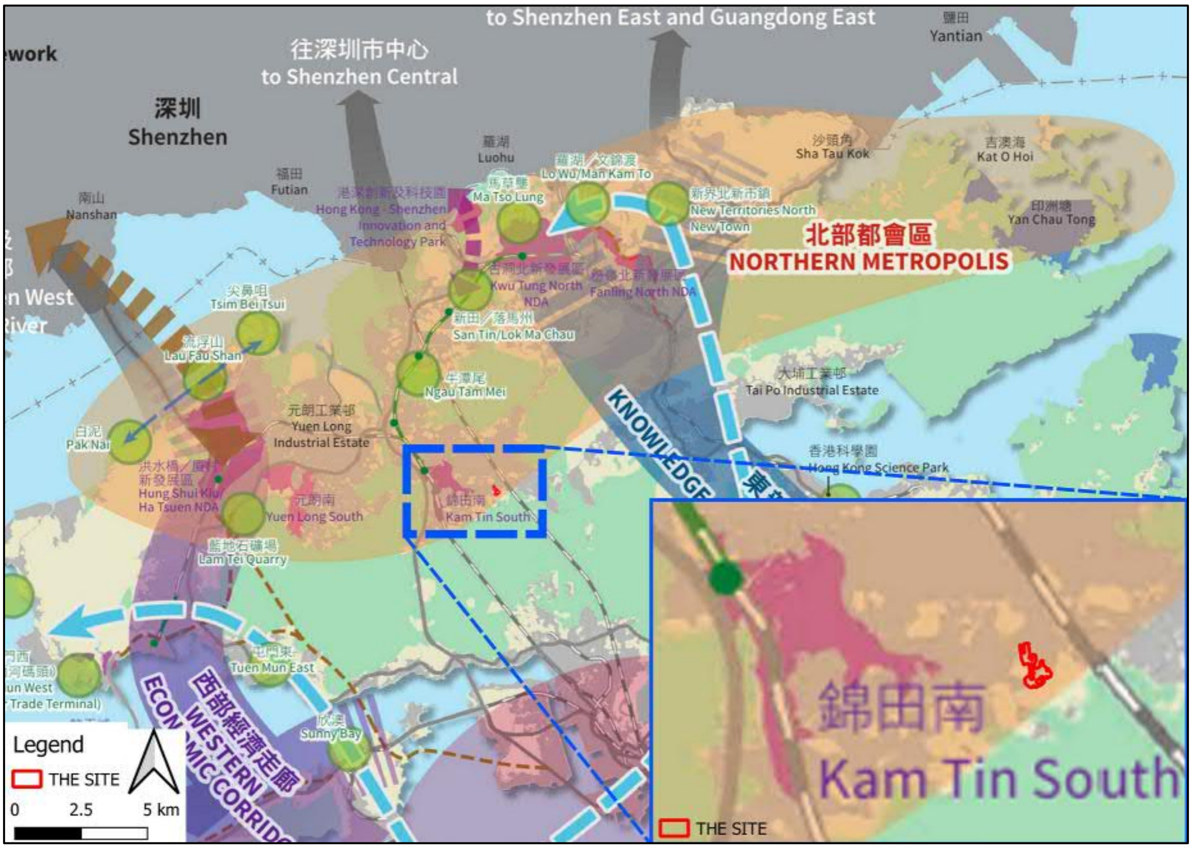


Figure 3.1: The Northern Metropolis area and the Site

3.3 Land Use Review of Kam Tin South and Pat Heung

3.3.1 The Chief Executive announced in his 2013 Policy Address that the Government would increase the supply of housing land in short to medium term and to take forward the planning for residential development at West Rail Line Kam Sheung Road Station and Pat Heung Maintenance Depot and the adjoining areas. In March 2014, Planning Department and Mass Transit Railway Corporation Limited (“MTRCL”) completed a comprehensive Land Use Review (“LUR”) for Kam Tin South and Pat Heung Area. Kam Tin South and Pat Heung area have also been identified as the major committed land supply for housing in the HK 2030+.

3.3.2 The LUR has identified that Kam Tin South and Pat Heung area is considered suitable for development into a suburban township, covering a total area of about 152ha. The Kam Tin South and Pat Heung area would be developed into residential development sites for 33,701 flats (i.e. 16,900 for public housing and 16,800 for private housing) with a total population of about 92,800. The plot ratio of the area would gradually decrease from Kam Sheung Road Station (with a PR of 3) to Kam Shui South Road (with a PR of 0.8), spanning about 1.5km from the east to the west. The LUR concludes that the development proposals of the area would respect and integrate with the adjoining low-rise and low-density rural settlements.

3.3.3 The Rezoning Site is located only about 700m away from the eastern peripheries of the boundary of Kam Tin South and Pat Heung area (**Figures 3.2 and 3.3** refer).

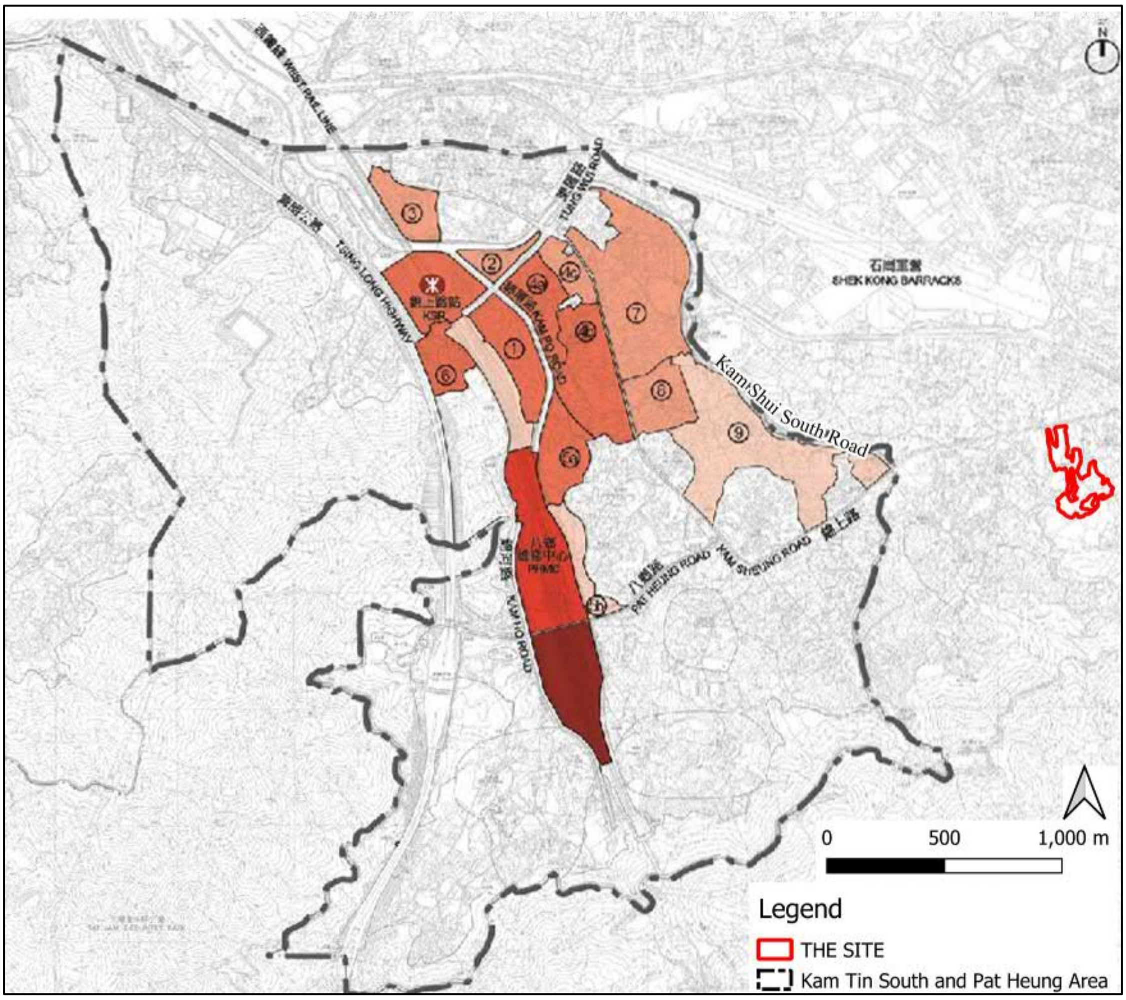


Figure 3.2: Kam Tin South and Pat Heung Area and the Site

Site ID	Residential Type	Gross Net Site Area (ha)	Total Plot Ratio	No. of Flat	Estimated Population
KSR	**Private**	**9.4**	**3.0**	**2,690**	**6,600**
PHMC	**Private**	**31.8**	**3.0**	**6,060**	**14,800**
1	**Public**	**7.9**	**3.0**	**3,700**	**11,300**
4a	**Public**	**6.5**	**3.0**	**3,200**	**9,800**
4b	**Public**	**13.0**	**3.0**	**5,700**	**17,400**
5a	**Public**	**7.3**	**3.0**	**3,300**	**10,100**
6	**Public**	**4.8**	**3.0**	**1,000**	**3,100**
2	**Private**	**2.5**	**2.1**	**450**	**1,100**
3	**Private**	**6.1**	**2.1**	**1,100**	**2,700**
4c	**Private**	**3.5**	**2.1**	**630**	**1,500**
5b	**Private**	**4.2**	**0.8**	**3,020**	**7,400**
7	**Private**	**23.5**	**1.5**	**880**	**2,200**
8	**Private**	**6.9**	**1.5**	**290**	**700**
9	**Private**	**24.4**	**0.8**	**1,680**	**4,100**
TOTAL		**151.8**	**---**	**33,700**	**92,800**

Figure 3.3: Development Parameters of Kam Tin South and Pat Heung area

3.4 Development Potential of the Rezoning Site

3.4.1 Based on the preliminary review of the statutory and local planning context, the following considerations are drawn to form the reasons for the proposed rezoning of the Site for low-rise and low-density Residential Development in this Amendment of Plan Application:

- The Northern Metropolis is identified as one of the major metropolises for the multi-functional land uses with highly concentrated residential and working population to drive the economic development in Hong Kong for the next 20 years. The Rezoning Site falls within the Northern Metropolis area.

- Kam Tin South and Pat Heung area is identified as the major committed land supply for housing in the HK 2030+. The Kam Tin South and Pat Heung Area would act as a major catalyst for unleashing the development potential of underutilised land in the neighboring areas. The Rezoning Site is located near the boundary of Kam Tin South and Pat Heung area in the east with only about 700m. It would be a strategic location advantage of the Rezoning Site to continue to contribute to the suburban township of Kam Tin South and Pat Heung area.

- As the Rezoning Site is directly accessible via Kam Sheung Road with good public transport facilities and the Applicant and its subsidiary companies are the landowner of the Rezoning Site (save for the adjoining government land), timely implementation of the proposed residential development is secured.

- Lin Fa Tei and its surrounding area have a general rural setting and are mainly occupied by low-rise residential developments and village settlements, temporary structures, and agricultural land. The area is gradually evolving to have more low-rise residential developments. There is potential to catalyse the transformation of the local area to improve the living quality. In any cases, the current residential zoning of the Site indicates that it is appropriate for residential development in the area. Given land is extremely scarce in the context of Hong Kong, optimum use of valuable land resources is essential.

4 REVIEW OF “RESIDENTIAL (GROUP D)” ZONE

4.1 “R(D)” zone DEFEATS the Development Potential of the Subject Site

4.1.1 The planning intention of “R(D)” zone is “*primarily for improvement and upgrading of exiting temporary structures within the rural areas through redevelopment of existing structures into permanent buildings…*”. This zoning is commonly found elsewhere in the rural area, typically where dilapidated temporary structures exist. According to “Review of rural Land Uses in the Northern New Territories” (the ‘Review’) conducted by the Planning Department in 2001, it states that the purpose of “R(D)” zoning is “originated from the Government’s housing policy in the 1980s **to designate rural upgrading areas to tackle the problem of high concentration of temporary structures scattered in rural areas**”.

4.1.2 Till March 2025, the 432.21 ha of “R(D)” zones within the Territories have largely remained status quo, providing minimal housing supply on land zoned for residential purposes. There had been in total 1,430 nos. of S16 Planning Applications within the “R(D)” zones in the whole territory since 2007, as observed from the Statutory Planning Portal. Amongst all the planning applications processed by TPB for “R(D)” zones, it is revealed that only 67 nos. (4.7%) involve applying for ‘House’ or ‘Flat’ or ‘NTEH’ uses; the rest of the 1363 applications (about 95.3%) applied for other uses, including open storage and other industrial uses contrary to the planning intention (**Table 4.1** refers).

Table 4.1: S16 Planning Applications in “R(D)” zones within the whole Territory between Jan 2007 and March 2025

Residential (Flat + House)			Residential (NTEH)			Others
Total	Approved	Rejected	Total	Approved	Rejected	Total
39	36	3	28	15	13	1,430

4.1.3 Among the approved applications for residential use, most of them only involved redevelopment of a relatively small scale with not more than 5 houses at most. There are only a few cases with more than 10 houses. Within the “R(D)” zone the Site falls within, there have been only 4 applications involving relatively small-scale residential development (i.e. 1 to 2 NTEHs) near the southwestern part of Site (**Figure 4.1** refers). It is evident that the current permissible plot ratio of 0.2 and 2 storeys in height under “R(D)” does not provide sufficient incentive for permanent residential developments with proper infrastructures.

4.1.4 The above information indicates that the R(D) zoning would not help or act as an incentive for an overall environmental improvement in a comprehensive manner.

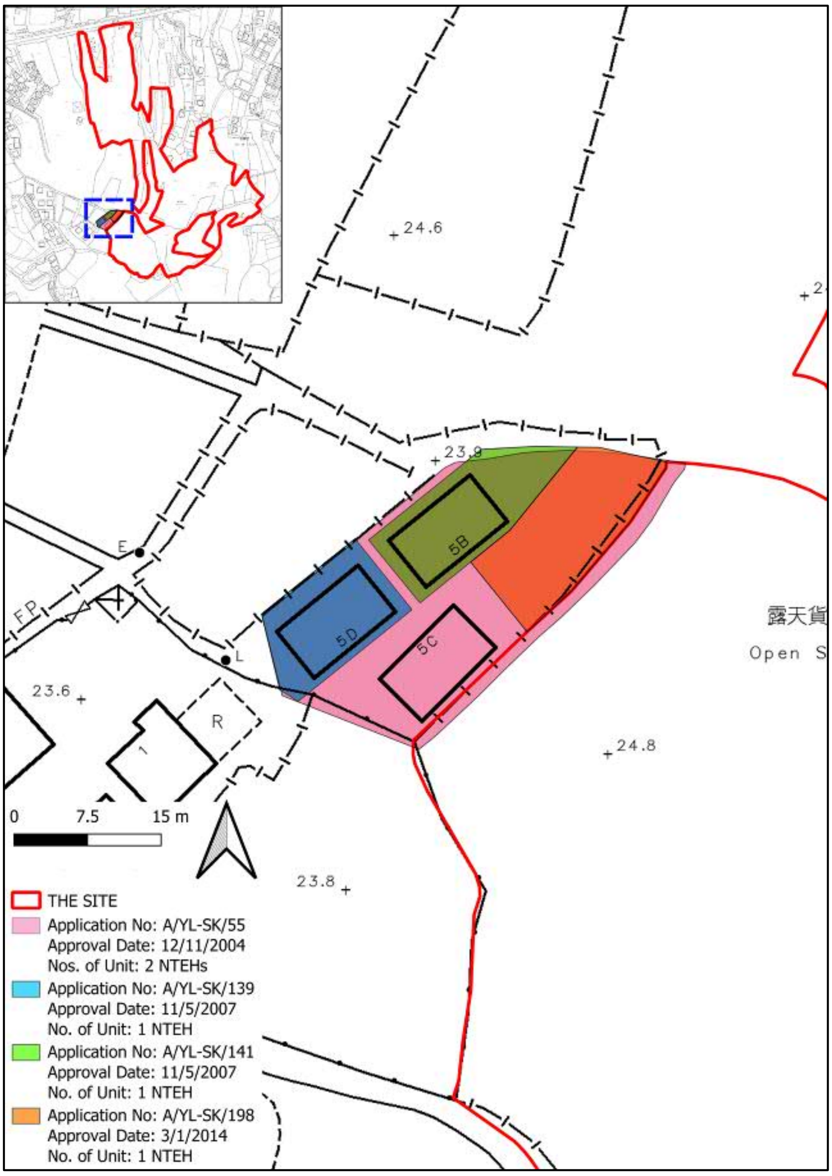


Figure 4.1: Location of 4 Approved NTEHs in the Subject “R(D)” Zone of the Site

4.1.5 The planning intention of “R(D)” in upgrading “high concentration of temporary structures” is also not considered an appropriate description for the Subject Site. It is noted from **Figure 4.2** that the Site currently comprises only a few temporary structures for the storage of building materials in the north, whilst, majority of the Site (about 75%) comprises vacant and abandoned farmland in the south.

4.1.6 The “R(D)” zoning may be suitable at some locations where there is a fragmented ownership pattern or unresolvable site constraint (i.e. infrastructures) while allowing landowners to redevelop their dwellings individually. These factors were also commensurated with the very low plot ratio of only 0.2 and only 2 storeys in height. However, this should not be applied to the Site. The Site is readily available in terms of infrastructure and landholdings. The Applicant and its subsidiary companies have spent tremendous efforts, resulting in successful private land assembly and formulation of innovation solutions to site constraints.

The development restrictions of “R(D)” zone will defect the development potential of the Site with substantial landholdings of over 4 ha, as well as the potential for a comprehensive upgrading of the environment.

4.1.7 A large roadside housing site, falling within the Northern Metropolis Area and in close proximity to Kam Tin South and Pat Heung area, is considered to be significantly underutilised. In order to echo with Government’s initiatives of optimising land resource, a review of the “R(D)” zone for the Site is considered appropriate to realise its full and appropriate development potential.

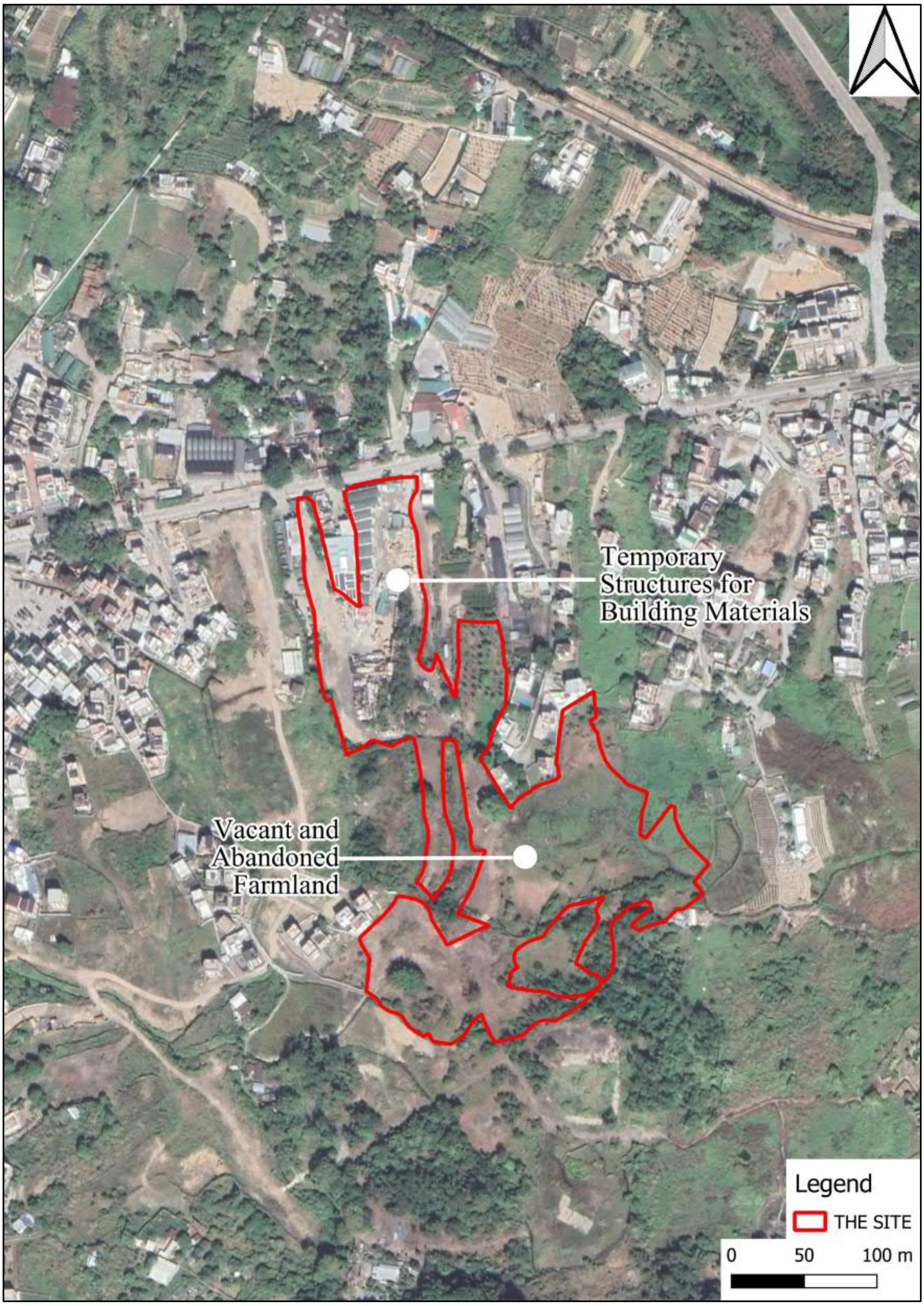


Figure 4.2: Aerial Photo of the Site

5 THE INDICATIVE DEVELOPMENT PROPOSAL

5.1 Overview of the Indicative Development

5.1.1 A schematic development proposal for the proposed residential development is prepared to facilitate the TPB’s consideration of this rezoning application. Based on the site area of about 41,290m^2 with domestic plot ratio 0.8, the total domestic Gross Floor Area (“GFA”) is about 33,032m^2. The proposed Development will yield a total of 850 units with an average unit size of about 38.9m^2. Design population of the Proposed Development is estimated at about 2,380.

5.1.2 The proposed development consists of 19 nos. of residential blocks with 6 storeys. It also comprises two stand-alone 1-storey clubhouses and two stand-alone 3-storeys carpark buildings. The proposed development is erected on formed level of between about 24mPD and 26mPD, increasing from the north to the south. Building height of the residential building will be not more than +44.2mPD. While, the building height of the two car parking buildings will be 37.5mPD, and the building height of the two clubhouses will be 30.6mPD.

5.1.3 The indicative architectural drawings for the Rezoning Site and sections of the Proposed Development are provided in **Appendix 1**. The purpose of the indicative Development Proposal is to demonstrate that the Proposed “R(C)” zone (with the proposed plot ratio and building height) is being appropriate and feasible. The key development parameters and proposed floor uses of the development are presented in **Tables 5.1** and **5.2,** respectively.

Table 5.1: Key Development Parameters of Proposed Development

	PROPOSED DEVELOPMENT (Approx.)
Site Area	41,290m^2
Proposed Domestic Plot Ratio	0.8
Proposed Domestic GFA	33,032m^2
No. of Residential Towers	19
No. of Residential Units	850
Average Unit Size (in GFA)	About 38.9m^2
Total No. of Storeys • Residential Tower • Clubhouse • Carpark Building	 6 (including G/F entrance lobby) 1 3
Maximum Building Height (Main Roof)	Not more than +44.2mPD
Site Coverage	Not more than 30%
Clubhouse GFA (Max 4.5% of total domestic GFA or Max 1,250m^2 for GFA concession, whichever is greater)	Not more than 1,486.4m^2
Communal Open Space (1sqm per person)	2,380m^2
Greening Ratio	30%

Estimated Population (Assuming 2.8 per household)	2,380

Table 5.2: Proposed Floor Uses of the Proposed Development

	PROPOSED FLOOR USES
R/F	Flat Roof
1/F- 5/F	Residential Units
G/F	Residential entrance lobby/ Residential Units

5.2 Key Design Considerations

5.2.1 The Indicative Development proposal has taken the following design considerations:

Design and Deposition of the Building Blocks

5.2.2 The building blocks of the proposed development have been carefully designed and positioned within the Site. Each of the building blocks is designed with a relatively small building footprint, which would offer generous open space at grade level with not less than 2,380m^2 (providing minimum 1m^2 per person of local open space) and greening ratio of not less than 30% of the Site Area (i.e. 12,387m^2) (**Figure 5.1** refers). The relatively small building footprint would also maximise the air permeability of the development and minimise its impact on wind capturing potential of the surrounding neighbourhood.

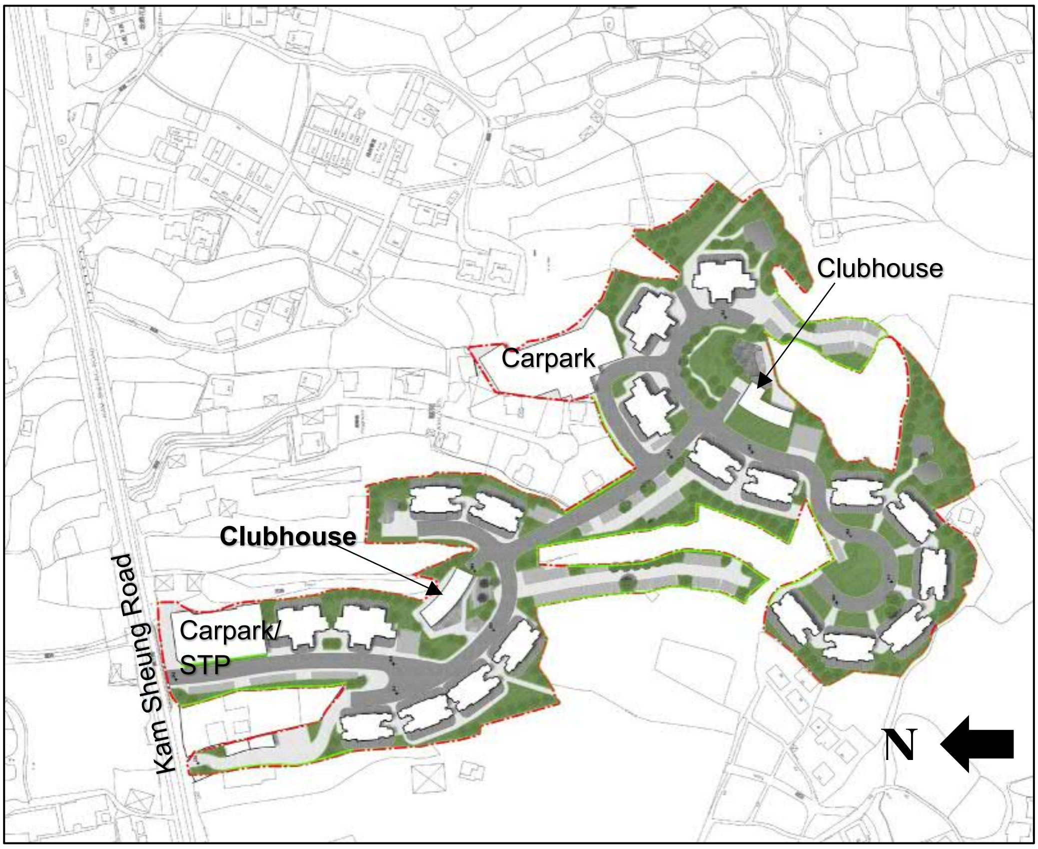


Figure 5.1: Design and Disposition of Building Blocks

Building Setback

5.2.3 The proposed development offers a significant setback from the kerb line of major arterial road, Kam Sheung Road, by at least 50m (**Figure 5.2** refers). This is to further enhance air ventilation and form the breezeways along Kam Sheung Road. In addition, the proposed development also offers a green buffer with appropriate landscape treatment along the edge of development site boundary. By offering a green buffer, it would be able to soften the building edge of the building blocks (**Figure 5.2** refers), as well as providing a visual relief to the public and surrounding neighborhoods.

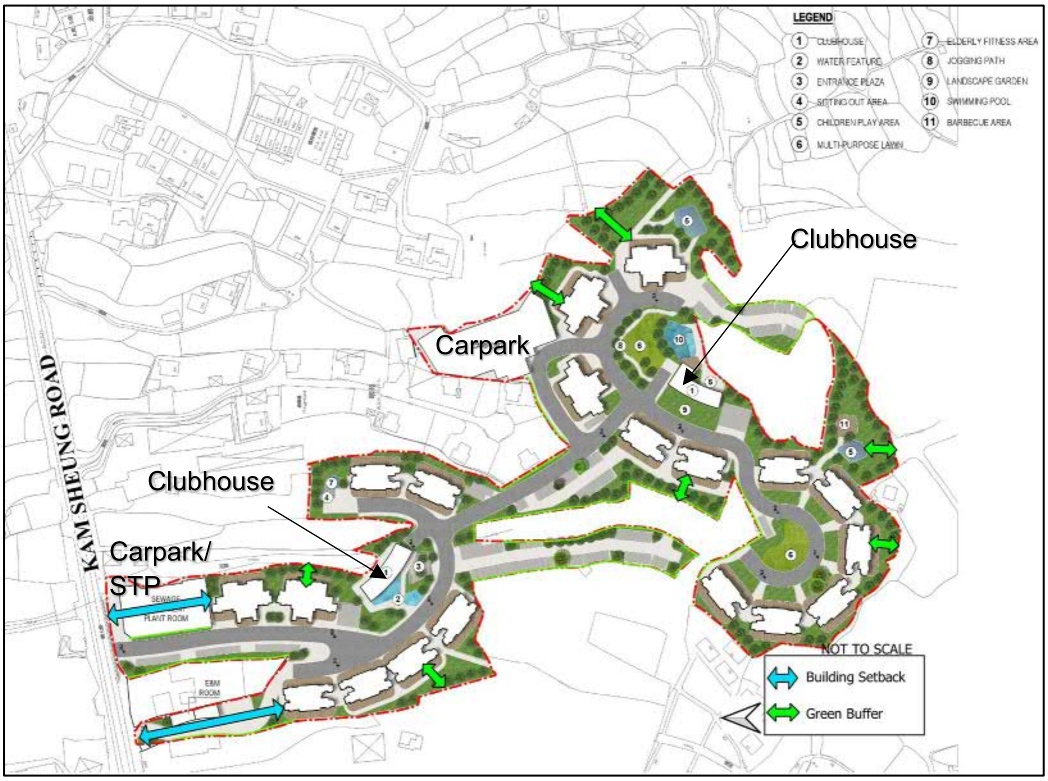


Figure 5.2: Providing Building Setback and Green Buffer within the Site

5.3 Vehicular Access Arrangement and Internal Transport Facilities

5.3.1 The Proposed Internal Transport Facilities are provided within the two stand-alone 3-storey carparks and the open-air car parking spaces of the Proposed Development, which are in accordance with the latest Hong Kong Planning Standards of Guidelines (HKPSG). The Proposed Internal Transport Facilities are summarized below (**Table 4.3**):

Table 5.3: Proposed Internal Transport Facilities

Park Space Component	Provision
Residential Car Parking (including Visitor Car Parking and Accessible Parking)	254 *
Motorcycle Parking	11
Bicycle Parking	51
Loading/Unloading Bay for Heavy Goods Vehicle (HGV)	21

* including 4 nos. of accessible carparking spaces

5.3.2 A Traffic Impact Assessment (TIA) has been conducted (in **Appendix 2**) on traffic forecasts for the design years 2034 of the Proposed Development. The results indicate that junctions, development access, and road links will operate with ample capacities under both reference and design scenarios, except Junction C. The improvement proposal for Junction C includes junction widening and converting the priority junction to a signalised junction. The Applicant will implement the junction improvement works either before or after the Highway Department's (HyD) public work projects (PWPs) on *"Upgrading of Remaining Section of Kam Tin Road and Lam Kam Road"* and *"Improvement to Kam Sheung Road"* or after the abovesaid PWPs.

5.3.3 The Applicant will also implement the pedestrian improvement works for the footpath and crossing abutting the Application Site along Kam Sheung Road, as illustrated in Figure 7.2 of Traffic Impact Assessment (TIA). Upon completion, the footpath and crossing facilities will be handed over to the relevant government department(s) for maintenance and management.

5.3.4 With the improvement proposals, the TIA therefore concludes that the proposed residential development is considered acceptable from the traffic engineering point of view.

5.4 Landscape Design Proposal

5.4.1 The Landscape Design Proposal, enclosed within **Appendix 3**, highlighted that due to low input of maintenance and management, most of the species within the Rezoning Site currently exhibits low amenity value in general. The Rezoning Site also gives no specific important ecological value. Some of the trees are commonly observed to be vined by climbers, with natural damage, bent trunk, bowing trunk, crooked trunk and broken leader. In this regard, a total of 29 trees amongst 35 nos. of existing trees (within the site boundary) are to be felled due to poor form and health condition. Total number of 200 new trees will be planted within the future development, to achieve not less than 1:6.9 compensation ratio in quantity. A total of 1 tree will be transplanted. A total of 5 trees will be retained, of which 3 mature trees: *Ficus virens*, *Ficus macrocarpa* and *Ficus rumphii* with DBH over 1m are observed and potentially meet the requirements for potentially registrable in accordance with the criteria for Old and Valuable Trees.

5.4.2 The overall Landscape Design on Rezoning Site is able to design and restore the landscape quality as far as technically possible, therefore maximising the possibility on the landscape character and amenity of the Site. High quality landscape designs include the followings:

- A row of trees along the EVA acting as a proper road tree approach and formal welcoming landscape design;
- Sitting-out areas are evenly distributed. Recreational open spaces, such as elderly fitness area, children play area, multi-purpose lawn, BBQ areas, Swimming pool belong to Clubhouse are proposed in between building blocks;
- Greening Feature such as Vertical Green is proposed at certain hierarchy areas such as along the welcoming entrance and major recreational open space areas; and
- Green buffer plantings along the site boundary to maintain a high landscape visual quality to the neighbourhood.

5.4.3 With the above greening and landscape measures within the Landscape Design Proposal, the greenery area of the Proposed Development will have not less than 12,387m^2 (30% of the Site Area).

5.4.4 Adequate open space is also envisaged within the Rezoning Site and will fully comply with the requirements of HKPSG in providing high quality passive recreational facilities. The Proposed Development is designed to meet the requirement providing minimum 1m^2 per person of local open spaces as required by HKPSG (i.e. not less than 2,380m^2).

5.5 Visual Impact

5.5.1 A Visual Impact Assessment (VIA) has been conducted (in **Appendix 4**) to demonstrate the Proposed Development at the Site is visually acceptable. The VIA has identified that although there would be some visual changes to the surrounding area due to the Proposed Development with PR 0.8 and building height of 6 storeys, the visual impact is considered to be acceptable.

5.5.2 The visual impact posed by the Proposed Development can be mitigated through the sensitive design measures (i.e. building setback, building façade materials etc.) to mitigate and improve the condition, quality, and character of the area. The resultant visual change due to the Proposed Development is considered acceptable.

5.6 Environmental Consideration

Noise Impact Assessment

5.6.1 A Noise Impact Assessment (NIA) has been conducted in **Appendix 5** to assess the impact from road traffic noise, fixed noise and aircraft and helicopter noise. The NIA concludes that no adverse environmental noise impacts for the Proposed Development is anticipated.

5.6.2 For road traffic noise, it is found that the predicted traffic noise level of the residential flats will be within the stipulated 70 dB(A), which is in line with the HKPSG maximum noise level from road traffic (i.e. 70dB(A)) at typical facades of new dwellings. Therefore, no mitigation measures will be required.

5.6.3 For fixed noise sources impact, all residential flats will be within the stipulated noise limits. Based on the predicted façade noise levels from fixed noise sources at the representative NSRs, they are in the range of 52-55dB(A) during day and evening time period, which falls within the Acceptable Noise Levels.

5.6.4 For the aircraft and helicopter noise, it is revealed that no adverse aircraft noise impact from contour of the Chek Lap Kok Airport. It is also found that Shek Kong Airfield is located at more than 300m north of the proposed development. However, the site survey indicates that helicopter noise was insignificant on site. The site measurements also comply with the stipulated noise criterion in HKPSG (i.e. 85dB(A)). Therefore, the Proposed Development will not be subject to any adverse noise impact from the aircraft/ helicopter operations at the Shek Kong Airfield.

5.7 Proposed Drainage, Sewerage and Water Supply Arrangement

Drainage Impact Assessment

5.7.1 The Drainage Impact Assessment (DIA) has been conducted in **Appendix 6**. The surface runoff running on existing catchments at the Site is currently discharged to two existing engineering channels (northern and southern channels) and the existing watercourse passing through the site. The Proposed Development takes the redevelopment opportunity to construct new channels and associated conduits and interception pipes. As detailed in the DIA, the proposed drainage system for the development will have sufficient capacity even in the absence of drainage improvement works by the Drainage Service Department (DSD) and Home Affairs Department (HAD). Two scenarios were conducted in the DIA, including scenario 1- proposed development without DSD and HAD drainage improvement works and scenario 2- proposed development with DSD and HAD drainage improvement works. Both scenarios have demonstrated that there will be no adverse drainage impacts to the nearby drainage system arising from the proposed development with the proposed drainage system.

5.7.2 Besides that, there is an improvement to the existing channels in the maximum water levels for the 10 years, 50 years, and 200 years of flood event for all the control points with the proposed drainage system in place. For further details on the Drainage Arrangement, please refer to the DIA report.

Sewerage Impact

5.7.3 The Sewerage Impact Assessment (SIA) has been conducted in **Appendix 7**. The assessment identifies that the existing Kam Tin South Pumping Station has reached its limits for the existing developments and reserved sewage flow for the planned development. An onsite sewage treatment plan (with about 800m^2) is proposed within the proposed development to treat the sewage flow (915.6m^3/d) generated from the proposed development. The treated effluent will be discharged to the nearby stormwater drainage system. It is concluded that there is no adverse impact from the Proposed Development. For further details on the sewerage arrangement, please refer to the SIA report.

Water Supply

5.7.4 The Water Supply Impact Assessment (WSIA) has been conducted in **Appendix 8**. The assessment identifies that the total fresh and flushing water demand required for the Proposed Residential Development is approximately 1,300m^3/d. It is proposed that a DN150 fresh water main be branched off from the existing DN450 fresh water main at Kam Sheung Road. It is concluded that water supply would not be affected by the Proposed Development. For further details on the water supply arrangement, please refer to the WSIA report.

5.8 Ecological Impact

5.8.1 The Ecological Impact Assessment (EcoIA) has been conducted in **Appendix 9**. The assessment presents the findings of the ecological baseline survey and evaluates the ecological value of the application. Although the EcoIA highlights that the proposed development will result in the loss of vegetation cover, the site is only found with low ecological value of habitats, and the recorded flora and fauna species are all locally common. It is concluded that the impact will be minimised and thus, no adverse impact on the local ecology would be anticipated for the project.

5.9 Water Quality Impact

5.9.1 The Water Quality Impact Assessment (WQIA)has been conducted in **Appendix 10**. The WQIA presents the potential water quality impacts arising from the proposed development of the Application Site. The water quality sensitive receivers within the 500m assessment area of the Project are identified. The WQIA concludes that no water impact would be anticipated during construction phase, operation phase and decommissioning phase of the onsite STP of the proposed development. The long-term/ultimate use of the proposed development is inline with the planning intention of the Government sustainable in environmental terms.

5.10 Land Contamination Impact

5.10.1 The Land contamination assessment has been conducted in **Appendix 11**. The potential land contamination impacts associated with the project site have been reviewed. Based on the observation from the site inspection and the review of historical aerial photographs, the project site was mainly vacant and vegetated. However, the project site was previously used as open storage during year 1990 to 1995 which may potentially polluting activities. A detailed land contamination assessment will be carried out in the later stage.

5.11 Waste Management

5.11.1 The Waste Management has been conducted in **Appendix 12**. It is to identify key waste management issues arising during the construction and operation phase of the proposed development. With the implementation of control measures in Sections 3 and 4 of the report, adverse waste management implication is not anticipated during construction and operation phases.

5.12 Air Quality Assessment

5.12.1 The Air Quality Assessment has been conducted in **Appendix 13**. It is to assess the air quality impact due to the surrounding industrial and vehicular emissions on the proposed residential development. It is concluded that the proposed development satisfies the buffer distance requirements for vehicular and chimney emissions. There, no adverse air quality impact associated with the proposed development.

5.13 Implementation Programme

5.13.1 The Proposed Residential Development is expected to be implemented by the end of 2031.

6 PROPOSED AMENDMENT TO THE ZONING ON THE SITE

6.1 The Proposed Zoning and Amendments to Plan

6.1.1 The Rezoning Site (with about 41,290m^2) currently falls within an area zoned “Residential (Group D)” (“R(D)”) in the prevailing Approved OZP, with a maximum plot ratio of 0.2 and a maximum building height of 2 storeys (6m). The purpose of this S12A Amendment of Plan Application is to seek for the Board’s approval for rezoning and upzoning of the Site to enable the proposed residential development with a domestic PR of 0.8.

6.1.2 Responding to the Government’s Policy in establishing and developing the Northern Metropolis as one of the metropolises for the next 20 years, the Applicant has thus reviewed the development potential of the underutilised land in “R(D)” zone, with due consideration on the latest changing planning context (i.e. Northern Metropolis Development Strategy, Land Use Review for Kam Tin South and Pat Heung) and the local context (i.e. patterns of private land; and existing infrastructure capacities) of the area. Pursuant to the review, a proposed amendment to the current OZP to rezone the Site from “R(D)” to “R(C)” zone is sought (**Figure 6.1**, **Table 6.1**, **Figure 6.2a** and **Figure 6.2b**).

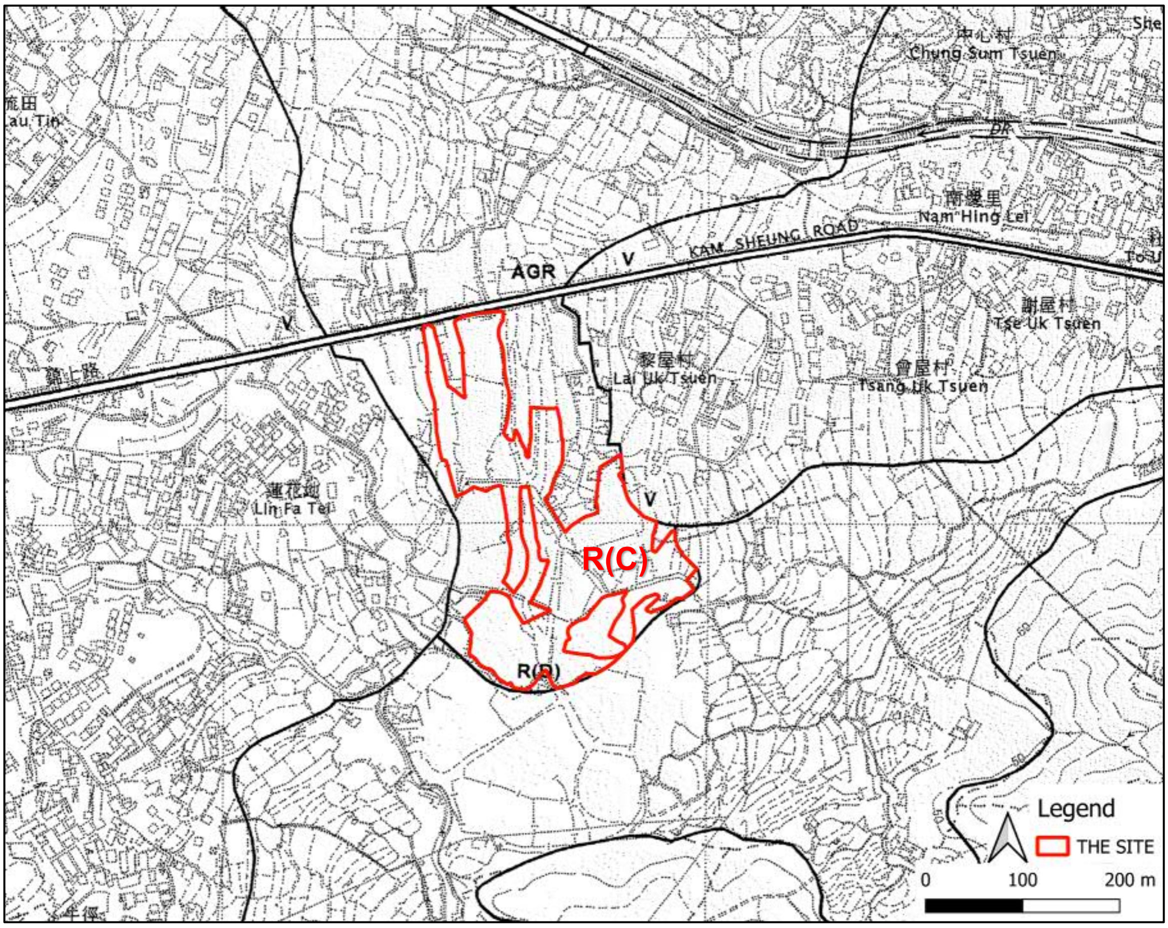
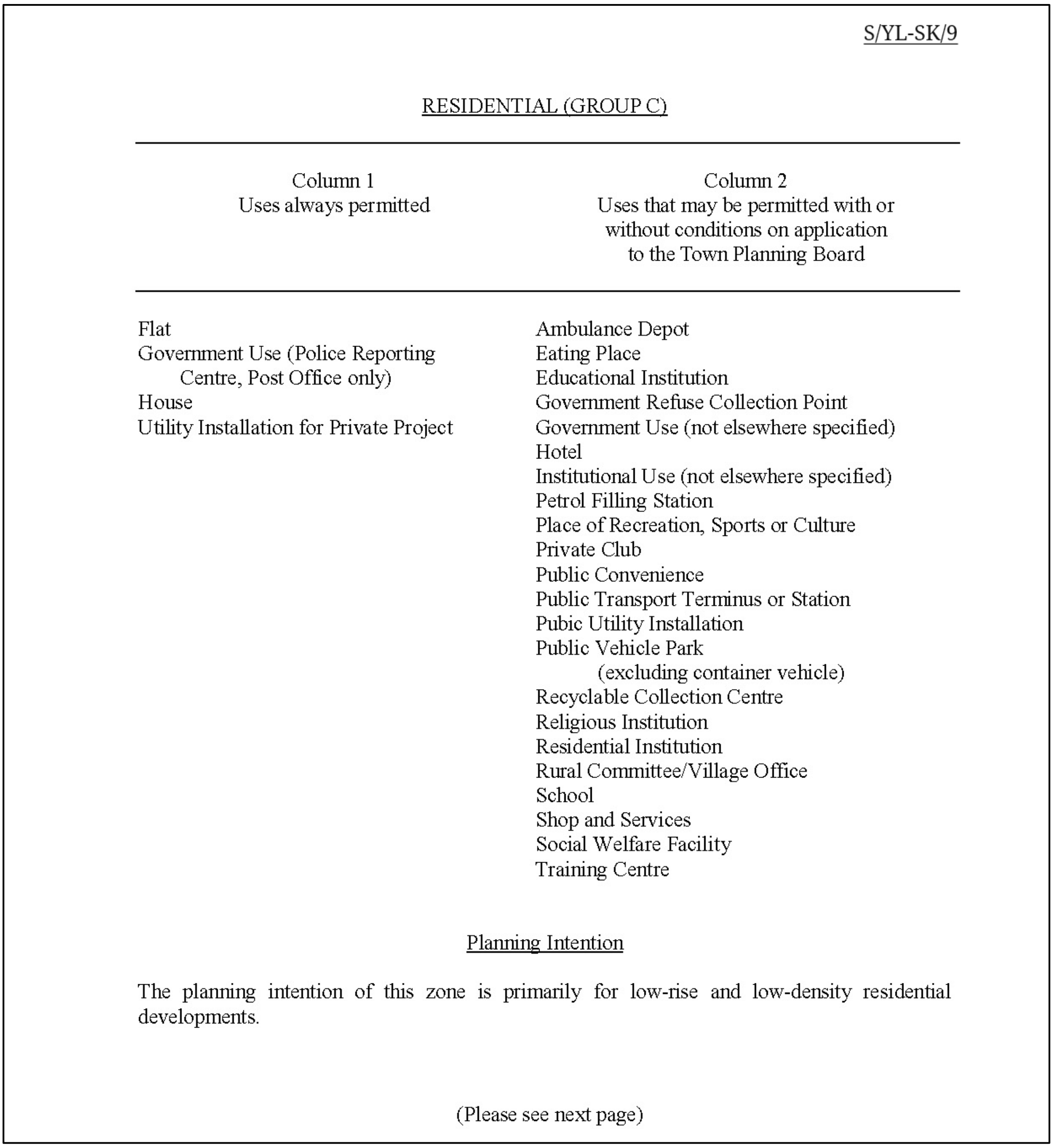


Figure 6.1: The Proposed Amendment from “R(D)” to “R(C)” zone

Table 6.1: Proposed Development Controls on “R(C)” zone

ZONE	MAXIMUM PLOT RATIO	MAXIMUM BUILDING HEIGHT
R(C)	0.8 for Domestic	6 storeys



S/YL-SK/9

RESIDENTIAL (GROUP C)

Column 1
Uses always permitted

Flat
Government Use (Police Reporting
Centre, Post Office only)
House
Utility Installation for Private Project

Column 2
Uses that may be permitted with or without conditions on application to the Town Planning Board

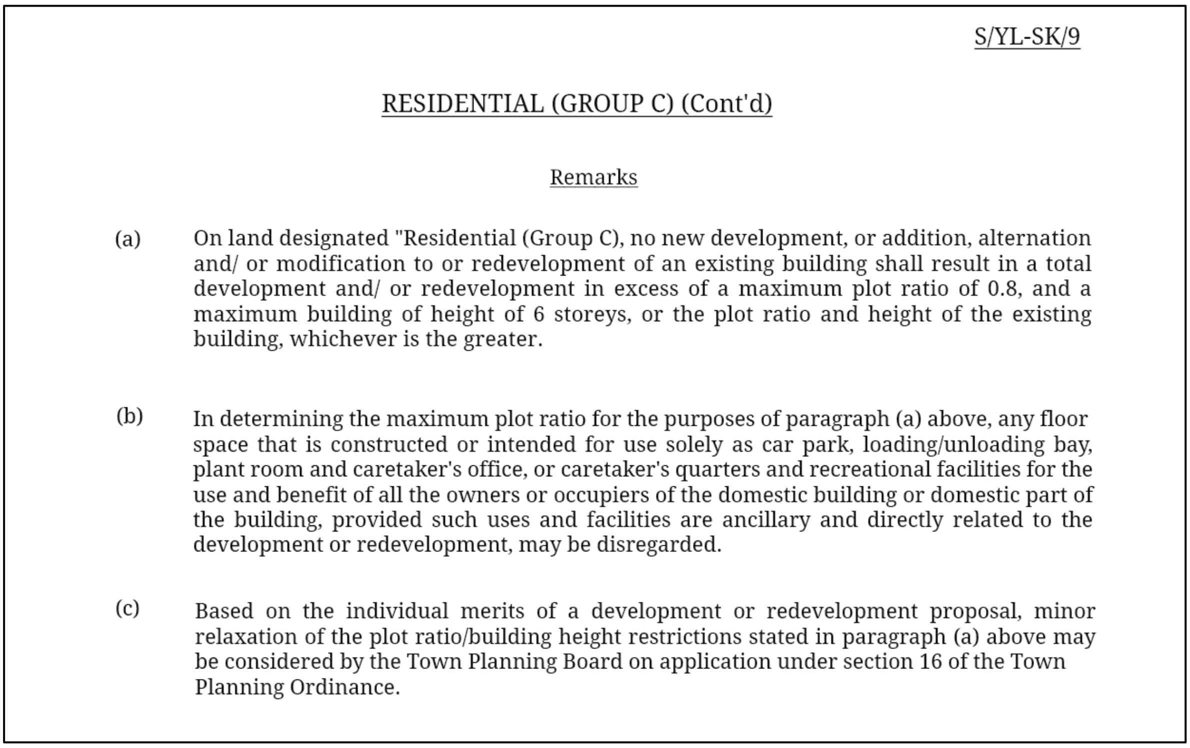
Ambulance Depot
Eating Place
Educational Institution
Government Refuse Collection Point
Government Use (not elsewhere specified)
Hotel
Institutional Use (not elsewhere specified)
Petrol Filling Station
Place of Recreation, Sports or Culture
Private Club
Public Convenience
Public Transport Terminus or Station
Pubic Utility Installation
Public Vehicle Park
(excluding container vehicle)
Recyclable Collection Centre
Religious Institution
Residential Institution
Rural Committee/Village Office
School
Shop and Services
Social Welfare Facility
Training Centre

Planning Intention

The planning intention of this zone is primarily for low-rise and low-density residential developments.

(Please see next page)

Figure 6.2a: The Proposed Amendments to the Statutory Notes of the “R(C)” zone



S/YL-SK/9

RESIDENTIAL (GROUP C) (Cont'd)

Remarks

(a) On land designated "Residential (Group C), no new development, or addition, alternation and/ or modification to or redevelopment of an existing building shall result in a total development and/ or redevelopment in excess of a maximum plot ratio of 0.8, and a maximum building of height of 6 storeys, or the plot ratio and height of the existing building, whichever is the greater.

(b) In determining the maximum plot ratio for the purposes of paragraph (a) above, any floor space that is constructed or intended for use solely as car park, loading/unloading bay, plant room and caretaker's office, or caretaker's quarters and recreational facilities for the use and benefit of all the owners or occupiers of the domestic building or domestic part of the building, provided such uses and facilities are ancillary and directly related to the development or redevelopment, may be disregarded.

(c) Based on the individual merits of a development or redevelopment proposal, minor relaxation of the plot ratio/building height restrictions stated in paragraph (a) above may be considered by the Town Planning Board on application under section 16 of the Town Planning Ordinance.

Figure 6.2b: The Proposed Amendments to the Statutory Notes of the “R(C)” zone

6.1.3 In deriving the proposed zoning of the Site, reference has also been made to other “R(C)” zones with similar PR of 0.8 under the prevailing Approved/ Draft OZPs (i.e. Fanling/ Sheung Shui, Kam Tin North, Kam Tin South, Tai Po, Discovery Bay and South Lantau Coast) (**Table 5.2** refers). Taking into account of the other OZPs with PR 0.8 and the surrounding context, the proposed “R(C)” zone with a maximum PR of 0.8 and a maximum building height of 6 storeys is therefore deemed to be appropriate.

Table 6.2: Development Controls of “R(C)” zone in Statutory Outline Zoning Plan

OZP No.	ZONING	MAXIMUM PLOT RATIO	MAXIMUM SITE COVERAGE	MAXIMUM BUILDING HEIGHT
S/FSS/25	R(C)1	0.8	50%	3 storeys over 1 storey carpark
S/YL-KTN/9	R(C)1	0.8	40%	4 storeys (12m)
S/YL-KTS/15	R(C)	0.8	40%	4 storeys (12m)
S/TP/28	R(C)6	0.8		4 storeys
S/I-DB/4	R(C)4	110,784m^2 in GFA[1]		Area B: 5 storeys and 64mPD
S/SLC/21	R(C)1	0.8	40%	3 storeys including carport

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[1] The PR is about 0.88, which is calculated based on the maximum GFA divided by the total area of R(C)4.

6.1.4 Besides, the proposed “R(C)” zone has made reference to the plot ratio proposed under Land Use Review (“LUR”) for Kam Tin South and Pat Heung Area. It is noted that the “Site 9” (located at the eastern peripheries of Kam Tin South and Pat Heung area) has been proposed with a PR 0.8 under the LUR (**Figures 3.2** and **3.3** refer). The LUR concludes that the development proposals of the area would respect and integrate with the adjoining low-rise and low-density rural settlements at the local context. The Proposed Development has therefore taken such material consideration in proposing PR 0.8 to continue to continue to the suburban township of Pat Heung area.

7 PLANNING MERITS AND JUSTIFICATIONS

7.1 In-line with Government’s Policy to increase Housing Supply

7.1.1 Increasing housing supply is always the top priority of the Government. It is also Government’s long-term strategy to tackle the imbalance supply and demand of housing. The Government has adopted multi-pronged approach to increasing land supply for housing through land creation strategy by unlocking development potential through rezoning sites to untap the development potential of underutilised land.

7.1.2 The proposed residential development is in fact well aligned with the government’s planning strategy and spatial development directions. The Site is situated within the southwestern portion of the Northern Metropolis area, in which it is identified as a metropolis with multi-functional land uses with highly concentrated residential and working population to drive the economic development in Hong Kong for the next 20 years. The Site is also about 700m away from the eastern peripheries of the boundary Kam Tin South and Pat Heung area, as the major committed land supply for housing in the HK 2030+. With the total housing provisions of about 850 units, the development scheme not only expediates the Government’s 10 year long term housing target, but also continues to contribute to the suburban township of Kam Tin South and Pat Heung area with low-rise and low-density rural settlement. The proposed “R(C)” zone would enable optimizing the land use for residential development expeditiously.

7.2 Enable to Seek a More Efficient Use of the Scarce Land Resources

7.2.1 As highlighted in **Section 4.1**, the purpose of “R(D)” zoning is originated from the Government’s housing policy to “designate rural upgrading areas to tackle the problem of high concentration of temporary structures scattered in rural areas”. However, it is noted that “high concentration of temporary structures” is not, and has hardly ever been, an appropriate description for the Site.

7.2.2 The 432.21 ha of “R(D)” zones within the Territories have largely remained status quo, providing minimal housing supply on land zoned for residential purpose. Majority of applications since 2007 were to seek permission for other uses, including open storage and other industrial uses in temporarily or permanent basis on land zoned “R(D)”. Only about 4.7% of the planning applications were to seek/ apply for permission since 2007 for houses or flats uses in a small individual scale. Rather than being left idled, both the public and the Applicant have reasonable expectation to utilise the scarce resource properly and efficiently to tackle housing shortage, as long as the future use is compatible with and will not bring adverse impact to the surrounding environment, as demonstrated in the technical assessment report.

7.2.3 The Site is considered inappropriate for the subject “R(D)” zone and will hinder the potential for increasing land supply for housing. The current mechanisms with plot ratio of only 0.2 and only 2 storeys in height under “R(D)” zone should not be applied to the Site. In terms of infrastructures and landholdings, the Site with an area of over 4ha is readily available for residential development. It also falls within the Northern Metropolis area and in close proximity to Kam Tin South and Pat Heung area. The Site will be considered to be significantly underutilised. In order to echo with Government’s initiatives of optimising land resource, a review of the “R(D)” zone for the Site is considered appropriate required to realise its full and appropriate development potential.

7.3 Facilitate Earlier Implementation of Residential Development and Meeting Urgent Housing Demand

7.3.1 The Site is readily available for development, as extensive site amalgamation exercise will not be required. Furthermore, majority of the landholdings of the private lots within the Site are solely owned by the Applicant and its subsidiary companies. Vehicular access to the Site can be directly provided from the existing Kam Sheung Road. Therefore, the timely implementation of the Proposed Residential Development is secured and able to facilitate early implementation. It is expected to have the first population intake by 2031.

7.4 Appropriate Development Quantum

7.4.1 The Applicant has carefully considered the statutory planning context and characteristics of the surrounding context in the proposed “R(C)” zone with PR of 0.8 and building height of not more than 6 storeys for the Proposed Residential Development.

7.4.2 The proposed plot ratio of 0.8 for the Rezoning Site, with direct access from the existing Kam Sheung Road should not be considered excessive with the readily available infrastructure. It is also noted that the PR of 0.8 for “Site 9” under the Land Use Review for Kam Tin South and Pat Heung Area is proposed and is considered to fit with the surrounding low-rise and low-density rural settlements. The proposed development with PR 0.8 should therefore not be considered to be incompatible with the surrounding context. Besides, the technical assessments conducted for this Planning Application have demonstrated that the proposed development with a PR 0.8 is considered to be technically feasible.

7.5 Incorporating Planning and Design Merits

Design and Deposition of the Building Blocks

7.5.1 The building blocks of the proposed development have been carefully designed and positioned within the Site. Each of the building blocks is designed with a relatively small building footprint with generous open space at grade level. The relatively small building footprint would also maximise the air permeability of the development and minimise its impact on wind capturing potential of the surrounding neighbourhood.

Building Setback

7.5.2 The proposed development offers a significant setback from the kerb line of Kam

Sheung Road, by at least 50m. In addition, the proposed development also offers a green buffer in setting back the proposed development from the edge of development site boundary to soften the building edge of the building blocks and provide a visual relief to the public and surrounding neighborhoods.

Provision of Pedestrian Access to the Unacquired Private Lots No. 854 S.A., 854 S.B., 855 and 860 in D.D. 112 within Site

7.5.3 The design of the Site has carefully considered the unacquired private lots, which are landlocked. An internal footpath will be provided to facilitate access to landlocked sites within the development. In case of emergencies, the Applicant will also discretionally permit/allow emergency vehicles to the landlocked sites.

7.6 No Insurmountable Technical Impact

7.6.1 As presented in **Section 5**, all of the Technical Assessments including TIA, landscape proposal, VIA, NIA, DIA, SIA, WSIA, WQIA, land contamination, waste management, air quality and EcoIA, have demonstrated that the Rezoning Site with proposed PR and building height is technically feasible with no insurmountable impacts. In this regard, the Rezoning Site is deemed to be acceptable in the wider and local context.

8 CONCLUSION

8.1 In light of the above, it is evident that the Proposed Amendments to the OZP is feasible and appropriate from the land use planning and technical points of view.

8.2 The TPB and the relevant government departments are respectfully requested to give favorable consideration to support the Proposed Amendment to the Approved OZP based on the following:

(a) The Proposed Rezoning is in line with the Government’s Policy and Planning Strategy to increase land supply for Housing and unleash the development potential of underutilized land (in Shek Kong area);

(b) A “R(D)” zoning for the area without “high concentration of temporary structures”, yet intended for “improvement and upgrading of existing temporary structures”, is considered inappropriate for the Site and a waste of land resources;

(c) The Proposed Rezoning facilitates Earlier Implementation of Residential Development and meeting urgent Housing Demand;

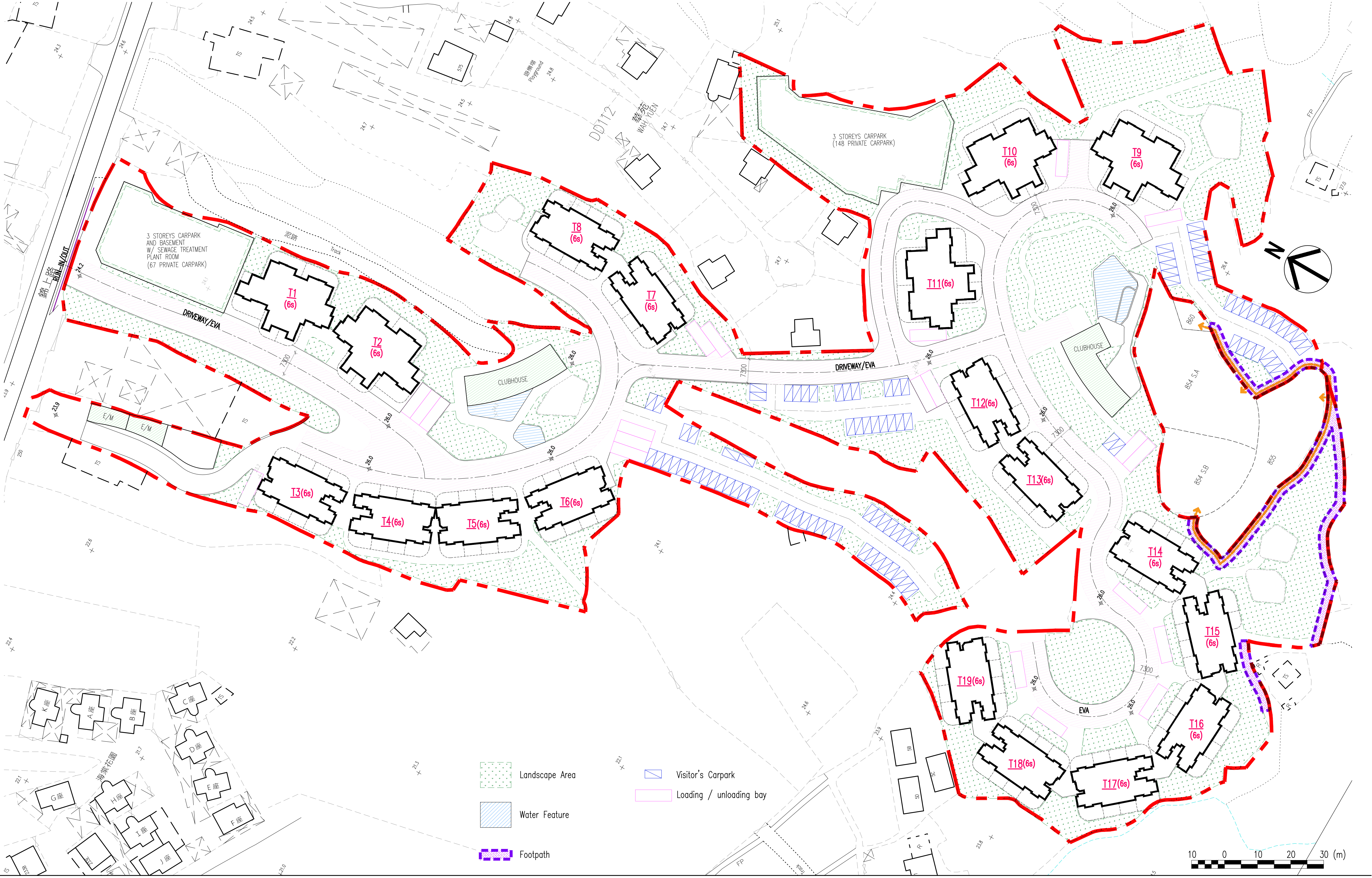
(d) The Proposed Development demonstrates appropriate Development Quantum and in-line with the range of Plot Ratio proposed within the Kam Tin South and Pat Heung area;

(e) The Proposed Development has incorporated significant Planning and Design Merits, including Design and Disposition of building blocks with Adequate building setback; and

(f) Technical Assessments demonstrated that the Proposed Development will not result in insurmountable visual, traffic, landscape, noise, drainage, sewerage, water supply, water quality, land contamination, waste management, air quality and ecological impacts.

Appendix 1

Indicative Architectural Drawings

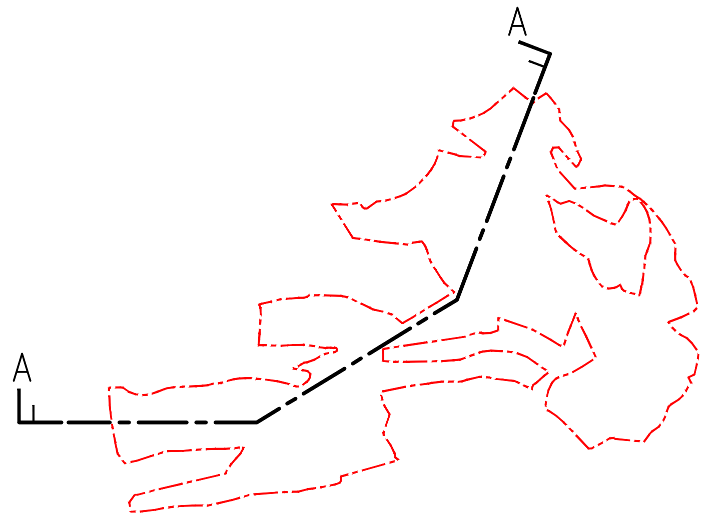


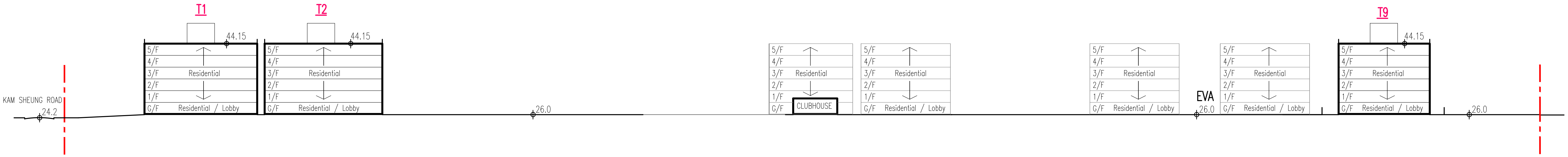
Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” zone
For Proposed Residential Development at Various Lots and Adjoining Government Land
in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

INDICATIVE MASTER LAYOUT PLAN

(1:1000)

06/03/2025





SECTION A

10 0 10 20 30 (m)

Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” zone
For Proposed Residential Development at Various Lots and Adjoining Government Land
in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

INDICATIVE SCHEMATIC SECTION (1:1000)

Appendix 2

Traffic Impact Assessment

“Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” zone
For Proposed Residential Development at Various Lots and Adjoining Government Land
in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories”

Traffic Impact Assessment

Revised Final Report

February 2025

CTA Consultants Limited

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1. INTRODUCTION

1.1 Background

1.1.1 According to the approved Shek Kong Outline Zoning Plan (OZP) No. S/YL-SK/9 published by Town Planning Board (TPB) in October 2006, the proposed residential development locates in the south of Kam Sheung Road and to the east of Lin Fa Tei, which is shown in **Figure 1.1**. The site was zoned as "Residential (Group D)".

1.1.2 CTA Consultants Limited was commissioned by the Applicant as a traffic consultant to carry out a traffic impact assessment to support the S12A Rezoning Application for the Application Site of the new development.

1.1.3 The purpose of this study is to review the traffic conditions and to assess the traffic impact caused by the proposed development. Any deficiency would be identified and improvement proposal would be recommended to resolve any foreseeable problem.

1.2 Study Objectives

1.2.1 The main objectives of this study are:

- to undertake manual classified count traffic surveys to determine the existing traffic conditions in the vicinity of the proposed development;
- to forecast traffic demands on the adjacent road network in the design year;
- to advise on the car parking and loading/unloading facilities provisions and access arrangements for the Redevelopment;
- to estimate the likely traffic generated by the proposed development based on proposed development schedule and carry out distribution and assignment of the estimated generated traffic;
- to assess the impact of traffic generated by the proposed development on the adjacent road network and compare with the reference scenario;
- to recommend improvement measures, if necessary, to alleviate any traffic problems on the road network;

2. THE PROPOSED REDEVELOPMENT

2.1 Site Location

2.1.1 The Application Site as shown in **Figure 1.1** which is located in the south of Kam Sheung Road in Yuen Long and situated to the East of Lin Fa Tei.

2.1.2 Kam Sheung Road allows both vehicles and pedestrians access to the proposed site and it will become the proposed vehicular accesses for the proposed development. The details of location, traffic arrangements are shown in **Figure 2.1**.

2.2 Development Scheme

2.2.1 The development parameter is tabulated in **Table 2.1** below:

Table 2.1 Planning Parameters of the Proposed Development

Parameters	Total
Site Area (m^2)	41,290 m^2
Plat Ratio	0.8
Domestic GFA (m^2)	33,032 m^2
Flat Numbers	850
Average Flat Size	38.861 m^2
No. of Tower	19

2.3 Parking Provisions

2.3.1 The proposed parking provision for the development is shown in **Table 2.2**.

Table 2.2 Proposed Internal Transport Facilities for Development

Proposed Development			**Parking Requirement**						**Loading/Unloading Requirement**
			Private Car Parking Space				**Motorcycle Parking Space**	**Bicycle Parking**	**Loading / Unloading Bay for Goods Vehicles**
	GFA	*No. of Flat*	GPS: 1 space per 4-7 flats			GPS x R1 X R2 X R3			
			R1	R2	R3				
Private Housing	FS ≤ 40	670	0.5	1	1.3	63 to 109	1 space per 100-150 flats	1 space for 15 flats with flat size ≤ 70m^2	Provision of minimum 1 L/UL bay for goods vehicles within the site for every 800 flats or part thereof, subject to a minimum of 1 bay for each housing block or as determined by the Authority
	40 <FS ≤ 70	90	1.2	1	1.3	21 to 36			
	70 < FS ≤ 100	90	2.4	1	1.3	41 to 71			
	100 < FS ≤ 130	0	4.1	1	1.3	0			
	130 < FS ≤ 160	0	5.5	1	1.3	0			
	FS > 160	0	7.0	1	1.3	0			
	Subtotal	***850***				***125 to 216***			
	No. of Block		2 visitor spaces per block for 31-45 units per block (3)						
	19		38						
Total			**163(1) to 254(2)**				**6 to 9**	**51**	**19 HGV**

Notes: (1) Including 3 accessible car parking spaces for total 151-250 number of parking spaces
(2) Including 4 accessible car parking spaces for total 251-350 number of parking spaces
(3) As TD's requirement

Table 2.3 Proposed Internal Transport Facilities of Proposed Development

Type		**Proposed Number of Spaces**	
Private Cars	Ancillary	216	254(1)
	Visitor	38	
Motorcycles		11(2)	
Bicycle		51	
L/UL for HGV		21(3)	

(1) Including 4 accessible car parking spaces for total 251-350 number of parking spaces.
(2) No. of motorcycles more than high-end would be provided to satisfy the parking demand.
(3) Proposed 1 HGV loading / unloading space is provided for each club house. (Total 2 nos.)

3. EXISTING TRAFFIC CONDITIONS

3.1 Existing Road Network

3.1.1 The existing road network is shown in **Figure 3.1**.

3.1.2 The Application Site locates south of the Kam Sheung Road. Kam Sheung Road is a main and local distributor which is two-ways lane road and connects to both east and west of New Territories.

3.2 Existing Public Transport Services

3.2.1 The Application Site is located out of a 500m radius of the rail station.

3.2.2 The area in the vicinity of the Application Site at present is served by a number of bus services which shown in **Figure 3.2**. Details of these services are listed in **Table 3.1**.

Table 3.1 Bus Routes in the Study Area

Route No.	Origin/Destination	Frequency (min.)
KMB Routes		
64K	Tai Po Market Station - Yuen Long (West)	8-20(1), 8-15(2), 7-15(3); 0710(4)
64S	Sheung Tsuen Playground- Kam Sheung Road Station	0710, 0725, 0735, 0750(1)
251A	Sheung Tsuen - Kam Sheung Road station	15-30(1)(2)(3)
LWB Route		
E36P	Sheung Tsuen - AsiaWorld Expo	0510, 0610 (1)(2)
GMB Routes		
72	Yuen Long (Yuen Long Tai Hang Street) - Lui Kung Tin	10
72M	Kam Sheung Road Station - Lui Kung Tin	15-20(5)
RMB Route		
23	Yuen Long (Yu King Sq) - Sheung Tsuen	No fix frequency

Note: *(1) Mondays to Fridays (except public holidays)*
(2) Saturdays (except public holidays)
(3) Holiday
(4) Special route from Kadoorie farm - Monday to Friday
(5) Morning and evening peak services only

3.3 Critical Junctions

3.3.1 Based on the location of the proposed development and the road network in the vicinity, it is identified that the traffic induced by the proposed development may cause critical impact to the following junctions, as shown in **Figure 3.1** and **Table 3.2**. The existing layouts of the junctions to be assessed are shown in **Figures 3.3 to 3.10**.

Table 3.2 Critical Junctions

Junction		Method of Control	Figure No.
A	Kam Sheung Road/ Pat Heung Road	Priority	**Fig 3.3**
B	Kam Sheung Road / Kam Shui South Road	Priority	**Fig 3.4**
C	Kam Sheung Road / Kam Tin Road	Priority	**Fig 3.5**
D	Kam Tin Road / Lam Kam Road / Route Twisk	Priority	**Fig 3.6**
E	Future Development Access	Priority	**Fig. 3.7**
F	Tung Wui Road / Kam Sheung Road	Signalized	**Fig. 3.8**
G	Ko Sheung Road / Kam Sheung Road	Priority	**Fig. 3.9**
H	Fan Kam Road / Kam Tin Road	Roundabout	**Fig. 3.10**

3.3.2 Junction improvements to Junctions A and F will be carried out by CEDD under Contract No. YL/2017/01 (Target Completion Date: Mid 2022) which will convert the priority control to a signalized controlled junction. While Junctions C, D and H will be improved by HyD under "PWP Item No.6820TH - Upgrading of Remaining Sections of Kam Tin Road and Lam Kam Road" (The tentative completion at 2028, under government review), while Junctions A, B, E, G, F and the portion of Kam Sheung Road near Junction C will be improved by HyD under "PWP Item No.6892TH - Improvement to Kam Sheung Road" project (The tentative completion at 2031, under government review). The arrangements are shown in **Figures 3.11** to **15** (Preliminary layouts under government review).

Traffic Surveys

3.3.3 Traffic count surveys were carried out to examine the critical junctions in the vicinity of the Application Site.

3.3.4 The surveys were undertaken between the hours of 7:30am to 9:30am and 5:00pm to 7:00pm on normal school weekdays in 18 November 2021.

3.3.5 Observed traffic data indicates that both morning peak hour, evening peak hour and the surveyed traffic flows are shown in **Figure 3.16**.

Baseline Traffic Flow

3.3.6 Due to the COVID-19 pandemic, the surveyed traffic flows may be less than that of the normal conditions. Therefore, additional surveys are carried at the ATC Core station 5029 (at Tsing Long Highway – Tai Lam Tunnel from Au Tau Int to Tuen

Mun Road) for the "corrected" factor. **Table 3.3** gives the surveyed results as compared to the ATC Core station 5029.

Table 3.3 Derivation of COVID-19 Factor

		South Bound (veh/hr)		**North Bound (veh/hr)**		**Total**
		AM Peak	**PM Peak**	**AM Peak**	**PM Peak**	
ATC Core station 5029 (Year 2020)		3,450	1,260	1,070	2,350	8,130
Growth Factor Flow from 2020 to 2021(1)		3,545	1,295	1,100	2,415	**8,355**
Surveyed Flow	Normal weekday	3,160	1,360	860	2,190	**7,570**
					COVID-19 Factor	**1.10**

Note (1): The growth factor = 2.73% (please refer to ***Section 4.2****)*

3.3.7 The COVID-19 Factor of **1.10** is then applied to the surveyed traffic flows in to give the COVID-19 corrected surveyed traffic flows "Baseline Flows" shown in **Figure 3.17** for the use in the later section of this report.

Junction Assessments

3.3.8 The site constraint factors for the on-street loading and unloading activities in the study area were also taken into account to review the junction performance.

3.3.9 To evaluate the existing traffic condition in the vicinity of the Application Site, the operational performance of the local junctions was assessed based on the "corrected" traffic flows (with covid-19 factor applied) and their existing junction layouts, control method, cycle time and the existing signal control data sheets provided by TD. Results are summarized in **Table 3.4** and **3.5**.

Table 3.4 Observed Junction Performance (With the COVID-19 Factor)

Ref. No.	**Junction**	**Method of Control**	**Observed Scenario RC (1)/DFC(2)**	
			AM Peak	PM Peak
A	Kam Sheung Road/ Pat Heung Road	Priority	0.57	0.49
B	Kam Sheung Road / Kam Shui South Road	Priority	0.19	0.13
C	Kam Sheung Road / Kam Tin Road	Priority	0.71	0.58
D	Kam Tin Road / Lam Kam Road / Route Twisk	Priority	0.62	0.51
E	Future Development Access	Priority	N/A	N/A
F	Tung Wui Road / Kam Sheung Road	Signalized	+26%	+25%
G	Ko Sheung Road / Kam Sheung Road	Priority	0.03	0.02
H	Fan Kam Road / Kam Tin Road	Roundabout	0.58	0.65

***Note*:**
(1) RC - Reserved capacity for signalized junction
(2) DFC - Design Flow / Capacity for priority junction / roundabout

Table 3.5 V/C Ratio of Critical Road Link in Year 2021

Index	**Direction**	**Cap. (veh/hr) (C)$^{(1)}$**	**Observed Scenario**			
			Flow (veh/hr) (V)		**V/C**	
			AM Peak	**PM Peak**	**AM Peak**	**PM Peak**
L1	Two-way	1400	680	520	0.49	0.37
L2	Two-way	1400	620	510	0.36	0.3
L3	Two-way	1400	600	600	0.43	0.43
L4	Two-way	1400	480	490	0.34	0.35
L5	Two-way	1700	1310	1480	0.77	0.87
L6	Two-way	1400	900	1060	0.64	0.76
Tai Lam Tunnel	NB	4700	950	2400	0.2	0.51
Tai Lam Tunnel	SB	4700	3470	1500	0.74	0.32

***Note*:**
(1) Index please refer to Figure 3.1

3.3.10 The above results indicate that all junctions and road links are currently operating with ample capacities during the both morning peak and evening peak.

4. FUTURE TRAFFIC CONDITIONS

4.1 Design Year

4.1.1 The design year 2034 (OP + 3 years) is adopted as the design year for the assessment, and the development will be completed by year of 2031.

4.2 Reference Traffic Forecast

4.2.1 To derive the 2034 reference traffic flows in the local road network, an appropriate growth factor has to be identified for the area, which would be determined from the historical growth trend or the planning data from Planning Department.

Historical Trend

4.2.2 TD has traffic count stations in the vicinity of the Application Site. The past 5 years traffic counts reported in the Annual Traffic Census (ATC) are shown in **Table 4.1**.

Table 4.1 Average Annual Daily Traffic (A.A.D.T.) Data in the Vicinity of the Application Site from ATC

ATC Station	**Road Name**	**Annual Average Daily Traffic (AADT)**						
		2014	***2015***	**2016**	**2017**	**2018**	***2019***	***2020***
5014	Route Twisk	*5280*	*5,140*	**5,800**	**5,460**	**6,170**	*6,420*	*6,910*
5029	Tsing Long HyD - Tai Lam Tunnel	*62,440*	*61,010*	**60,480**	**60,280**	**61,100**	*57,450*	*45,880*
5,463	Lam Kam Rd	15,900	17,520	**18,000**	**18,340**	**18,610**	19,580	19,660
6,207	Kam Tin Rd	18,460	20,450	**20,060**	**20,550**	**20,390**	21,300	21,640
6,212	Fan Kam Rd	12,210	12,420	**11,900**	**10,780**	**11,570**	11,660	12,250
6,208	Kam Sheung Rd	7,170	7,550	**7,360**	**7,860**	**8,120**	8,080	9,400
Total		121,460	124,090	**123,600**	**123,270**	**125,960**	124,490	115,740

- Due to the Social Movement in 2019 and COVID-19 in 2020, the traffic flow will not be reliable and hence the Growth Rate will only take into account from 2016 to 2018
- Avg. Annual Growth Rate from 2016 to 2018 is **0.95%**

4.2.3 The Average Annual Daily Traffic (AADT) flows in **Table 4.1** shows the average traffic growth on surrounding roads which decreased at the rate of **0.95%** per annum.

Planning Data

4.2.4 Reference has also been made to the 2019-Based Territorial Population Employment Data Matrices (TPEDM) planning data which published by the Planning Department. It projects population and employment within the study district from years 2019 to 2031. The average annual growth rates in terms of population and employment from 2019 to 2031 are tabulated in **Table 4.2**.

Table 4.2 Population and Employment Estimates and Growth Rates for Rural North West New Territories (Other Area) and Yuen Long Districts

Rural North West New Territories (Other Area) and Yuen Long Districts				
Data	**Year**			**Average Annual Growth Rate**
	2019	**2026**	**2031**	
Population	397,950	411,600	513,750	+2.15%
Employment	126,500	147,550	210,400	+4.33%
Total	**524,450**	**559,150**	**724,150**	**+2.73%**

Adopted Growth Factor

4.2.5 A.A.D.T. of ATC indicates that the traffic flow of the local road network has an average annual growth rate of +0.95% from year 2016 to 2018.

4.2.6 Whilst, the planning data indicates the population and employment of the study area are expected to growth with an average annual growth rate of **+2.73%**.

4.2.7 As a conservative approach, the annual growth rate **+2.73%** and has been adopted projecting traffic forecasts from year 2021 to year 2034. It is deemed sufficient to allow for any unexpected future growth as a result of some changes in land use or development in the study area.

Planned / Committed Future developments in NWNT Area

4.2.8 There are numbers of planned/committed future developments in vicinity obtained from District Planning Office (DPO). The updated planning parameters are shown in **Table 4.3, 4.4 and 4.5**. The locations of these future developments are shown in **Figure 4.1.**

4.2.9 The traffic trips generated from these planned/committed developments are estimated and shown in **Table 4.3, 4.4 and 4.5**.

4.2.10 These traffic trips were assigned to the road network to obtain the reference traffic in the design year.

Table 4.3 Development Schedule of Proposed Residential Development at Vicinity

Ref.	Development Site / Planning Application No.	Use	Development Parameters
A	A/YL-KTS/960	Transition Housing	1,998 Units
B	A/YL-KTS/899	Transition Housing	1,020 Units

Note: According to their TIA reports / Planning Statement

Table 4.4 Development Schedule of Developments under LUR

Development Parameters	Proposed Scheme				
	KSRS	PHMC	Site 1	Site 4a	Site 6
Residential Type	Private	Private	PRH/SSF	PRH/SSF	PRH/SSF
No. of Flats	2,692	6,060	4,100	3,800	1,700
Average Flat Size	69m^2	70m^2	46m^2	46m^2	50m^2
Commercial / Retail GFA	40,000m^2	3,000m^2	7,000m^2	1,100m^2	-
Kindergarten	1	-	1	1	1
School	-	2	1	-	1

Note: According to the TIA report of Site 1, 4a and 6

Table 4.5 Estimated Traffic Generations of Planned Vicinity Development

Developments	AM Peak		PM Peak	
	Gen.	Att.	Gen.	Att.
	Pcu/hr			
A/YL-KTS/960	40	40	40	40
A/YL-KTS/899	5	5	5	5
KSRS	331	236	220	271
PHMC (via Kam Ho Road Access)	176	117	72	96
PHMC (via Pat Heung Road Access)	383	256	155	208
Site 1	318	266	184	250
Site 4a	239	165	116	156
Site 6	113	102	51	69

Note: According to their TIA reports

Reference Flows in Design Year

4.2.11 There are numbers of planned/committed future developments in NWNT area. The locations of these future developments are shown in **Figure 4.1** and the updated planning parameters of theses planned/committed future developments are listed in **Table 4.3, 4.4 and 4.5**. Adopting a conservative approach, it is assumed that these future developments will be completed and occupied before 2034. The traffic generation of these future developments have also been taken into account in the traffic forecast.

2034 Reference Traffic Flows (Without proposed development) = (**2021 (Baseline Traffic Flows)** x **Adopted Growth Factor i.e. 2.73% p.a. for 13 years**) + **Traffic Flows of Adjacent Planned/Committed Developments**

4.3 Development Traffic Flows

4.3.1 In order to estimate the traffic generation and attraction of the proposed residential development, reference has been made to the trip rates for private housing tabulated in TPDM.

4.3.2 The average flat size of the proposed development is about 38.861 m^2, and as presented in **Table 2.1**. As a conservative approach, the upper limit value of trip rates for the private housing development with average flat size of 60 m^2 are adopted for this development. The details of TPDM trips rates are summarized in **Table 4.6**.

Table 4.6 Adopted TPDM Trip Rates for the Development

Avg. Flat Size	Adopted Avg. Flat Size of TPDM	TPDM Upper Limit Rates (pcu/flat/hr)			
		AM Peak		PM Peak	
		Gen	Att	Gen	Att
38.861 m^2	60 m^2	0.1021(1)	0.0709(1)	0.0415(1)	0.0464(1)

Remarks:
(1): As a conservative approach, the upper limit trip rates of 60 m^2 Avg. Flat Size of TPDM will adopted for the development.

4.3.3 The corresponding trips generated/attracted from the proposed development is shown in **Table 4.7.**

Table 4.7 Estimated Traffic Trips of the Proposed Development

No. of Flats	Weekday AM Peak (pcu/hr)		Weekday PM Peak (pcu/hr)	
	Generation	Attraction	Generation	Attraction
850	87	60	35	39

4.4 Traffic Forecasts

4.4.1 The estimated traffic generated from the developments as presented in **Table 4.7** was then distributed and assigned to the road network. The development traffic trips of the proposed development then superimposed onto the year 2034 reference traffic flow (without the proposed development) as shown in **Figure 4.2.** It results in the peak hour traffic flows for the design years 2034, and the 2034 Design traffic flow (with the proposed development) as show in **Figures 4.3**. The development traffic flow is shown in **Figure 4.4**.

4.4.2 The future demand for public transport is derived from the equation below:

2034 Design Traffic Flows (With Proposed Development) = **2034 Reference Traffic Flows (without proposed development)** + **Proposed Development Traffic Flows**

5. TRAFFIC IMPACT ASSESSMENT

5.1 Operational Assessment

Reference Case in Year 2034

5.1.1 The operational assessment of the critical junctions and link capacity for the Reference Scenario (without the proposed development) in year 2034 were carried out and the results are summarized in **Tables 5.1** and **5.2.**

Table 5.1 Operational Performance for Reference Case in Design Year 2034

Ref. No.	Junction		Reference Scenario RC (1)/DFC(2)	
			AM Peak	**PM Peak**
A(3)	Kam Sheung Road/ Pat Heung Road		+62%	>+100%
B	Kam Sheung Road / Kam Shui South Road		0.25	0.16
C(4)	Kam Sheung Road / Kam Tin Road	w/o PWP	**1.13**	**0.92**
		w PWP	0.90	0.72
D(4)	Kam Tin Road / Lam Kam Road / Route Twisk	w/o PWP	0.80	0.64
		w PWP	0.79	0.63
E	Future Development Access		**N/A**	**N/A**
F(3)	Tung Wui Road / Kam Sheung Road		+25%	+28%
G	Ko Sheung Road / Kam Sheung Road		0.04	0.03
H(4)	Fan Kam Road / Kam Tin Road	w/o PWP	0.79	0.84
		w PWP	0.65	0.60

Note:
(1) RC - Reserved capacity for signalized junction
(2) DFC - Design Flow / Capacity for priority junction / roundabout
(3) Signalized by CEDD under Contract No. YL/2017/01 as shown in Figure 3.11and 3.14
(4) Improvement scheme was proposed by HyD under Public Works Project "PWP Item No.6820TH - Upgrading of Remaining Sections of Kam Tin Road and Lam Kam Road" and "PWP Item No.6892TH - Improvement to Kam Sheung Road" as shown in Figures 3.12, 3.13 and 3.15
(5) PWP Item No.6892TH - Improvement to Kam Sheung Road is mainly on road widening, the junction improvements are already carrying by CEDD under Contract No. YL/2017/01, therefore, existing or CEDD's layout of Junction A, B, E, F and G will be used for conservative approach.

Table 5.2 V/C Ratio of Critical Road Link for Reference Case in Design Year 2034

Index	Direction	Cap. (veh/hr) (C)(1)	Design Scenario			
			Flow (veh/hr) (V)		V/C	
			AM Peak	PM Peak	AM Peak	PM Peak
L1 (w/o PWP)	Two-way	1400	920	730	0.66	0.52
L1 (w PWP)	Two-way	1700	920	730	0.54	0.43
L2	Two-way	1700	890	740	0.52	0.44
L3 (w/o PWP)	Two-way	1400	780	760	0.56	0.54
L3 (w PWP)	Two-way	1700	780	760	0.46	0.45
L4 (w/o PWP)	Two-way	1400	630	640	0.45	0.46
L4 (w PWP)	Two-way	1700	630	640	0.37	0.38
L5 (w/o PWP)	Two-way	1700	1670	1850	0.98	1.09
L5 (w PWP)	Two-way	2200	1670	1850	0.76	0.84
L6 (w/o PWP)	Two-way	1400	1140	1310	0.81	0.94
L6 (w PWP)	Two-way	1700	1140	1310	0.67	0.77
Tai Lam Tunnel	NB	4700	1450	3210	0.31	0.68
Tai Lam Tunnel	SB	4700	4620	2050	0.98	0.44

Note:
(1) Index please refer to Figure 3.1
(2) Capacity based on future widening under government projects

Design Case in Year 2034

5.1.2 The operational assessment of the critical junctions for the Design Scenario (with the proposed development) in year 2034 were carried out and the results are summarized in **Tables 5.3** and **5.4.**

Table 5.3 Operational Performance for Design Case in Design Year 2034

Ref. No.	Junction		Design Scenario RC (1)/DFC(2)	
			AM Peak	PM Peak
A(3)	Kam Sheung Road/ Pat Heung Road		+59%	>+100%
B	Kam Sheung Road / Kam Shui South Road		0.27	0.16
C(4)	Kam Sheung Road / Kam Tin Road	w/o PWP	**1.25**	**0.97**
		w PWP	**0.99**	0.75
D(4)	Kam Tin Road / Lam Kam Road / Route Twisk	w/o PWP	0.83	0.65
		w PWP	0.81	0.64
E	Future Development Access		0.20	0.08
F(3)	Tung Wui Road / Kam Sheung Road		+25%	+28%
G	Ko Sheung Road / Kam Sheung Road		0.05	0.03
H(4)	Fan Kam Road / Kam Tin Road	w/o PWP	0.79	0.84
		w PWP	0.65	0.60

Note:
(1) RC - Reserved capacity for signalized junction
(2) DFC - Design Flow / Capacity for priority junction / roundabout
(3) Signalized by CEDD under Contract No. YL/2017/01 as shown in Figure 3.11and 3.14
(4) Improvement scheme was proposed by HyD under Public Works Project "PWP Item No.6820TH - Upgrading of Remaining Sections of Kam Tin Road and Lam Kam Road" and "PWP Item No.6892TH - Improvement to Kam Sheung Road" as shown in Figures 3.12, 3.13 and 3.15
(5) PWP Item No.6892TH - Improvement to Kam Sheung Road is mainly on road widening, the junction improvements are already carrying by CEDD under Contract No. YL/2017/01, therefore, existing or CEDD's layout of Junction A, B, E, F and G will be used for conservative approach.

Table 5.4 V/C Ratio of Critical Road Link for Design Case in Design Year 2034

Index	Direction	Cap. (veh/hr) (C)(1)	Design Scenario			
			Flow (veh/hr) (V)		V/C	
			AM Peak	PM Peak	AM Peak	PM Peak
L1 (w/o PWP)	Two-way	1400	950	740	0.68	0.53
L1 (w PWP)	Two-way	1700	950	740	0.56	0.44
L2	Two-way	1700	920	760	0.54	0.45
L3 (w/o PWP)	Two-way	1400	850	800	0.61	0.57
L3 (w PWP)	Two-way	1700	850	800	0.5	0.47
L4 (w/o PWP)	Two-way	1400	680	660	0.49	0.47
L4 (w PWP)	Two-way	1700	680	660	0.4	0.39
L5 (w/o PWP)	Two-way	1700	1710	1880	1.01	1.11
L5 (w PWP)	Two-way	2200	1710	1880	0.78	0.85
L6 (w/o PWP)	Two-way	1400	1150	1330	0.82	0.95
L6 (w PWP)	Two-way	1700	1150	1330	0.68	0.78
Tai Lam Tunnel	NB	4700	1460	3210	0.31	0.68
Tai Lam Tunnel	SB	4700	4640	2060	0.99	0.44

Note:
(1) Index please refer to Figure 3.1
(2) Capacity based on future widening under government projects

5.1.3 The results in **Table 5.3 and 5.4** shows all junctions and road links are predicted to be operated with ample spare capacities during AM and PM peaks in design year 2034 with proposed development except Junction C.

5.1.4 Improvement proposal (junction widening and converting the priority junction to a signalized junction) is proposed as shown in **Figure 5.1**. The assessment results for the improvement proposal are shown in **Table 5.5**.

Table 5.5 Operational Performance for Design Case in Design Year 2034

Ref. No.	Junction	RC (1)/RFC(2)			
		Design Scenario (Without Improvement)		Design Scenario (With Improvement)	
		AM Peak	PM Peak	AM Peak	PM Peak
C	Kam Sheung Road / Kam Tin Road	**0.99**	0.75	+38%	+28%

Note:
(1) RC - Reserved capacity for signalized junction
(2) RFC - Ratio of flow to capacity for priority junction

5.1.5 The results in **Table 5.5** show that Junctions C will operate with ample spare capacities during AM and PM peaks in design year 2034 with proposed improvement scheme.

5.1.6 Queue length assessment of Kam Sheung Road northbound is also carried out and the results are summarized in **Table 5.6**.

Table 5.6 Queue Length for Design Case in Design Year 2034

Ref. No.	**Road**	**Allowable Queue Length (m)**	**Queue Length (m)**			
			Design Scenario (Without Improvement)		**Design Scenario (With Improvement)**	
			AM Peak	**PM Peak**	**AM Peak**	**PM Peak**
C	Kam Sheung Road Northbound (LT)	70	126	18	12	12
	Kam Sheung Road Northbound (RT)	>300			42	36
	Kam Tin Road NEB (LT)	50	0	0	12	12
	Kam Tin Road NEB (STR)	100			48	54
	Kam Tin Road SEB	>300	0	0	54	60
	Car Park Access	70	6	6	18	18

5.1.7 The results in **Table 5.6** show that the queues at Junction Kam Sheung Road/Kam Tin Road will be within their allowable queue length during AM and PM peaks in design year 2034.

5.1.8 Our proposed improvement scheme will be a further improvement works to PWP improvement scheme. As the programme of PWP works are still under review, the PWP works maybe delayed. In case delay occurs, it is recommended to carry out our proposed improvement works in advance to PWP works. This layout could still match with PWP improvement layout. The improvement layout prior to the PWP works is shown in **Figure 5.2**. Details arrangement would be discussed with government departments at detailed design stage.

6. PUBLIC TRANSPORT DEMAND

6.1 Survey on Existing Public Transport Service

6.1.1 The proposed development is not close to MTR station and the public transport service is not comprehensive. A public transport survey was carried out at the existing bus/GMB stops on Kam Sheung Road as shown in **Figure 3.2**.

6.1.2 The survey was carried out on 10 October 2022 during the morning / evening peak periods. The findings are presented in the **Tables 6.1** to **6.4** below.

Table 6.1 Public Transport Survey at Stop A – East Bound

East Bound								
Stop A								
		Routes	**Observed Trips**	**Average Occupancy**	**No. of passenger (Arrival) (passenger)**	**No. of passenger (Departure) (passenger)**	**Surplus (passenger)**	
AM Peak (07:30-08:30)	**Bus**	64K	3	50%	180	182	90	402
		251A	4	10%	48	48	312	
	Mini-bus	GMB 72	6	25%	24	22	72	172
		GMB 72M	4	31%	20	19	44	
		RMB 23	4	12%	8	8	56	
PM Peak (18:00-19:00)	**Bus**	64K	7	52%	432	425	193	371
		251A	4	38%	180	168	178	
	Mini-bus	GMB 72	7	38%	42	41	69	159
		GMB 72M	4	45%	29	27	35	
		RMB 23	5	31%	23	22	55	

Remarks: (1) Full capacity of 120 passengers with max. 75% for double-decked Franchised Bus is assumed.
(2) Part of the observed GMBs are 19-seater. For conservative, full capacity of 16 passengers for minibus is assumed.

Table 6.2 Summary of Public Transport Survey – East Bound

East Bound					
		No. of passenger (Arrival) (passenger)	**No. of passenger (Departure) (passenger)**	**Total Surplus (passenger)**	**Expected Surplus in 2034**
AM Peak (07:30-08:30)	**Bus**	228	230	402	288
	Minibus	52	49	172	123
PM Peak (18:00-19:00)	**Bus**	612	593	371	266
	Minibus	94	90	159	114

Table 6.3 Public Transport Survey at Stop B – West Bound

West Bound								
Stop B								
		Routes	**Observed Trips**	**Average Occupancy**	**No. of passenger (Arrival) (passenger)**	**No. of passenger (Departure) (passenger)**	**Surplus (passenger)**	
AM Peak (08:30-09:30)	**Bus**	64K	9	43%	456	462	346	544
		251A	3	20%	72	72	198	
	Mini-bus	GMB 72	5	56%	47	58	35	184
		GMB 72M	4	62%	40	46	24	
		RMB 23	9	13%	20	29	125	
PM Peak (17:00-18:00)	**Bus**	64K	9	38%	408	408	400	515
		251A	3	43%	156	156	115	
	Mini-bus	GMB 72	6	44%	40	41	54	153
		GMB 72M	4	54%	35	36	29	
		RMB 23	5	13%	11	14	70	

Remarks: (1) Full capacity of 120 passengers with max. 75% for double-decked Franchised Bus is assumed.
(2) Part of the observed GMBs are 19-seater. For conservative, full capacity of 16 passengers for minibus is assumed.

Table 6.4 Summary of Public Transport Survey – West Bound

West Bound					
		No. of passenger (Arrival) (passenger)	**No. of passenger (Departure) (passenger)**	**Total Surplus (passenger)**	**Expected Surplus in 2034**
AM Peak (08:30-09:30)	**Bus**	528	534	544	390
	Minibus	107	133	184	132
PM Peak (17:00-18:00)	**Bus**	564	564	515	369
	Minibus	86	91	153	110

6.2 Survey on Directional Split

6.2.1 Survey on the directional split (Eastbound and Westbound) was also carried out and the results are given in **Table 6.5** below:

Table 6.5 Surveyed Directional Split

	Eastbound	**Westbound**
AM Peak	44%	56%
PM Peak	44%	56%

6.3 Assessment on Public Transport Demand

6.3.1 Reference is made to the "Travel Characteristics Survey 2011 Report" as published by Transport Department in February 2014 to derive the estimated public transport demand due to the proposed development.

6.3.2 The total trips generated from the proposed development are derived from development parameters and assumptions from the TCS Report 2011. The calculation of total trips during peak hours is summarized in **Tables 6.6** and **6.7** below:

Table 6.6 Calculation of Total Passenger Trips from Proposed Development

Item	**Proposed Development (Site B)**
Nos. of units	850
Average household size	2.7 ppl/unit*
Total population	= 850 x 2.7 = 2,295ppl
Trip Rate per Person	1.83**
Daily trips generated from proposed development	= 2,295ppl x 1.83 = 4,200 trips
Peak Hour Factor	12%**
Peak hour trips (Two-ways)	= 4,200 trips x 12% = 504 trips

*Notes: * Latest average household size 2.7 in Hong Kong obtains from Census and Statistics Department*
***Data extracted from TCS Report 2011*

6.3.3 The distribution of trips by transport mode derived from 2021 Population Census is given in below **Table 6.7**. Due to there is no MTR, no Light Rail and no ferry services, and assume there is no residential coach services from the proposed development, the modal split is therefore re-distributed on a conservative approach, and the model split after re-distribution is also shown in **Table 6.7**.

Table 6.7 Distribution of Transport Modal Split

Year 2021 Census (Yuen Long)														
North District		**Mass Transit Railway**	**Bus**	**On foot only**	**Private car/ Passenger van**	**Public light bus**	**Company bus/ van**	**Light Rail**	**Taxi**	**Residential coach service**	**Ferry/ Vessel**	**Others**	**Total**	
Number of Persons		90,523	59,345	16,860	24,012	7,913	6,848	20,458	1,275	2,628	468	4,146	234,476	
Modal Split		39%	25%	7%	10%	3%	3%	9%	1%	1%	0%	2%	100%	
Number of Persons (excluded on foot only)		90,523	59,345	-	24,012	7,913	6,848	20,458	1,275	2,628	468	4,146	217,616	
Modal Split (excluded on foot only)		42%	27%	-	11%	4%	3%	9%	1%	1%	0%	2%	100%	
Adjusted Modal Split for the Development Site	**PT**	-	**71%**	-	-	**11%**	-	-	-	-	-	-	**82%**	**100%**
	Non-PT	-	-	-	**14%**	-	-	-	**1%**	-	-	**3%**	**18%**	

Notes: Example for PT:	%Sum of MTR + LRT = 42% + 9% = 51%
	%Sum of other PT = 27% + 4% = 31%
	Adjusted Modal Split of Bus = 27% + 51% x 27% / 31% = 71%
Example for Non-PT:	%Sum of Remaining Non related Model Split = 3% + 1% + 0 %= 4%
	%Sum of Remaining related Model Split = 11% + 1% + 2% = 14%
	Adjusted Modal Split of PV = 11% + 4% x 11% / 14% = 14%

6.3.4 From **Table 6.7**, about 51% (42% MTR + 9% Light Rail) of model split is railway services. Assume all these trips will go to KSR MTR station, based on surveyed directional split in **Table 6.5**, the distribution of passenger demand is estimated as **Tables 6.8** and **6.9**.

Table 6.8 Adjusted Directional Split

Item	**Eastbound (From KSR MTR)**	**Westbound (To KSR MTR)**	**Total**
AM Peak	31% x 44% = 14%	51% + 31% x 56% = 68%	82%
PM Peak	51% + 31% x 44% = 65%	31% x 56% = 17%	82%

Table 6.9 Passenger Trips Generated

Item	**Passenger trips**		**Total**
	Eastbound (From KSR MTR)	**Westbound (To KSR MTR)**	
AM Peak	504 x 14% = 70	343	**413**
PM Peak	328	85	**413**

6.3.5 The Public Transport Trips (Bus and GMB/RMB) for the proposed development, based on the information shown in **Table 6.10** is:

Table 6.10 Trips for Bus and Mini-buses

Peak	**PT Passenger trips**				
	Eastbound				
	Total Trips	Bus Demand	Surplus(a)	Minibus Demand	Surplus(a)
AM Peak	70	**70 x 71%/82% = 61**	**<288, OK**	**70 x 11%/82% = 9**	**<123, OK**
PM Peak	328	**284**	**<266, OK**	**44**	**<114, OK**
	Westbound				
	Total Trips	Bus Demand	Surplus(b)	Minibus Demand	Surplus(b)
AM Peak	343	**297**	**<390, OK**	**46**	**<132, OK**
PM Peak	85	**74**	**<369, OK**	**11**	**<110, OK**

Note: (a) Refer to Table 6.2
(b) Refer to Table 6.4

Assessment of GMB on KSR MTR station PTI

6.3.6 A survey at Kam Sheung Road MTR station PTI was carried out, the occupancy of Bus and GMB is about 50% and 91% respectively during PM peak, which may affect the boarding of the residents of the proposed development. The assessment is summarized as **Table 6.11** below.

Table 6.11 Trips PT at KSR MTR station during PM peak

Item	**PT Passenger trips**				
	To proposed development				
	Total Trips	Bus$^{(a)}$	Surplus	Minibus$^{(a)}$	Surplus
PM Peak	328	**284**	**120 x 11 x (75% - 50%) = 330** **OK**	**44**	**16 x 10 x (1-91%) = 14** **Not OK**

Note: (a) Refer to Table 6.10

6.3.7 To ensure the residents of the proposed development could aboard the mini-bus, it is proposed to increase 2 nos. of GMB trip/hr in PM peak. The assessment is summarized as **Table 6.12** below.

Table 6.12 Trips Mini-buses at KSR MTR station PM peak

Item	**PT Passenger trips**	
	Eastbound	
	Minibus$^{(a)}$	Surplus
PM Peak	**44**	**14 + 16 x 2 = 46** **OK**

Note: (a) Refer to Table 6.9

6.4 Conclusion

6.4.1 Based on the surveyed results and the forecast surplus for the public transport in 2034, the forecast surplus is able to meet the expected public transport demand due to the proposed in design year 2034. To ensure the residents could board the mini-bus, it is proposed to increase 2 nos. of GMB trip/hr in PM peak.

7. PEDESTRIAN ASSESSMENT

7.1 Existing Pedestrian Condition

7.1.1 In order to acquire the existing pedestrian condition around the proposed development, a pedestrian headcount survey was conducted at concerned footpath sections during periods on a typical weekday on February 2023 from 07:30 to 09:30 and 17:00 to 19:00 respectively. The layout of the critical sections of footpath is shown in **Figure 7.1**.

Footpath Assessment

7.1.2 The level-of-service (LOS) for the observed pedestrian flows of the identified critical sections are shown in **Table 7.1**.

Table 7.1 Operational Performance of Critical Footpath in Existing Scenario

Critical Section	Total Footpath Width (m)	Effective Width (m)(1)	Year 2023 Observed Scenario					
			AM Peak			PM Peak		
			Two-way Pedestrian Flow (ped/hr)	Two-way Pedestrian Flow Rate (ped/min/m)(2)	LOS(3)	Two-way Pedestrian Flow (ped/hr)	Two-way Pedestrian Flow Rate (ped/min/m)(2)	LOS(3)
F1	1.0	0.5	10	0.33	A	10	0.33	A
F2	1.0	0.5	10	0.33	A	10	0.33	A

Notes:
(1) Effective Width = Total Footpath Width – Death Width (0.5m from railings or walls each for both sides and 1m from shop frontage).
(2) Two-way Pedestrian Flow Rate (ped/min/m) = Peak Pedestrian Flow / 60 min / Effective Width.
(3) LOS details extracted from the HCM are tabulated in TPDM Volume 6 Chapter 10 Clause 10.4.2.3.

7.1.3 The assessment results shown in **Table 7.1** indicate that critical sections are operating within LOS A.

7.2 Pedestrian Traffic Forecast

7.2.1 To assess the future impact due to the proposed development, based on the survey flow and the adopted growth rate of **+2.73%** in Chapter 4, future reference pedestrian flows (without the proposed development) at the critical sections are estimated The LOS are assessed and summarized in **Table 7.2** below:

Footpath Assessment

Table 7.2 Operational Performance of Critical Footpath in Reference Scenario

Critical Section	Total Footpath Width (m)	Effective Width (m)(1)	Year 2034 Reference Scenario					
			AM Peak			PM Peak		
			Two-way Pedestrian Flow (ped/hr)	Two-way Pedestrian Flow Rate (ped/min/m)(2)	LOS(3)	Two-way Pedestrian Flow (ped/hr)	Two-way Pedestrian Flow Rate (ped/min/m)(2)	LOS(3)
F1 (w/o PWP)	1.00	0.50	10	0.33	A	10	0.33	A
F1 (w PWP)	2.0(4)	1.5	10	0.11	A	10	0.11	A
F2 (w/o PWP)	1.00	0.50	10	0.33	A	10	0.33	A
F2 (w PWP)	2.0(4)	1.5	10	0.11	A	10	0.11	A

Notes:
(1) Effective Width = Total Footpath Width – Death Width (0.5m from railings or walls each for both sides and 1m from shop frontage).
(2) Two-way Pedestrian Flow Rate (ped/min/m) = Peak Pedestrian Flow / 60 min / Effective Width.
(3) LOS details extracted from the HCM are tabulated in TPDM Volume 6 Chapter 10 Clause 10.4.2.3.
(4) Widening of Kam Sheung Road will be carried out by HyD and 2m footpaths will be provided along both sides of the road.

7.2.2 The total trips generated from the proposed development are estimated in **Tables 6.9** of **Chapter 6** above.

7.2.3 The estimated trips are superimposed to the network. The assessment of the design scenario is summarized in **Tables 7.3**.

Footpath Assessment

Table 7.3 Operational Performance of Critical Footpath in Reference Scenario

Critical Section	Total Footpath Width (m)	Effective Width (m)(1)	Year 2034 Design Scenario					
			AM Peak			PM Peak		
			Two-way Pedestrian Flow (ped/hr)	Two-way Pedestrian Flow Rate (ped/min/m)(2)	LOS(3)	Two-way Pedestrian Flow (ped/hr)	Two-way Pedestrian Flow Rate (ped/min/m)(2)	LOS(3)
F1 (w/o PWP)	1.00	0.50	515	17.17	B	515	17.17	B
F1 (w PWP/ Proposed Widening)	2.0(4)	1.5	515	5.72	A	515	5.72	A
F2 (w/o PWP)	1.00	0.50	305	10.17	A	290	9.67	A
F2 (w PWP/ Proposed Widening)	2.0(4)	1.5	305	3.39	A	290	3.22	A

Notes:
(1) Effective Width = Total Footpath Width – Death Width (0.5m from railings or walls each for both sides and 1m from shop frontage).
(2) Two-way Pedestrian Flow Rate (ped/min/m) = Peak Pedestrian Flow / 60 min / Effective Width.
(3) LOS details extracted from the HCM are tabulated in TPDM Volume 6 Chapter 10 Clause 10.4.2.3.
(4) Widening of Kam Sheung Road will be carried out by HyD and 2m footpaths will be provided along both sides of the road.

Pedestrian Crossing Assessment

7.2.4 For a better connectivity between the site and the public transport, a pedestrian crossing is proposed and shown in **Figure 7.1**

Table 7.4 V/C Ratio of Critical Crossing in Design Scenario

Critical Sections	**Lateral Width of Ped. Crossing [W] (m)**	**Year 2034 Design Scenario**											
		AM Peak						**PM Peak**					
		Two-way Ped. Flow (ped/hr)	**Ped. Green + Flashing Green Time**	**Cycle time**	**Green Time Proportion [GTP)]**	**Ped. Crossing Capacity [PC] (ped/hr)**	**V/C**	**Two-way Ped. Flow (ped/hr)**	**Ped. Green + Flashing Green Time**	**Cycle time**	**Green Time Proportion [GTP)]**	**Ped. Crossing Capacity [PC] (ped/hr)**	**V/C**
C1	4.50	295	12	60	0.20	6130	0.05	280	12	60	0.20	6600	0.04

Note:
(1) PC = K x GTP x W
where PC = Pedestrian crossing capacity in pedestrians per hour
GTP = Green time proportion
i.e. (Pedestrian green + flashing green time) / Cycle time
W = Lateral width of pedestrian crossing
K = A constant equivalent to saturation flow for pedestrians (1900 ped/metre/hours)

7.2.5 The assessment results shown in **Table 7.4** indicate that proposed crossing would operate within ample capacity.

7.2.6 As the programme of PWP works are still under review, the PWP works maybe delayed. In case delay occurs, the Applicant will carry out our proposed improvement works in advance to PWP works. The layout general follows the preliminary layout of PWP works and could match with PWP improvement layout. The improvement layout prior to the PWP works is shown in **Figure 7.2**. Details arrangement would be discussed with government departments at detailed design stage.

8. SUMMARY AND CONCLUSION

8.1 According to the Shek Kong Outline Zoning Plan (OZP) No. S/YL-SK/9 published by Town Planning Board (TPB) in October 2006, the Application Site is located at the south of Kam Sheung Road and was zoned as "Residential (Group D) ("R (D)").

8.2 The proposed development is planned to provide 850 residential units with the average flat size of 38.861 m^2.

8.3 Some public transport services provided at the Kam Sheung Road. Both regular and special services of buses are available, and provides a coverage to Yuen Long West, AsiaWorld Expo, Tai Po and Shek Kong.

8.4 The provision of the internal transport facilities of the proposed development will follow the guidelines stipulated in the latest Hong Kong Planning and Standard Guidelines (HKPSG).

8.5 To appreciate the existing traffic condition, traffic count surveys were conducted on normal weekdays in November 2021 in the surrounding road network of the Application Site. Correction due to the COVID-19 pandemic was applied to obtain the "Corrected Traffic Flow" for assessment.

8.6 The traffic forecasts for the design years 2034 were derived for assessment purposes. Operational traffic impact assessment has been carried out for the 2034 traffic situation under both reference and design scenarios. The results indicate that all junctions, Development Access and road links will operate with ample spare capacities in both reference and design scenarios except Junction C.

8.7 Junction improvement scheme was proposed. With the improvement scheme, Junction C will operate with ample reserve capacity for both the reference and design cases.

8.8 The assessment of public transport indicates that the public transport services could cater the future demand by increasing the frequency of the GMBs.

8.9 Therefore, it can be concluded that the proposed residential development is considered acceptable from traffic engineering point of view.

FIGURE NO.: 1.1

PROJECT TITLE: S12A Application for DD112 in Kam Tin

PROJECT NO.: 21134HK-DD112

DRAWING TITLE: SITE LOCATION PLAN

SCALE: 1 : 12000 @A4

DATE: 10 DEC 2021

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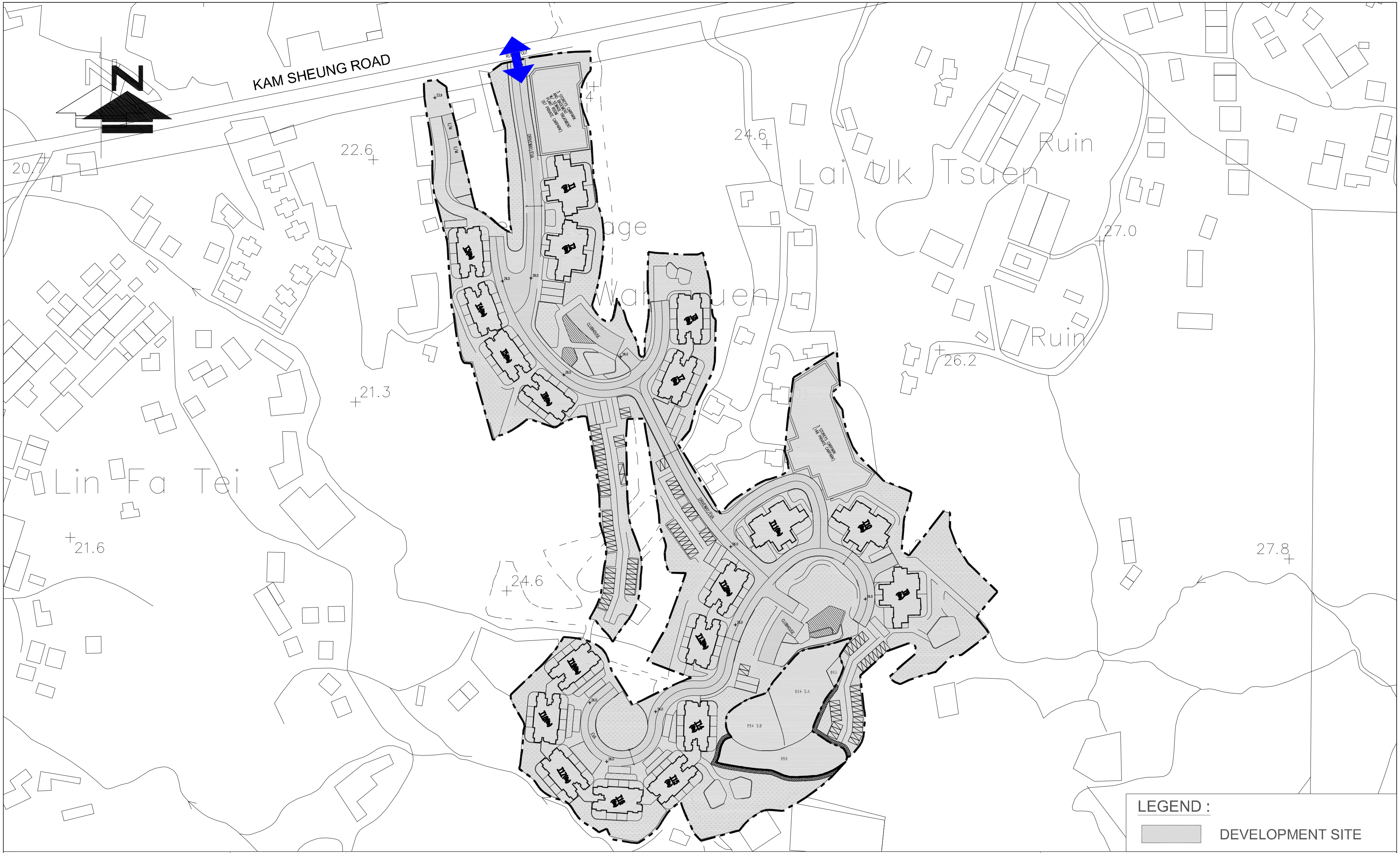

LEGEND :

▨ DEVELOPMENT SITE

FIGURE NO.: 2.1	PROJECT TITLE: S12A Application for DD112 in Kam Tin
PROJECT NO.: 21134HK-DD112	DRAWING TITLE: PROPOSED ACCESS ARRANGEMENT
SCALE: 1 : 2500 @A4 DATE: 01 MAR 2023	

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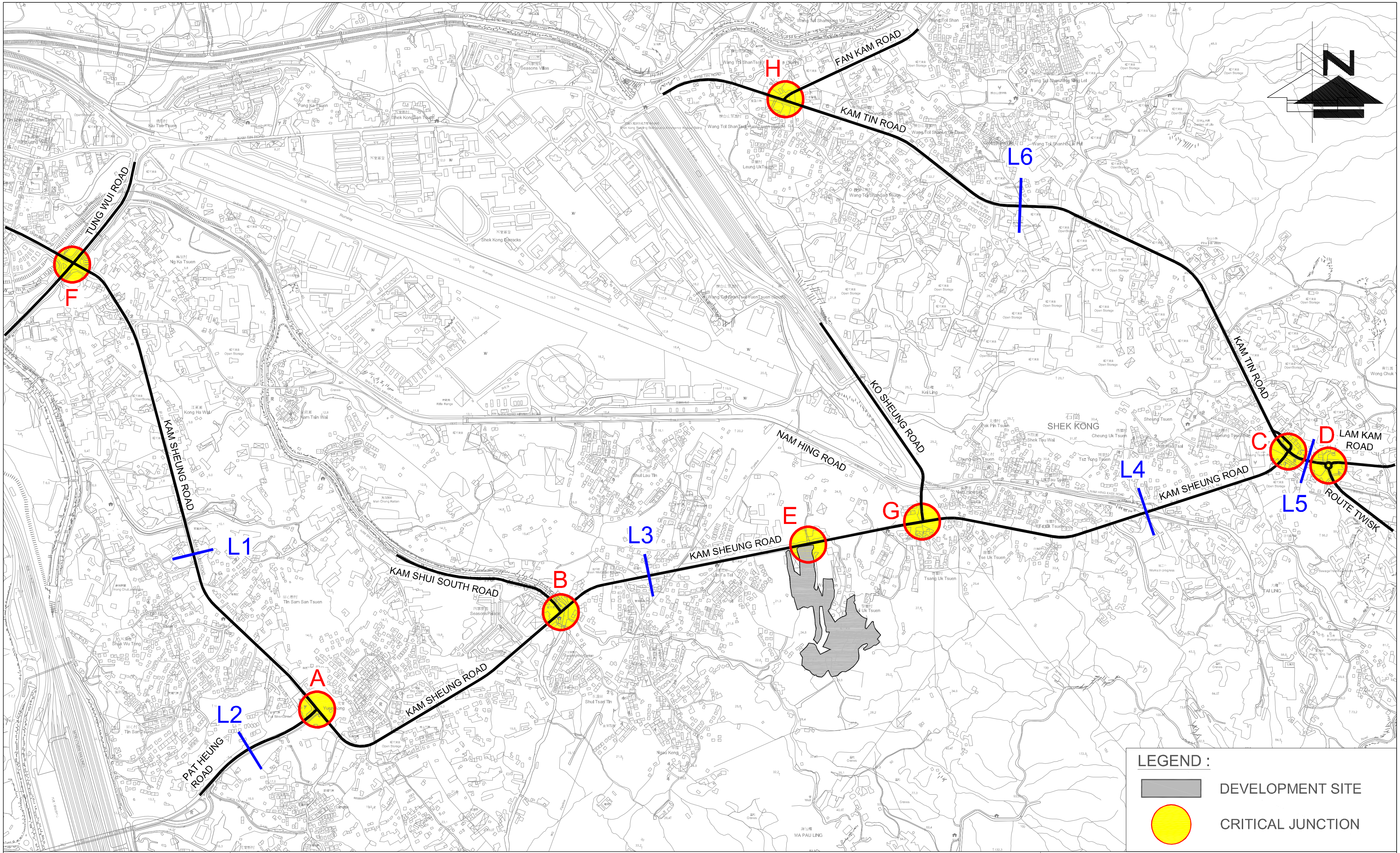

FIGURE NO.:	3.1
PROJECT NO.:	21134HK-DD112
SCALE: 1 : 15000 @A4	DATE: 26 OCT 2022

PROJECT TITLE:

S12A Application for DD112 in Kam Tin

DRAWING TITLE:

KEY JUNCTION & EXISTING ROAD NETWORK

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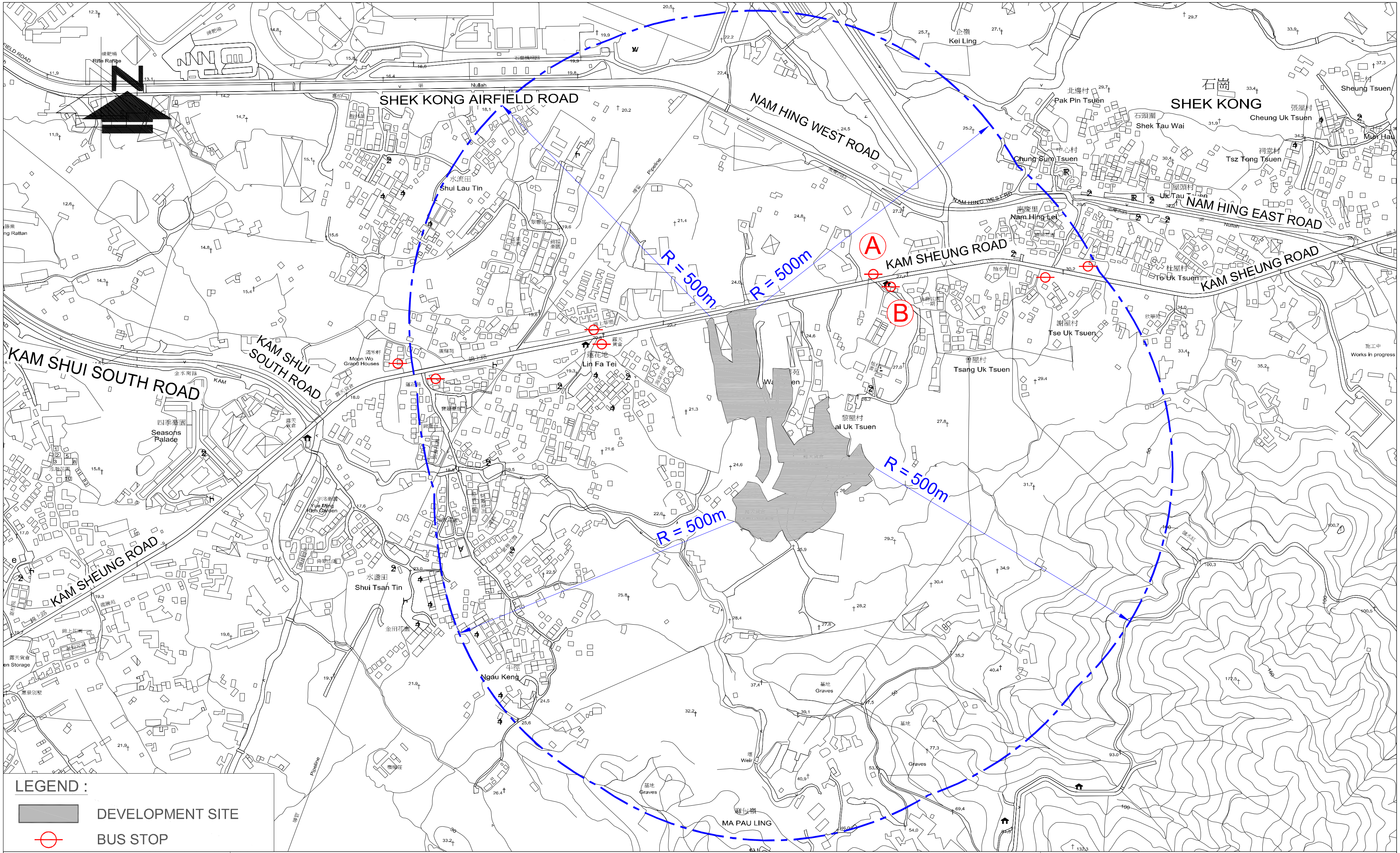

FIGURE NO.:	3.2
PROJECT NO.:	21134HK-DD112
SCALE: 1 : 8500 @A4	DATE: 27 OCT 2022

PROJECT TITLE:

S12A Application for DD112 in Kam Tin

DRAWING TITLE:

PUBLIC TRANSPORT SERVICES IN THE VICINITY
OF THE PROPOSED DEVELOPMENT

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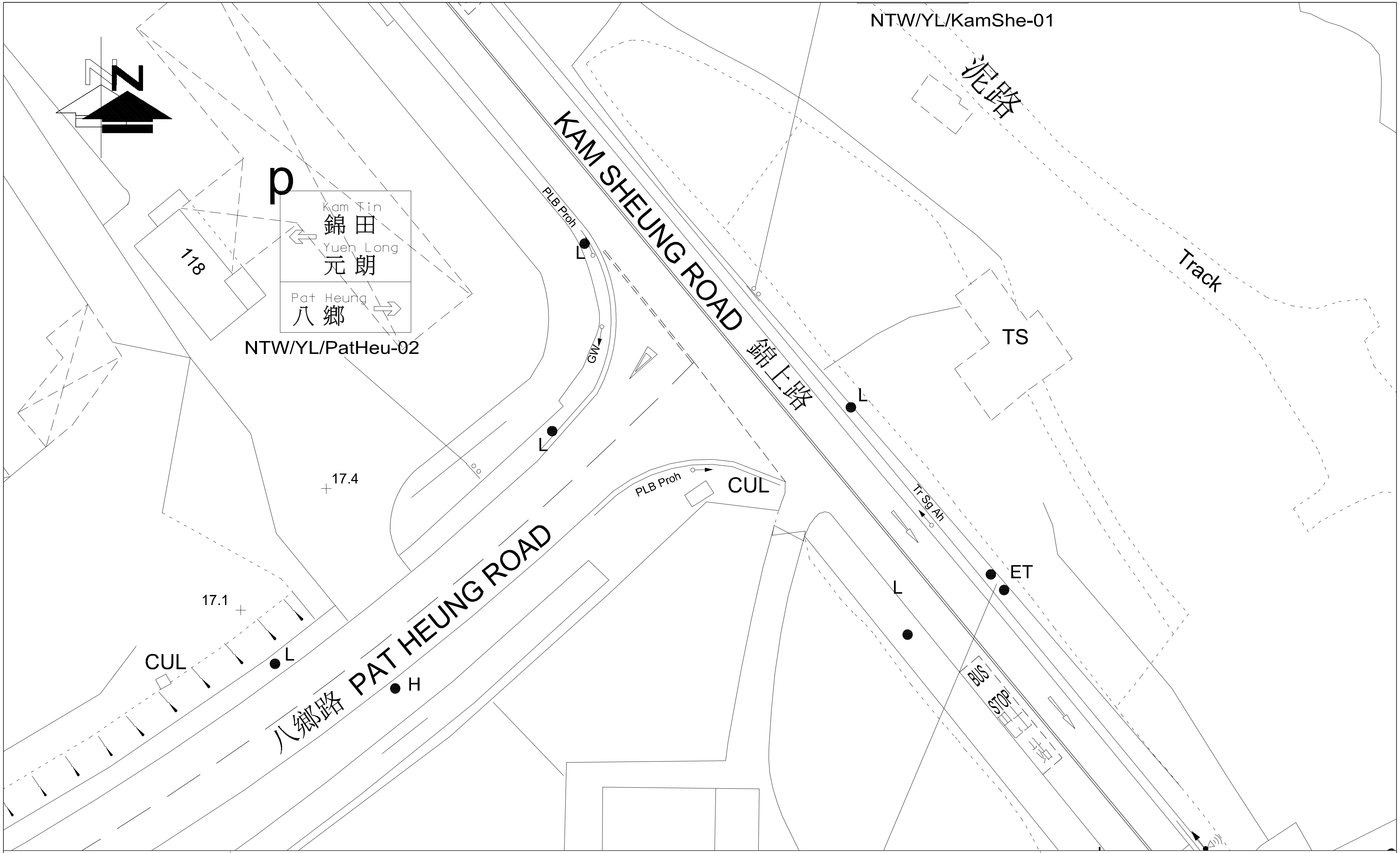

FIGURE NO.: 3.3	PROJECT TITLE: S12A Application for DD112 in Kam Tin
PROJECT NO.: 21134HK-DD112	DRAWING TITLE: EXISTING JUNCTION LAYOUT OF KAM SHEUNG ROAD / PAT HEUNG ROAD (A)
SCALE: 1 : 500 @A4	DATE: 10 DEC 2021

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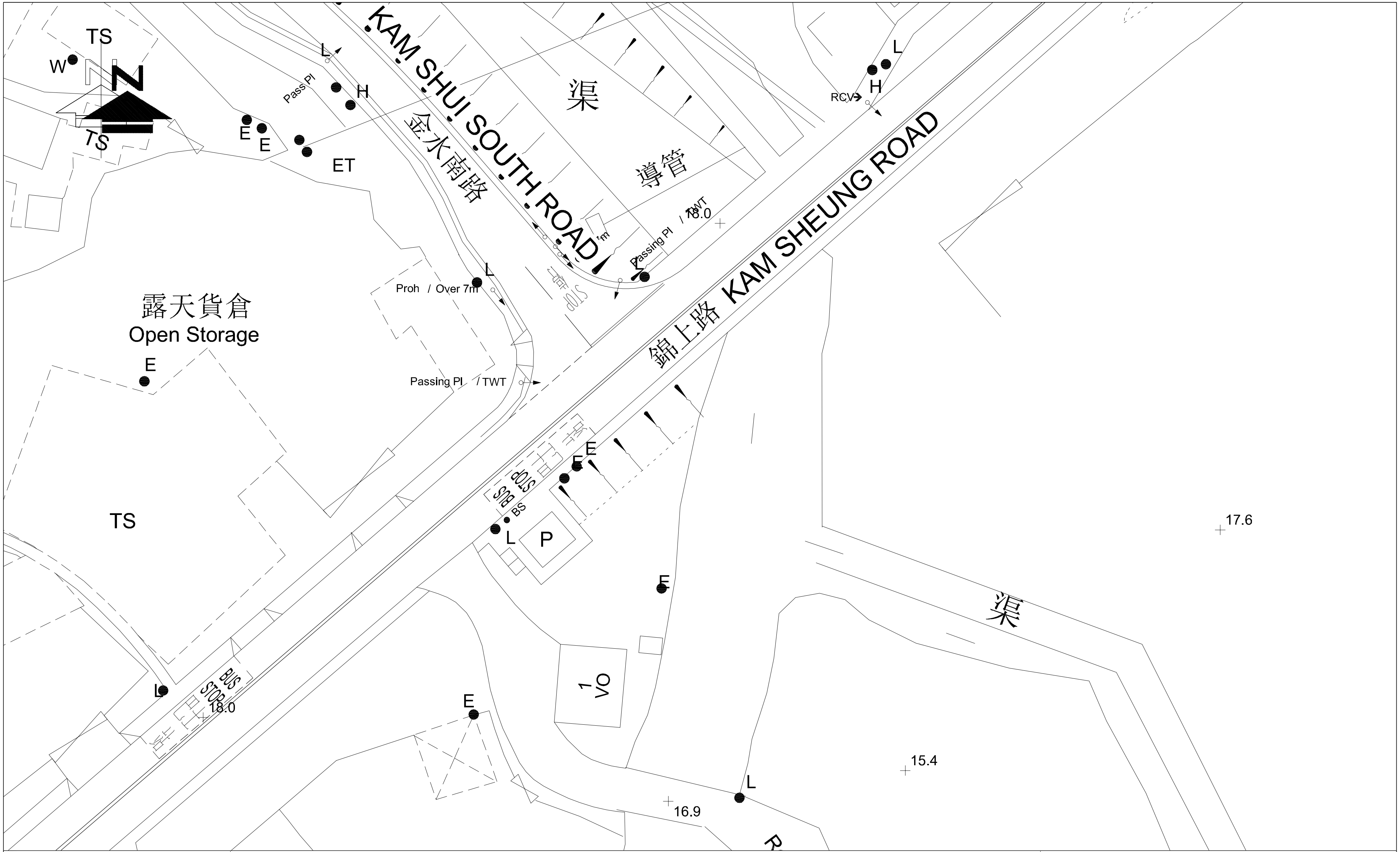

FIGURE NO.:	3.4
PROJECT NO.:	21134HK-DD112
SCALE: 1 : 500 @A4	DATE: 10 DEC 2021

PROJECT TITLE:

S12A Application for DD112 in Kam Tin

DRAWING TITLE:

EXISTING JUNCTION LAYOUT OF
KAM SHEUNG ROAD / KAM SHUI SOUTH ROAD (B)

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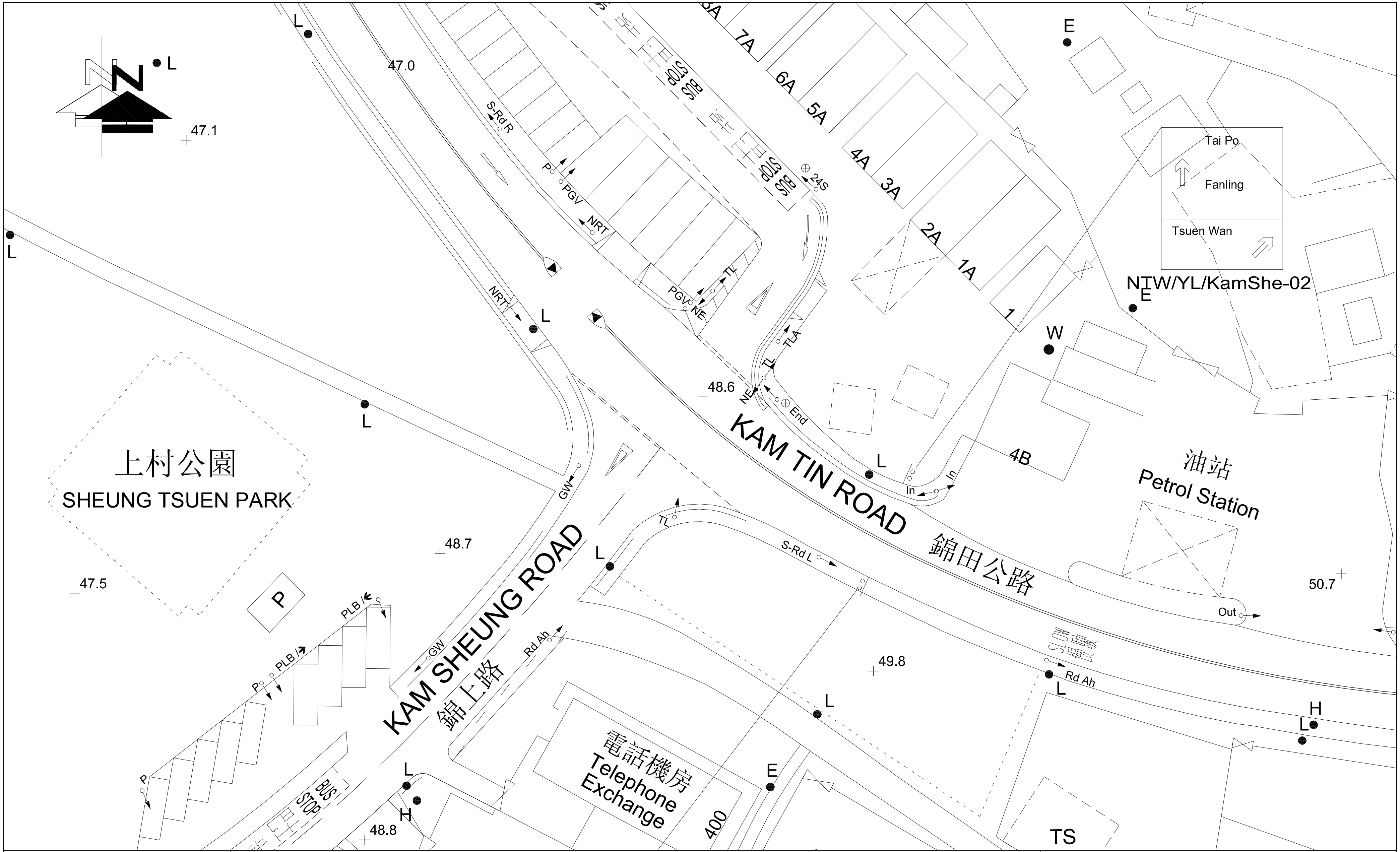

FIGURE NO.:	3.5
PROJECT NO.:	21134HK-DD112
SCALE: 1 : 500 @A4	DATE: 10 DEC 2021

PROJECT TITLE:

S12A Application for DD112 in Kam Tin

DRAWING TITLE:

EXISTING JUNCTION LAYOUT OF
KAM SHEUNG ROAD / KAM TIN ROAD (C)

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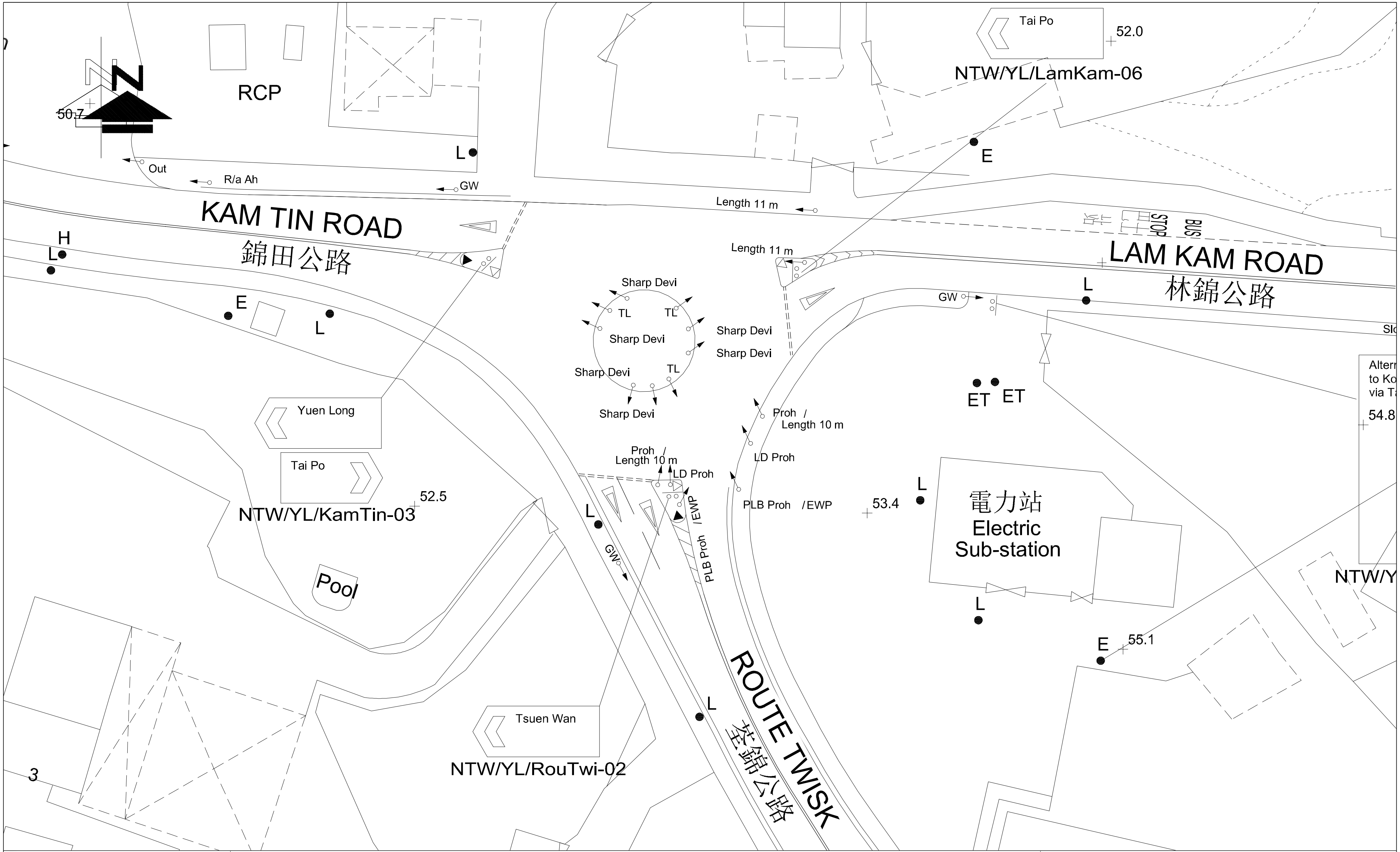

FIGURE NO.: 3.6

PROJECT TITLE: S12A Application for DD112 in Kam Tin

PROJECT NO.: 21134HK-DD112

DRAWING TITLE: EXISTING JUNCTION LAYOUT OF
KAM TIN ROAD / LAM KAM ROAD / ROUTE TWISK (D)

SCALE: 1 : 500 @A4

DATE: 10 DEC 2021

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FIGURE NO.: 3.7	PROJECT TITLE: S12A Application for DD112 in Kam Tin
PROJECT NO.: 21134HK-DD112	DRAWING TITLE: KAM SHEUNG ROAD / DEVELOPMENT ACCESS (E)
SCALE: 1 : 500 @A4 DATE: 01 MAR 2023	

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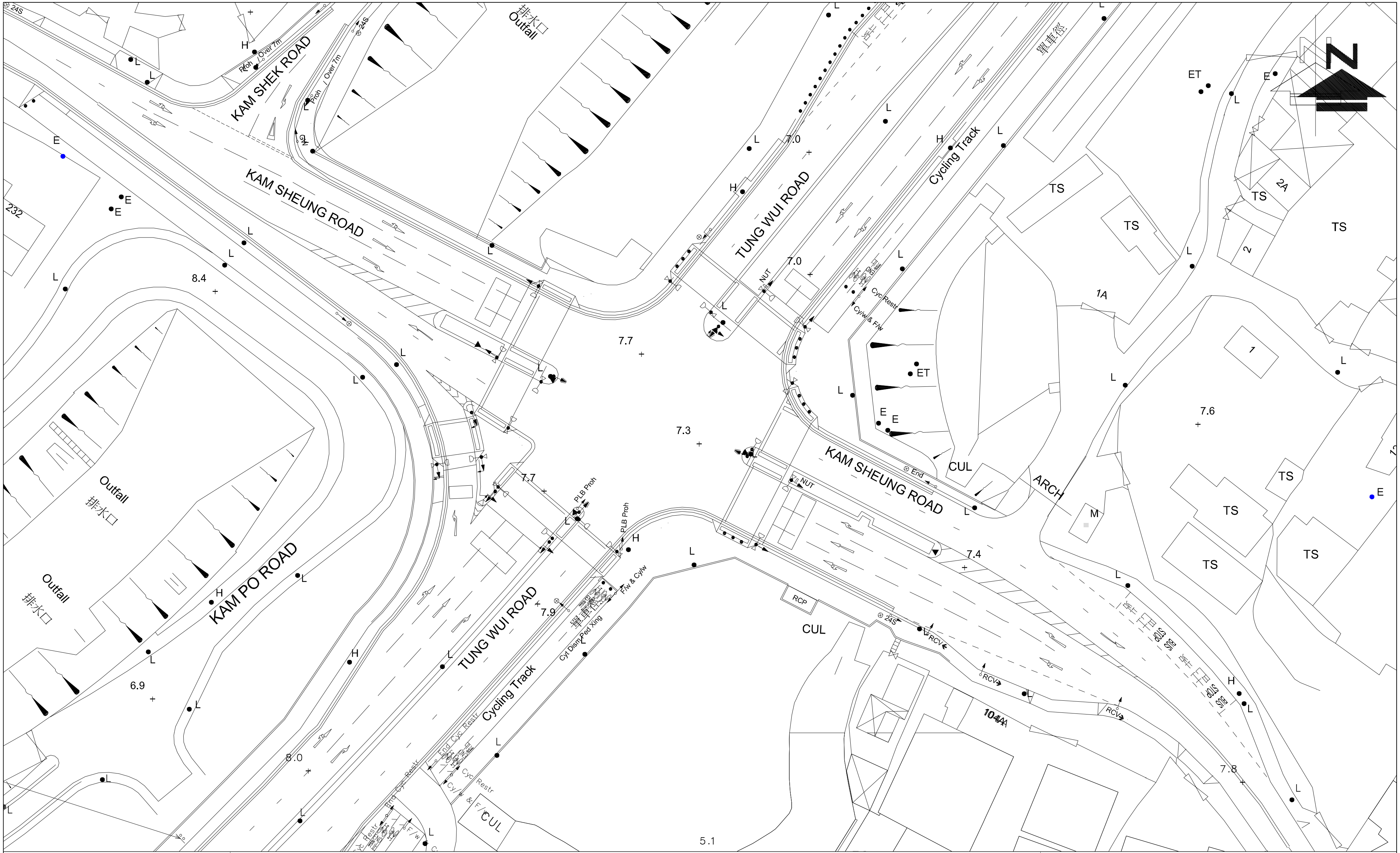

FIGURE NO.: 3.8

PROJECT TITLE: S12A Application for DD112 in Kam Tin

PROJECT NO.: 21134HK-DD112

DRAWING TITLE:

EXISTING JUNCTION LAYOUT OF
TUNG WUI ROAD / KAM SHEUNG ROAD (F)

SCALE: 1 : 800 @A4

DATE: 06 OCT 2022

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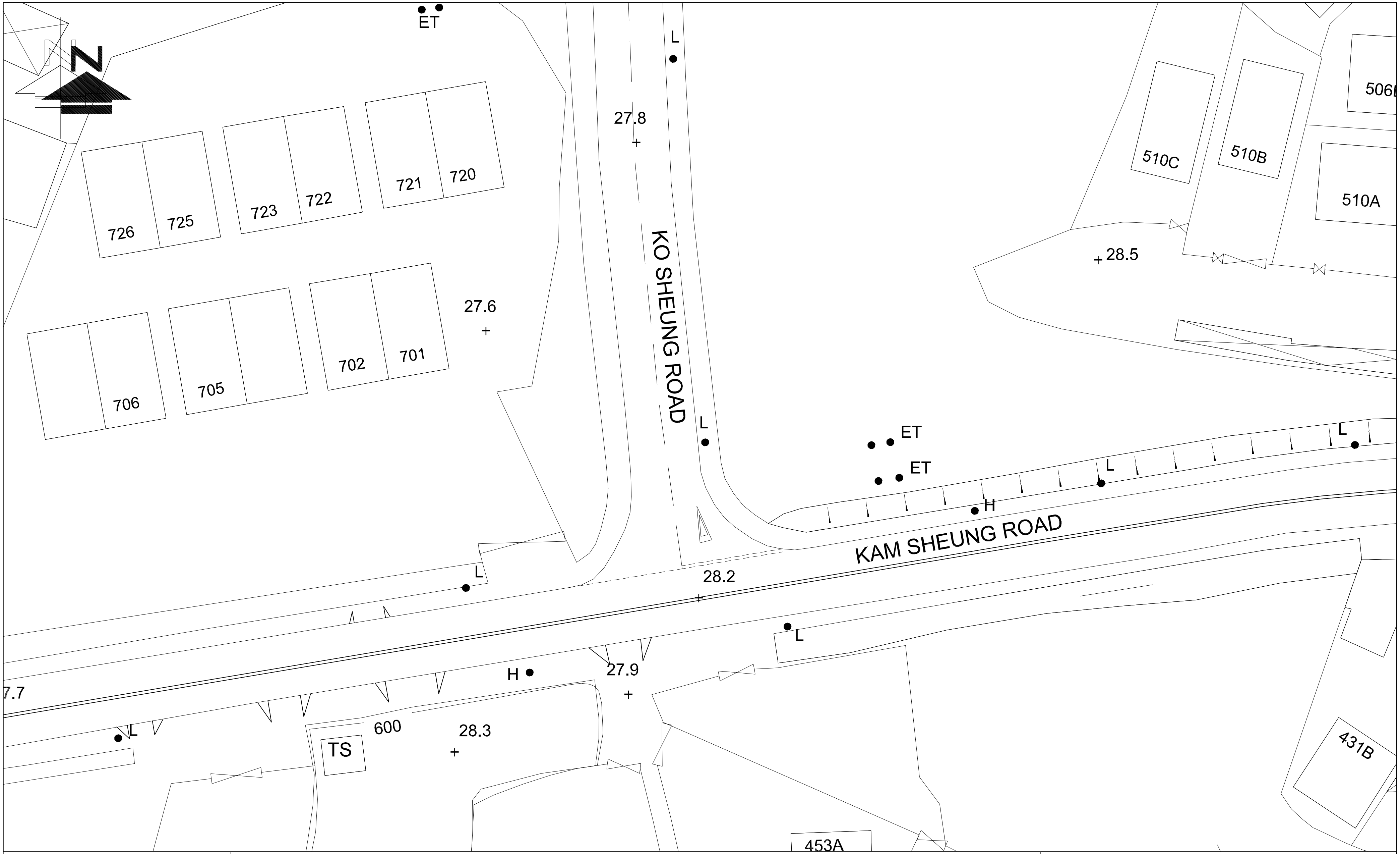

FIGURE NO.: 3.9	PROJECT TITLE: S12A Application for DD112 in Kam Tin
PROJECT NO.: 21134HK-DD112	DRAWING TITLE: EXISTING JUNCTION LAYOUT OF KO SHEUNG ROAD / KAM SHEUNG ROAD (G)
SCALE: 1 : 500 @A4 / DATE: 06 OCT 2022	

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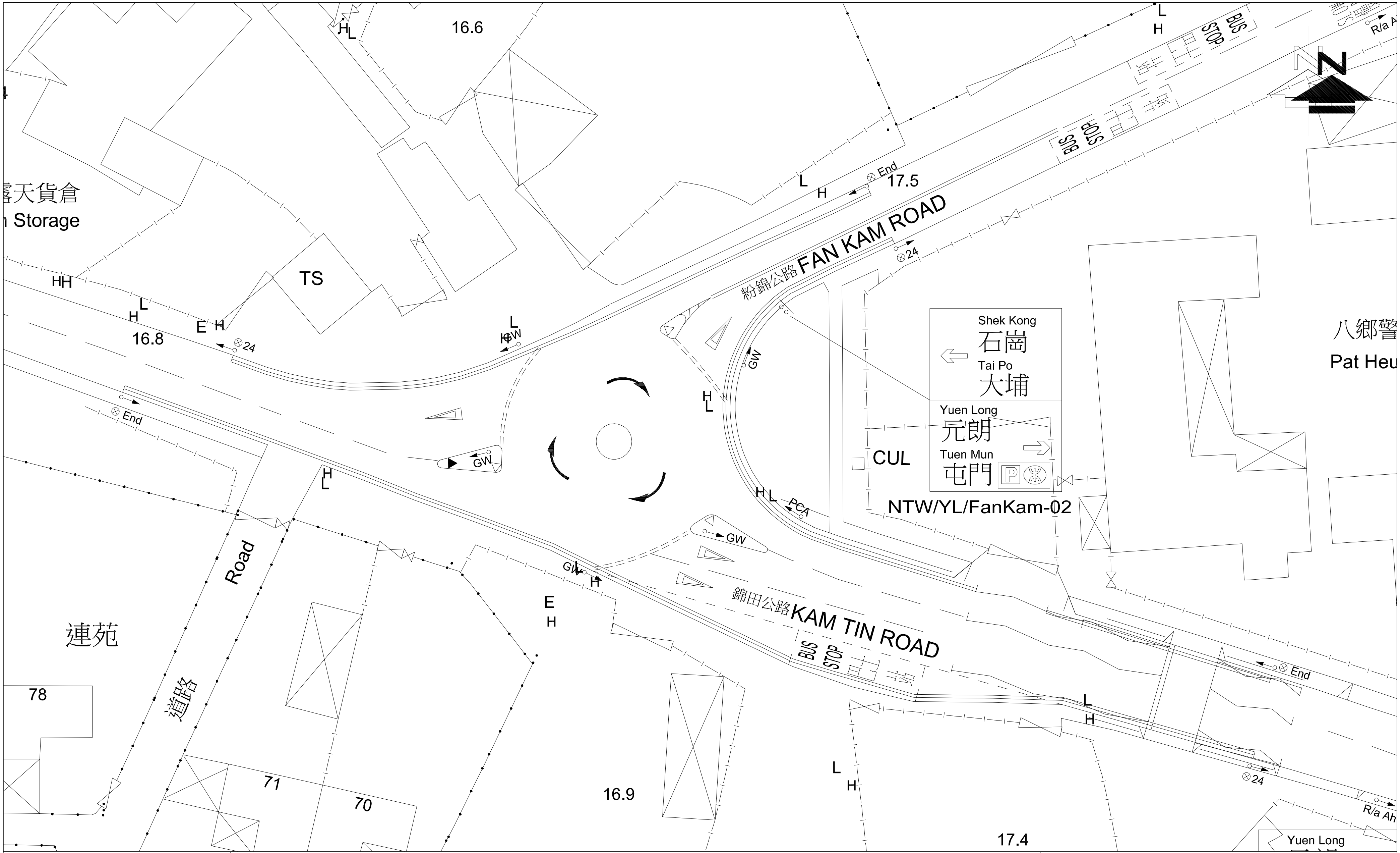

FIGURE NO.: 3.10

PROJECT TITLE: S12A Application for DD112 in Kam Tin

PROJECT NO.: 21134HK-DD112

DRAWING TITLE: EXISTING JUNCTION LAYOUT OF KAM TIN ROAD / FAN KAM ROAD (H)

SCALE: 1 : 500 @A4

DATE: 06 OCT 2022

CTA Consultants Limited
志達顧問有限公司

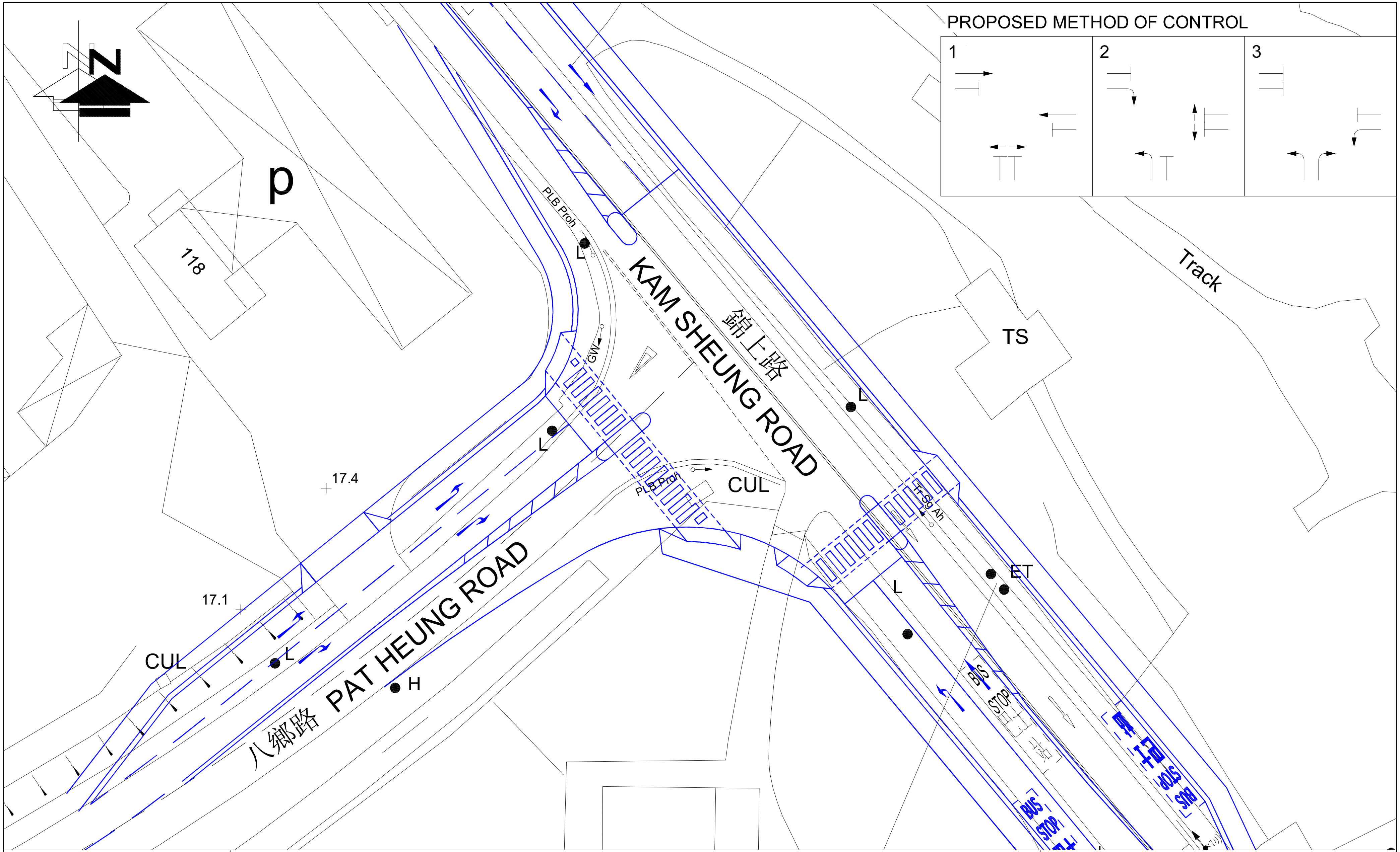

FIGURE NO.:	PROJECT TITLE:
3.11	S12A Rezoning Application DD112 in Kam Tin, Yuen Long

PROJECT NO.:
21134HK-DD112

SCALE:
1 : 500 @A4

DATE:
22 JUL 2024

DRAWING TITLE:

PROPOSED JUNCTION IMPROVEMENT LAYOUT OF
KAM SHEUNG ROAD / PAT HEUNG ROAD (A)
(CARRIED OUT BY CEDD UNDER CONTRACT NO. YL/2017/01)
(PRELIMINARY LAYOUT)

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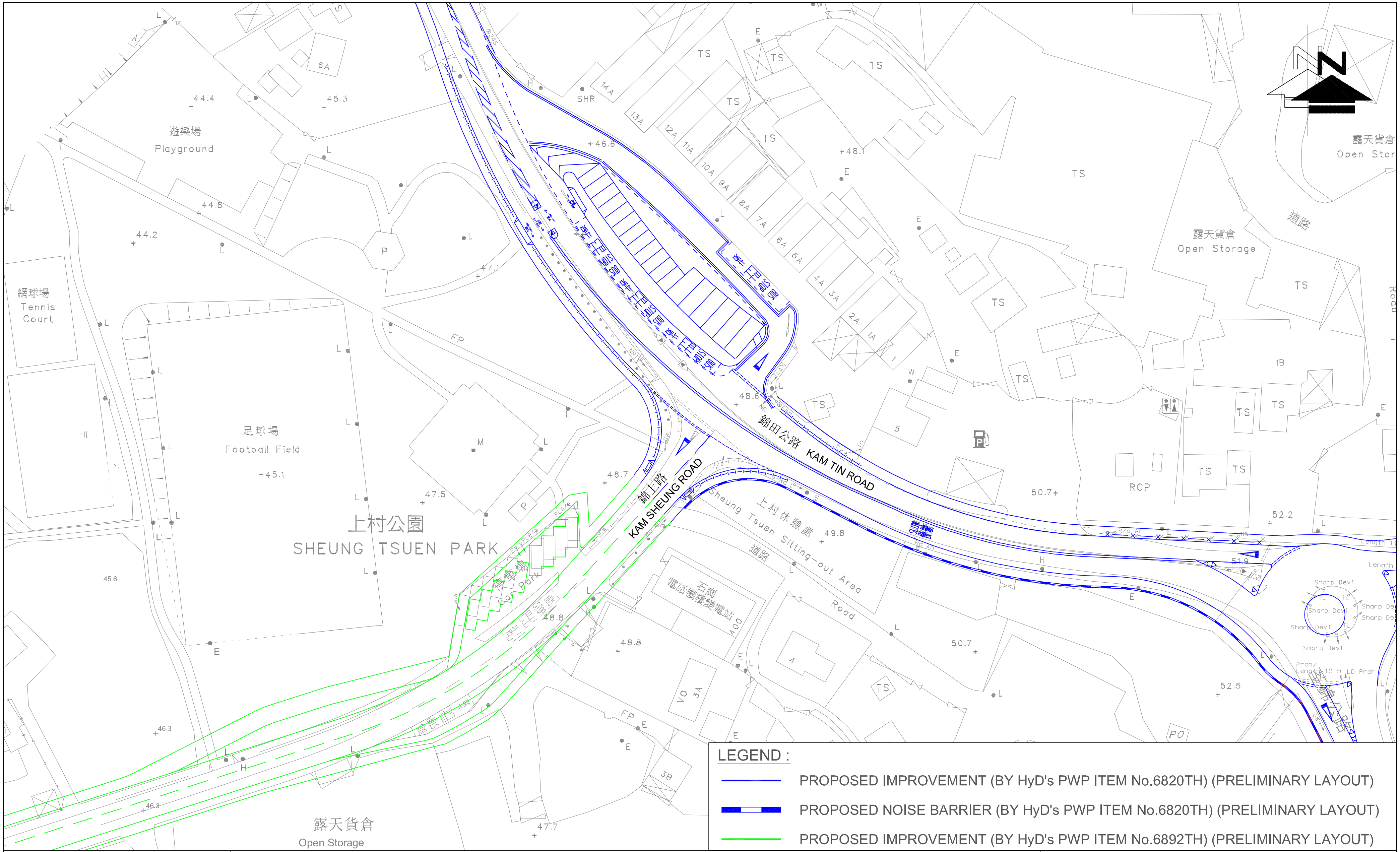
志達顧問有限公司



LEGEND :

━ PROPOSED IMPROVEMENT (BY HyD's PWP ITEM No.6820TH) (PRELIMINARY LAYOUT)

▬▭▬ PROPOSED NOISE BARRIER (BY HyD's PWP ITEM No.6820TH) (PRELIMINARY LAYOUT)

━ PROPOSED IMPROVEMENT (BY HyD's PWP ITEM No.6892TH) (PRELIMINARY LAYOUT)

FIGURE NO.: 3.12

PROJECT TITLE:

S12A Application for DD112 in Kam Tin

PROJECT NO.: 21134HK-DD112

DRAWING TITLE:

PROPOSED JUNCTION IMPROVEMENT LAYOUT OF
KAM SHEUNG ROAD / KAM TIN ROAD (C)
(CARRIED BY OUT HyD UNDER PWP ITEM No.6820TH & No.6892TH)
(PRELIMINARY LAYOUT)

SCALE: 1 : 1000 @A4

DATE: 22 JUL 2024

CTA Consultants Limited
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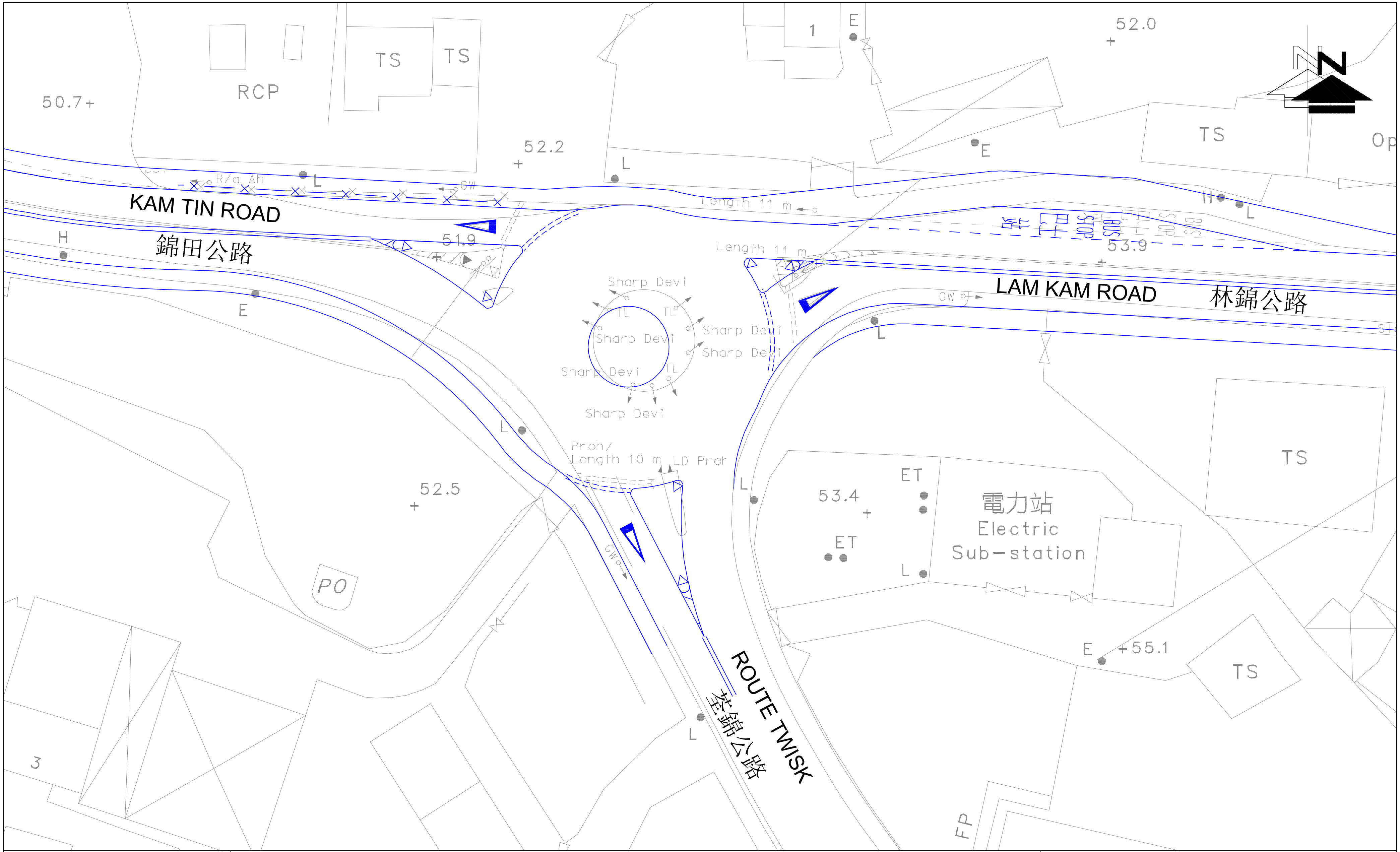

FIGURE NO.:	3.13
PROJECT NO.:	21134HK-DD112
SCALE:	1 : 500 @A4
DATE:	22 JUL 2024

PROJECT TITLE:

S12A Application for DD112 in Kam Tin

DRAWING TITLE:

PROPOSED JUNCTION IMPROVEMENT LAYOUT OF
KAM TIN ROAD / LAM KAM ROAD / ROUTE TWISK (D)
(CARRIED OUT BY HyD UNDER PWP ITEM No.6820TH)
(PRELIMINARY LAYOUT)

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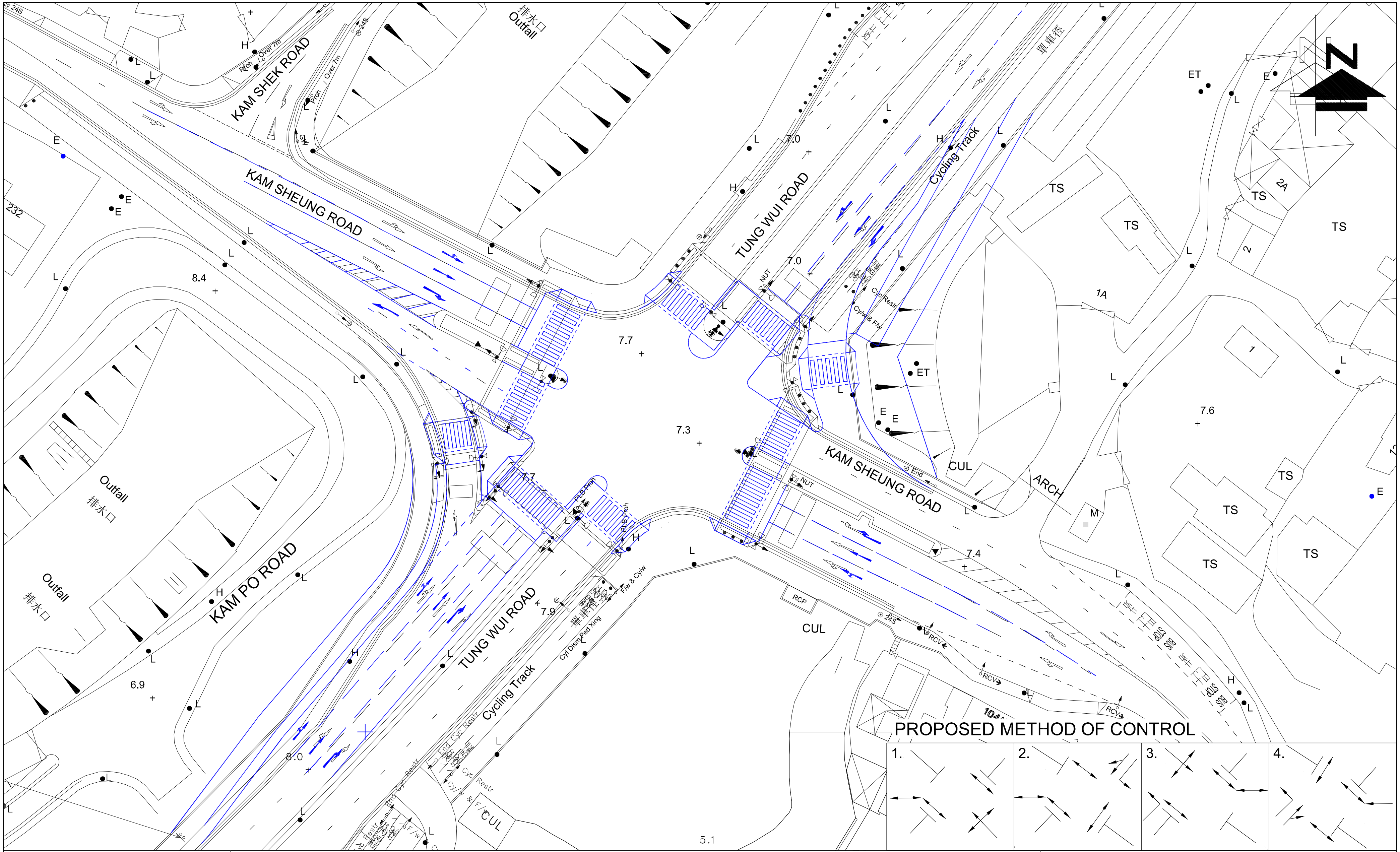


FIGURE NO.: 3.14

PROJECT NO.: 21134HK-DD112

SCALE: 1 : 800 @A4

DATE: 22 JUL 2024

PROJECT TITLE:

S12A Application for DD112 in Kam Tin

DRAWING TITLE:

PROPOSED JUNCTION IMPROVEMENT LAYOUT OF
TUNG WUI ROAD / KAM SHEUNG ROAD (F)
(CARRIED OUT BY CEDD UNDER CONTRACT NO. YL/2017/01)
(PRELIMINARY LAYOUT)

CTA Consultants Limited
志達顧問有限公司

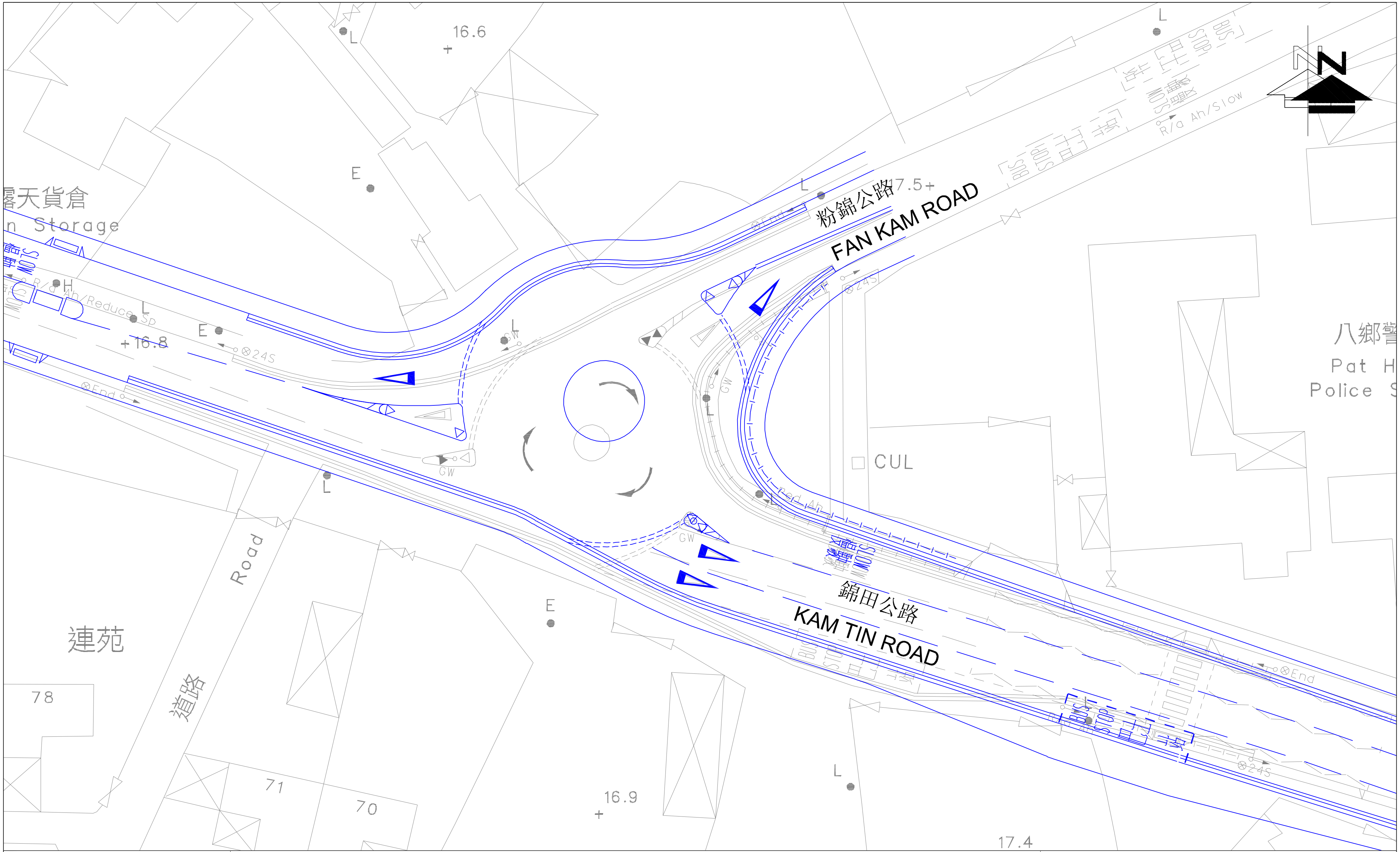
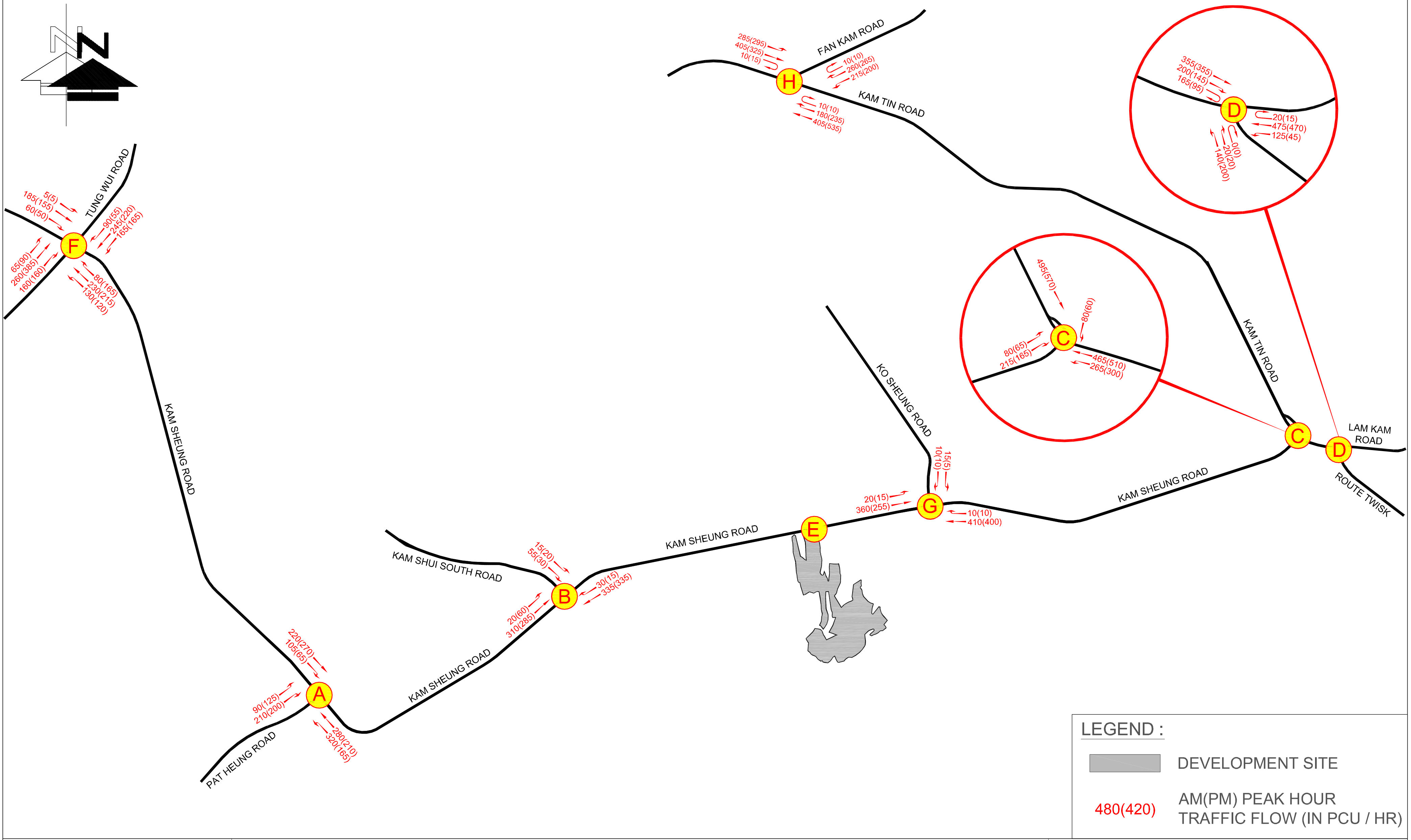


FIGURE NO.:	PROJECT TITLE:
3.15	S12A Application for DD112 in Kam Tin

PROJECT NO.:	DRAWING TITLE:
21134HK-DD112	PROPOSED JUNCTION IMPROVEMENT OF KAM TIN ROAD / FAN KAM ROAD (H) (CARRIED BY OUT HyD UNDER PWP ITEM No.6820TH) (PRELIMINARY LAYOUT)

SCALE:	DATE:
1 : 500 @A4	22 JUL 2024

CTA Consultants Limited
志達顧問有限公司



LEGEND :

▨	DEVELOPMENT SITE
480(420)	AM(PM) PEAK HOUR TRAFFIC FLOW (IN PCU / HR)

FIGURE NO.: 3.16

PROJECT TITLE: S12A Application for DD112 in Kam Tin

PROJECT NO.: 21134HK-DD112

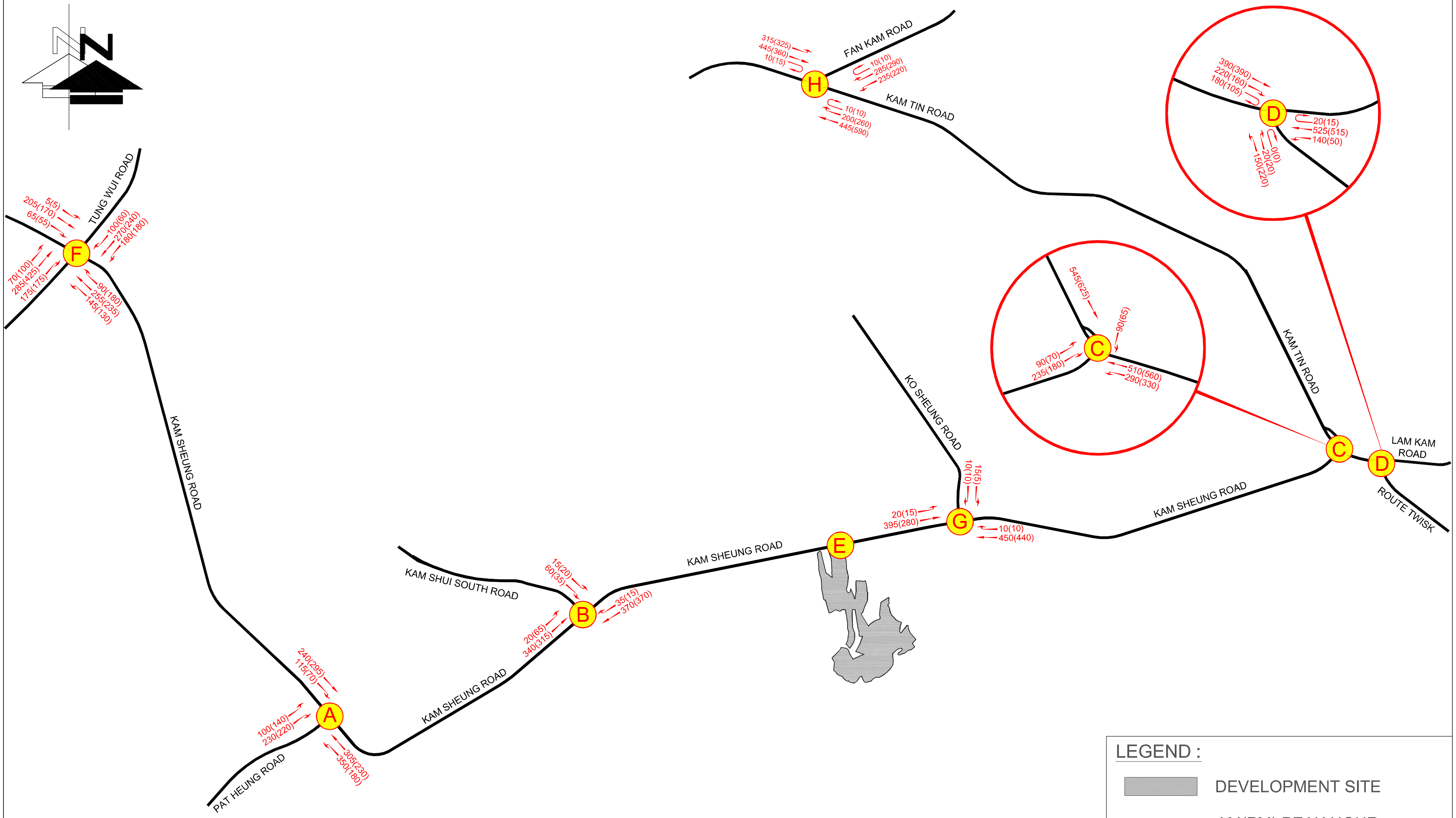
DRAWING TITLE:

2021 OBSERVED TRAFFIC FLOWS

SCALE: N. T. S. @A4

DATE: 28 OCT 2022

CTA Consultants Limited
志達顧問有限公司



LEGEND :

▨	DEVELOPMENT SITE
480(420)	AM(PM) PEAK HOUR TRAFFIC FLOW (IN PCU / HR)

FIGURE NO.: 3.17

PROJECT TITLE:
S12A Application for DD112 in Kam Tin

PROJECT NO.: 21134HK-DD112

DRAWING TITLE:
2021 CORRECTED TRAFFIC FLOWS

SCALE: N. T. S. @A4

DATE: 28 OCT 2022

CTA Consultants Limited
志達顧問有限公司

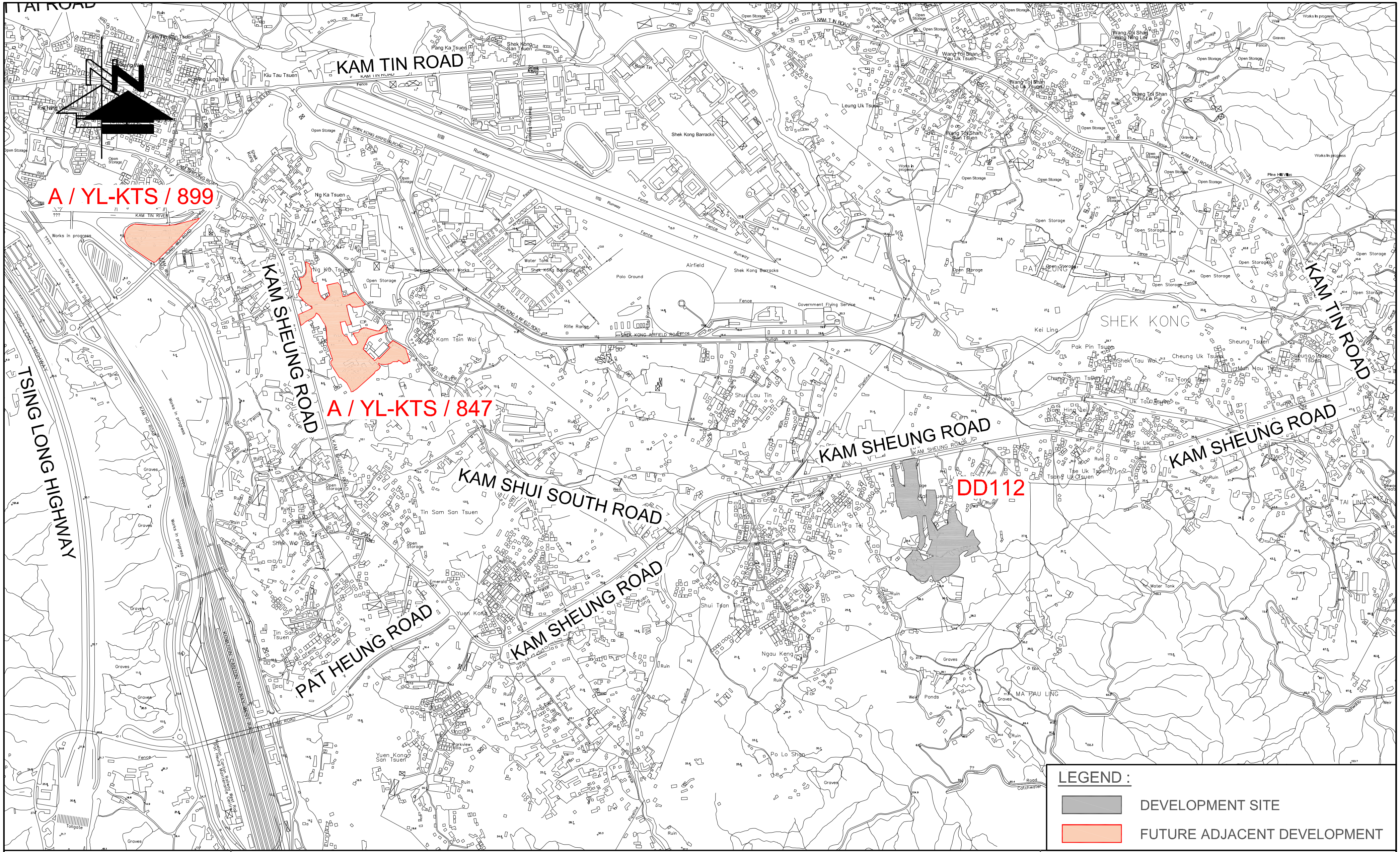


FIGURE NO.: 4.1

PROJECT TITLE: S12A Application for DD112 in Kam Tin

PROJECT NO.: 21134HK-DD112

DRAWING TITLE: PLANNED / COMMITTED FUTURE DEVELOPMENT IN THE VICINITY

SCALE: 1 : 16000 @A4

DATE: 30 MAR 2022

CTA Consultants Limited
志達顧問有限公司

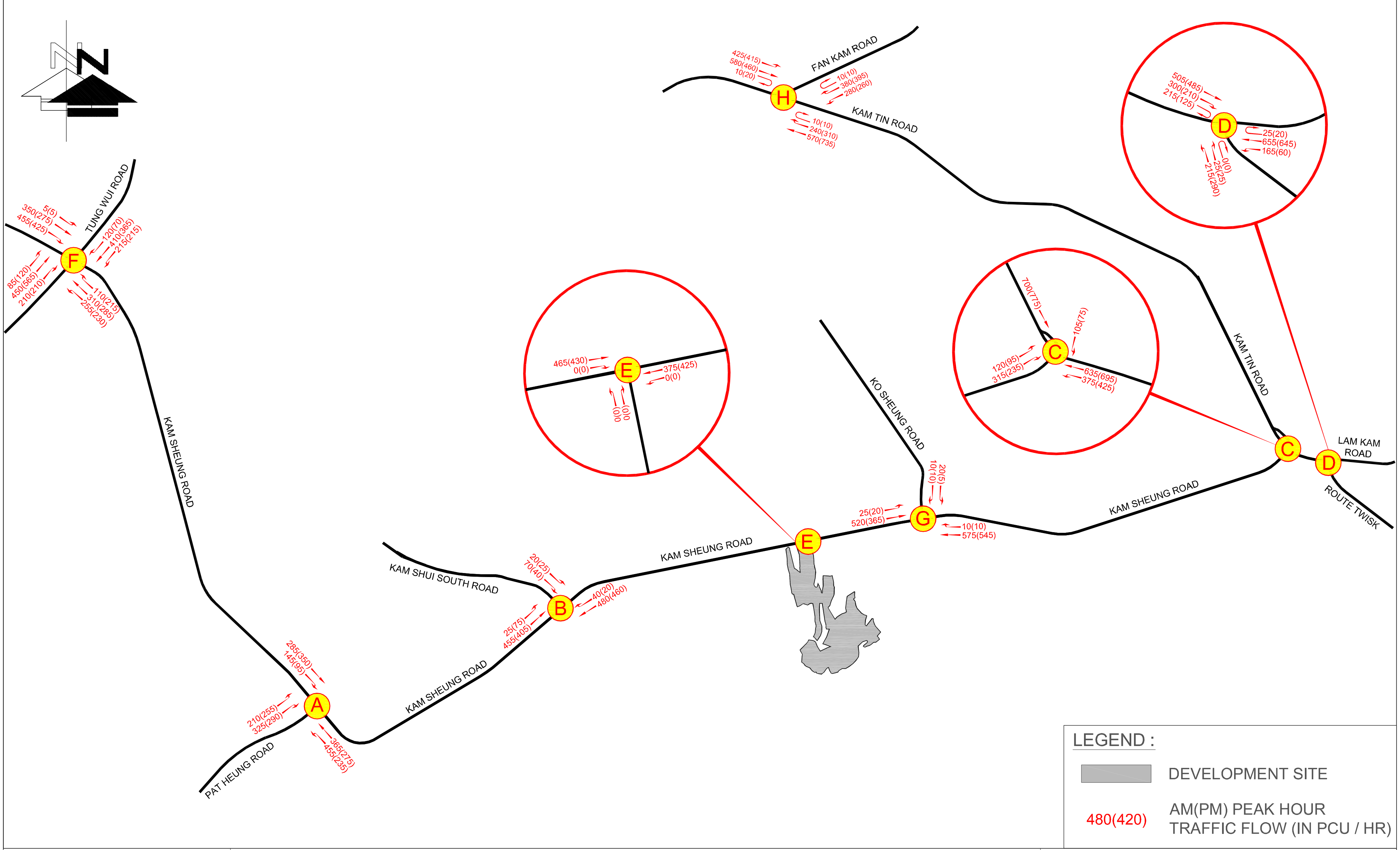


FIGURE NO.: 4.2

PROJECT NO.: 21134HK-DD112

SCALE: N. T. S. @A4

DATE: 22 FEB 2024

PROJECT TITLE: S12A Application for DD112 in Kam Tin

DRAWING TITLE: 2034 REFERENCE TRAFFIC FLOWS

CTA Consultants Limited
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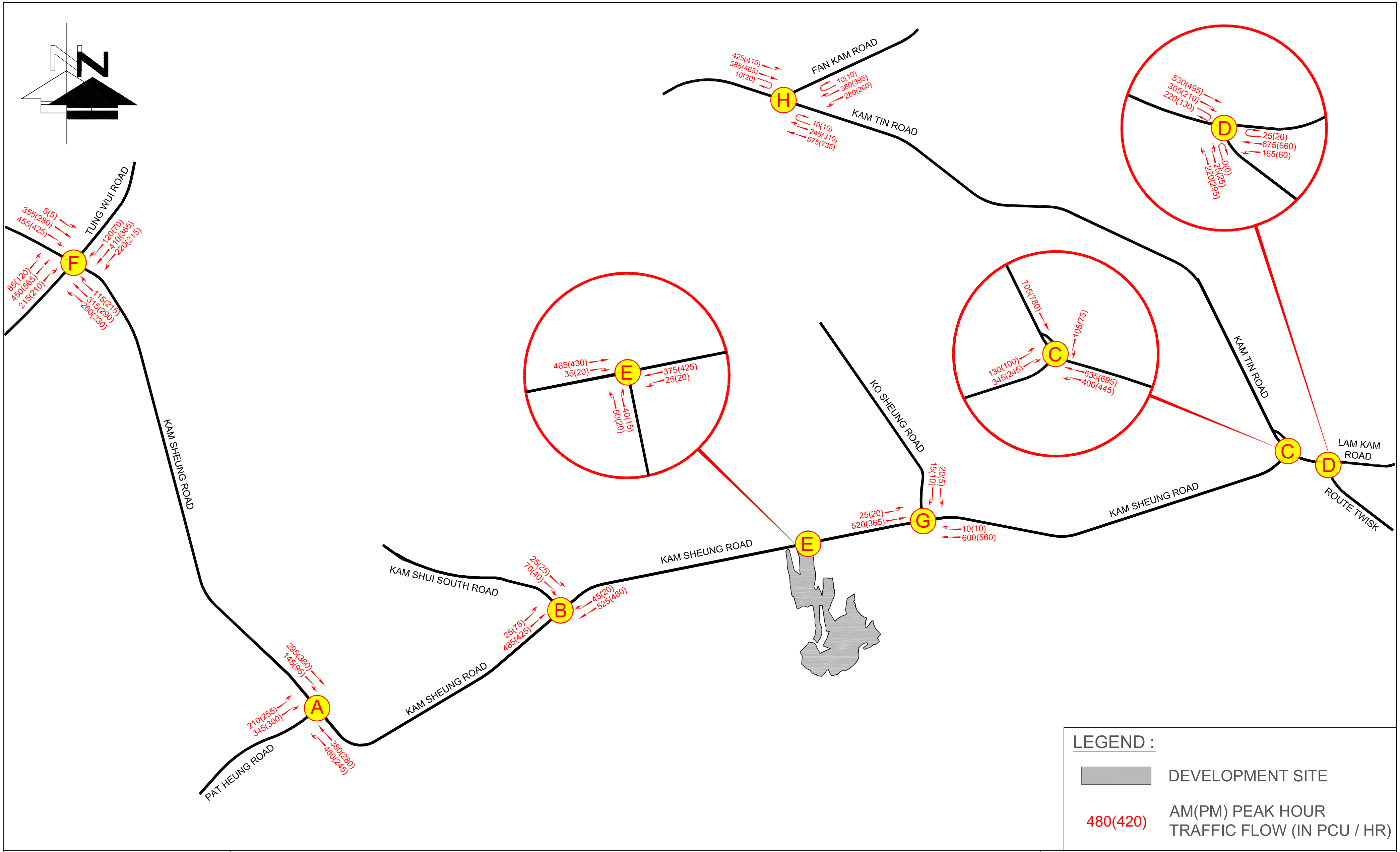


FIGURE NO.: 4.3

PROJECT TITLE: S12A Application for DD112 in Kam Tin

PROJECT NO.: 21134HK-DD112

DRAWING TITLE:

2034 DESIGN TRAFFIC FLOWS

SCALE: N. T. S. @A4

DATE: 22 FEB 2024

CTA Consultants Limited
志達顧問有限公司

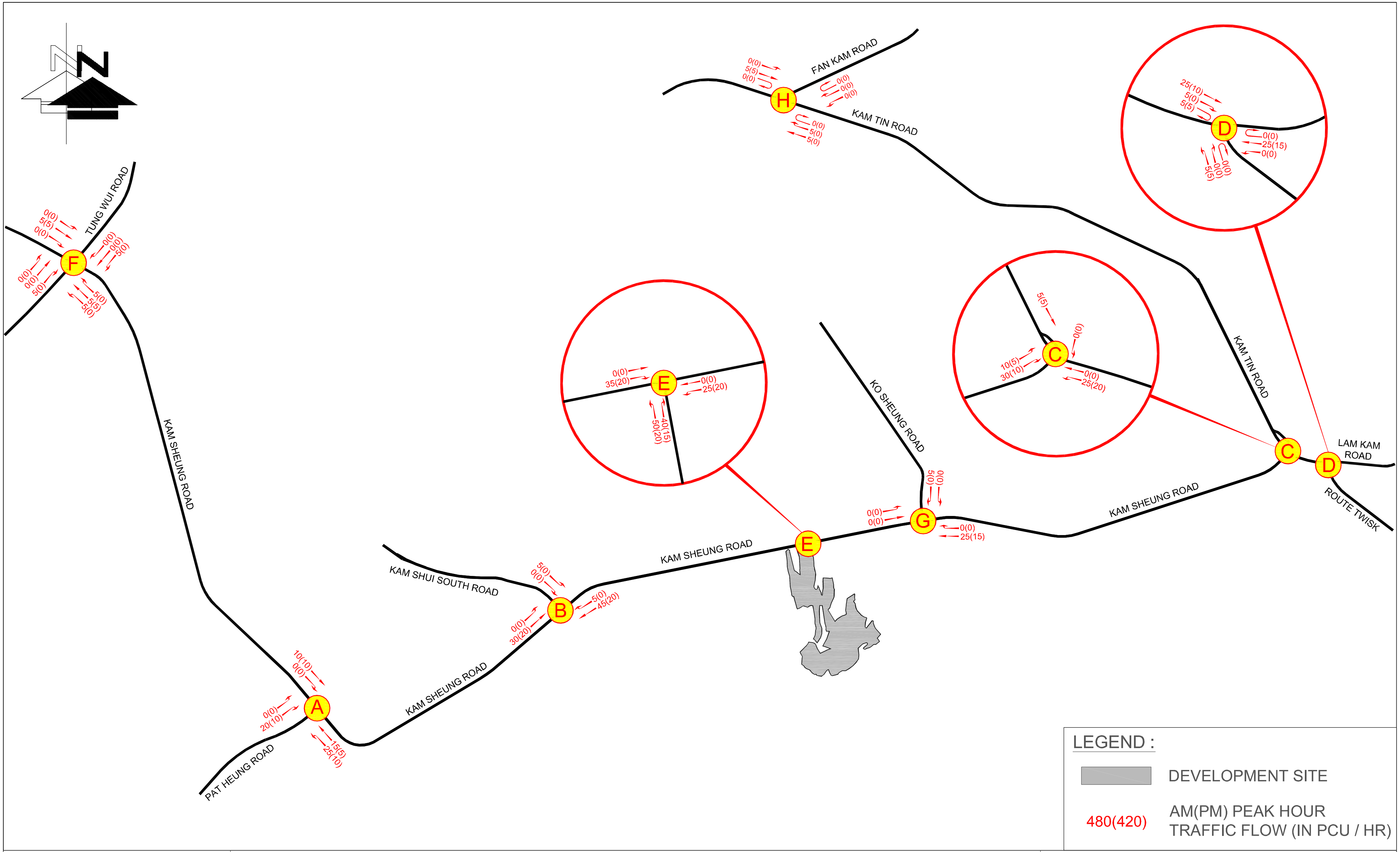
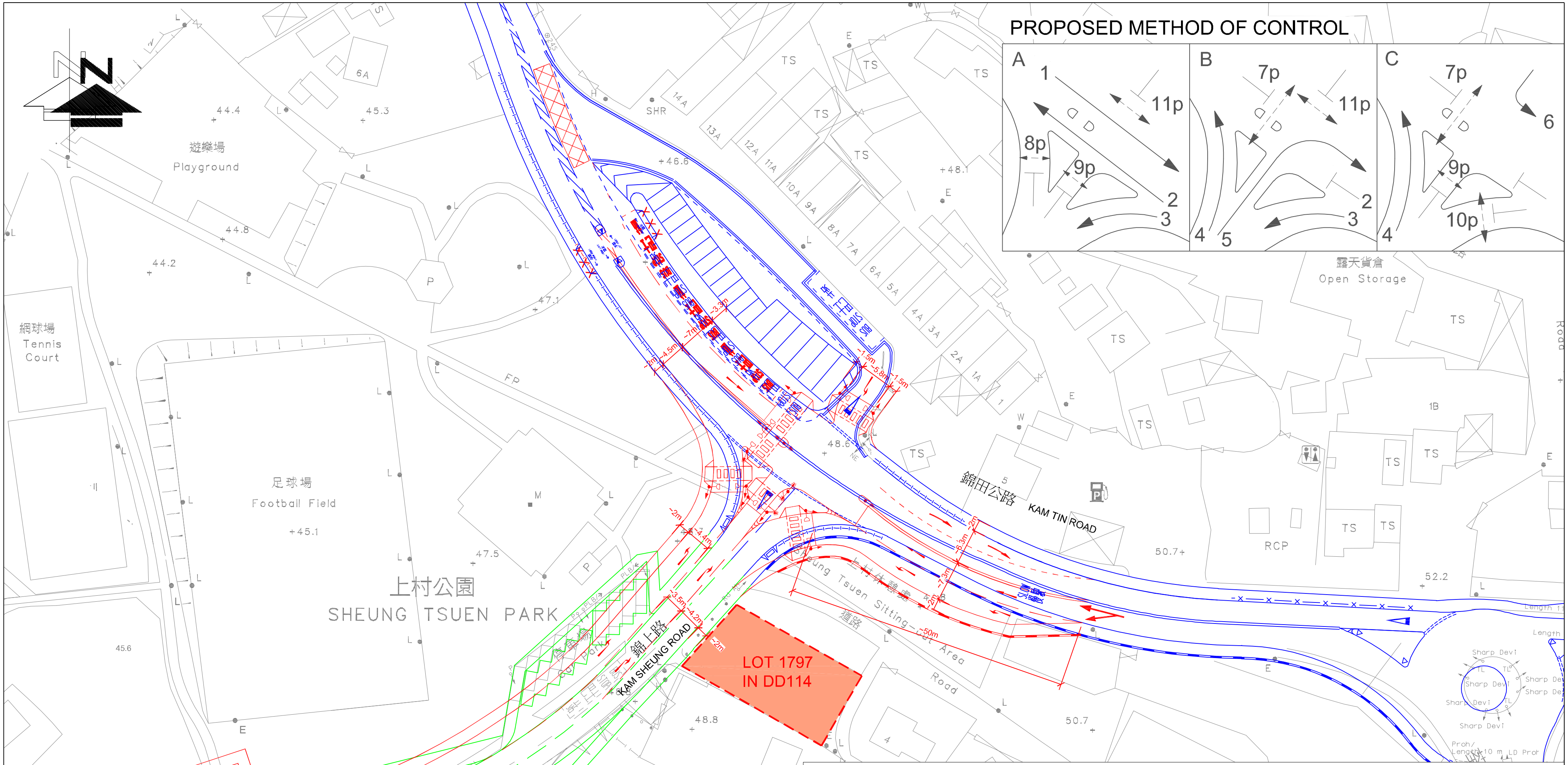


FIGURE NO.: 4.4	PROJECT TITLE: S12A Application for DD112 in Kam Tin
PROJECT NO.: 21134HK-DD112	DRAWING TITLE: 2030 DEVELOPMENT TRAFFIC FLOWS
SCALE: N. T. S. @A4 DATE: 28 OCT 2022	

CTA Consultants Limited
志達顧問有限公司

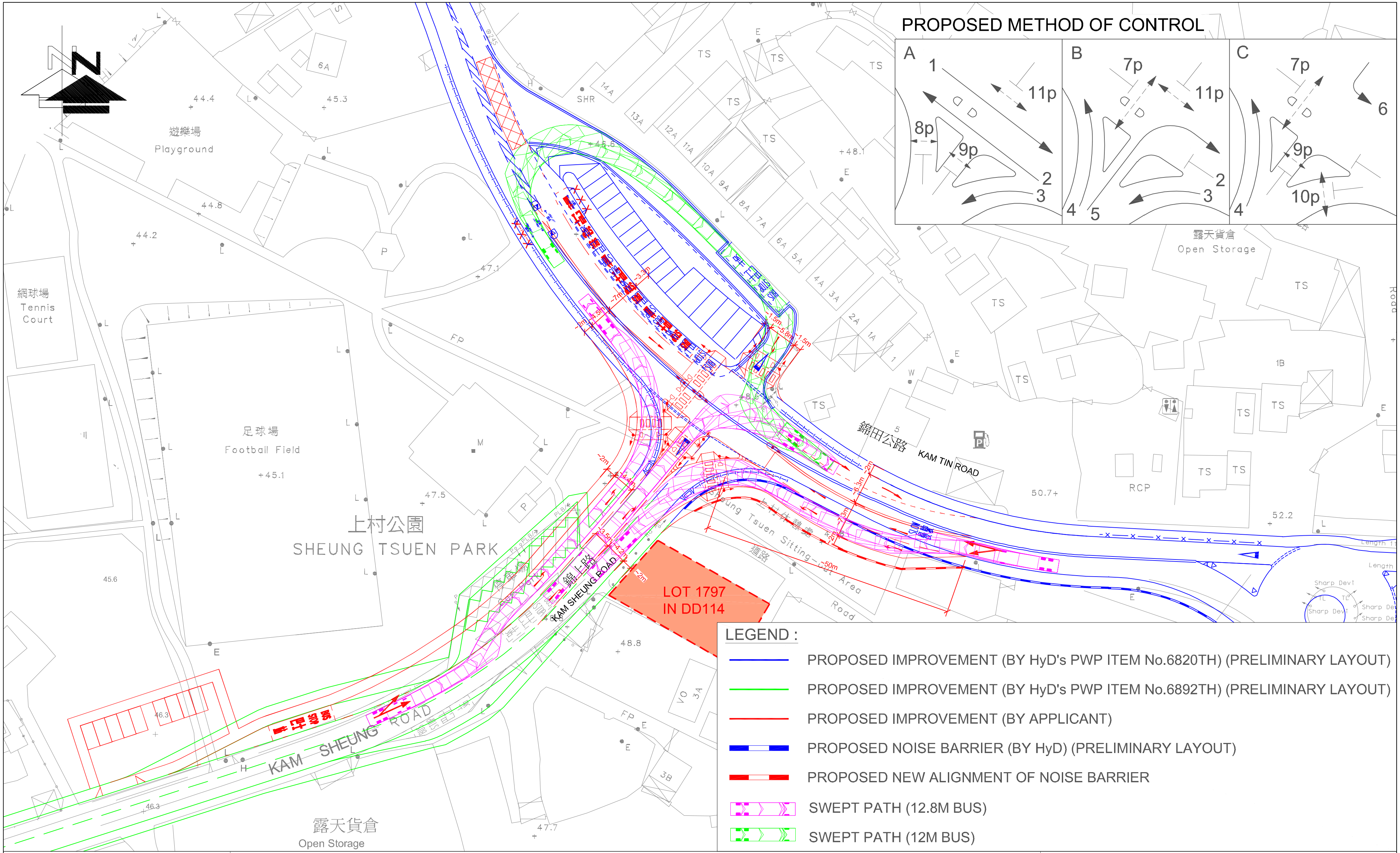


LEGEND :

- PROPOSED IMPROVEMENT (BY HyD's PWP ITEM No.6820TH) (PRELIMINARY LAYOUT)
- PROPOSED IMPROVEMENT (BY HyD's PWP ITEM No.6892TH) (PRELIMINARY LAYOUT)
- PROPOSED IMPROVEMENT (BY APPLICANT)
- PROPOSED NOISE BARRIER (BY HyD) (PRELIMINARY LAYOUT)
- PROPOSED NEW ALIGNMENT OF NOISE BARRIER

FIGURE NO.: 5.1	PROJECT TITLE: S12A Application for DD112 in Kam Tin
PROJECT NO.: 21134HK-DD112	DRAWING TITLE: PROPOSED FURTHER IMPROVEMENT LAYOUT ON HYD'S PWP SCHEME OF JUNCTION KAM SHEUNG ROAD / KAM TIN ROAD (C)
SCALE: 1 : 1000 @A4	DATE: 21 NOV 2024

CTA Consultants Limited
志達顧問有限公司



LEGEND :

🟦	PROPOSED IMPROVEMENT (BY HyD's PWP ITEM No.6820TH) (PRELIMINARY LAYOUT)
🟩	PROPOSED IMPROVEMENT (BY HyD's PWP ITEM No.6892TH) (PRELIMINARY LAYOUT)
🟥	PROPOSED IMPROVEMENT (BY APPLICANT)
🟦	PROPOSED NOISE BARRIER (BY HyD) (PRELIMINARY LAYOUT)
🟥	PROPOSED NEW ALIGNMENT OF NOISE BARRIER
▨	SWEPT PATH (12.8M BUS)
▨	SWEPT PATH (12M BUS)

FIGURE NO.:
5.1 (SP1)

PROJECT TITLE:
S12A Application for DD112 in Kam Tin

PROJECT NO.:
21134HK-DD112

DRAWING TITLE:
PROPOSED FURTHER IMPROVEMENT LAYOUT ON HYD'S PWP SCHEME
OF JUNCTION KAM SHEUNG ROAD / KAM TIN ROAD (C)
(SWEPT PATH ANALYSIS)

SCALE:
1 : 1000 @A4

DATE:
10 OCT 2024

CTA Consultants Limited
志達顧問有限公司

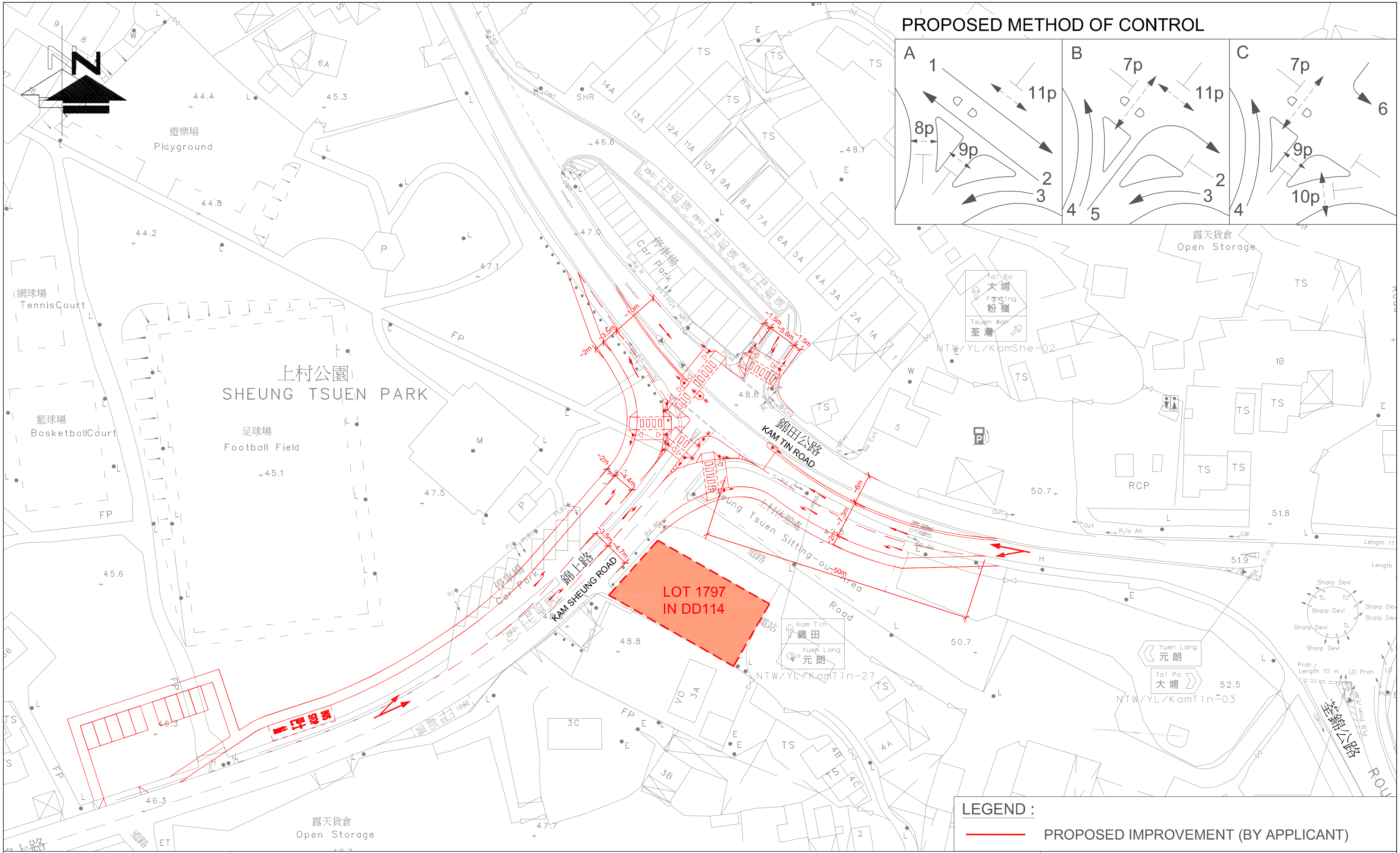


FIGURE NO.: 5.2

PROJECT TITLE: S12A Application for DD112 in Kam Tin

PROJECT NO.: 21134HK-DD112

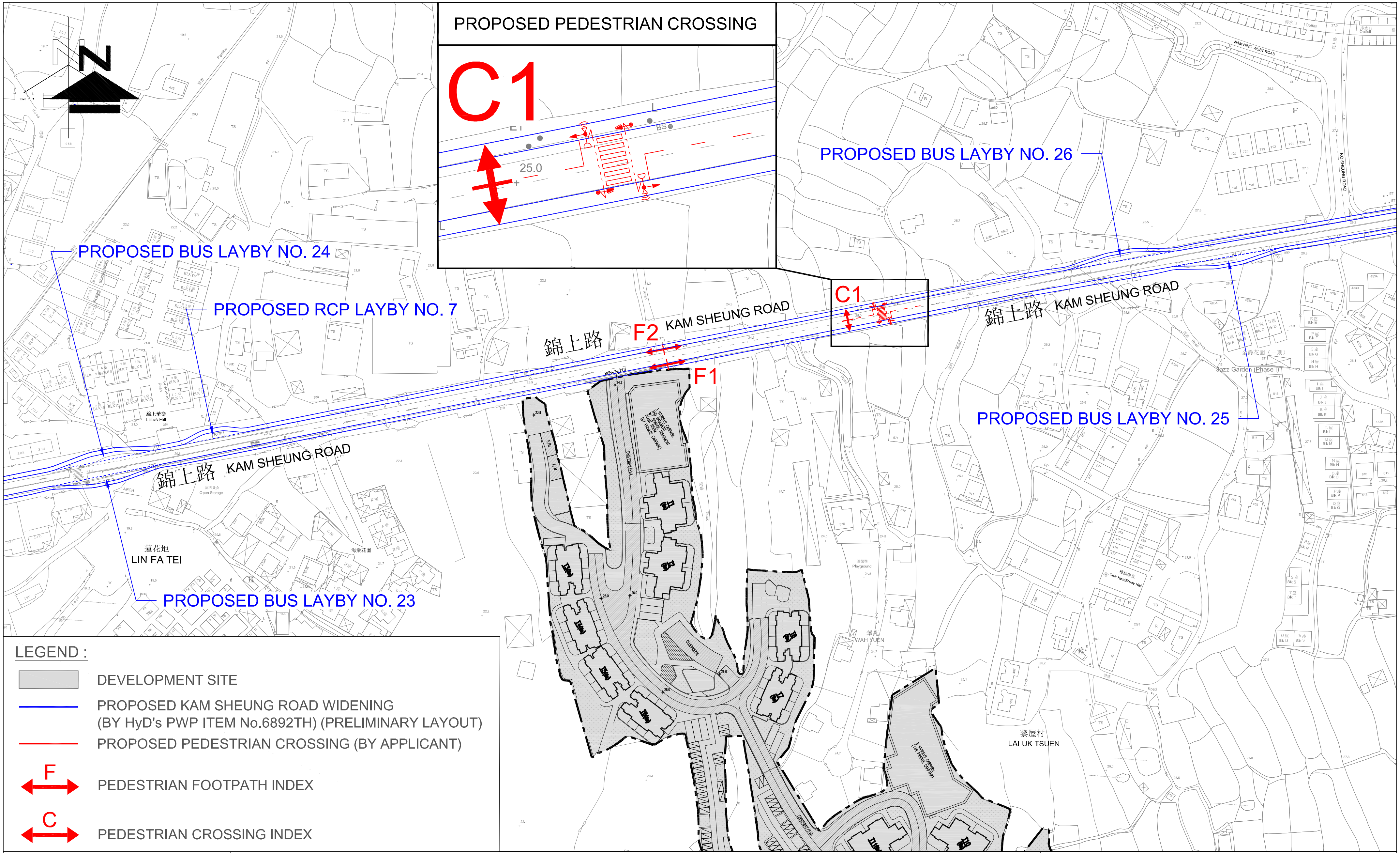
DRAWING TITLE:

PROPOSED IMPROVEMENT LAYOUT BY THE APPLICANT ON
JUNCTION OF KAM SHEUNG ROAD / KAM TIN ROAD (C)
(PRIOR TO PWP'S WORKS)

SCALE: 1 : 1000 @A4

DATE: 21 NOV 2024

CTA Consultants Limited
志達顧問有限公司



LEGEND :

▨	DEVELOPMENT SITE
—	PROPOSED KAM SHEUNG ROAD WIDENING (BY HyD's PWP ITEM No.6892TH) (PRELIMINARY LAYOUT)
—	PROPOSED PEDESTRIAN CROSSING (BY APPLICANT)
F ↔	PEDESTRIAN FOOTPATH INDEX
C ↔	PEDESTRIAN CROSSING INDEX

FIGURE NO.: 7.1

PROJECT TITLE: S12A Application for DD112 in Kam Tin

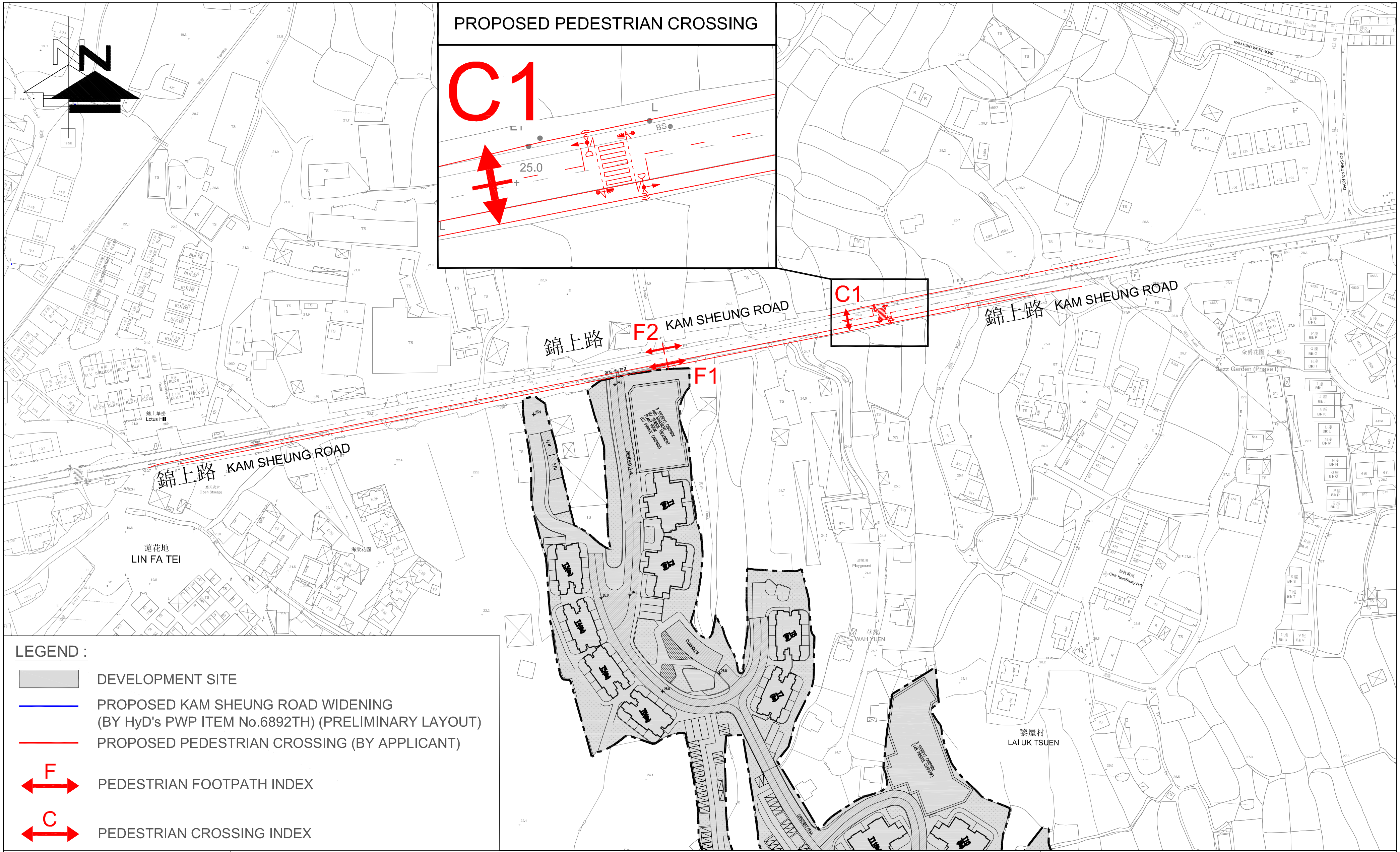
PROJECT NO.: 21134HK-DD112

DRAWING TITLE: PROPOSED PEDESTRIAN CROSSING

SCALE: 1 : 2500 @A4

DATE: 06 MAR 2025

CTA Consultants Limited
志達顧問有限公司



LEGEND :

▨	DEVELOPMENT SITE
—	PROPOSED KAM SHEUNG ROAD WIDENING (BY HyD's PWP ITEM No.6892TH) (PRELIMINARY LAYOUT)
—	PROPOSED PEDESTRIAN CROSSING (BY APPLICANT)
F ↔	PEDESTRIAN FOOTPATH INDEX
C ↔	PEDESTRIAN CROSSING INDEX

FIGURE NO.: 7.2

PROJECT TITLE:
S12A Application for DD112 in Kam Tin

PROJECT NO.:
21134HK-DD112

DRAWING TITLE:
PROPOSED PEDESTRIAN CROSSING
(PRIOR TO PWP'S WORKS)

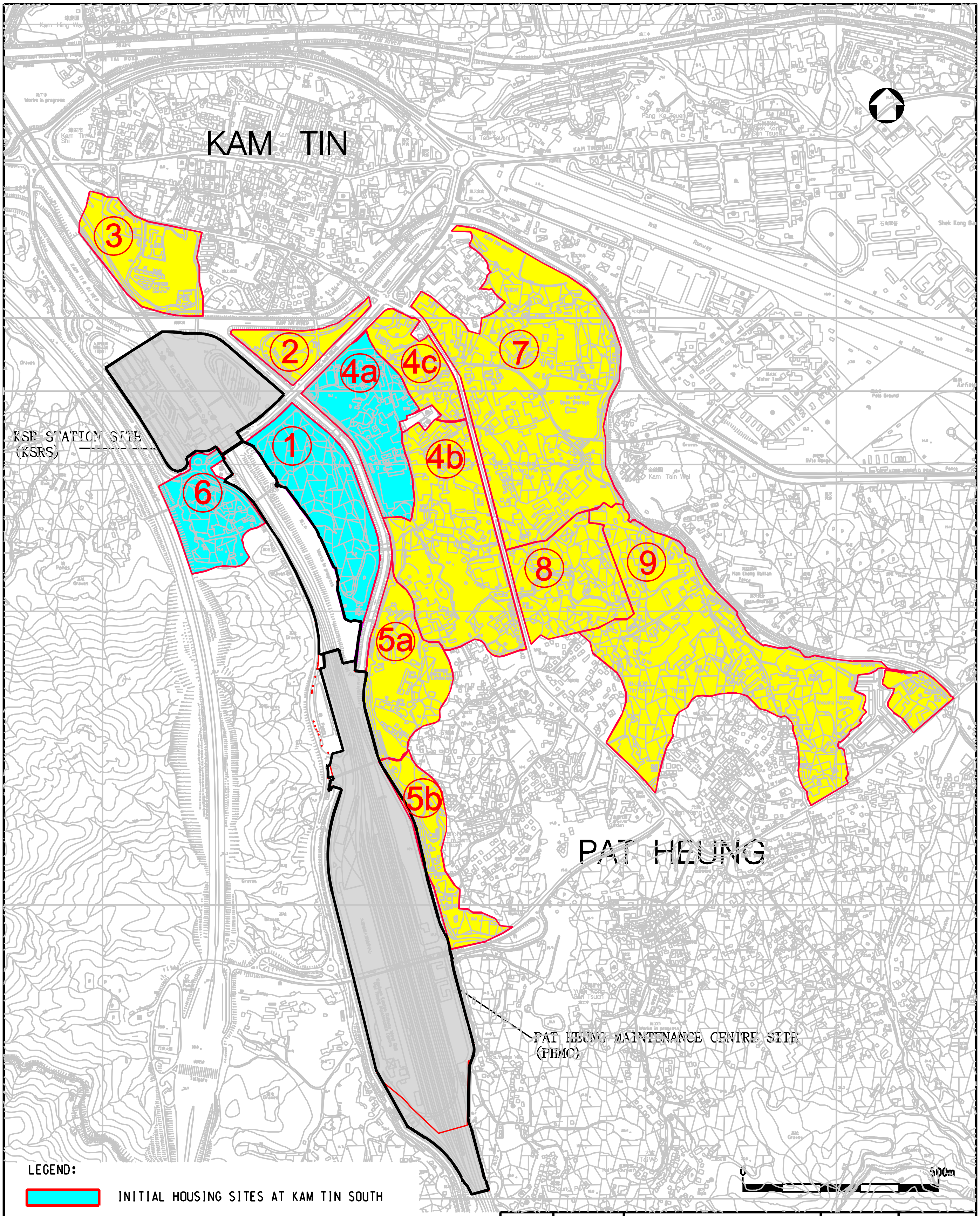
SCALE:
1 : 2500 @A4

DATE:
06 MAR 2025

CTA Consultants Limited
志達顧問有限公司

Appendix I

Kam Tin South Housing Development – Layout Plan



LEGEND:

🟦 INITIAL HOUSING SITES AT KAM TIN SOUTH

🟨 REMAINING HOUSING SITES AT KAM TIN SOUTH

編號 no.	日期 date	內容摘要 description	核對 checked	核准 approved
A	12.08.2014	TITLE BLOCK UPDATED	SIGNED	SIGNED

修訂 REVISION

圖則名稱 drawing title

KAM TIN SOUTH HOUSING DEVELOPMENT
-LAYOUT PLAN

繪圖 drawn S M CHU	簽署 initial SIGNED	日期 date 18.10.13	項目編號 item no.
核對 checked H S KO	簽署 initial SIGNED	日期 date 18.10.13	比例 scale AS SHOWN
核准 approved K L CHEUNG	簽署 initial SIGNED	日期 date 18.10.13	圖則編號 drawing no. NTNZ1855A

辦事處 office
新界西拓展處
NEW TERRITORIES WEST
DEVELOPMENT OFFICE

CEDD 土木工程拓展署
CIVIL ENGINEERING AND
DEVELOPMENT DEPARTMENT

date filename (Updaled as at 30 JUL 2014) L:\Drawing-MS\Ntnz1855-1856\Ntnz1855A.dgn

A3 297MM X 420MM

Appendix II
Junction Calculation Sheets

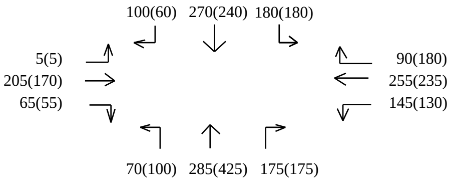
TRAFFIC SIGNALS CALCULATION Job No: 21134HK-DD112 **CTA Consultants Ltd.**

Junction: **(F) Kam Sheung Road / Tung Wui Road**
Description: **2021 CORRECTED TRAFFIC FLOWS**

Approach	Direction	Movement notation	Phase	Stage	Width (m)	Radius (m)		Nearside 0/1	Pro. Turning (%)		Saturation Flow (pcu/hr)	Total Saturation Flow (pcu/hr)	Revised Saturation Flow (pcu/hr)		Total Revised Saturation Flow (pcu/hr)		A.M. Peak			P.M. Peak		
						Left	Right		A.M.	P.M.			A.M.	P.M.	A.M.	P.M.	Flow (pcu/hr)	y Value	Critical y	Flow (pcu/hr)	y Value	Critical y
Kam Sheung Road	W	↰	C	1	3.3	0	20	0	100%	100%	2085	2085	1940	1940	1940	1940	90	0.046	0.104	180	0.093	0.095
	W	←	C	1	3.0	15	0	1	79%	77%	1915	4000	1775	1775	3860	3860	184	0.104		168	0.095	
	W	↲	C	1	3.3	0	0	0	0%	0%	2085	0	2085	2085	0	0	216	0.104		197	0.095	
Tung Wui Road	S	↲	B	2	3.0	15	0	1	71%	82%	1915	4040	1790	1770	3855	3855	255	0.143		220	0.125	
	S	↳	B	2	3.7	0	18	0	34%	23%	2125	0	2065	2085	0	0	295	0.143	0.143	260	0.124	0.125
Kam Sheung Road	E	↱	D	3	2.6	15	0	1	5%	6%	1875	3960	1865	1865	3950	3950	99	0.053		83	0.044	
	E	→	D	3	3.3	0	0	0	0%	0%	2085	0	2085	2085	0	0	111	0.053	0.053	92	0.044	0.044
	E	↴	D	3	3.0	0	20	0	100%	100%	2055	2055	1910	1910	1910	1910	65	0.034		55	0.029	
Tung Wui Road	N	↰	A	4	4.0	15	0	1	41%	40%	2015	4130	1935	1940	4050	4055	170	0.088		251	0.129	
	N	↑	A	4	3.6	0	0	0	0%	0%	2115	0	2115	2115	0	0	185	0.088		274	0.130	
	N	↱	A	4	3.4	0	20	0	100%	100%	2095	2095	1950	1950	1950	1950	175	0.090	0.090	175	0.090	0.130
Pedestrian crossing		⤢	Ep	1,2,3,5	Min. Crossing Time = 5GM + 5FGM = 10s																	
		↕	Fp	4,5	Min. Crossing Time = 9GM + 9FGM = 18s																	
		↔	Gp	5	Min. Crossing Time = 9GM + 9FGM = 18s																	
		↕	Hp	5	Min. Crossing Time = 7GM + 9FGM = 16s																	
		↔	Ip	5	Min. Crossing Time = 16GM + 9FGM = 25s																	

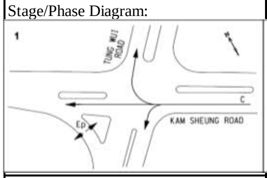
Notes:

Traffic Flow (pcu / hr)

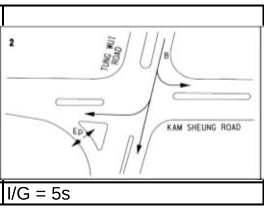


A.M. Check Phase		P.M. Check Phase	
εy	0.389	εy	0.393
L (sec)	41	L (sec)	41
C (sec)	90	C (sec)	90
y pract.	0.490	y pract.	0.490
R.C. (%)	26%	R.C. (%)	25%

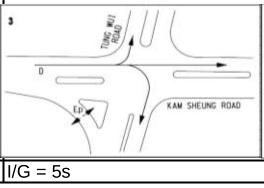
Stage/Phase Diagram:



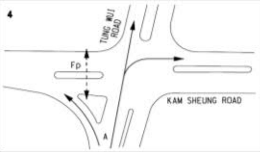
I/G = 2s



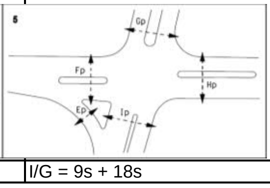
I/G = 5s



I/G = 5s



I/G = 6s



I/G = 9s + 18s

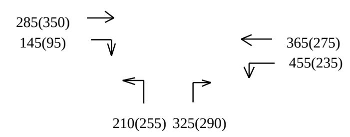
TRAFFIC SIGNALS CALCULATION Job No: 21134HK-DD112 **CTA Consultants Ltd.**

Junction: **(A) Kam Sheung Road/ Pat Heung Road**
Description: **2034 Reference Traffic Flows** **(With Planned CEDD's Improvement Scheme)**

Approach	Direction	Movement notation	Phase	Stage	Width (m)	Radius (m)		Nearside 0/1	Pro. Turning (%)		Saturation Flow (pcu/hr)	Total Saturation Flow (pcu/hr)	Revised Saturation Flow (pcu/hr)		Total Revised Saturation Flow (pcu/hr)		A.M. Peak			P.M. Peak		
						Left	Right		A.M.	P.M.			A.M.	P.M.	A.M.	P.M.	Flow (pcu/hr)	y Value	Critical y	Flow (pcu/hr)	y Value	Critical y
Kam Sheung Road	E	→	A	1	3.5	0	0	1	0%	0%	1965	1965	1965	1965	1965	1965	285	0.145		350	0.178	0.178
	E	↴	B	2	3.5	0	15	0	100%	100%	2105	2105	1915	1915	1915	1915	145	0.076	0.076	95	0.050	0.050
Yuen Kong San Tsuen	N	↰	C	2,3	3.5	25	0	1	100%	100%	1965	1965	1855	1855	1855	1855	210	0.113		255	0.137	
	N	↱	D	3	3.5	0	27.5	0	100%	100%	2105	2105	1995	1995	1995	1995	325	0.163		290	0.145	0.137
Kam Sheung Road	W	←	E	1	3.5	0	0	0	0%	0%	2105	2105	2105	2105	2105	2105	365	0.173	0.173	275	0.131	
	W	↙	F	3	3.5	24	0	1	100%	100%	1965	1965	1850	1850	1850	1850	455	0.246	0.246	235	0.127	
Pedestrian crossing		↔	Gp	1	Min. Crossing Time = 5GM + 11FGM = 16s																	
		↕	Hp	2	Min. Crossing Time = 5GM + 7FGM = 12s																	

Notes:

Traffic Flow (pcu / hr)



A.M. Check Phase

εy	0.495
L (sec)	14
C (sec)	130
y pract.	0.803
R.C. (%)	62%

P.M. Check Phase

εy	0.365
L (sec)	14
C (sec)	130
y pract.	0.803
R.C. (%)	120%

Stage/Phase Diagram:

I/G = 3s
I/G = 5s
I/G = 5s
I/G = 5s + 11s

TRAFFIC SIGNALS CALCULATION Job No: 21134HK-DD112 **CTA Consultants Ltd.**

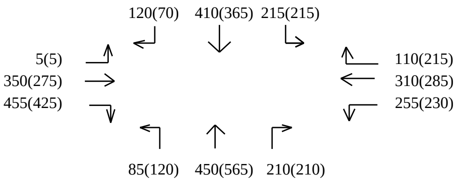
Junction: **(F) Kam Sheung Road / Tung Wui Road**
Description: **2034 Reference Traffic Flows (With Planned CEDD's Improvement Scheme)**

Approach	Direction	Movement notation	Phase	Stage	Width (m)	Radius (m) Left	Radius (m) Right	Nearside 0/1	Pro. Turning (%) A.M.	Pro. Turning (%) P.M.	Saturation Flow (pcu/hr)	Total Saturation Flow (pcu/hr)	Revised Saturation Flow (pcu/hr) A.M.	Revised Saturation Flow (pcu/hr) P.M.	Total Revised Saturation Flow (pcu/hr) A.M.	Total Revised Saturation Flow (pcu/hr) P.M.	A.M. Peak Flow (pcu/hr)	A.M. Peak y Value	A.M. Peak Critical y	P.M. Peak Flow (pcu/hr)	P.M. Peak y Value	P.M. Peak Critical y
Kam Sheung Road	W	↰	C	1	3.3	0	20	0	100%	100%	2085	2085	1940	1940	1940	1940	110	0.057	0.148	215	0.111	0.135
	W	←	C	1	3.0	15	0	1	99%	98%	1915	4000	1740	1745	3825	3830	257	0.148		235	0.134	
	W	←↓	C	1	3.3	0	0	0	0%	0%	2085	0	2085	2085	0	0	308	0.148		280	0.135	
Tung Wui Road	S	↲	B	2	3.5	0	20	0	46%	32%	2105	0	2035	2055	0	0	262	0.129		216	0.105	
	S	↓	B	2	3.3	0	0	0	0%	0%	2085	4190	2085	2085	4120	4140	268	0.129	0.129	219	0.105	0.116
	S	↳	B	2	3.5	25	0	1	100%	100%	1965	1965	1855	1855	1855	1855	215	0.116		215	0.116	
Kam Sheung Road	E	↱	D	3	2.6	15	0	1	3%	4%	1875	3960	1870	1870	3955	3955	168	0.090		132	0.071	
	E	→	D	3	3.3	0	0	0	0%	0%	2085	0	2085	2085	0	0	187	0.090	0.238	148	0.071	0.223
	E	↴	D	3	3.0	0	20	0	100%	100%	2055	2055	1910	1910	1910	1910	455	0.238		425	0.223	
Tung Wui Road	N	↰	A	3,4	3.5	24	0	1	100%	100%	393	393	370	370	370	370	85	0.230		120	0.324	
	N	↑	A	4	3.5	0	0	0	0%	0%	1965	4070	1965	1965	4070	4070	217	0.111		273	0.139	
	N	↑	A	4	3.5	0	0	0	0%	0%	2105	0	2105	2105	0	0	233	0.111		292	0.139	
	N	↱	A	4	3.4	0	20	0	100%	100%	2095	2095	1950	1950	1950	1950	210	0.108	0.111	210	0.108	0.139

Approach	Movement notation	Phase	Stage	
Pedestrian crossing	⤢	Ep	1,2,3,5	Min. Crossing Time = 5GM + 5FGM = 10s
	↕	Fp	4,5	Min. Crossing Time = 9GM + 9FGM = 18s
	↔	Gp	5	Min. Crossing Time = 9GM + 9FGM = 18s
	↕	Hp	5	Min. Crossing Time = 7GM + 9FGM = 16s
	↔	Ip	5	Min. Crossing Time = 16GM + 9FGM = 25s

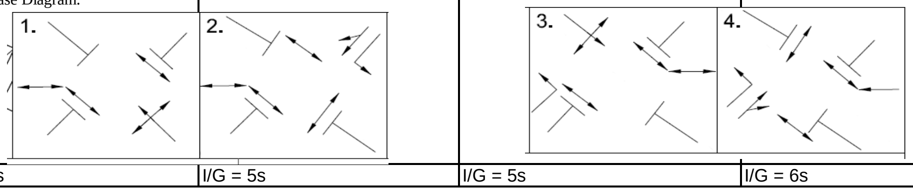
Notes:

Traffic Flow (pcu / hr)



	A.M. Check Phase		P.M. Check Phase
εy	0.625	εy	0.612
L (sec)	17	L (sec)	17
C (sec)	130	C (sec)	130
y pract.	0.782	y pract.	0.782
R.C. (%)	25%	R.C. (%)	28%

Stage/Phase Diagram:



I/G = 5s I/G = 5s I/G = 5s I/G = 6s

TRAFFIC SIGNALS CALCULATION Job No: 21134HK-DD112 **CTA Consultants Ltd.**

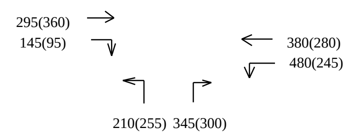
Junction: **(A) Kam Sheung Road/ Pat Heung Road**

Description: **2034 Design Traffic Flows** **(With Planned CEDD's Improvement Scheme)**

Approach	Direction	Movement notation	Phase	Stage	Width (m)	Radius (m)		Nearside 0/1	Pro. Turning (%)		Saturation Flow (pcu/hr)	Total Saturation Flow (pcu/hr)	Revised Saturation Flow (pcu/hr)		Total Revised Saturation Flow (pcu/hr)		A.M. Peak			P.M. Peak		
						Left	Right		A.M.	P.M.			A.M.	P.M.	A.M.	P.M.	Flow (pcu/hr)	y Value	Critical y	Flow (pcu/hr)	y Value	Critical y
Kam Sheung Road	E	→	A	1	3.5	0	0	1	0%	0%	1965	1965	1965	1965	1965	1965	295	0.150		360	0.183	0.183
	E	↴	B	2	3.5	0	15	0	100%	100%	2105	2105	1915	1915	1915	1915	145	0.076	0.076	95	0.050	0.050
Yuen Kong San Tsuen	N	↰	C	2,3	3.5	25	0	1	100%	100%	1965	1965	1855	1855	1855	1855	210	0.113		255	0.137	
	N	↱	D	3	3.5	0	27.5	0	100%	100%	2105	2105	1995	1995	1995	1995	345	0.173		300	0.150	0.137
Kam Sheung Road	W	←	E	1	3.5	0	0	0	0%	0%	2105	2105	2105	2105	2105	2105	380	0.181	0.181	280	0.133	
	W	↙	F	3	3.5	24	0	1	100%	100%	1965	1965	1850	1850	1850	1850	480	0.259	0.259	245	0.132	
Pedestrian crossing		↔	Gp	1		Min. Crossing Time = 5GM + 11FGM = 16s																
		↕	Hp	2		Min. Crossing Time = 5GM + 7FGM = 12s																

Notes:

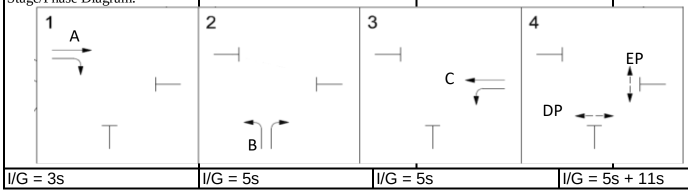
Traffic Flow (pcu / hr)



A.M. Check Phase	
εy	0.516
L (sec)	14
C (sec)	130
y pract.	0.803
R.C. (%)	56%

P.M. Check Phase	
εy	0.370
L (sec)	14
C (sec)	130
y pract.	0.803
R.C. (%)	117%

Stage/Phase Diagram:



I/G = 3s | I/G = 5s | I/G = 5s | I/G = 5s + 11s

TRAFFIC SIGNALS CALCULATION Job No: 21134HK-DD112 **CTA Consultants Ltd.**

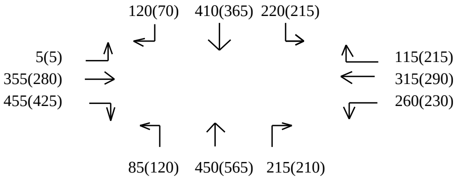
Junction: **(F) Kam Sheung Road / Tung Wui Road**
Description: **2034 Design Traffic Flows (With Planned CEDD's Improvement Scheme)**

Approach	Direction	Movement notation	Phase	Stage	Width (m)	Radius (m) Left	Radius (m) Right	Nearside 0/1	Pro. Turning (%) A.M.	Pro. Turning (%) P.M.	Saturation Flow (pcu/hr)	Total Saturation Flow (pcu/hr)	Revised Saturation Flow (pcu/hr) A.M.	Revised Saturation Flow (pcu/hr) P.M.	Total Revised Saturation Flow (pcu/hr) A.M.	Total Revised Saturation Flow (pcu/hr) P.M.	A.M. Peak Flow (pcu/hr)	A.M. Peak y Value	A.M. Peak Critical y	P.M. Peak Flow (pcu/hr)	P.M. Peak y Value	P.M. Peak Critical y
Kam Sheung Road	W	↰	C	1	3.3	0	20	0	100%	100%	2085	2085	1940	1940	1940	1940	115	0.059	0.150	215	0.111	0.136
	W	←	C	1	3.0	15	0	1	99%	97%	1915	4000	1740	1745	3825	3830	262	0.150		237	0.136	
	W	↲	C	1	3.3	0	0	0	0%	0%	2085	0	2085	2085	0	0	313	0.150		283	0.136	
Tung Wui Road	S	↲	B	2	3.5	0	20	0	46%	32%	2105	0	2035	2055	0	0	262	0.129		216	0.105	
	S	↓	B	2	3.3	0	0	0	0%	0%	2085	4190	2085	2085	4120	4140	268	0.129	0.129	219	0.105	0.116
	S	↳	B	2	3.5	25	0	1	100%	100%	1965	1965	1855	1855	1855	1855	220	0.119		215	0.116	
Kam Sheung Road	E	↗	D	3	2.6	15	0	1	3%	4%	1875	3960	1870	1870	3955	3955	170	0.091		135	0.072	
	E	→	D	3	3.3	0	0	0	0%	0%	2085	0	2085	2085	0	0	190	0.091	0.238	150	0.072	0.223
	E	↴	D	3	3.0	0	20	0	100%	100%	2055	2055	1910	1910	1910	1910	455	0.238		425	0.223	
Tung Wui Road	N	↰	A	3,4	3.5	24	0	1	100%	100%	393	393	370	370	370	370	85	0.230		120	0.324	
	N	↑	A	4	3.5	0	0	0	0%	0%	1965	4070	1965	1965	4070	4070	217	0.111		273	0.139	
	N	↑	A	4	3.5	0	0	0	0%	0%	2105	0	2105	2105	0	0	233	0.111		292	0.139	
	N	↱	A	4	3.4	0	20	0	100%	100%	2095	2095	1950	1950	1950	1950	215	0.110	0.111	210	0.108	0.139

Pedestrian crossing	Movement notation	Phase	Stage	
	⤢	Ep	1,2,3,5	Min. Crossing Time = 5GM + 5FGM = 10s
	↕	Fp	4,5	Min. Crossing Time = 9GM + 9FGM = 18s
	↔	Gp	5	Min. Crossing Time = 9GM + 9FGM = 18s
	↕	Hp	5	Min. Crossing Time = 7GM + 9FGM = 16s
	↔	Ip	5	Min. Crossing Time = 16GM + 9FGM = 25s

Notes:

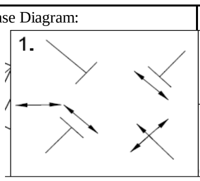
Traffic Flow (pcu / hr)



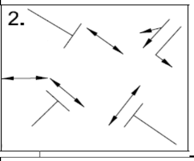
A.M. Check Phase	
εy	0.628
L (sec)	17
C (sec)	130
y pract.	0.782
R.C. (%)	25%

P.M. Check Phase	
εy	0.613
L (sec)	17
C (sec)	130
y pract.	0.782
R.C. (%)	28%

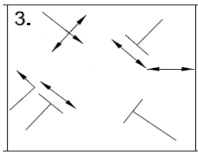
Stage/Phase Diagram:



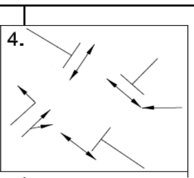
I/G = 5s



I/G = 5s



I/G = 5s



I/G = 6s

TRAFFIC SIGNALS CALCULATION Job No: 21134HK-DD112 **CTA Consultants Ltd.**

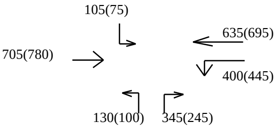
Junction: **(C) Kam Sheung Road / Kam Tin Road**
Description: **2034 Design Traffic Flows** **(Propsoed Improvement Scheme)**

Approach	Direction	Movement notation	Phase	Stage	Width (m)	Radius (m)		Nearside 0/1	Pro. Turning (%)		Site Factor	Revised Saturation Flow (pcu/hr)		Total Revised Saturation Flow (pcu/hr)		AM Peak			PM Peak		
						Left	Right		AM	PM		AM	PM	AM	PM	Flow (pcu/hr)	y Value	Critical y	Flow (pcu/hr)	y Value	Critical y
Kam Tin Road	SEB		1	A	4.5	0.0	0	1	0%	0%	1	2065	2065	2065	2065	705	0.341		780	0.378	
Kam Sheung Road	NEB		4	B, C	4.5	15.0	0	1	100%	100%	1	1875	1875	1875	1875	130	0.069		100	0.053	
			5	B	3.5	0.0	10	0	100%	100%	1	1830	1830	1830	1830	345	0.189		245	0.134	
Kam Tin Road	NWB		2	A	3.5	0.0	0	0	0%	0%	1	2105	2105	2105	2105	635	0.302		695	0.330	
			3	A,B	4.0	20.0	0	1	100%	100%	0.384	720	720	720	720	400	0.556	0.556	445	0.618	0.618
Car Park Access	SWB		6	C	5.0	15.0	0	1	100%	100%	1	1925	1925	1925	1925	105	0.055	0.055	75	0.039	0.039

Pedestrian Crossing	7p	B,C	Min. Crossing Time = 7GM + 6FGM = 13s
	8p	A	Min. Crossing Time = 5GM + 5FGM = 10s
	9p	A,C	Min. Crossing Time = 5GM + 5FGM = 10s
	10p	C	Min. Crossing Time = 5GM + 5FGM = 10s
	11p	A,B	Min. Crossing Time = 5GM + 5FGM = 10s

Notes:
(None)

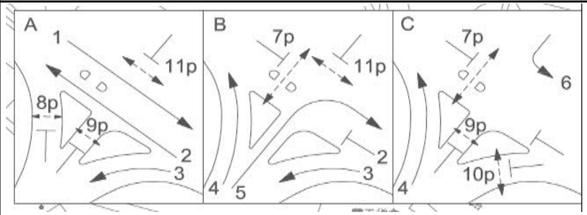
Traffic Flow (pcu / hr) Sunday AM Peak



AM Peak Check Phase	
εy	0.610
L (sec)	8
C (sec)	120
y pract.	0.840
R.C. (%)	38%

PM Peak Check Phase	
εy	0.657
L (sec)	8
C (sec)	120
y pract.	0.840
R.C. (%)	28%

Stage / Phase Diagrams



I/G = 5		I/G = 5	
I/G = 5		I/G = 5	

JUNCTION DELAY CALCULATION Job No: 21134HK-DD112 **CTA Consultants Ltd.**

Junction: **(C) Kam Sheung Road / Kam Tin Road**

Description: **2034 Design Traffic Flows** **(Propsoed Improvement Scheme)**

TRRL Method (Transport Road Research Laboratory)

$$d = \frac{c(1 \lambda\ )^2}{2(1 \cdot \lambda\ X)} + \frac{X}{2q(1 - X)} -0.65 \left(\frac{c}{q^2}\right)^{\frac{1}{3}} X^{(2+5\lambda)}$$

where d = average delay per vehicle on the particular arm

λ = proportion of the cycle which is effectively green for the phase under

consideration i.e.f g/c

x = The degree of saturation. This is the ratio of actual flow to the maximum possible flow under the given setting of signals and equals 3600q/¦Ës where S = saturation flow in veh/hour

c = Cycle time in seconds

g = Effective green time in seconds

q should be the flow in vehicles per second to give delay in seconds

Approach:	Kam Sheung Road (LT)		Kam Sheung Road (RT)		Kam Tin Road NEB (LT)		Kam Tin Road NEB (STR)		Kam Tin Road SEB		Car Park Access	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
q (veh/hr)	104	80	276	196	320	356	508	556	564	624	84	60
g (sec)	48	32	34	22	101	104	62	63	62	63	9	6
c (sec)	120	120	120	120	120	120	120	120	120	120	120	120
s (veh/hr)	1,500	1,500	1,464	1,464	576	576	1,684	1,684	1,652	1,652	1,540	1,540
λ	0.40	0.27	0.28	0.18	0.84	0.87	0.51	0.53	0.51	0.53	0.08	0.05
x	0.17	0.20	0.67	0.74	0.66	0.71	0.59	0.63	0.66	0.72	0.73	0.83
M=qc	3.47	2.67	9.20	6.53	10.67	11.87	16.93	18.53	18.80	20.80	2.80	2.00
Delay												
d	24.06	34.64	42.74	56.08	9.38	9.78	22.22	22.05	24.02	24.46	77.20	144.71

From TPDM Vol4 Table 4.2.5

Average Queue N calculated by

N=q(r/2+d) or qr,whichever the greater

Approach:	Kam Sheung Road (LT)		Kam Sheung Road (RT)		Kam Tin Road NEB (LT)		Kam Tin Road NEB (STR)		Kam Tin Road SEB		Car Park Access	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
r (sec)	72	88	86	98	19	16	58	57	58	57	111	114
N (veh)	**2**	**2**	**7**	**6**	**2**	**2**	**8**	**9**	**9**	**10**	**3**	**3**
Average Queue length (m)	**12.0**	**12.0**	**42.0**	**36.0**	**12.0**	**12.0**	**48.0**	**54.0**	**54.0**	**60.0**	**18.0**	**18.0**

Junctions 8

PICADY 8 - Priority Intersection Module

Version: 8.0.5.523 [19102,19/06/2015]

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Filename: DD112 Jn A_Ext.arc8
Path: \\PROJSRV\Project\CTA Consultants Limited\CTA - Project\21134HK (wkk) - S12A Application (DD106, 110, 112 & 113) in Kam Tin\DD112 - LFT (Alex Leung)\Cal\2022-10-26
Report generation date: 1/11/2022 18:57:48

- » Junction A - 2021 Existing, AM
- » Junction A - 2021 Existing, PM

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	Junction A - 2021 Existing							
Stream B-C	0.25	9.13	0.20	A	0.34	8.77	0.25	A
Stream B-A	1.30	20.57	0.57	C	0.96	15.76	0.49	C
Stream C-A	-	-	-	-	-	-	-	-
Stream C-B	0.33	10.28	0.25	B	0.16	8.06	0.14	A
Stream A-B	-	-	-	-	-	-	-	-
Stream A-C	-	-	-	-	-	-	-	-

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle.

"D1 - 2021 Existing, AM " model duration: 8:00 - 9:30
"D2 - 2021 Existing, PM" model duration: 18:00 - 19:30

Run using Junctions 8.0.5.523 at 1/11/2022 18:57:46

File summary

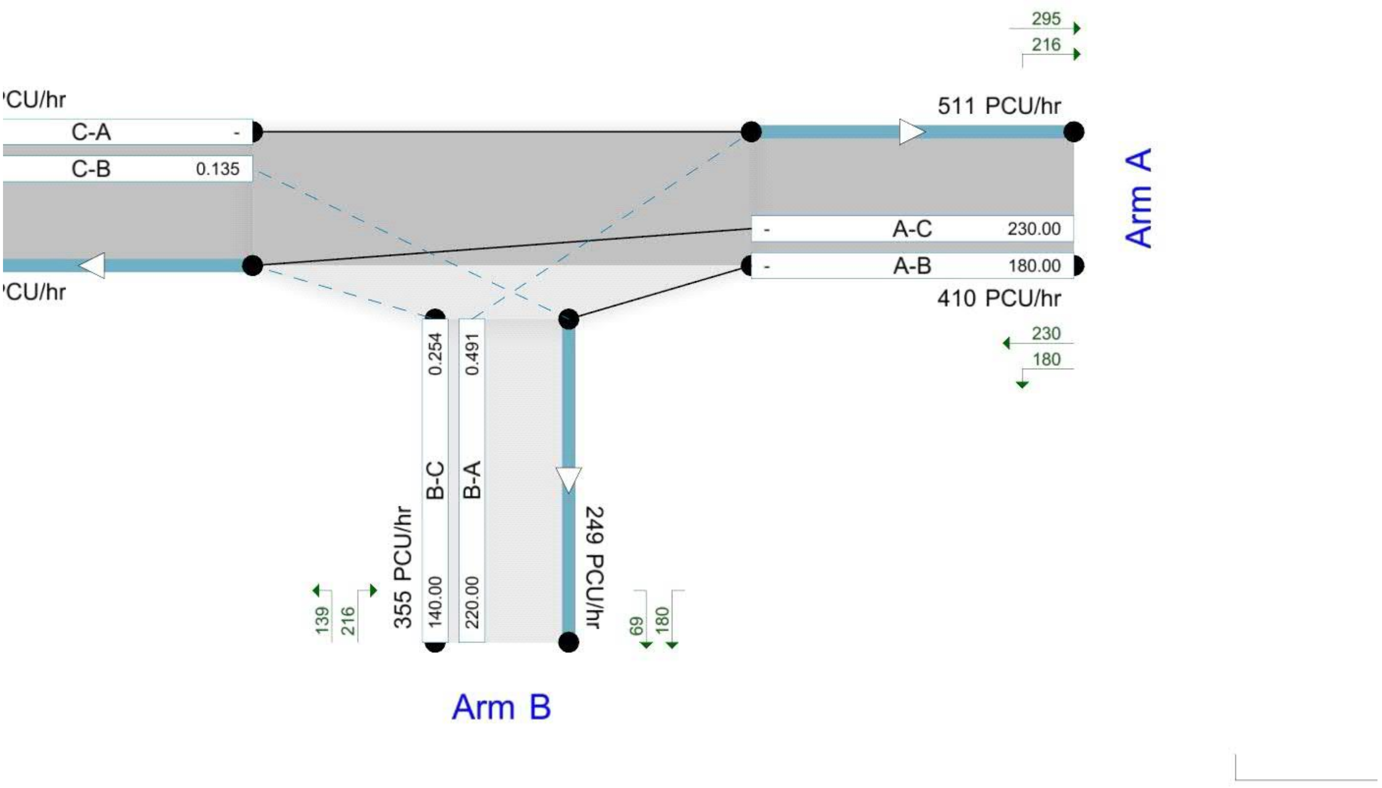
Title	(untitled)
Location	
Site Number	
Date	3/7/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	ITADMIN
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCU	PCU	perHour	s	-Min	perMin



Showing modelled flow through junction (PCU/hr).
Streams (upstreams) show Total Demand (PCU/hr); Streams (downstreams) show RFC ()
Time Segment: (08:00-08:15)
Showing Analysis Set "A1 - Junction A "; Demand Set "D1 - 2021 Existing, AM "

The junction diagram reflects the last run of ARCADY.

Junction A - 2021 Existing, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction A	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2021 Existing, AM	2021 Existing	AM		FLAT	08:00	09:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
A	Pat Heung Road/ Kam Sheung Road	T-Junction	Two-way	A,B,C	15.34	C

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Kam Sheung Road		Major
B	B	Pat Heung Road		Minor
C	C	Kam Sheung Road		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	8.30		0.00		2.20	50.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane plus flare				10.00	6.30	4.20	4.20	4.20		10.00	50	50

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
A	B-A	591.088	0.097	0.245	0.154	0.350
A	B-C	685.240	0.095	0.239	-	-
A	C-B	602.919	0.210	0.210	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	FLAT	✓	655.00	100.000
B	FLAT	✓	330.00	100.000
C	FLAT	✓	355.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
08:00-08:15	**A**	655.00	655.00		
08:00-08:15	**B**	330.00	330.00		
08:00-08:15	**C**	355.00	355.00		
08:15-08:30	**A**	655.00	655.00		
08:15-08:30	**B**	330.00	330.00		
08:15-08:30	**C**	355.00	355.00		
08:30-08:45	**A**	655.00	655.00		
08:30-08:45	**B**	330.00	330.00		
08:30-08:45	**C**	355.00	355.00		
08:45-09:00	**A**	655.00	655.00		
08:45-09:00	**B**	330.00	330.00		
08:45-09:00	**C**	355.00	355.00		
09:00-09:15	**A**	655.00	655.00		
09:00-09:15	**B**	330.00	330.00		
09:00-09:15	**C**	355.00	355.00		
09:15-09:30	**A**	655.00	655.00		
09:15-09:30	**B**	330.00	330.00		
09:15-09:30	**C**	355.00	355.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction A (for whole period)

		To		
		A	**B**	**C**
From	**A**	0.000	350.000	305.000
	B	230.000	0.000	100.000
	C	240.000	115.000	0.000

Turning Proportions (PCU) - Junction A (for whole period)

		To		
		A	**B**	**C**
From	**A**	0.00	0.53	0.47
	B	0.70	0.00	0.30
	C	0.68	0.32	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction A (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction A (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.20	9.13	0.25	A
B-A	0.57	20.57	1.30	C
C-A	-	-	-	-
C-B	0.25	10.28	0.33	B
A-B	-	-	-	-
A-C	-	-	-	-

Main Results for each time segment

Main results: (08:00-08:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	100.00	99.00	0.00	496.74	0.201	0.25	9.029	A
B-A	230.00	225.01	0.00	405.28	0.568	1.25	19.478	C
C-A	240.00	240.00	0.00	-	-	-	-	-
C-B	115.00	113.71	0.00	465.22	0.247	0.32	10.204	B
A-B	350.00	350.00	0.00	-	-	-	-	-
A-C	305.00	305.00	0.00	-	-	-	-	-

Main results: (08:15-08:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	100.00	99.99	0.00	494.41	0.202	0.25	9.127	A
B-A	230.00	229.87	0.00	404.94	0.568	1.28	20.521	C
C-A	240.00	240.00	0.00	-	-	-	-	-
C-B	115.00	114.99	0.00	465.22	0.247	0.33	10.278	B
A-B	350.00	350.00	0.00	-	-	-	-	-
A-C	305.00	305.00	0.00	-	-	-	-	-

Main results: (08:30-08:45)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	100.00	100.00	0.00	494.35	0.202	0.25	9.128	A
B-A	230.00	229.96	0.00	404.94	0.568	1.29	20.550	C
C-A	240.00	240.00	0.00	-	-	-	-	-
C-B	115.00	115.00	0.00	465.22	0.247	0.33	10.278	B
A-B	350.00	350.00	0.00	-	-	-	-	-
A-C	305.00	305.00	0.00	-	-	-	-	-

Main results: (08:45-09:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	100.00	100.00	0.00	494.32	0.202	0.25	9.129	A
B-A	230.00	229.98	0.00	404.94	0.568	1.30	20.560	C
C-A	240.00	240.00	0.00	-	-	-	-	-
C-B	115.00	115.00	0.00	465.22	0.247	0.33	10.278	B
A-B	350.00	350.00	0.00	-	-	-	-	-
A-C	305.00	305.00	0.00	-	-	-	-	-

Main results: (09:00-09:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	100.00	100.00	0.00	494.31	0.202	0.25	9.129	A
B-A	230.00	229.99	0.00	404.94	0.568	1.30	20.564	C
C-A	240.00	240.00	0.00	-	-	-	-	-
C-B	115.00	115.00	0.00	465.22	0.247	0.33	10.278	B
A-B	350.00	350.00	0.00	-	-	-	-	-
A-C	305.00	305.00	0.00	-	-	-	-	-

Main results: (09:15-09:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	100.00	100.00	0.00	494.31	0.202	0.25	9.129	A
B-A	230.00	229.99	0.00	404.94	0.568	1.30	20.568	C
C-A	240.00	240.00	0.00	-	-	-	-	-
C-B	115.00	115.00	0.00	465.22	0.247	0.33	10.278	B
A-B	350.00	350.00	0.00	-	-	-	-	-
A-C	305.00	305.00	0.00	-	-	-	-	-

Junction A - 2021 Existing, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction A	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2021 Existing, PM	2021 Existing	PM		FLAT	18:00	19:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
A	Pat Heung Road/ Kam Sheung Road	T-Junction	Two-way	A,B,C	12.23	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Kam Sheung Road		Major
B	B	Pat Heung Road		Minor
C	C	Kam Sheung Road		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	8.30		0.00		2.20	50.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane plus flare				10.00	6.30	4.20	4.20	4.20		10.00	50	50

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
A	B-A	592.480	0.097	0.245	0.154	0.351
A	B-C	702.986	0.097	0.245	-	-
A	C-B	602.919	0.210	0.210	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	FLAT	✓	410.00	100.000
B	FLAT	✓	360.00	100.000
C	FLAT	✓	365.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
18:00-18:15	**A**	410.00	410.00		
18:00-18:15	**B**	360.00	360.00		
18:00-18:15	**C**	365.00	365.00		
18:15-18:30	**A**	410.00	410.00		
18:15-18:30	**B**	360.00	360.00		
18:15-18:30	**C**	365.00	365.00		
18:30-18:45	**A**	410.00	410.00		
18:30-18:45	**B**	360.00	360.00		
18:30-18:45	**C**	365.00	365.00		
18:45-19:00	**A**	410.00	410.00		
18:45-19:00	**B**	360.00	360.00		
18:45-19:00	**C**	365.00	365.00		
19:00-19:15	**A**	410.00	410.00		
19:00-19:15	**B**	360.00	360.00		
19:00-19:15	**C**	365.00	365.00		
19:15-19:30	**A**	410.00	410.00		
19:15-19:30	**B**	360.00	360.00		
19:15-19:30	**C**	365.00	365.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction A (for whole period)

		To		
		A	**B**	**C**
From	**A**	0.000	180.000	230.000
	B	220.000	0.000	140.000
	C	295.000	70.000	0.000

Turning Proportions (PCU) - Junction A (for whole period)

		To		
		A	**B**	**C**
From	**A**	0.00	0.44	0.56
	B	0.61	0.00	0.39
	C	0.81	0.19	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction A (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction A (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.25	8.77	0.34	A
B-A	0.49	15.76	0.96	C
C-A	-	-	-	-
C-B	0.14	8.06	0.16	A
A-B	-	-	-	-
A-C	-	-	-	-

Main Results for each time segment

Main results: (18:00-18:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	140.00	138.66	0.00	551.94	0.254	0.34	8.684	A
B-A	220.00	216.27	0.00	448.44	0.491	0.93	15.277	C
C-A	295.00	295.00	0.00	-	-	-	-	-
C-B	70.00	69.38	0.00	516.73	0.135	0.16	8.035	A
A-B	180.00	180.00	0.00	-	-	-	-	-
A-C	230.00	230.00	0.00	-	-	-	-	-

Main results: (18:15-18:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	140.00	139.99	0.00	550.34	0.254	0.34	8.772	A
B-A	220.00	219.94	0.00	448.44	0.491	0.95	15.743	C
C-A	295.00	295.00	0.00	-	-	-	-	-
C-B	70.00	70.00	0.00	516.73	0.135	0.16	8.058	A
A-B	180.00	180.00	0.00	-	-	-	-	-
A-C	230.00	230.00	0.00	-	-	-	-	-

Main results: (18:30-18:45)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	140.00	140.00	0.00	550.31	0.254	0.34	8.773	A
B-A	220.00	219.98	0.00	448.44	0.491	0.95	15.751	C
C-A	295.00	295.00	0.00	-	-	-	-	-
C-B	70.00	70.00	0.00	516.73	0.135	0.16	8.058	A
A-B	180.00	180.00	0.00	-	-	-	-	-
A-C	230.00	230.00	0.00	-	-	-	-	-

Main results: (18:45-19:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	140.00	140.00	0.00	550.30	0.254	0.34	8.773	A
B-A	220.00	219.99	0.00	448.44	0.491	0.95	15.754	C
C-A	295.00	295.00	0.00	-	-	-	-	-
C-B	70.00	70.00	0.00	516.73	0.135	0.16	8.058	A
A-B	180.00	180.00	0.00	-	-	-	-	-
A-C	230.00	230.00	0.00	-	-	-	-	-

Main results: (19:00-19:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	140.00	140.00	0.00	550.30	0.254	0.34	8.773	A
B-A	220.00	219.99	0.00	448.44	0.491	0.96	15.755	C
C-A	295.00	295.00	0.00	-	-	-	-	-
C-B	70.00	70.00	0.00	516.73	0.135	0.16	8.058	A
A-B	180.00	180.00	0.00	-	-	-	-	-
A-C	230.00	230.00	0.00	-	-	-	-	-

Main results: (19:15-19:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	140.00	140.00	0.00	550.29	0.254	0.34	8.773	A
B-A	220.00	220.00	0.00	448.44	0.491	0.96	15.755	C
C-A	295.00	295.00	0.00	-	-	-	-	-
C-B	70.00	70.00	0.00	516.73	0.135	0.16	8.058	A
A-B	180.00	180.00	0.00	-	-	-	-	-
A-C	230.00	230.00	0.00	-	-	-	-	-

Junctions 8

PICADY 8 - Priority Intersection Module

Version: 8.0.5.523 [19102,19/06/2015]

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Filename: DD112 Jn B.arc8
Path: F:\21134HK-DD112\2024-02-23
Report generation date: 23/2/2024 11:09:49

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	Junction B - 2021 Existing							
Stream B-AC	0.23	11.00	0.19	B	0.14	9.47	0.13	A
Stream C-A	-	-	-	-	-	-	-	-
Stream C-B	0.07	7.38	0.07	A	0.03	7.16	0.03	A
Stream A-B	-	-	-	-	-	-	-	-
Stream A-C	-	-	-	-	-	-	-	-
	Junction B - 2034 Design							
Stream B-AC	0.37	13.92	0.27	B	0.20	10.85	0.16	B
Stream C-A	-	-	-	-	-	-	-	-
Stream C-B	0.10	8.11	0.09	A	0.04	7.64	0.04	A
Stream A-B	-	-	-	-	-	-	-	-
Stream A-C	-	-	-	-	-	-	-	-
	Junction B - 2034 Reference							
Stream B-AC	0.33	13.25	0.25	B	0.19	10.62	0.16	B
Stream C-A	-	-	-	-	-	-	-	-
Stream C-B	0.09	7.90	0.08	A	0.04	7.57	0.04	A
Stream A-B	-	-	-	-	-	-	-	-
Stream A-C	-	-	-	-	-	-	-	-

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle.

"D1 - 2021 Existing, AM " model duration: 8:00 - 9:30
"D2 - 2021 Existing, PM" model duration: 18:00 - 19:30
"D10 - 2034 Reference, AM" model duration: 8:00 - 9:30
"D11 - 2034 Reference, PM" model duration: 18:00 - 19:30
"D12 - 2034 Design, AM" model duration: 8:00 - 9:30
"D13 - 2034 Design, PM" model duration: 18:00 - 19:30

Run using Junctions 8.0.5.523 at 23/2/2024 11:09:44

File summary

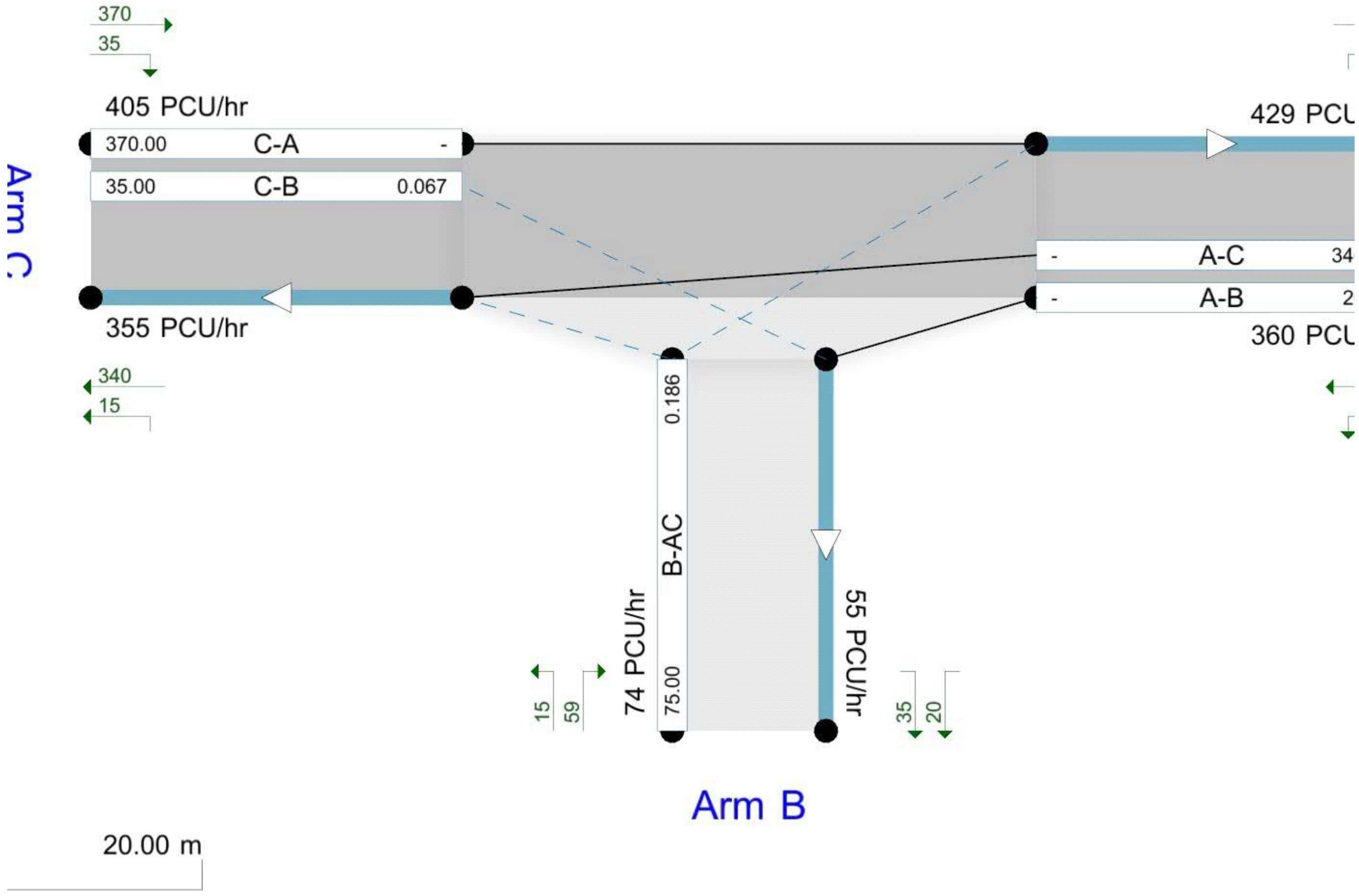
Title	(untitled)
Location	
Site Number	
Date	3/7/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	ITADMIN
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCU	PCU	perHour	s	-Min	perMin



Showing modelled flow through junction (PCU/hr).
Streams (upstreams) show Total Demand (PCU/hr); Streams (downstreams) show RFC ()
Time Segment: (08:00-08:15)
Showing Analysis Set "A1 - Junction B "; Demand Set "D1 - 2021 Existing, AM "

The junction diagram reflects the last run of ARCADY.

Junction B - 2021 Existing, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction B	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2021 Existing, AM	2021 Existing	AM		FLAT	08:00	09:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
B	Kam Seung Road / Kam Shui South road	T-Junction	Two-way	A,B,C	9.85	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Kam Sheung Road		Major
B	B	Kam Shui South Road		Minor
C	C	Kam Sheung Road		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	7.00		0.00		2.20	50.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	3.00										50	50

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B	B-A	518.507	0.090	0.228	0.144	0.326
B	B-C	655.413	0.096	0.243	-	-
B	C-B	602.919	0.223	0.223	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	FLAT	✓	360.00	100.000
B	FLAT	✓	75.00	100.000
C	FLAT	✓	405.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
08:00-08:15	**A**	360.00	360.00		
08:00-08:15	**B**	75.00	75.00		
08:00-08:15	**C**	405.00	405.00		
08:15-08:30	**A**	360.00	360.00		
08:15-08:30	**B**	75.00	75.00		
08:15-08:30	**C**	405.00	405.00		
08:30-08:45	**A**	360.00	360.00		
08:30-08:45	**B**	75.00	75.00		
08:30-08:45	**C**	405.00	405.00		
08:45-09:00	**A**	360.00	360.00		
08:45-09:00	**B**	75.00	75.00		
08:45-09:00	**C**	405.00	405.00		
09:00-09:15	**A**	360.00	360.00		
09:00-09:15	**B**	75.00	75.00		
09:00-09:15	**C**	405.00	405.00		
09:15-09:30	**A**	360.00	360.00		
09:15-09:30	**B**	75.00	75.00		
09:15-09:30	**C**	405.00	405.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction B (for whole period)

		To		
		A	B	C
From	A	0.000	20.000	340.000
	B	60.000	0.000	15.000
	C	370.000	35.000	0.000

Turning Proportions (PCU) - Junction B (for whole period)

		To		
		A	B	C
From	A	0.00	0.06	0.94
	B	0.80	0.00	0.20
	C	0.91	0.09	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction B (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction B (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.19	11.00	0.23	B
C-A	-	-	-	-
C-B	0.07	7.38	0.07	A
A-B	-	-	-	-
A-C	-	-	-	-

Main Results for each time segment

Main results: (08:00-08:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	75.00	74.10	0.00	402.18	0.186	0.23	10.944	B
C-A	370.00	370.00	0.00	-	-	-	-	-
C-B	35.00	34.72	0.00	522.48	0.067	0.07	7.378	A
A-B	20.00	20.00	0.00	-	-	-	-	-
A-C	340.00	340.00	0.00	-	-	-	-	-

Main results: (08:15-08:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	75.00	74.99	0.00	402.09	0.187	0.23	11.005	B
C-A	370.00	370.00	0.00	-	-	-	-	-
C-B	35.00	35.00	0.00	522.48	0.067	0.07	7.383	A
A-B	20.00	20.00	0.00	-	-	-	-	-
A-C	340.00	340.00	0.00	-	-	-	-	-

Main results: (08:30-08:45)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	75.00	75.00	0.00	402.09	0.187	0.23	11.005	B
C-A	370.00	370.00	0.00	-	-	-	-	-
C-B	35.00	35.00	0.00	522.48	0.067	0.07	7.383	A
A-B	20.00	20.00	0.00	-	-	-	-	-
A-C	340.00	340.00	0.00	-	-	-	-	-

Main results: (08:45-09:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	75.00	75.00	0.00	402.09	0.187	0.23	11.005	B
C-A	370.00	370.00	0.00	-	-	-	-	-
C-B	35.00	35.00	0.00	522.48	0.067	0.07	7.383	A
A-B	20.00	20.00	0.00	-	-	-	-	-
A-C	340.00	340.00	0.00	-	-	-	-	-

Main results: (09:00-09:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	75.00	75.00	0.00	402.09	0.187	0.23	11.005	B
C-A	370.00	370.00	0.00	-	-	-	-	-
C-B	35.00	35.00	0.00	522.48	0.067	0.07	7.383	A
A-B	20.00	20.00	0.00	-	-	-	-	-
A-C	340.00	340.00	0.00	-	-	-	-	-

Main results: (09:15-09:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	75.00	75.00	0.00	402.09	0.187	0.23	11.005	B
C-A	370.00	370.00	0.00	-	-	-	-	-
C-B	35.00	35.00	0.00	522.48	0.067	0.07	7.383	A
A-B	20.00	20.00	0.00	-	-	-	-	-
A-C	340.00	340.00	0.00	-	-	-	-	-

Junction B - 2021 Existing, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction B	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2021 Existing, PM	2021 Existing	PM		FLAT	18:00	19:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
B	Kam Seung Road / Kam Shui South road	T-Junction	Two-way	A,B,C	8.97	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Kam Sheung Road		Major
B	B	Kam Shui South Road		Minor
C	C	Kam Sheung Road		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	7.00		0.00		2.20	50.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	3.00										50	50

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B	B-A	518.507	0.090	0.228	0.144	0.326
B	B-C	655.413	0.096	0.243	-	-
B	C-B	602.919	0.223	0.223	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	FLAT	✓	380.00	100.000
B	FLAT	✓	55.00	100.000
C	FLAT	✓	385.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
18:00-18:15	**A**	380.00	380.00		
18:00-18:15	**B**	55.00	55.00		
18:00-18:15	**C**	385.00	385.00		
18:15-18:30	**A**	380.00	380.00		
18:15-18:30	**B**	55.00	55.00		
18:15-18:30	**C**	385.00	385.00		
18:30-18:45	**A**	380.00	380.00		
18:30-18:45	**B**	55.00	55.00		
18:30-18:45	**C**	385.00	385.00		
18:45-19:00	**A**	380.00	380.00		
18:45-19:00	**B**	55.00	55.00		
18:45-19:00	**C**	385.00	385.00		
19:00-19:15	**A**	380.00	380.00		
19:00-19:15	**B**	55.00	55.00		
19:00-19:15	**C**	385.00	385.00		
19:15-19:30	**A**	380.00	380.00		
19:15-19:30	**B**	55.00	55.00		
19:15-19:30	**C**	385.00	385.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction B (for whole period)

		To		
		A	**B**	**C**
From	**A**	0.000	65.000	315.000
	B	35.000	0.000	20.000
	C	370.000	15.000	0.000

Turning Proportions (PCU) - Junction B (for whole period)

		To		
		A	**B**	**C**
From	**A**	0.00	0.17	0.83
	B	0.64	0.00	0.36
	C	0.96	0.04	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction B (for whole period)

	To			
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction B (for whole period)

	To			
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.13	9.47	0.14	A
C-A	-	-	-	-
C-B	0.03	7.16	0.03	A
A-B	-	-	-	-
A-C	-	-	-	-

Main Results for each time segment

Main results: (18:00-18:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	55.00	54.43	0.00	435.17	0.126	0.14	9.441	A
C-A	370.00	370.00	0.00	-	-	-	-	-
C-B	15.00	14.88	0.00	518.01	0.029	0.03	7.153	A
A-B	65.00	65.00	0.00	-	-	-	-	-
A-C	315.00	315.00	0.00	-	-	-	-	-

Main results: (18:15-18:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	55.00	55.00	0.00	435.14	0.126	0.14	9.469	A
C-A	370.00	370.00	0.00	-	-	-	-	-
C-B	15.00	15.00	0.00	518.01	0.029	0.03	7.155	A
A-B	65.00	65.00	0.00	-	-	-	-	-
A-C	315.00	315.00	0.00	-	-	-	-	-

Main results: (18:30-18:45)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	55.00	55.00	0.00	435.14	0.126	0.14	9.469	A
C-A	370.00	370.00	0.00	-	-	-	-	-
C-B	15.00	15.00	0.00	518.01	0.029	0.03	7.155	A
A-B	65.00	65.00	0.00	-	-	-	-	-
A-C	315.00	315.00	0.00	-	-	-	-	-

Main results: (18:45-19:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	55.00	55.00	0.00	435.14	0.126	0.14	9.469	A
C-A	370.00	370.00	0.00	-	-	-	-	-
C-B	15.00	15.00	0.00	518.01	0.029	0.03	7.155	A
A-B	65.00	65.00	0.00	-	-	-	-	-
A-C	315.00	315.00	0.00	-	-	-	-	-

Main results: (19:00-19:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	55.00	55.00	0.00	435.14	0.126	0.14	9.469	A
C-A	370.00	370.00	0.00	-	-	-	-	-
C-B	15.00	15.00	0.00	518.01	0.029	0.03	7.158	A
A-B	65.00	65.00	0.00	-	-	-	-	-
A-C	315.00	315.00	0.00	-	-	-	-	-

Main results: (19:15-19:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	55.00	55.00	0.00	435.14	0.126	0.14	9.469	A
C-A	370.00	370.00	0.00	-	-	-	-	-
C-B	15.00	15.00	0.00	518.01	0.029	0.03	7.158	A
A-B	65.00	65.00	0.00	-	-	-	-	-
A-C	315.00	315.00	0.00	-	-	-	-	-

Junction B - 2034 Reference, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction B	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Reference, AM	2034 Reference	AM		FLAT	08:00	09:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
B	Kam Seung Road / Kam Shui South road	T-Junction	Two-way	A,B,C	11.60	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Kam Sheung Road		Major
B	B	Kam Shui South Road		Minor
C	C	Kam Sheung Road		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	7.00		0.00		2.20	50.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	3.00										50	50

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B	B-A	518.507	0.090	0.228	0.144	0.326
B	B-C	655.413	0.096	0.243	-	-
B	C-B	602.919	0.223	0.223	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	FLAT	✓	480.00	100.000
B	FLAT	✓	90.00	100.000
C	FLAT	✓	520.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
08:00-08:15	**A**	480.00	480.00		
08:00-08:15	**B**	90.00	90.00		
08:00-08:15	**C**	520.00	520.00		
08:15-08:30	**A**	480.00	480.00		
08:15-08:30	**B**	90.00	90.00		
08:15-08:30	**C**	520.00	520.00		
08:30-08:45	**A**	480.00	480.00		
08:30-08:45	**B**	90.00	90.00		
08:30-08:45	**C**	520.00	520.00		
08:45-09:00	**A**	480.00	480.00		
08:45-09:00	**B**	90.00	90.00		
08:45-09:00	**C**	520.00	520.00		
09:00-09:15	**A**	480.00	480.00		
09:00-09:15	**B**	90.00	90.00		
09:00-09:15	**C**	520.00	520.00		
09:15-09:30	**A**	480.00	480.00		
09:15-09:30	**B**	90.00	90.00		
09:15-09:30	**C**	520.00	520.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction B (for whole period)

		To		
		A	**B**	**C**
From	**A**	0.000	25.000	455.000
	B	70.000	0.000	20.000
	C	480.000	40.000	0.000

Turning Proportions (PCU) - Junction B (for whole period)

		To		
		A	**B**	**C**
From	**A**	0.00	0.05	0.95
	B	0.78	0.00	0.22
	C	0.92	0.08	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction B (for whole period)

		To		
		A	**B**	**C**
From	**A**	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction B (for whole period)

		To		
		A	**B**	**C**
From	**A**	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.25	13.25	0.33	B
C-A	-	-	-	-
C-B	0.08	7.90	0.09	A
A-B	-	-	-	-
A-C	-	-	-	-

Main Results for each time segment

Main results: (08:00-08:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	90.00	88.70	0.00	361.81	0.249	0.32	13.122	B
C-A	480.00	480.00	0.00	-	-	-	-	-
C-B	40.00	39.65	0.00	495.67	0.081	0.09	7.889	A
A-B	25.00	25.00	0.00	-	-	-	-	-
A-C	455.00	455.00	0.00	-	-	-	-	-

Main results: (08:15-08:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	90.00	89.99	0.00	361.70	0.249	0.33	13.249	B
C-A	480.00	480.00	0.00	-	-	-	-	-
C-B	40.00	40.00	0.00	495.67	0.081	0.09	7.900	A
A-B	25.00	25.00	0.00	-	-	-	-	-
A-C	455.00	455.00	0.00	-	-	-	-	-

Main results: (08:30-08:45)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	90.00	90.00	0.00	361.70	0.249	0.33	13.249	B
C-A	480.00	480.00	0.00	-	-	-	-	-
C-B	40.00	40.00	0.00	495.67	0.081	0.09	7.900	A
A-B	25.00	25.00	0.00	-	-	-	-	-
A-C	455.00	455.00	0.00	-	-	-	-	-

Main results: (08:45-09:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	90.00	90.00	0.00	361.70	0.249	0.33	13.249	B
C-A	480.00	480.00	0.00	-	-	-	-	-
C-B	40.00	40.00	0.00	495.67	0.081	0.09	7.900	A
A-B	25.00	25.00	0.00	-	-	-	-	-
A-C	455.00	455.00	0.00	-	-	-	-	-

Main results: (09:00-09:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	90.00	90.00	0.00	361.70	0.249	0.33	13.249	B
C-A	480.00	480.00	0.00	-	-	-	-	-
C-B	40.00	40.00	0.00	495.67	0.081	0.09	7.900	A
A-B	25.00	25.00	0.00	-	-	-	-	-
A-C	455.00	455.00	0.00	-	-	-	-	-

Main results: (09:15-09:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	90.00	90.00	0.00	361.70	0.249	0.33	13.249	B
C-A	480.00	480.00	0.00	-	-	-	-	-
C-B	40.00	40.00	0.00	495.67	0.081	0.09	7.900	A
A-B	25.00	25.00	0.00	-	-	-	-	-
A-C	455.00	455.00	0.00	-	-	-	-	-

Junction B - 2034 Reference, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction B	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Reference, PM	2034 Reference	PM		FLAT	18:00	19:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
B	Kam Seung Road / Kam Shui South road	T-Junction	Two-way	A,B,C	9.90	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Kam Sheung Road		Major
B	B	Kam Shui South Road		Minor
C	C	Kam Sheung Road		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	7.00		0.00		2.20	50.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	3.00										50	50

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B	B-A	518.507	0.090	0.228	0.144	0.326
B	B-C	655.413	0.096	0.243	-	-
B	C-B	602.919	0.223	0.223	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	FLAT	✓	480.00	100.000
B	FLAT	✓	65.00	100.000
C	FLAT	✓	480.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
18:00-18:15	**A**	480.00	480.00		
18:00-18:15	**B**	65.00	65.00		
18:00-18:15	**C**	480.00	480.00		
18:15-18:30	**A**	480.00	480.00		
18:15-18:30	**B**	65.00	65.00		
18:15-18:30	**C**	480.00	480.00		
18:30-18:45	**A**	480.00	480.00		
18:30-18:45	**B**	65.00	65.00		
18:30-18:45	**C**	480.00	480.00		
18:45-19:00	**A**	480.00	480.00		
18:45-19:00	**B**	65.00	65.00		
18:45-19:00	**C**	480.00	480.00		
19:00-19:15	**A**	480.00	480.00		
19:00-19:15	**B**	65.00	65.00		
19:00-19:15	**C**	480.00	480.00		
19:15-19:30	**A**	480.00	480.00		
19:15-19:30	**B**	65.00	65.00		
19:15-19:30	**C**	480.00	480.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction B (for whole period)

		To		
From		**A**	**B**	**C**
	A	0.000	75.000	405.000
	B	40.000	0.000	25.000
	C	460.000	20.000	0.000

Turning Proportions (PCU) - Junction B (for whole period)

		To		
From		**A**	**B**	**C**
	A	0.00	0.16	0.84
	B	0.62	0.00	0.38
	C	0.96	0.04	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction B (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction B (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.16	10.62	0.19	B
C-A	-	-	-	-
C-B	0.04	7.57	0.04	A
A-B	-	-	-	-
A-C	-	-	-	-

Main Results for each time segment

Main results: (18:00-18:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	65.00	64.24	0.00	404.09	0.161	0.19	10.570	B
C-A	460.00	460.00	0.00	-	-	-	-	-
C-B	20.00	19.83	0.00	495.67	0.040	0.04	7.564	A
A-B	75.00	75.00	0.00	-	-	-	-	-
A-C	405.00	405.00	0.00	-	-	-	-	-

Main results: (18:15-18:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	65.00	64.99	0.00	404.05	0.161	0.19	10.617	B
C-A	460.00	460.00	0.00	-	-	-	-	-
C-B	20.00	20.00	0.00	495.67	0.040	0.04	7.567	A
A-B	75.00	75.00	0.00	-	-	-	-	-
A-C	405.00	405.00	0.00	-	-	-	-	-

Main results: (18:30-18:45)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	65.00	65.00	0.00	404.05	0.161	0.19	10.617	B
C-A	460.00	460.00	0.00	-	-	-	-	-
C-B	20.00	20.00	0.00	495.67	0.040	0.04	7.567	A
A-B	75.00	75.00	0.00	-	-	-	-	-
A-C	405.00	405.00	0.00	-	-	-	-	-

Main results: (18:45-19:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	65.00	65.00	0.00	404.05	0.161	0.19	10.617	B
C-A	460.00	460.00	0.00	-	-	-	-	-
C-B	20.00	20.00	0.00	495.67	0.040	0.04	7.567	A
A-B	75.00	75.00	0.00	-	-	-	-	-
A-C	405.00	405.00	0.00	-	-	-	-	-

Main results: (19:00-19:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	65.00	65.00	0.00	404.05	0.161	0.19	10.617	B
C-A	460.00	460.00	0.00	-	-	-	-	-
C-B	20.00	20.00	0.00	495.67	0.040	0.04	7.567	A
A-B	75.00	75.00	0.00	-	-	-	-	-
A-C	405.00	405.00	0.00	-	-	-	-	-

Main results: (19:15-19:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	65.00	65.00	0.00	404.05	0.161	0.19	10.617	B
C-A	460.00	460.00	0.00	-	-	-	-	-
C-B	20.00	20.00	0.00	495.67	0.040	0.04	7.570	A
A-B	75.00	75.00	0.00	-	-	-	-	-
A-C	405.00	405.00	0.00	-	-	-	-	-

Junction B - 2034 Design, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction B	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Design, AM	2034 Design	AM		FLAT	08:00	09:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
B	Kam Seung Road / Kam Shui South road	T-Junction	Two-way	A,B,C	12.05	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Kam Sheung Road		Major
B	B	Kam Shui South Road		Minor
C	C	Kam Sheung Road		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	7.00		0.00		2.20	50.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	3.00										50	50

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B	B-A	518.507	0.090	0.228	0.144	0.326
B	B-C	655.413	0.096	0.243	-	-
B	C-B	602.919	0.223	0.223	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	FLAT	✓	510.00	100.000
B	FLAT	✓	95.00	100.000
C	FLAT	✓	570.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
08:00-08:15	**A**	510.00	510.00		
08:00-08:15	**B**	95.00	95.00		
08:00-08:15	**C**	570.00	570.00		
08:15-08:30	**A**	510.00	510.00		
08:15-08:30	**B**	95.00	95.00		
08:15-08:30	**C**	570.00	570.00		
08:30-08:45	**A**	510.00	510.00		
08:30-08:45	**B**	95.00	95.00		
08:30-08:45	**C**	570.00	570.00		
08:45-09:00	**A**	510.00	510.00		
08:45-09:00	**B**	95.00	95.00		
08:45-09:00	**C**	570.00	570.00		
09:00-09:15	**A**	510.00	510.00		
09:00-09:15	**B**	95.00	95.00		
09:00-09:15	**C**	570.00	570.00		
09:15-09:30	**A**	510.00	510.00		
09:15-09:30	**B**	95.00	95.00		
09:15-09:30	**C**	570.00	570.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction B (for whole period)

		To		
		A	B	C
From	A	0.000	25.000	485.000
	B	70.000	0.000	25.000
	C	525.000	45.000	0.000

Turning Proportions (PCU) - Junction B (for whole period)

		To		
		A	B	C
From	A	0.00	0.05	0.95
	B	0.74	0.00	0.26
	C	0.92	0.08	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction B (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction B (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.27	13.92	0.37	B
C-A	-	-	-	-
C-B	0.09	8.11	0.10	A
A-B	-	-	-	-
A-C	-	-	-	-

Main Results for each time segment

Main results: (08:00-08:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	95.00	93.56	0.00	353.64	0.269	0.36	13.768	B
C-A	525.00	525.00	0.00	-	-	-	-	-
C-B	45.00	44.60	0.00	488.96	0.092	0.10	8.094	A
A-B	25.00	25.00	0.00	-	-	-	-	-
A-C	485.00	485.00	0.00	-	-	-	-	-

Main results: (08:15-08:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	95.00	94.98	0.00	353.52	0.269	0.36	13.921	B
C-A	525.00	525.00	0.00	-	-	-	-	-
C-B	45.00	45.00	0.00	488.96	0.092	0.10	8.108	A
A-B	25.00	25.00	0.00	-	-	-	-	-
A-C	485.00	485.00	0.00	-	-	-	-	-

Main results: (08:30-08:45)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	95.00	94.99	0.00	353.52	0.269	0.36	13.924	B
C-A	525.00	525.00	0.00	-	-	-	-	-
C-B	45.00	45.00	0.00	488.96	0.092	0.10	8.108	A
A-B	25.00	25.00	0.00	-	-	-	-	-
A-C	485.00	485.00	0.00	-	-	-	-	-

Main results: (08:45-09:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	95.00	95.00	0.00	353.52	0.269	0.37	13.924	B
C-A	525.00	525.00	0.00	-	-	-	-	-
C-B	45.00	45.00	0.00	488.96	0.092	0.10	8.108	A
A-B	25.00	25.00	0.00	-	-	-	-	-
A-C	485.00	485.00	0.00	-	-	-	-	-

Main results: (09:00-09:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	95.00	95.00	0.00	353.52	0.269	0.37	13.924	B
C-A	525.00	525.00	0.00	-	-	-	-	-
C-B	45.00	45.00	0.00	488.96	0.092	0.10	8.108	A
A-B	25.00	25.00	0.00	-	-	-	-	-
A-C	485.00	485.00	0.00	-	-	-	-	-

Main results: (09:15-09:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	95.00	95.00	0.00	353.52	0.269	0.37	13.924	B
C-A	525.00	525.00	0.00	-	-	-	-	-
C-B	45.00	45.00	0.00	488.96	0.092	0.10	8.108	A
A-B	25.00	25.00	0.00	-	-	-	-	-
A-C	485.00	485.00	0.00	-	-	-	-	-

Junction B - 2034 Design, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction B	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Design, PM	2034 Design	PM		FLAT	18:00	19:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
B	Kam Seung Road / Kam Shui South road	T-Junction	Two-way	A,B,C	10.09	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Kam Sheung Road		Major
B	B	Kam Shui South Road		Minor
C	C	Kam Sheung Road		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	7.00		0.00		2.20	50.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	3.00										50	50

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B	B-A	518.507	0.090	0.228	0.144	0.326
B	B-C	655.413	0.096	0.243	-	-
B	C-B	602.919	0.223	0.223	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	FLAT	✓	500.00	100.000
B	FLAT	✓	65.00	100.000
C	FLAT	✓	500.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
18:00-18:15	**A**	500.00	500.00		
18:00-18:15	**B**	65.00	65.00		
18:00-18:15	**C**	500.00	500.00		
18:15-18:30	**A**	500.00	500.00		
18:15-18:30	**B**	65.00	65.00		
18:15-18:30	**C**	500.00	500.00		
18:30-18:45	**A**	500.00	500.00		
18:30-18:45	**B**	65.00	65.00		
18:30-18:45	**C**	500.00	500.00		
18:45-19:00	**A**	500.00	500.00		
18:45-19:00	**B**	65.00	65.00		
18:45-19:00	**C**	500.00	500.00		
19:00-19:15	**A**	500.00	500.00		
19:00-19:15	**B**	65.00	65.00		
19:00-19:15	**C**	500.00	500.00		
19:15-19:30	**A**	500.00	500.00		
19:15-19:30	**B**	65.00	65.00		
19:15-19:30	**C**	500.00	500.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction B (for whole period)

		To		
		A	**B**	**C**
From	**A**	0.000	75.000	425.000
	B	40.000	0.000	25.000
	C	480.000	20.000	0.000

Turning Proportions (PCU) - Junction B (for whole period)

		To		
		A	**B**	**C**
From	**A**	0.00	0.15	0.85
	B	0.62	0.00	0.38
	C	0.96	0.04	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction B (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction B (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.16	10.85	0.20	B
C-A	-	-	-	-
C-B	0.04	7.64	0.04	A
A-B	-	-	-	-
A-C	-	-	-	-

Main Results for each time segment

Main results: (18:00-18:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	65.00	64.23	0.00	396.85	0.164	0.19	10.798	B
C-A	480.00	480.00	0.00	-	-	-	-	-
C-B	20.00	19.83	0.00	491.20	0.041	0.04	7.636	A
A-B	75.00	75.00	0.00	-	-	-	-	-
A-C	425.00	425.00	0.00	-	-	-	-	-

Main results: (18:15-18:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	65.00	64.99	0.00	396.81	0.164	0.19	10.849	B
C-A	480.00	480.00	0.00	-	-	-	-	-
C-B	20.00	20.00	0.00	491.20	0.041	0.04	7.639	A
A-B	75.00	75.00	0.00	-	-	-	-	-
A-C	425.00	425.00	0.00	-	-	-	-	-

Main results: (18:30-18:45)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	65.00	65.00	0.00	396.81	0.164	0.19	10.849	B
C-A	480.00	480.00	0.00	-	-	-	-	-
C-B	20.00	20.00	0.00	491.20	0.041	0.04	7.639	A
A-B	75.00	75.00	0.00	-	-	-	-	-
A-C	425.00	425.00	0.00	-	-	-	-	-

Main results: (18:45-19:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	65.00	65.00	0.00	396.80	0.164	0.20	10.849	B
C-A	480.00	480.00	0.00	-	-	-	-	-
C-B	20.00	20.00	0.00	491.20	0.041	0.04	7.639	A
A-B	75.00	75.00	0.00	-	-	-	-	-
A-C	425.00	425.00	0.00	-	-	-	-	-

Main results: (19:00-19:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	65.00	65.00	0.00	396.80	0.164	0.20	10.849	B
C-A	480.00	480.00	0.00	-	-	-	-	-
C-B	20.00	20.00	0.00	491.20	0.041	0.04	7.639	A
A-B	75.00	75.00	0.00	-	-	-	-	-
A-C	425.00	425.00	0.00	-	-	-	-	-

Main results: (19:15-19:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	65.00	65.00	0.00	396.80	0.164	0.20	10.849	B
C-A	480.00	480.00	0.00	-	-	-	-	-
C-B	20.00	20.00	0.00	491.20	0.041	0.04	7.642	A
A-B	75.00	75.00	0.00	-	-	-	-	-
A-C	425.00	425.00	0.00	-	-	-	-	-

Junctions 8

PICADY 8 - Priority Intersection Module

Version: 8.0.5.523 [19102,19/06/2015]

For sales and distribution information, program advice and maintenance, contact TRL:
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Filename: DD112 Jn C_(wo PWP Works).arc8
Path: \\CTA_NAS01\Project\CTA Consultants Limited\CTA - Project\21134HK (wkk) - S12A Application (DD106, 110, 112 & 113) in Kam Tin\DD112 - LFT (Alex Leung)\Cal\2024-07-26
Report generation date: 26/7/2024 11:32:03

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	Junction C - 2021 Existing							
Stream B-ACD	2.42	27.15	0.71	D	1.35	19.63	0.58	C
Stream A-B	-	-	-	-	-	-	-	-
Stream A-C	-	-	-	-	-	-	-	-
Stream A-D	0.00	0.00	0.00	A	0.00	0.00	0.00	A
Stream D-ABC	0.15	6.17	0.13	A	0.11	6.14	0.10	A
Stream C-D	-	-	-	-	-	-	-	-
Stream C-A	-	-	-	-	-	-	-	-
Stream C-B	0.00	0.00	0.00	A	0.00	0.00	0.00	A
	Junction C - 2034 Design (w/o PWP Works)							
Stream B-ACD	145.66	1279.01	1.25	F	15.12	165.67	0.97	F
Stream A-B	-	-	-	-	-	-	-	-
Stream A-C	-	-	-	-	-	-	-	-
Stream A-D	0.00	0.00	0.00	A	0.00	0.00	0.00	A
Stream D-ABC	0.20	6.87	0.17	A	0.14	6.76	0.12	A
Stream C-D	-	-	-	-	-	-	-	-
Stream C-A	-	-	-	-	-	-	-	-
Stream C-B	0.00	0.00	0.00	A	0.00	0.00	0.00	A
	Junction C - 2034 Reference (w/o PWP Works)							
Stream B-ACD	82.62	728.55	1.13	F	9.05	103.96	0.92	F
Stream A-B	-	-	-	-	-	-	-	-
Stream A-C	-	-	-	-	-	-	-	-
Stream A-D	0.00	0.00	0.00	A	0.00	0.00	0.00	A
Stream D-ABC	0.20	6.86	0.17	A	0.14	6.74	0.12	A
Stream C-D	-	-	-	-	-	-	-	-
Stream C-A	-	-	-	-	-	-	-	-
Stream C-B	0.00	0.00	0.00	A	0.00	0.00	0.00	A

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle.

"D1 - 2021 Existing, AM " model duration: 8:00 - 9:30
"D2 - 2021 Existing, PM" model duration: 18:00 - 19:30
"D3 - 2034 Reference (w/o PWP Works), AM" model duration: 8:00 - 9:30
"D4 - 2034 Reference (w/o PWP Works), PM" model duration: 18:00 - 19:30
"D5 - 2034 Design (w/o PWP Works), AM" model duration: 8:00 - 9:30
"D6 - 2034 Design (w/o PWP Works), PM" model duration: 18:00 - 19:30

Run using Junctions 8.0.5.523 at 26/7/2024 11:31:57

File summary

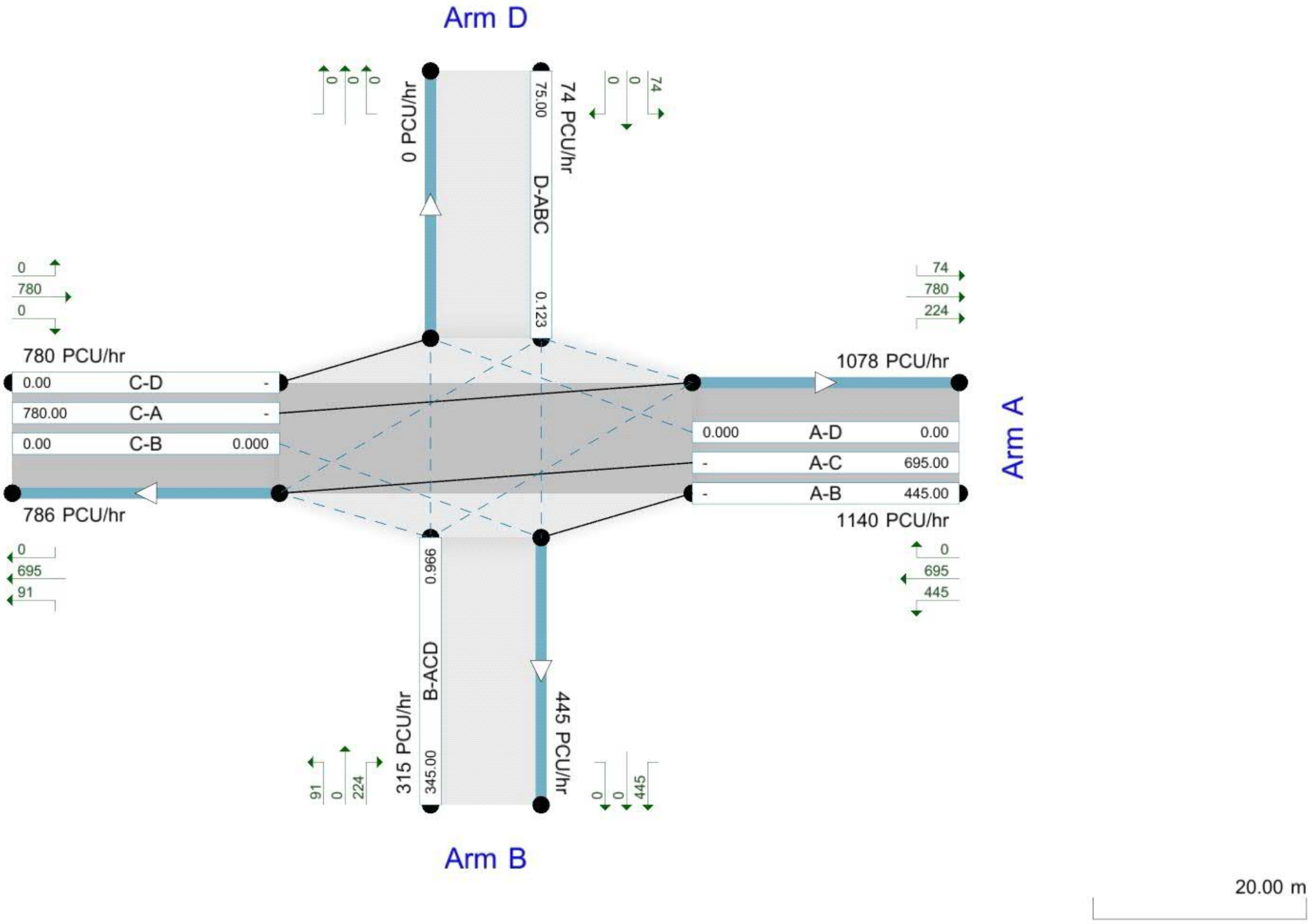
Title	(untitled)
Location	
Site Number	
Date	3/7/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	ITADMIN
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCU	PCU	perHour	s	-Min	perMin



Showing modelled flow through junction (PCU/hr).
Streams (upstreams) show Total Demand (PCU/hr); Streams (downstreams) show RFC ()
Time Segment: (08:00-08:15)
Showing Analysis Set "A1 - Junction C "; Demand Set "D1 - 2021 Existing, AM "

The junction diagram reflects the last run of ARCADY.

Junction C - 2021 Existing, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction C	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2021 Existing, AM	2021 Existing	AM		FLAT	08:00	09:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
C	Kam Sheung Road/Kam Tin Road	Crossroads	Two-way	A,B,C,D	22.60	C

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Kam Tin Road NWB		Major
B	B	Kam Sheung Road NEB		Minor
C	C	Kam Tin Road SEB		Major
D	D	Car Park		Minor

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
A	9.00	✓	1.50		2.20	200.00		
C	9.00	✓	1.50		2.20	200.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	5.00								✓		100	100
D	One lane	5.00										100	100

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for A-D	Slope for B-A	Slope for B-C	Slope for B-D	Slope for C-A	Slope for C-B	Slope for C-D	Slope for D-A	Slope for D-B	Slope for D-C
C	A-D	689.785	-	-	-	-	-	-	0.232	0.332	0.232	-	-	-
C	B-A	695.574	0.107	0.269	0.269	-	-	-	0.169	0.385	-	0.269	0.269	0.135
C	B-C	824.429	0.110	0.278	-	-	-	-	-	-	-	-	-	-
C	B-D, nearside lane	695.574	0.107	0.269	0.269	-	-	-	0.169	0.385	0.169	-	-	-
C	B-D, offside lane	695.574	0.107	0.269	0.269	-	-	-	0.169	0.385	0.169	-	-	-
C	C-B	689.785	0.232	0.232	0.332	-	-	-	-	-	-	-	-	-
C	D-A	824.429	-	-	-	-	-	-	0.278	-	0.110	-	-	-
C	D-B, nearside lane	695.574	0.169	0.169	0.385	-	-	-	0.269	0.269	0.107	-	-	-
C	D-B, offside lane	695.574	0.169	0.169	0.385	-	-	-	0.269	0.269	0.107	-	-	-
C	D-C	695.574	-	0.169	0.385	0.135	0.269	0.269	0.269	0.269	0.107	-	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	FLAT	✓	800.00	100.000
B	FLAT	✓	325.00	100.000
C	FLAT	✓	545.00	100.000
D	FLAT	✓	90.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
08:00-08:15	A	800.00	800.00		
08:00-08:15	B	325.00	325.00		
08:00-08:15	C	545.00	545.00		
08:00-08:15	D	90.00	90.00		
08:15-08:30	A	800.00	800.00		
08:15-08:30	B	325.00	325.00		
08:15-08:30	C	545.00	545.00		
08:15-08:30	D	90.00	90.00		
08:30-08:45	A	800.00	800.00		
08:30-08:45	B	325.00	325.00		
08:30-08:45	C	545.00	545.00		
08:30-08:45	D	90.00	90.00		
08:45-09:00	A	800.00	800.00		
08:45-09:00	B	325.00	325.00		
08:45-09:00	C	545.00	545.00		
08:45-09:00	D	90.00	90.00		
09:00-09:15	A	800.00	800.00		
09:00-09:15	B	325.00	325.00		
09:00-09:15	C	545.00	545.00		
09:00-09:15	D	90.00	90.00		
09:15-09:30	A	800.00	800.00		
09:15-09:30	B	325.00	325.00		
09:15-09:30	C	545.00	545.00		
09:15-09:30	D	90.00	90.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction C (for whole period)

		To			
		A	B	C	D
From	A	0.000	290.000	510.000	0.000
	B	235.000	0.000	90.000	0.000
	C	545.000	0.000	0.000	0.000
	D	90.000	0.000	0.000	0.000

Turning Proportions (PCU) - Junction C (for whole period)

		To			
		A	B	C	D
From	A	0.00	0.36	0.64	0.00
	B	0.72	0.00	0.28	0.00
	C	1.00	0.00	0.00	0.00
	D	1.00	0.00	0.00	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction C (for whole period)

	To				
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction C (for whole period)

	To				
		A	B	C	D
From	A	0.0	0.0	0.0	0.0
	B	0.0	0.0	0.0	0.0
	C	0.0	0.0	0.0	0.0
	D	0.0	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-ACD	0.71	27.15	2.42	D
A-B	-	-	-	-
A-C	-	-	-	-
A-D	0.00	0.00	0.00	A
D-ABC	0.13	6.17	0.15	A
C-D	-	-	-	-
C-A	-	-	-	-
C-B	0.00	0.00	0.00	A

Main Results for each time segment

Main results: (08:00-08:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	325.00	316.06	0.00	457.41	0.711	2.24	24.166	C
A-B	290.00	290.00	0.00	-	-	-	-	-
A-C	510.00	510.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	563.14	0.000	0.00	0.000	A
D-ABC	90.00	89.39	0.00	673.06	0.134	0.15	6.161	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	545.00	545.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	503.88	0.000	0.00	0.000	A

Main results: (08:15-08:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	325.00	324.59	0.00	457.26	0.711	2.34	26.920	D
A-B	290.00	290.00	0.00	-	-	-	-	-
A-C	510.00	510.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	563.14	0.000	0.00	0.000	A
D-ABC	90.00	90.00	0.00	673.06	0.134	0.15	6.173	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	545.00	545.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	503.88	0.000	0.00	0.000	A

Main results: (08:30-08:45)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	325.00	324.85	0.00	457.26	0.711	2.38	27.058	D
A-B	290.00	290.00	0.00	-	-	-	-	-
A-C	510.00	510.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	563.14	0.000	0.00	0.000	A
D-ABC	90.00	90.00	0.00	673.06	0.134	0.15	6.173	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	545.00	545.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	503.88	0.000	0.00	0.000	A

Main results: (08:45-09:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	325.00	324.92	0.00	457.26	0.711	2.40	27.109	D
A-B	290.00	290.00	0.00	-	-	-	-	-
A-C	510.00	510.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	563.14	0.000	0.00	0.000	A
D-ABC	90.00	90.00	0.00	673.06	0.134	0.15	6.173	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	545.00	545.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	503.88	0.000	0.00	0.000	A

Main results: (09:00-09:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	325.00	324.95	0.00	457.26	0.711	2.41	27.135	D
A-B	290.00	290.00	0.00	-	-	-	-	-
A-C	510.00	510.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	563.14	0.000	0.00	0.000	A
D-ABC	90.00	90.00	0.00	673.06	0.134	0.15	6.173	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	545.00	545.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	503.88	0.000	0.00	0.000	A

Main results: (09:15-09:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	325.00	324.97	0.00	457.26	0.711	2.42	27.151	D
A-B	290.00	290.00	0.00	-	-	-	-	-
A-C	510.00	510.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	563.14	0.000	0.00	0.000	A
D-ABC	90.00	90.00	0.00	673.06	0.134	0.15	6.173	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	545.00	545.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	503.88	0.000	0.00	0.000	A

Junction C - 2021 Existing, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction C	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2021 Existing, PM	2021 Existing	PM		FLAT	18:00	19:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
C	Kam Sheung Road/Kam Tin Road	Crossroads	Two-way	A,B,C,D	16.85	C

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Kam Tin Road NWB		Major
B	B	Kam Sheung Road NEB		Minor
C	C	Kam Tin Road SEB		Major
D	D	Car Park		Minor

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
A	9.00	✓	1.50		2.20	200.00		
C	9.00	✓	1.50		2.20	200.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	5.00								✓		100	100
D	One lane	5.00										100	100

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for A-D	Slope for B-A	Slope for B-C	Slope for B-D	Slope for C-A	Slope for C-B	Slope for C-D	Slope for D-A	Slope for D-B	Slope for D-C
C	A-D	689.785	-	-	-	-	-	-	0.232	0.332	0.232	-	-	-
C	B-A	695.574	0.107	0.269	0.269	-	-	-	0.169	0.385	-	0.269	0.269	0.135
C	B-C	824.429	0.110	0.278	-	-	-	-	-	-	-	-	-	-
C	B-D, nearside lane	695.574	0.107	0.269	0.269	-	-	-	0.169	0.385	0.169	-	-	-
C	B-D, offside lane	695.574	0.107	0.269	0.269	-	-	-	0.169	0.385	0.169	-	-	-
C	C-B	689.785	0.232	0.232	0.332	-	-	-	-	-	-	-	-	-
C	D-A	824.429	-	-	-	-	-	-	0.278	-	0.110	-	-	-
C	D-B, nearside lane	695.574	0.169	0.169	0.385	-	-	-	0.269	0.269	0.107	-	-	-
C	D-B, offside lane	695.574	0.169	0.169	0.385	-	-	-	0.269	0.269	0.107	-	-	-
C	D-C	695.574	-	0.169	0.385	0.135	0.269	0.269	0.269	0.269	0.107	-	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	FLAT	✓	890.00	100.000
B	FLAT	✓	250.00	100.000
C	FLAT	✓	625.00	100.000
D	FLAT	✓	65.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
18:00-18:15	**A**	890.00	890.00		
18:00-18:15	**B**	250.00	250.00		
18:00-18:15	**C**	625.00	625.00		
18:00-18:15	**D**	65.00	65.00		
18:15-18:30	**A**	890.00	890.00		
18:15-18:30	**B**	250.00	250.00		
18:15-18:30	**C**	625.00	625.00		
18:15-18:30	**D**	65.00	65.00		
18:30-18:45	**A**	890.00	890.00		
18:30-18:45	**B**	250.00	250.00		
18:30-18:45	**C**	625.00	625.00		
18:30-18:45	**D**	65.00	65.00		
18:45-19:00	**A**	890.00	890.00		
18:45-19:00	**B**	250.00	250.00		
18:45-19:00	**C**	625.00	625.00		
18:45-19:00	**D**	65.00	65.00		
19:00-19:15	**A**	890.00	890.00		
19:00-19:15	**B**	250.00	250.00		
19:00-19:15	**C**	625.00	625.00		
19:00-19:15	**D**	65.00	65.00		
19:15-19:30	**A**	890.00	890.00		
19:15-19:30	**B**	250.00	250.00		
19:15-19:30	**C**	625.00	625.00		
19:15-19:30	**D**	65.00	65.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction C (for whole period)

		To			
		A	B	C	D
From	A	0.000	330.000	560.000	0.000
	B	180.000	0.000	70.000	0.000
	C	625.000	0.000	0.000	0.000
	D	65.000	0.000	0.000	0.000

Turning Proportions (PCU) - Junction C (for whole period)

		To			
		A	B	C	D
From	A	0.00	0.37	0.63	0.00
	B	0.72	0.00	0.28	0.00
	C	1.00	0.00	0.00	0.00
	D	1.00	0.00	0.00	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction C (for whole period)

		To			
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction C (for whole period)

		To			
		A	B	C	D
From	A	0.0	0.0	0.0	0.0
	B	0.0	0.0	0.0	0.0
	C	0.0	0.0	0.0	0.0
	D	0.0	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-ACD	0.58	19.63	1.35	C
A-B	-	-	-	-
A-C	-	-	-	-
A-D	0.00	0.00	0.00	A
D-ABC	0.10	6.14	0.11	A
C-D	-	-	-	-
C-A	-	-	-	-
C-B	0.00	0.00	0.00	A

Main Results for each time segment

Main results: (18:00-18:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	250.00	244.81	0.00	433.39	0.577	1.30	18.621	C
A-B	330.00	330.00	0.00	-	-	-	-	-
A-C	560.00	560.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	544.55	0.000	0.00	0.000	A
D-ABC	65.00	64.56	0.00	650.84	0.100	0.11	6.137	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	625.00	625.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	482.97	0.000	0.00	0.000	A

Main results: (18:15-18:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	250.00	249.87	0.00	433.28	0.577	1.33	19.591	C
A-B	330.00	330.00	0.00	-	-	-	-	-
A-C	560.00	560.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	544.55	0.000	0.00	0.000	A
D-ABC	65.00	65.00	0.00	650.84	0.100	0.11	6.144	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	625.00	625.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	482.97	0.000	0.00	0.000	A

Main results: (18:30-18:45)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	250.00	249.96	0.00	433.28	0.577	1.34	19.616	C
A-B	330.00	330.00	0.00	-	-	-	-	-
A-C	560.00	560.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	544.55	0.000	0.00	0.000	A
D-ABC	65.00	65.00	0.00	650.84	0.100	0.11	6.144	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	625.00	625.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	482.97	0.000	0.00	0.000	A

Main results: (18:45-19:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	250.00	249.98	0.00	433.28	0.577	1.35	19.624	C
A-B	330.00	330.00	0.00	-	-	-	-	-
A-C	560.00	560.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	544.55	0.000	0.00	0.000	A
D-ABC	65.00	65.00	0.00	650.84	0.100	0.11	6.144	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	625.00	625.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	482.97	0.000	0.00	0.000	A

Main results: (19:00-19:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	250.00	249.99	0.00	433.28	0.577	1.35	19.628	C
A-B	330.00	330.00	0.00	-	-	-	-	-
A-C	560.00	560.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	544.55	0.000	0.00	0.000	A
D-ABC	65.00	65.00	0.00	650.84	0.100	0.11	6.144	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	625.00	625.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	482.97	0.000	0.00	0.000	A

Main results: (19:15-19:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	250.00	249.99	0.00	433.28	0.577	1.35	19.632	C
A-B	330.00	330.00	0.00	-	-	-	-	-
A-C	560.00	560.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	544.55	0.000	0.00	0.000	A
D-ABC	65.00	65.00	0.00	650.84	0.100	0.11	6.144	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	625.00	625.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	482.97	0.000	0.00	0.000	A

Junction C - 2034 Reference (w/o PWP Works), AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction C	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Reference (w/o PWP Works), AM	2034 Reference (w/o PWP Works)	AM		FLAT	08:00	09:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
C	Kam Sheung Road/Kam Tin Road	Crossroads	Two-way	A,B,C,D	588.22	F

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Kam Tin Road NWB		Major
B	B	Kam Sheung Road NEB		Minor
C	C	Kam Tin Road SEB		Major
D	D	Car Park		Minor

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
A	9.00	✓	1.50		2.20	200.00		
C	9.00	✓	1.50		2.20	200.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	5.00								✓		100	100
D	One lane	5.00										100	100

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for A-D	Slope for B-A	Slope for B-C	Slope for B-D	Slope for C-A	Slope for C-B	Slope for C-D	Slope for D-A	Slope for D-B	Slope for D-C
C	A-D	689.785	-	-	-	-	-	-	0.232	0.332	0.232	-	-	-
C	B-A	695.574	0.107	0.269	0.269	-	-	-	0.169	0.385	-	0.269	0.269	0.135
C	B-C	824.429	0.110	0.278	-	-	-	-	-	-	-	-	-	-
C	B-D, nearside lane	695.574	0.107	0.269	0.269	-	-	-	0.169	0.385	0.169	-	-	-
C	B-D, offside lane	695.574	0.107	0.269	0.269	-	-	-	0.169	0.385	0.169	-	-	-
C	C-B	689.785	0.232	0.232	0.332	-	-	-	-	-	-	-	-	-
C	D-A	824.429	-	-	-	-	-	-	0.278	-	0.110	-	-	-
C	D-B, nearside lane	695.574	0.169	0.169	0.385	-	-	-	0.269	0.269	0.107	-	-	-
C	D-B, offside lane	695.574	0.169	0.169	0.385	-	-	-	0.269	0.269	0.107	-	-	-
C	D-C	695.574	-	0.169	0.385	0.135	0.269	0.269	0.269	0.269	0.107	-	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	FLAT	✓	1010.00	100.000
B	FLAT	✓	435.00	100.000
C	FLAT	✓	700.00	100.000
D	FLAT	✓	105.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
08:00-08:15	A	1010.00	1010.00		
08:00-08:15	B	435.00	435.00		
08:00-08:15	C	700.00	700.00		
08:00-08:15	D	105.00	105.00		
08:15-08:30	A	1010.00	1010.00		
08:15-08:30	B	435.00	435.00		
08:15-08:30	C	700.00	700.00		
08:15-08:30	D	105.00	105.00		
08:30-08:45	A	1010.00	1010.00		
08:30-08:45	B	435.00	435.00		
08:30-08:45	C	700.00	700.00		
08:30-08:45	D	105.00	105.00		
08:45-09:00	A	1010.00	1010.00		
08:45-09:00	B	435.00	435.00		
08:45-09:00	C	700.00	700.00		
08:45-09:00	D	105.00	105.00		
09:00-09:15	A	1010.00	1010.00		
09:00-09:15	B	435.00	435.00		
09:00-09:15	C	700.00	700.00		
09:00-09:15	D	105.00	105.00		
09:15-09:30	A	1010.00	1010.00		
09:15-09:30	B	435.00	435.00		
09:15-09:30	C	700.00	700.00		
09:15-09:30	D	105.00	105.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction C (for whole period)

		To			
		A	B	C	D
From	A	0.000	375.000	635.000	0.000
	B	315.000	0.000	120.000	0.000
	C	700.000	0.000	0.000	0.000
	D	105.000	0.000	0.000	0.000

Turning Proportions (PCU) - Junction C (for whole period)

		To			
		A	B	C	D
From	A	0.00	0.37	0.63	0.00
	B	0.72	0.00	0.28	0.00
	C	1.00	0.00	0.00	0.00
	D	1.00	0.00	0.00	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction C (for whole period)

		To			
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction C (for whole period)

		To			
		A	B	C	D
From	A	0.0	0.0	0.0	0.0
	B	0.0	0.0	0.0	0.0
	C	0.0	0.0	0.0	0.0
	D	0.0	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-ACD	1.13	728.55	82.62	F
A-B	-	-	-	-
A-C	-	-	-	-
A-D	0.00	0.00	0.00	A
D-ABC	0.17	6.86	0.20	A
C-D	-	-	-	-
C-A	-	-	-	-
C-B	0.00	0.00	0.00	A

Main Results for each time segment

Main results: (08:00-08:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	435.00	364.14	0.00	384.69	1.131	17.72	107.419	F
A-B	375.00	375.00	0.00	-	-	-	-	-
A-C	635.00	635.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	527.12	0.000	0.00	0.000	A
D-ABC	105.00	104.21	0.00	630.01	0.167	0.20	6.837	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	700.00	700.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	455.08	0.000	0.00	0.000	A

Main results: (08:15-08:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	435.00	381.12	0.00	384.49	1.131	31.19	251.128	F
A-B	375.00	375.00	0.00	-	-	-	-	-
A-C	635.00	635.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	527.12	0.000	0.00	0.000	A
D-ABC	105.00	105.00	0.00	630.01	0.167	0.20	6.856	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	700.00	700.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	455.08	0.000	0.00	0.000	A

Main results: (08:30-08:45)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	435.00	382.86	0.00	384.49	1.131	44.22	371.804	F
A-B	375.00	375.00	0.00	-	-	-	-	-
A-C	635.00	635.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	527.12	0.000	0.00	0.000	A
D-ABC	105.00	105.00	0.00	630.01	0.167	0.20	6.856	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	700.00	700.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	455.08	0.000	0.00	0.000	A

Main results: (08:45-09:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	435.00	383.52	0.00	384.49	1.131	57.09	491.089	F
A-B	375.00	375.00	0.00	-	-	-	-	-
A-C	635.00	635.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	527.12	0.000	0.00	0.000	A
D-ABC	105.00	105.00	0.00	630.01	0.167	0.20	6.856	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	700.00	700.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	455.08	0.000	0.00	0.000	A

Main results: (09:00-09:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	435.00	383.84	0.00	384.49	1.131	69.88	609.925	F
A-B	375.00	375.00	0.00	-	-	-	-	-
A-C	635.00	635.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	527.12	0.000	0.00	0.000	A
D-ABC	105.00	105.00	0.00	630.01	0.167	0.20	6.856	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	700.00	700.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	455.08	0.000	0.00	0.000	A

Main results: (09:15-09:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	435.00	384.02	0.00	384.49	1.131	82.62	728.553	F
A-B	375.00	375.00	0.00	-	-	-	-	-
A-C	635.00	635.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	527.12	0.000	0.00	0.000	A
D-ABC	105.00	105.00	0.00	630.01	0.167	0.20	6.856	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	700.00	700.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	455.08	0.000	0.00	0.000	A

Junction C - 2034 Reference (w/o PWP Works), PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction C	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Reference (w/o PWP Works), PM	2034 Reference (w/o PWP Works)	PM		FLAT	18:00	19:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
C	Kam Sheung Road/Kam Tin Road	Crossroads	Two-way	A,B,C,D	85.96	F

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Kam Tin Road NWB		Major
B	B	Kam Sheung Road NEB		Minor
C	C	Kam Tin Road SEB		Major
D	D	Car Park		Minor

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
A	9.00	✓	1.50		2.20	200.00		
C	9.00	✓	1.50		2.20	200.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	5.00								✓		100	100
D	One lane	5.00										100	100

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for A-D	Slope for B-A	Slope for B-C	Slope for B-D	Slope for C-A	Slope for C-B	Slope for C-D	Slope for D-A	Slope for D-B	Slope for D-C
C	A-D	689.785	-	-	-	-	-	-	0.232	0.332	0.232	-	-	-
C	B-A	695.574	0.107	0.269	0.269	-	-	-	0.169	0.385	-	0.269	0.269	0.135
C	B-C	824.429	0.110	0.278	-	-	-	-	-	-	-	-	-	-
C	B-D, nearside lane	695.574	0.107	0.269	0.269	-	-	-	0.169	0.385	0.169	-	-	-
C	B-D, offside lane	695.574	0.107	0.269	0.269	-	-	-	0.169	0.385	0.169	-	-	-
C	C-B	689.785	0.232	0.232	0.332	-	-	-	-	-	-	-	-	-
C	D-A	824.429	-	-	-	-	-	-	0.278	-	0.110	-	-	-
C	D-B, nearside lane	695.574	0.169	0.169	0.385	-	-	-	0.269	0.269	0.107	-	-	-
C	D-B, offside lane	695.574	0.169	0.169	0.385	-	-	-	0.269	0.269	0.107	-	-	-
C	D-C	695.574	-	0.169	0.385	0.135	0.269	0.269	0.269	0.269	0.107	-	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	FLAT	✓	1120.00	100.000
B	FLAT	✓	330.00	100.000
C	FLAT	✓	775.00	100.000
D	FLAT	✓	75.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
18:00-18:15	**A**	1120.00	1120.00		
18:00-18:15	**B**	330.00	330.00		
18:00-18:15	**C**	775.00	775.00		
18:00-18:15	**D**	75.00	75.00		
18:15-18:30	**A**	1120.00	1120.00		
18:15-18:30	**B**	330.00	330.00		
18:15-18:30	**C**	775.00	775.00		
18:15-18:30	**D**	75.00	75.00		
18:30-18:45	**A**	1120.00	1120.00		
18:30-18:45	**B**	330.00	330.00		
18:30-18:45	**C**	775.00	775.00		
18:30-18:45	**D**	75.00	75.00		
18:45-19:00	**A**	1120.00	1120.00		
18:45-19:00	**B**	330.00	330.00		
18:45-19:00	**C**	775.00	775.00		
18:45-19:00	**D**	75.00	75.00		
19:00-19:15	**A**	1120.00	1120.00		
19:00-19:15	**B**	330.00	330.00		
19:00-19:15	**C**	775.00	775.00		
19:00-19:15	**D**	75.00	75.00		
19:15-19:30	**A**	1120.00	1120.00		
19:15-19:30	**B**	330.00	330.00		
19:15-19:30	**C**	775.00	775.00		
19:15-19:30	**D**	75.00	75.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction C (for whole period)

		To			
		A	B	C	D
From	A	0.000	425.000	695.000	0.000
	B	235.000	0.000	95.000	0.000
	C	775.000	0.000	0.000	0.000
	D	75.000	0.000	0.000	0.000

Turning Proportions (PCU) - Junction C (for whole period)

		To			
		A	B	C	D
From	A	0.00	0.38	0.62	0.00
	B	0.71	0.00	0.29	0.00
	C	1.00	0.00	0.00	0.00
	D	1.00	0.00	0.00	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction C (for whole period)

		To			
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction C (for whole period)

		To			
		A	B	C	D
From	A	0.0	0.0	0.0	0.0
	B	0.0	0.0	0.0	0.0
	C	0.0	0.0	0.0	0.0
	D	0.0	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-ACD	0.92	103.96	9.05	F
A-B	-	-	-	-
A-C	-	-	-	-
A-D	0.00	0.00	0.00	A
D-ABC	0.12	6.74	0.14	A
C-D	-	-	-	-
C-A	-	-	-	-
C-B	0.00	0.00	0.00	A

Main Results for each time segment

Main results: (18:00-18:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	330.00	306.86	0.00	359.90	0.917	5.79	54.785	F
A-B	425.00	425.00	0.00	-	-	-	-	-
A-C	695.00	695.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	509.69	0.000	0.00	0.000	A
D-ABC	75.00	74.44	0.00	609.18	0.123	0.14	6.725	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	775.00	775.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	429.52	0.000	0.00	0.000	A

Main results: (18:15-18:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	330.00	324.52	0.00	359.76	0.917	7.16	84.175	F
A-B	425.00	425.00	0.00	-	-	-	-	-
A-C	695.00	695.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	509.69	0.000	0.00	0.000	A
D-ABC	75.00	75.00	0.00	609.18	0.123	0.14	6.738	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	775.00	775.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	429.52	0.000	0.00	0.000	A

Main results: (18:30-18:45)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	330.00	326.95	0.00	359.76	0.917	7.92	92.884	F
A-B	425.00	425.00	0.00	-	-	-	-	-
A-C	695.00	695.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	509.69	0.000	0.00	0.000	A
D-ABC	75.00	75.00	0.00	609.18	0.123	0.14	6.738	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	775.00	775.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	429.52	0.000	0.00	0.000	A

Main results: (18:45-19:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	330.00	327.99	0.00	359.75	0.917	8.42	97.991	F
A-B	425.00	425.00	0.00	-	-	-	-	-
A-C	695.00	695.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	509.69	0.000	0.00	0.000	A
D-ABC	75.00	75.00	0.00	609.18	0.123	0.14	6.738	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	775.00	775.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	429.52	0.000	0.00	0.000	A

Main results: (19:00-19:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	330.00	328.56	0.00	359.75	0.917	8.78	101.443	F
A-B	425.00	425.00	0.00	-	-	-	-	-
A-C	695.00	695.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	509.69	0.000	0.00	0.000	A
D-ABC	75.00	75.00	0.00	609.18	0.123	0.14	6.738	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	775.00	775.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	429.52	0.000	0.00	0.000	A

Main results: (19:15-19:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	330.00	328.92	0.00	359.75	0.917	9.05	103.959	F
A-B	425.00	425.00	0.00	-	-	-	-	-
A-C	695.00	695.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	509.69	0.000	0.00	0.000	A
D-ABC	75.00	75.00	0.00	609.18	0.123	0.14	6.738	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	775.00	775.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	429.52	0.000	0.00	0.000	A

Junction C - 2034 Design (w/o PWP Works), AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction C	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Design (w/o PWP Works), AM	2034 Design (w/o PWP Works)	AM		FLAT	08:00	09:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
C	Kam Sheung Road/Kam Tin Road	Crossroads	Two-way	A,B,C,D	1048.71	F

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Kam Tin Road NWB		Major
B	B	Kam Sheung Road NEB		Minor
C	C	Kam Tin Road SEB		Major
D	D	Car Park		Minor

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
A	9.00	✓	1.50		2.20	200.00		
C	9.00	✓	1.50		2.20	200.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	5.00								✓		100	100
D	One lane	5.00										100	100

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for A-D	Slope for B-A	Slope for B-C	Slope for B-D	Slope for C-A	Slope for C-B	Slope for C-D	Slope for D-A	Slope for D-B	Slope for D-C
C	A-D	689.785	-	-	-	-	-	-	0.232	0.332	0.232	-	-	-
C	B-A	695.574	0.107	0.269	0.269	-	-	-	0.169	0.385	-	0.269	0.269	0.135
C	B-C	824.429	0.110	0.278	-	-	-	-	-	-	-	-	-	-
C	B-D, nearside lane	695.574	0.107	0.269	0.269	-	-	-	0.169	0.385	0.169	-	-	-
C	B-D, offside lane	695.574	0.107	0.269	0.269	-	-	-	0.169	0.385	0.169	-	-	-
C	C-B	689.785	0.232	0.232	0.332	-	-	-	-	-	-	-	-	-
C	D-A	824.429	-	-	-	-	-	-	0.278	-	0.110	-	-	-
C	D-B, nearside lane	695.574	0.169	0.169	0.385	-	-	-	0.269	0.269	0.107	-	-	-
C	D-B, offside lane	695.574	0.169	0.169	0.385	-	-	-	0.269	0.269	0.107	-	-	-
C	D-C	695.574	-	0.169	0.385	0.135	0.269	0.269	0.269	0.269	0.107	-	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	FLAT	✓	1035.00	100.000
B	FLAT	✓	475.00	100.000
C	FLAT	✓	705.00	100.000
D	FLAT	✓	105.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
08:00-08:15	**A**	1035.00	1035.00		
08:00-08:15	**B**	475.00	475.00		
08:00-08:15	**C**	705.00	705.00		
08:00-08:15	**D**	105.00	105.00		
08:15-08:30	**A**	1035.00	1035.00		
08:15-08:30	**B**	475.00	475.00		
08:15-08:30	**C**	705.00	705.00		
08:15-08:30	**D**	105.00	105.00		
08:30-08:45	**A**	1035.00	1035.00		
08:30-08:45	**B**	475.00	475.00		
08:30-08:45	**C**	705.00	705.00		
08:30-08:45	**D**	105.00	105.00		
08:45-09:00	**A**	1035.00	1035.00		
08:45-09:00	**B**	475.00	475.00		
08:45-09:00	**C**	705.00	705.00		
08:45-09:00	**D**	105.00	105.00		
09:00-09:15	**A**	1035.00	1035.00		
09:00-09:15	**B**	475.00	475.00		
09:00-09:15	**C**	705.00	705.00		
09:00-09:15	**D**	105.00	105.00		
09:15-09:30	**A**	1035.00	1035.00		
09:15-09:30	**B**	475.00	475.00		
09:15-09:30	**C**	705.00	705.00		
09:15-09:30	**D**	105.00	105.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction C (for whole period)

		To			
		A	**B**	**C**	**D**
From	**A**	0.000	400.000	635.000	0.000
	B	345.000	0.000	130.000	0.000
	C	705.000	0.000	0.000	0.000
	D	105.000	0.000	0.000	0.000

Turning Proportions (PCU) - Junction C (for whole period)

		To			
		A	**B**	**C**	**D**
From	**A**	0.00	0.39	0.61	0.00
	B	0.73	0.00	0.27	0.00
	C	1.00	0.00	0.00	0.00
	D	1.00	0.00	0.00	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction C (for whole period)

		To			
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction C (for whole period)

		To			
		A	B	C	D
From	A	0.0	0.0	0.0	0.0
	B	0.0	0.0	0.0	0.0
	C	0.0	0.0	0.0	0.0
	D	0.0	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-ACD	1.25	1279.01	145.66	F
A-B	-	-	-	-
A-C	-	-	-	-
A-D	0.00	0.00	0.00	A
D-ABC	0.17	6.87	0.20	A
C-D	-	-	-	-
C-A	-	-	-	-
C-B	0.00	0.00	0.00	A

Main Results for each time segment

Main results: (08:00-08:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	475.00	367.06	0.00	380.66	1.248	26.99	149.471	F
A-B	400.00	400.00	0.00	-	-	-	-	-
A-C	635.00	635.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	525.96	0.000	0.00	0.000	A
D-ABC	105.00	104.21	0.00	628.62	0.167	0.20	6.855	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	705.00	705.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	449.28	0.000	0.00	0.000	A

Main results: (08:15-08:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	475.00	379.38	0.00	380.46	1.248	50.89	387.611	F
A-B	400.00	400.00	0.00	-	-	-	-	-
A-C	635.00	635.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	525.96	0.000	0.00	0.000	A
D-ABC	105.00	105.00	0.00	628.62	0.167	0.20	6.874	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	705.00	705.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	449.28	0.000	0.00	0.000	A

Main results: (08:30-08:45)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	475.00	380.03	0.00	380.46	1.248	74.63	609.808	F
A-B	400.00	400.00	0.00	-	-	-	-	-
A-C	635.00	635.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	525.96	0.000	0.00	0.000	A
D-ABC	105.00	105.00	0.00	628.62	0.167	0.20	6.874	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	705.00	705.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	449.28	0.000	0.00	0.000	A

Main results: (08:45-09:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	475.00	380.23	0.00	380.46	1.249	98.33	832.606	F
A-B	400.00	400.00	0.00	-	-	-	-	-
A-C	635.00	635.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	525.96	0.000	0.00	0.000	A
D-ABC	105.00	105.00	0.00	628.62	0.167	0.20	6.874	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	705.00	705.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	449.28	0.000	0.00	0.000	A

Main results: (09:00-09:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	475.00	380.31	0.00	380.46	1.249	122.00	1055.722	F
A-B	400.00	400.00	0.00	-	-	-	-	-
A-C	635.00	635.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	525.96	0.000	0.00	0.000	A
D-ABC	105.00	105.00	0.00	628.62	0.167	0.20	6.874	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	705.00	705.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	449.28	0.000	0.00	0.000	A

Main results: (09:15-09:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	475.00	380.36	0.00	380.46	1.249	145.66	1279.009	F
A-B	400.00	400.00	0.00	-	-	-	-	-
A-C	635.00	635.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	525.96	0.000	0.00	0.000	A
D-ABC	105.00	105.00	0.00	628.62	0.167	0.20	6.874	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	705.00	705.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	449.28	0.000	0.00	0.000	A

Junction C - 2034 Design (w/o PWP Works), PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction C	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Design (w/o PWP Works), PM	2034 Design (w/o PWP Works)	PM		FLAT	18:00	19:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
C	Kam Sheung Road/Kam Tin Road	Crossroads	Two-way	A,B,C,D	137.30	F

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Kam Tin Road NWB		Major
B	B	Kam Sheung Road NEB		Minor
C	C	Kam Tin Road SEB		Major
D	D	Car Park		Minor

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
A	9.00	✓	1.50		2.20	200.00		
C	9.00	✓	1.50		2.20	200.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	5.00								✓		100	100
D	One lane	5.00										100	100

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for A-D	Slope for B-A	Slope for B-C	Slope for B-D	Slope for C-A	Slope for C-B	Slope for C-D	Slope for D-A	Slope for D-B	Slope for D-C
C	A-D	689.785	-	-	-	-	-	-	0.232	0.332	0.232	-	-	-
C	B-A	695.574	0.107	0.269	0.269	-	-	-	0.169	0.385	-	0.269	0.269	0.135
C	B-C	824.429	0.110	0.278	-	-	-	-	-	-	-	-	-	-
C	B-D, nearside lane	695.574	0.107	0.269	0.269	-	-	-	0.169	0.385	0.169	-	-	-
C	B-D, offside lane	695.574	0.107	0.269	0.269	-	-	-	0.169	0.385	0.169	-	-	-
C	C-B	689.785	0.232	0.232	0.332	-	-	-	-	-	-	-	-	-
C	D-A	824.429	-	-	-	-	-	-	0.278	-	0.110	-	-	-
C	D-B, nearside lane	695.574	0.169	0.169	0.385	-	-	-	0.269	0.269	0.107	-	-	-
C	D-B, offside lane	695.574	0.169	0.169	0.385	-	-	-	0.269	0.269	0.107	-	-	-
C	D-C	695.574	-	0.169	0.385	0.135	0.269	0.269	0.269	0.269	0.107	-	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	FLAT	✓	1140.00	100.000
B	FLAT	✓	345.00	100.000
C	FLAT	✓	780.00	100.000
D	FLAT	✓	75.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
18:00-18:15	**A**	1140.00	1140.00		
18:00-18:15	**B**	345.00	345.00		
18:00-18:15	**C**	780.00	780.00		
18:00-18:15	**D**	75.00	75.00		
18:15-18:30	**A**	1140.00	1140.00		
18:15-18:30	**B**	345.00	345.00		
18:15-18:30	**C**	780.00	780.00		
18:15-18:30	**D**	75.00	75.00		
18:30-18:45	**A**	1140.00	1140.00		
18:30-18:45	**B**	345.00	345.00		
18:30-18:45	**C**	780.00	780.00		
18:30-18:45	**D**	75.00	75.00		
18:45-19:00	**A**	1140.00	1140.00		
18:45-19:00	**B**	345.00	345.00		
18:45-19:00	**C**	780.00	780.00		
18:45-19:00	**D**	75.00	75.00		
19:00-19:15	**A**	1140.00	1140.00		
19:00-19:15	**B**	345.00	345.00		
19:00-19:15	**C**	780.00	780.00		
19:00-19:15	**D**	75.00	75.00		
19:15-19:30	**A**	1140.00	1140.00		
19:15-19:30	**B**	345.00	345.00		
19:15-19:30	**C**	780.00	780.00		
19:15-19:30	**D**	75.00	75.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction C (for whole period)

		To			
		A	B	C	D
From	A	0.000	445.000	695.000	0.000
	B	245.000	0.000	100.000	0.000
	C	780.000	0.000	0.000	0.000
	D	75.000	0.000	0.000	0.000

Turning Proportions (PCU) - Junction C (for whole period)

		To			
		A	B	C	D
From	A	0.00	0.39	0.61	0.00
	B	0.71	0.00	0.29	0.00
	C	1.00	0.00	0.00	0.00
	D	1.00	0.00	0.00	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction C (for whole period)

		To			
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction C (for whole period)

		To			
		A	B	C	D
From	A	0.0	0.0	0.0	0.0
	B	0.0	0.0	0.0	0.0
	C	0.0	0.0	0.0	0.0
	D	0.0	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-ACD	0.97	165.67	15.12	F
A-B	-	-	-	-
A-C	-	-	-	-
A-D	0.00	0.00	0.00	A
D-ABC	0.12	6.76	0.14	A
C-D	-	-	-	-
C-A	-	-	-	-
C-B	0.00	0.00	0.00	A

Main Results for each time segment

Main results: (18:00-18:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	345.00	315.08	0.00	357.21	0.966	7.48	64.745	F
A-B	445.00	445.00	0.00	-	-	-	-	-
A-C	695.00	695.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	508.53	0.000	0.00	0.000	A
D-ABC	75.00	74.44	0.00	607.79	0.123	0.14	6.742	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	780.00	780.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	424.88	0.000	0.00	0.000	A

Main results: (18:15-18:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	345.00	334.63	0.00	357.07	0.966	10.07	111.116	F
A-B	445.00	445.00	0.00	-	-	-	-	-
A-C	695.00	695.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	508.53	0.000	0.00	0.000	A
D-ABC	75.00	75.00	0.00	607.79	0.123	0.14	6.756	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	780.00	780.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	424.88	0.000	0.00	0.000	A

Main results: (18:30-18:45)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	345.00	338.00	0.00	357.06	0.966	11.82	131.042	F
A-B	445.00	445.00	0.00	-	-	-	-	-
A-C	695.00	695.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	508.53	0.000	0.00	0.000	A
D-ABC	75.00	75.00	0.00	607.79	0.123	0.14	6.756	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	780.00	780.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	424.88	0.000	0.00	0.000	A

Main results: (18:45-19:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	345.00	339.68	0.00	357.06	0.966	13.15	145.290	F
A-B	445.00	445.00	0.00	-	-	-	-	-
A-C	695.00	695.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	508.53	0.000	0.00	0.000	A
D-ABC	75.00	75.00	0.00	607.79	0.123	0.14	6.756	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	780.00	780.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	424.88	0.000	0.00	0.000	A

Main results: (19:00-19:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	345.00	340.71	0.00	357.06	0.966	14.22	156.474	F
A-B	445.00	445.00	0.00	-	-	-	-	-
A-C	695.00	695.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	508.53	0.000	0.00	0.000	A
D-ABC	75.00	75.00	0.00	607.79	0.123	0.14	6.756	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	780.00	780.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	424.88	0.000	0.00	0.000	A

Main results: (19:15-19:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-ACD	345.00	341.42	0.00	357.06	0.966	15.12	165.673	F
A-B	445.00	445.00	0.00	-	-	-	-	-
A-C	695.00	695.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	508.53	0.000	0.00	0.000	A
D-ABC	75.00	75.00	0.00	607.79	0.123	0.14	6.756	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	780.00	780.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	424.88	0.000	0.00	0.000	A

Junctions 8

PICADY 8 - Priority Intersection Module

Version: 8.0.5.523 [19102,19/06/2015]

For sales and distribution information, program advice and maintenance, contact TRL:
Tel: +44 (0)1344 770758   email: software@trl.co.uk   Web: http://www.trlsoftware.co.uk

Filename: DD112 Jn C_Fut (w PWP Works).arc8
Path: \\CTA_NAS01\Project\CTA Consultants Limited\CTA - Project\21134HK (wkk) - S12A Application (DD106, 110, 112 & 113) in Kam Tin\DD112 - LFT (Alex Leung)\Cal\2024-07-26
Report generation date: 26/7/2024 11:26:14

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	Junction C - 2034 Design (w PWP Works)							
Stream B-CD	0.54	14.89	0.35	B	0.35	12.62	0.26	B
Stream B-AD	20.46	222.49	0.99	F	2.98	44.87	0.75	E
Stream A-B	-	-	-	-	-	-	-	-
Stream A-C	-	-	-	-	-	-	-	-
Stream A-D	0.00	0.00	0.00	A	0.00	0.00	0.00	A
Stream D-ABC	0.19	6.63	0.16	A	0.14	6.49	0.12	A
Stream C-D	-	-	-	-	-	-	-	-
Stream C-A	-	-	-	-	-	-	-	-
Stream C-B	0.00	0.00	0.00	A	0.00	0.00	0.00	A
	Junction C - 2034 Reference (w PWP Works)							
Stream B-CD	0.47	14.10	0.32	B	0.32	12.14	0.24	B
Stream B-AD	7.60	91.25	0.90	F	2.48	38.83	0.72	E
Stream A-B	-	-	-	-	-	-	-	-
Stream A-C	-	-	-	-	-	-	-	-
Stream A-D	0.00	0.00	0.00	A	0.00	0.00	0.00	A
Stream D-ABC	0.19	6.61	0.16	A	0.13	6.48	0.12	A
Stream C-D	-	-	-	-	-	-	-	-
Stream C-A	-	-	-	-	-	-	-	-
Stream C-B	0.00	0.00	0.00	A	0.00	0.00	0.00	A

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle.

"D7 - 2034 Reference (w PWP Works), AM " model duration: 8:00 - 9:30
"D8 - 2034 Reference (w PWP Works), PM" model duration: 18:00 - 19:30
"D9 - 2034 Design (w PWP Works), AM" model duration: 8:00 - 9:30
"D10 - 2034 Design (w PWP Works), PM" model duration: 18:00 - 19:30

Run using Junctions 8.0.5.523 at 26/7/2024 11:26:10

File summary

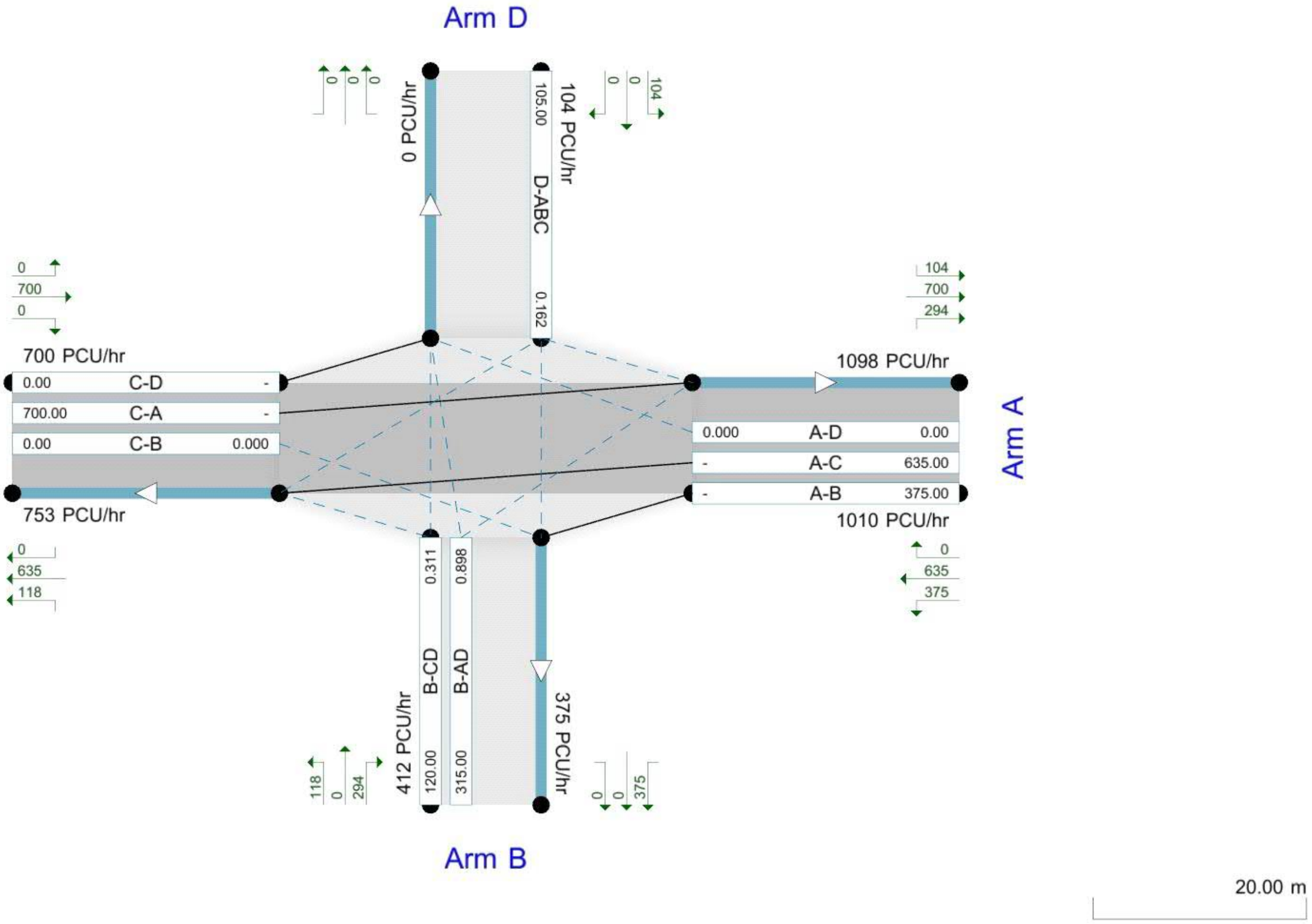
Title	(untitled)
Location	
Site Number	
Date	3/7/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	ITADMIN
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCU	PCU	perHour	s	-Min	perMin



Showing modelled flow through junction (PCU/hr).
Streams (upstreams) show Total Demand (PCU/hr); Streams (downstreams) show RFC ()
Time Segment: (08:00-08:15)
Showing Analysis Set "A1 - Junction C "; Demand Set "D7 - 2034 Reference (w PWP Works), AM "

The junction diagram reflects the last run of ARCADY.

Junction C - 2034 Reference (w PWP Works), AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction C	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Reference (w PWP Works), AM	2034 Reference (w PWP Works)	AM		FLAT	08:00	09:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
C	Kam Sheung Road/Kam Tin Road	Crossroads	Two-way	A,B,C,D	57.65	F

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Kam Tin Road NWB		Major
B	B	Kam Sheung Road NEB		Minor
C	C	Kam Tin Road SEB		Major
D	D	Car Park		Minor

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
A	11.00		0.00		2.20	200.00		
C	11.00		0.00		2.20	200.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	Two lanes		2.50	5.00						✓		100	100
D	One lane	5.00										100	100

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for A-D	Slope for B-A	Slope for B-C	Slope for B-D	Slope for C-A	Slope for C-B	Slope for C-D	Slope for D-A	Slope for D-B	Slope for D-C
C	A-D	689.785	-	-	-	-	-	-	0.209	0.299	0.209	-	-	-
C	B-A	673.033	0.096	0.242	0.242	-	-	-	0.153	0.346	-	0.242	0.242	0.121
C	B-C	652.505	0.078	0.198	-	-	-	-	-	-	-	-	-	-
C	B-D, nearside lane	532.681	0.076	0.192	0.192	-	-	-	0.121	0.274	0.121	-	-	-
C	B-D, offside lane	673.033	0.096	0.242	0.242	-	-	-	0.153	0.346	0.153	-	-	-
C	C-B	689.785	0.209	0.209	0.299	-	-	-	-	-	-	-	-	-
C	D-A	824.429	-	-	-	-	-	-	0.250	-	0.099	-	-	-
C	D-B, nearside lane	673.033	0.153	0.153	0.346	-	-	-	0.242	0.242	0.096	-	-	-
C	D-B, offside lane	673.033	0.153	0.153	0.346	-	-	-	0.242	0.242	0.096	-	-	-
C	D-C	673.033	-	0.153	0.346	0.121	0.242	0.242	0.242	0.242	0.096	-	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	FLAT	✓	1010.00	100.000
B	FLAT	✓	435.00	100.000
C	FLAT	✓	700.00	100.000
D	FLAT	✓	105.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
08:00-08:15	A	1010.00	1010.00		
08:00-08:15	B	435.00	435.00		
08:00-08:15	C	700.00	700.00		
08:00-08:15	D	105.00	105.00		
08:15-08:30	A	1010.00	1010.00		
08:15-08:30	B	435.00	435.00		
08:15-08:30	C	700.00	700.00		
08:15-08:30	D	105.00	105.00		
08:30-08:45	A	1010.00	1010.00		
08:30-08:45	B	435.00	435.00		
08:30-08:45	C	700.00	700.00		
08:30-08:45	D	105.00	105.00		
08:45-09:00	A	1010.00	1010.00		
08:45-09:00	B	435.00	435.00		
08:45-09:00	C	700.00	700.00		
08:45-09:00	D	105.00	105.00		
09:00-09:15	A	1010.00	1010.00		
09:00-09:15	B	435.00	435.00		
09:00-09:15	C	700.00	700.00		
09:00-09:15	D	105.00	105.00		
09:15-09:30	A	1010.00	1010.00		
09:15-09:30	B	435.00	435.00		
09:15-09:30	C	700.00	700.00		
09:15-09:30	D	105.00	105.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction C (for whole period)

		To			
		A	B	C	D
From	A	0.000	375.000	635.000	0.000
	B	315.000	0.000	120.000	0.000
	C	700.000	0.000	0.000	0.000
	D	105.000	0.000	0.000	0.000

Turning Proportions (PCU) - Junction C (for whole period)

		To			
		A	B	C	D
From	A	0.00	0.37	0.63	0.00
	B	0.72	0.00	0.28	0.00
	C	1.00	0.00	0.00	0.00
	D	1.00	0.00	0.00	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction C (for whole period)

		To			
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction C (for whole period)

		To			
		A	B	C	D
From	A	0.0	0.0	0.0	0.0
	B	0.0	0.0	0.0	0.0
	C	0.0	0.0	0.0	0.0
	D	0.0	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-CD	0.32	14.10	0.47	B
B-AD	0.90	91.25	7.60	F
A-B	-	-	-	-
A-C	-	-	-	-
A-D	0.00	0.00	0.00	A
D-ABC	0.16	6.61	0.19	A
C-D	-	-	-	-
C-A	-	-	-	-
C-B	0.00	0.00	0.00	A

Main Results for each time segment

Main results: (08:00-08:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-CD	120.00	118.23	0.00	385.88	0.311	0.44	13.367	B
B-AD	315.00	294.23	0.00	350.89	0.898	5.19	52.378	F
A-B	375.00	375.00	0.00	-	-	-	-	-
A-C	635.00	635.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	543.40	0.000	0.00	0.000	A
D-ABC	105.00	104.24	0.00	649.47	0.162	0.19	6.593	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	700.00	700.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	478.57	0.000	0.00	0.000	A

Main results: (08:15-08:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-CD	120.00	119.94	0.00	378.45	0.317	0.46	13.920	B
B-AD	315.00	310.71	0.00	350.70	0.898	6.26	77.423	F
A-B	375.00	375.00	0.00	-	-	-	-	-
A-C	635.00	635.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	543.40	0.000	0.00	0.000	A
D-ABC	105.00	105.00	0.00	649.47	0.162	0.19	6.611	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	700.00	700.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	478.57	0.000	0.00	0.000	A

Main results: (08:30-08:45)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-CD	120.00	119.98	0.00	376.93	0.318	0.46	14.007	B
B-AD	315.00	312.76	0.00	350.70	0.898	6.82	83.849	F
A-B	375.00	375.00	0.00	-	-	-	-	-
A-C	635.00	635.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	543.40	0.000	0.00	0.000	A
D-ABC	105.00	105.00	0.00	649.47	0.162	0.19	6.611	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	700.00	700.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	478.57	0.000	0.00	0.000	A

Main results: (08:45-09:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-CD	120.00	119.99	0.00	376.14	0.319	0.46	14.051	B
B-AD	315.00	313.59	0.00	350.70	0.898	7.18	87.373	F
A-B	375.00	375.00	0.00	-	-	-	-	-
A-C	635.00	635.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	543.40	0.000	0.00	0.000	A
D-ABC	105.00	105.00	0.00	649.47	0.162	0.19	6.611	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	700.00	700.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	478.57	0.000	0.00	0.000	A

Main results: (09:00-09:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-CD	120.00	119.99	0.00	375.64	0.319	0.47	14.081	B
B-AD	315.00	314.02	0.00	350.70	0.898	7.42	89.648	F
A-B	375.00	375.00	0.00	-	-	-	-	-
A-C	635.00	635.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	543.40	0.000	0.00	0.000	A
D-ABC	105.00	105.00	0.00	649.47	0.162	0.19	6.611	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	700.00	700.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	478.57	0.000	0.00	0.000	A

Main results: (09:15-09:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-CD	120.00	120.00	0.00	375.29	0.320	0.47	14.100	B
B-AD	315.00	314.28	0.00	350.70	0.898	7.60	91.252	F
A-B	375.00	375.00	0.00	-	-	-	-	-
A-C	635.00	635.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	543.40	0.000	0.00	0.000	A
D-ABC	105.00	105.00	0.00	649.47	0.162	0.19	6.611	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	700.00	700.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	478.57	0.000	0.00	0.000	A

Junction C - 2034 Reference (w PWP Works), PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction C	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Reference (w PWP Works), PM	2034 Reference (w PWP Works)	PM		FLAT	18:00	19:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
C	Kam Sheung Road/Kam Tin Road	Crossroads	Two-way	A,B,C,D	26.58	D

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Kam Tin Road NWB		Major
B	B	Kam Sheung Road NEB		Minor
C	C	Kam Tin Road SEB		Major
D	D	Car Park		Minor

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
A	11.00		0.00		2.20	200.00		
C	11.00		0.00		2.20	200.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	Two lanes		2.50	5.00						✓		100	100
D	One lane	5.00										100	100

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for A-D	Slope for B-A	Slope for B-C	Slope for B-D	Slope for C-A	Slope for C-B	Slope for C-D	Slope for D-A	Slope for D-B	Slope for D-C
C	A-D	689.785	-	-	-	-	-	-	0.209	0.299	0.209	-	-	-
C	B-A	673.033	0.096	0.242	0.242	-	-	-	0.153	0.346	-	0.242	0.242	0.121
C	B-C	652.505	0.078	0.198	-	-	-	-	-	-	-	-	-	-
C	B-D, nearside lane	532.681	0.076	0.192	0.192	-	-	-	0.121	0.274	0.121	-	-	-
C	B-D, offside lane	673.033	0.096	0.242	0.242	-	-	-	0.153	0.346	0.153	-	-	-
C	C-B	689.785	0.209	0.209	0.299	-	-	-	-	-	-	-	-	-
C	D-A	824.429	-	-	-	-	-	-	0.250	-	0.099	-	-	-
C	D-B, nearside lane	673.033	0.153	0.153	0.346	-	-	-	0.242	0.242	0.096	-	-	-
C	D-B, offside lane	673.033	0.153	0.153	0.346	-	-	-	0.242	0.242	0.096	-	-	-
C	D-C	673.033	-	0.153	0.346	0.121	0.242	0.242	0.242	0.242	0.096	-	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	FLAT	✓	1120.00	100.000
B	FLAT	✓	330.00	100.000
C	FLAT	✓	775.00	100.000
D	FLAT	✓	75.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
18:00-18:15	**A**	1120.00	1120.00		
18:00-18:15	**B**	330.00	330.00		
18:00-18:15	**C**	775.00	775.00		
18:00-18:15	**D**	75.00	75.00		
18:15-18:30	**A**	1120.00	1120.00		
18:15-18:30	**B**	330.00	330.00		
18:15-18:30	**C**	775.00	775.00		
18:15-18:30	**D**	75.00	75.00		
18:30-18:45	**A**	1120.00	1120.00		
18:30-18:45	**B**	330.00	330.00		
18:30-18:45	**C**	775.00	775.00		
18:30-18:45	**D**	75.00	75.00		
18:45-19:00	**A**	1120.00	1120.00		
18:45-19:00	**B**	330.00	330.00		
18:45-19:00	**C**	775.00	775.00		
18:45-19:00	**D**	75.00	75.00		
19:00-19:15	**A**	1120.00	1120.00		
19:00-19:15	**B**	330.00	330.00		
19:00-19:15	**C**	775.00	775.00		
19:00-19:15	**D**	75.00	75.00		
19:15-19:30	**A**	1120.00	1120.00		
19:15-19:30	**B**	330.00	330.00		
19:15-19:30	**C**	775.00	775.00		
19:15-19:30	**D**	75.00	75.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction C (for whole period)

		To			
		A	B	C	D
From	A	0.000	425.000	695.000	0.000
	B	235.000	0.000	95.000	0.000
	C	775.000	0.000	0.000	0.000
	D	75.000	0.000	0.000	0.000

Turning Proportions (PCU) - Junction C (for whole period)

		To			
		A	B	C	D
From	A	0.00	0.38	0.62	0.00
	B	0.71	0.00	0.29	0.00
	C	1.00	0.00	0.00	0.00
	D	1.00	0.00	0.00	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction C (for whole period)

		To			
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction C (for whole period)

		To			
		A	B	C	D
From	A	0.0	0.0	0.0	0.0
	B	0.0	0.0	0.0	0.0
	C	0.0	0.0	0.0	0.0
	D	0.0	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-CD	0.24	12.14	0.32	B
B-AD	0.72	38.83	2.48	E
A-B	-	-	-	-
A-C	-	-	-	-
A-D	0.00	0.00	0.00	A
D-ABC	0.12	6.48	0.13	A
C-D	-	-	-	-
C-A	-	-	-	-
C-B	0.00	0.00	0.00	A

Main Results for each time segment

Main results: (18:00-18:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-CD	95.00	93.76	0.00	395.31	0.240	0.31	11.891	B
B-AD	235.00	226.07	0.00	327.38	0.718	2.23	33.175	D
A-B	425.00	425.00	0.00	-	-	-	-	-
A-C	695.00	695.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	527.72	0.000	0.00	0.000	A
D-ABC	75.00	74.46	0.00	630.72	0.119	0.13	6.467	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	775.00	775.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	455.57	0.000	0.00	0.000	A

Main results: (18:15-18:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-CD	95.00	94.98	0.00	391.99	0.242	0.32	12.118	B
B-AD	235.00	234.43	0.00	327.25	0.718	2.37	38.219	E
A-B	425.00	425.00	0.00	-	-	-	-	-
A-C	695.00	695.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	527.72	0.000	0.00	0.000	A
D-ABC	75.00	75.00	0.00	630.72	0.119	0.13	6.477	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	775.00	775.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	455.57	0.000	0.00	0.000	A

Main results: (18:30-18:45)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-CD	95.00	94.99	0.00	391.78	0.242	0.32	12.129	B
B-AD	235.00	234.78	0.00	327.25	0.718	2.43	38.578	E
A-B	425.00	425.00	0.00	-	-	-	-	-
A-C	695.00	695.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	527.72	0.000	0.00	0.000	A
D-ABC	75.00	75.00	0.00	630.72	0.119	0.13	6.477	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	775.00	775.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	455.57	0.000	0.00	0.000	A

Main results: (18:45-19:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-CD	95.00	95.00	0.00	391.70	0.243	0.32	12.132	B
B-AD	235.00	234.89	0.00	327.25	0.718	2.46	38.715	E
A-B	425.00	425.00	0.00	-	-	-	-	-
A-C	695.00	695.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	527.72	0.000	0.00	0.000	A
D-ABC	75.00	75.00	0.00	630.72	0.119	0.13	6.477	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	775.00	775.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	455.57	0.000	0.00	0.000	A

Main results: (19:00-19:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-CD	95.00	95.00	0.00	391.66	0.243	0.32	12.134	B
B-AD	235.00	234.93	0.00	327.25	0.718	2.47	38.787	E
A-B	425.00	425.00	0.00	-	-	-	-	-
A-C	695.00	695.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	527.72	0.000	0.00	0.000	A
D-ABC	75.00	75.00	0.00	630.72	0.119	0.13	6.477	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	775.00	775.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	455.57	0.000	0.00	0.000	A

Main results: (19:15-19:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-CD	95.00	95.00	0.00	391.63	0.243	0.32	12.135	B
B-AD	235.00	234.95	0.00	327.25	0.718	2.48	38.833	E
A-B	425.00	425.00	0.00	-	-	-	-	-
A-C	695.00	695.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	527.72	0.000	0.00	0.000	A
D-ABC	75.00	75.00	0.00	630.72	0.119	0.13	6.477	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	775.00	775.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	455.57	0.000	0.00	0.000	A

Junction C - 2034 Design (w PWP Works), AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction C	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Design (w PWP Works), AM	2034 Design (w PWP Works)	AM		FLAT	08:00	09:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
C	Kam Sheung Road/Kam Tin Road	Crossroads	Two-way	A,B,C,D	136.88	F

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Kam Tin Road NWB		Major
B	B	Kam Sheung Road NEB		Minor
C	C	Kam Tin Road SEB		Major
D	D	Car Park		Minor

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
A	11.00		0.00		2.20	200.00		
C	11.00		0.00		2.20	200.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	Two lanes		2.50	5.00						✓		100	100
D	One lane	5.00										100	100

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for A-D	Slope for B-A	Slope for B-C	Slope for B-D	Slope for C-A	Slope for C-B	Slope for C-D	Slope for D-A	Slope for D-B	Slope for D-C
C	A-D	689.785	-	-	-	-	-	-	0.209	0.299	0.209	-	-	-
C	B-A	673.033	0.096	0.242	0.242	-	-	-	0.153	0.346	-	0.242	0.242	0.121
C	B-C	652.505	0.078	0.198	-	-	-	-	-	-	-	-	-	-
C	B-D, nearside lane	532.681	0.076	0.192	0.192	-	-	-	0.121	0.274	0.121	-	-	-
C	B-D, offside lane	673.033	0.096	0.242	0.242	-	-	-	0.153	0.346	0.153	-	-	-
C	C-B	689.785	0.209	0.209	0.299	-	-	-	-	-	-	-	-	-
C	D-A	824.429	-	-	-	-	-	-	0.250	-	0.099	-	-	-
C	D-B, nearside lane	673.033	0.153	0.153	0.346	-	-	-	0.242	0.242	0.096	-	-	-
C	D-B, offside lane	673.033	0.153	0.153	0.346	-	-	-	0.242	0.242	0.096	-	-	-
C	D-C	673.033	-	0.153	0.346	0.121	0.242	0.242	0.242	0.242	0.096	-	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	FLAT	✓	1035.00	100.000
B	FLAT	✓	475.00	100.000
C	FLAT	✓	705.00	100.000
D	FLAT	✓	105.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
08:00-08:15	**A**	1035.00	1035.00		
08:00-08:15	**B**	475.00	475.00		
08:00-08:15	**C**	705.00	705.00		
08:00-08:15	**D**	105.00	105.00		
08:15-08:30	**A**	1035.00	1035.00		
08:15-08:30	**B**	475.00	475.00		
08:15-08:30	**C**	705.00	705.00		
08:15-08:30	**D**	105.00	105.00		
08:30-08:45	**A**	1035.00	1035.00		
08:30-08:45	**B**	475.00	475.00		
08:30-08:45	**C**	705.00	705.00		
08:30-08:45	**D**	105.00	105.00		
08:45-09:00	**A**	1035.00	1035.00		
08:45-09:00	**B**	475.00	475.00		
08:45-09:00	**C**	705.00	705.00		
08:45-09:00	**D**	105.00	105.00		
09:00-09:15	**A**	1035.00	1035.00		
09:00-09:15	**B**	475.00	475.00		
09:00-09:15	**C**	705.00	705.00		
09:00-09:15	**D**	105.00	105.00		
09:15-09:30	**A**	1035.00	1035.00		
09:15-09:30	**B**	475.00	475.00		
09:15-09:30	**C**	705.00	705.00		
09:15-09:30	**D**	105.00	105.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction C (for whole period)

		To			
		A	**B**	**C**	**D**
From	**A**	0.000	400.000	635.000	0.000
	B	345.000	0.000	130.000	0.000
	C	705.000	0.000	0.000	0.000
	D	105.000	0.000	0.000	0.000

Turning Proportions (PCU) - Junction C (for whole period)

		To			
		A	**B**	**C**	**D**
From	**A**	0.00	0.39	0.61	0.00
	B	0.73	0.00	0.27	0.00
	C	1.00	0.00	0.00	0.00
	D	1.00	0.00	0.00	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction C (for whole period)

		To			
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction C (for whole period)

		To			
		A	B	C	D
From	A	0.0	0.0	0.0	0.0
	B	0.0	0.0	0.0	0.0
	C	0.0	0.0	0.0	0.0
	D	0.0	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-CD	0.35	14.89	0.54	B
B-AD	0.99	222.49	20.46	F
A-B	-	-	-	-
A-C	-	-	-	-
A-D	0.00	0.00	0.00	A
D-ABC	0.16	6.63	0.19	A
C-D	-	-	-	-
C-A	-	-	-	-
C-B	0.00	0.00	0.00	A

Main Results for each time segment

Main results: (08:00-08:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-CD	130.00	127.91	0.00	372.66	0.349	0.52	14.591	B
B-AD	345.00	311.06	0.00	347.73	0.992	8.48	71.754	F
A-B	400.00	400.00	0.00	-	-	-	-	-
A-C	635.00	635.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	542.35	0.000	0.00	0.000	A
D-ABC	105.00	104.23	0.00	648.22	0.162	0.19	6.608	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	705.00	705.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	473.34	0.000	0.00	0.000	A

Main results: (08:15-08:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-CD	130.00	129.97	0.00	371.69	0.350	0.53	14.888	B
B-AD	345.00	330.80	0.00	347.54	0.993	12.03	130.633	F
A-B	400.00	400.00	0.00	-	-	-	-	-
A-C	635.00	635.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	542.35	0.000	0.00	0.000	A
D-ABC	105.00	105.00	0.00	648.22	0.162	0.19	6.626	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	705.00	705.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	473.34	0.000	0.00	0.000	A

Main results: (08:30-08:45)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-CD	130.00	129.99	0.00	371.69	0.350	0.53	14.891	B
B-AD	345.00	334.39	0.00	347.54	0.993	14.69	160.714	F
A-B	400.00	400.00	0.00	-	-	-	-	-
A-C	635.00	635.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	542.35	0.000	0.00	0.000	A
D-ABC	105.00	105.00	0.00	648.22	0.162	0.19	6.626	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	705.00	705.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	473.34	0.000	0.00	0.000	A

Main results: (08:45-09:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-CD	130.00	130.00	0.00	371.69	0.350	0.53	14.894	B
B-AD	345.00	336.23	0.00	347.54	0.993	16.88	184.468	F
A-B	400.00	400.00	0.00	-	-	-	-	-
A-C	635.00	635.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	542.35	0.000	0.00	0.000	A
D-ABC	105.00	105.00	0.00	648.22	0.162	0.19	6.626	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	705.00	705.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	473.34	0.000	0.00	0.000	A

Main results: (09:00-09:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-CD	130.00	130.00	0.00	371.69	0.350	0.54	14.894	B
B-AD	345.00	337.41	0.00	347.54	0.993	18.77	204.671	F
A-B	400.00	400.00	0.00	-	-	-	-	-
A-C	635.00	635.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	542.35	0.000	0.00	0.000	A
D-ABC	105.00	105.00	0.00	648.22	0.162	0.19	6.626	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	705.00	705.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	473.34	0.000	0.00	0.000	A

Main results: (09:15-09:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-CD	130.00	130.00	0.00	371.69	0.350	0.54	14.894	B
B-AD	345.00	338.25	0.00	347.54	0.993	20.46	222.492	F
A-B	400.00	400.00	0.00	-	-	-	-	-
A-C	635.00	635.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	542.35	0.000	0.00	0.000	A
D-ABC	105.00	105.00	0.00	648.22	0.162	0.19	6.626	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	705.00	705.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	473.34	0.000	0.00	0.000	A

Junction C - 2034 Design (w PWP Works), PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction C	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Design (w PWP Works), PM	2034 Design (w PWP Works)	PM		FLAT	18:00	19:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
C	Kam Sheung Road/Kam Tin Road	Crossroads	Two-way	A,B,C,D	30.34	D

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Kam Tin Road NWB		Major
B	B	Kam Sheung Road NEB		Minor
C	C	Kam Tin Road SEB		Major
D	D	Car Park		Minor

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
A	11.00		0.00		2.20	200.00		
C	11.00		0.00		2.20	200.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	Two lanes		2.50	5.00						✓		100	100
D	One lane	5.00										100	100

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for A-D	Slope for B-A	Slope for B-C	Slope for B-D	Slope for C-A	Slope for C-B	Slope for C-D	Slope for D-A	Slope for D-B	Slope for D-C
C	A-D	689.785	-	-	-	-	-	-	0.209	0.299	0.209	-	-	-
C	B-A	673.033	0.096	0.242	0.242	-	-	-	0.153	0.346	-	0.242	0.242	0.121
C	B-C	652.505	0.078	0.198	-	-	-	-	-	-	-	-	-	-
C	B-D, nearside lane	532.681	0.076	0.192	0.192	-	-	-	0.121	0.274	0.121	-	-	-
C	B-D, offside lane	673.033	0.096	0.242	0.242	-	-	-	0.153	0.346	0.153	-	-	-
C	C-B	689.785	0.209	0.209	0.299	-	-	-	-	-	-	-	-	-
C	D-A	824.429	-	-	-	-	-	-	0.250	-	0.099	-	-	-
C	D-B, nearside lane	673.033	0.153	0.153	0.346	-	-	-	0.242	0.242	0.096	-	-	-
C	D-B, offside lane	673.033	0.153	0.153	0.346	-	-	-	0.242	0.242	0.096	-	-	-
C	D-C	673.033	-	0.153	0.346	0.121	0.242	0.242	0.242	0.242	0.096	-	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	FLAT	✓	1140.00	100.000
B	FLAT	✓	345.00	100.000
C	FLAT	✓	780.00	100.000
D	FLAT	✓	75.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
18:00-18:15	**A**	1140.00	1140.00		
18:00-18:15	**B**	345.00	345.00		
18:00-18:15	**C**	780.00	780.00		
18:00-18:15	**D**	75.00	75.00		
18:15-18:30	**A**	1140.00	1140.00		
18:15-18:30	**B**	345.00	345.00		
18:15-18:30	**C**	780.00	780.00		
18:15-18:30	**D**	75.00	75.00		
18:30-18:45	**A**	1140.00	1140.00		
18:30-18:45	**B**	345.00	345.00		
18:30-18:45	**C**	780.00	780.00		
18:30-18:45	**D**	75.00	75.00		
18:45-19:00	**A**	1140.00	1140.00		
18:45-19:00	**B**	345.00	345.00		
18:45-19:00	**C**	780.00	780.00		
18:45-19:00	**D**	75.00	75.00		
19:00-19:15	**A**	1140.00	1140.00		
19:00-19:15	**B**	345.00	345.00		
19:00-19:15	**C**	780.00	780.00		
19:00-19:15	**D**	75.00	75.00		
19:15-19:30	**A**	1140.00	1140.00		
19:15-19:30	**B**	345.00	345.00		
19:15-19:30	**C**	780.00	780.00		
19:15-19:30	**D**	75.00	75.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction C (for whole period)

		To			
		A	B	C	D
From	A	0.000	445.000	695.000	0.000
	B	245.000	0.000	100.000	0.000
	C	780.000	0.000	0.000	0.000
	D	75.000	0.000	0.000	0.000

Turning Proportions (PCU) - Junction C (for whole period)

		To			
		A	B	C	D
From	A	0.00	0.39	0.61	0.00
	B	0.71	0.00	0.29	0.00
	C	1.00	0.00	0.00	0.00
	D	1.00	0.00	0.00	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction C (for whole period)

		To			
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction C (for whole period)

		To			
		A	B	C	D
From	A	0.0	0.0	0.0	0.0
	B	0.0	0.0	0.0	0.0
	C	0.0	0.0	0.0	0.0
	D	0.0	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-CD	0.26	12.62	0.35	B
B-AD	0.75	44.87	2.98	E
A-B	-	-	-	-
A-C	-	-	-	-
A-D	0.00	0.00	0.00	A
D-ABC	0.12	6.49	0.14	A
C-D	-	-	-	-
C-A	-	-	-	-
C-B	0.00	0.00	0.00	A

Main Results for each time segment

Main results: (18:00-18:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-CD	100.00	98.64	0.00	389.61	0.257	0.34	12.318	B
B-AD	245.00	234.59	0.00	324.70	0.755	2.60	36.679	E
A-B	445.00	445.00	0.00	-	-	-	-	-
A-C	695.00	695.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	526.67	0.000	0.00	0.000	A
D-ABC	75.00	74.46	0.00	629.47	0.119	0.13	6.481	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	780.00	780.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	451.39	0.000	0.00	0.000	A

Main results: (18:15-18:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-CD	100.00	99.97	0.00	385.72	0.259	0.35	12.596	B
B-AD	245.00	244.18	0.00	324.57	0.755	2.81	43.745	E
A-B	445.00	445.00	0.00	-	-	-	-	-
A-C	695.00	695.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	526.67	0.000	0.00	0.000	A
D-ABC	75.00	75.00	0.00	629.47	0.119	0.13	6.491	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	780.00	780.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	451.39	0.000	0.00	0.000	A

Main results: (18:30-18:45)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-CD	100.00	99.99	0.00	385.42	0.259	0.35	12.612	B
B-AD	245.00	244.68	0.00	324.57	0.755	2.89	44.384	E
A-B	445.00	445.00	0.00	-	-	-	-	-
A-C	695.00	695.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	526.67	0.000	0.00	0.000	A
D-ABC	75.00	75.00	0.00	629.47	0.119	0.13	6.491	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	780.00	780.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	451.39	0.000	0.00	0.000	A

Main results: (18:45-19:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-CD	100.00	100.00	0.00	385.30	0.260	0.35	12.617	B
B-AD	245.00	244.83	0.00	324.57	0.755	2.93	44.640	E
A-B	445.00	445.00	0.00	-	-	-	-	-
A-C	695.00	695.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	526.67	0.000	0.00	0.000	A
D-ABC	75.00	75.00	0.00	629.47	0.119	0.13	6.491	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	780.00	780.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	451.39	0.000	0.00	0.000	A

Main results: (19:00-19:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-CD	100.00	100.00	0.00	385.24	0.260	0.35	12.620	B
B-AD	245.00	244.89	0.00	324.57	0.755	2.96	44.779	E
A-B	445.00	445.00	0.00	-	-	-	-	-
A-C	695.00	695.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	526.67	0.000	0.00	0.000	A
D-ABC	75.00	75.00	0.00	629.47	0.119	0.14	6.491	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	780.00	780.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	451.39	0.000	0.00	0.000	A

Main results: (19:15-19:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-CD	100.00	100.00	0.00	385.20	0.260	0.35	12.622	B
B-AD	245.00	244.93	0.00	324.57	0.755	2.98	44.865	E
A-B	445.00	445.00	0.00	-	-	-	-	-
A-C	695.00	695.00	0.00	-	-	-	-	-
A-D	0.00	0.00	0.00	526.67	0.000	0.00	0.000	A
D-ABC	75.00	75.00	0.00	629.47	0.119	0.14	6.491	A
C-D	0.00	0.00	0.00	-	-	-	-	-
C-A	780.00	780.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	451.39	0.000	0.00	0.000	A

Junctions 8

ARCADY 8 - Roundabout Module

Version: 8.0.5.523 [19102,19/06/2015]

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Filename: DD112 Jn D_(wo PWP Works).arc8
Path: \\CTA_NAS01\Project\CTA Consultants Limited\CTA - Project\21134HK (wkk) - S12A Application (DD106, 110, 112 & 113) in Kam Tin\DD112 - LFT (Alex Leung)\Cal\2024-07-26
Report generation date: 26/7/2024 11:32:11

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	Junction D - 2021 Existing							
Arm 1	1.22	6.42	0.55	A	0.77	4.79	0.44	A
Arm 2	0.15	3.17	0.13	A	0.21	3.18	0.17	A
Arm 3	1.59	7.29	0.62	A	1.03	5.70	0.51	A
	Junction D - 2034 Design (w/o PWP Works)							
Arm 1	2.85	11.98	0.74	B	1.36	6.62	0.58	A
Arm 2	0.26	3.88	0.21	A	0.34	3.87	0.26	A
Arm 3	4.65	16.10	0.83	C	1.86	8.07	0.65	A
	Junction D - 2034 Reference (w/o PWP Works)							
Arm 1	2.57	11.01	0.72	B	1.29	6.41	0.56	A
Arm 2	0.25	3.79	0.20	A	0.33	3.79	0.25	A
Arm 3	3.90	13.93	0.80	B	1.77	7.81	0.64	A

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle.

"D1 - 2021 Existing, AM " model duration: 8:00 - 9:30
"D2 - 2021 Existing, PM" model duration: 18:00 - 19:30
"D3 - 2034 Reference (w/o PWP Works), AM" model duration: 8:00 - 9:30
"D4 - 2034 Reference (w/o PWP Works), PM" model duration: 18:00 - 19:30
"D5 - 2034 Design (w/o PWP Works), AM" model duration: 8:00 - 9:30
"D6 - 2034 Design (w/o PWP Works), PM" model duration: 18:00 - 19:30

Run using Junctions 8.0.5.523 at 26/7/2024 11:32:07

File summary

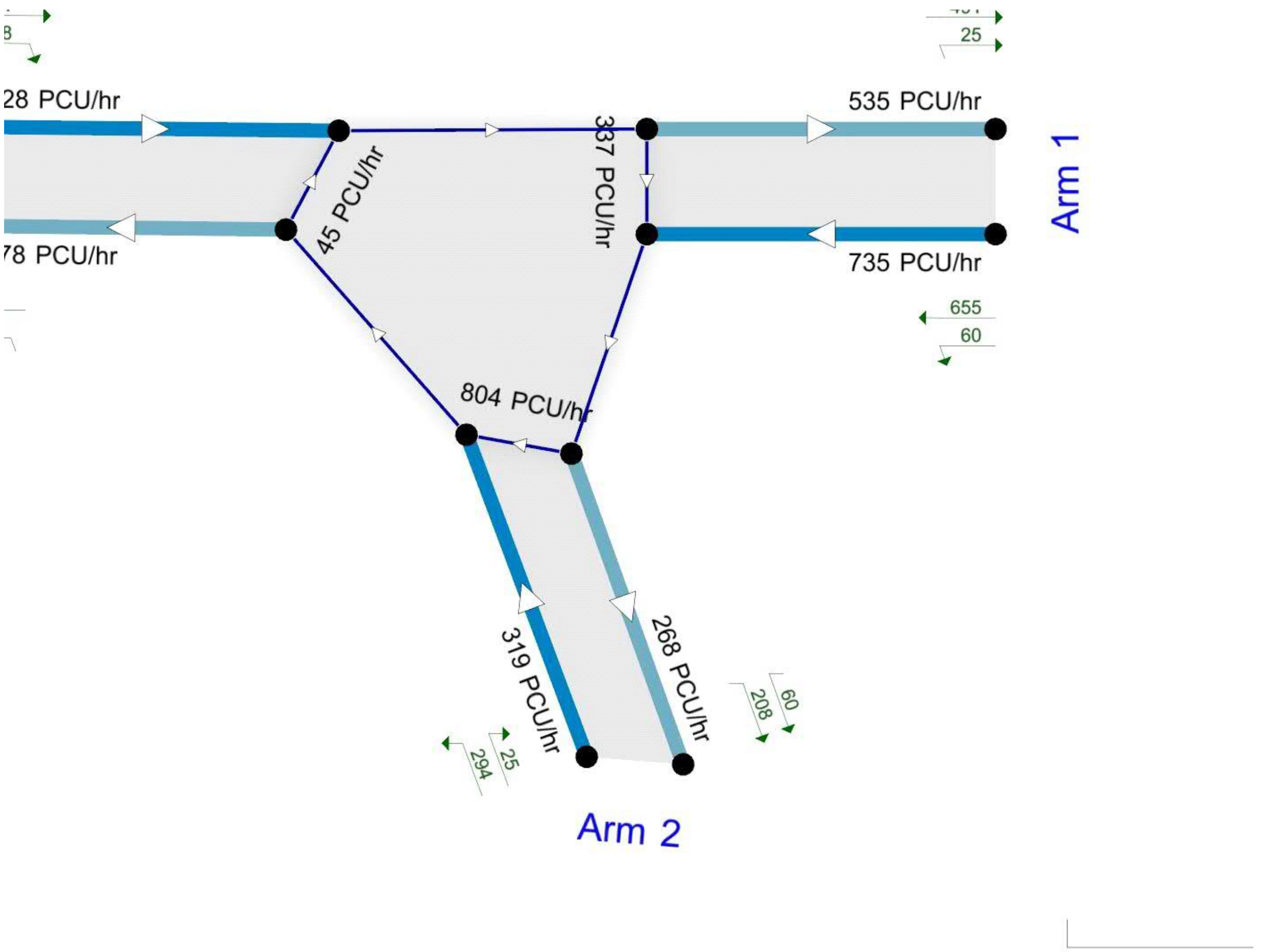
Title	(untitled)
Location	KAM TIN RD/ LAM KAM RD/ ROUTE TWISK
Site Number	
Date	10/12/2021
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	user
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCU	PCU	perHour	s	-Min	perMin



Showing modelled flow through junction (PCU/hr).
Time Segment: (08:00-08:15)
Showing Analysis Set "A1 - Junction D "; Demand Set "D1 - 2021 Existing, AM "

The junction diagram reflects the last run of ARCADY.

Junction D - 2021 Existing, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction D	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2021 Existing, AM	2021 Existing	AM		FLAT	08:00	09:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	1,2,3			6.49	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	LAM KAM RD	
2	2	ROUTE TWISK	
3	3	KAM TIN RD	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	3.50	5.30	10.00	60.00	28.00	20.00	
2	3.80	7.30	12.00	85.00	28.00	20.00	
3	3.50	4.50	10.00	999.00	28.00	40.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.640	1501.228
2		(calculated)	(calculated)	0.707	1822.490
3		(calculated)	(calculated)	0.583	1307.101

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
1	FLAT	✓	685.00	100.000
2	FLAT	✓	175.00	100.000
3	FLAT	✓	790.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
08:00-08:15	**1**	685.00	685.00		
08:00-08:15	**2**	175.00	175.00		
08:00-08:15	**3**	790.00	790.00		
08:15-08:30	**1**	685.00	685.00		
08:15-08:30	**2**	175.00	175.00		
08:15-08:30	**3**	790.00	790.00		
08:30-08:45	**1**	685.00	685.00		
08:30-08:45	**2**	175.00	175.00		
08:30-08:45	**3**	790.00	790.00		
08:45-09:00	**1**	685.00	685.00		
08:45-09:00	**2**	175.00	175.00		
08:45-09:00	**3**	790.00	790.00		
09:00-09:15	**1**	685.00	685.00		
09:00-09:15	**2**	175.00	175.00		
09:00-09:15	**3**	790.00	790.00		
09:15-09:30	**1**	685.00	685.00		
09:15-09:30	**2**	175.00	175.00		
09:15-09:30	**3**	790.00	790.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

		To		
		1	2	3
From	1	20.000	140.000	525.000
	2	20.000	0.000	155.000
	3	390.000	220.000	180.000

Turning Proportions (PCU) - Junction 1 (for whole period)

		To		
		1	2	3
From	1	0.03	0.20	0.77
	2	0.11	0.00	0.89
	3	0.49	0.28	0.23

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		1	2	3
From	1	1.000	1.000	1.000
	2	1.000	1.000	1.000
	3	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		1	2	3
From	1	0.0	0.0	0.0
	2	0.0	0.0	0.0
	3	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.55	6.42	1.22	A
2	0.13	3.17	0.15	A
3	0.62	7.29	1.59	A

Main Results for each time segment

Main results: (08:00-08:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	685.00	680.20	396.83	0.00	1247.31	0.549	1.20	6.296	A
2	175.00	174.39	719.75	0.00	1313.41	0.133	0.15	3.159	A
3	790.00	783.73	39.79	0.00	1283.89	0.615	1.57	7.111	A

Main results: (08:15-08:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	685.00	684.95	399.97	0.00	1245.30	0.550	1.21	6.424	A
2	175.00	175.00	724.95	0.00	1309.74	0.134	0.15	3.171	A
3	790.00	789.93	40.00	0.00	1283.77	0.615	1.58	7.287	A

Main results: (08:30-08:45)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	685.00	684.99	399.99	0.00	1245.29	0.550	1.22	6.424	A
2	175.00	175.00	724.98	0.00	1309.72	0.134	0.15	3.171	A
3	790.00	789.98	40.00	0.00	1283.77	0.615	1.59	7.289	A

Main results: (08:45-09:00)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	685.00	684.99	399.99	0.00	1245.28	0.550	1.22	6.424	A
2	175.00	175.00	724.99	0.00	1309.71	0.134	0.15	3.171	A
3	790.00	789.99	40.00	0.00	1283.77	0.615	1.59	7.289	A

Main results: (09:00-09:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	685.00	685.00	400.00	0.00	1245.28	0.550	1.22	6.424	A
2	175.00	175.00	725.00	0.00	1309.71	0.134	0.15	3.171	A
3	790.00	789.99	40.00	0.00	1283.77	0.615	1.59	7.289	A

Main results: (09:15-09:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	685.00	685.00	400.00	0.00	1245.28	0.550	1.22	6.424	A
2	175.00	175.00	725.00	0.00	1309.71	0.134	0.15	3.171	A
3	790.00	790.00	40.00	0.00	1283.77	0.615	1.59	7.289	A

Junction D - 2021 Existing, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction D	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2021 Existing, PM	2021 Existing	PM		FLAT	18:00	19:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	1,2,3			4.93	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	LAM KAM RD	
2	2	ROUTE TWISK	
3	3	KAM TIN RD	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	3.50	5.30	10.00	60.00	28.00	20.00	
2	3.80	7.30	12.00	85.00	28.00	20.00	
3	3.50	4.50	10.00	999.00	28.00	40.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.640	1501.228
2		(calculated)	(calculated)	0.707	1822.490
3		(calculated)	(calculated)	0.583	1307.101

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
1	FLAT	✓	580.00	100.000
2	FLAT	✓	240.00	100.000
3	FLAT	✓	655.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
18:00-18:15	**1**	580.00	580.00		
18:00-18:15	**2**	240.00	240.00		
18:00-18:15	**3**	655.00	655.00		
18:15-18:30	**1**	580.00	580.00		
18:15-18:30	**2**	240.00	240.00		
18:15-18:30	**3**	655.00	655.00		
18:30-18:45	**1**	580.00	580.00		
18:30-18:45	**2**	240.00	240.00		
18:30-18:45	**3**	655.00	655.00		
18:45-19:00	**1**	580.00	580.00		
18:45-19:00	**2**	240.00	240.00		
18:45-19:00	**3**	655.00	655.00		
19:00-19:15	**1**	580.00	580.00		
19:00-19:15	**2**	240.00	240.00		
19:00-19:15	**3**	655.00	655.00		
19:15-19:30	**1**	580.00	580.00		
19:15-19:30	**2**	240.00	240.00		
19:15-19:30	**3**	655.00	655.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

	To			
		1	**2**	**3**
From	**1**	15.000	50.000	515.000
	2	20.000	0.000	220.000
	3	390.000	160.000	105.000

Turning Proportions (PCU) - Junction 1 (for whole period)

	To			
		1	**2**	**3**
From	**1**	0.03	0.09	0.89
	2	0.08	0.00	0.92
	3	0.60	0.24	0.16

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

	To			
		1	**2**	**3**
From	**1**	1.000	1.000	1.000
	2	1.000	1.000	1.000
	3	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

	To			
		1	**2**	**3**
From	**1**	0.0	0.0	0.0
	2	0.0	0.0	0.0
	3	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.44	4.79	0.77	A
2	0.17	3.18	0.21	A
3	0.51	5.70	1.03	A

Main Results for each time segment

Main results: (18:00-18:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	580.00	576.95	263.34	0.00	1332.72	0.435	0.76	4.744	A
2	240.00	239.16	631.55	0.00	1375.80	0.174	0.21	3.166	A
3	655.00	650.91	34.85	0.00	1286.78	0.509	1.02	5.626	A

Main results: (18:15-18:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	580.00	579.98	264.99	0.00	1331.67	0.436	0.77	4.788	A
2	240.00	240.00	634.98	0.00	1373.37	0.175	0.21	3.175	A
3	655.00	654.97	35.00	0.00	1286.69	0.509	1.03	5.698	A

Main results: (18:30-18:45)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	580.00	579.99	265.00	0.00	1331.66	0.436	0.77	4.788	A
2	240.00	240.00	634.99	0.00	1373.37	0.175	0.21	3.175	A
3	655.00	654.99	35.00	0.00	1286.69	0.509	1.03	5.698	A

Main results: (18:45-19:00)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	580.00	580.00	265.00	0.00	1331.66	0.436	0.77	4.788	A
2	240.00	240.00	635.00	0.00	1373.36	0.175	0.21	3.175	A
3	655.00	655.00	35.00	0.00	1286.69	0.509	1.03	5.698	A

Main results: (19:00-19:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	580.00	580.00	265.00	0.00	1331.66	0.436	0.77	4.788	A
2	240.00	240.00	635.00	0.00	1373.36	0.175	0.21	3.175	A
3	655.00	655.00	35.00	0.00	1286.69	0.509	1.03	5.698	A

Main results: (19:15-19:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	580.00	580.00	265.00	0.00	1331.66	0.436	0.77	4.788	A
2	240.00	240.00	635.00	0.00	1373.36	0.175	0.21	3.175	A
3	655.00	655.00	35.00	0.00	1286.69	0.509	1.03	5.698	A

Junction D - 2034 Reference (w/o PWP Works), AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction D	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Reference (w/o PWP Works), AM	2034 Reference (w/o PWP Works)	AM		FLAT	08:00	09:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	1,2,3			11.60	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	LAM KAM RD	
2	2	ROUTE TWISK	
3	3	KAM TIN RD	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	3.50	5.30	10.00	60.00	28.00	20.00	
2	3.80	7.30	12.00	85.00	28.00	20.00	
3	3.50	4.50	10.00	999.00	28.00	40.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.640	1501.228
2		(calculated)	(calculated)	0.707	1822.490
3		(calculated)	(calculated)	0.583	1307.101

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
1	FLAT	✓	845.00	100.000
2	FLAT	✓	240.00	100.000
3	FLAT	✓	1020.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
08:00-08:15	**1**	845.00	845.00		
08:00-08:15	**2**	240.00	240.00		
08:00-08:15	**3**	1020.00	1020.00		
08:15-08:30	**1**	845.00	845.00		
08:15-08:30	**2**	240.00	240.00		
08:15-08:30	**3**	1020.00	1020.00		
08:30-08:45	**1**	845.00	845.00		
08:30-08:45	**2**	240.00	240.00		
08:30-08:45	**3**	1020.00	1020.00		
08:45-09:00	**1**	845.00	845.00		
08:45-09:00	**2**	240.00	240.00		
08:45-09:00	**3**	1020.00	1020.00		
09:00-09:15	**1**	845.00	845.00		
09:00-09:15	**2**	240.00	240.00		
09:00-09:15	**3**	1020.00	1020.00		
09:15-09:30	**1**	845.00	845.00		
09:15-09:30	**2**	240.00	240.00		
09:15-09:30	**3**	1020.00	1020.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

		To		
		1	**2**	**3**
From	**1**	25.000	165.000	655.000
	2	25.000	0.000	215.000
	3	505.000	300.000	215.000

Turning Proportions (PCU) - Junction 1 (for whole period)

		To		
		1	**2**	**3**
From	**1**	0.03	0.20	0.78
	2	0.10	0.00	0.90
	3	0.50	0.29	0.21

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		1	**2**	**3**
From	**1**	1.000	1.000	1.000
	2	1.000	1.000	1.000
	3	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		1	**2**	**3**
From	**1**	0.0	0.0	0.0
	2	0.0	0.0	0.0
	3	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.72	11.01	2.57	B
2	0.20	3.79	0.25	A
3	0.80	13.93	3.90	B

Main Results for each time segment

Main results: (08:00-08:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	845.00	835.21	507.56	0.00	1176.46	0.718	2.45	10.277	B
2	240.00	239.00	884.02	0.00	1197.23	0.200	0.25	3.753	A
3	1020.00	1005.27	49.61	0.00	1278.17	0.798	3.68	12.589	B

Main results: (08:15-08:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	845.00	844.70	514.74	0.00	1171.86	0.721	2.52	10.981	B
2	240.00	239.99	894.65	0.00	1189.71	0.202	0.25	3.789	A
3	1020.00	1019.49	49.99	0.00	1277.95	0.798	3.81	13.854	B

Main results: (08:30-08:45)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	845.00	844.91	514.91	0.00	1171.75	0.721	2.55	11.001	B
2	240.00	240.00	894.89	0.00	1189.54	0.202	0.25	3.790	A
3	1020.00	1019.82	50.00	0.00	1277.94	0.798	3.86	13.903	B

Main results: (08:45-09:00)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	845.00	844.96	514.95	0.00	1171.73	0.721	2.56	11.009	B
2	240.00	240.00	894.95	0.00	1189.50	0.202	0.25	3.790	A
3	1020.00	1019.91	50.00	0.00	1277.94	0.798	3.88	13.920	B

Main results: (09:00-09:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	845.00	844.97	514.97	0.00	1171.71	0.721	2.56	11.011	B
2	240.00	240.00	894.97	0.00	1189.49	0.202	0.25	3.790	A
3	1020.00	1019.94	50.00	0.00	1277.94	0.798	3.90	13.928	B

Main results: (09:15-09:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	845.00	844.98	514.98	0.00	1171.71	0.721	2.57	11.014	B
2	240.00	240.00	894.98	0.00	1189.48	0.202	0.25	3.790	A
3	1020.00	1019.96	50.00	0.00	1277.94	0.798	3.90	13.934	B

Junction D - 2034 Reference (w/o PWP Works), PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction D	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Reference (w/o PWP Works), PM	2034 Reference (w/o PWP Works)	PM		FLAT	18:00	19:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	1,2,3			6.58	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	LAM KAM RD	
2	2	ROUTE TWISK	
3	3	KAM TIN RD	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	3.50	5.30	10.00	60.00	28.00	20.00	
2	3.80	7.30	12.00	85.00	28.00	20.00	
3	3.50	4.50	10.00	999.00	28.00	40.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.640	1501.228
2		(calculated)	(calculated)	0.707	1822.490
3		(calculated)	(calculated)	0.583	1307.101

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
1	FLAT	✓	725.00	100.000
2	FLAT	✓	315.00	100.000
3	FLAT	✓	820.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
18:00-18:15	**1**	725.00	725.00		
18:00-18:15	**2**	315.00	315.00		
18:00-18:15	**3**	820.00	820.00		
18:15-18:30	**1**	725.00	725.00		
18:15-18:30	**2**	315.00	315.00		
18:15-18:30	**3**	820.00	820.00		
18:30-18:45	**1**	725.00	725.00		
18:30-18:45	**2**	315.00	315.00		
18:30-18:45	**3**	820.00	820.00		
18:45-19:00	**1**	725.00	725.00		
18:45-19:00	**2**	315.00	315.00		
18:45-19:00	**3**	820.00	820.00		
19:00-19:15	**1**	725.00	725.00		
19:00-19:15	**2**	315.00	315.00		
19:00-19:15	**3**	820.00	820.00		
19:15-19:30	**1**	725.00	725.00		
19:15-19:30	**2**	315.00	315.00		
19:15-19:30	**3**	820.00	820.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

	To			
From		**1**	**2**	**3**
	1	20.000	60.000	645.000
	2	25.000	0.000	290.000
	3	485.000	210.000	125.000

Turning Proportions (PCU) - Junction 1 (for whole period)

	To			
From		**1**	**2**	**3**
	1	0.03	0.08	0.89
	2	0.08	0.00	0.92
	3	0.59	0.26	0.15

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

	To			
From		**1**	**2**	**3**
	1	1.000	1.000	1.000
	2	1.000	1.000	1.000
	3	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

	To			
From		**1**	**2**	**3**
	1	0.0	0.0	0.0
	2	0.0	0.0	0.0
	3	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.56	6.41	1.29	A
2	0.25	3.79	0.33	A
3	0.64	7.81	1.77	A

Main Results for each time segment

Main results: (18:00-18:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	725.00	719.94	332.16	0.00	1288.69	0.563	1.27	6.275	A
2	315.00	313.68	784.30	0.00	1267.76	0.248	0.33	3.768	A
3	820.00	813.05	44.76	0.00	1281.00	0.640	1.74	7.586	A

Main results: (18:15-18:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	725.00	724.95	334.97	0.00	1286.89	0.563	1.28	6.406	A
2	315.00	314.99	789.94	0.00	1263.77	0.249	0.33	3.793	A
3	820.00	819.92	45.00	0.00	1280.86	0.640	1.76	7.806	A

Main results: (18:30-18:45)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	725.00	724.98	334.99	0.00	1286.88	0.563	1.28	6.406	A
2	315.00	315.00	789.98	0.00	1263.74	0.249	0.33	3.793	A
3	820.00	819.97	45.00	0.00	1280.86	0.640	1.77	7.809	A

Main results: (18:45-19:00)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	725.00	724.99	334.99	0.00	1286.88	0.563	1.28	6.406	A
2	315.00	315.00	789.99	0.00	1263.74	0.249	0.33	3.793	A
3	820.00	819.99	45.00	0.00	1280.86	0.640	1.77	7.809	A

Main results: (19:00-19:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	725.00	725.00	335.00	0.00	1286.87	0.563	1.29	6.406	A
2	315.00	315.00	789.99	0.00	1263.73	0.249	0.33	3.793	A
3	820.00	819.99	45.00	0.00	1280.86	0.640	1.77	7.811	A

Main results: (19:15-19:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	725.00	725.00	335.00	0.00	1286.87	0.563	1.29	6.406	A
2	315.00	315.00	790.00	0.00	1263.73	0.249	0.33	3.793	A
3	820.00	819.99	45.00	0.00	1280.86	0.640	1.77	7.811	A

Junction D - 2034 Design (w/o PWP Works), AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction D	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Design (w/o PWP Works), AM	2034 Design (w/o PWP Works)	AM		FLAT	08:00	09:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	1,2,3			13.07	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	LAM KAM RD	
2	2	ROUTE TWISK	
3	3	KAM TIN RD	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	3.50	5.30	10.00	60.00	28.00	20.00	
2	3.80	7.30	12.00	85.00	28.00	20.00	
3	3.50	4.50	10.00	999.00	28.00	40.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.640	1501.228
2		(calculated)	(calculated)	0.707	1822.490
3		(calculated)	(calculated)	0.583	1307.101

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
1	FLAT	✓	865.00	100.000
2	FLAT	✓	245.00	100.000
3	FLAT	✓	1055.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
08:00-08:15	**1**	865.00	865.00		
08:00-08:15	**2**	245.00	245.00		
08:00-08:15	**3**	1055.00	1055.00		
08:15-08:30	**1**	865.00	865.00		
08:15-08:30	**2**	245.00	245.00		
08:15-08:30	**3**	1055.00	1055.00		
08:30-08:45	**1**	865.00	865.00		
08:30-08:45	**2**	245.00	245.00		
08:30-08:45	**3**	1055.00	1055.00		
08:45-09:00	**1**	865.00	865.00		
08:45-09:00	**2**	245.00	245.00		
08:45-09:00	**3**	1055.00	1055.00		
09:00-09:15	**1**	865.00	865.00		
09:00-09:15	**2**	245.00	245.00		
09:00-09:15	**3**	1055.00	1055.00		
09:15-09:30	**1**	865.00	865.00		
09:15-09:30	**2**	245.00	245.00		
09:15-09:30	**3**	1055.00	1055.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

	To			
		1	**2**	**3**
From	**1**	25.000	165.000	675.000
	2	25.000	0.000	220.000
	3	530.000	305.000	220.000

Turning Proportions (PCU) - Junction 1 (for whole period)

	To			
		1	**2**	**3**
From	**1**	0.03	0.19	0.78
	2	0.10	0.00	0.90
	3	0.50	0.29	0.21

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

	To			
		1	**2**	**3**
From	**1**	1.000	1.000	1.000
	2	1.000	1.000	1.000
	3	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

	To			
		1	**2**	**3**
From	**1**	0.0	0.0	0.0
	2	0.0	0.0	0.0
	3	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.74	11.98	2.85	B
2	0.21	3.88	0.26	A
3	0.83	16.10	4.65	C

Main Results for each time segment

Main results: (08:00-08:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	865.00	854.21	516.41	0.00	1170.79	0.739	2.70	11.027	B
2	245.00	243.96	907.67	0.00	1180.51	0.208	0.26	3.840	A
3	1055.00	1037.74	49.58	0.00	1278.18	0.825	4.32	14.104	B

Main results: (08:15-08:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	865.00	864.61	524.62	0.00	1165.54	0.742	2.80	11.926	B
2	245.00	244.99	919.52	0.00	1172.12	0.209	0.26	3.882	A
3	1055.00	1054.23	49.99	0.00	1277.95	0.826	4.51	15.949	C

Main results: (08:30-08:45)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	865.00	864.88	524.86	0.00	1165.39	0.742	2.83	11.960	B
2	245.00	245.00	919.85	0.00	1171.89	0.209	0.26	3.883	A
3	1055.00	1054.72	50.00	0.00	1277.94	0.826	4.58	16.041	C

Main results: (08:45-09:00)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	865.00	864.94	524.93	0.00	1165.34	0.742	2.84	11.971	B
2	245.00	245.00	919.92	0.00	1171.84	0.209	0.26	3.883	A
3	1055.00	1054.85	50.00	0.00	1277.94	0.826	4.62	16.074	C

Main results: (09:00-09:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	865.00	864.97	524.96	0.00	1165.32	0.742	2.85	11.976	B
2	245.00	245.00	919.95	0.00	1171.82	0.209	0.26	3.884	A
3	1055.00	1054.91	50.00	0.00	1277.94	0.826	4.64	16.092	C

Main results: (09:15-09:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	865.00	864.98	524.97	0.00	1165.32	0.742	2.85	11.979	B
2	245.00	245.00	919.97	0.00	1171.80	0.209	0.26	3.884	A
3	1055.00	1054.94	50.00	0.00	1277.94	0.826	4.65	16.103	C

Junction D - 2034 Design (w/o PWP Works), PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction D	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Design (w/o PWP Works), PM	2034 Design (w/o PWP Works)	PM		FLAT	18:00	19:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	1,2,3			6.80	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	LAM KAM RD	
2	2	ROUTE TWISK	
3	3	KAM TIN RD	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	3.50	5.30	10.00	60.00	28.00	20.00	
2	3.80	7.30	12.00	85.00	28.00	20.00	
3	3.50	4.50	10.00	999.00	28.00	40.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.640	1501.228
2		(calculated)	(calculated)	0.707	1822.490
3		(calculated)	(calculated)	0.583	1307.101

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
1	FLAT	✓	740.00	100.000
2	FLAT	✓	320.00	100.000
3	FLAT	✓	835.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
18:00-18:15	**1**	740.00	740.00		
18:00-18:15	**2**	320.00	320.00		
18:00-18:15	**3**	835.00	835.00		
18:15-18:30	**1**	740.00	740.00		
18:15-18:30	**2**	320.00	320.00		
18:15-18:30	**3**	835.00	835.00		
18:30-18:45	**1**	740.00	740.00		
18:30-18:45	**2**	320.00	320.00		
18:30-18:45	**3**	835.00	835.00		
18:45-19:00	**1**	740.00	740.00		
18:45-19:00	**2**	320.00	320.00		
18:45-19:00	**3**	835.00	835.00		
19:00-19:15	**1**	740.00	740.00		
19:00-19:15	**2**	320.00	320.00		
19:00-19:15	**3**	835.00	835.00		
19:15-19:30	**1**	740.00	740.00		
19:15-19:30	**2**	320.00	320.00		
19:15-19:30	**3**	835.00	835.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

		To		
		1	2	3
From	1	20.000	60.000	660.000
	2	25.000	0.000	295.000
	3	495.000	210.000	130.000

Turning Proportions (PCU) - Junction 1 (for whole period)

		To		
		1	2	3
From	1	0.03	0.08	0.89
	2	0.08	0.00	0.92
	3	0.59	0.25	0.16

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		1	2	3
From	1	1.000	1.000	1.000
	2	1.000	1.000	1.000
	3	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		1	2	3
From	1	0.0	0.0	0.0
	2	0.0	0.0	0.0
	3	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.58	6.62	1.36	A
2	0.26	3.87	0.34	A
3	0.65	8.07	1.86	A

Main Results for each time segment

Main results: (18:00-18:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	740.00	734.67	337.03	0.00	1285.58	0.576	1.33	6.474	A
2	320.00	318.64	803.96	0.00	1253.86	0.255	0.34	3.844	A
3	835.00	827.70	44.75	0.00	1281.00	0.652	1.83	7.822	A

Main results: (18:15-18:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	740.00	739.94	339.96	0.00	1283.70	0.576	1.35	6.617	A
2	320.00	319.99	809.93	0.00	1249.63	0.256	0.34	3.872	A
3	835.00	834.91	45.00	0.00	1280.86	0.652	1.85	8.067	A

Main results: (18:30-18:45)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	740.00	739.98	339.99	0.00	1283.68	0.576	1.35	6.620	A
2	320.00	320.00	809.98	0.00	1249.60	0.256	0.34	3.872	A
3	835.00	834.97	45.00	0.00	1280.86	0.652	1.86	8.070	A

Main results: (18:45-19:00)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	740.00	739.99	339.99	0.00	1283.68	0.576	1.35	6.620	A
2	320.00	320.00	809.99	0.00	1249.59	0.256	0.34	3.872	A
3	835.00	834.98	45.00	0.00	1280.86	0.652	1.86	8.072	A

Main results: (19:00-19:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	740.00	739.99	340.00	0.00	1283.67	0.576	1.36	6.620	A
2	320.00	320.00	809.99	0.00	1249.59	0.256	0.34	3.872	A
3	835.00	834.99	45.00	0.00	1280.86	0.652	1.86	8.072	A

Main results: (19:15-19:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	740.00	740.00	340.00	0.00	1283.67	0.576	1.36	6.620	A
2	320.00	320.00	810.00	0.00	1249.59	0.256	0.34	3.872	A
3	835.00	834.99	45.00	0.00	1280.86	0.652	1.86	8.074	A

Junctions 8

ARCADY 8 - Roundabout Module

Version: 8.0.5.523 [19102,19/06/2015]

For sales and distribution information, program advice and maintenance, contact TRL:
Tel: +44 (0)1344 770758 email: software@trl.co.uk Web: http://www.trlsoftware.co.uk

Filename: DD112 Jn D_Fut (w PWP Works).arc8
Path: \\CTA_NAS01\Project\CTA Consultants Limited\CTA - Project\21134HK (wkk) - S12A Application (DD106, 110, 112 & 113) in Kam Tin\DD112 - LFT (Alex Leung)\Cal\2024-07-26
Report generation date: 26/7/2024 11:25:10

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	Junction D - 2034 Design (w PWP Works)							
Arm 1	2.59	10.86	0.72	B	1.29	6.28	0.56	A
Arm 2	0.54	7.99	0.35	A	0.73	8.23	0.42	A
Arm 3	4.33	14.97	0.81	B	1.80	7.78	0.64	A
	Junction D - 2034 Reference (w PWP Works)							
Arm 1	2.35	10.07	0.70	B	1.22	6.09	0.55	A
Arm 2	0.51	7.67	0.34	A	0.69	7.93	0.41	A
Arm 3	3.67	13.08	0.79	B	1.71	7.53	0.63	A

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle.

"D7 - 2034 Reference (w PWP Works), AM " model duration: 8:00 - 9:30
"D8 - 2034 Reference (w PWP Works), PM" model duration: 18:00 - 19:30
"D9 - 2034 Design (w PWP Works), AM" model duration: 8:00 - 9:30
"D10 - 2034 Design (w PWP Works), PM" model duration: 18:00 - 19:30

Run using Junctions 8.0.5.523 at 26/7/2024 11:25:08

File summary

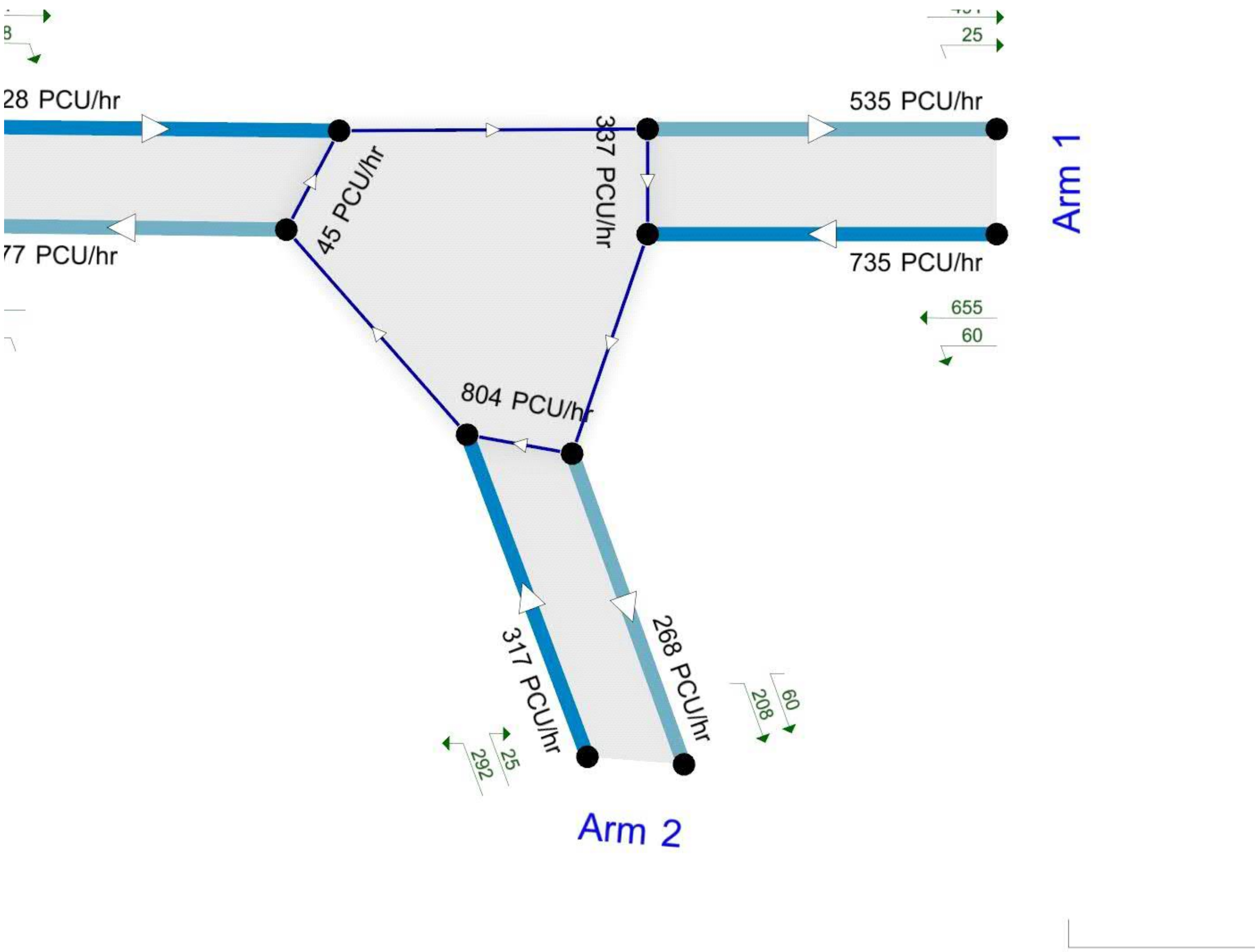
Title	(untitled)
Location	KAM TIN RD/ LAM KAM RD/ ROUTE TWISK
Site Number	
Date	10/12/2021
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	user
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCU	PCU	perHour	s	-Min	perMin



Showing modelled flow through junction (PCU/hr).
Time Segment: (08:00-08:15)
Showing Analysis Set "A1 - Junction D "; Demand Set "D7 - 2034 Reference (w PWP Works), AM "

The junction diagram reflects the last run of ARCADY.

Junction D - 2034 Reference (w PWP Works), AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction D	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Reference (w PWP Works), AM	2034 Reference (w PWP Works)	AM		FLAT	08:00	09:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	1,2,3			11.25	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	LAM KAM RD	
2	2	ROUTE TWISK	
3	3	KAM TIN RD	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	3.50	6.20	10.00	15.00	28.00	20.00	
2	3.50	4.00	12.00	15.00	28.00	20.00	
3	4.00	4.50	5.00	60.00	28.00	40.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.630	1526.984
2		(calculated)	(calculated)	0.566	1216.149
3		(calculated)	(calculated)	0.582	1323.987

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
1	FLAT	✓	845.00	100.000
2	FLAT	✓	240.00	100.000
3	FLAT	✓	1020.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
08:00-08:15	**1**	845.00	845.00		
08:00-08:15	**2**	240.00	240.00		
08:00-08:15	**3**	1020.00	1020.00		
08:15-08:30	**1**	845.00	845.00		
08:15-08:30	**2**	240.00	240.00		
08:15-08:30	**3**	1020.00	1020.00		
08:30-08:45	**1**	845.00	845.00		
08:30-08:45	**2**	240.00	240.00		
08:30-08:45	**3**	1020.00	1020.00		
08:45-09:00	**1**	845.00	845.00		
08:45-09:00	**2**	240.00	240.00		
08:45-09:00	**3**	1020.00	1020.00		
09:00-09:15	**1**	845.00	845.00		
09:00-09:15	**2**	240.00	240.00		
09:00-09:15	**3**	1020.00	1020.00		
09:15-09:30	**1**	845.00	845.00		
09:15-09:30	**2**	240.00	240.00		
09:15-09:30	**3**	1020.00	1020.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

		To		
		1	**2**	**3**
From	**1**	25.000	165.000	655.000
	2	25.000	0.000	215.000
	3	505.000	300.000	215.000

Turning Proportions (PCU) - Junction 1 (for whole period)

		To		
		1	**2**	**3**
From	**1**	0.03	0.20	0.78
	2	0.10	0.00	0.90
	3	0.50	0.29	0.21

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		1	**2**	**3**
From	**1**	1.000	1.000	1.000
	2	1.000	1.000	1.000
	3	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		1	**2**	**3**
From	**1**	0.0	0.0	0.0
	2	0.0	0.0	0.0
	3	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.70	10.07	2.35	B
2	0.34	7.67	0.51	A
3	0.79	13.08	3.67	B

Main Results for each time segment

Main results: (08:00-08:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	845.00	835.99	507.97	0.00	1206.99	0.700	2.25	9.488	A
2	240.00	238.00	884.81	0.00	715.20	0.336	0.50	7.512	A
3	1020.00	1006.08	49.53	0.00	1295.17	0.788	3.48	11.940	B

Main results: (08:15-08:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	845.00	844.76	514.78	0.00	1202.70	0.703	2.31	10.042	B
2	240.00	239.97	894.71	0.00	709.59	0.338	0.51	7.665	A
3	1020.00	1019.56	49.99	0.00	1294.90	0.788	3.59	13.018	B

Main results: (08:30-08:45)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	845.00	844.93	514.92	0.00	1202.61	0.703	2.33	10.056	B
2	240.00	239.99	894.91	0.00	709.48	0.338	0.51	7.667	A
3	1020.00	1019.84	50.00	0.00	1294.89	0.788	3.63	13.056	B

Main results: (08:45-09:00)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	845.00	844.97	514.96	0.00	1202.58	0.703	2.34	10.061	B
2	240.00	240.00	894.96	0.00	709.45	0.338	0.51	7.667	A
3	1020.00	1019.92	50.00	0.00	1294.89	0.788	3.65	13.069	B

Main results: (09:00-09:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	845.00	844.98	514.98	0.00	1202.57	0.703	2.34	10.063	B
2	240.00	240.00	894.97	0.00	709.44	0.338	0.51	7.667	A
3	1020.00	1019.95	50.00	0.00	1294.89	0.788	3.66	13.074	B

Main results: (09:15-09:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	845.00	844.99	514.98	0.00	1202.57	0.703	2.35	10.066	B
2	240.00	240.00	894.98	0.00	709.44	0.338	0.51	7.667	A
3	1020.00	1019.97	50.00	0.00	1294.89	0.788	3.67	13.080	B

Junction D - 2034 Reference (w PWP Works), PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction D	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Reference (w PWP Works), PM	2034 Reference (w PWP Works)	PM		FLAT	18:00	19:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	1,2,3			7.04	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	LAM KAM RD	
2	2	ROUTE TWISK	
3	3	KAM TIN RD	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	3.50	6.20	10.00	15.00	28.00	20.00	
2	3.50	4.00	12.00	15.00	28.00	20.00	
3	4.00	4.50	5.00	60.00	28.00	40.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.630	1526.984
2		(calculated)	(calculated)	0.566	1216.149
3		(calculated)	(calculated)	0.582	1323.987

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
1	FLAT	✓	725.00	100.000
2	FLAT	✓	315.00	100.000
3	FLAT	✓	820.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
18:00-18:15	**1**	725.00	725.00		
18:00-18:15	**2**	315.00	315.00		
18:00-18:15	**3**	820.00	820.00		
18:15-18:30	**1**	725.00	725.00		
18:15-18:30	**2**	315.00	315.00		
18:15-18:30	**3**	820.00	820.00		
18:30-18:45	**1**	725.00	725.00		
18:30-18:45	**2**	315.00	315.00		
18:30-18:45	**3**	820.00	820.00		
18:45-19:00	**1**	725.00	725.00		
18:45-19:00	**2**	315.00	315.00		
18:45-19:00	**3**	820.00	820.00		
19:00-19:15	**1**	725.00	725.00		
19:00-19:15	**2**	315.00	315.00		
19:00-19:15	**3**	820.00	820.00		
19:15-19:30	**1**	725.00	725.00		
19:15-19:30	**2**	315.00	315.00		
19:15-19:30	**3**	820.00	820.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

		To		
		1	2	3
From	1	20.000	60.000	645.000
	2	25.000	0.000	290.000
	3	485.000	210.000	125.000

Turning Proportions (PCU) - Junction 1 (for whole period)

		To		
		1	2	3
From	1	0.03	0.08	0.89
	2	0.08	0.00	0.92
	3	0.59	0.26	0.15

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		1	2	3
From	1	1.000	1.000	1.000
	2	1.000	1.000	1.000
	3	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		1	2	3
From	1	0.0	0.0	0.0
	2	0.0	0.0	0.0
	3	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.55	6.09	1.22	A
2	0.41	7.93	0.69	A
3	0.63	7.53	1.71	A

Main Results for each time segment

Main results: (18:00-18:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	725.00	720.18	332.26	0.00	1317.68	0.550	1.21	5.978	A
2	315.00	312.28	784.55	0.00	771.96	0.408	0.68	7.787	A
3	820.00	813.29	44.65	0.00	1298.00	0.632	1.68	7.330	A

Main results: (18:15-18:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	725.00	724.95	334.97	0.00	1315.97	0.551	1.22	6.090	A
2	315.00	314.97	789.95	0.00	768.91	0.410	0.69	7.929	A
3	820.00	819.92	45.00	0.00	1297.80	0.632	1.70	7.530	A

Main results: (18:30-18:45)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	725.00	724.99	334.99	0.00	1315.96	0.551	1.22	6.091	A
2	315.00	314.99	789.98	0.00	768.88	0.410	0.69	7.931	A
3	820.00	819.97	45.00	0.00	1297.80	0.632	1.70	7.533	A

Main results: (18:45-19:00)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	725.00	724.99	334.99	0.00	1315.95	0.551	1.22	6.091	A
2	315.00	315.00	789.99	0.00	768.88	0.410	0.69	7.931	A
3	820.00	819.99	45.00	0.00	1297.80	0.632	1.71	7.533	A

Main results: (19:00-19:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	725.00	725.00	335.00	0.00	1315.95	0.551	1.22	6.091	A
2	315.00	315.00	790.00	0.00	768.88	0.410	0.69	7.931	A
3	820.00	819.99	45.00	0.00	1297.80	0.632	1.71	7.533	A

Main results: (19:15-19:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	725.00	725.00	335.00	0.00	1315.95	0.551	1.22	6.091	A
2	315.00	315.00	790.00	0.00	768.88	0.410	0.69	7.931	A
3	820.00	819.99	45.00	0.00	1297.80	0.632	1.71	7.533	A

Junction D - 2034 Design (w PWP Works), AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction D	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Design (w PWP Works), AM	2034 Design (w PWP Works)	AM		FLAT	08:00	09:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	1,2,3			12.54	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	LAM KAM RD	
2	2	ROUTE TWISK	
3	3	KAM TIN RD	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	3.50	6.20	10.00	15.00	28.00	20.00	
2	3.50	4.00	12.00	15.00	28.00	20.00	
3	4.00	4.50	5.00	60.00	28.00	40.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.630	1526.984
2		(calculated)	(calculated)	0.566	1216.149
3		(calculated)	(calculated)	0.582	1323.987

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
1	FLAT	✓	865.00	100.000
2	FLAT	✓	245.00	100.000
3	FLAT	✓	1055.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
08:00-08:15	**1**	865.00	865.00		
08:00-08:15	**2**	245.00	245.00		
08:00-08:15	**3**	1055.00	1055.00		
08:15-08:30	**1**	865.00	865.00		
08:15-08:30	**2**	245.00	245.00		
08:15-08:30	**3**	1055.00	1055.00		
08:30-08:45	**1**	865.00	865.00		
08:30-08:45	**2**	245.00	245.00		
08:30-08:45	**3**	1055.00	1055.00		
08:45-09:00	**1**	865.00	865.00		
08:45-09:00	**2**	245.00	245.00		
08:45-09:00	**3**	1055.00	1055.00		
09:00-09:15	**1**	865.00	865.00		
09:00-09:15	**2**	245.00	245.00		
09:00-09:15	**3**	1055.00	1055.00		
09:15-09:30	**1**	865.00	865.00		
09:15-09:30	**2**	245.00	245.00		
09:15-09:30	**3**	1055.00	1055.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

		To		
		1	**2**	**3**
From	**1**	25.000	165.000	675.000
	2	25.000	0.000	220.000
	3	530.000	305.000	220.000

Turning Proportions (PCU) - Junction 1 (for whole period)

		To		
		1	**2**	**3**
From	**1**	0.03	0.19	0.78
	2	0.10	0.00	0.90
	3	0.50	0.29	0.21

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		1	**2**	**3**
From	**1**	1.000	1.000	1.000
	2	1.000	1.000	1.000
	3	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		1	**2**	**3**
From	**1**	0.0	0.0	0.0
	2	0.0	0.0	0.0
	3	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.72	10.86	2.59	B
2	0.35	7.99	0.54	A
3	0.81	14.97	4.33	B

Main Results for each time segment

Main results: (08:00-08:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	865.00	855.12	516.94	0.00	1201.34	0.720	2.47	10.130	B
2	245.00	242.88	908.63	0.00	701.71	0.349	0.53	7.811	A
3	1055.00	1038.79	49.50	0.00	1295.18	0.815	4.05	13.310	B

Main results: (08:15-08:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	865.00	864.69	524.68	0.00	1196.46	0.723	2.55	10.828	B
2	245.00	244.96	919.62	0.00	695.49	0.352	0.54	7.989	A
3	1055.00	1054.35	49.99	0.00	1294.90	0.815	4.21	14.861	B

Main results: (08:30-08:45)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	865.00	864.91	524.88	0.00	1196.33	0.723	2.57	10.849	B
2	245.00	244.99	919.88	0.00	695.34	0.352	0.54	7.993	A
3	1055.00	1054.77	50.00	0.00	1294.89	0.815	4.27	14.929	B

Main results: (08:45-09:00)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	865.00	864.96	524.94	0.00	1196.30	0.723	2.58	10.857	B
2	245.00	245.00	919.94	0.00	695.31	0.352	0.54	7.994	A
3	1055.00	1054.88	50.00	0.00	1294.89	0.815	4.30	14.953	B

Main results: (09:00-09:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	865.00	864.97	524.96	0.00	1196.28	0.723	2.59	10.859	B
2	245.00	245.00	919.96	0.00	695.29	0.352	0.54	7.994	A
3	1055.00	1054.93	50.00	0.00	1294.89	0.815	4.32	14.967	B

Main results: (09:15-09:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	865.00	864.98	524.98	0.00	1196.28	0.723	2.59	10.862	B
2	245.00	245.00	919.98	0.00	695.29	0.352	0.54	7.994	A
3	1055.00	1054.95	50.00	0.00	1294.89	0.815	4.33	14.973	B

Junction D - 2034 Design (w PWP Works), PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction D	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Design (w PWP Works), PM	2034 Design (w PWP Works)	PM		FLAT	18:00	19:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	1,2,3			7.27	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	LAM KAM RD	
2	2	ROUTE TWISK	
3	3	KAM TIN RD	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	3.50	6.20	10.00	15.00	28.00	20.00	
2	3.50	4.00	12.00	15.00	28.00	20.00	
3	4.00	4.50	5.00	60.00	28.00	40.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.630	1526.984
2		(calculated)	(calculated)	0.566	1216.149
3		(calculated)	(calculated)	0.582	1323.987

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
1	FLAT	✓	740.00	100.000
2	FLAT	✓	320.00	100.000
3	FLAT	✓	835.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
18:00-18:15	**1**	740.00	740.00		
18:00-18:15	**2**	320.00	320.00		
18:00-18:15	**3**	835.00	835.00		
18:15-18:30	**1**	740.00	740.00		
18:15-18:30	**2**	320.00	320.00		
18:15-18:30	**3**	835.00	835.00		
18:30-18:45	**1**	740.00	740.00		
18:30-18:45	**2**	320.00	320.00		
18:30-18:45	**3**	835.00	835.00		
18:45-19:00	**1**	740.00	740.00		
18:45-19:00	**2**	320.00	320.00		
18:45-19:00	**3**	835.00	835.00		
19:00-19:15	**1**	740.00	740.00		
19:00-19:15	**2**	320.00	320.00		
19:00-19:15	**3**	835.00	835.00		
19:15-19:30	**1**	740.00	740.00		
19:15-19:30	**2**	320.00	320.00		
19:15-19:30	**3**	835.00	835.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

		To		
		1	**2**	**3**
From	**1**	20.000	60.000	660.000
	2	25.000	0.000	295.000
	3	495.000	210.000	130.000

Turning Proportions (PCU) - Junction 1 (for whole period)

		To		
		1	**2**	**3**
From	**1**	0.03	0.08	0.89
	2	0.08	0.00	0.92
	3	0.59	0.25	0.16

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		1	**2**	**3**
From	**1**	1.000	1.000	1.000
	2	1.000	1.000	1.000
	3	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		1	**2**	**3**
From	**1**	0.0	0.0	0.0
	2	0.0	0.0	0.0
	3	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.56	6.28	1.29	A
2	0.42	8.23	0.73	A
3	0.64	7.78	1.80	A

Main Results for each time segment

Main results: (18:00-18:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	740.00	734.93	337.13	0.00	1314.61	0.563	1.27	6.159	A
2	320.00	317.14	804.24	0.00	760.81	0.421	0.71	8.064	A
3	835.00	827.95	44.64	0.00	1298.01	0.643	1.76	7.554	A

Main results: (18:15-18:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	740.00	739.95	339.97	0.00	1312.82	0.564	1.28	6.283	A
2	320.00	319.96	809.94	0.00	757.59	0.422	0.72	8.225	A
3	835.00	834.92	45.00	0.00	1297.80	0.643	1.78	7.773	A

Main results: (18:30-18:45)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	740.00	739.98	339.99	0.00	1312.81	0.564	1.28	6.284	A
2	320.00	319.99	809.98	0.00	757.56	0.422	0.73	8.227	A
3	835.00	834.97	45.00	0.00	1297.80	0.643	1.79	7.776	A

Main results: (18:45-19:00)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	740.00	739.99	339.99	0.00	1312.80	0.564	1.29	6.284	A
2	320.00	320.00	809.99	0.00	757.56	0.422	0.73	8.227	A
3	835.00	834.99	45.00	0.00	1297.80	0.643	1.79	7.776	A

Main results: (19:00-19:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	740.00	740.00	340.00	0.00	1312.80	0.564	1.29	6.284	A
2	320.00	320.00	809.99	0.00	757.55	0.422	0.73	8.227	A
3	835.00	834.99	45.00	0.00	1297.80	0.643	1.80	7.778	A

Main results: (19:15-19:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	740.00	740.00	340.00	0.00	1312.80	0.564	1.29	6.284	A
2	320.00	320.00	810.00	0.00	757.55	0.422	0.73	8.227	A
3	835.00	834.99	45.00	0.00	1297.80	0.643	1.80	7.778	A

Junctions 8

PICADY 8 - Priority Intersection Module

Version: 8.0.5.523 [19102,19/06/2015]

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Filename: DD112 Jn E.arc8
Path: \\CTA_NAS01\Project\CTA Consultants Limited\CTA - Project\21134HK (wkk) - S12A Application (DD106, 110, 112 & 113) in Kam Tin\DD112 - LFT (Alex Leung)\Cal\2024-07-26
Report generation date: 26/7/2024 11:34:56

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	Junction E - 2034 Design							
Stream B-AC	0.25	10.16	0.20	B	0.09	8.83	0.08	A
Stream C-A	-	-	-	-	-	-	-	-
Stream C-B	0.07	7.52	0.07	A	0.04	7.44	0.04	A
Stream A-B	-	-	-	-	-	-	-	-
Stream A-C	-	-	-	-	-	-	-	-
	Junction E - 2034 Reference							
Stream B-AC	0.00	0.00	0.00	A	0.00	0.00	0.00	A
Stream C-A	-	-	-	-	-	-	-	-
Stream C-B	0.00	0.00	0.00	A	0.00	0.00	0.00	A
Stream A-B	-	-	-	-	-	-	-	-
Stream A-C	-	-	-	-	-	-	-	-

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle.

"D10 - 2034 Reference, AM " model duration: 8:00 - 9:30
"D11 - 2034 Reference, PM" model duration: 18:00 - 19:30
"D12 - 2034 Design, AM" model duration: 8:00 - 9:30
"D13 - 2034 Design, PM" model duration: 18:00 - 19:30

Run using Junctions 8.0.5.523 at 26/7/2024 11:34:53

File summary

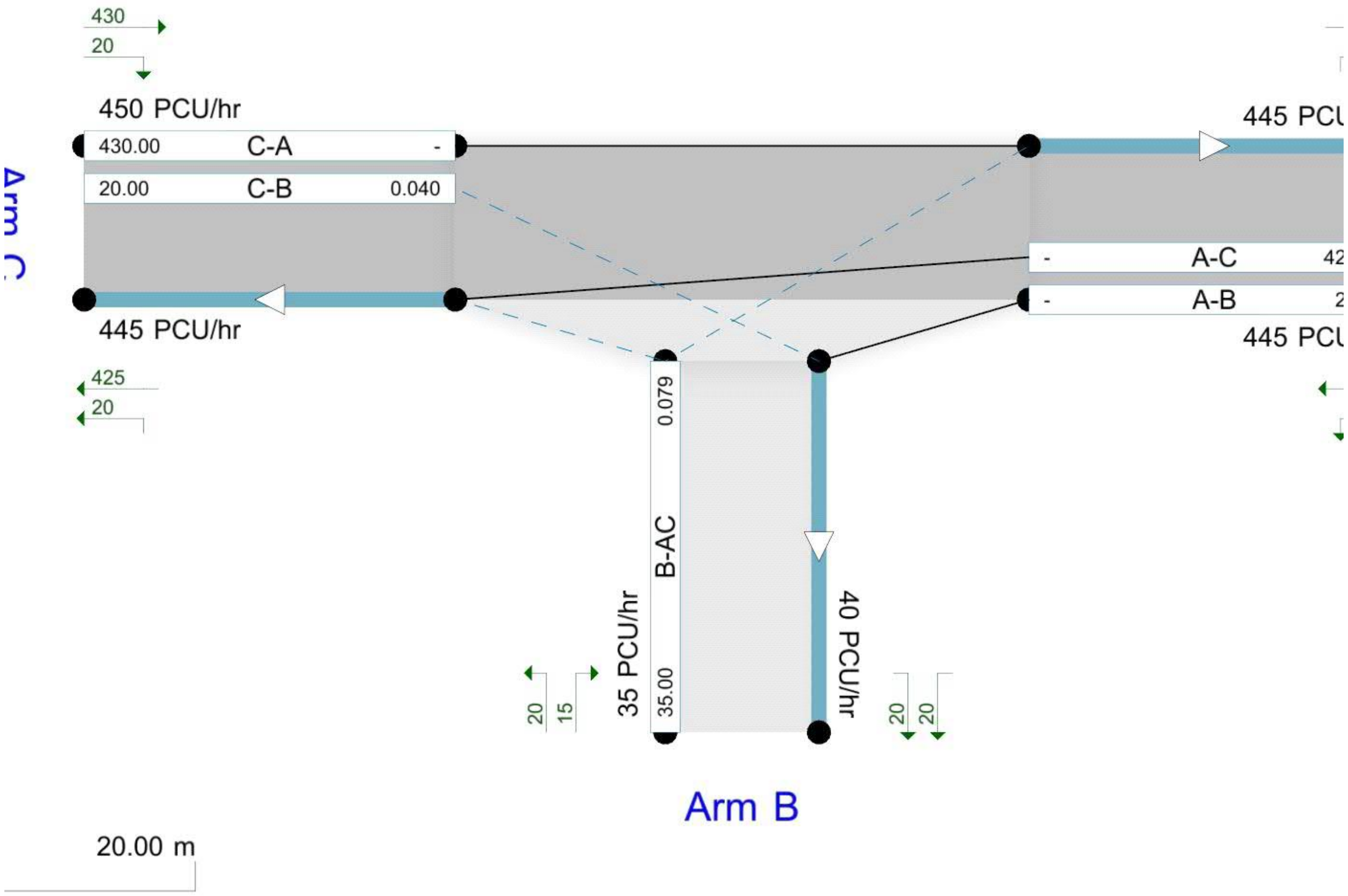
Title	(untitled)
Location	
Site Number	
Date	3/7/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	ITADMIN
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCU	PCU	perHour	s	-Min	perMin



Showing modelled flow through junction (PCU/hr).
Streams (upstreams) show Total Demand (PCU/hr); Streams (downstreams) show RFC ()
Time Segment: (08:00-08:15)
Showing Analysis Set "A1 - Junction E "; Demand Set "D10 - 2034 Reference, AM "

The junction diagram reflects the last run of ARCADY.

Junction E - 2034 Reference, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction E	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Reference, AM	2034 Reference	AM		FLAT	08:00	09:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
B	Kam Seung Road / Kam Shui South road	T-Junction	Two-way	A,B,C	0.00	F

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Kam Sheung Road		Major
B	B	Development Access		Minor
C	C	Kam Sheung Road		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	7.00		0.00		2.20	50.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	3.00										50	50

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B	B-A	518.507	0.090	0.228	0.144	0.326
B	B-C	655.413	0.096	0.243	-	-
B	C-B	602.919	0.223	0.223	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	FLAT	✓	375.00	100.000
B	FLAT	✓	0.00	100.000
C	FLAT	✓	465.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
08:00-08:15	**A**	375.00	375.00		
08:00-08:15	**B**	0.00	0.00		
08:00-08:15	**C**	465.00	465.00		
08:15-08:30	**A**	375.00	375.00		
08:15-08:30	**B**	0.00	0.00		
08:15-08:30	**C**	465.00	465.00		
08:30-08:45	**A**	375.00	375.00		
08:30-08:45	**B**	0.00	0.00		
08:30-08:45	**C**	465.00	465.00		
08:45-09:00	**A**	375.00	375.00		
08:45-09:00	**B**	0.00	0.00		
08:45-09:00	**C**	465.00	465.00		
09:00-09:15	**A**	375.00	375.00		
09:00-09:15	**B**	0.00	0.00		
09:00-09:15	**C**	465.00	465.00		
09:15-09:30	**A**	375.00	375.00		
09:15-09:30	**B**	0.00	0.00		
09:15-09:30	**C**	465.00	465.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction B (for whole period)

		To		
		A	B	C
From	A	0.000	0.000	375.000
	B	0.000	0.000	0.000
	C	465.000	0.000	0.000

Turning Proportions (PCU) - Junction B (for whole period)

		To		
		A	B	C
From	A	0.00	0.00	1.00
	B	0.33	0.33	0.33
	C	1.00	0.00	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction B (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction B (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.00	0.00	0.00	A
C-A	-	-	-	-
C-B	0.00	0.00	0.00	A
A-B	-	-	-	-
A-C	-	-	-	-

Main Results for each time segment

Main results: (08:00-08:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	0.00	0.00	0.00	444.09	0.000	0.00	0.000	A
C-A	465.00	465.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	519.13	0.000	0.00	0.000	A
A-B	0.00	0.00	0.00	-	-	-	-	-
A-C	375.00	375.00	0.00	-	-	-	-	-

Main results: (08:15-08:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	0.00	0.00	0.00	444.09	0.000	0.00	0.000	A
C-A	465.00	465.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	519.13	0.000	0.00	0.000	A
A-B	0.00	0.00	0.00	-	-	-	-	-
A-C	375.00	375.00	0.00	-	-	-	-	-

Main results: (08:30-08:45)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	0.00	0.00	0.00	444.09	0.000	0.00	0.000	A
C-A	465.00	465.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	519.13	0.000	0.00	0.000	A
A-B	0.00	0.00	0.00	-	-	-	-	-
A-C	375.00	375.00	0.00	-	-	-	-	-

Main results: (08:45-09:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	0.00	0.00	0.00	444.09	0.000	0.00	0.000	A
C-A	465.00	465.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	519.13	0.000	0.00	0.000	A
A-B	0.00	0.00	0.00	-	-	-	-	-
A-C	375.00	375.00	0.00	-	-	-	-	-

Main results: (09:00-09:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	0.00	0.00	0.00	444.09	0.000	0.00	0.000	A
C-A	465.00	465.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	519.13	0.000	0.00	0.000	A
A-B	0.00	0.00	0.00	-	-	-	-	-
A-C	375.00	375.00	0.00	-	-	-	-	-

Main results: (09:15-09:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	0.00	0.00	0.00	444.09	0.000	0.00	0.000	A
C-A	465.00	465.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	519.13	0.000	0.00	0.000	A
A-B	0.00	0.00	0.00	-	-	-	-	-
A-C	375.00	375.00	0.00	-	-	-	-	-

Junction E - 2034 Reference, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction E	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Reference, PM	2034 Reference	PM		FLAT	18:00	19:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
B	Kam Seung Road / Kam Shui South road	T-Junction	Two-way	A,B,C	0.00	F

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Kam Sheung Road		Major
B	B	Development Access		Minor
C	C	Kam Sheung Road		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	7.00		0.00		2.20	50.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	3.00										50	50

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B	B-A	518.507	0.090	0.228	0.144	0.326
B	B-C	655.413	0.096	0.243	-	-
B	C-B	602.919	0.223	0.223	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	FLAT	✓	425.00	100.000
B	FLAT	✓	0.00	100.000
C	FLAT	✓	430.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
18:00-18:15	**A**	425.00	425.00		
18:00-18:15	**B**	0.00	0.00		
18:00-18:15	**C**	430.00	430.00		
18:15-18:30	**A**	425.00	425.00		
18:15-18:30	**B**	0.00	0.00		
18:15-18:30	**C**	430.00	430.00		
18:30-18:45	**A**	425.00	425.00		
18:30-18:45	**B**	0.00	0.00		
18:30-18:45	**C**	430.00	430.00		
18:45-19:00	**A**	425.00	425.00		
18:45-19:00	**B**	0.00	0.00		
18:45-19:00	**C**	430.00	430.00		
19:00-19:15	**A**	425.00	425.00		
19:00-19:15	**B**	0.00	0.00		
19:00-19:15	**C**	430.00	430.00		
19:15-19:30	**A**	425.00	425.00		
19:15-19:30	**B**	0.00	0.00		
19:15-19:30	**C**	430.00	430.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction B (for whole period)

		To		
		A	**B**	**C**
From	**A**	0.000	0.000	425.000
	B	0.000	0.000	0.000
	C	430.000	0.000	0.000

Turning Proportions (PCU) - Junction B (for whole period)

		To		
		A	**B**	**C**
From	**A**	0.00	0.00	1.00
	B	0.33	0.33	0.33
	C	1.00	0.00	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction B (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction B (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.00	0.00	0.00	A
C-A	-	-	-	-
C-B	0.00	0.00	0.00	A
A-B	-	-	-	-
A-C	-	-	-	-

Main Results for each time segment

Main results: (18:00-18:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	0.00	0.00	0.00	435.63	0.000	0.00	0.000	A
C-A	430.00	430.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	507.96	0.000	0.00	0.000	A
A-B	0.00	0.00	0.00	-	-	-	-	-
A-C	425.00	425.00	0.00	-	-	-	-	-

Main results: (18:15-18:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	0.00	0.00	0.00	435.63	0.000	0.00	0.000	A
C-A	430.00	430.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	507.96	0.000	0.00	0.000	A
A-B	0.00	0.00	0.00	-	-	-	-	-
A-C	425.00	425.00	0.00	-	-	-	-	-

Main results: (18:30-18:45)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	0.00	0.00	0.00	435.63	0.000	0.00	0.000	A
C-A	430.00	430.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	507.96	0.000	0.00	0.000	A
A-B	0.00	0.00	0.00	-	-	-	-	-
A-C	425.00	425.00	0.00	-	-	-	-	-

Main results: (18:45-19:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	0.00	0.00	0.00	435.63	0.000	0.00	0.000	A
C-A	430.00	430.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	507.96	0.000	0.00	0.000	A
A-B	0.00	0.00	0.00	-	-	-	-	-
A-C	425.00	425.00	0.00	-	-	-	-	-

Main results: (19:00-19:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	0.00	0.00	0.00	435.63	0.000	0.00	0.000	A
C-A	430.00	430.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	507.96	0.000	0.00	0.000	A
A-B	0.00	0.00	0.00	-	-	-	-	-
A-C	425.00	425.00	0.00	-	-	-	-	-

Main results: (19:15-19:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	0.00	0.00	0.00	435.63	0.000	0.00	0.000	A
C-A	430.00	430.00	0.00	-	-	-	-	-
C-B	0.00	0.00	0.00	507.96	0.000	0.00	0.000	A
A-B	0.00	0.00	0.00	-	-	-	-	-
A-C	425.00	425.00	0.00	-	-	-	-	-

Junction E - 2034 Design, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction E	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Design, AM	2034 Design	AM		FLAT	08:00	09:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
B	Kam Seung Road / Kam Shui South road	T-Junction	Two-way	A,B,C	9.42	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Kam Sheung Road		Major
B	B	Development Access		Minor
C	C	Kam Sheung Road		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	7.00		0.00		2.20	50.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	3.00										50	50

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B	B-A	518.507	0.090	0.228	0.144	0.326
B	B-C	655.413	0.096	0.243	-	-
B	C-B	602.919	0.223	0.223	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	FLAT	✓	400.00	100.000
B	FLAT	✓	90.00	100.000
C	FLAT	✓	500.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
08:00-08:15	**A**	400.00	400.00		
08:00-08:15	**B**	90.00	90.00		
08:00-08:15	**C**	500.00	500.00		
08:15-08:30	**A**	400.00	400.00		
08:15-08:30	**B**	90.00	90.00		
08:15-08:30	**C**	500.00	500.00		
08:30-08:45	**A**	400.00	400.00		
08:30-08:45	**B**	90.00	90.00		
08:30-08:45	**C**	500.00	500.00		
08:45-09:00	**A**	400.00	400.00		
08:45-09:00	**B**	90.00	90.00		
08:45-09:00	**C**	500.00	500.00		
09:00-09:15	**A**	400.00	400.00		
09:00-09:15	**B**	90.00	90.00		
09:00-09:15	**C**	500.00	500.00		
09:15-09:30	**A**	400.00	400.00		
09:15-09:30	**B**	90.00	90.00		
09:15-09:30	**C**	500.00	500.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction B (for whole period)

	To			
From		A	B	C
	A	0.000	25.000	375.000
	B	40.000	0.000	50.000
	C	465.000	35.000	0.000

Turning Proportions (PCU) - Junction B (for whole period)

	To			
From		A	B	C
	A	0.00	0.06	0.94
	B	0.44	0.00	0.56
	C	0.93	0.07	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction B (for whole period)

	To			
From		A	B	C
	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction B (for whole period)

	To			
From		A	B	C
	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.20	10.16	0.25	B
C-A	-	-	-	-
C-B	0.07	7.52	0.07	A
A-B	-	-	-	-
A-C	-	-	-	-

Main Results for each time segment

Main results: (08:00-08:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	90.00	89.00	0.00	444.49	0.202	0.25	10.099	B
C-A	465.00	465.00	0.00	-	-	-	-	-
C-B	35.00	34.71	0.00	513.54	0.068	0.07	7.513	A
A-B	25.00	25.00	0.00	-	-	-	-	-
A-C	375.00	375.00	0.00	-	-	-	-	-

Main results: (08:15-08:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	90.00	89.99	0.00	444.42	0.203	0.25	10.156	B
C-A	465.00	465.00	0.00	-	-	-	-	-
C-B	35.00	35.00	0.00	513.54	0.068	0.07	7.521	A
A-B	25.00	25.00	0.00	-	-	-	-	-
A-C	375.00	375.00	0.00	-	-	-	-	-

Main results: (08:30-08:45)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	90.00	90.00	0.00	444.42	0.203	0.25	10.156	B
C-A	465.00	465.00	0.00	-	-	-	-	-
C-B	35.00	35.00	0.00	513.54	0.068	0.07	7.521	A
A-B	25.00	25.00	0.00	-	-	-	-	-
A-C	375.00	375.00	0.00	-	-	-	-	-

Main results: (08:45-09:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	90.00	90.00	0.00	444.42	0.203	0.25	10.156	B
C-A	465.00	465.00	0.00	-	-	-	-	-
C-B	35.00	35.00	0.00	513.54	0.068	0.07	7.521	A
A-B	25.00	25.00	0.00	-	-	-	-	-
A-C	375.00	375.00	0.00	-	-	-	-	-

Main results: (09:00-09:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	90.00	90.00	0.00	444.42	0.203	0.25	10.156	B
C-A	465.00	465.00	0.00	-	-	-	-	-
C-B	35.00	35.00	0.00	513.54	0.068	0.07	7.521	A
A-B	25.00	25.00	0.00	-	-	-	-	-
A-C	375.00	375.00	0.00	-	-	-	-	-

Main results: (09:15-09:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	90.00	90.00	0.00	444.42	0.203	0.25	10.156	B
C-A	465.00	465.00	0.00	-	-	-	-	-
C-B	35.00	35.00	0.00	513.54	0.068	0.07	7.521	A
A-B	25.00	25.00	0.00	-	-	-	-	-
A-C	375.00	375.00	0.00	-	-	-	-	-

Junction E - 2034 Design, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction E	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Design, PM	2034 Design	PM		FLAT	18:00	19:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
B	Kam Seung Road / Kam Shui South road	T-Junction	Two-way	A,B,C	8.32	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Kam Sheung Road		Major
B	B	Development Access		Minor
C	C	Kam Sheung Road		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	7.00		0.00		2.20	50.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	3.00										50	50

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B	B-A	518.507	0.090	0.228	0.144	0.326
B	B-C	655.413	0.096	0.243	-	-
B	C-B	602.919	0.223	0.223	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	FLAT	✓	445.00	100.000
B	FLAT	✓	35.00	100.000
C	FLAT	✓	450.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
18:00-18:15	**A**	445.00	445.00		
18:00-18:15	**B**	35.00	35.00		
18:00-18:15	**C**	450.00	450.00		
18:15-18:30	**A**	445.00	445.00		
18:15-18:30	**B**	35.00	35.00		
18:15-18:30	**C**	450.00	450.00		
18:30-18:45	**A**	445.00	445.00		
18:30-18:45	**B**	35.00	35.00		
18:30-18:45	**C**	450.00	450.00		
18:45-19:00	**A**	445.00	445.00		
18:45-19:00	**B**	35.00	35.00		
18:45-19:00	**C**	450.00	450.00		
19:00-19:15	**A**	445.00	445.00		
19:00-19:15	**B**	35.00	35.00		
19:00-19:15	**C**	450.00	450.00		
19:15-19:30	**A**	445.00	445.00		
19:15-19:30	**B**	35.00	35.00		
19:15-19:30	**C**	450.00	450.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction B (for whole period)

		To		
		A	**B**	**C**
From	**A**	0.000	20.000	425.000
	B	15.000	0.000	20.000
	C	430.000	20.000	0.000

Turning Proportions (PCU) - Junction B (for whole period)

		To		
		A	**B**	**C**
From	**A**	0.00	0.04	0.96
	B	0.43	0.00	0.57
	C	0.96	0.04	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction B (for whole period)

	To			
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction B (for whole period)

	To			
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.08	8.83	0.09	A
C-A	-	-	-	-
C-B	0.04	7.44	0.04	A
A-B	-	-	-	-
A-C	-	-	-	-

Main Results for each time segment

Main results: (18:00-18:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	35.00	34.66	0.00	442.84	0.079	0.08	8.812	A
C-A	430.00	430.00	0.00	-	-	-	-	-
C-B	20.00	19.84	0.00	503.49	0.040	0.04	7.442	A
A-B	20.00	20.00	0.00	-	-	-	-	-
A-C	425.00	425.00	0.00	-	-	-	-	-

Main results: (18:15-18:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	35.00	35.00	0.00	442.80	0.079	0.09	8.827	A
C-A	430.00	430.00	0.00	-	-	-	-	-
C-B	20.00	20.00	0.00	503.49	0.040	0.04	7.444	A
A-B	20.00	20.00	0.00	-	-	-	-	-
A-C	425.00	425.00	0.00	-	-	-	-	-

Main results: (18:30-18:45)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	35.00	35.00	0.00	442.80	0.079	0.09	8.827	A
C-A	430.00	430.00	0.00	-	-	-	-	-
C-B	20.00	20.00	0.00	503.49	0.040	0.04	7.444	A
A-B	20.00	20.00	0.00	-	-	-	-	-
A-C	425.00	425.00	0.00	-	-	-	-	-

Main results: (18:45-19:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	35.00	35.00	0.00	442.80	0.079	0.09	8.827	A
C-A	430.00	430.00	0.00	-	-	-	-	-
C-B	20.00	20.00	0.00	503.49	0.040	0.04	7.444	A
A-B	20.00	20.00	0.00	-	-	-	-	-
A-C	425.00	425.00	0.00	-	-	-	-	-

Main results: (19:00-19:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	35.00	35.00	0.00	442.80	0.079	0.09	8.827	A
C-A	430.00	430.00	0.00	-	-	-	-	-
C-B	20.00	20.00	0.00	503.49	0.040	0.04	7.444	A
A-B	20.00	20.00	0.00	-	-	-	-	-
A-C	425.00	425.00	0.00	-	-	-	-	-

Main results: (19:15-19:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	35.00	35.00	0.00	442.80	0.079	0.09	8.827	A
C-A	430.00	430.00	0.00	-	-	-	-	-
C-B	20.00	20.00	0.00	503.49	0.040	0.04	7.444	A
A-B	20.00	20.00	0.00	-	-	-	-	-
A-C	425.00	425.00	0.00	-	-	-	-	-

Junctions 8

PICADY 8 - Priority Intersection Module

Version: 8.0.5.523 [19102,19/06/2015]

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Filename: DD112 Jn G.arc8
Path: \\CTA_NAS01\Project\CTA Consultants Limited\CTA - Project\21134HK (wkk) - S12A Application (DD106, 110, 112 & 113) in Kam Tin\DD112 - LFT (Alex Leung)\Cal\2024-07-26
Report generation date: 26/7/2024 11:35:06

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	Junction G - 2021 Exist							
Stream B-C	0.03	6.65	0.03	A	0.01	6.20	0.01	A
Stream B-A	0.03	9.88	0.03	A	0.03	9.11	0.02	A
Stream C-A	-	-	-	-	-	-	-	-
Stream C-B	0.02	7.24	0.02	A	0.02	6.86	0.02	A
Stream A-B	-	-	-	-	-	-	-	-
Stream A-C	-	-	-	-	-	-	-	-
	Junction G - 2034 Design							
Stream B-C	0.04	7.18	0.04	A	0.01	6.44	0.01	A
Stream B-A	0.05	11.84	0.05	B	0.03	10.15	0.03	B
Stream C-A	-	-	-	-	-	-	-	-
Stream C-B	0.02	7.71	0.02	A	0.02	7.14	0.02	A
Stream A-B	-	-	-	-	-	-	-	-
Stream A-C	-	-	-	-	-	-	-	-
	Junction G - 2034 Reference							
Stream B-C	0.04	7.15	0.04	A	0.01	6.44	0.01	A
Stream B-A	0.03	11.50	0.03	B	0.03	10.08	0.03	B
Stream C-A	-	-	-	-	-	-	-	-
Stream C-B	0.02	7.71	0.02	A	0.02	7.14	0.02	A
Stream A-B	-	-	-	-	-	-	-	-
Stream A-C	-	-	-	-	-	-	-	-

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle.

"D10 - 2021 Exist, AM " model duration: 8:00 - 9:30
"D11 - 2021 Exist, PM" model duration: 18:00 - 19:30
"D14 - 2034 Reference, AM" model duration: 8:00 - 9:30
"D15 - 2034 Reference, PM" model duration: 18:00 - 19:30
"D16 - 2034 Design, AM" model duration: 8:00 - 9:30
"D17 - 2034 Design, PM" model duration: 18:00 - 19:30

Run using Junctions 8.0.5.523 at 26/7/2024 11:35:01

File summary

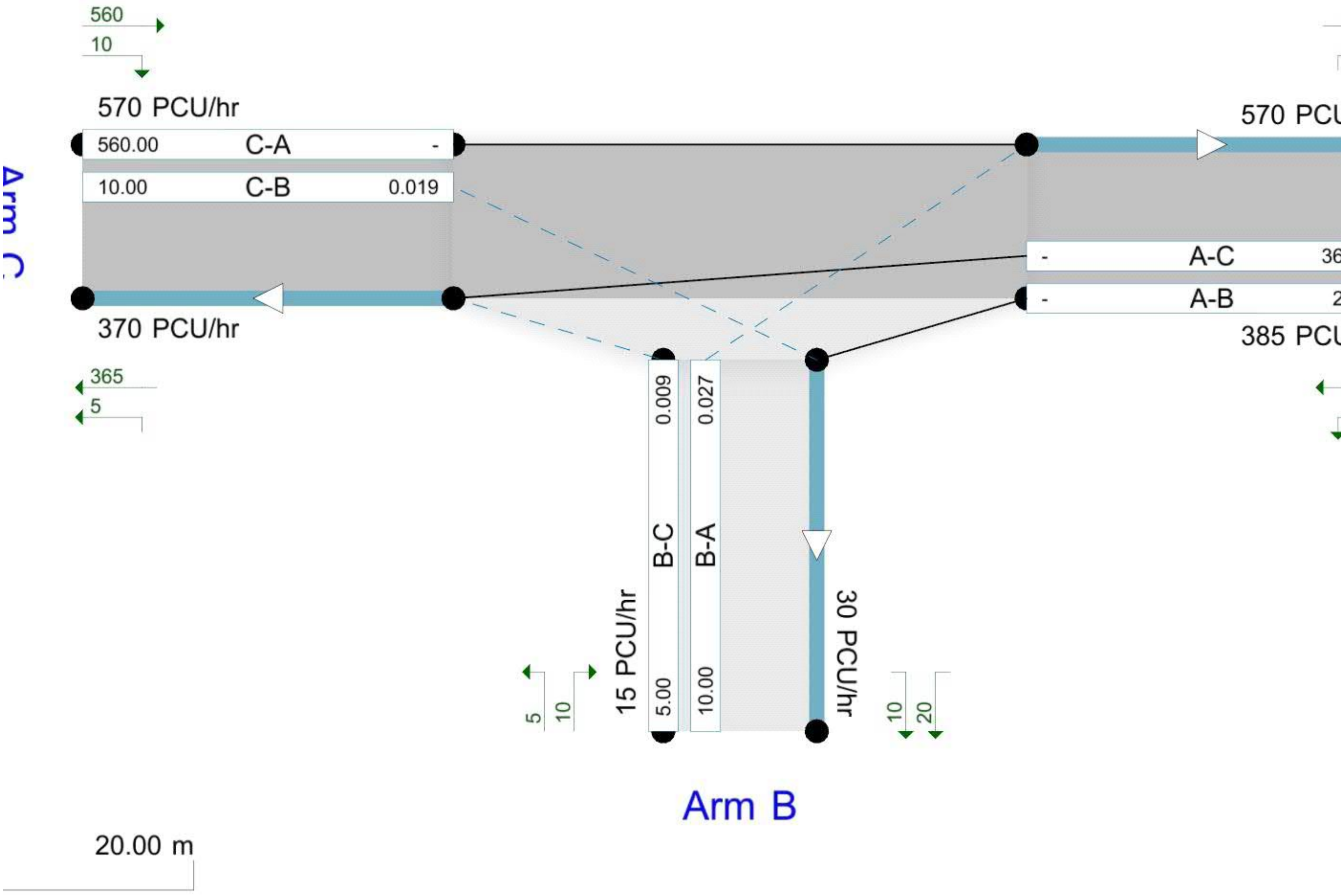
Title	(untitled)
Location	
Site Number	
Date	3/7/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	ITADMIN
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCU	PCU	perHour	s	-Min	perMin



Showing modelled flow through junction (PCU/hr).
Streams (upstreams) show Total Demand (PCU/hr); Streams (downstreams) show RFC ()
Time Segment: (08:00-08:15)
Showing Analysis Set "A1 - Junction G "; Demand Set "D10 - 2021 Exist, AM "

The junction diagram reflects the last run of ARCADY.

Junction G - 2021 Exist, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction G	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2021 Exist, AM	2021 Exist	AM		FLAT	08:00	09:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
G	Ko Sheung Road / Kam Sheung Road	T-Junction	Two-way	A,B,C	7.74	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Kam Sheung Road		Major
B	B	Development Access		Minor
C	C	Kam Sheung Road		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	6.26		0.00		2.20	50.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	Two lanes		3.10	3.60								50	50

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
G	B-A	549.653	0.099	0.250	0.157	0.357
G	B-C	661.975	0.100	0.254	-	-
G	C-B	602.919	0.231	0.231	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	FLAT	✓	415.00	100.000
B	FLAT	✓	25.00	100.000
C	FLAT	✓	460.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
08:00-08:15	**A**	415.00	415.00		
08:00-08:15	**B**	25.00	25.00		
08:00-08:15	**C**	460.00	460.00		
08:15-08:30	**A**	415.00	415.00		
08:15-08:30	**B**	25.00	25.00		
08:15-08:30	**C**	460.00	460.00		
08:30-08:45	**A**	415.00	415.00		
08:30-08:45	**B**	25.00	25.00		
08:30-08:45	**C**	460.00	460.00		
08:45-09:00	**A**	415.00	415.00		
08:45-09:00	**B**	25.00	25.00		
08:45-09:00	**C**	460.00	460.00		
09:00-09:15	**A**	415.00	415.00		
09:00-09:15	**B**	25.00	25.00		
09:00-09:15	**C**	460.00	460.00		
09:15-09:30	**A**	415.00	415.00		
09:15-09:30	**B**	25.00	25.00		
09:15-09:30	**C**	460.00	460.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction G (for whole period)

		To		
		A	B	C
From	A	0.000	20.000	395.000
	B	10.000	0.000	15.000
	C	450.000	10.000	0.000

Turning Proportions (PCU) - Junction G (for whole period)

		To		
		A	B	C
From	A	0.00	0.05	0.95
	B	0.40	0.00	0.60
	C	0.98	0.02	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction G (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction G (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.03	6.65	0.03	A
B-A	0.03	9.88	0.03	A
C-A	-	-	-	-
C-B	0.02	7.24	0.02	A
A-B	-	-	-	-
A-C	-	-	-	-

Main Results for each time segment

Main results: (08:00-08:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	15.00	14.89	0.00	556.07	0.027	0.03	6.650	A
B-A	10.00	9.89	0.00	374.45	0.027	0.03	9.871	A
C-A	450.00	450.00	0.00	-	-	-	-	-
C-B	10.00	9.92	0.00	507.07	0.020	0.02	7.241	A
A-B	20.00	20.00	0.00	-	-	-	-	-
A-C	395.00	395.00	0.00	-	-	-	-	-

Main results: (08:15-08:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	15.00	15.00	0.00	556.03	0.027	0.03	6.653	A
B-A	10.00	10.00	0.00	374.42	0.027	0.03	9.878	A
C-A	450.00	450.00	0.00	-	-	-	-	-
C-B	10.00	10.00	0.00	507.07	0.020	0.02	7.241	A
A-B	20.00	20.00	0.00	-	-	-	-	-
A-C	395.00	395.00	0.00	-	-	-	-	-

Main results: (08:30-08:45)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	15.00	15.00	0.00	556.02	0.027	0.03	6.653	A
B-A	10.00	10.00	0.00	374.42	0.027	0.03	9.878	A
C-A	450.00	450.00	0.00	-	-	-	-	-
C-B	10.00	10.00	0.00	507.07	0.020	0.02	7.241	A
A-B	20.00	20.00	0.00	-	-	-	-	-
A-C	395.00	395.00	0.00	-	-	-	-	-

Main results: (08:45-09:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	15.00	15.00	0.00	556.02	0.027	0.03	6.653	A
B-A	10.00	10.00	0.00	374.42	0.027	0.03	9.878	A
C-A	450.00	450.00	0.00	-	-	-	-	-
C-B	10.00	10.00	0.00	507.07	0.020	0.02	7.241	A
A-B	20.00	20.00	0.00	-	-	-	-	-
A-C	395.00	395.00	0.00	-	-	-	-	-

Main results: (09:00-09:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	15.00	15.00	0.00	556.02	0.027	0.03	6.653	A
B-A	10.00	10.00	0.00	374.42	0.027	0.03	9.878	A
C-A	450.00	450.00	0.00	-	-	-	-	-
C-B	10.00	10.00	0.00	507.07	0.020	0.02	7.241	A
A-B	20.00	20.00	0.00	-	-	-	-	-
A-C	395.00	395.00	0.00	-	-	-	-	-

Main results: (09:15-09:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	15.00	15.00	0.00	556.02	0.027	0.03	6.653	A
B-A	10.00	10.00	0.00	374.42	0.027	0.03	9.878	A
C-A	450.00	450.00	0.00	-	-	-	-	-
C-B	10.00	10.00	0.00	507.07	0.020	0.02	7.241	A
A-B	20.00	20.00	0.00	-	-	-	-	-
A-C	395.00	395.00	0.00	-	-	-	-	-

Junction G - 2021 Exist, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction G	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2021 Exist, PM	2021 Exist	PM		FLAT	18:00	19:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
G	Ko Sheung Road / Kam Sheung Road	T-Junction	Two-way	A,B,C	7.63	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Kam Sheung Road		Major
B	B	Development Access		Minor
C	C	Kam Sheung Road		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	6.26		0.00		2.20	50.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	Two lanes		3.10	3.60								50	50

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
G	B-A	549.653	0.099	0.250	0.157	0.357
G	B-C	661.975	0.100	0.254	-	-
G	C-B	602.919	0.231	0.231	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	FLAT	✓	295.00	100.000
B	FLAT	✓	15.00	100.000
C	FLAT	✓	450.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
18:00-18:15	**A**	295.00	295.00		
18:00-18:15	**B**	15.00	15.00		
18:00-18:15	**C**	450.00	450.00		
18:15-18:30	**A**	295.00	295.00		
18:15-18:30	**B**	15.00	15.00		
18:15-18:30	**C**	450.00	450.00		
18:30-18:45	**A**	295.00	295.00		
18:30-18:45	**B**	15.00	15.00		
18:30-18:45	**C**	450.00	450.00		
18:45-19:00	**A**	295.00	295.00		
18:45-19:00	**B**	15.00	15.00		
18:45-19:00	**C**	450.00	450.00		
19:00-19:15	**A**	295.00	295.00		
19:00-19:15	**B**	15.00	15.00		
19:00-19:15	**C**	450.00	450.00		
19:15-19:30	**A**	295.00	295.00		
19:15-19:30	**B**	15.00	15.00		
19:15-19:30	**C**	450.00	450.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction G (for whole period)

		To		
		A	**B**	**C**
From	**A**	0.000	15.000	280.000
	B	10.000	0.000	5.000
	C	440.000	10.000	0.000

Turning Proportions (PCU) - Junction G (for whole period)

		To		
		A	**B**	**C**
From	**A**	0.00	0.05	0.95
	B	0.67	0.00	0.33
	C	0.98	0.02	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction G (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction G (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.01	6.20	0.01	A
B-A	0.02	9.11	0.03	A
C-A	-	-	-	-
C-B	0.02	6.86	0.02	A
A-B	-	-	-	-
A-C	-	-	-	-

Main Results for each time segment

Main results: (18:00-18:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	5.00	4.97	0.00	585.83	0.009	0.01	6.197	A
B-A	10.00	9.90	0.00	405.29	0.025	0.03	9.103	A
C-A	440.00	440.00	0.00	-	-	-	-	-
C-B	10.00	9.92	0.00	534.79	0.019	0.02	6.859	A
A-B	15.00	15.00	0.00	-	-	-	-	-
A-C	280.00	280.00	0.00	-	-	-	-	-

Main results: (18:15-18:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	5.00	5.00	0.00	585.79	0.009	0.01	6.197	A
B-A	10.00	10.00	0.00	405.26	0.025	0.03	9.107	A
C-A	440.00	440.00	0.00	-	-	-	-	-
C-B	10.00	10.00	0.00	534.79	0.019	0.02	6.859	A
A-B	15.00	15.00	0.00	-	-	-	-	-
A-C	280.00	280.00	0.00	-	-	-	-	-

Main results: (18:30-18:45)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	5.00	5.00	0.00	585.79	0.009	0.01	6.197	A
B-A	10.00	10.00	0.00	405.26	0.025	0.03	9.107	A
C-A	440.00	440.00	0.00	-	-	-	-	-
C-B	10.00	10.00	0.00	534.79	0.019	0.02	6.859	A
A-B	15.00	15.00	0.00	-	-	-	-	-
A-C	280.00	280.00	0.00	-	-	-	-	-

Main results: (18:45-19:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	5.00	5.00	0.00	585.79	0.009	0.01	6.197	A
B-A	10.00	10.00	0.00	405.26	0.025	0.03	9.107	A
C-A	440.00	440.00	0.00	-	-	-	-	-
C-B	10.00	10.00	0.00	534.79	0.019	0.02	6.859	A
A-B	15.00	15.00	0.00	-	-	-	-	-
A-C	280.00	280.00	0.00	-	-	-	-	-

Main results: (19:00-19:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	5.00	5.00	0.00	585.79	0.009	0.01	6.197	A
B-A	10.00	10.00	0.00	405.26	0.025	0.03	9.107	A
C-A	440.00	440.00	0.00	-	-	-	-	-
C-B	10.00	10.00	0.00	534.79	0.019	0.02	6.859	A
A-B	15.00	15.00	0.00	-	-	-	-	-
A-C	280.00	280.00	0.00	-	-	-	-	-

Main results: (19:15-19:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	5.00	5.00	0.00	585.79	0.009	0.01	6.200	A
B-A	10.00	10.00	0.00	405.26	0.025	0.03	9.107	A
C-A	440.00	440.00	0.00	-	-	-	-	-
C-B	10.00	10.00	0.00	534.79	0.019	0.02	6.859	A
A-B	15.00	15.00	0.00	-	-	-	-	-
A-C	280.00	280.00	0.00	-	-	-	-	-

Junction G - 2034 Reference, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction G	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Reference, AM	2034 Reference	AM		FLAT	08:00	09:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
G	Ko Sheung Road / Kam Sheung Road	T-Junction	Two-way	A,B,C	8.38	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Kam Sheung Road		Major
B	B	Development Access		Minor
C	C	Kam Sheung Road		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	6.26		0.00		2.20	50.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	Two lanes		3.10	3.60								50	50

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
G	B-A	549.653	0.099	0.250	0.157	0.357
G	B-C	661.975	0.100	0.254	-	-
G	C-B	602.919	0.231	0.231	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	FLAT	✓	545.00	100.000
B	FLAT	✓	30.00	100.000
C	FLAT	✓	585.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
08:00-08:15	**A**	545.00	545.00		
08:00-08:15	**B**	30.00	30.00		
08:00-08:15	**C**	585.00	585.00		
08:15-08:30	**A**	545.00	545.00		
08:15-08:30	**B**	30.00	30.00		
08:15-08:30	**C**	585.00	585.00		
08:30-08:45	**A**	545.00	545.00		
08:30-08:45	**B**	30.00	30.00		
08:30-08:45	**C**	585.00	585.00		
08:45-09:00	**A**	545.00	545.00		
08:45-09:00	**B**	30.00	30.00		
08:45-09:00	**C**	585.00	585.00		
09:00-09:15	**A**	545.00	545.00		
09:00-09:15	**B**	30.00	30.00		
09:00-09:15	**C**	585.00	585.00		
09:15-09:30	**A**	545.00	545.00		
09:15-09:30	**B**	30.00	30.00		
09:15-09:30	**C**	585.00	585.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction G (for whole period)

		To		
		A	**B**	**C**
From	**A**	0.000	25.000	520.000
	B	10.000	0.000	20.000
	C	575.000	10.000	0.000

Turning Proportions (PCU) - Junction G (for whole period)

		To		
		A	**B**	**C**
From	**A**	0.00	0.05	0.95
	B	0.33	0.00	0.67
	C	0.98	0.02	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction G (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction G (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.04	7.15	0.04	A
B-A	0.03	11.50	0.03	B
C-A	-	-	-	-
C-B	0.02	7.71	0.02	A
A-B	-	-	-	-
A-C	-	-	-	-

Main Results for each time segment

Main results: (08:00-08:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	20.00	19.84	0.00	523.52	0.038	0.04	7.145	A
B-A	10.00	9.87	0.00	323.01	0.031	0.03	11.488	B
C-A	575.00	575.00	0.00	-	-	-	-	-
C-B	10.00	9.92	0.00	477.05	0.021	0.02	7.706	A
A-B	25.00	25.00	0.00	-	-	-	-	-
A-C	520.00	520.00	0.00	-	-	-	-	-

Main results: (08:15-08:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	20.00	20.00	0.00	523.47	0.038	0.04	7.149	A
B-A	10.00	10.00	0.00	322.98	0.031	0.03	11.501	B
C-A	575.00	575.00	0.00	-	-	-	-	-
C-B	10.00	10.00	0.00	477.05	0.021	0.02	7.707	A
A-B	25.00	25.00	0.00	-	-	-	-	-
A-C	520.00	520.00	0.00	-	-	-	-	-

Main results: (08:30-08:45)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	20.00	20.00	0.00	523.47	0.038	0.04	7.149	A
B-A	10.00	10.00	0.00	322.98	0.031	0.03	11.501	B
C-A	575.00	575.00	0.00	-	-	-	-	-
C-B	10.00	10.00	0.00	477.05	0.021	0.02	7.707	A
A-B	25.00	25.00	0.00	-	-	-	-	-
A-C	520.00	520.00	0.00	-	-	-	-	-

Main results: (08:45-09:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	20.00	20.00	0.00	523.47	0.038	0.04	7.149	A
B-A	10.00	10.00	0.00	322.98	0.031	0.03	11.501	B
C-A	575.00	575.00	0.00	-	-	-	-	-
C-B	10.00	10.00	0.00	477.05	0.021	0.02	7.707	A
A-B	25.00	25.00	0.00	-	-	-	-	-
A-C	520.00	520.00	0.00	-	-	-	-	-

Main results: (09:00-09:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	20.00	20.00	0.00	523.47	0.038	0.04	7.149	A
B-A	10.00	10.00	0.00	322.98	0.031	0.03	11.501	B
C-A	575.00	575.00	0.00	-	-	-	-	-
C-B	10.00	10.00	0.00	477.05	0.021	0.02	7.707	A
A-B	25.00	25.00	0.00	-	-	-	-	-
A-C	520.00	520.00	0.00	-	-	-	-	-

Main results: (09:15-09:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	20.00	20.00	0.00	523.47	0.038	0.04	7.149	A
B-A	10.00	10.00	0.00	322.98	0.031	0.03	11.501	B
C-A	575.00	575.00	0.00	-	-	-	-	-
C-B	10.00	10.00	0.00	477.05	0.021	0.02	7.707	A
A-B	25.00	25.00	0.00	-	-	-	-	-
A-C	520.00	520.00	0.00	-	-	-	-	-

Junction G - 2034 Reference, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction G	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Reference, PM	2034 Reference	PM		FLAT	18:00	19:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
G	Ko Sheung Road / Kam Sheung Road	T-Junction	Two-way	A,B,C	8.18	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Kam Sheung Road		Major
B	B	Development Access		Minor
C	C	Kam Sheung Road		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	6.26		0.00		2.20	50.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	Two lanes		3.10	3.60								50	50

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
G	B-A	549.653	0.099	0.250	0.157	0.357
G	B-C	661.975	0.100	0.254	-	-
G	C-B	602.919	0.231	0.231	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	FLAT	✓	385.00	100.000
B	FLAT	✓	15.00	100.000
C	FLAT	✓	555.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
18:00-18:15	**A**	385.00	385.00		
18:00-18:15	**B**	15.00	15.00		
18:00-18:15	**C**	555.00	555.00		
18:15-18:30	**A**	385.00	385.00		
18:15-18:30	**B**	15.00	15.00		
18:15-18:30	**C**	555.00	555.00		
18:30-18:45	**A**	385.00	385.00		
18:30-18:45	**B**	15.00	15.00		
18:30-18:45	**C**	555.00	555.00		
18:45-19:00	**A**	385.00	385.00		
18:45-19:00	**B**	15.00	15.00		
18:45-19:00	**C**	555.00	555.00		
19:00-19:15	**A**	385.00	385.00		
19:00-19:15	**B**	15.00	15.00		
19:00-19:15	**C**	555.00	555.00		
19:15-19:30	**A**	385.00	385.00		
19:15-19:30	**B**	15.00	15.00		
19:15-19:30	**C**	555.00	555.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction G (for whole period)

		To		
		A	**B**	**C**
From	**A**	0.000	20.000	365.000
	B	10.000	0.000	5.000
	C	545.000	10.000	0.000

Turning Proportions (PCU) - Junction G (for whole period)

		To		
		A	**B**	**C**
From	**A**	0.00	0.05	0.95
	B	0.67	0.00	0.33
	C	0.98	0.02	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction G (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction G (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.01	6.44	0.01	A
B-A	0.03	10.08	0.03	B
C-A	-	-	-	-
C-B	0.02	7.14	0.02	A
A-B	-	-	-	-
A-C	-	-	-	-

Main Results for each time segment

Main results: (18:00-18:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	5.00	4.96	0.00	563.55	0.009	0.01	6.444	A
B-A	10.00	9.89	0.00	367.00	0.027	0.03	10.077	B
C-A	545.00	545.00	0.00	-	-	-	-	-
C-B	10.00	9.92	0.00	514.00	0.019	0.02	7.141	A
A-B	20.00	20.00	0.00	-	-	-	-	-
A-C	365.00	365.00	0.00	-	-	-	-	-

Main results: (18:15-18:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	5.00	5.00	0.00	563.50	0.009	0.01	6.445	A
B-A	10.00	10.00	0.00	366.98	0.027	0.03	10.084	B
C-A	545.00	545.00	0.00	-	-	-	-	-
C-B	10.00	10.00	0.00	514.00	0.019	0.02	7.141	A
A-B	20.00	20.00	0.00	-	-	-	-	-
A-C	365.00	365.00	0.00	-	-	-	-	-

Main results: (18:30-18:45)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	5.00	5.00	0.00	563.50	0.009	0.01	6.445	A
B-A	10.00	10.00	0.00	366.98	0.027	0.03	10.084	B
C-A	545.00	545.00	0.00	-	-	-	-	-
C-B	10.00	10.00	0.00	514.00	0.019	0.02	7.141	A
A-B	20.00	20.00	0.00	-	-	-	-	-
A-C	365.00	365.00	0.00	-	-	-	-	-

Main results: (18:45-19:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	5.00	5.00	0.00	563.50	0.009	0.01	6.445	A
B-A	10.00	10.00	0.00	366.98	0.027	0.03	10.084	B
C-A	545.00	545.00	0.00	-	-	-	-	-
C-B	10.00	10.00	0.00	514.00	0.019	0.02	7.144	A
A-B	20.00	20.00	0.00	-	-	-	-	-
A-C	365.00	365.00	0.00	-	-	-	-	-

Main results: (19:00-19:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	5.00	5.00	0.00	563.50	0.009	0.01	6.445	A
B-A	10.00	10.00	0.00	366.98	0.027	0.03	10.084	B
C-A	545.00	545.00	0.00	-	-	-	-	-
C-B	10.00	10.00	0.00	514.00	0.019	0.02	7.144	A
A-B	20.00	20.00	0.00	-	-	-	-	-
A-C	365.00	365.00	0.00	-	-	-	-	-

Main results: (19:15-19:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	5.00	5.00	0.00	563.50	0.009	0.01	6.445	A
B-A	10.00	10.00	0.00	366.98	0.027	0.03	10.084	B
C-A	545.00	545.00	0.00	-	-	-	-	-
C-B	10.00	10.00	0.00	514.00	0.019	0.02	7.144	A
A-B	20.00	20.00	0.00	-	-	-	-	-
A-C	365.00	365.00	0.00	-	-	-	-	-

Junction G - 2034 Design, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction G	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Design, AM	2034 Design	AM		FLAT	08:00	09:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
G	Ko Sheung Road / Kam Sheung Road	T-Junction	Two-way	A,B,C	8.85	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Kam Sheung Road		Major
B	B	Development Access		Minor
C	C	Kam Sheung Road		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	6.26		0.00		2.20	50.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	Two lanes		3.10	3.60								50	50

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
G	B-A	549.653	0.099	0.250	0.157	0.357
G	B-C	661.975	0.100	0.254	-	-
G	C-B	602.919	0.231	0.231	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	FLAT	✓	545.00	100.000
B	FLAT	✓	35.00	100.000
C	FLAT	✓	610.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
08:00-08:15	A	545.00	545.00		
08:00-08:15	B	35.00	35.00		
08:00-08:15	C	610.00	610.00		
08:15-08:30	A	545.00	545.00		
08:15-08:30	B	35.00	35.00		
08:15-08:30	C	610.00	610.00		
08:30-08:45	A	545.00	545.00		
08:30-08:45	B	35.00	35.00		
08:30-08:45	C	610.00	610.00		
08:45-09:00	A	545.00	545.00		
08:45-09:00	B	35.00	35.00		
08:45-09:00	C	610.00	610.00		
09:00-09:15	A	545.00	545.00		
09:00-09:15	B	35.00	35.00		
09:00-09:15	C	610.00	610.00		
09:15-09:30	A	545.00	545.00		
09:15-09:30	B	35.00	35.00		
09:15-09:30	C	610.00	610.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction G (for whole period)

	To			
		A	B	C
From	A	0.000	25.000	520.000
	B	15.000	0.000	20.000
	C	600.000	10.000	0.000

Turning Proportions (PCU) - Junction G (for whole period)

	To			
		A	B	C
From	A	0.00	0.05	0.95
	B	0.43	0.00	0.57
	C	0.98	0.02	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction G (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction G (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.04	7.18	0.04	A
B-A	0.05	11.84	0.05	B
C-A	-	-	-	-
C-B	0.02	7.71	0.02	A
A-B	-	-	-	-
A-C	-	-	-	-

Main Results for each time segment

Main results: (08:00-08:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	20.00	19.84	0.00	521.40	0.038	0.04	7.176	A
B-A	15.00	14.81	0.00	319.07	0.047	0.05	11.824	B
C-A	600.00	600.00	0.00	-	-	-	-	-
C-B	10.00	9.92	0.00	477.05	0.021	0.02	7.706	A
A-B	25.00	25.00	0.00	-	-	-	-	-
A-C	520.00	520.00	0.00	-	-	-	-	-

Main results: (08:15-08:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	20.00	20.00	0.00	521.32	0.038	0.04	7.180	A
B-A	15.00	15.00	0.00	319.04	0.047	0.05	11.839	B
C-A	600.00	600.00	0.00	-	-	-	-	-
C-B	10.00	10.00	0.00	477.05	0.021	0.02	7.707	A
A-B	25.00	25.00	0.00	-	-	-	-	-
A-C	520.00	520.00	0.00	-	-	-	-	-

Main results: (08:30-08:45)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	20.00	20.00	0.00	521.32	0.038	0.04	7.180	A
B-A	15.00	15.00	0.00	319.04	0.047	0.05	11.839	B
C-A	600.00	600.00	0.00	-	-	-	-	-
C-B	10.00	10.00	0.00	477.05	0.021	0.02	7.707	A
A-B	25.00	25.00	0.00	-	-	-	-	-
A-C	520.00	520.00	0.00	-	-	-	-	-

Main results: (08:45-09:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	20.00	20.00	0.00	521.32	0.038	0.04	7.180	A
B-A	15.00	15.00	0.00	319.04	0.047	0.05	11.839	B
C-A	600.00	600.00	0.00	-	-	-	-	-
C-B	10.00	10.00	0.00	477.05	0.021	0.02	7.707	A
A-B	25.00	25.00	0.00	-	-	-	-	-
A-C	520.00	520.00	0.00	-	-	-	-	-

Main results: (09:00-09:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	20.00	20.00	0.00	521.32	0.038	0.04	7.180	A
B-A	15.00	15.00	0.00	319.04	0.047	0.05	11.839	B
C-A	600.00	600.00	0.00	-	-	-	-	-
C-B	10.00	10.00	0.00	477.05	0.021	0.02	7.707	A
A-B	25.00	25.00	0.00	-	-	-	-	-
A-C	520.00	520.00	0.00	-	-	-	-	-

Main results: (09:15-09:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	20.00	20.00	0.00	521.32	0.038	0.04	7.180	A
B-A	15.00	15.00	0.00	319.04	0.047	0.05	11.839	B
C-A	600.00	600.00	0.00	-	-	-	-	-
C-B	10.00	10.00	0.00	477.05	0.021	0.02	7.707	A
A-B	25.00	25.00	0.00	-	-	-	-	-
A-C	520.00	520.00	0.00	-	-	-	-	-

Junction G - 2034 Design, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction G	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Design, PM	2034 Design	PM		FLAT	18:00	19:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
G	Ko Sheung Road / Kam Sheung Road	T-Junction	Two-way	A,B,C	8.21	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Kam Sheung Road		Major
B	B	Development Access		Minor
C	C	Kam Sheung Road		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	6.26		0.00		2.20	50.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	Two lanes		3.10	3.60								50	50

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
G	B-A	549.653	0.099	0.250	0.157	0.357
G	B-C	661.975	0.100	0.254	-	-
G	C-B	602.919	0.231	0.231	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	FLAT	✓	385.00	100.000
B	FLAT	✓	15.00	100.000
C	FLAT	✓	570.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
18:00-18:15	**A**	385.00	385.00		
18:00-18:15	**B**	15.00	15.00		
18:00-18:15	**C**	570.00	570.00		
18:15-18:30	**A**	385.00	385.00		
18:15-18:30	**B**	15.00	15.00		
18:15-18:30	**C**	570.00	570.00		
18:30-18:45	**A**	385.00	385.00		
18:30-18:45	**B**	15.00	15.00		
18:30-18:45	**C**	570.00	570.00		
18:45-19:00	**A**	385.00	385.00		
18:45-19:00	**B**	15.00	15.00		
18:45-19:00	**C**	570.00	570.00		
19:00-19:15	**A**	385.00	385.00		
19:00-19:15	**B**	15.00	15.00		
19:00-19:15	**C**	570.00	570.00		
19:15-19:30	**A**	385.00	385.00		
19:15-19:30	**B**	15.00	15.00		
19:15-19:30	**C**	570.00	570.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction G (for whole period)

		To		
		A	**B**	**C**
From	**A**	0.000	20.000	365.000
	B	10.000	0.000	5.000
	C	560.000	10.000	0.000

Turning Proportions (PCU) - Junction G (for whole period)

		To		
		A	**B**	**C**
From	**A**	0.00	0.05	0.95
	B	0.67	0.00	0.33
	C	0.98	0.02	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction G (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction G (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.01	6.44	0.01	A
B-A	0.03	10.15	0.03	B
C-A	-	-	-	-
C-B	0.02	7.14	0.02	A
A-B	-	-	-	-
A-C	-	-	-	-

Main Results for each time segment

Main results: (18:00-18:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	5.00	4.96	0.00	563.52	0.009	0.01	6.444	A
B-A	10.00	9.89	0.00	364.64	0.027	0.03	10.144	B
C-A	560.00	560.00	0.00	-	-	-	-	-
C-B	10.00	9.92	0.00	514.00	0.019	0.02	7.141	A
A-B	20.00	20.00	0.00	-	-	-	-	-
A-C	365.00	365.00	0.00	-	-	-	-	-

Main results: (18:15-18:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	5.00	5.00	0.00	563.48	0.009	0.01	6.445	A
B-A	10.00	10.00	0.00	364.61	0.027	0.03	10.151	B
C-A	560.00	560.00	0.00	-	-	-	-	-
C-B	10.00	10.00	0.00	514.00	0.019	0.02	7.141	A
A-B	20.00	20.00	0.00	-	-	-	-	-
A-C	365.00	365.00	0.00	-	-	-	-	-

Main results: (18:30-18:45)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	5.00	5.00	0.00	563.48	0.009	0.01	6.445	A
B-A	10.00	10.00	0.00	364.61	0.027	0.03	10.151	B
C-A	560.00	560.00	0.00	-	-	-	-	-
C-B	10.00	10.00	0.00	514.00	0.019	0.02	7.141	A
A-B	20.00	20.00	0.00	-	-	-	-	-
A-C	365.00	365.00	0.00	-	-	-	-	-

Main results: (18:45-19:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	5.00	5.00	0.00	563.48	0.009	0.01	6.445	A
B-A	10.00	10.00	0.00	364.61	0.027	0.03	10.151	B
C-A	560.00	560.00	0.00	-	-	-	-	-
C-B	10.00	10.00	0.00	514.00	0.019	0.02	7.144	A
A-B	20.00	20.00	0.00	-	-	-	-	-
A-C	365.00	365.00	0.00	-	-	-	-	-

Main results: (19:00-19:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	5.00	5.00	0.00	563.48	0.009	0.01	6.445	A
B-A	10.00	10.00	0.00	364.61	0.027	0.03	10.151	B
C-A	560.00	560.00	0.00	-	-	-	-	-
C-B	10.00	10.00	0.00	514.00	0.019	0.02	7.144	A
A-B	20.00	20.00	0.00	-	-	-	-	-
A-C	365.00	365.00	0.00	-	-	-	-	-

Main results: (19:15-19:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-C	5.00	5.00	0.00	563.48	0.009	0.01	6.445	A
B-A	10.00	10.00	0.00	364.61	0.027	0.03	10.151	B
C-A	560.00	560.00	0.00	-	-	-	-	-
C-B	10.00	10.00	0.00	514.00	0.019	0.02	7.144	A
A-B	20.00	20.00	0.00	-	-	-	-	-
A-C	365.00	365.00	0.00	-	-	-	-	-

Junctions 8

ARCADY 8 - Roundabout Module

Version: 8.0.5.523 [19102,19/06/2015]

For sales and distribution information, program advice and maintenance, contact TRL:
Tel: +44 (0)1344 770758   email: software@trl.co.uk   Web: http://www.trlsoftware.co.uk

Filename: DD112 Jn H_(wo PWP Works).arc8
Path: \\CTA_NAS01\Project\CTA Consultants Limited\CTA - Project\21134HK (wkk) - S12A Application (DD106, 110, 112 & 113) in Kam Tin\DD112 - LFT (Alex Leung)\Cal\2024-07-26
Report generation date: 26/7/2024 11:32:22

Summary of junction performance

	AM				PM			
	Queue (PCU)	**Delay (s)**	**RFC**	**LOS**	**Queue (PCU)**	**Delay (s)**	**RFC**	**LOS**
	Junction H (Ext) - 2021 Existing							
Arm 1	0.97	5.34	0.49	A	1.84	7.72	0.65	A
Arm 2	1.39	6.53	0.58	A	1.17	6.08	0.54	A
Arm 3	1.35	9.20	0.58	A	1.16	8.03	0.54	A
	Junction H (Ext) - 2034 Design (w/o PWP Works)							
Arm 1	1.88	8.21	0.65	A	5.23	18.17	0.84	C
Arm 2	3.66	13.04	0.79	B	2.49	10.02	0.71	B
Arm 3	3.78	20.62	0.79	C	2.74	15.00	0.74	B
	Junction H (Ext) - 2034 Reference (w/o PWP Works)							
Arm 1	1.82	8.03	0.65	A	5.23	18.17	0.84	C
Arm 2	3.54	12.68	0.78	B	2.44	9.88	0.71	A
Arm 3	3.72	20.30	0.79	C	2.71	14.83	0.73	B

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle.

"D1 - 2021 Existing, AM " model duration: 8:00 - 9:30
"D2 - 2021 Existing, PM" model duration: 17:00 - 18:30
"D3 - 2034 Reference (w/o PWP Works), AM" model duration: 8:00 - 9:30
"D4 - 2034 Reference (w/o PWP Works), PM" model duration: 17:00 - 18:30
"D5 - 2034 Design (w/o PWP Works), AM" model duration: 8:00 - 9:30
"D6 - 2034 Design (w/o PWP Works), PM" model duration: 17:00 - 18:30

Run using Junctions 8.0.5.523 at 26/7/2024 11:32:19

File summary

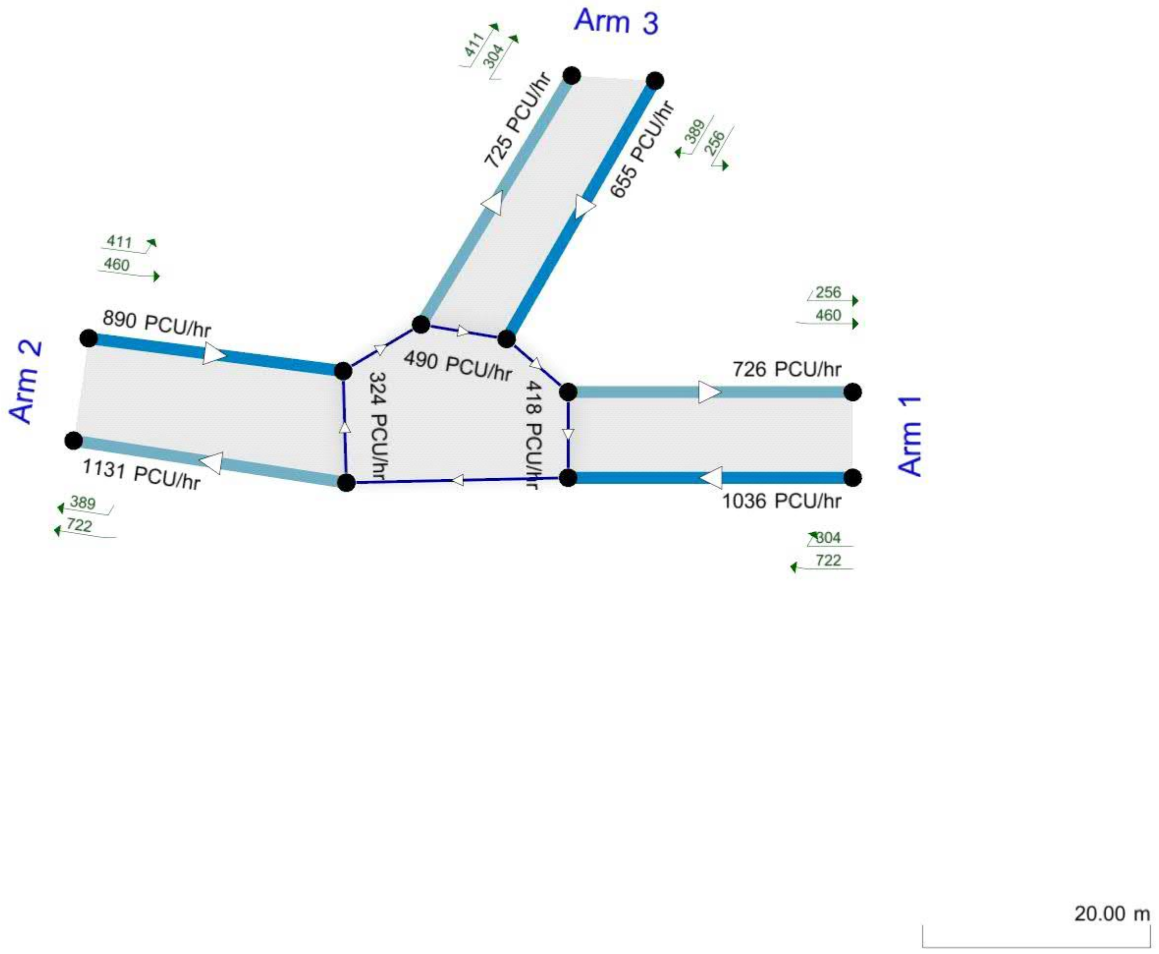
Title	(untitled)
Location	
Site Number	
Date	13/6/2018
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	ITADMIN
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCU	PCU	perHour	s	-Min	perMin



Showing modelled flow through junction (PCU/hr).
Time Segment: (08:00-08:15)
Showing Analysis Set "A1 - Junction H (Ext) "; Demand Set "D1 - 2021 Existing, AM "

The junction diagram reflects the last run of ARCADY.

Junction H (Ext) - 2021 Existing, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction H (Ext)	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2021 Existing, AM	2021 Existing	AM		FLAT	08:00	09:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
A	A	Roundabout	1,2,3			6.85	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	Kam Tin Road WB	
2	2	Kam Tin Road EB	
3	3	Fam Kam Road	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	3.50	6.40	7.80	166.00	22.00	30.00	
2	3.80	8.00	10.00	44.00	22.00	80.00	
3	3.00	6.80	4.00	13.40	22.00	27.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.641	1524.649
2		(calculated)	(calculated)	0.565	1445.546
3		(calculated)	(calculated)	0.552	1177.672

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
1	FLAT	✓	655.00	100.000
2	FLAT	✓	770.00	100.000
3	FLAT	✓	530.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
08:00-08:15	**1**	655.00	655.00		
08:00-08:15	**2**	770.00	770.00		
08:00-08:15	**3**	530.00	530.00		
08:15-08:30	**1**	655.00	655.00		
08:15-08:30	**2**	770.00	770.00		
08:15-08:30	**3**	530.00	530.00		
08:30-08:45	**1**	655.00	655.00		
08:30-08:45	**2**	770.00	770.00		
08:30-08:45	**3**	530.00	530.00		
08:45-09:00	**1**	655.00	655.00		
08:45-09:00	**2**	770.00	770.00		
08:45-09:00	**3**	530.00	530.00		
09:00-09:15	**1**	655.00	655.00		
09:00-09:15	**2**	770.00	770.00		
09:00-09:15	**3**	530.00	530.00		
09:15-09:30	**1**	655.00	655.00		
09:15-09:30	**2**	770.00	770.00		
09:15-09:30	**3**	530.00	530.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction A (for whole period)

		To		
		1	**2**	**3**
From	**1**	10.000	445.000	200.000
	2	445.000	10.000	315.000
	3	235.000	285.000	10.000

Turning Proportions (PCU) - Junction A (for whole period)

		To		
		1	**2**	**3**
From	**1**	0.02	0.68	0.31
	2	0.58	0.01	0.41
	3	0.44	0.54	0.02

Vehicle Mix

Average PCU Per Vehicle - Junction A (for whole period)

		To		
		1	**2**	**3**
From	**1**	1.000	1.000	1.000
	2	1.000	1.000	1.000
	3	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction A (for whole period)

		To		
		1	**2**	**3**
From	**1**	0.0	0.0	0.0
	2	0.0	0.0	0.0
	3	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.49	5.34	0.97	A
2	0.58	6.53	1.39	A
3	0.58	9.20	1.35	A

Main Results for each time segment

Main results: (08:00-08:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	655.00	651.17	302.00	0.00	1331.11	0.492	0.96	5.265	A
2	770.00	764.51	218.67	0.00	1321.96	0.582	1.37	6.396	A
3	530.00	524.73	461.70	0.00	923.04	0.574	1.32	8.926	A

Main results: (08:15-08:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	655.00	654.97	304.96	0.00	1329.22	0.493	0.97	5.338	A
2	770.00	769.95	219.99	0.00	1321.22	0.583	1.38	6.530	A
3	530.00	529.92	464.97	0.00	921.24	0.575	1.34	9.195	A

Main results: (08:30-08:45)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	655.00	654.99	304.99	0.00	1329.20	0.493	0.97	5.339	A
2	770.00	769.98	220.00	0.00	1321.21	0.583	1.39	6.530	A
3	530.00	529.98	464.99	0.00	921.23	0.575	1.34	9.199	A

Main results: (08:45-09:00)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	655.00	655.00	304.99	0.00	1329.19	0.493	0.97	5.339	A
2	770.00	769.99	220.00	0.00	1321.21	0.583	1.39	6.530	A
3	530.00	529.99	465.00	0.00	921.23	0.575	1.35	9.199	A

Main results: (09:00-09:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	655.00	655.00	305.00	0.00	1329.19	0.493	0.97	5.339	A
2	770.00	770.00	220.00	0.00	1321.21	0.583	1.39	6.530	A
3	530.00	529.99	465.00	0.00	921.23	0.575	1.35	9.201	A

Main results: (09:15-09:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	655.00	655.00	305.00	0.00	1329.19	0.493	0.97	5.339	A
2	770.00	770.00	220.00	0.00	1321.21	0.583	1.39	6.530	A
3	530.00	530.00	465.00	0.00	921.23	0.575	1.35	9.201	A

Junction H (Ext) - 2021 Existing, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction H (Ext)	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2021 Existing, PM	2021 Existing	PM		FLAT	17:00	18:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
A	A	Roundabout	1,2,3			7.25	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	Kam Tin Road WB	
2	2	Kam Tin Road EB	
3	3	Fam Kam Road	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	3.50	6.40	7.80	166.00	22.00	30.00	
2	3.80	8.00	10.00	44.00	22.00	80.00	
3	3.00	6.80	4.00	13.40	22.00	27.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.641	1524.649
2		(calculated)	(calculated)	0.565	1445.546
3		(calculated)	(calculated)	0.552	1177.672

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
1	FLAT	✓	860.00	100.000
2	FLAT	✓	695.00	100.000
3	FLAT	✓	520.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
17:00-17:15	**1**	860.00	860.00		
17:00-17:15	**2**	695.00	695.00		
17:00-17:15	**3**	520.00	520.00		
17:15-17:30	**1**	860.00	860.00		
17:15-17:30	**2**	695.00	695.00		
17:15-17:30	**3**	520.00	520.00		
17:30-17:45	**1**	860.00	860.00		
17:30-17:45	**2**	695.00	695.00		
17:30-17:45	**3**	520.00	520.00		
17:45-18:00	**1**	860.00	860.00		
17:45-18:00	**2**	695.00	695.00		
17:45-18:00	**3**	520.00	520.00		
18:00-18:15	**1**	860.00	860.00		
18:00-18:15	**2**	695.00	695.00		
18:00-18:15	**3**	520.00	520.00		
18:15-18:30	**1**	860.00	860.00		
18:15-18:30	**2**	695.00	695.00		
18:15-18:30	**3**	520.00	520.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction A (for whole period)

	To			
From		**1**	**2**	**3**
	1	10.000	590.000	260.000
	2	360.000	10.000	325.000
	3	220.000	290.000	10.000

Turning Proportions (PCU) - Junction A (for whole period)

	To			
From		**1**	**2**	**3**
	1	0.01	0.69	0.30
	2	0.52	0.01	0.47
	3	0.42	0.56	0.02

Vehicle Mix

Average PCU Per Vehicle - Junction A (for whole period)

	To			
From		**1**	**2**	**3**
	1	1.000	1.000	1.000
	2	1.000	1.000	1.000
	3	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction A (for whole period)

	To			
From		**1**	**2**	**3**
	1	0.0	0.0	0.0
	2	0.0	0.0	0.0
	3	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.65	7.72	1.84	A
2	0.54	6.08	1.17	A
3	0.54	8.03	1.16	A

Main Results for each time segment

Main results: (17:00-17:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	860.00	852.82	307.31	0.00	1327.71	0.648	1.80	7.472	A
2	695.00	690.38	277.66	0.00	1288.63	0.539	1.15	5.973	A
3	520.00	515.46	377.46	0.00	969.50	0.536	1.14	7.853	A

Main results: (17:15-17:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	860.00	859.90	309.97	0.00	1326.01	0.649	1.82	7.718	A
2	695.00	694.96	279.97	0.00	1287.32	0.540	1.16	6.077	A
3	520.00	519.95	379.98	0.00	968.11	0.537	1.15	8.030	A

Main results: (17:30-17:45)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	860.00	859.97	309.99	0.00	1325.99	0.649	1.83	7.724	A
2	695.00	694.99	279.99	0.00	1287.31	0.540	1.17	6.077	A
3	520.00	519.98	379.99	0.00	968.11	0.537	1.15	8.031	A

Main results: (17:45-18:00)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	860.00	859.98	310.00	0.00	1325.99	0.649	1.83	7.723	A
2	695.00	694.99	279.99	0.00	1287.30	0.540	1.17	6.077	A
3	520.00	519.99	380.00	0.00	968.10	0.537	1.15	8.033	A

Main results: (18:00-18:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	860.00	859.99	310.00	0.00	1325.99	0.649	1.84	7.725	A
2	695.00	695.00	280.00	0.00	1287.30	0.540	1.17	6.077	A
3	520.00	520.00	380.00	0.00	968.10	0.537	1.16	8.033	A

Main results: (18:15-18:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	860.00	859.99	310.00	0.00	1325.99	0.649	1.84	7.725	A
2	695.00	695.00	280.00	0.00	1287.30	0.540	1.17	6.077	A
3	520.00	520.00	380.00	0.00	968.10	0.537	1.16	8.033	A

Junction H (Ext) - 2034 Reference (w/o PWP Works), AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction H (Ext)	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Reference (w/o PWP Works), AM	2034 Reference (w/o PWP Works)	AM		FLAT	08:00	09:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
A	A	Roundabout	1,2,3			13.20	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	Kam Tin Road WB	
2	2	Kam Tin Road EB	
3	3	Fam Kam Road	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	3.50	6.40	7.80	166.00	22.00	30.00	
2	3.80	8.00	10.00	44.00	22.00	80.00	
3	3.00	6.80	4.00	13.40	22.00	27.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.641	1524.649
2		(calculated)	(calculated)	0.565	1445.546
3		(calculated)	(calculated)	0.552	1177.672

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
1	FLAT	✓	820.00	100.000
2	FLAT	✓	1015.00	100.000
3	FLAT	✓	670.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
08:00-08:15	1	820.00	820.00		
08:00-08:15	2	1015.00	1015.00		
08:00-08:15	3	670.00	670.00		
08:15-08:30	1	820.00	820.00		
08:15-08:30	2	1015.00	1015.00		
08:15-08:30	3	670.00	670.00		
08:30-08:45	1	820.00	820.00		
08:30-08:45	2	1015.00	1015.00		
08:30-08:45	3	670.00	670.00		
08:45-09:00	1	820.00	820.00		
08:45-09:00	2	1015.00	1015.00		
08:45-09:00	3	670.00	670.00		
09:00-09:15	1	820.00	820.00		
09:00-09:15	2	1015.00	1015.00		
09:00-09:15	3	670.00	670.00		
09:15-09:30	1	820.00	820.00		
09:15-09:30	2	1015.00	1015.00		
09:15-09:30	3	670.00	670.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction A (for whole period)

		To		
From		**1**	**2**	**3**
	1	10.000	570.000	240.000
	2	580.000	10.000	425.000
	3	280.000	380.000	10.000

Turning Proportions (PCU) - Junction A (for whole period)

		To		
From		**1**	**2**	**3**
	1	0.01	0.70	0.29
	2	0.57	0.01	0.42
	3	0.42	0.57	0.01

Vehicle Mix

Average PCU Per Vehicle - Junction A (for whole period)

		To		
		1	2	3
From	1	1.000	1.000	1.000
	2	1.000	1.000	1.000
	3	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction A (for whole period)

		To		
		1	2	3
From	1	0.0	0.0	0.0
	2	0.0	0.0	0.0
	3	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.65	8.03	1.82	A
2	0.78	12.68	3.54	B
3	0.79	20.30	3.72	C

Main Results for each time segment

Main results: (08:00-08:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	820.00	812.94	392.01	0.00	1273.43	0.644	1.77	7.705	A
2	1015.00	1001.57	257.65	0.00	1299.93	0.781	3.36	11.597	B
3	670.00	656.51	592.11	0.00	851.12	0.787	3.37	17.462	C

Main results: (08:15-08:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	820.00	819.86	399.51	0.00	1268.62	0.646	1.80	8.016	A
2	1015.00	1014.57	259.94	0.00	1298.64	0.782	3.47	12.622	B
3	670.00	669.17	599.75	0.00	846.91	0.791	3.58	20.040	C

Main results: (08:30-08:45)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	820.00	819.96	399.84	0.00	1268.41	0.646	1.81	8.024	A
2	1015.00	1014.85	259.98	0.00	1298.61	0.782	3.50	12.657	B
3	670.00	669.72	599.91	0.00	846.82	0.791	3.65	20.204	C

Main results: (08:45-09:00)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	820.00	819.98	399.92	0.00	1268.36	0.647	1.82	8.027	A
2	1015.00	1014.92	259.99	0.00	1298.61	0.782	3.52	12.670	B
3	670.00	669.86	599.96	0.00	846.80	0.791	3.69	20.258	C

Main results: (09:00-09:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	820.00	819.99	399.95	0.00	1268.34	0.647	1.82	8.027	A
2	1015.00	1014.95	260.00	0.00	1298.61	0.782	3.53	12.675	B
3	670.00	669.92	599.97	0.00	846.79	0.791	3.71	20.285	C

Main results: (09:15-09:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	820.00	819.99	399.97	0.00	1268.33	0.647	1.82	8.029	A
2	1015.00	1014.97	260.00	0.00	1298.61	0.782	3.54	12.680	B
3	670.00	669.94	599.98	0.00	846.78	0.791	3.72	20.301	C

Junction H (Ext) - 2034 Reference (w/o PWP Works), PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction H (Ext)	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Reference (w/o PWP Works), PM	2034 Reference (w/o PWP Works)	PM		FLAT	17:00	18:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
A	A	Roundabout	1,2,3			14.48	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	Kam Tin Road WB	
2	2	Kam Tin Road EB	
3	3	Fam Kam Road	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	3.50	6.40	7.80	166.00	22.00	30.00	
2	3.80	8.00	10.00	44.00	22.00	80.00	
3	3.00	6.80	4.00	13.40	22.00	27.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.641	1524.649
2		(calculated)	(calculated)	0.565	1445.546
3		(calculated)	(calculated)	0.552	1177.672

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
1	FLAT	✓	1055.00	100.000
2	FLAT	✓	895.00	100.000
3	FLAT	✓	665.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
17:00-17:15	1	1055.00	1055.00		
17:00-17:15	2	895.00	895.00		
17:00-17:15	3	665.00	665.00		
17:15-17:30	1	1055.00	1055.00		
17:15-17:30	2	895.00	895.00		
17:15-17:30	3	665.00	665.00		
17:30-17:45	1	1055.00	1055.00		
17:30-17:45	2	895.00	895.00		
17:30-17:45	3	665.00	665.00		
17:45-18:00	1	1055.00	1055.00		
17:45-18:00	2	895.00	895.00		
17:45-18:00	3	665.00	665.00		
18:00-18:15	1	1055.00	1055.00		
18:00-18:15	2	895.00	895.00		
18:00-18:15	3	665.00	665.00		
18:15-18:30	1	1055.00	1055.00		
18:15-18:30	2	895.00	895.00		
18:15-18:30	3	665.00	665.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction A (for whole period)

	To			
		1	2	3
From	1	10.000	735.000	310.000
	2	460.000	20.000	415.000
	3	260.000	395.000	10.000

Turning Proportions (PCU) - Junction A (for whole period)

	To			
		1	2	3
From	1	0.01	0.70	0.29
	2	0.51	0.02	0.46
	3	0.39	0.59	0.02

Vehicle Mix

Average PCU Per Vehicle - Junction A (for whole period)

	To			
		1	2	3
From	1	1.000	1.000	1.000
	2	1.000	1.000	1.000
	3	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction A (for whole period)

	To			
		1	2	3
From	1	0.0	0.0	0.0
	2	0.0	0.0	0.0
	3	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.84	18.17	5.23	C
2	0.71	9.88	2.44	A
3	0.73	14.83	2.71	B

Main Results for each time segment

Main results: (17:00-17:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1055.00	1036.18	418.55	0.00	1256.42	0.840	4.70	15.254	C
2	895.00	885.60	324.14	0.00	1262.36	0.709	2.35	9.338	A
3	665.00	654.75	484.78	0.00	910.32	0.731	2.56	13.593	B

Main results: (17:15-17:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1055.00	1053.76	424.77	0.00	1252.44	0.842	5.01	17.864	C
2	895.00	894.77	329.62	0.00	1259.26	0.711	2.41	9.861	A
3	665.00	664.63	489.87	0.00	907.51	0.733	2.65	14.768	B

Main results: (17:30-17:45)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1055.00	1054.57	424.93	0.00	1252.34	0.842	5.12	18.050	C
2	895.00	894.93	329.87	0.00	1259.12	0.711	2.43	9.876	A
3	665.00	664.88	489.96	0.00	907.46	0.733	2.68	14.809	B

Main results: (17:45-18:00)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1055.00	1054.78	424.96	0.00	1252.31	0.842	5.18	18.114	C
2	895.00	894.97	329.93	0.00	1259.08	0.711	2.43	9.881	A
3	665.00	664.94	489.98	0.00	907.45	0.733	2.70	14.824	B

Main results: (18:00-18:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1055.00	1054.87	424.98	0.00	1252.30	0.842	5.21	18.147	C
2	895.00	894.98	329.96	0.00	1259.07	0.711	2.44	9.883	A
3	665.00	664.96	489.99	0.00	907.44	0.733	2.71	14.830	B

Main results: (18:15-18:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1055.00	1054.91	424.99	0.00	1252.30	0.842	5.23	18.167	C
2	895.00	894.99	329.97	0.00	1259.06	0.711	2.44	9.884	A
3	665.00	664.98	489.99	0.00	907.44	0.733	2.71	14.833	B

Junction H (Ext) - 2034 Design (w/o PWP Works), AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction H (Ext)	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Design (w/o PWP Works), AM	2034 Design (w/o PWP Works)	AM		FLAT	08:00	09:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
A	A	Roundabout	1,2,3			13.46	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	Kam Tin Road WB	
2	2	Kam Tin Road EB	
3	3	Fam Kam Road	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	3.50	6.40	7.80	166.00	22.00	30.00	
2	3.80	8.00	10.00	44.00	22.00	80.00	
3	3.00	6.80	4.00	13.40	22.00	27.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.641	1524.649
2		(calculated)	(calculated)	0.565	1445.546
3		(calculated)	(calculated)	0.552	1177.672

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
1	FLAT	✓	830.00	100.000
2	FLAT	✓	1020.00	100.000
3	FLAT	✓	670.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
08:00-08:15	1	830.00	830.00		
08:00-08:15	2	1020.00	1020.00		
08:00-08:15	3	670.00	670.00		
08:15-08:30	1	830.00	830.00		
08:15-08:30	2	1020.00	1020.00		
08:15-08:30	3	670.00	670.00		
08:30-08:45	1	830.00	830.00		
08:30-08:45	2	1020.00	1020.00		
08:30-08:45	3	670.00	670.00		
08:45-09:00	1	830.00	830.00		
08:45-09:00	2	1020.00	1020.00		
08:45-09:00	3	670.00	670.00		
09:00-09:15	1	830.00	830.00		
09:00-09:15	2	1020.00	1020.00		
09:00-09:15	3	670.00	670.00		
09:15-09:30	1	830.00	830.00		
09:15-09:30	2	1020.00	1020.00		
09:15-09:30	3	670.00	670.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction A (for whole period)

	To			
From		**1**	**2**	**3**
	1	10.000	575.000	245.000
	2	585.000	10.000	425.000
	3	280.000	380.000	10.000

Turning Proportions (PCU) - Junction A (for whole period)

	To			
From		**1**	**2**	**3**
	1	0.01	0.69	0.30
	2	0.57	0.01	0.42
	3	0.42	0.57	0.01

Vehicle Mix

Average PCU Per Vehicle - Junction A (for whole period)

		To		
		1	2	3
From	1	1.000	1.000	1.000
	2	1.000	1.000	1.000
	3	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction A (for whole period)

		To		
		1	2	3
From	1	0.0	0.0	0.0
	2	0.0	0.0	0.0
	3	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.65	8.21	1.88	A
2	0.79	13.04	3.66	B
3	0.79	20.62	3.78	C

Main Results for each time segment

Main results: (08:00-08:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	830.00	822.70	391.91	0.00	1273.49	0.652	1.83	7.865	A
2	1020.00	1006.17	262.55	0.00	1297.16	0.786	3.46	11.866	B
3	670.00	656.34	596.84	0.00	848.51	0.790	3.42	17.663	C

Main results: (08:15-08:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	830.00	829.85	399.49	0.00	1268.64	0.654	1.86	8.198	A
2	1020.00	1019.53	264.94	0.00	1295.81	0.787	3.58	12.972	B
3	670.00	669.13	604.72	0.00	844.17	0.794	3.63	20.340	C

Main results: (08:30-08:45)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	830.00	829.96	399.83	0.00	1268.42	0.654	1.87	8.207	A
2	1020.00	1019.84	264.98	0.00	1295.79	0.787	3.62	13.011	B
3	670.00	669.71	604.90	0.00	844.07	0.794	3.71	20.515	C

Main results: (08:45-09:00)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	830.00	829.98	399.91	0.00	1268.36	0.654	1.88	8.210	A
2	1020.00	1019.92	264.99	0.00	1295.78	0.787	3.64	13.027	B
3	670.00	669.85	604.95	0.00	844.04	0.794	3.74	20.573	C

Main results: (09:00-09:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	830.00	829.99	399.95	0.00	1268.34	0.654	1.88	8.210	A
2	1020.00	1019.95	265.00	0.00	1295.78	0.787	3.65	13.032	B
3	670.00	669.91	604.97	0.00	844.03	0.794	3.76	20.602	C

Main results: (09:15-09:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	830.00	829.99	399.97	0.00	1268.33	0.654	1.88	8.212	A
2	1020.00	1019.97	265.00	0.00	1295.78	0.787	3.66	13.037	B
3	670.00	669.94	604.98	0.00	844.03	0.794	3.78	20.619	C

Junction H (Ext) - 2034 Design (w/o PWP Works), PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction H (Ext)	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Design (w/o PWP Works), PM	2034 Design (w/o PWP Works)	PM		FLAT	17:00	18:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
A	A	Roundabout	1,2,3			14.57	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	Kam Tin Road WB	
2	2	Kam Tin Road EB	
3	3	Fam Kam Road	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	3.50	6.40	7.80	166.00	22.00	30.00	
2	3.80	8.00	10.00	44.00	22.00	80.00	
3	3.00	6.80	4.00	13.40	22.00	27.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.641	1524.649
2		(calculated)	(calculated)	0.565	1445.546
3		(calculated)	(calculated)	0.552	1177.672

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
1	FLAT	✓	1055.00	100.000
2	FLAT	✓	900.00	100.000
3	FLAT	✓	665.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
17:00-17:15	1	1055.00	1055.00		
17:00-17:15	2	900.00	900.00		
17:00-17:15	3	665.00	665.00		
17:15-17:30	1	1055.00	1055.00		
17:15-17:30	2	900.00	900.00		
17:15-17:30	3	665.00	665.00		
17:30-17:45	1	1055.00	1055.00		
17:30-17:45	2	900.00	900.00		
17:30-17:45	3	665.00	665.00		
17:45-18:00	1	1055.00	1055.00		
17:45-18:00	2	900.00	900.00		
17:45-18:00	3	665.00	665.00		
18:00-18:15	1	1055.00	1055.00		
18:00-18:15	2	900.00	900.00		
18:00-18:15	3	665.00	665.00		
18:15-18:30	1	1055.00	1055.00		
18:15-18:30	2	900.00	900.00		
18:15-18:30	3	665.00	665.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction A (for whole period)

		To		
		1	**2**	**3**
From	**1**	10.000	735.000	310.000
	2	465.000	20.000	415.000
	3	260.000	395.000	10.000

Turning Proportions (PCU) - Junction A (for whole period)

		To		
		1	**2**	**3**
From	**1**	0.01	0.70	0.29
	2	0.52	0.02	0.46
	3	0.39	0.59	0.02

Vehicle Mix

Average PCU Per Vehicle - Junction A (for whole period)

		To		
From		**1**	**2**	**3**
	1	1.000	1.000	1.000
	2	1.000	1.000	1.000
	3	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction A (for whole period)

		To		
From		**1**	**2**	**3**
	1	0.0	0.0	0.0
	2	0.0	0.0	0.0
	3	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.84	18.17	5.23	C
2	0.71	10.02	2.49	B
3	0.74	15.00	2.74	B

Main Results for each time segment

Main results: (17:00-17:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1055.00	1036.18	418.48	0.00	1256.46	0.840	4.70	15.251	C
2	900.00	890.42	324.14	0.00	1262.36	0.713	2.39	9.453	A
3	665.00	654.65	489.66	0.00	907.62	0.733	2.59	13.724	B

Main results: (17:15-17:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1055.00	1053.76	424.76	0.00	1252.44	0.842	5.01	17.864	C
2	900.00	899.76	329.62	0.00	1259.26	0.715	2.45	9.998	A
3	665.00	664.62	494.86	0.00	904.76	0.735	2.68	14.932	B

Main results: (17:30-17:45)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1055.00	1054.56	424.92	0.00	1252.34	0.842	5.12	18.050	C
2	900.00	899.93	329.87	0.00	1259.12	0.715	2.47	10.014	B
3	665.00	664.88	494.96	0.00	904.70	0.735	2.71	14.979	B

Main results: (17:45-18:00)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1055.00	1054.78	424.96	0.00	1252.31	0.842	5.18	18.114	C
2	900.00	899.96	329.93	0.00	1259.08	0.715	2.48	10.019	B
3	665.00	664.94	494.98	0.00	904.69	0.735	2.73	14.991	B

Main results: (18:00-18:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1055.00	1054.87	424.98	0.00	1252.30	0.842	5.21	18.147	C
2	900.00	899.98	329.96	0.00	1259.07	0.715	2.49	10.021	B
3	665.00	664.96	494.99	0.00	904.69	0.735	2.74	15.001	B

Main results: (18:15-18:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1055.00	1054.91	424.99	0.00	1252.30	0.842	5.23	18.167	C
2	900.00	899.99	329.97	0.00	1259.06	0.715	2.49	10.021	B
3	665.00	664.98	494.99	0.00	904.68	0.735	2.74	15.004	B

Junctions 8

ARCADY 8 - Roundabout Module

Version: 8.0.5.523 [19102,19/06/2015]

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Filename: DD112 Jn H_Fut (w PWP Works).arc8
Path: \\CTA_NAS01\Project\CTA Consultants Limited\CTA - Project\21134HK (wkk) - S12A Application (DD106, 110, 112 & 113) in Kam Tin\DD112 - LFT (Alex Leung)\Cal\2024-07-26
Report generation date: 26/7/2024 11:29:15

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	Junction H (Future) - 2034 Design (w PWP Works)							
Arm 1	0.67	2.89	0.40	A	1.05	3.59	0.51	A
Arm 2	1.79	6.35	0.64	A	1.39	5.57	0.58	A
Arm 3	1.83	9.87	0.65	A	1.52	8.28	0.60	A
	Junction H (Future) - 2034 Reference (w PWP Works)							
Arm 1	0.65	2.86	0.39	A	1.05	3.59	0.51	A
Arm 2	1.76	6.26	0.64	A	1.37	5.53	0.58	A
Arm 3	1.81	9.79	0.65	A	1.51	8.22	0.60	A

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle.

"D7 - 2034 Reference (w PWP Works), AM " model duration: 8:00 - 9:30
"D8 - 2034 Reference (w PWP Works), PM" model duration: 17:00 - 18:30
"D9 - 2034 Design (w PWP Works), AM" model duration: 8:00 - 9:30
"D10 - 2034 Design (w PWP Works), PM" model duration: 17:00 - 18:30

Run using Junctions 8.0.5.523 at 26/7/2024 11:29:12

File summary

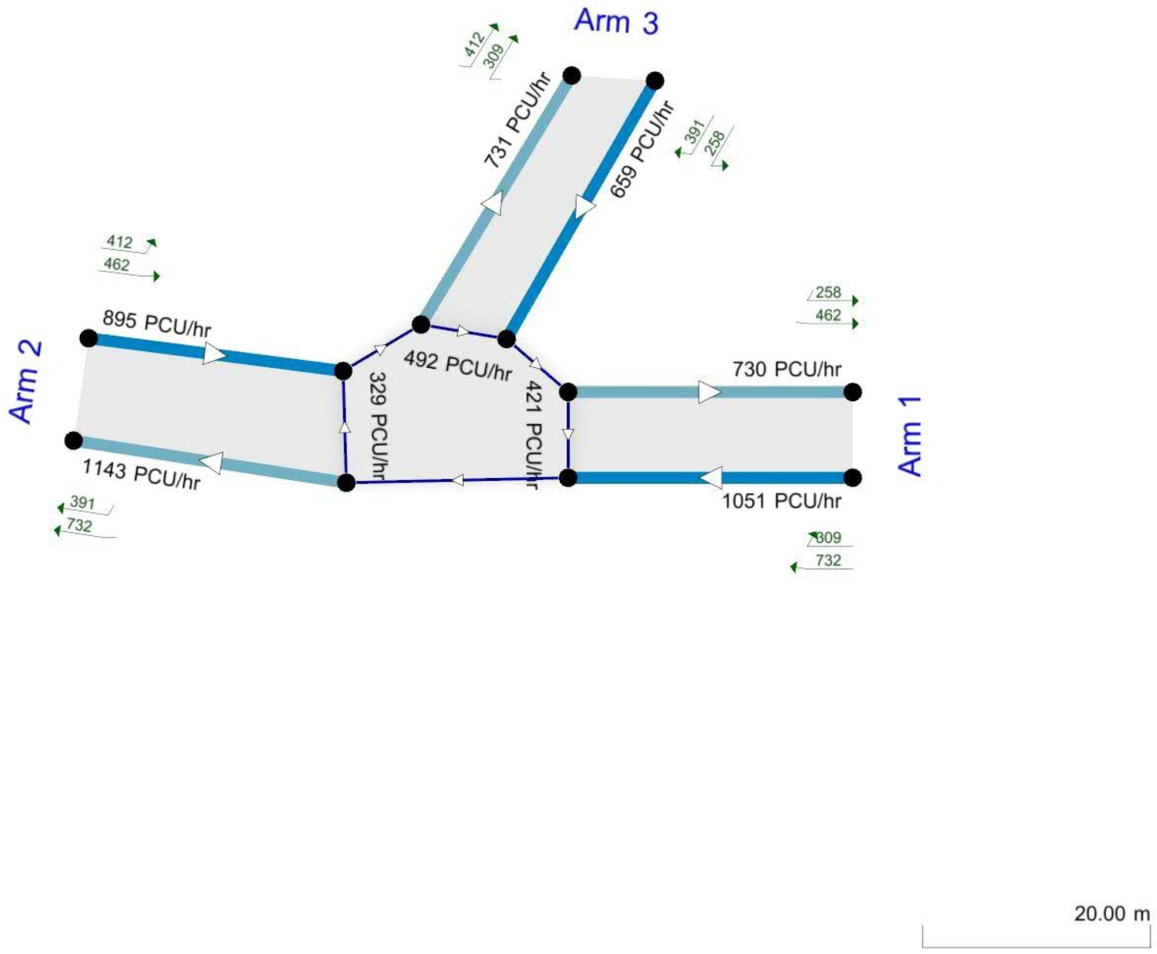
Title	(untitled)
Location	
Site Number	
Date	13/6/2018
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	ITADMIN
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCU	PCU	perHour	s	-Min	perMin



Showing modelled flow through junction (PCU/hr).
Time Segment: (08:00-08:15)
Showing Analysis Set "A1 - Junction H (Future) "; Demand Set "D7 - 2034 Reference (w PWP Works), AM "

The junction diagram reflects the last run of ARCADY.

Junction H (Future) - 2034 Reference (w PWP Works), AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction H (Future)	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Reference (w PWP Works), AM	2034 Reference (w PWP Works)	AM		FLAT	08:00	09:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
A	A	Roundabout	1,2,3			6.09	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	Kam Tin Road WB	
2	2	Kam Tin Road EB	
3	3	Fam Kam Road	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	6.35	9.00	12.00	170.00	28.00	42.00	
2	5.40	7.00	15.00	55.00	28.00	74.00	
3	3.30	5.20	16.00	20.00	28.00	35.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.803	2398.137
2		(calculated)	(calculated)	0.633	1754.796
3		(calculated)	(calculated)	0.591	1392.488

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
1	FLAT	✓	820.00	100.000
2	FLAT	✓	1015.00	100.000
3	FLAT	✓	670.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
08:00-08:15	1	820.00	820.00		
08:00-08:15	2	1015.00	1015.00		
08:00-08:15	3	670.00	670.00		
08:15-08:30	1	820.00	820.00		
08:15-08:30	2	1015.00	1015.00		
08:15-08:30	3	670.00	670.00		
08:30-08:45	1	820.00	820.00		
08:30-08:45	2	1015.00	1015.00		
08:30-08:45	3	670.00	670.00		
08:45-09:00	1	820.00	820.00		
08:45-09:00	2	1015.00	1015.00		
08:45-09:00	3	670.00	670.00		
09:00-09:15	1	820.00	820.00		
09:00-09:15	2	1015.00	1015.00		
09:00-09:15	3	670.00	670.00		
09:15-09:30	1	820.00	820.00		
09:15-09:30	2	1015.00	1015.00		
09:15-09:30	3	670.00	670.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction A (for whole period)

	To			
From		**1**	**2**	**3**
	1	10.000	570.000	240.000
	2	580.000	10.000	425.000
	3	280.000	380.000	10.000

Turning Proportions (PCU) - Junction A (for whole period)

	To			
From		**1**	**2**	**3**
	1	0.01	0.70	0.29
	2	0.57	0.01	0.42
	3	0.42	0.57	0.01

Vehicle Mix

Average PCU Per Vehicle - Junction A (for whole period)

	To			
From		**1**	**2**	**3**
	1	1.000	1.000	1.000
	2	1.000	1.000	1.000
	3	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction A (for whole period)

	To			
From		**1**	**2**	**3**
	1	0.0	0.0	0.0
	2	0.0	0.0	0.0
	3	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.39	2.86	0.65	A
2	0.64	6.26	1.76	A
3	0.65	9.79	1.81	A

Main Results for each time segment

Main results: (08:00-08:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	820.00	817.41	395.84	0.00	2080.09	0.394	0.65	2.845	A
2	1015.00	1008.08	259.11	0.00	1590.73	0.638	1.73	6.108	A
3	670.00	662.97	595.95	0.00	1040.14	0.644	1.76	9.379	A

Main results: (08:15-08:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	820.00	819.99	399.92	0.00	2076.81	0.395	0.65	2.863	A
2	1015.00	1014.93	259.99	0.00	1590.17	0.638	1.75	6.255	A
3	670.00	669.86	599.96	0.00	1037.77	0.646	1.79	9.776	A

Main results: (08:30-08:45)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	820.00	820.00	399.98	0.00	2076.77	0.395	0.65	2.863	A
2	1015.00	1014.98	260.00	0.00	1590.17	0.638	1.75	6.258	A
3	670.00	669.96	599.99	0.00	1037.75	0.646	1.80	9.783	A

Main results: (08:45-09:00)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	820.00	820.00	399.99	0.00	2076.76	0.395	0.65	2.863	A
2	1015.00	1014.99	260.00	0.00	1590.17	0.638	1.76	6.258	A
3	670.00	669.98	599.99	0.00	1037.75	0.646	1.81	9.785	A

Main results: (09:00-09:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	820.00	820.00	399.99	0.00	2076.75	0.395	0.65	2.863	A
2	1015.00	1014.99	260.00	0.00	1590.17	0.638	1.76	6.258	A
3	670.00	669.99	600.00	0.00	1037.75	0.646	1.81	9.787	A

Main results: (09:15-09:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	820.00	820.00	400.00	0.00	2076.75	0.395	0.65	2.863	A
2	1015.00	1015.00	260.00	0.00	1590.17	0.638	1.76	6.258	A
3	670.00	669.99	600.00	0.00	1037.75	0.646	1.81	9.787	A

Junction H (Future) - 2034 Reference (w PWP Works), PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction H (Future)	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Reference (w PWP Works), PM	2034 Reference (w PWP Works)	PM		FLAT	17:00	18:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
A	A	Roundabout	1,2,3			5.43	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	Kam Tin Road WB	
2	2	Kam Tin Road EB	
3	3	Fam Kam Road	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	6.35	9.00	12.00	170.00	28.00	42.00	
2	5.40	7.00	15.00	55.00	28.00	74.00	
3	3.30	5.20	16.00	20.00	28.00	35.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.803	2398.137
2		(calculated)	(calculated)	0.633	1754.796
3		(calculated)	(calculated)	0.591	1392.488

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
1	FLAT	✓	1055.00	100.000
2	FLAT	✓	895.00	100.000
3	FLAT	✓	665.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
17:00-17:15	1	1055.00	1055.00		
17:00-17:15	2	895.00	895.00		
17:00-17:15	3	665.00	665.00		
17:15-17:30	1	1055.00	1055.00		
17:15-17:30	2	895.00	895.00		
17:15-17:30	3	665.00	665.00		
17:30-17:45	1	1055.00	1055.00		
17:30-17:45	2	895.00	895.00		
17:30-17:45	3	665.00	665.00		
17:45-18:00	1	1055.00	1055.00		
17:45-18:00	2	895.00	895.00		
17:45-18:00	3	665.00	665.00		
18:00-18:15	1	1055.00	1055.00		
18:00-18:15	2	895.00	895.00		
18:00-18:15	3	665.00	665.00		
18:15-18:30	1	1055.00	1055.00		
18:15-18:30	2	895.00	895.00		
18:15-18:30	3	665.00	665.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction A (for whole period)

		To		
		1	**2**	**3**
From	**1**	10.000	735.000	310.000
	2	460.000	20.000	415.000
	3	260.000	395.000	10.000

Turning Proportions (PCU) - Junction A (for whole period)

		To		
		1	**2**	**3**
From	**1**	0.01	0.70	0.29
	2	0.51	0.02	0.46
	3	0.39	0.59	0.02

Vehicle Mix

Average PCU Per Vehicle - Junction A (for whole period)

		To		
		1	2	3
From	1	1.000	1.000	1.000
	2	1.000	1.000	1.000
	3	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction A (for whole period)

		To		
		1	2	3
From	1	0.0	0.0	0.0
	2	0.0	0.0	0.0
	3	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.51	3.59	1.05	A
2	0.58	5.53	1.37	A
3	0.60	8.22	1.51	A

Main Results for each time segment

Main results: (17:00-17:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1055.00	1050.83	421.27	0.00	2059.66	0.512	1.04	3.554	A
2	895.00	889.58	328.65	0.00	1546.70	0.579	1.35	5.434	A
3	665.00	659.08	487.06	0.00	1104.52	0.602	1.48	7.980	A

Main results: (17:15-17:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1055.00	1054.97	424.95	0.00	2056.70	0.513	1.05	3.592	A
2	895.00	894.96	329.99	0.00	1545.85	0.579	1.36	5.530	A
3	665.00	664.92	489.98	0.00	1102.79	0.603	1.50	8.217	A

Main results: (17:30-17:45)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1055.00	1054.99	424.98	0.00	2056.68	0.513	1.05	3.593	A
2	895.00	894.99	330.00	0.00	1545.84	0.579	1.37	5.530	A
3	665.00	664.97	489.99	0.00	1102.78	0.603	1.51	8.221	A

Main results: (17:45-18:00)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1055.00	1055.00	424.99	0.00	2056.67	0.513	1.05	3.593	A
2	895.00	894.99	330.00	0.00	1545.84	0.579	1.37	5.530	A
3	665.00	664.99	490.00	0.00	1102.78	0.603	1.51	8.221	A

Main results: (18:00-18:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1055.00	1055.00	425.00	0.00	2056.67	0.513	1.05	3.593	A
2	895.00	895.00	330.00	0.00	1545.84	0.579	1.37	5.530	A
3	665.00	664.99	490.00	0.00	1102.78	0.603	1.51	8.222	A

Main results: (18:15-18:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1055.00	1055.00	425.00	0.00	2056.66	0.513	1.05	3.593	A
2	895.00	895.00	330.00	0.00	1545.84	0.579	1.37	5.530	A
3	665.00	665.00	490.00	0.00	1102.78	0.603	1.51	8.222	A

Junction H (Future) - 2034 Design (w PWP Works), AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction H (Future)	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Design (w PWP Works), AM	2034 Design (w PWP Works)	AM		FLAT	08:00	09:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
A	A	Roundabout	1,2,3			6.14	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	Kam Tin Road WB	
2	2	Kam Tin Road EB	
3	3	Fam Kam Road	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	6.35	9.00	12.00	170.00	28.00	42.00	
2	5.40	7.00	15.00	55.00	28.00	74.00	
3	3.30	5.20	16.00	20.00	28.00	35.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.803	2398.137
2		(calculated)	(calculated)	0.633	1754.796
3		(calculated)	(calculated)	0.591	1392.488

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
1	FLAT	✓	830.00	100.000
2	FLAT	✓	1020.00	100.000
3	FLAT	✓	670.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
08:00-08:15	1	830.00	830.00		
08:00-08:15	2	1020.00	1020.00		
08:00-08:15	3	670.00	670.00		
08:15-08:30	1	830.00	830.00		
08:15-08:30	2	1020.00	1020.00		
08:15-08:30	3	670.00	670.00		
08:30-08:45	1	830.00	830.00		
08:30-08:45	2	1020.00	1020.00		
08:30-08:45	3	670.00	670.00		
08:45-09:00	1	830.00	830.00		
08:45-09:00	2	1020.00	1020.00		
08:45-09:00	3	670.00	670.00		
09:00-09:15	1	830.00	830.00		
09:00-09:15	2	1020.00	1020.00		
09:00-09:15	3	670.00	670.00		
09:15-09:30	1	830.00	830.00		
09:15-09:30	2	1020.00	1020.00		
09:15-09:30	3	670.00	670.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction A (for whole period)

		To		
		1	2	3
From	1	10.000	575.000	245.000
	2	585.000	10.000	425.000
	3	280.000	380.000	10.000

Turning Proportions (PCU) - Junction A (for whole period)

		To		
		1	2	3
From	1	0.01	0.69	0.30
	2	0.57	0.01	0.42
	3	0.42	0.57	0.01

Vehicle Mix

Average PCU Per Vehicle - Junction A (for whole period)

		To		
		1	2	3
From	1	1.000	1.000	1.000
	2	1.000	1.000	1.000
	3	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction A (for whole period)

		To		
		1	2	3
From	1	0.0	0.0	0.0
	2	0.0	0.0	0.0
	3	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.40	2.89	0.67	A
2	0.64	6.35	1.79	A
3	0.65	9.87	1.83	A

Main Results for each time segment

Main results: (08:00-08:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	830.00	827.36	395.81	0.00	2080.12	0.399	0.66	2.867	A
2	1020.00	1012.95	264.08	0.00	1587.58	0.642	1.76	6.193	A
3	670.00	662.92	600.86	0.00	1037.24	0.646	1.77	9.448	A

Main results: (08:15-08:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	830.00	829.99	399.92	0.00	2076.82	0.400	0.66	2.886	A
2	1020.00	1019.93	264.99	0.00	1587.00	0.643	1.78	6.345	A
3	670.00	669.86	604.96	0.00	1034.81	0.647	1.81	9.856	A

Main results: (08:30-08:45)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	830.00	830.00	399.97	0.00	2076.77	0.400	0.66	2.886	A
2	1020.00	1019.98	265.00	0.00	1587.00	0.643	1.79	6.348	A
3	670.00	669.96	604.99	0.00	1034.80	0.647	1.82	9.862	A

Main results: (08:45-09:00)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	830.00	830.00	399.99	0.00	2076.76	0.400	0.66	2.886	A
2	1020.00	1019.99	265.00	0.00	1587.00	0.643	1.79	6.348	A
3	670.00	669.98	604.99	0.00	1034.79	0.647	1.82	9.864	A

Main results: (09:00-09:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	830.00	830.00	399.99	0.00	2076.75	0.400	0.66	2.886	A
2	1020.00	1019.99	265.00	0.00	1587.00	0.643	1.79	6.348	A
3	670.00	669.99	605.00	0.00	1034.79	0.647	1.82	9.866	A

Main results: (09:15-09:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	830.00	830.00	400.00	0.00	2076.75	0.400	0.67	2.886	A
2	1020.00	1020.00	265.00	0.00	1587.00	0.643	1.79	6.348	A
3	670.00	669.99	605.00	0.00	1034.79	0.647	1.83	9.866	A

Junction H (Future) - 2034 Design (w PWP Works), PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Junction H (Future)	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2034 Design (w PWP Works), PM	2034 Design (w PWP Works)	PM		FLAT	17:00	18:30	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
A	A	Roundabout	1,2,3			5.46	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	Kam Tin Road WB	
2	2	Kam Tin Road EB	
3	3	Fam Kam Road	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	6.35	9.00	12.00	170.00	28.00	42.00	
2	5.40	7.00	15.00	55.00	28.00	74.00	
3	3.30	5.20	16.00	20.00	28.00	35.00	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.803	2398.137
2		(calculated)	(calculated)	0.633	1754.796
3		(calculated)	(calculated)	0.591	1392.488

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
1	FLAT	✓	1055.00	100.000
2	FLAT	✓	900.00	100.000
3	FLAT	✓	665.00	100.000

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
17:00-17:15	1	1055.00	1055.00		
17:00-17:15	2	900.00	900.00		
17:00-17:15	3	665.00	665.00		
17:15-17:30	1	1055.00	1055.00		
17:15-17:30	2	900.00	900.00		
17:15-17:30	3	665.00	665.00		
17:30-17:45	1	1055.00	1055.00		
17:30-17:45	2	900.00	900.00		
17:30-17:45	3	665.00	665.00		
17:45-18:00	1	1055.00	1055.00		
17:45-18:00	2	900.00	900.00		
17:45-18:00	3	665.00	665.00		
18:00-18:15	1	1055.00	1055.00		
18:00-18:15	2	900.00	900.00		
18:00-18:15	3	665.00	665.00		
18:15-18:30	1	1055.00	1055.00		
18:15-18:30	2	900.00	900.00		
18:15-18:30	3	665.00	665.00		

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction A (for whole period)

		To		
		1	**2**	**3**
From	**1**	10.000	735.000	310.000
	2	465.000	20.000	415.000
	3	260.000	395.000	10.000

Turning Proportions (PCU) - Junction A (for whole period)

		To		
		1	**2**	**3**
From	**1**	0.01	0.70	0.29
	2	0.52	0.02	0.46
	3	0.39	0.59	0.02

Vehicle Mix

Average PCU Per Vehicle - Junction A (for whole period)

		To		
		1	**2**	**3**
From	**1**	1.000	1.000	1.000
	2	1.000	1.000	1.000
	3	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction A (for whole period)

		To		
		1	**2**	**3**
From	**1**	0.0	0.0	0.0
	2	0.0	0.0	0.0
	3	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.51	3.59	1.05	A
2	0.58	5.57	1.39	A
3	0.60	8.28	1.52	A

Main Results for each time segment

Main results: (17:00-17:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1055.00	1050.83	421.25	0.00	2059.68	0.512	1.04	3.554	A
2	900.00	894.51	328.65	0.00	1546.70	0.582	1.37	5.474	A
3	665.00	659.04	492.00	0.00	1101.60	0.604	1.49	8.031	A

Main results: (17:15-17:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1055.00	1054.97	424.95	0.00	2056.70	0.513	1.05	3.592	A
2	900.00	899.95	329.99	0.00	1545.85	0.582	1.38	5.573	A
3	665.00	664.91	494.98	0.00	1099.84	0.605	1.51	8.273	A

Main results: (17:30-17:45)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1055.00	1054.99	424.98	0.00	2056.68	0.513	1.05	3.593	A
2	900.00	899.99	330.00	0.00	1545.84	0.582	1.39	5.573	A
3	665.00	664.97	494.99	0.00	1099.83	0.605	1.52	8.277	A

Main results: (17:45-18:00)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1055.00	1055.00	424.99	0.00	2056.67	0.513	1.05	3.593	A
2	900.00	899.99	330.00	0.00	1545.84	0.582	1.39	5.573	A
3	665.00	664.99	495.00	0.00	1099.83	0.605	1.52	8.277	A

Main results: (18:00-18:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1055.00	1055.00	425.00	0.00	2056.67	0.513	1.05	3.593	A
2	900.00	900.00	330.00	0.00	1545.84	0.582	1.39	5.573	A
3	665.00	664.99	495.00	0.00	1099.83	0.605	1.52	8.278	A

Main results: (18:15-18:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1055.00	1055.00	425.00	0.00	2056.66	0.513	1.05	3.593	A
2	900.00	900.00	330.00	0.00	1545.84	0.582	1.39	5.573	A
3	665.00	665.00	495.00	0.00	1099.82	0.605	1.52	8.278	A

Appendix 3

Landscape Masterplan and Tree Preservation and Removal Proposal

PROPOSED REZONING FROM "RESIDENTIAL (GROUP D)" TO "RESIDENTIAL (GROUP C)" ZONE FOR PROPOSED RESIDENTIAL DEVELOPMENT AT VARIOUS LOTS AND ADJOINING GOVERNMENT LAND IN D.D. 112, KAM SHEUNG ROAD, SHEK KONG, YUEN LONG, NEW TERRITORIES

LANDSCAPE MASTER PLAN
AND
TREE PRESERVATION AND REMOVAL PROPOSAL

PREPARED BY

STEPHEN LAI STUDIO LIMITED

ON BEHALF OF

TENOX DEVELOPMENT LIMITED

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APPENDICES

1 INTRODUCTION

1.1 Background

This Landscape Master Plan and Tree Preservation and Removal Proposal ("LMP&TPRP") seeks to present landscape design, tree treatment and tree proposal for the **Proposed Development in various Lots and adjoining government land in D.D.112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories** ("The Application Site") in support of the S12A Planning Application for proposed rezoning from Residential (Group D)" to "Residential (Group C)" zone.

This LMP&TPRP outlines the approach and the findings of a tree survey on the type and extent of trees that are subject to impacts due to the proposed development within the Application Site. Effort is also made to advise on the values of the existing vegetation and the necessary protection approach. The tree survey is conducted on 12 February 2022

The following legislation, standards and guidelines are applicable to the landscape design, tree survey, tree felling, and new planting proposal associated with the proposed works for the project.

- LAO Practice Note No.1/2020 – Compliance of Landscape Clause under Lease;
- PlanD's Practice Note for Professional Persons No. 1/2019 – Processing and Compliance Checking of Landscape Submissions related to Planning Applications
- Joint Practice Note No. 3 – Landscape and Site Coverage of Greenery;
- DEVB TC(W) No.6/2015 – Maintenance of Vegetation and Hard Landscape Features;
- DEVB TC(W) No.5/2020 – Registration of Old and Valuable Trees;
- LAO Practice Note No.2/2020 – Tree Preservation and Removal Proposal for Building Development in Private Projects – Compliance of Tree Preservation Clause under Lease

1.2 Description of the Site

The Application Site, with a site area of approximate 41,290m^2. The Lot numbers of the Land involved is various lots and adjoining government land in D.D.112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories. The Application site is a flat piece of land, which is located to the South of Shek Kong Airfield and Shek Kong Stabling Sidings. The Site is also situated about 3.5km Southeast of Kam Sheung Road Station and about 2.4km east of the MTR Pat Heung Maintenance Centre. At the local level, the Site is bounded by Kam Sheung Road to the North. *(refer to Fig.1)*

The surrounding context is in general in rural setting with low-rise villages, open storage sites and scattered active farmland. Site generally has a rural setting and occupied with rural plots. The area to he East and West of the Site is mainly surrounded by different villages zoned "Village Type Development" ("V") zone. There is a declared monument within the Village to the East of the Site. The area zoned "Agriculture" with temporary structures is situated to the North of Site across Kam Sheung Road. The area to the immediate South is mainly zoned "Agriculture", which is in general abandoned farmland.

1.3 Proposed Development

The proposed development consists of 19 nos. of residential blocks with 6 storeys. It also comprises of two stand-alone 1-storey clubhouses and two stand-alone 3-storey carport. The proposed development is erected on formed level of between about 24mPD and about 26mPD from the North to the South. The proposed development seeks to develop and upgrade the present environment and condition of the Site through the implementation of high-quality **low-rise residential development** with generous landscape and amenity provisions for an improved living environment for the future residents as well as visual amenity to neighbourhoods.

The building blocks of the proposed development have been carefully designed and positioned within the Site. Each of the building blocks is designed with a relatively small building footprint, which would offer generous open space at grade level and greening elements for the users' enjoyment. The relatively small building footprint would also maximize the air permeability of the development and minimize its impact on wind capturing potential of the surrounding neighbourhood.

A new tree proposal has been designed to restore the landscape quality as far as technically possible, therefore maximizing the possibility on the landscape character and amenity of the site.

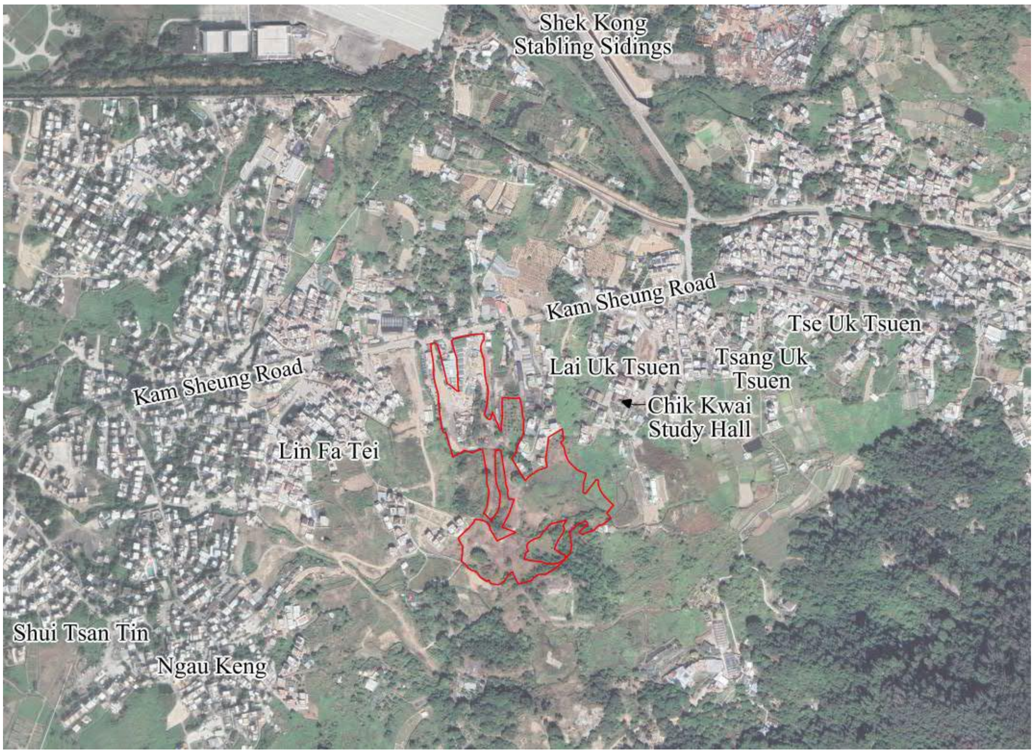

Fig.1 Location Map

2 TREE SURVEY METHODOLOGY

All living trees of 300mm girth (= 95mm diameter) or over (measured at 1.3m above ground level), within the Lot were studied. Each tree was identified to species level, and its girth, height and spread measured. The condition of each tree was then evaluated according to the following criteria (Webb 1991 Tree Planting & Maintenance in Hong Kong, Government Printer. The attributes of trees were identified as follows:

- Botanical name (Scientific Name & Chinese Name);
- Government Department for tree felling jurisdiction;
- Trunk diameter (measured 1.3 meters from the ground);
- Height;
- Crown spread;
- Tree form;
- Health condition;
- Amenity value;
- The likelihood of the tree surviving after transplanting;
- Proposed treatment; and,
- Brief description and remarks,
- Soil level at root collar tree.

2.1 Assessment of Tree Form

The form of each tree was reviewed giving consideration to the canopy balance, branching structure and the expected form of the species. The assessment criteria used to evaluate the value of the tree form is summarized in ***Table 1***.

Table 1 – Assessment Criteria for Tree Form

Parameter	Category	Criteria
Tree form	Good	Trees with well balanced form, upright, evenly branching, well-formed head and generally in accordance with the standard form for its species.
	Fair	Trees with general balanced form and compensated by loss of branches of leaning trunks.
	Poor	Trees with very unbalanced form, leaning, contorted, bending trunk, suffering from loss of major branches with general damage and growing close to adjacent trees.

2.2 Assessment of Tree Health

The health of the trees was assessed as follows:

Foliage
- Colour and general appearance, and;
- Evidence of insect or fungal infection.

Branches
Evidence of:
- Dead or die-back or crossing branches;
- Heavy horizontal branches which may cause tree instability;
- Damaged, broken or cut branches;
- Insect and fungal infection on branches, and;
- Other uncharacteristic pattern of the branches.

Trunk
- Tightly forked or multi-ascending trunk that can be a weakness in trees;
- Cavities or internal/external rot;
- Sap seeping through the trunk;

- Fungi growing on the trunk, and;
- Serious bark damage.

Based on the study team's assessment of these features, the health conditions are categorized according to the definitions presented in ***Table 2***.

Table 2 – Assessment Criteria for Tree Health

Parameter	Category	Criteria
Health	Good	Tree with a low incidence of the less serious features (i.e. damage and infection) and a high chance of a fast recovery from such feature.
	Fair	Tree with a higher incidence of the less serious features (i.e. damage and infection) and a medium chance of recovery.
	Poor	A tree with more serious health features (i.e. damage and infection) and with low chance of recovery even with remedial measures or, the tree is dead.

2.3 Assessment of Survival Rate after Transplantation

The survival rates of the transplanted trees were assessed with consideration of the following parameters:

- The overall health condition of tree before transplantation;
- Expected regeneration rate of root system and tree crown after pruning.
- Expected overall tree form after transplantation, and;
- Botanical Suitability.

The assessment criterion for survival rate of each transplanted tree is shown in ***Table 3***.

Table 3 – Assessment Criteria for Survival Rate after Transplantation

Parameter	Category	Detail
Survival Rate	High	Has excellent health condition with high expected regeneration rate of tree crown and form and is botanically suitable.
	Medium	Overall good health condition, moderate expected regeneration rate of tree crown and moderately botanically suitable.
	Low	Common species with low expected regeneration rate of tree crown and not botanically suitable.

2.4 Native or Exotic Species

To improve the ecological function of the study area, native species will be retained if technically feasible. Similarly native species will be selected for compensatory planting (refer Section 6).

2.5 Recommendation for Tree Treatment

Based on the assessment of tree form, health, survival rate and amenity value one of the recommendations is made for each tree as follows:

Retain
Tree is in an unaffected area and is to be retained and protected during construction.

Transplant
Trees with overall good/fair condition and high/medium amenity value within the delineated work areas are recommended to be transplanted. Special consideration is necessary for relocation of the trees to a suitable location before the commencement of the construction work.

The criteria for the assessment of the suitability of transplantation are based on the following:

- The tree is a rare species or is protected by Hong Kong laws;
- Distinctiveness – trees with high amenity value and high local importance e.g. fung shui;
- Condition of tree – tree with balanced form, good health and high amenity value;
- Maturity – younger trees have higher survival rate than the mature ones;
- Species characteristics – different tree species have different rates of survival after transplantation;
- Root ball feasibility – trees growing on loose rocky sub base/slope or adjacent to an important utility will not be considered; and
- Access – heavy machinery may be required to raise the tree. Steep slopes and rocky terrain may make the operation not feasible.

Fell

Trees of low health, amenity value, form, etc. in conflict with the proposed construction work will be felled. The guidance and criteria for the proposed felling of trees are:

- No irreplaceable rare tree species involved;
- Felling of trees would not cause a serious environmental impact;
- The location of the tree is in conflict with the development;
- A genuine development or traffic need to fell exists, which cannot be reasonably overcome;
- The tree is not unusually large or a fine example of its type; or
- The tree is in poor condition.

All trees to be felled will require compensatory planting to be agreed with the relevant authorities of the Hong Kong Government.

3 TREE SURVEY

The tree survey has been completed in broad accordance with LAO Practice Note Issue No.2/2020 Tree Preservation and Removal Proposal for Building Development in Private Projects – Compliance of Tree Preservation Clause under Lease. The survey approach is presented in *Para. 2*.

Details of each tree are recorded in the Tree Survey carried out on **12 February, 2022** to reflect the current condition of existing trees within and 2m beyond the application site boundary including various lots and adjoining government land in D.D.112.

The location of each individual tree within and 2m beyond the application site boundary is shown in ***Appendix 2 - Tree Survey Plan (Drawing No.TS_001-002*****)** and the detailed description of each tree including DBH, crown spread, tree ID number, photos, etc. is tabulated in ***Tree Assessment Schedule***.

3.1 Description of Vegetation

Existing trees are fully covering the site. The application site contains approximately **41** trees (including 5 trees that are outside the lot but 2m beyond site boundary, and 1 tree inside adjoining government land). The photographic record in ***Appendix 2 – Photographic Record of individual Tree*** shows the condition and character of the vegetation covering the Application Site.

None of the tree species are protected under the local regulations and ordinances.

No rare or endangered tree species were recorded within the tree survey boundary (based on Forests and Countryside Ordinance, Cap. 96) or Champion Trees (identified in the book 'Champion Trees in Urban Hong Kong') were found to exist on the Site. All recorded species are commonly found in Hong Kong.

No registered "Old and Valuable Trees" (OVTs), but 3nos. of the existing trees meet the requirements for potentially registrable in accordance with the criteria for **Old and Valuable Trees** as set out in the Works Branch of Development Bureau ("DevB") Technical Circular (Works) ("TC (W)") No. 5/2020. They are **T9** (*Ficus virens* 大葉榕), **T15** (*Ficus macrocarpa* 細葉榕) and **T34** (*Ficus rumphii* 心葉榕), with DBH over 1m.

Refer to below Table 4, A total of **16** tree species were identified of which **8** are native to Hong Kong and **8** exotic species; some of the exotics have become naturalized and others are widely cultivated in the region as pioneer tree or amenity tree. There are total 24 nos. native trees and 17 nos. exotic trees.

3.2 Summary of Existing Trees

Species and quantity of existing trees were recorded within the site boundary, inside adjoining government land and outside the lot but 2m beyond site boundary as tabulated below ***Table 4***:

Table 4 – Summary of surveyed trees within Site

Species	Chinese Name	Total Number of Individuals
1. Within the site boundary		
Aleurites moluccana	石栗	1
Bombax ceiba	木棉	3
Celtis sinensis	**朴樹**	**4**
Cleistocalyx nervosum	**水翁**	**2**
Elaeocarpus decipiens	杜英	1
Ficus benjamina	垂葉榕	1
Ficus hispida	**對葉榕**	**1**
Ficus microcarpa	**細葉榕**	**5**
Ficus rumphii	心葉榕	1
Ficus virens	**大葉榕**	**1**
Leucaena leucocephala	銀合歡	5
Macaranga tanarius var. tomentosa	**血桐**	**5**
Melia azedarach	苦楝	1
Sapium discolor	**山烏桕**	**1**
Sapium sebiferum	**烏桕**	**1**
Spathodea campanulata	火焰木	1
	Sub-total	**34**
2. Inside adjoining Government Land		
Ficus hispida	**對葉榕**	**1**
	Sub-total	**1**
3. Outside the Lot but 2m beyond site boundary (for reference only)		
Cleistocalyx nervosum	**水翁**	**1**
Ficus hispida	**對葉榕**	**1**
Leucaena leucocephala	銀合歡	3
Macaranga tanarius var. tomentosa	**血桐**	**1**
	Sub-total	**6**
	Total Tree Survey No.	**41**

NOTE: Species highlighted in **BOLD** text denote Native plant species.

3.3 Condition of Existing Trees

The Site is originally full of weeds and hard to access, so that the owner carried out a site cleaning works to clear all weeds, remove some debris and waste from the site, before the topographical survey and tree survey. Refer to the ***Tree Assessment Schedule and Photographic records*** in ***Appendix 2***, majority of the trees are in poor to fair tree form and health condition.

With low input of maintenance and management, some of the trees are vined by climbers, with natural damage, bent trunk, bowing trunk, crooked trunk and broken leader can be commonly observed. Thus, most specie exhibits low amenity value in general and the original site gives no specific important ecological value.

3.4 Proposed Treatment of Existing Trees

The development scheme recognises the importance of the landscape context to the future development. Careful consideration has been given to preservation of existing trees in accordance with the criteria set down in LAO PN 2/2020. Where possible, trees are proposed to be retained in situ.

The species, size, maturity, character, amenity and cultural value of all trees have been carefully considered in the preparation of this proposal. Tree removal has been proposed only once all other options for preservation have been exhausted. All tree works will be carried out in accordance with the specifications/ latest local guidelines / best practices and internationally standards, etc. ***Dwg. TT_001-003 under Appendix 2*** indicates the overall tree treatment, Tree Felling justification is classified into below with specific drawing for easier review:

Table 5 Summary of Proposed Treatments to Existing Trees Surveyed

Location	No. of Trees			
	Retain	Fell	Transplant	Total
i) Within Site	5	28	1	**34 (97.1%)**
ii) Adjoining Government Land	-	1	-	**1 (2.9%)**
Total	**5 (14.2%)**	**29 (82.9%)**	**1 (2.9%)**	**35 (100%)**
iii) Outside Site but 2m beyond Site Boundary (for reference only)	6	-	-	**6**
Remarks: For 6nos. of trees located outside site but 2m beyond site boundary, they are T21, T22, T23, T26, T29 and T31, they are remained "retained" in this submission. Tree Preservation and Removal Proposal for these 6 nos. of trees to be applied in separate submission.				

3.5 New Tree Planting

29nos. existing trees within site are proposed to be felled mainly due to direct impact of development and low survival rate if transplantation. **5nos.** existing trees will be retained including **3nos.** potential OVT, **1no.** existing tree will be transplanted.

Sufficient new trees will be planted within the Development Area as illustrated on the **Landscape Master Plan *(refer to Appendix 1*)** and **Dwg. No. CP_001-002 *(refer to Appendix 2)***. Ratio of new trees and tree lost in term of quantity is not less than **1:6.7**.

The proposed species and sizes for new tree planting are given below ***Table 6***. Note that this is an indicative list and will be developed further during detailed planting design in line with the selection criteria given above.

Table 6 Summary of Proposed New Tree Species

Code	Tree Species (Botanicla Name)	Tree Species (Chinese Name)	DBH (mm)	Crown Spread (m)	Overall Hight (m)	Spacing (m)	Live-Crown Ratio
CB	***Cinnamomum burmannii***	**陰香**	120	3.5	4	5	0.4
CC	***Cinnamomum camphora***	**樟**	120	3.5	4	5	0.4
CS	*Cassia surattensis*	黄槐	100	3	3.5	5	0.4
CT	***Celtis sinensis Pers***	**朴樹**	120	3.5	4	5	0.4
CU	*Crateva unilocularis*	樹頭菜	120	3.5	4	5	0.4
DD	*Dracontomelon duperreanum Pierre*	人面子	120	3.5	4	5	0.4
DR	*Delonix regia*	鳳凰木	120	3.5	4	5	0.4
LF	*Liquidambar formosana*	楓香	120	3.5	4	5	0.4
IR	***Ilex rotunda Thunb. var. microcarpa***	**小果鐵冬青**	120	3.5	4	5	0.4
JM	*Jacaranda mimosifolia*	藍花楹	120	3.5	4	5	0.4
LF	***Liquidambar formosana Hance***	**楓香**	120	3.5	4	5	0.4
OF2	*Osmanthus fragrans*	桂花	100	3	3.5	5	0.4
SS	***Sapium sebiferum***	**烏桕**	100	3	3.5	5	0.4
TM	*Terminalia Mantaly*	小葉欖仁	120	3.5	4	5	0.4
TMT	*Terminalia mantaly cv. tricolor*	錦葉欖仁	120	3.5	4	5	0.4
TR	*Tabebuia rosea*	紅花風鈴木	100	3	3.5	5	0.4

NOTE: Species highlighted in **BOLD** text denote Native plant species.

4 LANDSCAPE PROPOSAL

4.1 Landscape Design Concept

The concept underpinning the Landscape Master Plan, presented as **Appendix 1** is to provide a high-quality living environment for the future residents whilst preserving and enhancing the existing landscape context. The landscape design concept responds to the development's rural context and surroundings, it is aiming to restore a quiet and green-shaded landscape design with a new definition of open spaces.

The landscape plan is described in terms of the main design objectives followed by a description of the key landscape components, and finally the hard and soft landscape elements, which form the palette of materials.

4.2 Landscape Design Objective

The design objectives for the Landscape Plan are to:

- Integrate the proposed development from a landscape and visual perspective with the existing and planned landscape context;
- Soften the form of the built environment including the proposed boundary areas through the use of green measures;
- Create distinctive and high quality landscape setting for the private gardens and open space network;
- Provide a quality and sustainable living environment for the future residents of the development;

- Provide adequate open space for the future residents, especially on the common roof of the carparking and clubhouse;
- Maximise the greenery incorporated within the overall landscape design plan;
- Maximise opportunities for the planting of new trees and shrubs.

4.3 Landscape Design Components

With reference to **Appendix 1** Landscape Master Plan, the landscape design components are summarized below, relevant landscape details can refer to **Appendix 3**:

- A row of trees along the EVA acting as a proper road tree approach and formal welcoming landscape design;
- Due to the large scale of the Site, Sitting-out areas are evenly distributed. Recreational open spaces, such as elderly fitness area, children play area, multi-purpose lawn, BBQ areas, Swimming pool belong to Clubhouse are proposed in between building blocks;
- Greening Feature such as Vertical Green is proposed at certain hierarchy areas such as along the welcoming entrance and major recreational open space areas;
- Green buffer plantings along the application site boundary to maintain a high landscape visual quality to the neighbourhood;

4.4 Open Space Proposal

Adequate private open space will be provided in accordance with the requirements of HKPSG Chapter 4, Recreation, Open Space and Greening for the provision of local open space with the objective of providing high quality recreational facilities that will satisfy the needs of the future residents of the development. The proposed development scheme is designed to meet the requirements, providing a minimum of 1m^2 per person of local open space, as stipulated in the HKPSG.

Refer to **Private Open Space Figure (*Dwg. No. LMP_005*) in Appendix 1**, the communal private open space within the proposed development is designed for the exclusive use of the future residents, with a provision of area not less than 2,380m^2 for an estimated population of 2,380 persons. Private open space within this development would be maintained by the property management agent of the development.

Apart from communal private open space within the development, private gardens will be accommodated at ground floor of the residential blocks. These private gardens would be maintained by the future property owners for their own exclusive use.

4.5 Site Coverage of Greenery (SCG) *(For Information Only)*

Upon the full establishment of the greening measures proposed within the development, refer to **Site Coverage of Greenery Figure *(Dwg. No. LMP_004*) in Appendix 1**, visible greening in the communal areas of the proposed development will not less than 30% of the total site area, i.e. not less than 12,387m^2. The proposed development would maximise the greening opportunities at ground level. For approval and compliance checking in fulfilling the SCG requirement under Lease, the procedures as stipulated in paragraphs 9 to 11 of JPN3 shall be followed.

4.6 Landscape Design Elements

Soft Landscape

The landscape design will maximise opportunities for tree and shrub plantings to enhance the semi-rural context. The basis for the proposed planting scheme would be to provide a green and comfortable environment for resident's recreational needs while also responding to the ecological design imperatives for the site and its immediate environs. The spaces will be characterised by the use of shrub species have been selected to provide a lush landscaped area whilst responding to the character of the architecture which embraces it. The plant species will provide colour throughout the year to emphasise the changing of the seasons. The plant selection will also consider form, colour and foliage texture; and also include species which are designed architectural highlights. The landscape buffer areas would utilise native tree and shrub species to enhance the ecological value of the site and provide connectivity where possible to the fragmented landscape beyond.

In order to achieve an instant greening effect at the initial stages, to ensure the healthy establishment of planting, tree planting selection will consider the market availability of the species and the suitable tree stock size. With reference to ***Table 7***, the planting mix will form the basis of the planting design proposals.

Table 7 Summary of Proposed Shrub and Groundcover Species

Botanical Name	Chinese Name	Height x Spread (mm)	Spacing (mm)	Desity (nos/m2)
Shrub Species				
Cuphea ignea	雪茄花	200 x 300	150	51.59
Epipremnum aureum	黄金葛	200 x 300	150	51.59
Hedera helix	金葉石菖蒲	250 x 350	150	51.59
Phyllanthus myrtifolius	錫蘭葉下珠	200 x 250	150	51.59
Coleus hybrida	洋紫蘇 (紅心綠邊）	250 x 200	200	29
Duranta repens cv. Marginata'	黃邊金露花	300 x 300	200	29
Trachelospermum asiaticum	花葉絡石	300 x 300	200	29
Zanthoxylum piperitum	胡椒木	300 x 300	200	29
Asplenium nidus 'Avis'	雀巢芒	400 x 400	250	18.4
Fagraea ceilanica	非洲茉莉	900 x 500	350	9.57
Ixora chinensis	龍船花（粉紅）	500 x 400	350	9.57
Rhapis excelsa	細葉棕竹	1500 x 600	450	5.72
Philodendron selloum	春羽	600 x 500	450	5.72
Ground Cover Species				
Botanical Name	**Chinese Name**	**Thickness (mm)**		**Spread (mm)**
Ophiopogon japonicus f. nanus	玉龍草	50		100
Zoysia japonica	朝鮮草	50		-

Soil Depth for Planting Areas

In order to ensure that these planting proposals are feasible, it is proposed that an adequate planting medium be incorporated into the design of the soft landscape areas. For example the proposed planting areas will incorporate a minimum 1200mm for the tree planting areas and 600mm depth of planting medium (internal dimension excluding drainage layer and utilities) for the shrub planting. Lawn areas will incorporate a minimum soil depth of 300mm.

Irrigation and Drainage

The proposed soft landscape area will be irrigated manually with tap water from lockable water points at 40m centres throughout the entire site. The proposed source of water supply will be subject to final approval from the Water Services Department. Sub-soil drainage shall be provided for all planting areas.

Feature Paving

The paving will be an important element of the open space both in aesthetic terms and in term of producing a hardwearing landscape for usage by future residents. The design of the proposed paving will highlight entrance areas and major pedestrian routes through the site providing a hierarchy for pedestrian movement. It would be constructed of quality materials in feature patterns creating a distinct identity for each of the key landscape zones responding to the architectural design and function of each. Colour changes within the patterns would be used to break the linearity of the spaces and establish a theme across the development.

Non-slip paving materials will be selected to suit the various passive recreational areas within the site. Wherever possible all open spaces will cater for multiple use needs including people with impaired ability and access for the disabled provided in accordance with Building Department’s Design Manual on ‘Barrier Free Access, 2008’.

Lighting

The lighting concept for the landscaped areas will be designed to contribute to the quality of the development in nocturnal views while using high pressure sodium and cut-off lighting to minimise light spillage and disturbance to the adjacent areas. The lighting will provide an aesthetically pleasing landscape through the highlighting of landscape elements and ensure the safety of users. All the accessible points and open space areas will be provided with sufficient illumination to meet the required lighting standards. Safety lighting with the minimum lux level lighting for safety will last between midnight until early morning.

4.7 Landscape Management and Maintenance

Upon completion of the construction works, a 12-months defect liability period will be implemented which applies to both hard and soft landscape works. The soft landscape specialist contractor will be responsible for the maintenance of planting during this first year following practical completion to ensure proper establishment of planting works. General maintenance Schedule refer to **Para.5.**

5 FUTURE MAINTENANCE AND MANAGEMENT

Maintenance and establishment works to soft landscape areas within Site shall be undertaken by the softworks contractor for an Establishment Period of a minimum of 12 months following Practical Completion. This will ensure the proper establishment of the planted material. Tree risk assessment will be conducted by future property management at appropriate time for appropriate tree as instructed by the owner in accordance with the Handbook of Tree Management by DEVB.

Soft Landscape Maintenance Schedule

Watering:	Water all plants as necessary, adjusted to rainfall, to ensure adequate water supply for plant consumption during the establishment period.

Pruning:	Cut back annuals after flowering period. Healthy cuttings may be used for propagation. Prune shrubs and groundcover in early March to encourage flowering. Prune woody shrubs and trees selectively according to species (annually). Remove dead fronds from palm trees. Utilise established and approved tree surgery techniques as necessary and seal all sharp cut wounds with approved material to resist decease attack.
Fertilizing:	Two to three times annually, emphasis shall be in the March application. Test soil in January to analyse quality ameliorates as necessary
Fungicide / Insecticide:	Spray only as necessary with approved chemical
Weeding:	Manually or use selective non-toxic, biodegradable herbicide to keep the weed growth and its establishment under control.
Securing:	Adjust tree stakes in spring and as necessary to taut up the staking. Care shall be applied to avoid chaffing of tree bark.
Mulching:	Top up the mulching inside all planting beds twice a year and as necessary.
Thinning:	Reduce overcrowding and transplant as necessary at selected periods: • Evergreens: Spring • Deciduous: Winter • Palms: June to August

Table 8: Maintenance Schedule

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Watering	●	●	●	●	●	•	•	•	•	●	●	●
Pruning		D	GC									
Fertilizing	Soil test			×							×	
Fungicide / Insecticide									×			×
Weeding		×	×	×	×	×	×	×		×		×
Securing			×									
Thinning			EG								D	

***Remarks:**

Tree risk assessment will be conducted by future property management at appropriate time for appropriate tree as instructed by the owner in accordance with the Handbook of Tree Management by DEVB.

Schedule Legend:

GC	Groundcover	EG	Evergreen	D	Deciduous
●	Size proportional to quantity	×	Application		

6 CONCLUSION

The landscape design of the Project as presented in this Landscape Master Plan will provide the following key benefits:

- Softening of building forms and enhancement of the appearance of the project to those viewing it from outside.
- Maximize the greening and recreation possibility;
- Total **41nos.** existing trees were surveyed within site boundary. Not less than **200nos.** new tree plantings within the future development, to achieve a min. **1:6.7** compensation ratio in quantity. A summary is shown in ***Table 9***.

Table 9: Tree Felling and New Tree Proposal

Description	**Current Scheme**
Total Nos. of Trees Surveyed including 6nos. of trees outside site but 2m beyond site boundary	41 nos.
Total Nos. of Trees outside Site but 2m beyond site boundary (for reference only)	6nos.
Total Nos. of Trees within Site Boundary and Adjoining Government Land	35nos.
Nos. of Trees Proposed to be Retained	5 nos.
Nos. of Trees Proposed to be Felled	29 nos.
Nos. of Trees Proposed to be Transplanted	1 no.
Nos. of New Trees	Not less than 200nos.
Compensation Ratio in quantity	Not less than 1: 6.9

The overall landscape treatment will complement the development as well as the surrounding area, providing plentiful greenery and creating a coherent visual setting for the development in this rural waterside location.

Appendix 1

LANDSCAPE MASTER PLAN

PRIVATE OPEN SPACE FIGURE

SITE COVERAGE OF GREENERY (FOR INFORMATION ONLY)

LANDSCAPE SECTIONS

LANDSCAPE MASTER PLAN

1:800 (A1) / 1:1600 (A3)

Rev.	Date	Amendment	Purpose

LEGEND

🟥	SITE BOUNDARY
XX.XX	PROPOSED LEVEL
●	PROPOSED NEW TREES
●	RETAINED TREES
●	TRANSPLANTED TREES
🟩	PLANTING AREA
🟩	LAWN
▨	EVA / VEHICLE ACCESS
▨	SAFETY MAT
▨	HARD PAVED AREA
— · —	VERTICAL GREEN (DETAIL REFER TO DWG. NO. LD_005&006)
— —	BOUNDARY METAL FENCE WALL (DETAIL REFER TO DWG. NO. LD_001)
— —	BOUNDARY RC FENCE WALL (DETAIL REFER TO DWG. NO. LD_002)

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Developer

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Project

PROPOSED REZONING FROM "RESIDENTIAL (GROUP D)" TO "RESIDENTIAL (GROUP C)" ZONE FOR PROPOSED RESIDENTIAL DEVELOPMENT AT VARIOUS LOTS AND ADJOINING GOVERNMENT LAND IN D.D. 112, KAM SHEUNG ROAD, SHEK KONG, YUEN LONG, N.T.

Drawing Title

LANDSCAPE MASTER PLAN

Job No.	Drawing No.	Revision No.
HKA-01063	LMP_001	-
Scale	Date	CAD Ref.
AS	FEB 2022	LMP_001
Drawn	Checked	Approved
NN	SL	SL

Authorized Person - Architect

Consultant Logo

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LEGEND

① CLUBHOUSE
② WATER FEATURE
③ ENTRANCE PLAZA
④ SITTING OUT AREA
⑤ CHILDREN PLAY AREA
⑥ MULTI-PURPOSE LAWN
⑦ ELDERLY FITNESS AREA
⑧ JOGGING PATH
⑨ LANDSCAPE GARDEN
⑩ SWIMMING POOL
⑪ BARBECUE AREA

① LANDSCAPE MASTER PLAN 01
1: 400 (A1) / 1: 800 (A3)

Rev.	Date	Amendment	Purpose

LEGEND

- SITE BOUNDARY
- +XX.XX PROPOSED LEVEL
- PROPOSED NEW TREES
- RETAINED TREES
- TRANSPLANTED TREES
- 🟩 PLANTING AREA
- 🟩 LAWN
- EVA / VEHICLE ACCESS
- SAFETY MAT
- HARD PAVED AREA
- VERTICAL GREEN (DETAIL REFER TO DWG. NO. LD_005&006)
- BOUNDARY METAL FENCE WALL (DETAIL REFER TO DWG. NO. LD_001)
- BOUNDARY RC FENCE WALL (DETAIL REFER TO DWG. NO. LD_002)
- ✳ IRRIGATION POINT (20M RADIUS)

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Drawing Title
LANDSCAPE MASTER PLAN 01

Job No.	Drawing No.	Revision No.
HKA-01063	LMP_002	-
Scale	Date	CAD Ref.
AS	FEB 2022	LMP_001
Drawn	Checked	Approved
NN	SL	SL

Authorized Person - Architect

Consultant Logo

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LEGEND

① CLUBHOUSE
② WATER FEATURE
③ ENTRANCE PLAZA
④ SITTING OUT AREA
⑤ CHILDREN PLAY AREA
⑥ MULTI-PURPOSE LAWN
⑦ ELDERLY FITNESS AREA
⑧ JOGGING PATH
⑨ LANDSCAPE GARDEN
⑩ SWIMMING POOL
⑪ BARBECUE AREA

① LANDSCAPE MASTER PLAN 02
1:400 (A1) / 1:800 (A3)

Rev.	Date	Amendment	Purpose

LEGEND

SITE BOUNDARY
+XX.XX PROPOSED LEVEL
PROPOSED NEW TREES
RETAINED TREES
TRANSPLANTED TREES
🟩 PLANTING AREA
🟩 LAWN
EVA / VEHICLE ACCESS
SAFETY MAT
HARD PAVED AREA
VERTICAL GREEN (DETAIL REFER TO DWG. NO. LD_005&006)
BOUNDARY METAL FENCE WALL (DETAIL REFER TO DWG. NO. LD_001)
BOUNDARY RC FENCE WALL (DETAIL REFER TO DWG. NO. LD_002)
✳ IRRIGATION POINT (20M RADIUS)

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Drawing Title

LANDSCAPE MASTER PLAN 02

Job No.	Drawing No.	Revision No.
HKA-01063	LMP_003	-
Scale	Date	CAD Ref.
AS	FEB 2022	LMP_001
Drawn	Checked	Approved
NN	SL	SL

Authorized Person - Architect

Consultant Logo

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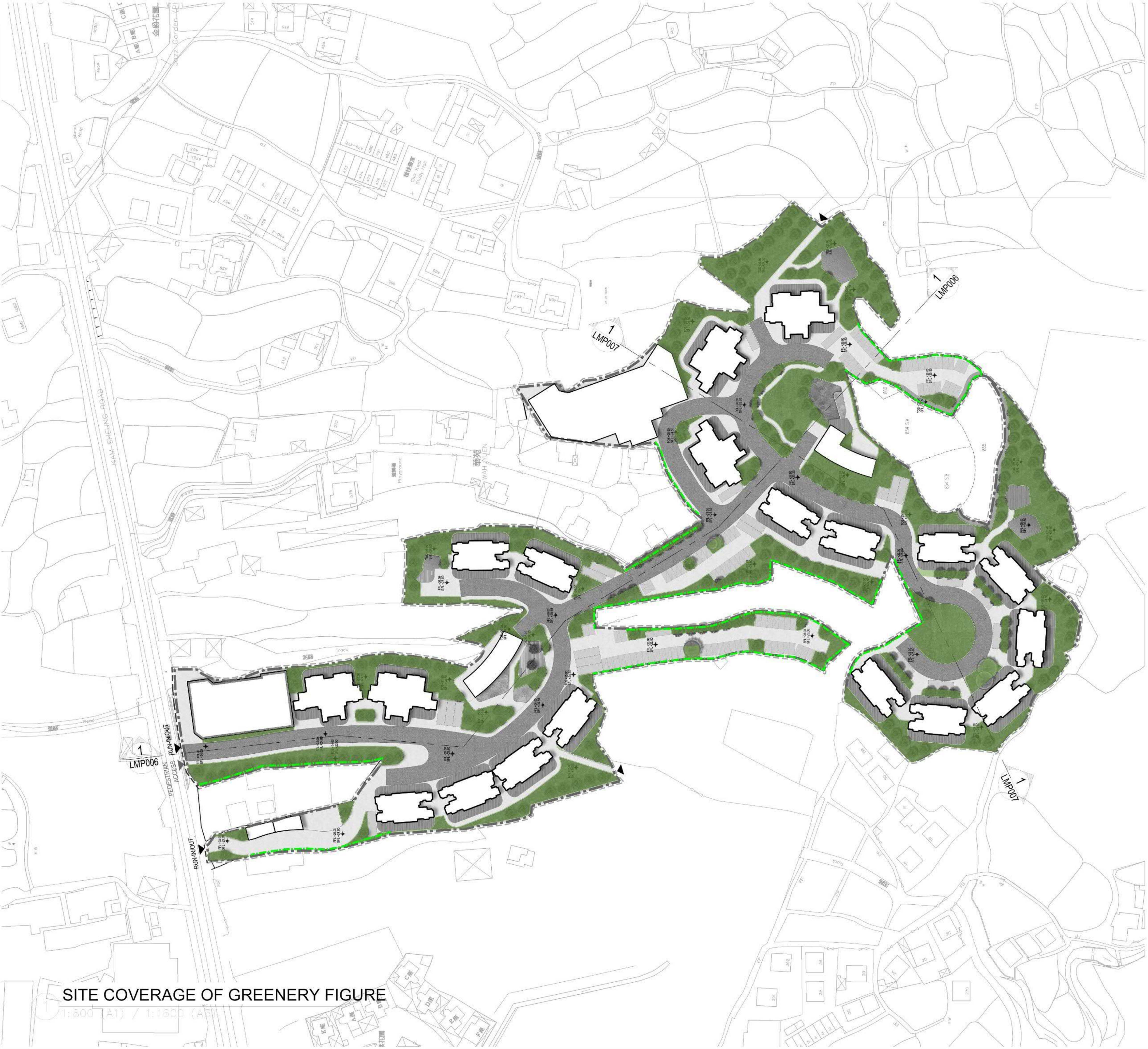

SITE COVERAGE OF GREENERY FIGURE

1:800 (A1) / 1:1600 (A3)

Rev.	Date	Amendment	Purpose

TOTAL SITE COVERAGE OF GREENERY
= NOT LESS THAN 12,387 SQM

LEGEND

🟩	PLANTER AREA MIN 1200MM SOIL DEPTH EXCLUDING DRAINAGE LAYER
— · —	VERTICAL GREEN (2M HIGH)

Drawing Purposes

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Drawing Title

SITE COVERAGE OF GREENERY FIGURE

Job No.	Drawing No.	Revision No.
HKA-01063	LMP_004	-
Scale	Date	CAD Ref.
AS	FEB 2022	LMP_001
Drawn	Checked	Approved
NN	SL	SL

Authorized Person - Architect

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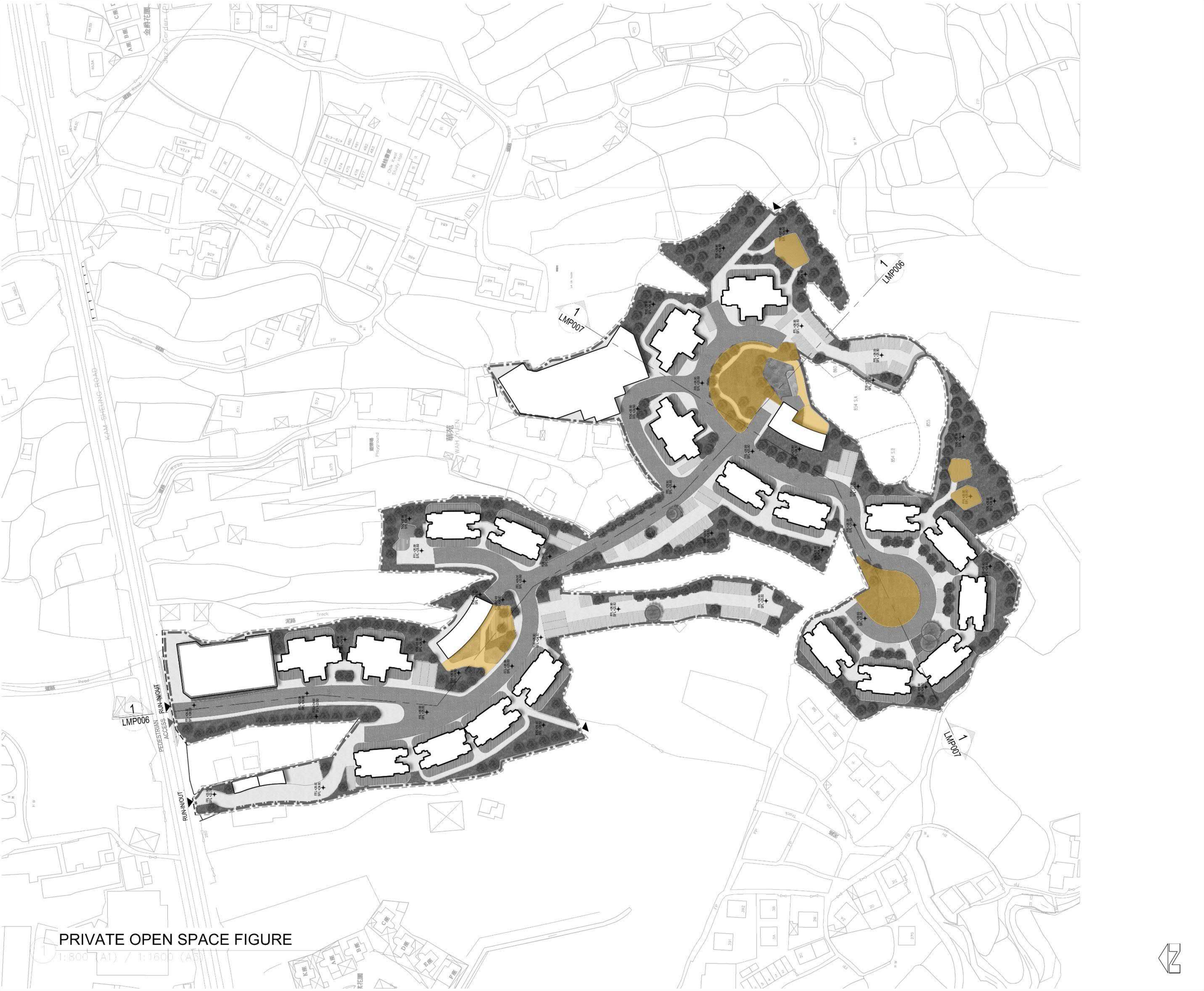

PRIVATE OPEN SPACE FIGURE

1:800 (A1) / 1:1600 (A3)

Rev. Date Amendment Purpose

PRIVATE OPEN SPACE
NOT LESS THAN 2,380 SQM

LEGEND

🟧	PRIVATE OPEN SPACE

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Drawing Title
PRIVATE OPEN SPACE
FIGURE

Job No.	Drawing No.	Revision No.
HKA-01063	LMP_005	-
Scale	Date	CAD Ref.
AS	FEB 2022	LMP_001
Drawn	Checked	Approved
NN	SL	SL

Authorized Person - Architect

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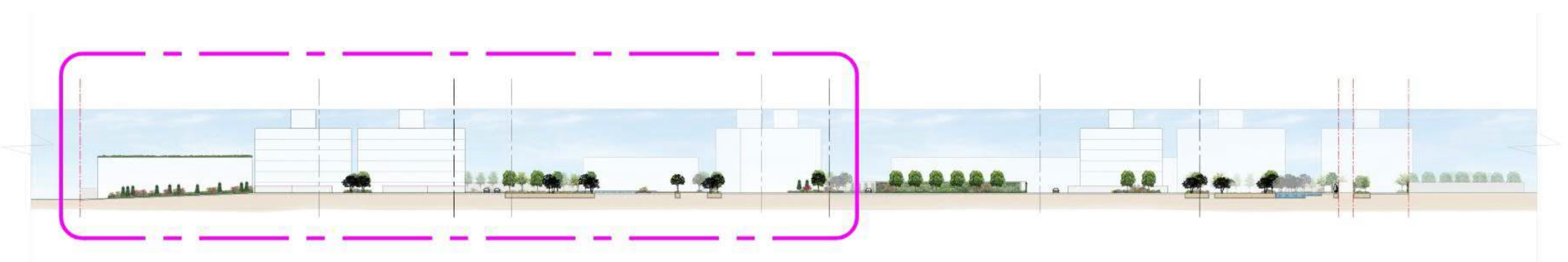
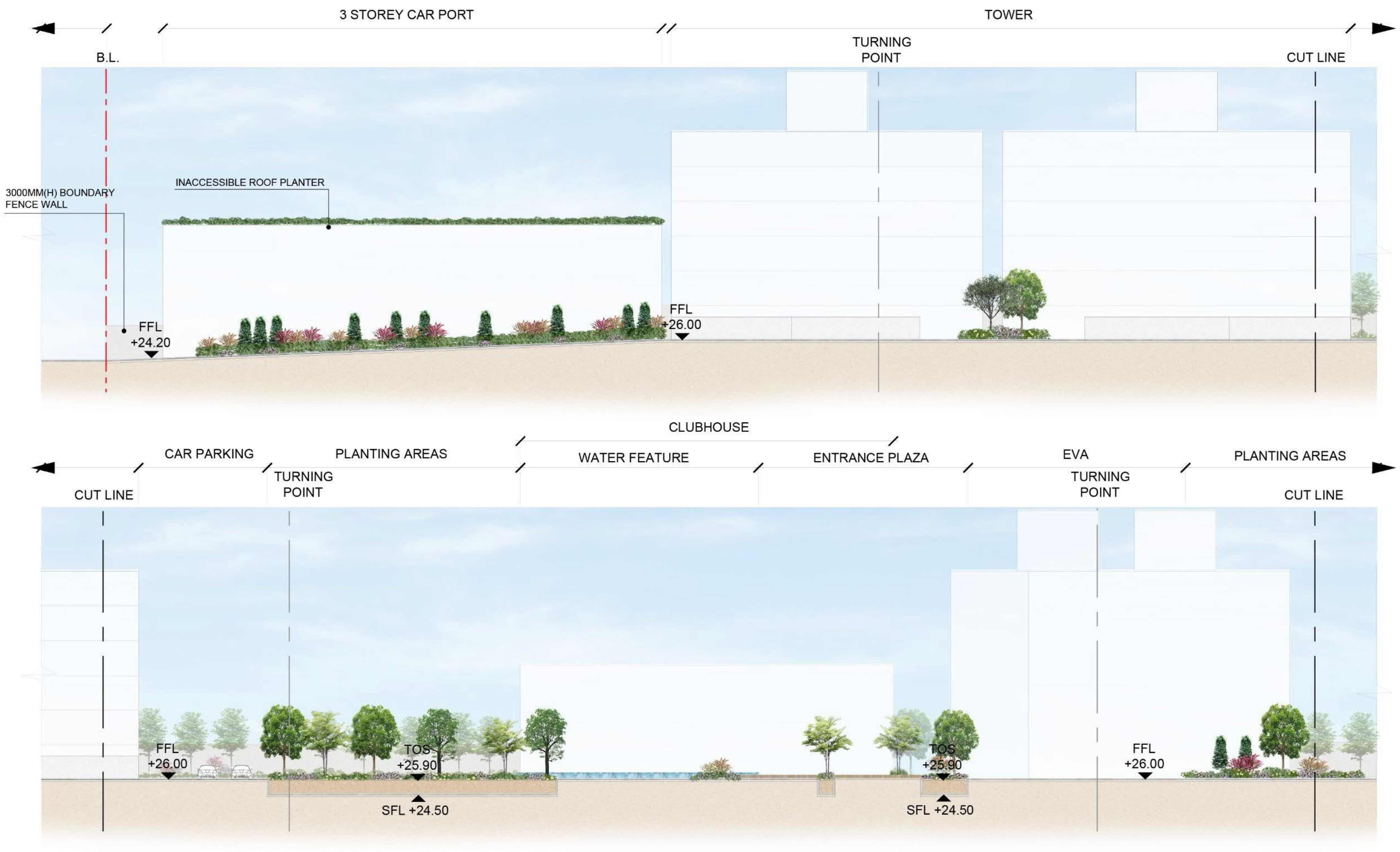


KEY PLAN



1 SECTION 01
SCALE 1:400 @A3

Rev.	Date	Amendment	Purpose

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Drawing Title

LANDSCAPE SECTION 01
(SHEET 1 OF 2)

Job No.	Drawing No.	Revision No.
HKA-01056	LMP_006	-
Scale	Date	CAD Ref.
AS	JUN 2022	LP_006
Drawn	Checked	Approved
NN	SL	SL

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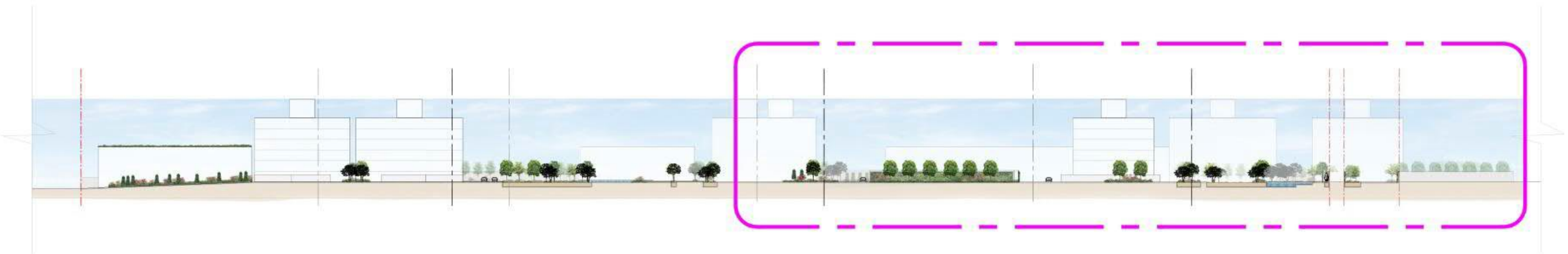

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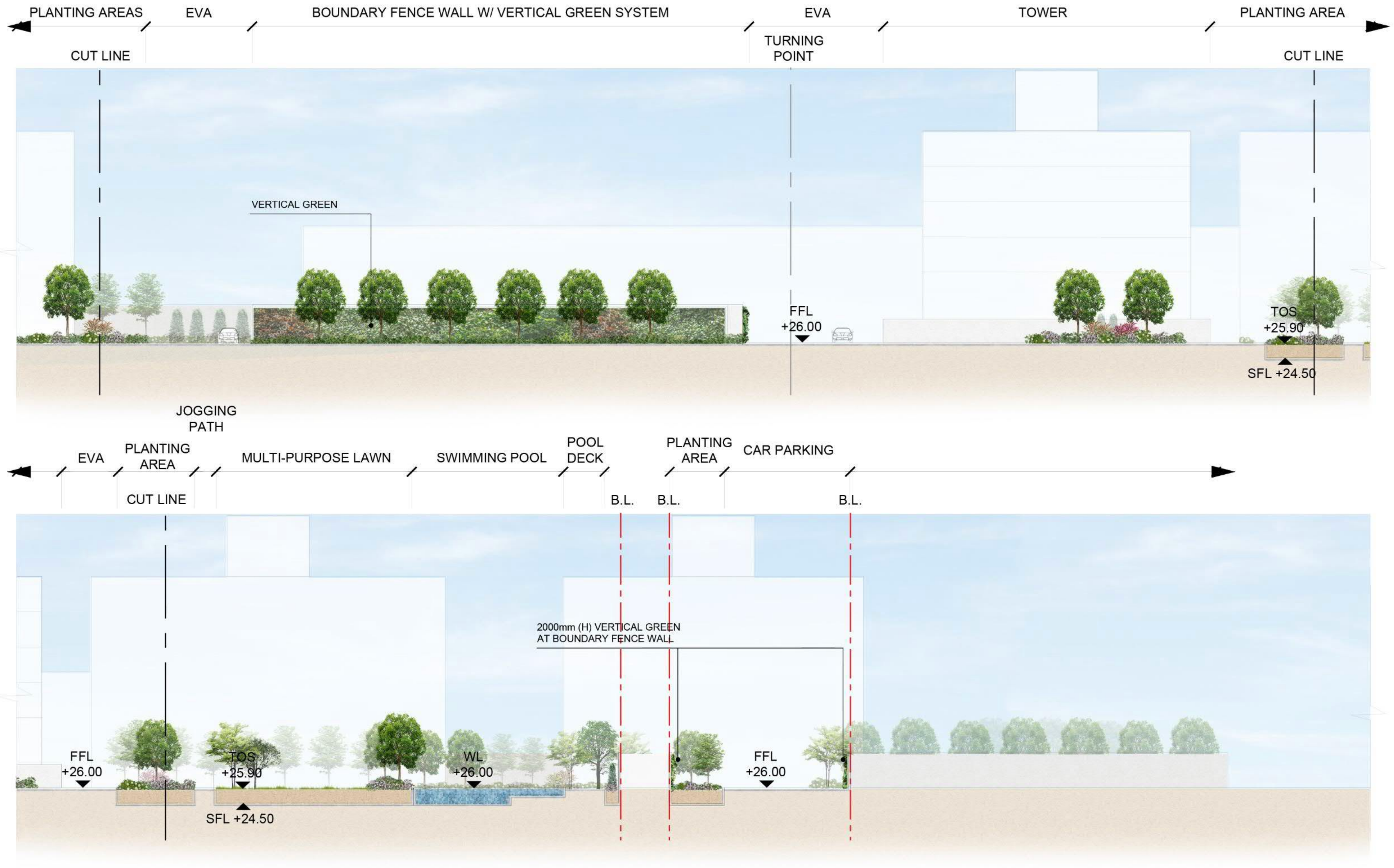

1 SECTION 01
SCALE 1:400 @A3

Rev.	Date	Amendment	Purpose

Drawing Purposes
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PROPOSED REZONING FROM "RESIDENTIAL (GROUP D)" TO "RESIDENTIAL (GROUP C)" ZONE FOR PROPOSED RESIDENTIAL DEVELOPMENT AT VARIOUS LOTS AND ADJOINING GOVERNMENT LAND IN D.D. 112, KAM SHEUNG ROAD, SHEK KONG, YUEN LONG, N.T.

Drawing Title
LANDSCAPE SECTION 01
(SHEET 2 OF 2)

Job No.	Drawing No.	Revision No.
HKA-01056	LMP_006.1	-
Scale	Date	CAD Ref.
AS	JUN 2022	LP_006
Drawn	Checked	Approved
NN	SL	SL

Authorized Person - Architect

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① SECTION 02
SCALE 1:400 @A3

Rev.	Date	Amendment	Purpose

BD Reference:

Dwg No.:

Drawing Purposes

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Drawing Title

LANDSCAPE SECTION 02

Job No.	Drawing No.	Revision No.
HKA-01056	LMP_007	-
Scale	Date	CAD Ref.
AS	JUN 2022	LP_007
Drawn	Checked	Approved
NN	SL	SL

Authorized Person - Architect

Consultant Logo

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Appendix 2

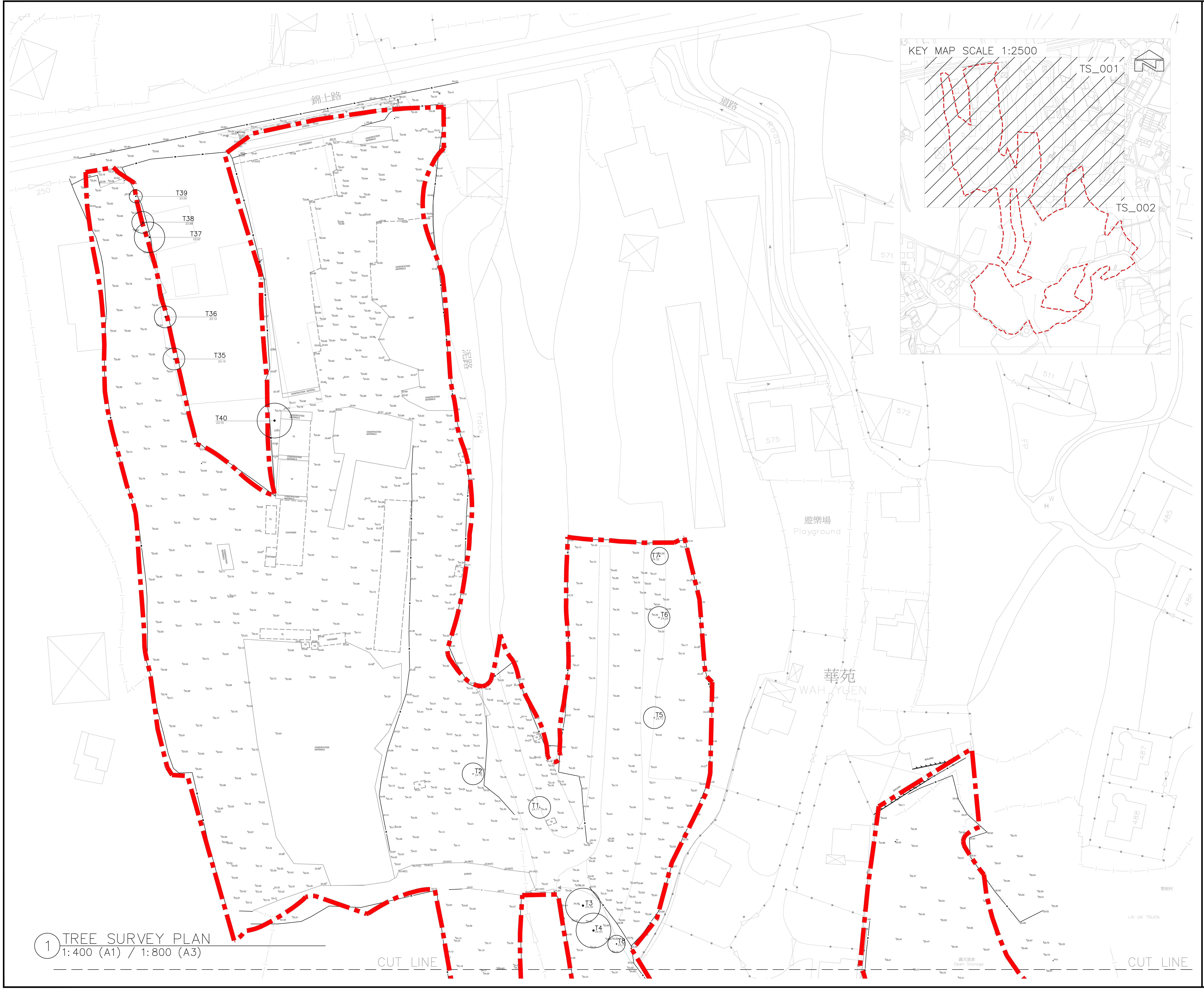
TREE SURVEY PLANS

TREE ASSESSMENT SCHEDULE

TREE PHOTOGRAPHIC RECORD

TREE TREATMENT PLANS

TREE PROPOSAL



1 TREE SURVEY PLAN
1: 400 (A1) / 1: 800 (A3)

Rev.	Date	Amendment	Purpose

LEGEND

🟥 SITE BOUNDARY

+XX.XX EXISTING LEVEL

Txx TREE NUMBER

EXISTING TREE

BD Reference:

Dwg No.:

Drawing Purposes

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Drawing Title

TREE SUVERY PLAN 01

Job No.	Drawing No.	Revision No.
HKA-01063	TS_001	-
Scale	Date	CAD Ref.
AS	DEC 2021	TS_001
Drawn	Checked	Approved
NN	SL	SL

Authorized Person - Architect

Consultant Logo

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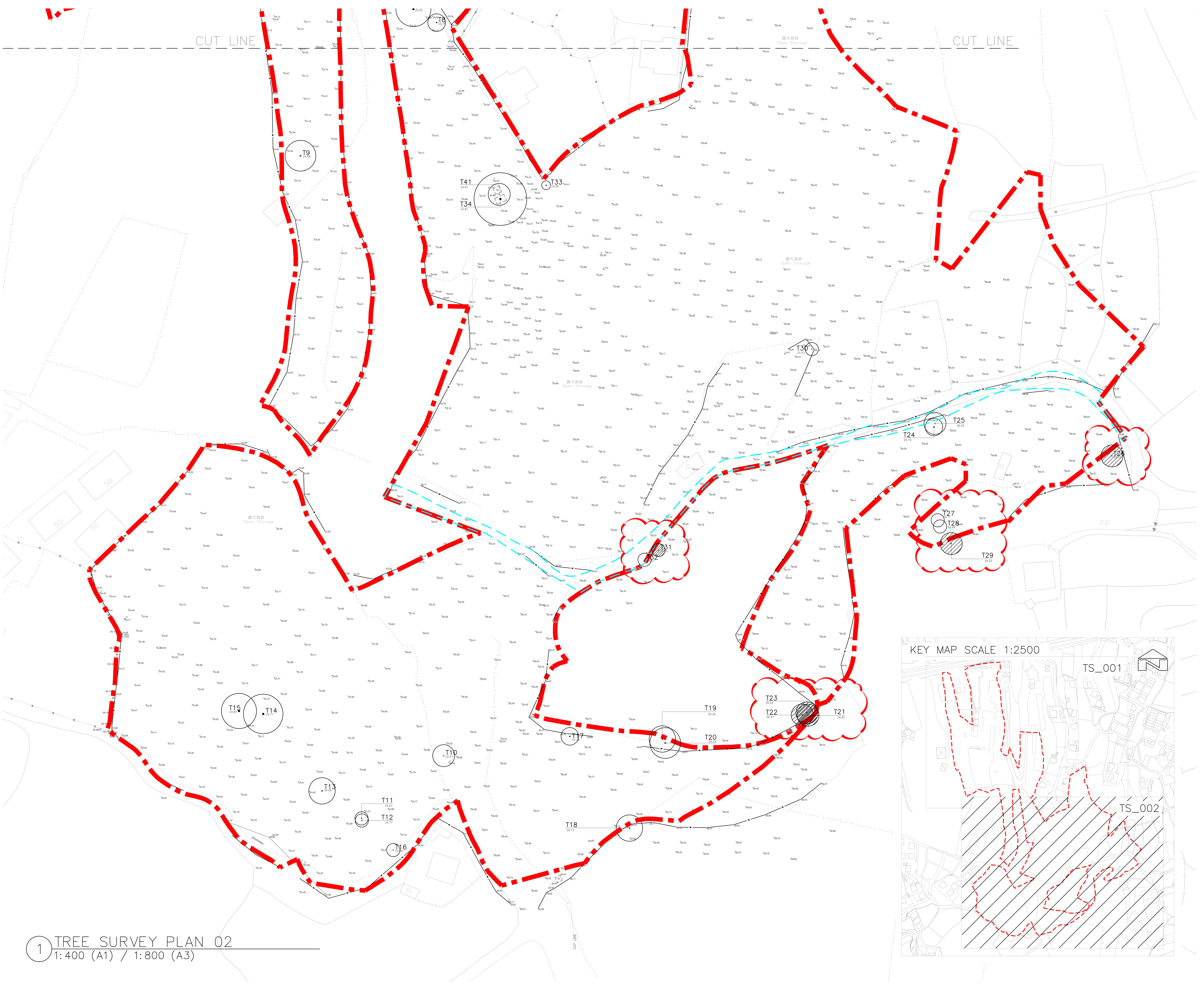

1 TREE SURVEY PLAN 02
1: 400 (A1) / 1: 800 (A3)

Rev.	Date	Amendment	Purpose

LEGEND

▬ · ▬	SITE BOUNDARY
─ · ─	GOVERNMENT LAND BOUNDARY
+XX.XX	EXISTING LEVEL
Txx ●	TREE NUMBER EXISTING TREE
Txx ▨	TREE NUMBER TREE OUTSIDE SITE BUT 2M BEYOND SITE BOUNDARY *(for reference only)*

BD Reference:

Dwg No.:

Drawing Purposes

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Project

PROPOSED REZONING FROM “RESIDENTIAL (GROUP D)” TO “RESIDENTIAL (GROUP C)” ZONE FOR PROPOSED RESIDENTIAL DEVELOPMENT AT VARIOUS LOTS AND ADJOINING GOVERNMENT LAND IN D.D. 112, KAM SHEUNG ROAD, SHEK KONG, YUEN LONG, N.T.

Drawing Title

TREE SUVERY PLAN 02

Job No.	Drawing No.	Revision No.
HKA-01063	TS_002	-
Scale	Date	CAD Ref.
AS	FEB 2022	TS_002
Drawn	Checked	Approved
NN	SL	SL

Authorized Person - Architect

Consultant Logo

TREE ASSESSMENT SCHEDULE

Location: Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone for Proposed Development at Various Lots and Adjoining Government Land in DD 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

Field Survey was conducted / updated on: 12 February 2022 Surveyed by: Wong Yun Keung (ISA-CA no. HK-0007BUM, TRAQ, HKILA-AA no. AA024)

To be read in conjunction with drawing nos. TS_001 - 002 and TT_001 - 002

Tree No.	Scientific Name	Chinese Name	Original location (Lot/GA/YA/GHBA, etc.)	Height (m)	DBH (mm)	Crown Spread (m)	Top of soil level above root collar	Form	Health Condition	Structural Condition	Suitability for Transplanting		*Justification	Proposed Treatment		Additional Remarks
								(Good/ Fair/ Poor)	(Good/ Fair/ Poor)	(Good/ Fair/ Poor)	(High, Medium, Low)	#Remarks		in initial/approved application (Retain/Transplant /Fell)	in this revision, if applicable (Retain/ Transplant/ Fell)	
T1	*Celtis sinensis*	朴樹	Lot	7	420	5	24.71	Poor	Fair	Fair	Low	a, f	A, E	Fell		Leaning, seasonal leaf shred (deciduous) codominant main branches
T2	*Bombax ceiba*	木棉	Lot	8	500	5	24.70	Fair	Fair	Fair	Medium	b	A	Fell		Seasonal leaf shred (deciduous)
T3	*Celtis sinensis*	朴樹	Lot	8	500	8	24.39	Poor	Fair	Fair	Low	b, c, f	A, E	Fell		Leaning, forked, seasonal leaf shred (deciduous), vined, broken branches, codominant main branches, grade filled within dripline
T4	*Ficus microcarpa*	細葉榕	Lot	11	450	8	24.62	Poor	Poor	Fair	Low	a, c, f	A, E	Fell		Leaning, asymmetric form, sparse crown, sign of pest foliage, dead branches, broken branch
T5	***Ficus benjamina***	**垂葉榕**	**Lot**	**5**	**260**	**4**	**24.17**	**Fair**	**Fair**	**Fair**	**High**	**-**	**A**	**Transplant**		**-**
T6	*Spathodea campanulata*	火焰木	Lot	7	300	5	24.29	Poor	Fair	Fair	Low	a, f	A, E	Fell		Regenerated from previously partially toppled tree, main trunk pruned
T7	*Elaeocarpus decipiens*	杜英	Lot	5	230	4	24.32	Poor	Poor	Poor	Low	a, c, f	A, C, E	Fell		Dying, leaning, crown dieback, large area of exposed dead wood & abnormal bark crack on trunk, sign of borer
T8	*Bombax ceiba*	木棉	Lot	7	280	4	23.78	Fair	Fair	Fair	High	-	A	Fell		Seasonal leaf shred (deciduous)
T9	***Ficus virens***	**大葉榕**	**Lot**	**12**	**1000**	**12**	**24.56**	**Fair**	**Fair**	**Fair**	**Low**	**b, c, d**	**pOVT**	**Retain**		**Multiple trunks, forked, broken branch**
T10	*Leucaena leucocephala*	銀合歡	Lot	10	300	8	25.57	Poor	Fair	Poor	Low	g	B	Fell		Undesirable species, vined
T11	*Sapium discolor*	山烏桕	Lot	5	250	3	24.67	Poor	Poor	Fair	Low	a, c, f	A, E	Fell		Heavyily vined, seasonal leaf shred (deciduous), one broken main branch, shared root plate with other tree
T12	*Celtis sinensis*	朴樹	Lot	5	130	3	24.77	Poor	Poor	Fair	Low	a, c, f	A, E	Fell		Heavily vined, seasonal leaf shred (deciduous), shared root plate with other tree
T13	*Sapium sebiferum*	烏桕	Lot	8	330	6	24.66	Poor	Fair	Fair	Low	a, f	A, E	Fell		Seasonal leaf shred (deciduous), vined, broken branch
T14	***Ficus microcarpa***	**細葉榕**	**Lot**	**11**	**660**	**9**	**24.77**	**Poor**	**Fair**	**Fair**	**Low**	**b, c, d, f**	**-**	**Retain**		**Multiple trunks, sign of foliage pest**
T15	***Ficus microcarpa***	**細葉榕**	**Lot**	**11**	**1100**	**9**	**24.83**	**Good**	**Fair**	**Fair**	**Low**	**b, c, d**	**pOVT**	**Retain**		**Multiple trunks, sign of foliage pest**
T16	*Macaranga tanarius*	血桐	Lot	2	200	2	24.80	Poor	Poor	Poor	Low	a, c, f	C, D, E	Fell		Dying, leaning, leaders broken, heavily vined
T17	*Leucaena leucocephala*	銀合歡	Lot	7	100	4	25.78	Poor	Fair	Poor	Low	g	B	Fell		Undesirable species, partially failed previously
T18	*Leucaena leucocephala*	銀合歡	Lot	4	140	6	26.15	Poor	Poor	Poor	Low	g	B	Fell		Undesirable species, partially failed previously, partially uprooted
T19	*Leucaena leucocephala*	銀合歡	Lot	8	200	6	26.26	Poor	Fair	Poor	Low	g	B	Fell		Undesirable species, partially failed previously
T20	*Leucaena leucocephala*	銀合歡	Lot	6	150	7	26.29	Poor	Poor	Poor	Low	g	B	Fell		Undesirable species, partially failed previously
T21	*Leucaena leucocephala*	銀合歡	Outside Site but 2m beyond Site Boundary	8	180	5	26.62	Poor	Poor	Poor	Low	g		for reference only		Undesirable species, partially failed previously, vined
T22	*Leucaena leucocephala*	銀合歡	Outside Site but 2m beyond Site Boundary	7	160	5	26.47	Poor	Poor	Poor	Low	g		for reference only		Undesirable species, partially failed previously, vined
T23	*Leucaena leucocephala*	銀合歡	Outside Site but 2m beyond Site Boundary	7	150	5	26.42	Poor	Poor	Poor	Low	g		for reference only		Undesirable species, partially failed previously, vined
T24	*Ficus hispida*	對葉榕	Lot	6	160	4	26.19	Poor	Poor	Poor	Low	a, c, f	A, C, D, E	Fell		Leaning, vined, shared root plate with other tree
T25	*Macaranga tanarius*	血桐	Lot	6	380	7	26.40	Poor	Poor	Poor	Low	a, b, c, f	A, C, D, E	Fell		Forked, vined, codominant main branches, decay wound on main branch, shared root plate with other trees

TREE ASSESSMENT SCHEDULE

Location: Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone for Proposed Development at Various Lots and Adjoining Government Land in DD 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

Field Survey was conducted / updated on: 12 February 2022 Surveyed by: Wong Yun Keung (ISA-CA no. HK-0007BUM, TRAQ, HKILA-AA no. AA024)

To be read in conjunction with drawing nos. TS_001 - 002 and TT_001 - 002

Tree No.	Scientific Name	Chinese Name	Original location (Lot/GA/YA/GHBA, etc.)	Height (m)	DBH (mm)	Crown Spread (m)	Top of soil level above root collar	Form	Health Condition	Structural Condition	Suitability for Transplanting		*Justification	Proposed Treatment		Additional Remarks
								(Good/ Fair/ Poor)	(Good/ Fair/ Poor)	(Good/ Fair/ Poor)	(High, Medium, Low)	#Remarks		in initial/approved application (Retain/Transplant /Fell)	in this revision, if applicable (Retain/ Transplant/ Fell)	
T26	*Macaranga tanarius*	血桐	Outside Site but 2m beyond Site Boundary	5	250	7	26.33	Poor	Poor	Poor	Low	a, b, c, f		for reference only		Forked, one broken trunk, vined, grade filled within dripline
T27	*Cleistocalyx nervosum*	水翁	Lot	11	380	3	26.71	Poor	Fair	Fair	Low	a, f	A, E	Fell		Leaning, shared root plate with other tree, grade filled within dripline
T28	*Cleistocalyx nervosum*	水翁	Lot	12	220	3	26.68	Poor	Fair	Fair	Low	a, f	A, E	Fell		Leaning, shared root plate with other tree
T29	*Cleistocalyx nervosum*	水翁	Outside Site but 2m beyond Site Boundary	9	470	5	26.93	Poor	Poor	Poor	Low	a, f		for reference only		Severe leaning, cavity on trunk, broken branch
T30	*Celtis sinensis*	朴樹	Lot	3	100	3	25.53	Poor	Poor	Poor	Low	a, f	A, C, D, E	Fell		Leaning, seasonal leaf shred (deciduous)
T31	*Ficus hispida*	對葉榕	Outside Site but 2m beyond Site Boundary	5	190	4	25.85	Poor	Poor	Poor	Low	a, b, c, f		for reference only		Leaning, forked, sparse crown, vined
T32	*Ficus hispida*	對葉榕	Government Land	5	300	4	25.87	Poor	Poor	Poor	Low	a, c, f	A, C, D, E	Fell		Broken leaders, vined, exposed dead wood & abnormal bark crack on trunk, broken branch
T33	*Aleurites moluccana*	石栗	Lot	9	380	5	24.06	Poor	Fair	Fair	Low	a, b, f	A, E	Fell		Codominant main branches, root cut, root restricted by wall
T34	***Ficus rumphii***	**心葉榕**	**Lot**	**12**	**1200**	**12**	**24.81**	**Good**	**Fair**	**Fair**	**Low**	**b, c, d**	**pOVT**	**Retain**		**Broken branch, wound on branches, root restricted by plinth of lamp post, shared root plate with other tree**
T35	*Ficus microcarpa*	細葉榕	Lot	10	380	6	23.15	Poor	Fair	Fair	Low	a, b, f	A, D, E	Fell		Leaning, root restricted by foundation
T36	*Bombax ceiba*	木棉	Lot	8	350	5	23.12	Poor	Fair	Fair	Low	a, b, f	A, D, E	Fell		Leaning, vined, bulge on trunk, root restricted by foundation
T37	*Macaranga tanarius*	血桐	Lot	6	200	7	22.92	Poor	Fair	Poor	Low	a, b, c, f	A, D, E	Fell		Large wound from previously broken trunk, broken branch, vined, root restricted by foundation
T38	*Macaranga tanarius*	血桐	Lot	7	260	5	22.88	Poor	Fair	Fair	Low	a, b, f	A, D, E	Fell		Codominant trunks, wound on trunk, root restricted by foundation
T39	*Melia azedarach*	苦楝	Lot	8	160	3	23.00	Poor	Fair	Fair	Low	a, b, f	A, D, E	Fell		Leaning, seasonal leaf shred (deciduous), vined, root restricted by foundation
T40	*Macaranga tanarius*	血桐	Lot	7	120	5	23.70	Poor	Poor	Poor	Low	a, b, f	C, D, E	Fell		Severe leaning, epicormics on trunk, vined, root restricted by foundation
T41	***Ficus microcarpa***	**細葉榕**	**Lot**	**8**	**420**	**5**	**-**	**Poor**	**Fair**	**Fair**	**Low**	**`**	**-**	**Retain**		**Leaning, sign of foliage pest, root restricted by plinth of lamp post, shared root plate with other tree**

* Justification for tree felling:

A	In direct conflict with the proposed works
B	Common undesirable species that are characterised by their aggressive and invasive growing habits
C	Tree with poor health, structure or form
D	Low amenity value
E	Low survival rate after transplantation
pOVT	Potential Old and Valuable Tree

Suitability for transplanting:

a	Low amenity value
b	Irrecoverable form after transplanting (e.g. if substantial crown and root pruning are necessary to facilitate the transplanting);
c	Low survival rate after transplanting;
d	Very large size (unless the feasibility to transplant has been considered financially reasonable and technically feasible during the feasibility stage);
e	With evidence of over-maturity and onset of senescence;
f	With poor health, structure or form (e.g. imbalanced form, leaning, with major cavity/cracks/splits)
g	Undesirable species (e.g. *Leucaena leucocephala* which is an invasive exotic tree)

Summary of the proposed treatment to existing trees

Existing trees surveyed	within the Lot	Adjoining Government Land	2m beyond Site Boundary (for reference only)
to be retained	5 nos.	0 no.	6 nos.
to be transplanted	1 no.	0 no.	0 no.
to be felled	28 nos.	1 no.	0 no.
Total	41 nos.		


2022/02/12

T1 OVERALL VIEW- FELL


2022/02/12

T1 LOWER TRUNK AND GROUND CONDITION - FELL


2022/02/12

T2 OVERALL VIEW - FELL


2022/02/12

T2 LOWER TRUNK AND GROUND CONDITION - FELL

T3 OVERALL VIEW- FELL

T3 LOWER TRUNK AND GROUND CONDITION - FELL

T4 OVERALL VIEW - FELL

T4 LOWER TRUNK AND GROUND CONDITION - FELL

T5 OVERALL VIEW- TRANSPLANT

T5 LOWER TRUNK AND GROUND CONDITION - TRANSPLANT

T6 OVERALL VIEW - FELL

T6 LOWER TRUNK AND GROUND CONDITION - FELL

T7 OVERALL VIEW- FELL

T7 LOWER TRUNK AND GROUND CONDITION - FELL

T7 LARGE AREA OF EXPOSED DEAD WOOD WITH BORERS ON TRUNK- FELL


2022/02/12

T8 OVERALL VIEW- FELL


2022/02/12

T8 LOWER TRUNK AND GROUND CONDITION - FELL


2022/02/12

T9 OVERALL VIEW - RETAIN


2022/02/12

T9 LOWER TRUNK AND GROUND CONDITION - RETAIN

T10 OVERALL VIEW- FELL

T10 LOWER TRUNK AND GROUND CONDITION - FELL

T11 OVERALL VIEW - FELL

T11 LOWER TRUNK AND GROUND CONDITION - FELL


2022/02/12

T12 OVERALL VIEW- FELL

2022/02/12

T12 LOWER TRUNK AND GROUND CONDITION - FELL


2022/02/12

T13 OVERALL VIEW - FELL


2022/02/12

T13 LOWER TRUNK AND GROUND CONDITION - FELL

T14 OVERALL VIEW - RETAIN

T14 LOWER TRUNK AND GROUND CONDITION - RETAIN

T14 LOWER TRUNK AND GROUND CONDITION - RETAIN

T15 OVERALL VIEW - RETAIN

T15 LOWER TRUNK AND GROUND CONDITION - RETAIN

T16 OVERALL VIEW- FELL

T16 LOWER TRUNK AND GROUND CONDITION - FELL

T16 LEADER BROKEN- FELL

T17 OVERALL VIEW- FELL

T17 LOWER TRUNK AND GROUND CONDITION - FELL

T18 OVERALL VIEW - FELL

T18 LOWER TRUNK AND GROUND CONDITION - FELL

T19 OVERALL VIEW- FELL

T19 LOWER TRUNK AND GROUND CONDITION - FELL

T20 OVERALL VIEW - FELL

T20 LOWER TRUNK AND GROUND CONDITION - FELL

T21 OVERALL VIEW-
Outside Site Boundary (for reference only)

T21 LOWER TRUNK AND GROUND CONDITION –
Outside Site Boundary (for reference only)

T22 OVERALL VIEW-
Outside Site Boundary (for reference only)

T22 LOWER TRUNK AND GROUND CONDITION –
Outside Site Boundary (for reference only)

T23 OVERALL VIEW- Outside Site Boundary (for reference only)

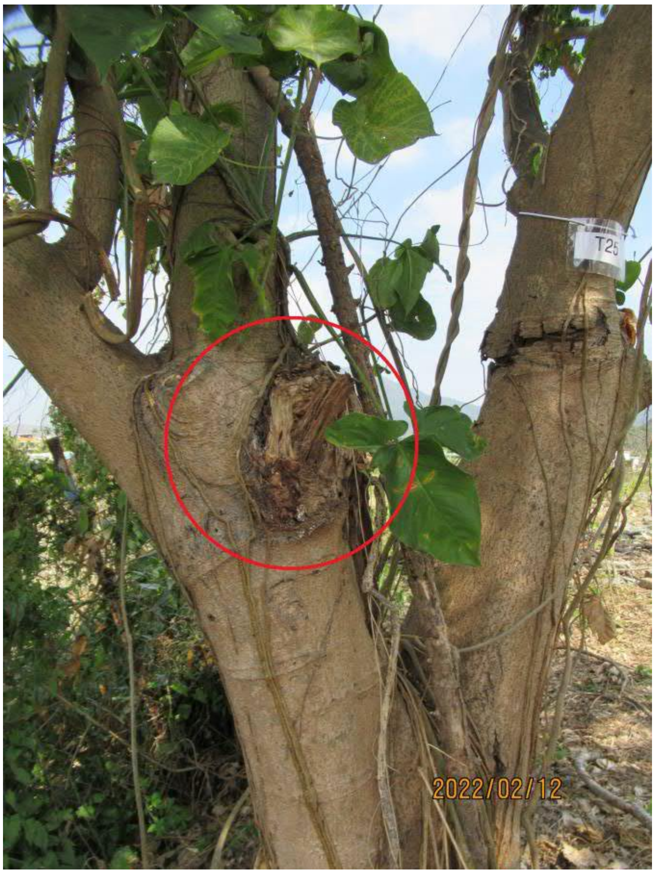
T23 LOWER TRUNK AND GROUND CONDITION – Outside Site Boundary (for reference only)

T24 OVERALL VIEW - FELL

T24 LOWER TRUNK AND GROUND CONDITION - FELL

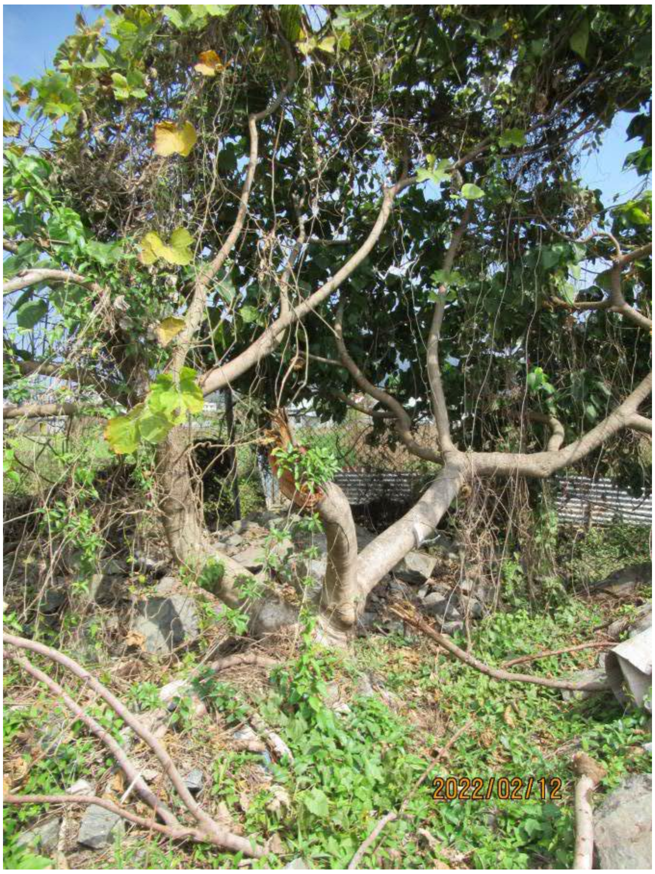
T25 OVERALL VIEW- FELL

T25 LOWER TRUNK AND GROUND CONDITION - FELL



T25 DECAY ON MAIN BRANCH - FELL

T26 OVERALL VIEW-
Outside Site Boundary (for reference only)



T26 LOWER TRUNK AND GROUND CONDITION –
Outside Site Boundary (for reference only)

T27 OVERALL VIEW - FELL

T27 LOWER TRUNK AND GROUND CONDITION - FELL

T28 OVERALL VIEW- FELL

T28 LOWER TRUNK AND GROUND CONDITION - FELL

T29 OVERALL VIEW-
Outside Site Boundary (for reference only)

T29 CAVITY ON TRUNK –
Outside Site Boundary (for reference only)

T30 OVERALL VIEW- FELL

T30 LOWER TRUNK AND GROUND CONDITION - FELL

T31 OVERALL VIEW-
Outside Site Boundary (for reference only)

T31 LOWER TRUNK AND GROUND CONDITION –
Outside Site Boundary (for reference only)

T32 OVERALL VIEW- FELL

T32 LOWER TRUNK AND GROUND CONDITION - FELL

T33 OVERALL VIEW - FELL

T33 LOWER TRUNK AND GROUND CONDITION - FELL

T34 OVERALL VIEW- RETAIN

T34 LOWER TRUNK AND GROUND CONDITION - RETAIN

T34 WOUND ON MAIN BRANCH - RETAIN

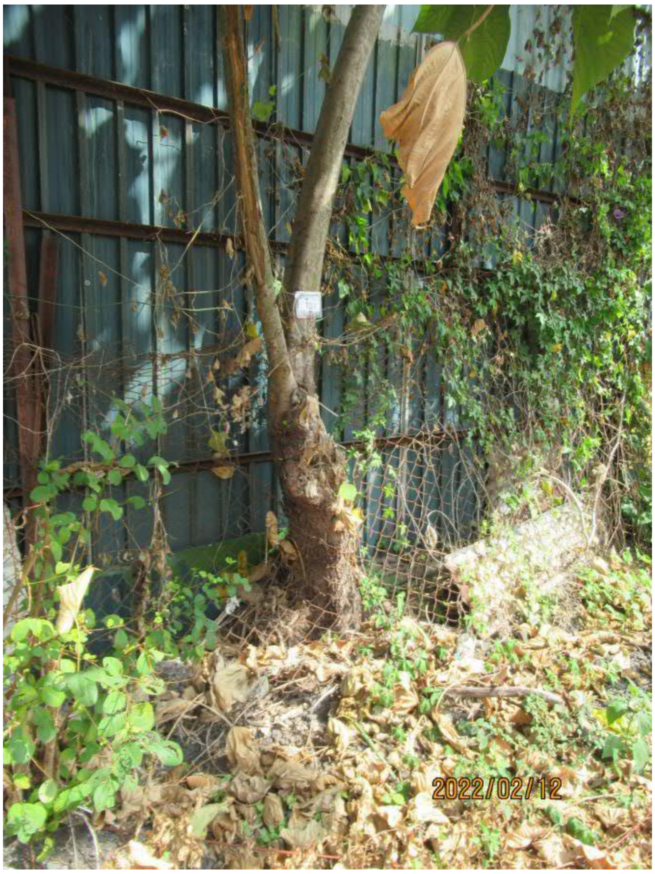
T35 OVERALL VIEW- FELL

T35 LOWER TRUNK AND GROUND CONDITION - FELL

T36 OVERALL VIEW - FELL

T36 LOWER TRUNK AND GROUND CONDITION - FELL

T37 OVERALL VIEW- FELL



T37 LOWER TRUNK AND GROUND CONDITION - FELL

T37 MAIN TRUNK BROKEN - FELL


2022/02/12

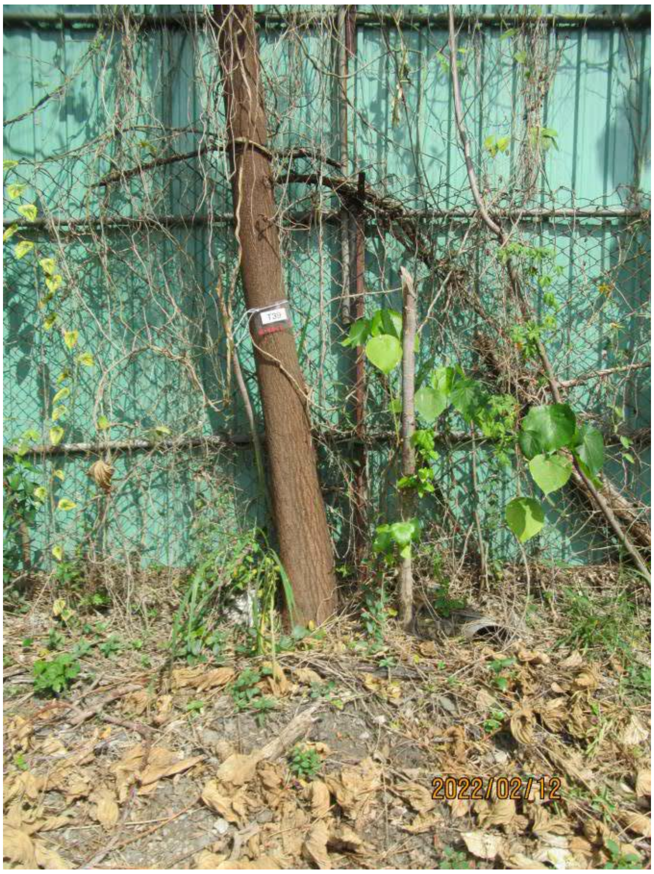
T38 OVERALL VIEW- FELL

2022/02/12

T38 LOWER TRUNK AND GROUND CONDITION - FELL


2022/02/12

T39 OVERALL VIEW - FELL



2022/02/12

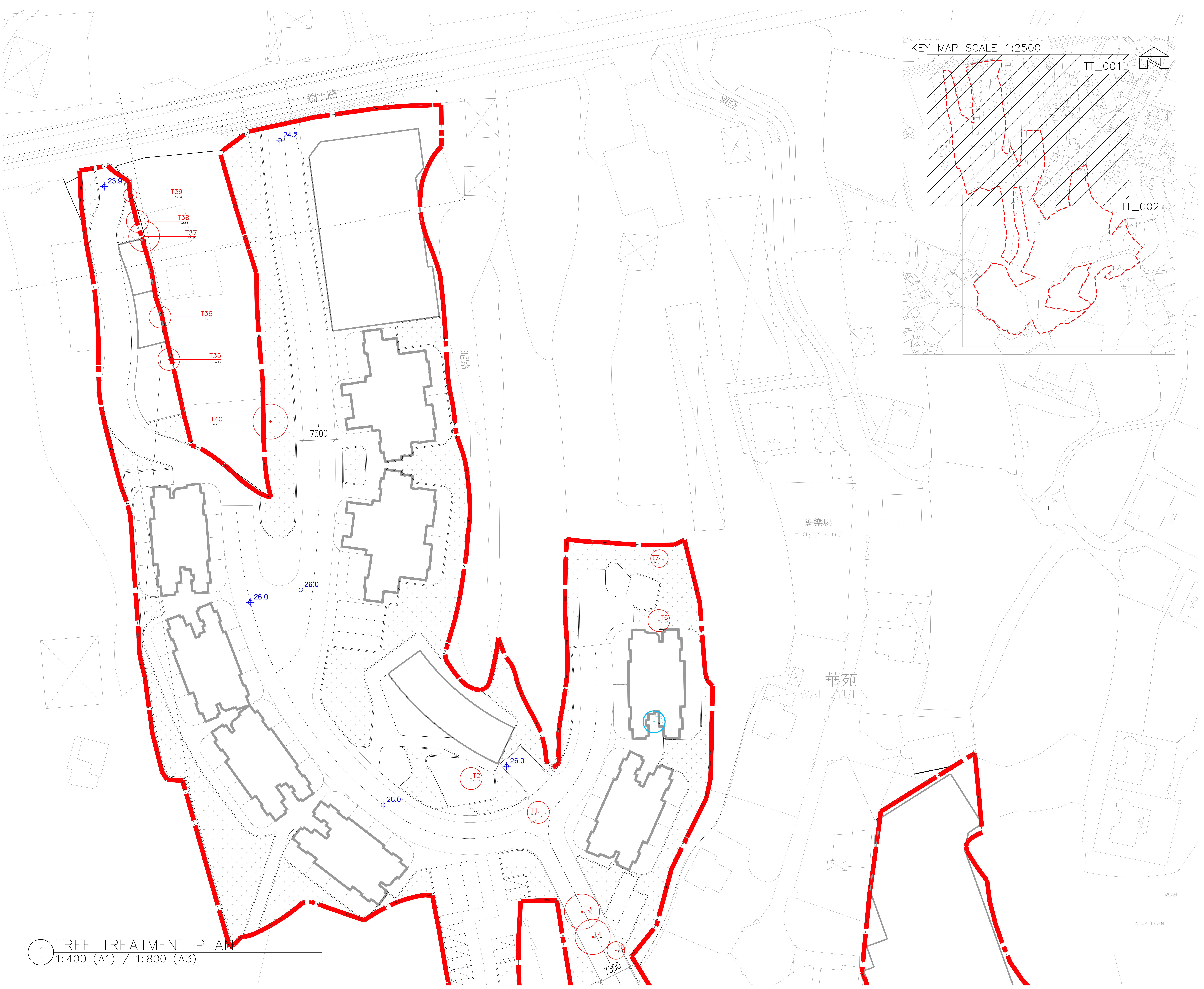
T39 LOWER TRUNK AND GROUND CONDITION - FELL

T40 OVERALL VIEW- FELL

T40 LOWER TRUNK AND GROUND CONDITION - FELL

T41 OVERALL VIEW - RETAIN

T41 LOWER TRUNK AND GROUND CONDITION - RETAIN



① TREE TREATMENT PLAN
1: 400 (A1) / 1: 800 (A3)

Rev.	Date	Amendment	Purpose

LEGEND

- SITE BOUNDARY
- +XX.XX PROPOSED LEVEL
- ○ PROPOSED TREES TO BE FELLED
- ○ PROPOSED TREES TO BE RETAIN
- ○ PROPOSED TREES TO BE TRANSPLANTED

BD Reference:

Dwg No.:

Drawing Purposes

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- Check and verify all dimensions on site.

Developer

TENOX DEVELOPMENT LIMITED

Project

PROPOSED REZONING FROM “RESIDENTIAL (GROUP D)” TO “RESIDENTIAL (GROUP C)” ZONE FOR PROPOSED RESIDENTIAL DEVELOPMENT AT VARIOUS LOTS AND ADJOINING GOVERNMENT LAND IN D.D. 112, KAM SHEUNG ROAD, SHEK KONG, YUEN LONG, N.T.

Drawing Title

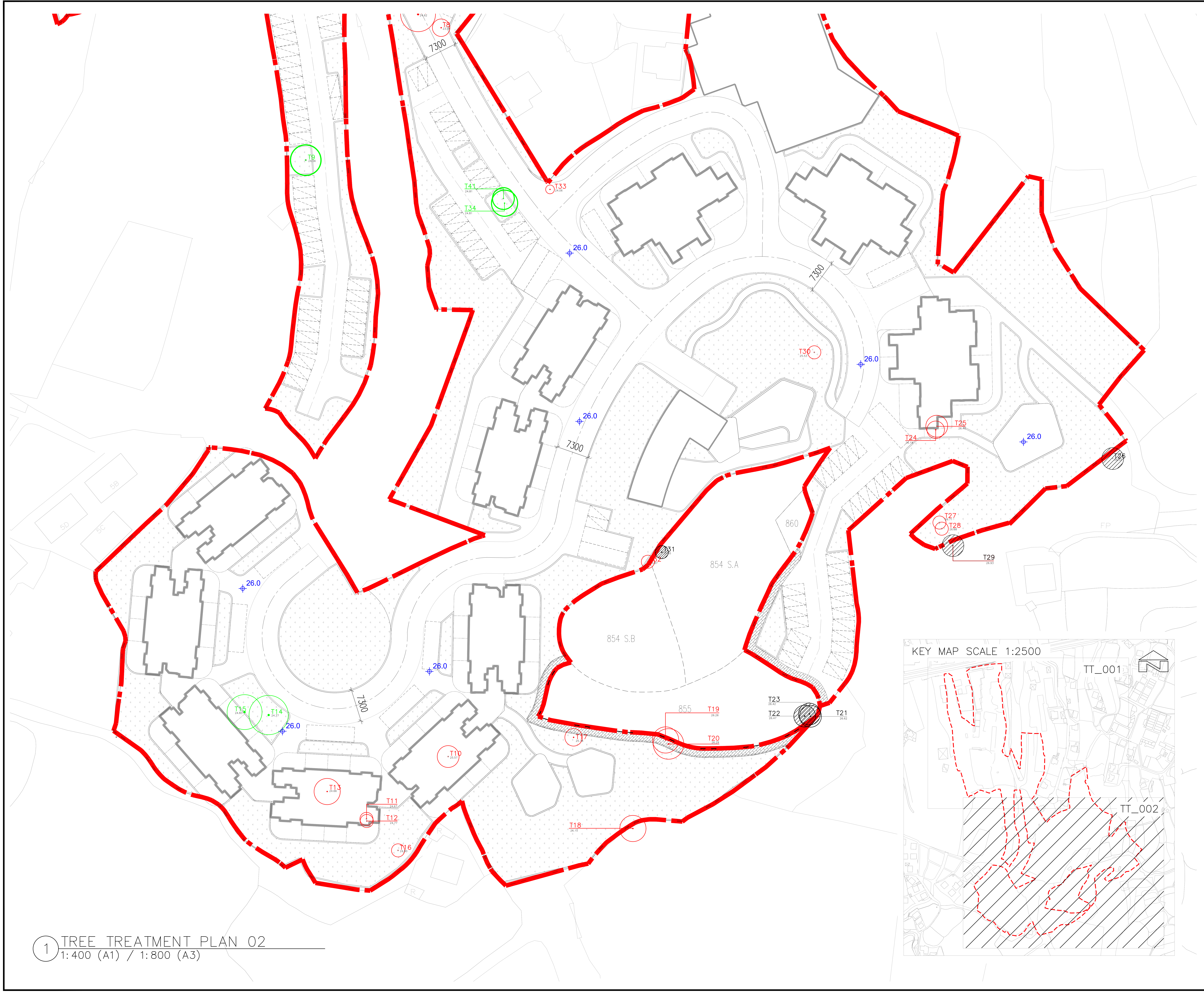
TREE TREATMENT PLAN

Job No.	Drawing No.	Revision No.
HKA-01063	TT_001	-
Scale	Date	CAD Ref.
AS	FEB 2022	TT_001
Drawn	Checked	Approved
NN	SL	SL

Authorized Person - Architect

Consultant Logo

SLSL



① TREE TREATMENT PLAN 02
1: 400 (A1) / 1:800 (A3)

Rev.	Date	Amendment	Purpose

LEGEND

▬	SITE BOUNDARY
+XX.XX	PROPOSED LEVEL
○	PROPOSED TREES TO BE FELLED
○	PROPOSED TREES TO BE RETAIN
○	PROPOSED TREES TO BE TRANSPLANTED
Txx	TREE NUMBER
▨	TREE OUTSIDE SITE BUT 2M BEYOND SITE BOUNDARY *(for reference only)*

BD Reference:

Dwg No.:

Drawing Purposes

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Developer

TENOX DEVELOPMENT LIMITED

Project

PROPOSED REZONING FROM "RESIDENTIAL (GROUP D)" TO "RESIDENTIAL (GROUP C)" ZONE FOR PROPOSED RESIDENTIAL DEVELOPMENT AT VARIOUS LOTS AND ADJOINING GOVERNMENT LAND IN D.D. 112, KAM SHEUNG ROAD, SHEK KONG, YUEN LONG, N.T.

Drawing Title

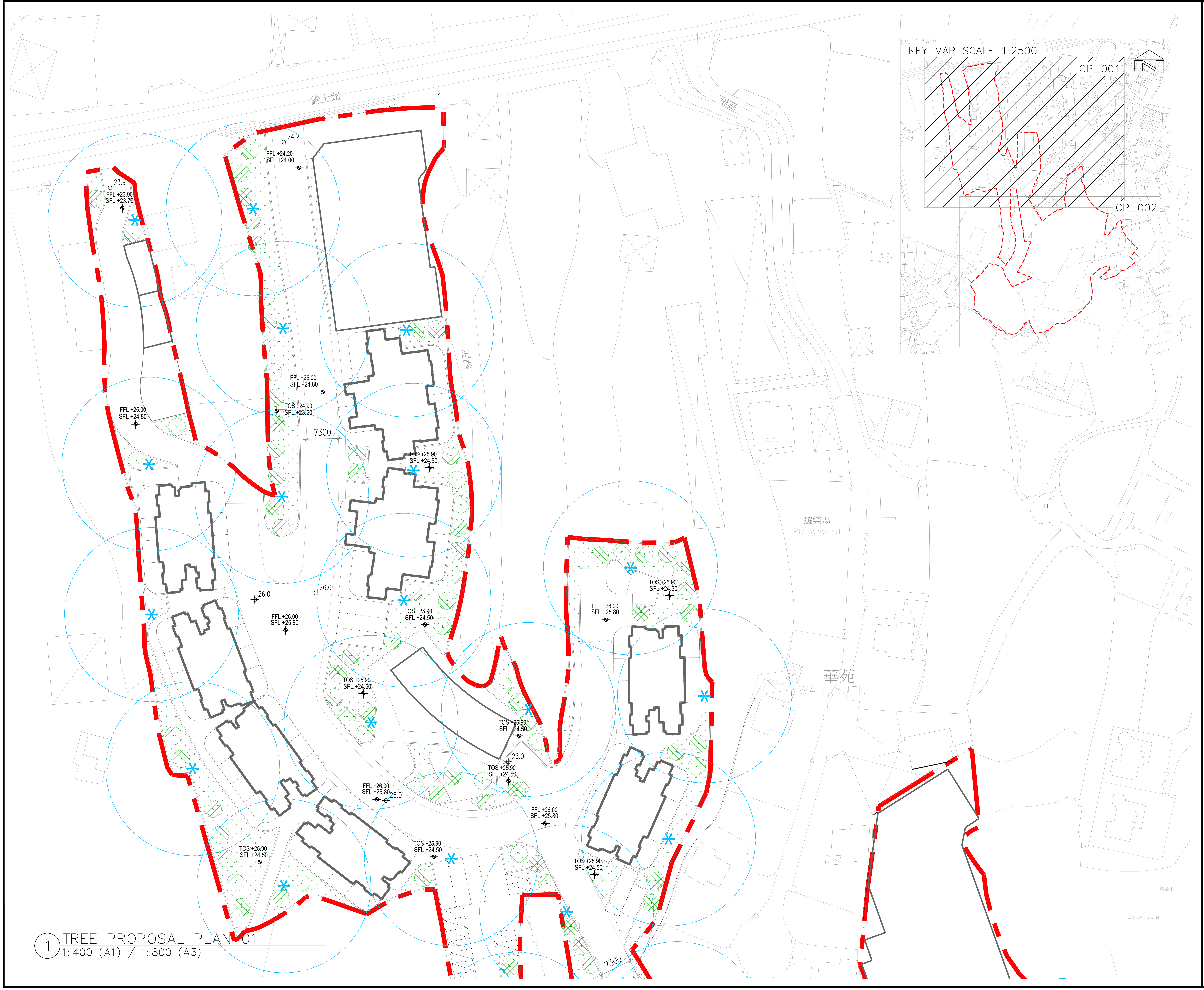
TREE TREATMENT PLAN
PLAN 02

Job No.	Drawing No.	Revision No.
HKA-01063	TT_002	-
Scale	Date	CAD Ref.
AS	FEB 2022	TT_002
Drawn	Checked	Approved
NN	SL	SL

Authorized Person - Architect

Consultant Logo

SLSL



① TREE PROPOSAL PLAN 01
1:400 (A1) / 1:800 (A3)

Rev.	Date	Amendment	Purpose

LEGEND

- 🟥 SITE BOUNDARY
- +XX.XX PROPOSED LEVEL
- ⊕ PROPOSED NEW TREES
- ▨ MIN. 1200MM SOIL DEPTH EXCLUDE DRAINAGE LAYER
- ✳ WATER POINT (20M RADIUS)

BD Reference:

Dwg No.:

Drawing Purposes

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Project

PROPOSED REZONING FROM “RESIDENTIAL (GROUP D)” TO “RESIDENTIAL (GROUP C)” ZONE FOR PROPOSED RESIDENTIAL DEVELOPMENT AT VARIOUS LOTS AND ADJOINING GOVERNMENT LAND IN D.D. 112, KAM SHEUNG ROAD, SHEK KONG, YUEN LONG, N.T.

Drawing Title

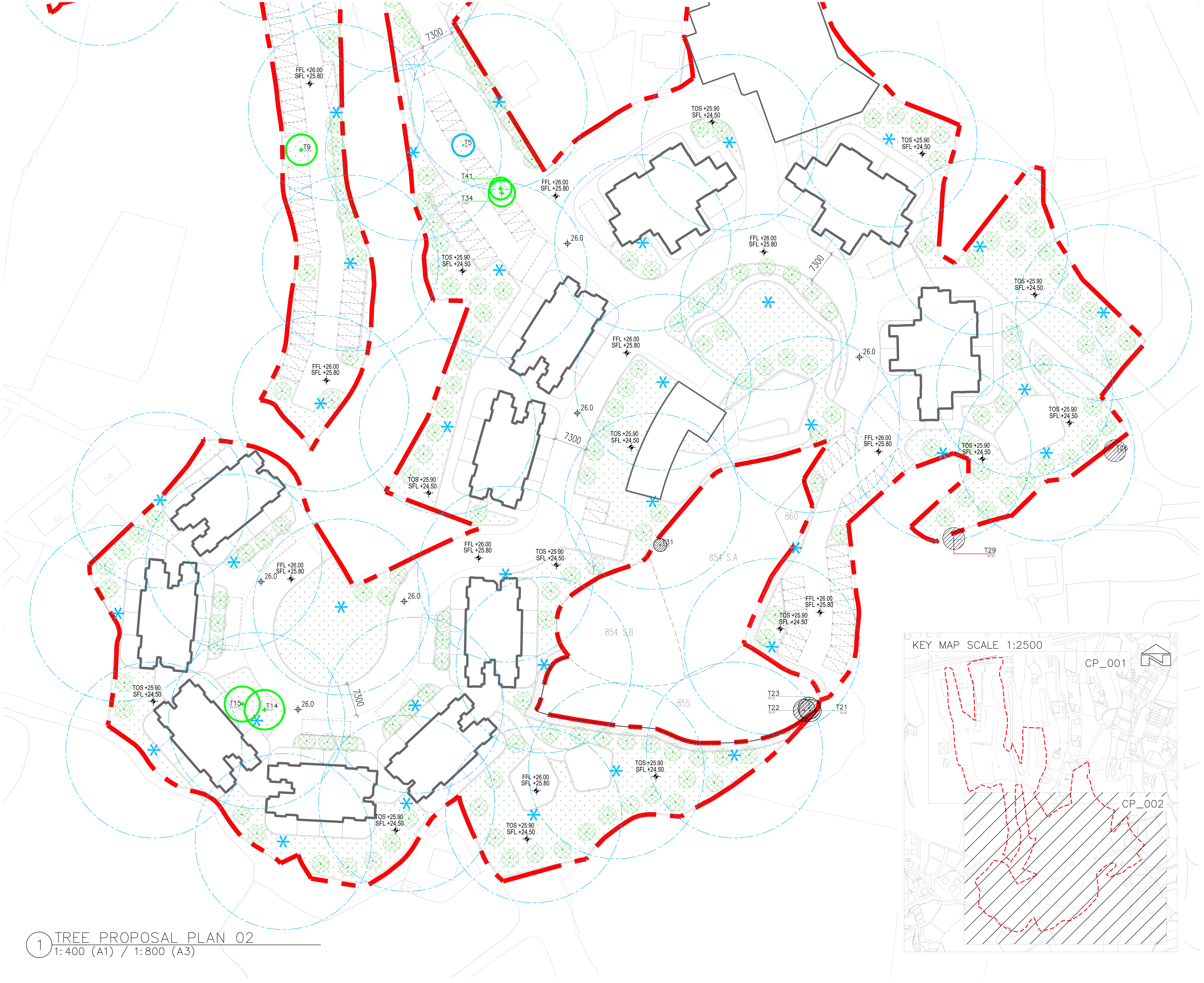
TREE PROPOSAL PLAN 01

Job No.	Drawing No.	Revision No.
HKA-01063	CP_001	-
Scale	Date	CAD Ref.
AS	FEB 2022	CP_001
Drawn	Checked	Approved
NN	SL	SL

Authorized Person - Architect

Consultant Logo

SLSL



① TREE PROPOSAL PLAN 02
1: 400 (A1) / 1: 800 (A3)

Rev.	Date	Amendment	Purpose

LEGEND

- SITE BOUNDARY
- +XX.XX PROPOSED LEVEL
- PROPOSED NEW TREES
- RETAINED TREES
- TRANSPLANTED TREES
- Txx TREE NUMBER
  TREE OUTSIDE SITE BUT 2M BEYOND SITE BOUNDARY *(for reference only)*
- MIN. 1200MM SOIL DEPTH EXCLUDE DRAINAGE LAYER
- ✱ WATER POINT (20M RADIUS)

BD Reference:

Dwg No.:

Drawing Purposes

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Project

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Drawing Title

TREE PROPOSAL PLAN 02

Job No.	Drawing No.	Revision No.
HKA-01063	CP_002	-
Scale	Date	CAD Ref.
AS	FEB 2022	CP_002
Drawn	Checked	Approved
NN	SL	SL

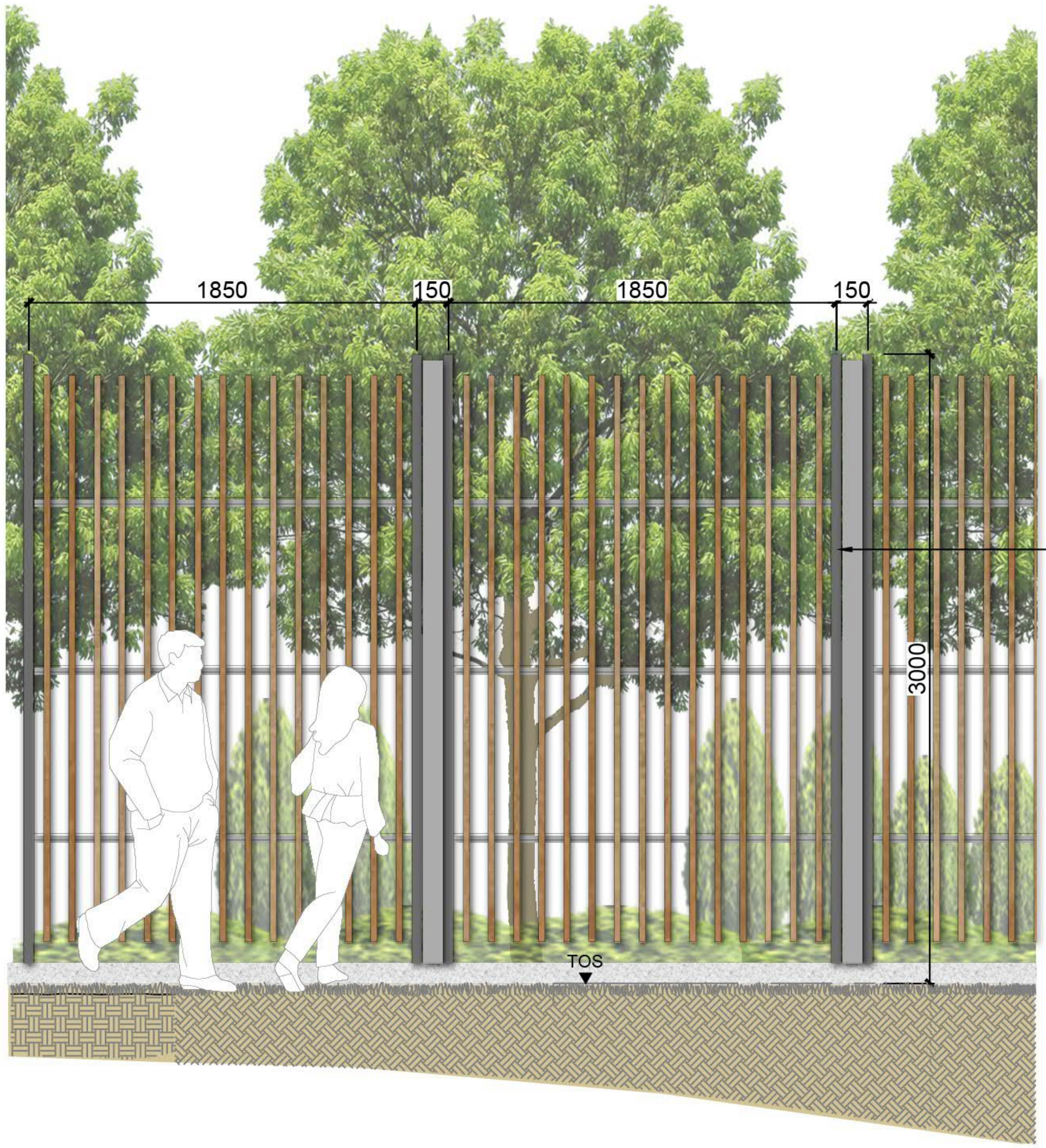
Authorized Person - Architect

Consultant Logo

SLSL

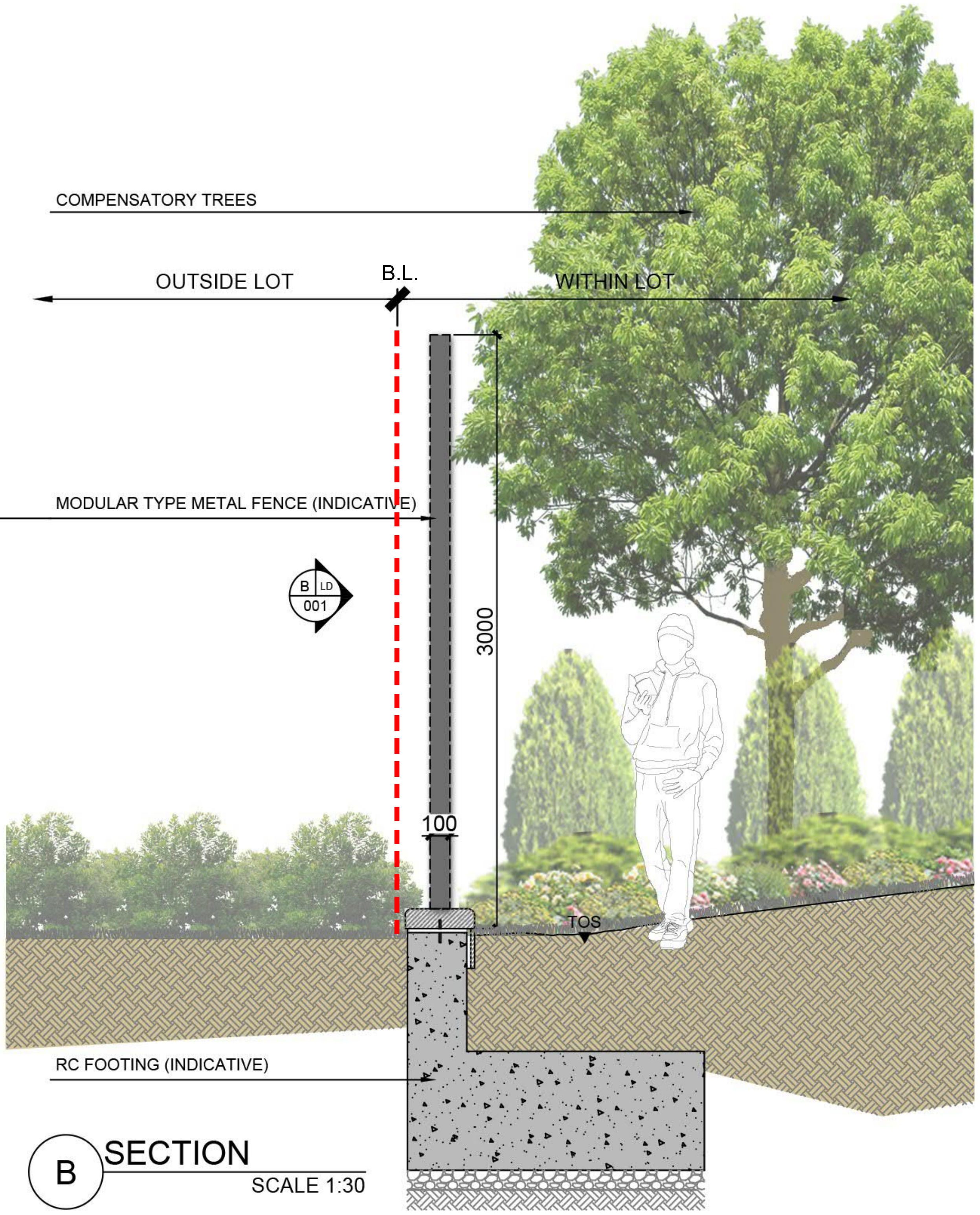
Appendix 3

TYPICAL LANDSCAPE DETAILS



A ELEVATION

SCALE 1:30



B SECTION

SCALE 1:30

Rev.	Date	Amendment	Purpose

Drawing Purposes

GOVERNMENT DRAWING

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Developer

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Project

PROPOSED REZONING FROM “RESIDENTIAL (GROUP D)” TO “RESIDENTIAL (GROUP C)” ZONE FOR PROPOSED RESIDENTIAL DEVELOPMENT AT VARIOUS LOTS AND ADJOINING GOVERNMENT LAND IN D.D. 112, KAM SHEUNG ROAD, SHEK KONG, YUEN LONG, N.T.

Drawing Title

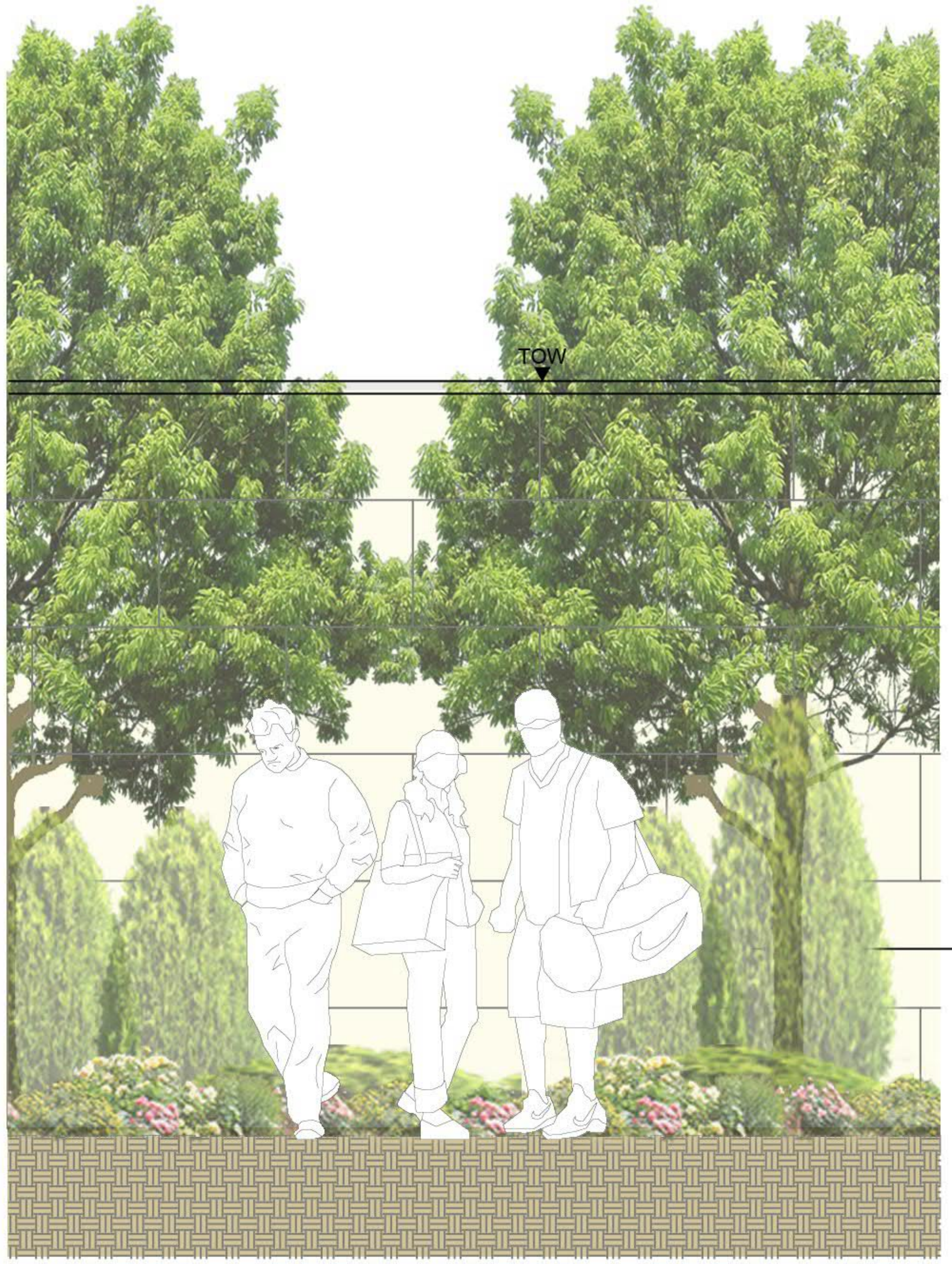
SCHEMATIC DESIGN OF METAL FENCE WALL SECTION & ELEVATION

Job No.	Drawing No.	Revision No.
HKA-01063	LD_001	-
Scale	Date	CAD Ref.
AS	MAY 2022	LD_001
Drawn	Checked	Approved
NN	SL	SL

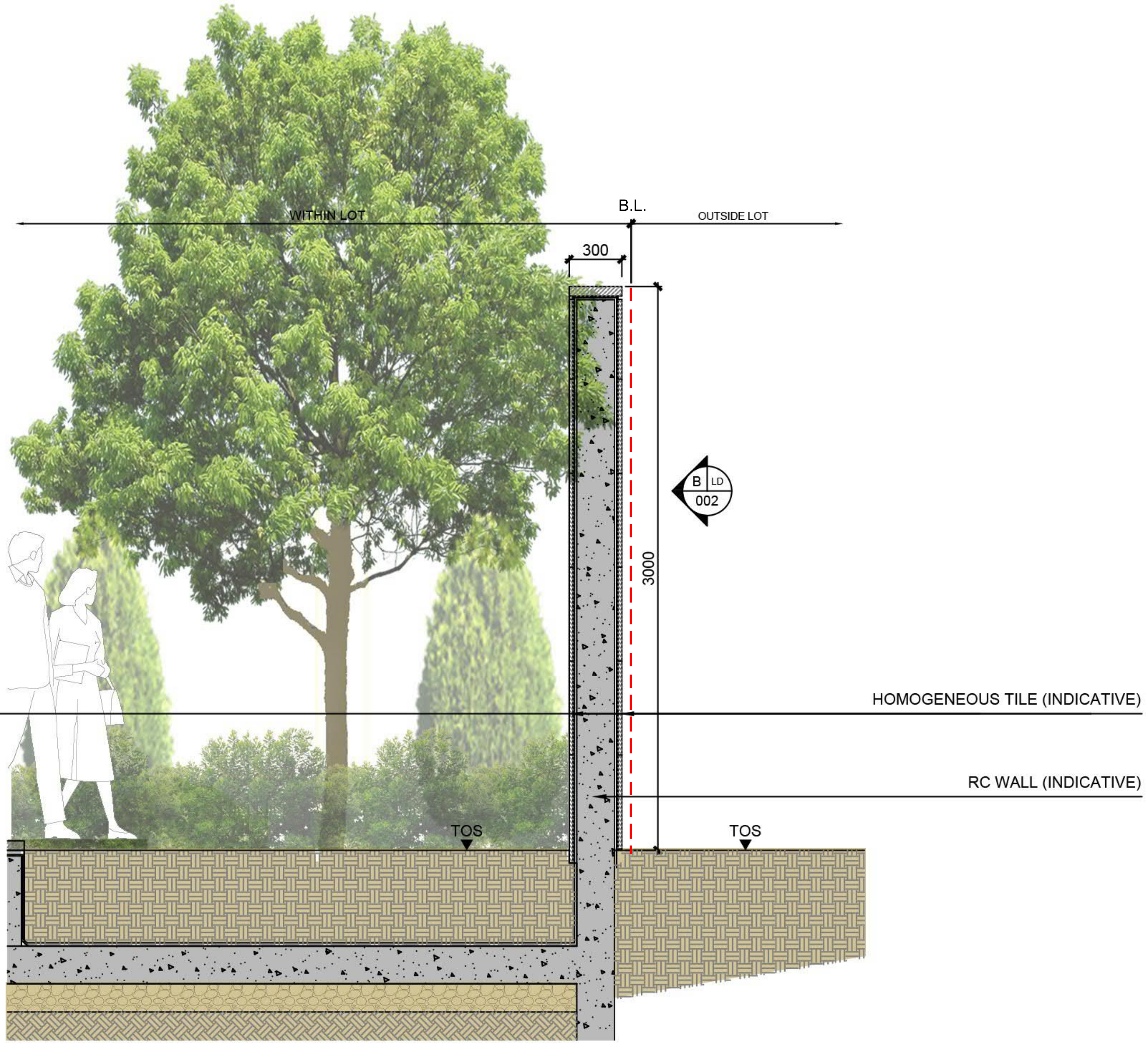
Authorized Person - Architect

Consultant Logo

SLSL



A ELEVATION
SCALE 1:30



B SECTION
SCALE 1:30

Rev.	Date	Amendment	Purpose

Drawing Purposes
GOVERNMENT DRAWING

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Developer
TENOX DEVELOPMENT LIMITED

Project
PROPOSED REZONING FROM "RESIDENTIAL (GROUP D)" TO "RESIDENTIAL (GROUP C)" ZONE FOR PROPOSED RESIDENTIAL DEVELOPMENT AT VARIOUS LOTS AND ADJOINING GOVERNMENT LAND IN D.D. 112, KAM SHEUNG ROAD, SHEK KONG, YUEN LONG, N.T.

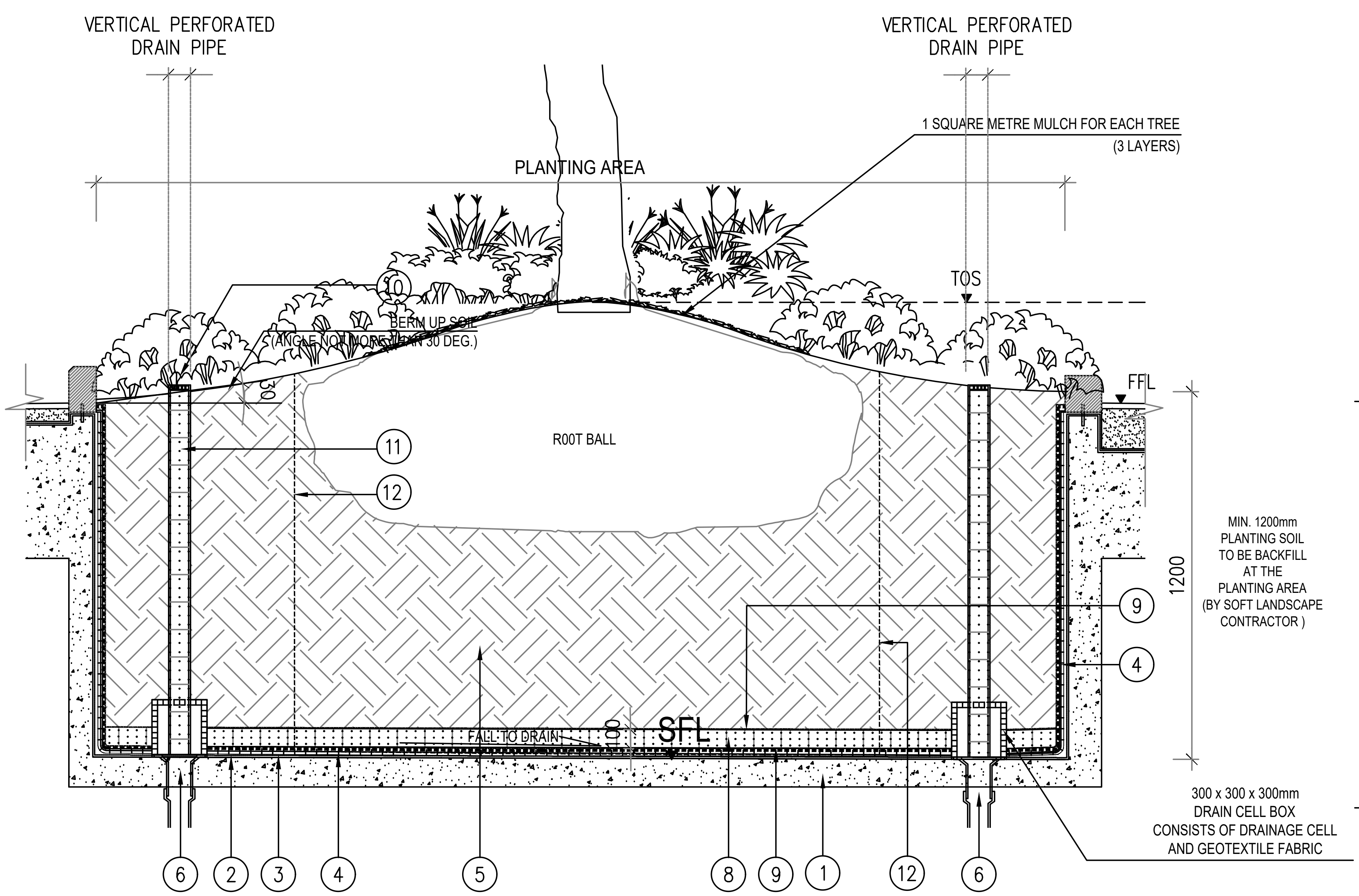
Drawing Title
SCHEMATIC DESIGN OF
RC FENCE WALL
SECTION & ELEVATION

Job No.	Drawing No.	Revision No.
HKA-01063	LD_002	-
Scale	Date	CAD Ref.
AS	MAY2022	LD_002
Drawn	Checked	Approved
NN	SL	SL

Authorized Person - Architect

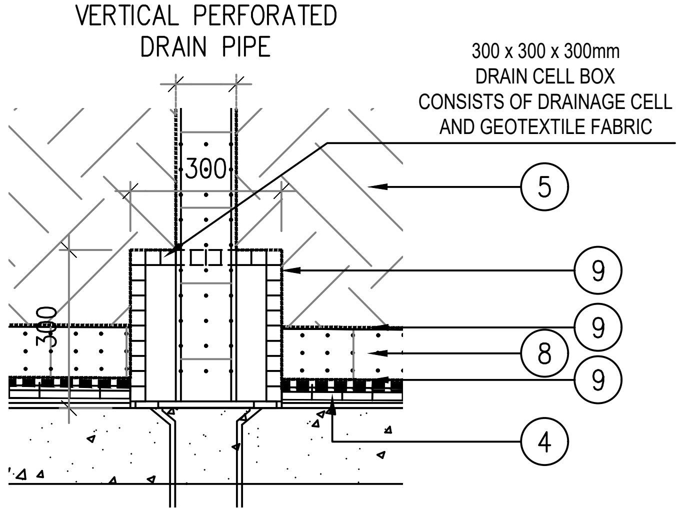
Consultant Logo

SLSL



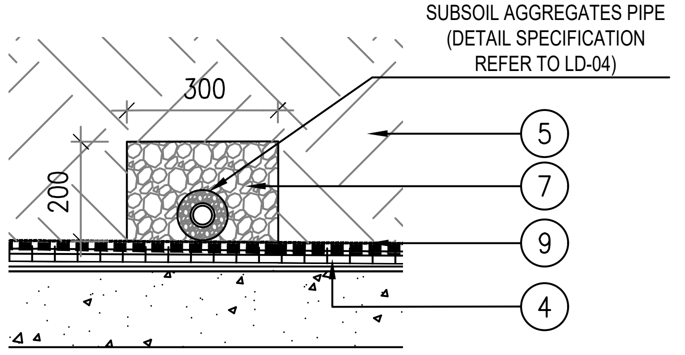
A | TYP PLANTER SECTION (ON STRUCTURE)

SCALE 1:30



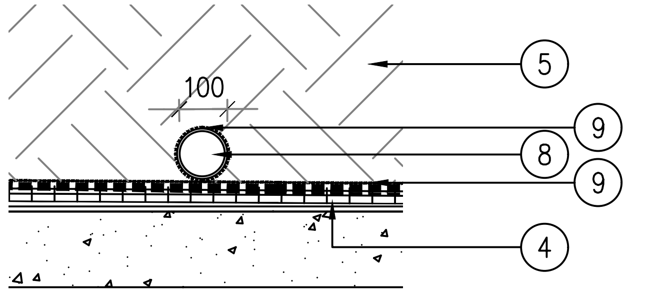
B | DRAINAGE CELL BOX DETAIL

SCALE 1:15



C | SUBSOIL DRAIN DETAIL (LAWN ONLY)

SCALE 1:15



D | SUBSOIL DRAIN DETAIL (ALL PLANTER EXCEPT LAWN)

SCALE 1:15

REMARKS:
LOCATION OF DRAIN POINTS REFER TO BUILDING SERVICES DRAWINGS

STRUCTURAL CODE

- ① STRUCTURAL SLAB (BY BUILDING CONTRACTOR)
- ② WATERPROOFING LAYER. REFER TO ARCHITECT'S DETAIL DIMENSION AND SPECIFICATION (BY BUILDING CONTRACTOR)
- ③ MIN 20MM THK MORTAR BASE (BY BUILDING CONTRACTOR)
- ④ 30MM THK PROPRIETARY HDPE DRAINAGE CELL & FILTER LAYER SYSTEM (RAINSMART OR APPROVED EQUAL) (BY SOFT LANDSCAPE CONTRACTOR)
- ⑤ PLANTING SOIL MIXTURE (BY SOFT LANDSCAPE CONTRACTOR)
- ⑥ DRAIN PIPE AS PER ENGINEERS SPECS (BY BUILDING CONTRACTOR)
- ⑦ 300MM (W) x 200MM (THK) 20-30MM Ø PELLETS LIGHTWEIGHT EXPANDED AGGREGATES (LECA) ALONG SUBSOIL AGGREGATES PIPE (BY SOFT LANDSCAPE CONTRACTOR)
- ⑧ 100MM Ø POLYSTYRENE PERFORATED SUBSOIL DRAIN PIPE (BY SOFT LANDSCAPE CONTRACTOR)
- ⑨ GEOTEXTILE FABRIC LAYER (BY SOFT LANDSCAPE CONTRACTOR)
- ⑩ MIN. 100MM Ø PVC STRAINER (THREADED, REMOVABLE) (BY SOFT LANDSCAPE CONTRACTOR)
- ⑪ MIN. 100MM Ø POLYSTYRENE PERFORATED DRAIN PIPE WRAPPED BY GEOTEXTILE
- ⑫ PROPRIETARY ROOT BARRIER SYSTEM AREA REFER TO DRAWING NO. LPP-01 (BY SOFT LANDSCAPE CONTRACTOR)

Rev.	Date	Amendment	Purpose

Drawing Purposes
GOVERNMENT DRAWING

Developer
TENOX DEVELOPMENT LIMITED

Project
PROPOSED REZONING FROM “RESIDENTIAL (GROUP D)” TO “RESIDENTIAL (GROUP C)” ZONE FOR PROPOSED RESIDENTIAL DEVELOPMENT AT VARIOUS LOTS AND ADJOINING GOVERNMENT LAND IN D.D. 112, KAM SHEUNG ROAD, SHEK KONG, YUEN LONG, N.T.

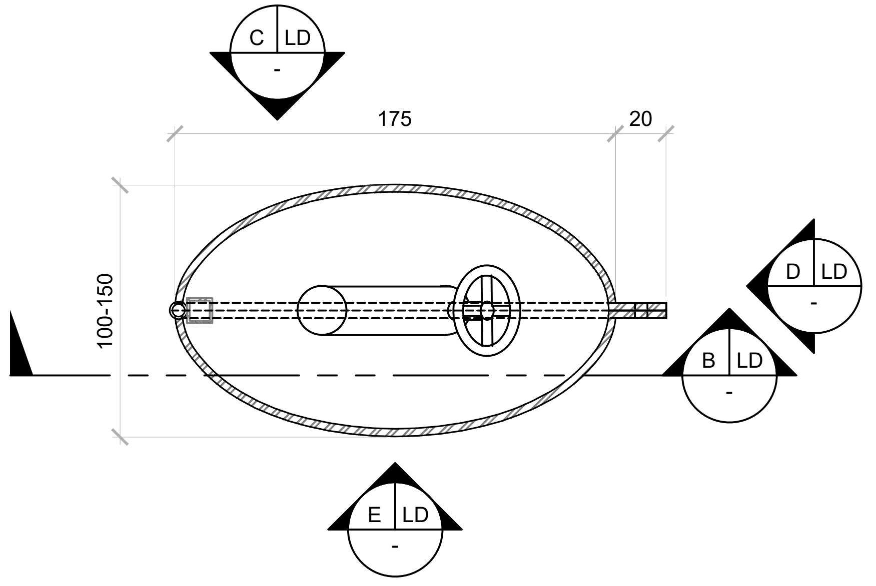
Drawing Title
TYPICAL PLANTER DETAIL

Job No.	Drawing No.	Revision No.
01063-LAN	LD_003	-
Scale	Date	CAD Ref.
AS(A3)	JUN 2022	LD_003.DWG
Drawn	Checked	Approved
NN	SL	SL

Authorized Person - Architect

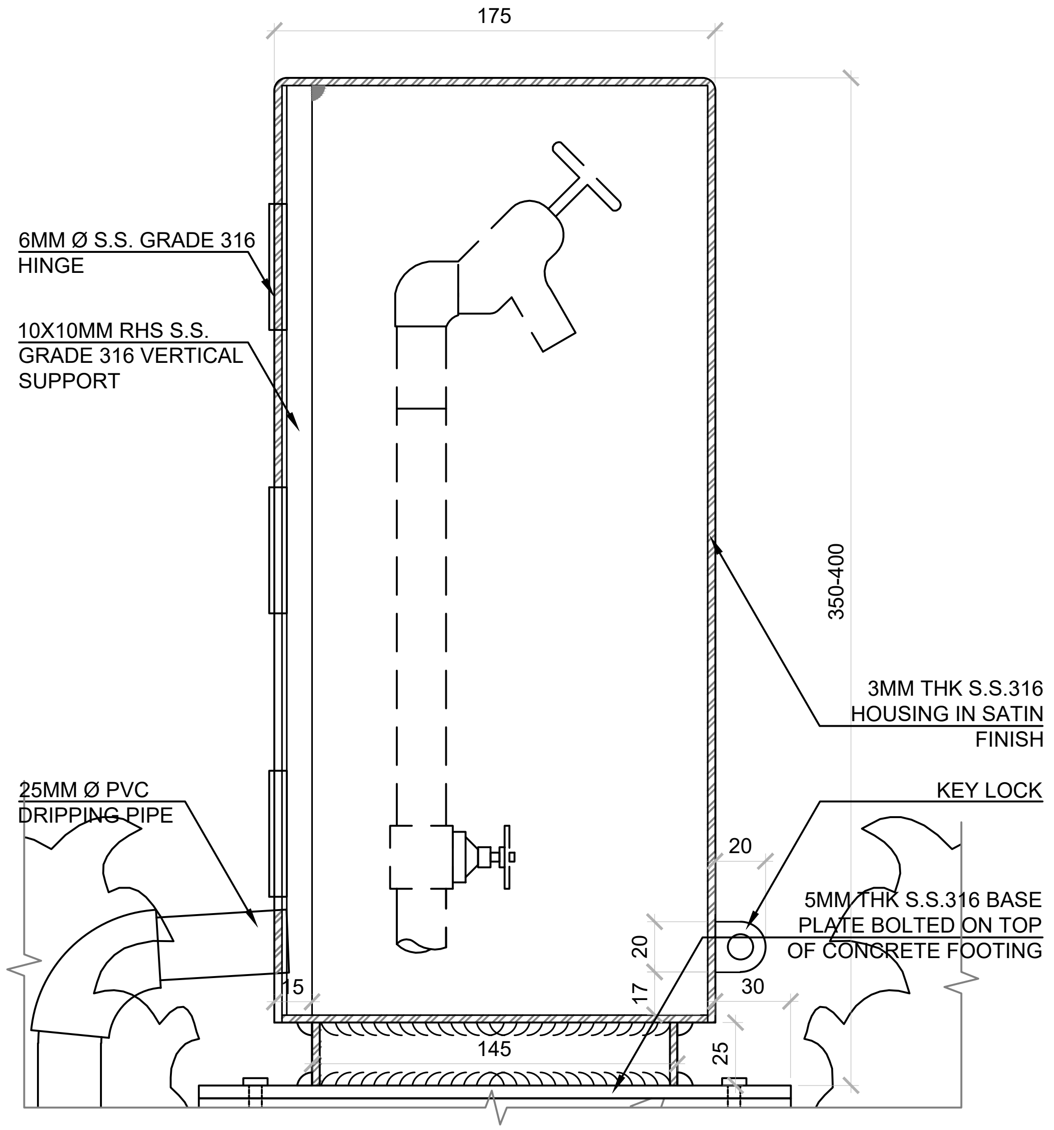
Consultant Logo

SLSL



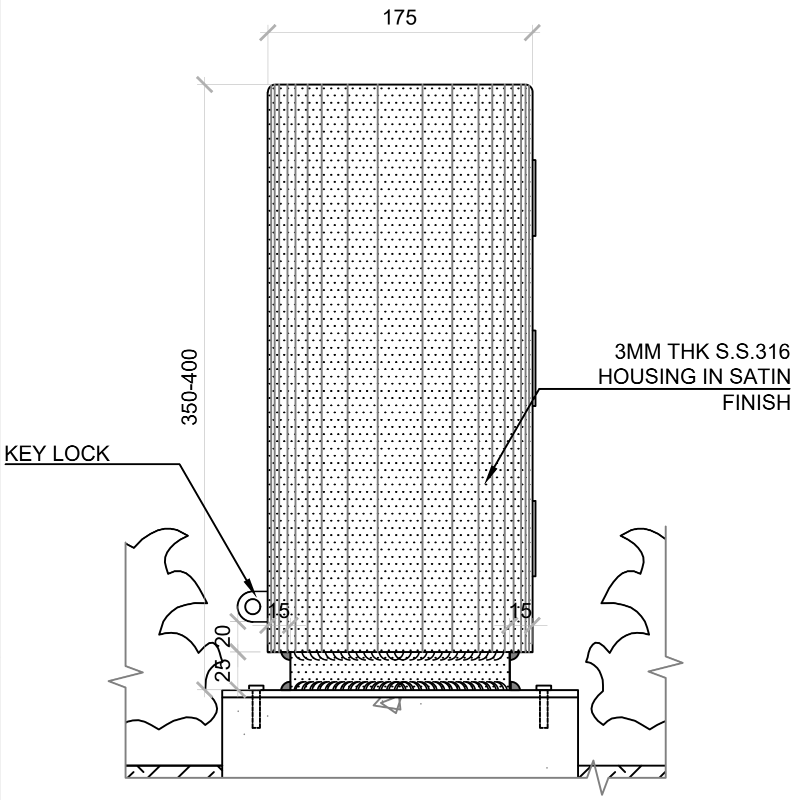
A PLAN

SCALE 1:3



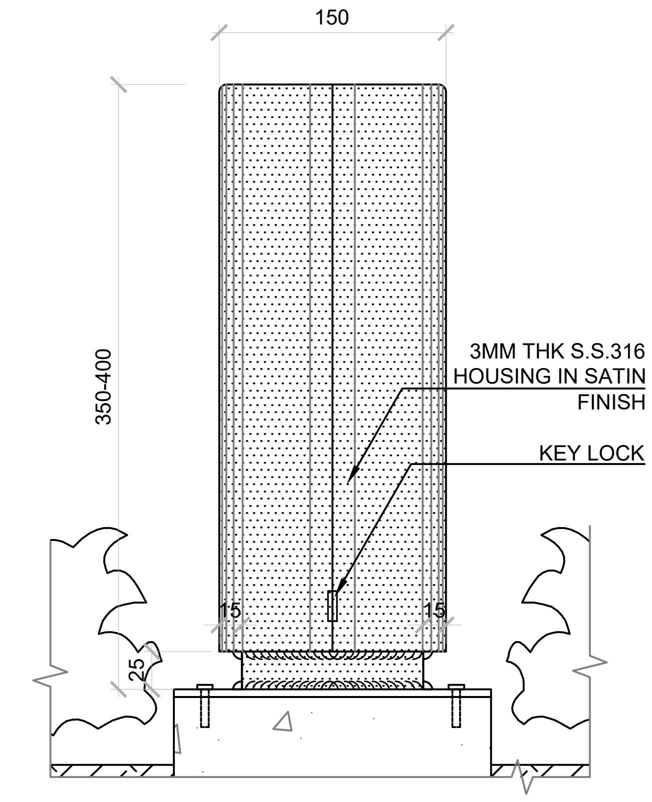
B SECTION

SCALE 1:3



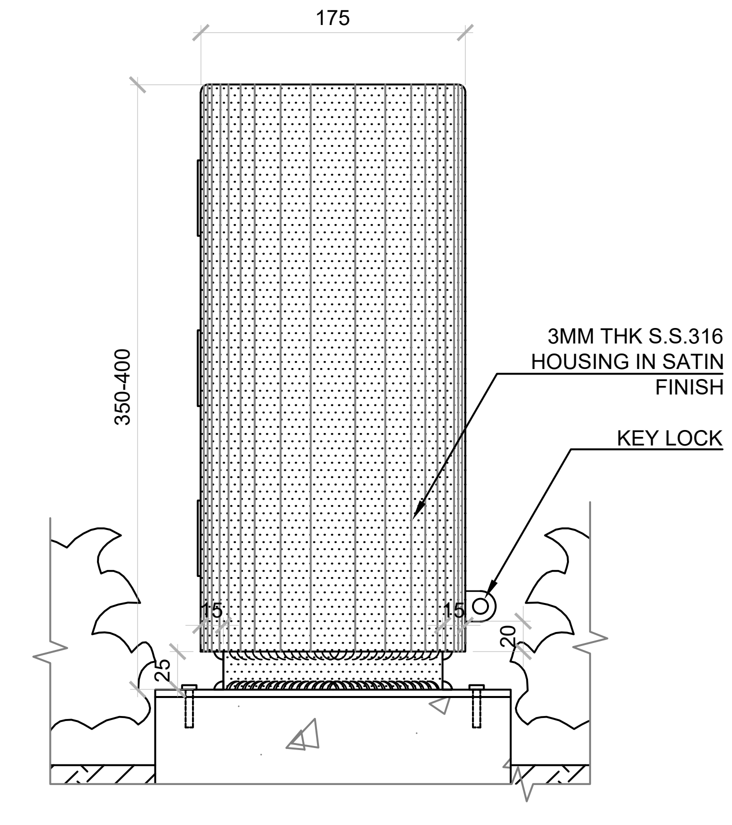
C SIDE ELEVATION

SCALE 1:5



D FRONT ELEVATION

SCALE 1:5



E SIDE ELEVATION

SCALE 1:5

Rev.	Date	Amendment	Purpose

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Developer

TENOX DEVELOPMENT LIMITED

Project

PROPOSED REZONING FROM "RESIDENTIAL (GROUP D)" TO "RESIDENTIAL (GROUP C)" ZONE FOR PROPOSED RESIDENTIAL DEVELOPMENT AT VARIOUS LOTS AND ADJOINING GOVERNMENT LAND IN D.D. 112, KAM SHEUNG ROAD, SHEK KONG, YUEN LONG, N.T.

Drawing Title

IRRIGATION POINT TYPICAL DETAIL

Job No.	Drawing No.	Revision No.
01063-LAN	LD_004	-
Scale	Date	CAD Ref.
AS (A3)	JUN 2022	LD_004.DWG
Drawn	Checked	Approved
NN	SL	SL

Authorized Person - Architect

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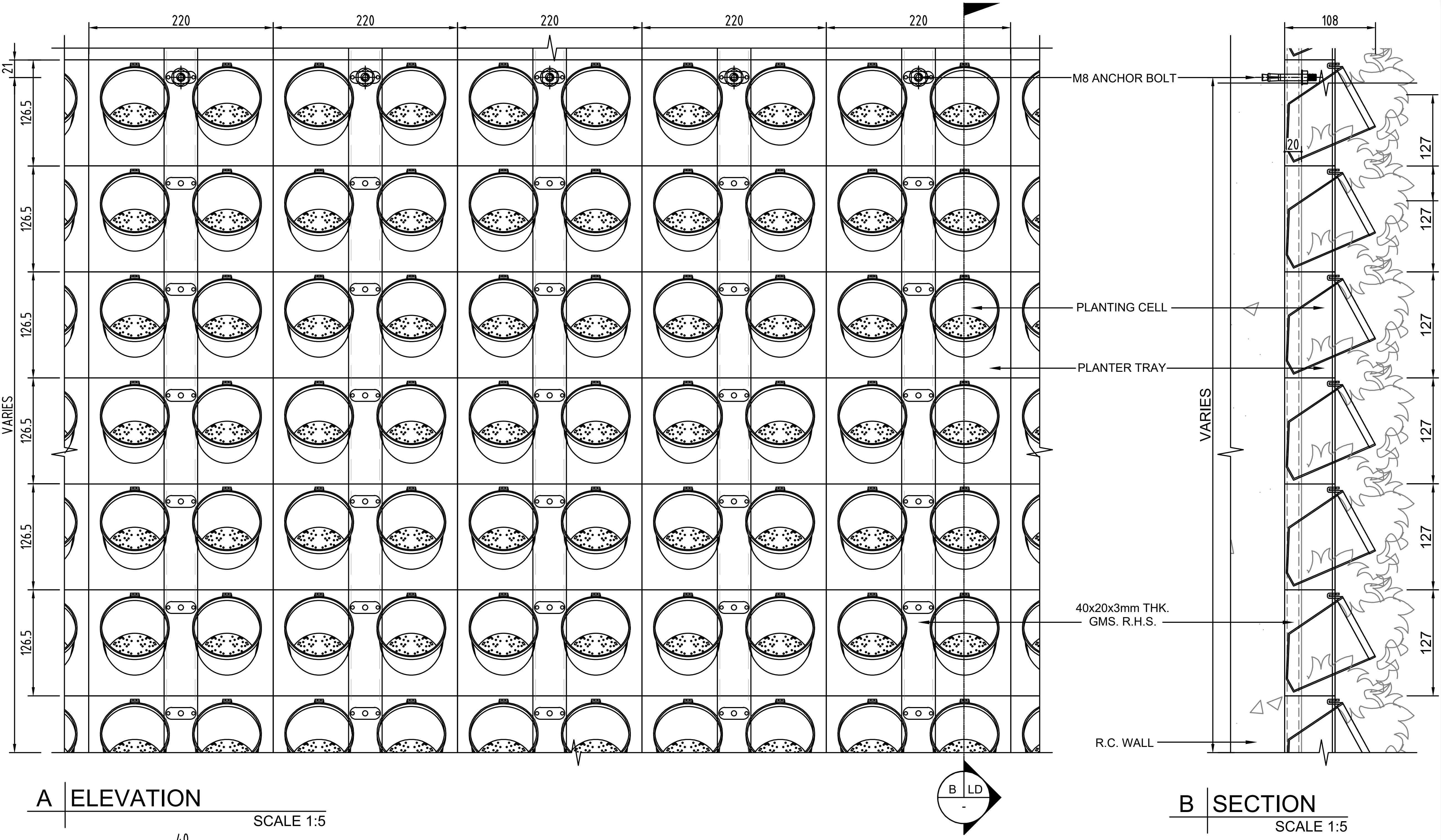
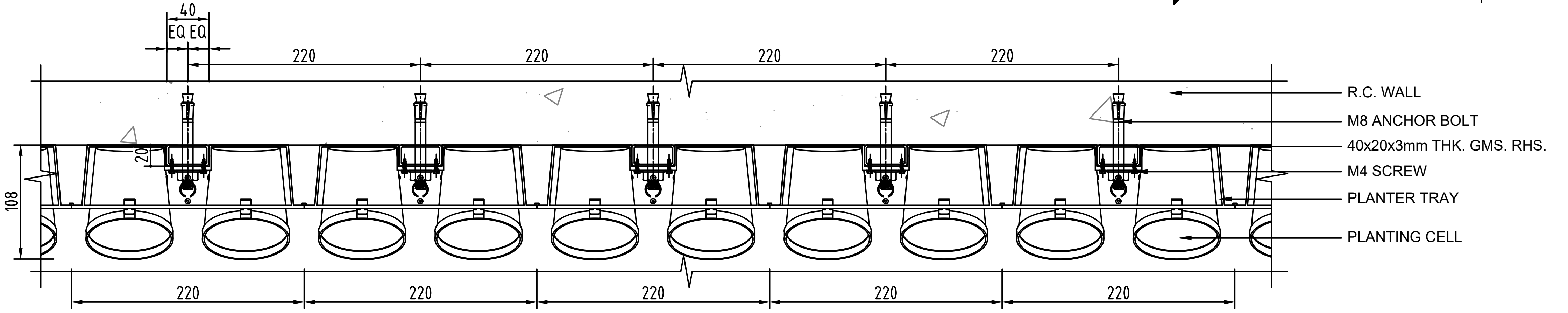


A ELEVATION

SCALE 1:5

B SECTION

SCALE 1:5



C PLAN

SCALE 1:5

Rev.	Date	Amendment	Purpose

Drawing Purposes

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Project

PROPOSED REZONING FROM "RESIDENTIAL (GROUP D)" TO "RESIDENTIAL (GROUP C)" ZONE FOR PROPOSED RESIDENTIAL DEVELOPMENT AT VARIOUS LOTS AND ADJOINING GOVERNMENT LAND IN D.D. 112, KAM SHEUNG ROAD, SHEK KONG, YUEN LONG, N.T.

Drawing Title

VERTICAL GREEN
(MODULAR TYPE) DETAIL 01

Job No.	Drawing No.	Revision No.
HKA-01063	LD_005	-
Scale	Date	CAD Ref.
AS	JUN 2022	LD_005.DWG
Drawn	Checked	Approved
NN	SL	SL

Authorized Person - Architect

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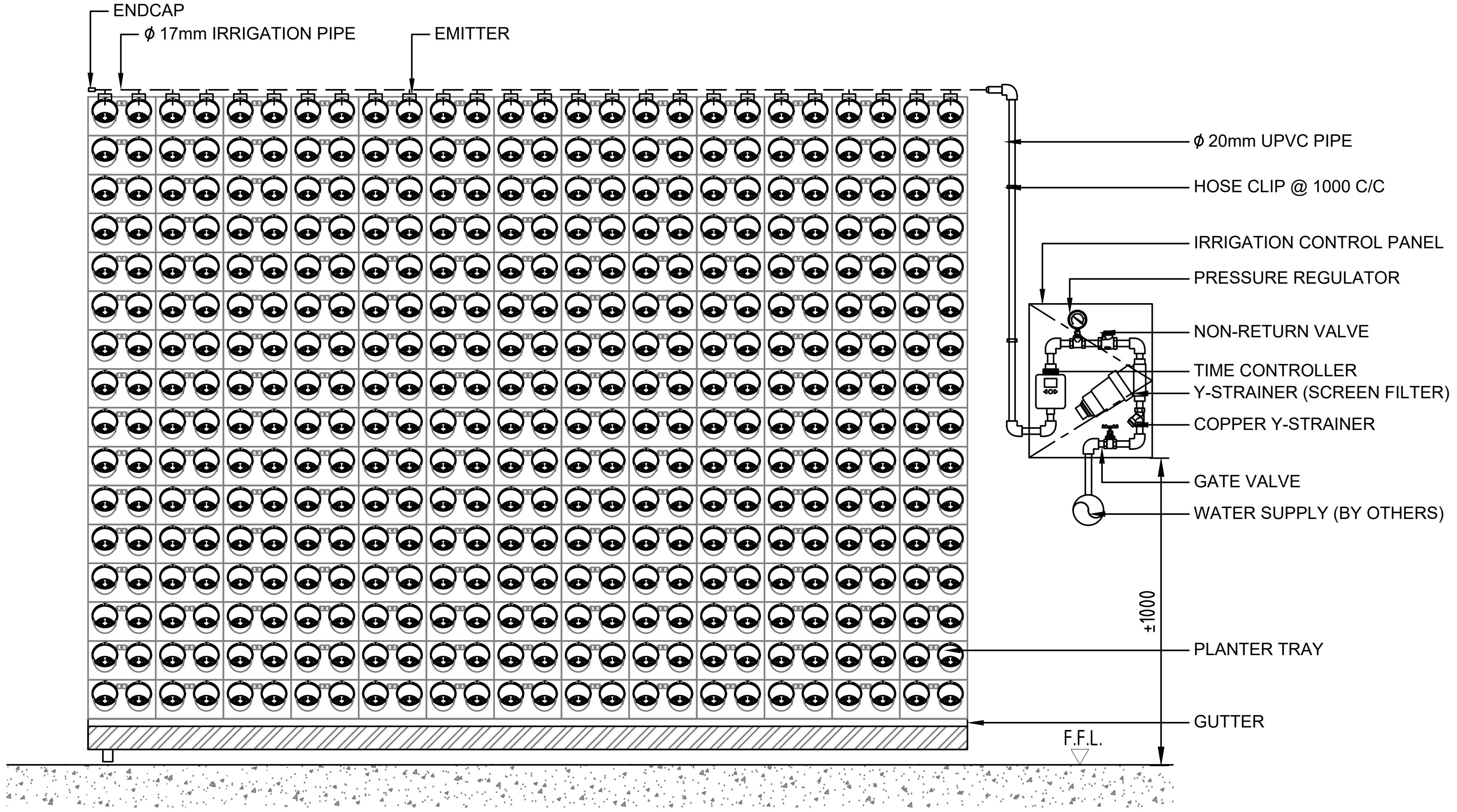
SLSL

LEGEND:

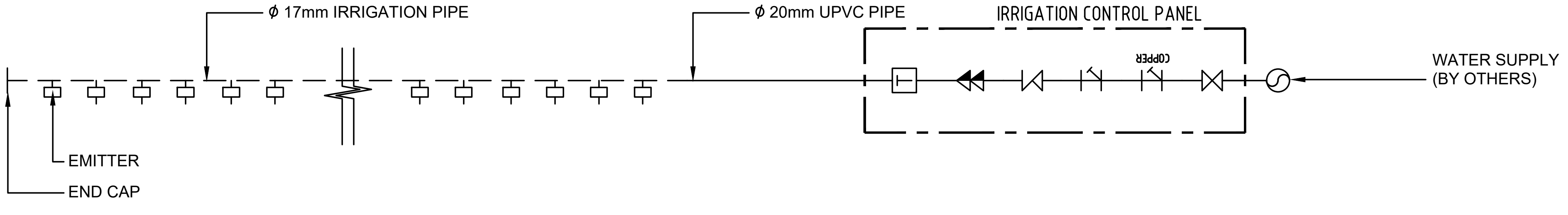
⊘	WATER SUPPLY (BY OTHERS)
⋈	GATE VALVE
⊣↘⊢	Y-STRAINER (SCREEN FILTER)
⊣↘⊢ COPPER	Y-STRAINER (COPPER)
▷|	NON-RETURN VALVE
▶▶	PRESSURE REGULATOR
T	TIMER CONTROLLER
⏚	EMITTER
——	Ø20mm UPVC PIPE
- - - -	Ø17mm IRRIGATION PIPE

WATER IRRIGATION MAIN REQUIREMENT
- FLOW RATE : 1.0 LITER / SECOND (MINIMUM)
- PRESSURE : 2.5 - 4 BAR AT WORKING LEVEL



A ELEVATION

SCALE 1:20



B SCHEMATIC DIAGRAM OF AUTOMATIC IRRIGATION SYSTEM

NA

Rev. Date Amendment Purpose

Drawing Purposes
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Developer
TENOX DEVELOPMENT LIMITED

Project
PROPOSED REZONING FROM “RESIDENTIAL (GROUP D)” TO “RESIDENTIAL (GROUP C)” ZONE FOR PROPOSED RESIDENTIAL DEVELOPMENT AT VARIOUS LOTS AND ADJOINING GOVERNMENT LAND IN D.D. 112, KAM SHEUNG ROAD, SHEK KONG, YUEN LONG, N.T.

Drawing Title
VERTICAL GREEN
(MODULAR TYPE) DETAIL 02

Job No.	Drawing No.	Revision No.
HKA-01063	LD_006	-
Scale	Date	CAD Ref.
AS	JUN 2022	LD_006.DWG
Drawn	Checked	Approved
NN	SL	SL

Authorized Person - Architect

Consultant Logo

SLSL

Appendix 4

Visual Impact Assessment

Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

VISUAL IMPACT ASSESSMENT

MARCH 2025

Project Proponent:
Tenox Development Limited

Visual Impact Specialist:
KTA Planning Limited

KTA
PLANNING LIMITED
規劃顧問有限公司

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For Proposed Residential Development at
Various Lotsand Adjoining Government Land in D.D. 112,
Kam Sheung Road, Shek Kong, Yuen Long, New Territories

Visual Impact Assessment

1. INTRODUCTION

1.1 Purpose

1.1.1 This Visual Impact Assessment (“VIA”) report is prepared on behalf of Tenox Development Limited (the “Project Proponent”) in support of S12A Amendment of Plan for Proposed Residential Development (“Proposed Development”) at Various Lots and Adjoining Government Land in D.D 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories (‘the Site”).

1.1.2 The Proposed Development consists of 19 nos. of residential blocks with 6 storeys. It also comprises two stand-alone 1-storey clubhouses and two stand-alone 3-storeys carpark buildings. The Proposed Development is erected on formed level of between about 24mPD and 26mPD, increasing from the north to the south. With domestic plot ratio of 0.8, the Proposed Development yields a total domestic GFA of about 33,032m^2 with a maximum building height at about +44.2mPD. The Site is currently zoned “Residential (Group D)” (“R(D)”) under the approved Shek Kong Outline Zoning Plan (OZP) No. S/YL-SK/9 (the “approved OZP”) (**Figure 1.1** refers). The development proposal involves in the S12A Amendment of Plan Application to rezone/ upzone of the Site to “Residential (Group C)” (“R(C)”). A Visual Impact Assessment shall be submitted at the S12A Amendment of Plan Application stage to demonstrate that the Proposed Development at the Site is visually acceptable.

1.1.3 This VIA evaluates, in accordance with the Town Planning Board Guidelines on Submission of Visual Impact Assessment for Planning Applications to TPB (“TPB PG-NO.41”), the anticipated visual impacts of the Proposed Development on the Visually Sensitive Receivers (“VSRs”) relevant to the Site and concludes with recommendation on mitigation measures if necessary.

1.2 Report Structure

1.2.1 Following this introductory section, the methodology adopted in this assessment will be set out in Section 2. The baseline review of the site and the surrounding area is included in Section 3. Section 4 includes the

Proposed Development scheme and discussion on the design merits. Visual envelops, visual sensitive receivers and their representative viewpoints will be identified in Section 5, followed by assessment of the visual impact in Section 6. Section 7 concludes and summarises this Visual Impact Assessment.

2. METHODOLOGY

2.1 Visual Impact Assessment Approach

2.1.1 This Visual Impact Assessment aims at evaluating the visual impact of the Proposed Development by comparing the visual effect of the existing at 44.15mPD (main roof level) on public visual sensitive receivers (“VSRs”).

2.1.2 According to TPB PG-No. 41, Visual Impacts shall be assessed based on i) the sensitivity of the key public viewers; ii) visual resources and visual amenities likely to be affected iii) the magnitude, extent and duration of impact and any resultant improvement or degradation in the visual quality and character of the surrounding area; and iv) the planning intention and known planned developments of the area. Visual Impacts could be either beneficial or adverse. Visual sensitivity of public viewers/VSRs is determined taking into account the activity of the VSR, the duration and distance over which the Proposed Development would remain visual, and the public perception of the value attached to the view being assessed. It typically qualitatively graded from high to low.

2.1.3 Visual changes could be positive or negative and they are not necessarily mutually exclusive. In considering the effect of visual changes, it covers the following four aspects:

- the total effect on the **Visual Composition** of the surrounding context;
- the degree of **Visual Obstruction** to key public viewing points;
- the visual **Effect on Public Viewer**/VSRs; and
- the **Effect on Visual Resources**.

The magnitude of visual changes will be qualitative graded as Substantial, Moderate, Slight or Negligible.

2.1.4 The VIA will be undertaken in the following steps:

- A baseline review will be conducted to capture the existing visual elements in the surroundings and the planning context of the Site.
- The development scheme for the Proposed Development at the Site will be briefly presented.
- Working closely with the Planning Department, the Visual Envelope (“VE”) will be determined and appropriate public viewpoints (“VPs”) to represent the view from public VSRs will be identified.
- Each VP and potential visual impacts of the Proposed Development on the VSRs will be analyzed based on the photomontages prepared from the selected VPs.
- The overall visual impact will be assessed and conclusion on the visual acceptability of the Proposed Development will then be drawn.

3. BASELINE REVIEW

3.1 Site Location

3.1.1 The Rezoning Site is located between Lin Fa Tei and Lai Uk Tsuen in Shek Kong. It is located to the south of Shek Kong Airfield and Shek Kong Stabling Sidings at about 1.3km. The Site is also situated about 3.5km southeast of Kam Sheung Road Station and about 2.4km east of the MTR Pat Heung Maintenance Centre (**Figure 3.1** refers). At the local level, the Site is bounded by Kam Sheung Road to the north (**Figure 3.2** refers).

3.1.2 The Site has a total area of about 41,290m^2. The existing site level varies slightly between 23.1mPD and 25.5mPD from the north to the south.

3.2 Existing Site Condition

3.2.1 The Site is currently occupied by an open storage yard with a few numbers of temporary structures for storage of building materials in the north. The majority of the Site (about 75%) in the south is vacant and abandoned overgrown with vegetation.

3.3 Existing Visual Elements in the Surrounding Context

3.3.1 The visual outlook of an area is shaped by a combined composition of all the visual elements which come into sights of the viewers. Kam Sheung Road is the main road access to the area and it is acts as a north-south defining elements for the visual character of the local context (**Figure 3.3** refers).

3.3.2 The Site is located in areas with low-rise village settlements, open storages and scattered active farmland. The area to the east and west of the Site is mainly surrounded by different villages zoned "Village Type Development" ("V") zone. There is a declared monument within the Village to the east of the Site. The area zoned "Agriculture" with temporary structures is situated to the north of Site across Kam Sheung Road. The area to the immediate south is mainly zoned "Agriculture", which is in general abandoned farmland.

3.3.3 Key visual elements in the surrounding context are summarized below:

(a) To the east of the Site, there are some villages (i.e. Lai Uk Tsuen, Tsang Uk Tsuen and Tse Uk Tsuen) as well as a declared monument – Chik Kwai Study Hall in Lai Uk Tsuen;

(b) Lin Fa Tei Village is located to west of the Site and other villages (i.e. Shui Tsan Tin and Ngau Keng) can also be found to the further southwest of the Site;

(c) An area zoned "Agriculture" with temporary structures is located to the north of Site across Kam Sheung Road; and

(d) The area to the south of the Site is mainly zoned “Agriculture”, which is in general abandoned farmland.

3.4 Statutory Zoning

3.4.1 According to the approved Shek Kong Outline Zoning Plan No. S/YL-SK/9 (the “approved OZP”), the Site is zoned “Residential (Group D)” (“R(D)”) (**Figure 1.1** refers). According to the approved OZP, the planning intention of the “R(D)” zone is “*primarily for improvement and upgrading of existing temporary structures within the rural areas through redevelopment of existing temporary structures into permanent buildings”.* It is also intended for *“low-rise, low-density residential developments subject to planning permission from the Town Planning Board*”.

3.4.2 According to the Remarks of the “R(D)” zone, any development including redevelopment for ‘Flat’ and ‘House’ shall not in excess of a maximum plot ratio of 0.2 and a maximum building height of 2 storeys (6m). Minor relaxation of the plot ratio and building height restrictions based on the individual merits of a development or redevelopment proposal may be considered by the Town Planning Board on application under section 16 of the Town Planning Ordinance. While it is proposed to develop residential development with domestic plot ratio of 0.8, S12A Application for proposed rezoning the Site into “Residential (Group C)” is required.

4. THE PROPOSED DEVELOPMENT

4.1 The Proposed Development

Proposed Use

4.1.1 The Proposed Development consists of 19 nos. of residential blocks with 6 storeys. It also comprises two stand-alone 1-storey clubhouses and two stand-alone 3-storeys carpark buildings. The Proposed Development is erected on formed level of between about 24mPD and 26mPD, increasing from the north to the south. With domestic plot ratio of 0.8, the Proposed Development yields a total domestic GFA of about 33,032m^2 with a maximum building height at about +44.2mPD. The total number of residential units is 850. Please refer to the key development parameters in **Table 4.1**.

	PROPOSED DEVELOPMENT (Approx.)
Site Area	41,290m^2
Proposed Domestic Plot Ratio	0.8
Proposed Domestic GFA	33,032m^2
No. of Residential Towers	19
No. of Residential Units	850
Average Unit Size (in GFA)	38.9m^2
Total No. of Storeys • Residential Tower • Clubhouse • Carpark Building	 6 (including G/F entrance lobby) 1 3
Maximum Building Height (Main Roof)	Not more than +44.15mPD
Site Coverage	Not more than 30%
Clubhouse GFA (Max 4.5% of total domestic GFA or Max 1,250m^2 for GFA concession, whichever is greater)	Not more than 1486.4m^2
Communal Open Space (1sqm per person)	2,380m^2
Greening Ratio	30%
Estimated Population (Assuming 2.8 per household)	2,380

Table 4.1 Key Development Parameters of Proposed Development

Design Principles

4.1.2 The Proposed Development has taken careful consideration of the surrounding context and the planning context of the area. The following aspects (i.e. design and disposition, building setback etc.) have taken into account when designing the Proposed Development and upon completion.

Design and Deposition of the Building Blocks

4.1.3 The building blocks of the Proposed Development have been carefully designed and positioned within the Site. Each of the building blocks is designed with a relatively small building footprint, which would offer generous open space at grade level with not less than 2,380m^2 (providing minimum 1m^2 per person of local open space) and greening ratio of not less than 30% of the Site Area (i.e. 12,387m^2) (**Figure 5.1** refers). The relatively small building footprint would also maximise the air permeability of the development and minimise its impact on wind capturing potential of the surrounding neighbourhood.

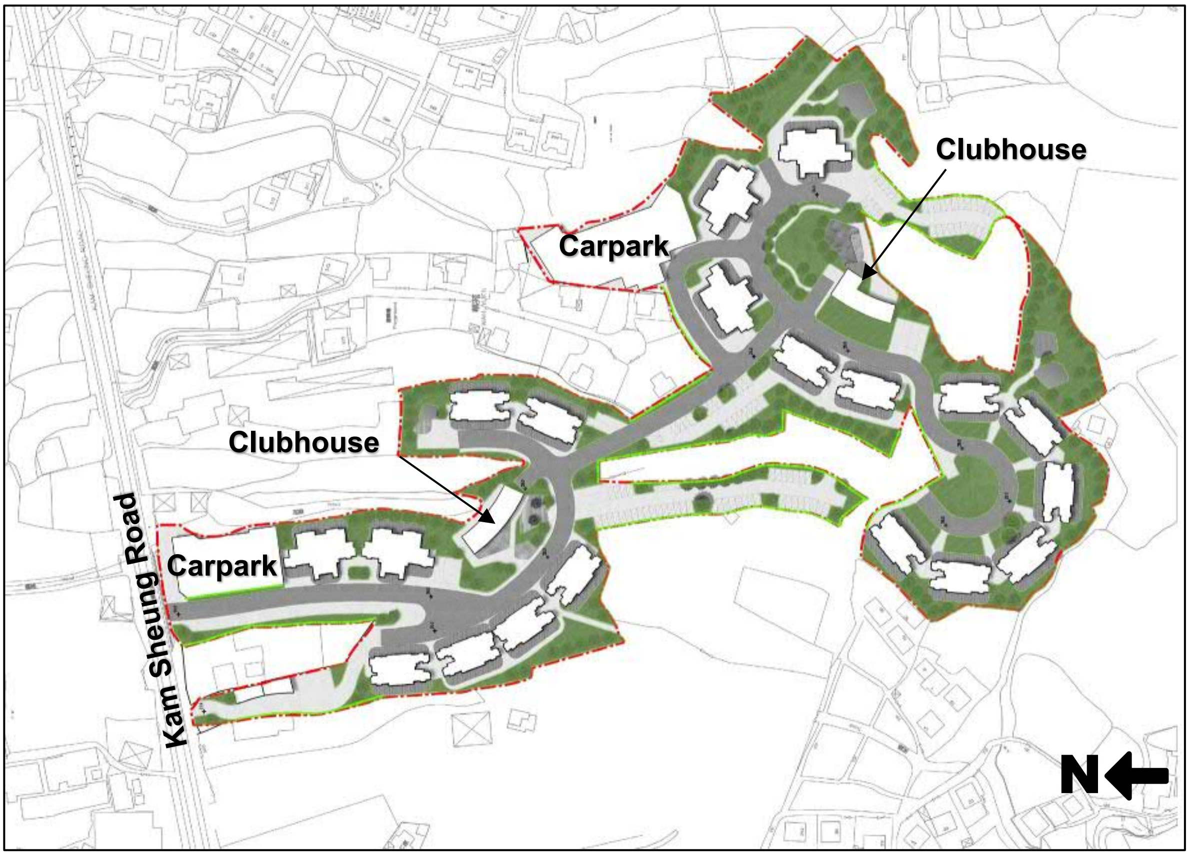


Figure 4.1: Design and Disposition of Building Blocks

Building Setback

4.1.4 The Proposed Development offers a significant setback from the kerb line of major arterial road, Kam Sheung Road, by at least 50m (**Figure 5.2** refers). This is to further enhance air ventilation and form the breezeways along Kam Sheung Road. In addition, the Proposed Development also offers a green buffer with appropriate landscape treatment along the edge of development site boundary. By offering a green buffer, it would be able to soften the building edge of the building blocks (**Figure 5.2** refers), as well as providing a visual relief to the public and surrounding neighborhoods

.

Figure 4.2: Providing Building Setback and Green Buffer within the Site

4.2 Sensitive Design Measures

4.2.1 The design of the Proposed Development has adopted the following sensitive design measures (“DM”) / design features, so as to alleviate the visual impact due to the Proposed Development to an acceptable level:

- DM1: The building block being setback by at least 50 meters from the kerb line of the major arterial route, Kam Sheung Road;
- DM2: Providing a green buffer along the periphery of the Site to soften the building edge of building blocks and to provide visual relief with surrounding domestic structures;
- DM3: Careful use of building façade materials with the appearance of lightweight and treatment with natural colors to be in harmony with the greenery context and the sky; and
- DM4: Providing a greenery of not less than 30% within the Site.

5 IDENTIFICATION OF VISUAL SENSITIVE RECEIVERS AND SELECTION OF VIEWPOINTS

5.1 Identifying Visual Envelope and Visual Sensitive Receivers

5.1.1 The Visual Envelope (“VE”) within which the Proposed Development is pronouncedly visible from key sensitive viewers is shown in **Figure 5.1**. In the interest of the public, the VIA will focus primarily on public Visual Sensitive Receivers (“VSRs”) only and no private VSR, such as residents of private developments and users of developments with restricted / exclusive accesses (e.g. school and office, etc.) will be included.

5.1.2 In the sub-urban context around the Site, when viewing from street level, existing developments and trees may screen off most of the view from VSRs while buildings of similar height may hide the development even from distant. Therefore, locally the identification of VSRs is largely constrained by the existing built environment and trees. The VE covers the area where direct sight towards the Proposed Development is available as presented in **Figure 5.1**.

5.2 Selection of Representative Viewpoints

5.2.1 Based on the identified VSRs, representative viewpoints (“VPs”) were selected for further assessment. Selected VPs shall cover public views from easily accessible and popular area from different directions. When selecting VPs, priority shall be given to public open space (or planned public open spaces), public focal points, open spaces, existing/future pedestrian node, key pedestrian/vehicular corridor, existing major vistas and key transient corridor will be considered as major visually sensitive viewpoints. In this VIA, 3 nos. of local VPs are selected within the visual envelope and 1 distant VP is selected based on their strategic importance to the vicinity or to the territory. A potential viewpoint (PVP) is also identified. The selected VPs are presented in **Table 5.1** and shown on **Figure 5.2** or **Figure 5.3**.

VP1 – Lin Fa Tei Bus Stop (Westbound) along Kam Sheung Road to the West

5.2.2 VP1 is taken from the bus stop in close proximity along Kam Sheung Road to the west. Local residents to and from the area in Lin Fai Tei usually rely on transport service along Kam Sheung Road. The bus stop serves the residents in Lin Fai Tei to travel to Yeung Long and Kam Sheung Road Station. At this viewpoint, the northern portion of the Proposed Development will be directly captured, with some 3-storey village houses of Lin Fa Tei in the foreground and Tai Mo Shan mountain range as the backdrop.

5.2.3 The bus stop is frequently used by the public, especially the local residents and workers. The quality of view is Good but the view is transient and short-lived as the users would not stay for long. This viewpoint may also represent the view of the drivers along Kam Sheung Road coming from the west. The public viewers at this viewpoint are considered to have a medium sensitivity to visual change.

VP2 – Lai Uk Tsuen Bus Stop (Eastbound) along Kam Sheung Road to the Northeast

5.2.4 VP2 is taken from the bus stop in close proximity along Kam Sheung Road to the northeast. The bus stop serves the residents in Lin Fai Tei to the east of the city such as Tai Po Market. At this viewpoint, mainly the carriageway of Kam Sheung Road, roadside trees along the southern side of the Kam Sheung Road as well as the open carpark behind the fence are captured. The roadside trees have predominantly screened off the low-rise houses and structures at the back. While there is no high-rise building in the area, the open skyview above the trees is captured.

5.2.5 The current viewpoint is frequently used by public, especially the local residents and workers. The quality of view is Good but the view is transient and short-lived as the users would not stay for long. This viewpoint may also represent the view of the drivers along Kam Sheung Road coming from the east. The public viewers at this viewpoint are considered to have a medium sensitivity to visual change.

VP3 – Front Entrance of Chik Kwai Study Hall to the East

5.2.6 VP3 is selected as one of the viewpoints, as Chik Kwai Study Hall is a declared monument available for public visit. Visitors and the locals would visit the study hall for appreciating the heritage. It is located about 147m o the east of the Site. At this viewpoint, the open skyview is captured with a few 3-storey village houses and some historical buildings in the foreground.

The row of roadside trees along the south of Kam Sheung Road is captured on the right-hand side.

5.2.7 The current viewpoint is occasionally used by public. The quality of view is Good for the public to capture the views of the open sky. The view is considered static. The public viewers from this viewpoint are considered to have a medium sensitivity to visual change.

VP4 – Hiking Trail Near Shek Kong Barbeque Site to the Southeast

5.2.8 This VP is taken on the Hiking Trail near Shek Kong Barbeque Site, which is to the southeast of the Site. It is selected as the viewpoint, as it is at +91.6mPD at an elevated location looking northeast to the Site. Hikers/ visitors would be able to enjoy the overall landscape setting of Lin Fa Tei, Shek Kong and Pat Heung, as well as the Kai Kung Leng mountain range (also known as Lam Tsuen Country Park) as the backdrop.

5.2.9 The current viewpoint is occasionally used by public. The quality is Very Good for the public to capture the views of the open sky, the mountain backdrop and the rural context of Lin Fa Tei and surrounding areas. The view is considered static. The public viewers from this viewpoint are considered to have a high sensitivity to visual change.

Potential Viewpoint:

PVP- Outdoor Area Outside Ngau Keng Village Office

5.2.10 This potential viewpoint (**Figure 5.4** refers) has been given with due consideration throughout the viewpoint selection stage. Given with the topography and distance to the Site, as well as the Proposed Development being screened off by the adjacent domestic buildings, this potential viewpoint in the southwest is not selected for preparation of the VIA.

Table 5.1 Summary of Selected Viewpoints

Viewpoints (VPs)	Represented VSRs	Distance/ Direction	Level of the VP	Nature of VP	Popularity by Public	Visual Quality	Visual Sensitivity
Local viewpoints							
VP1: Lin Fa Tei Bus Stop (Westbound) along Kam Sheung Road	VSR1	Approx. 207.5m/ West	Approx. 20.7mPD	Transient	Frequent	Good	Medium
VP2: Lai Uk Tsuen Bus Stop (Eastbound) along Kam Sheung Road	VSR2	Approx. 195m/ Northeast	Approx. 26.5mPD	Transient	Frequent	Good	Medium
VP3: Front Entrance of the Chik Kwai Study Hall	VSR3	Approx. 147m/ East	Approx. 26mPD	Static	Occasional	Good	Medium
Distant viewpoints							
VP4: Hiking Trail Near Shek Kong Barbeque Site	VSR4	Approx. 533.4m / Southeast	Approx. 91.6mPD	Static	Occasional	Very Good	High

6 ASSESSMENT OF VISUAL IMPACTS

6.1 General

6.1.1 The primary objective of this VIA is for evaluating the building height and visual impact of the Proposed Development. The assessment will focus on the visual impact of the overall bulk to the identified VSRs.

6.2 VP1 – Lin Fa Tei Bus Stop (Westbound) along Kam Sheung Road to the west *(**Figure 6.1** refers)*

Visual Composition

6.2.1 VP1 is located to the west of the Site. This VP captures the view of the shelter next to the bus stop, the Pai Lau of Li Fa Tei Village, village houses of Lin Fa Tei Village, carparking spaces of the village, and the Proposed Development as the backdrop of the village houses. Only a top edge of the few building blocks would be seen. It is noted that the entire development would be screened off by the rows of village houses in the Lin Fa Tei Village.

Visual Obstruction

6.2.2 From this VP, only a top edge of the few building blocks of the Proposed Development would be partially seen and located behind the Pai Lau of Lin Fa Teu Village. The entire proposed development would be screened off by the rows of village houses. It should also be noted that there will be no encroachment into the mountain ridgeline. The Proposed Development would result in slight changes with no impact to the sky openness and the mountain ridgelines.

Effect on Public Viewers

6.2.3 This VP represents the view of the users who would take bus or green minibus to the city centre, where the users would stay in order to wait for public transport. **Figure 6.1** shows the slight difference between existing view and the view with Proposed Development. With the rows of existing village houses in the foreground, the entire development would almost be screened off by the existing village houses. Only the roof level of some of the blocks can be seen. Since the Proposed Development is 6-storey high only, with appropriate scale compared to the village houses, the overall context should not consist of any substantial changes from this viewpoint. Besides, the Proposed Development would adopt lightweight and treatment with natural colors for the building façade, it is anticipated that the Proposed Development would blend in well with the surrounding context. In this regard, the visual change to the public viewers is considered to be **Negligible to Slightly Adverse**.

Effect on Visual Resources

6.2.4 The lower portion of the majority of the building blocks of the Proposed Development would be screened off by the existing village houses of Lin Fa Tei village. The building blocks of the Proposed Development would slightly occlude the mountain ridgeline to a small extent. The Proposed Development however would only result in minor changes and blockage to the mountain ridgeline and the open sky. The visual impact would be considered to be **Negligible.**

6.3 VP2 – Lai Uk Tsuen Bus Stop (Eastbound) along Kam Sheung Road to the northeast *(Figure 6.2 refers)*

Visual Composition

6.3.1 VP2 is located to the northeast of the Site. At present, the VP captures the mainly the carriageway of Kam Sheung Road, the roadside trees and the open carpark behind the fence. The sky view would form the backdrop above the tree groups. The Proposed Development would be entirely screened by the existing vegetations and trees.

Visual Obstruction

6.3.2 From this VP, while the Proposed Development is completely hidden behind existing vegetation and trees to the northeast of the Site, it is considered to have no visual obstruction due to the Proposed Development.

Effect on Public Viewers

6.3.3 This VP represents the view of the users who would take bus or green minibus to the city centre, where the users would stay in order to wait for public transport. **Figure 6.2** shows there is no difference between the existing view and the scenario with the Proposed Development. With the existing vegetation and trees along Kam Sheung Road, the entire building blocks of the Proposed Development would be completely screened off by the garden. The sky view and openness of it would be maintained. In this regard, visual change to the public viewers is considered to be **Negligible**.

Effect on Visual Resources

6.3.4 The building blocks of the Proposed Development would entirely be screened off by the existing vegetations and trees and thus well blend with the surrounding environment. The building blocks do not obstruct the sky view. There would be **no change** to the quality and character of the assessment area.

6.4 VP3 – Front Entrance of the Chik Kwai Study Hall to the east *(Figure 6.3 refers)*

Visual Composition

6.4.1 VP3 is located to the east of the Site. At present, the VP captures the village houses within the Lai Uk Tsuen, a Graded 2 historic Building - Lai Mansion and some existing vegetation and trees. Only a small part of building edge (one of the few of the building blocks) of the Proposed Development can be seen next to the Lai Mansion. However, it should be noted that majority of the residential blocks would be entirely screened off by the existing village houses, Lai Mansion and some existing vegetation and trees. The sky view would form the backdrop of the existing and Proposed Development.

Visual Obstruction

6.4.2 From this VP, only a small top edge of the few building blocks would be seen next to the right and left of the Lai Mansion. However, it should be noted that the lower portion of the few building blocks and the majority of building blocks across the entire development would be completely hidden behind the Lai Mansion and Village houses.

Effect on Public Viewers

6.4.3 This VP represents as the visitors and the local in visiting the Chik Kwai Study Hall for appreciating the heritage, as Chik Kwai Study Hall is a declared monument. **Figure 6.3** shows that there is slight difference between the existing view and the scenario with the Proposed Development. With the existing developments, all of 19 residential blocks would be entirely screened off, whilst, a small part of the building edge (of one of the residential blocks) and the roof level of another residential block would be slightly seen behind Lai Mansion. However, the residential blocks are seen with similar height or lower as compared to the 3-storey village house and Lai Mansion in the foreground. Hence, the visual change of the public viewers would not be affected to a large extent and is considered to be **Negligible to Slightly Adverse**.

Effect on Visual Resources

6.4.4 Majority of residential blocks across the development would be entirely covered by existing houses and the grade listed building, with only a small part of the building edge slightly seen. However, the Proposed Development continues to blend well with the surrounding environment. The building blocks would not obstruct the sky view and the overall rural setting. Thus, there would be no change to the quality and character of the assessment area.

6.5 VP4 – Hiking Trail Near Shek Kong Barbeque Site to the southeast *(**Figure 6.4** refers)*

Visual Composition

6.5.1 This VP is located to the southeast of the Site. This VP captures the overall development context of the Shek Kong area, including the Lin Fa Tei Village, Lai Uk Tsuen, Tsang Uk Tsuen and the Kai Kung Leng mountain range (also known as Lam Tsuen Country Park) as the backdrop. The building blocks of the Proposed Development are situated between Lin Fa Tei Village and Lai Uk Tsuen.

Visual Obstruction

6.5.2 From this VP, majority of the building blocks from the Proposed Development would appear directly in sight from the Hiking Trail. It would also change the overall local context to the certain context. However, the building height, massing and built form of the Proposed Development will continue to be harmonized with the rural setting and existing developments, as it is situated between and in front of the existing village houses. No out of context “sore thumb” development is anticipated. The building height of the Proposed Development does not affect any natural landscape context, particularly to its ridgelines.

Effect on Public Viewers

6.5.3 This VP represents the view of the hikers/ visitors who would be able to enjoy the overall landscape setting of Lin Fa Tei, Shek Kong and Pat Heung, as well as the Kai Kung Leng mountain range (also known as Lam Tsuen Country Park) as the backdrop. **Figure 6.4** shows the existing view and the view with Proposed Development. Although it is noted that there would be change to the overall local context of the area, the Proposed Development is situated between the existing village houses of different villages. Design measures (i.e. green buffer, natural color tone for the building façade) will be in place to further blend well with the surrounding development. In this regard, visual change to the public viewers is considered to be **slightly adverse**.

Effect on Visual Resources

6.5.4 Although the Proposed Development would induce change to the overall local context to a certain extent, design measures (i.e. green buffer, natural color tone) would be in place to mitigate the impacts of the Proposed Development. The building blocks however do not obstruct the sky view and the mountain ridgelines. There would be **slightly adverse** visual impact of the assessment area.

7 CONCLUSION

7.1 The Proposed Development consists of 19 nos. of residential blocks with 6 storeys. It also comprises two stand-alone 1-storey clubhouses and two stand-alone 3-storeys carpark buildings. The Proposed Development is erected on formed level of between about 24mPD and 26mPD, increasing from the north to the south. With domestic plot ratio of 0.8, the Proposed Development yields a total domestic GFA of about 33,032m^2 with a maximum building height at about +44.2mPD.

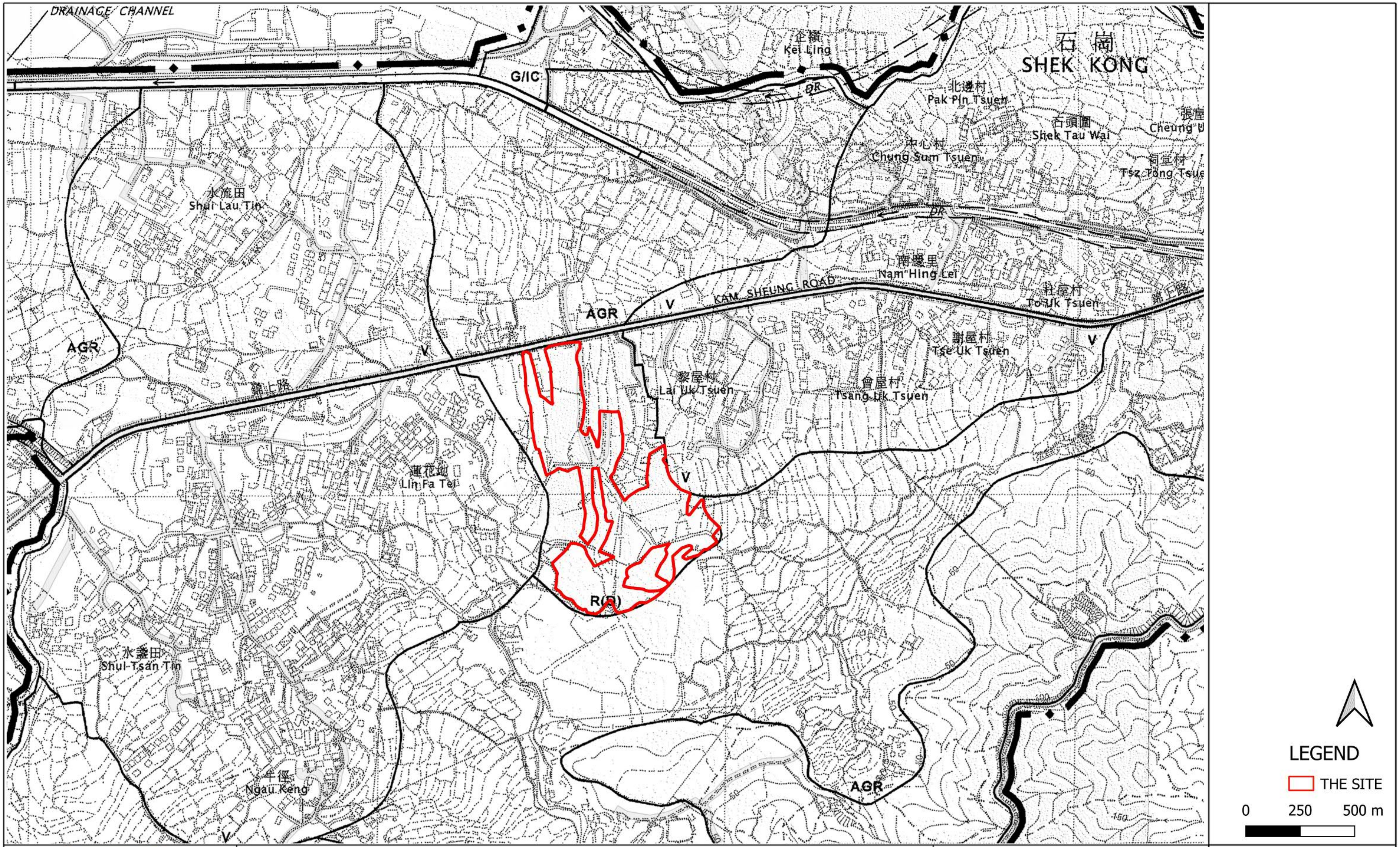
7.2 Based on the analysis on the visual impact appraisal on Visual Composition, Visual Obstruction, Effect on Public Views and Effect on Visual Resources, **Table 7.1** below presents the overall visual impact posed by the Proposed Development to the VSRs represented in each VP.

Table 7.1 Summary of Assessment of Visual Impact at the Viewpoints

Viewpoint	Location	Visual Impact due to Proposed Development
Local Viewpoint		
VP1	Lin Fa Tei Stop (Westbound) along Kam Sheung Road	Negligible
VP2	Lai Uk Tsuen Bus Stop (Eastbound) along Kam Sheung Road	Negligible
VP3	Front Entrance of the Chik Kwai Study Hall	Negligible to Slightly Adverse
Distant Viewpoint		
VP4	Hiking Trail Near Shek Kong Barbeque Site	Slightly Adverse

7.3 The Proposed Development would be completely screened off by the existing village houses and vegetations in VP2. There is no visual impact posed by the Proposed Development at these viewpoints. At VP1, the top edge of the Proposed Development would partially be seen behind the Pai Lau of Lin Fa Tei Village, despite that the entire Proposed Development would be screened off by the rows of existing village houses in Lin Fa Tei Village. Thus, the visual impact at VP1 is considered as negligible. At VP3, only a small top edge of the few building blocks would be seen next to the right and left of the Lai Mansion. However, it should be noted that the lower portion of the few building blocks and the majority of building blocks across the entire development would be completely hidden behind the Lai Mansion and Village houses. Thus, the visual impact at VP1 is considered as negligible to slightly adverse. For VP4, the Proposed Development would be directly visible from the hiking trail and there would be changes to the overall local context of the Shek Kong area. However, the building height, massing and built form of the Proposed Development would be able to blend with the adjoining developments, as the Proposed Development is situated between the existing developments of the different villages. No “out-of-context” image of the Proposed Development is anticipated. In this regard, the visual impact is slightly adverse.

7.4 Although there would be some visual changes to the surrounding area due to the Proposed Development with PR of 0.8 and building height of 6 storeys, the visual impact is considered to be acceptable. Visual impact due to the Proposed Development in fact can be mitigated through the design measures, as highlighted in **Section 4.2**. The Proposed Development will adopt sensitive design measures (i.e. building setback, building façade materials etc.) to mitigate and improve the condition, quality and character of the area. The resultant visual change due to the Proposed Development is considered **acceptable** to the identified visual sensitive receivers and not visually incompatible with the surrounding context.



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ZONING CONTEXT PLAN

Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone for Proposed Residential Development at Various Lots in D.D. 112 and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

Figure 1.1

Visual Impact Assessment

Date: 17/02/2022

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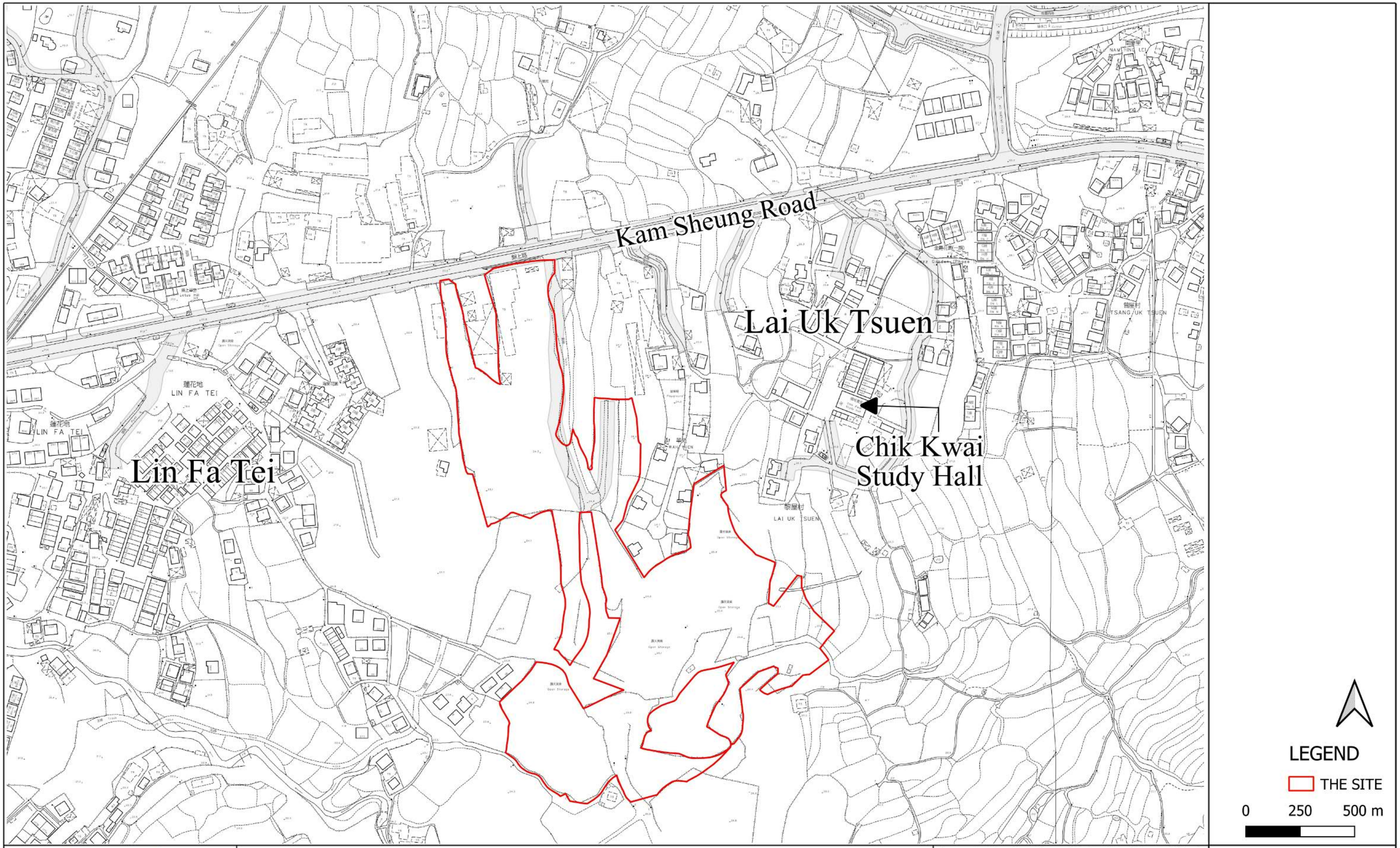
WIDER CONTEXT

Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone for Proposed Residential Development at Various Lots in D.D. 112 and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

Visual Impact Assessment

Figure 3.1

Date: 17/02/2022



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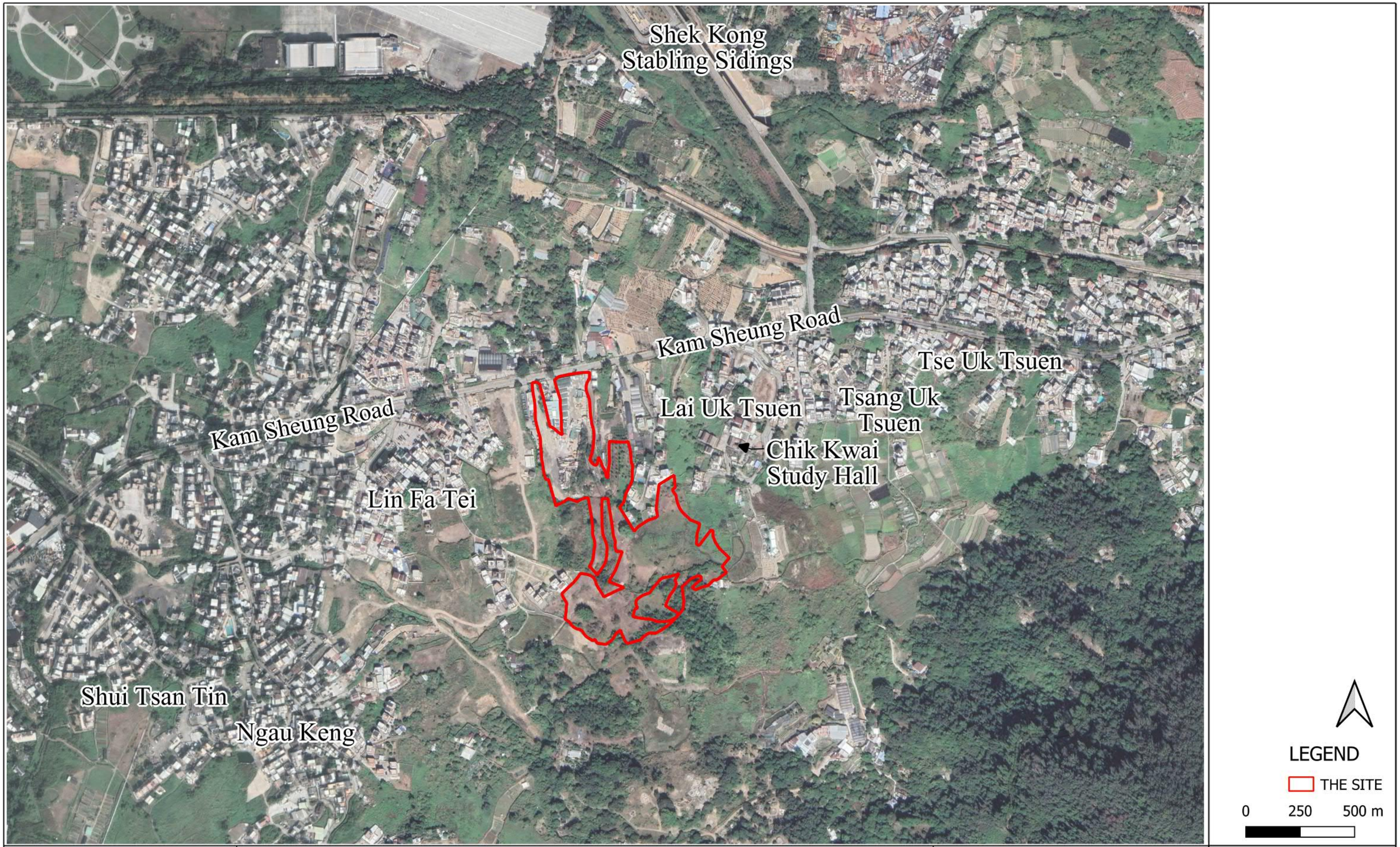
LOCAL CONTEXT

Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone for Proposed Residential Development at Various Lots in D.D. 112 and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

Figure 3.2

Visual Impact Assessment

Date: 17/02/2022



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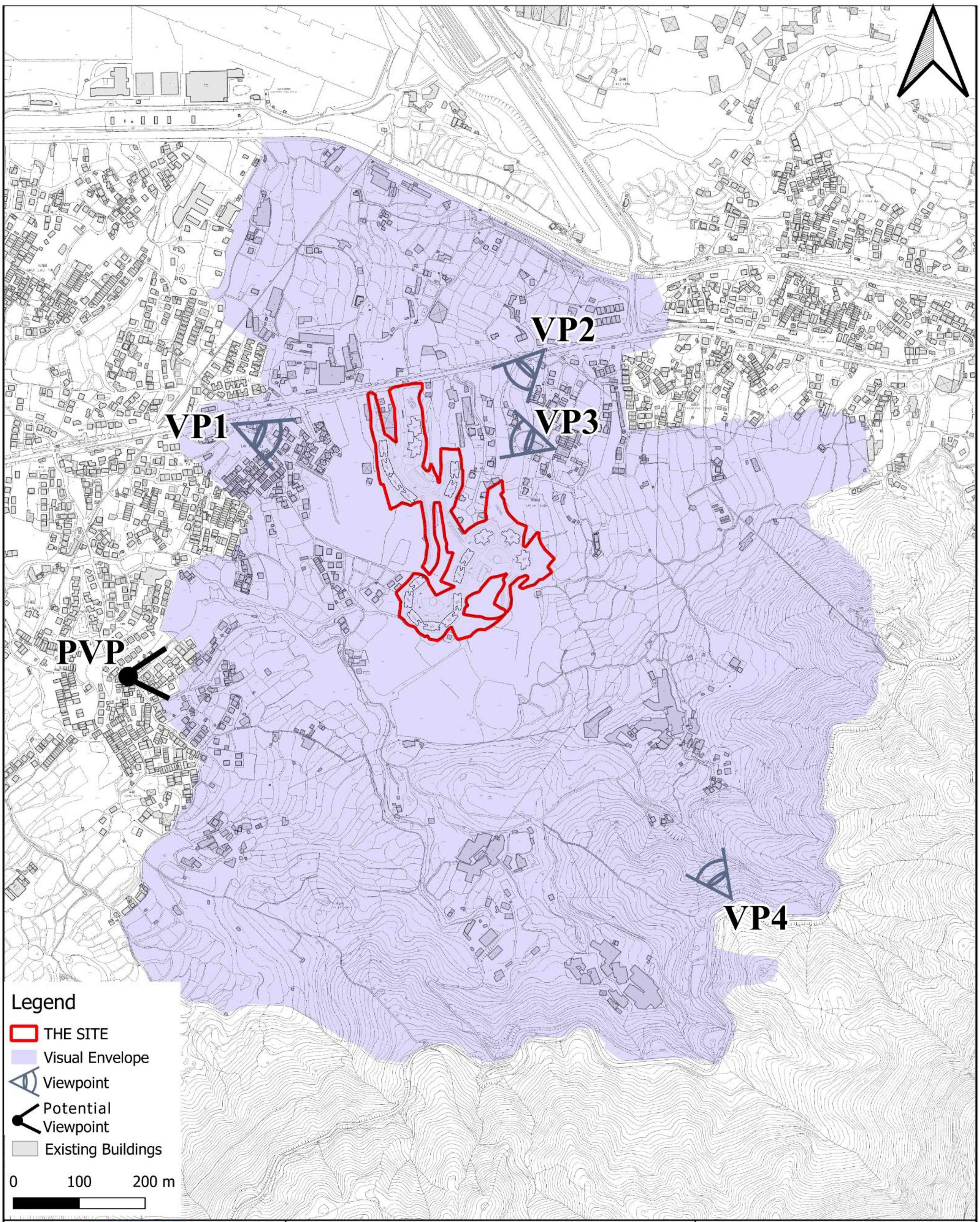
VISUAL ELEMENTS IN THE SURROUNDING AREA

Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone for Proposed Residential Development at Various Lots in D.D. 112 and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

Figure 3.3

Visual Impact Assessment

Date: 17/02/2022



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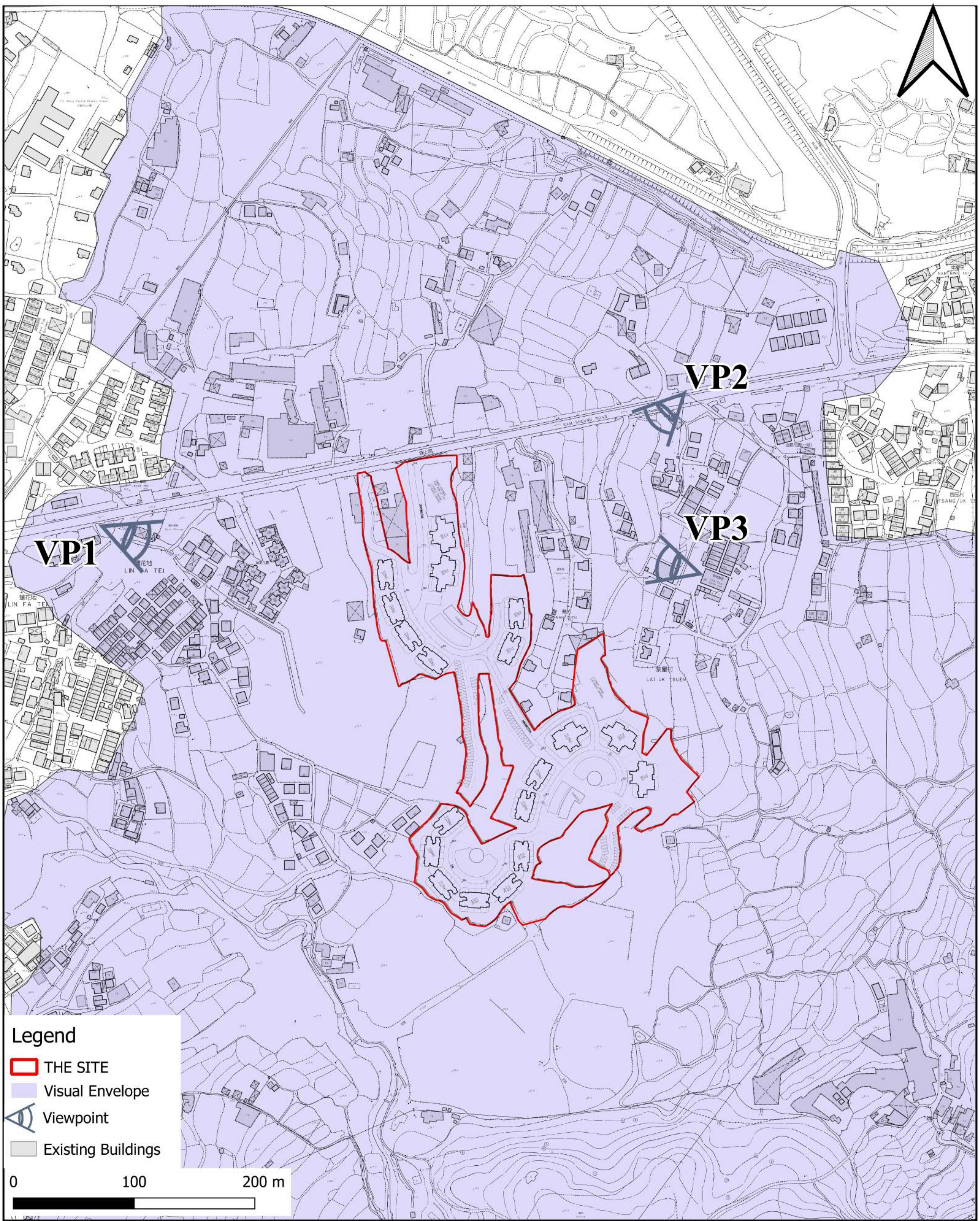
Visual Impact Assessment

VISUAL ENVELOPE

Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone for Proposed Residential Development at Various Lots in D.D. 112 and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

Figure 5.1

Date: 17/02/2022



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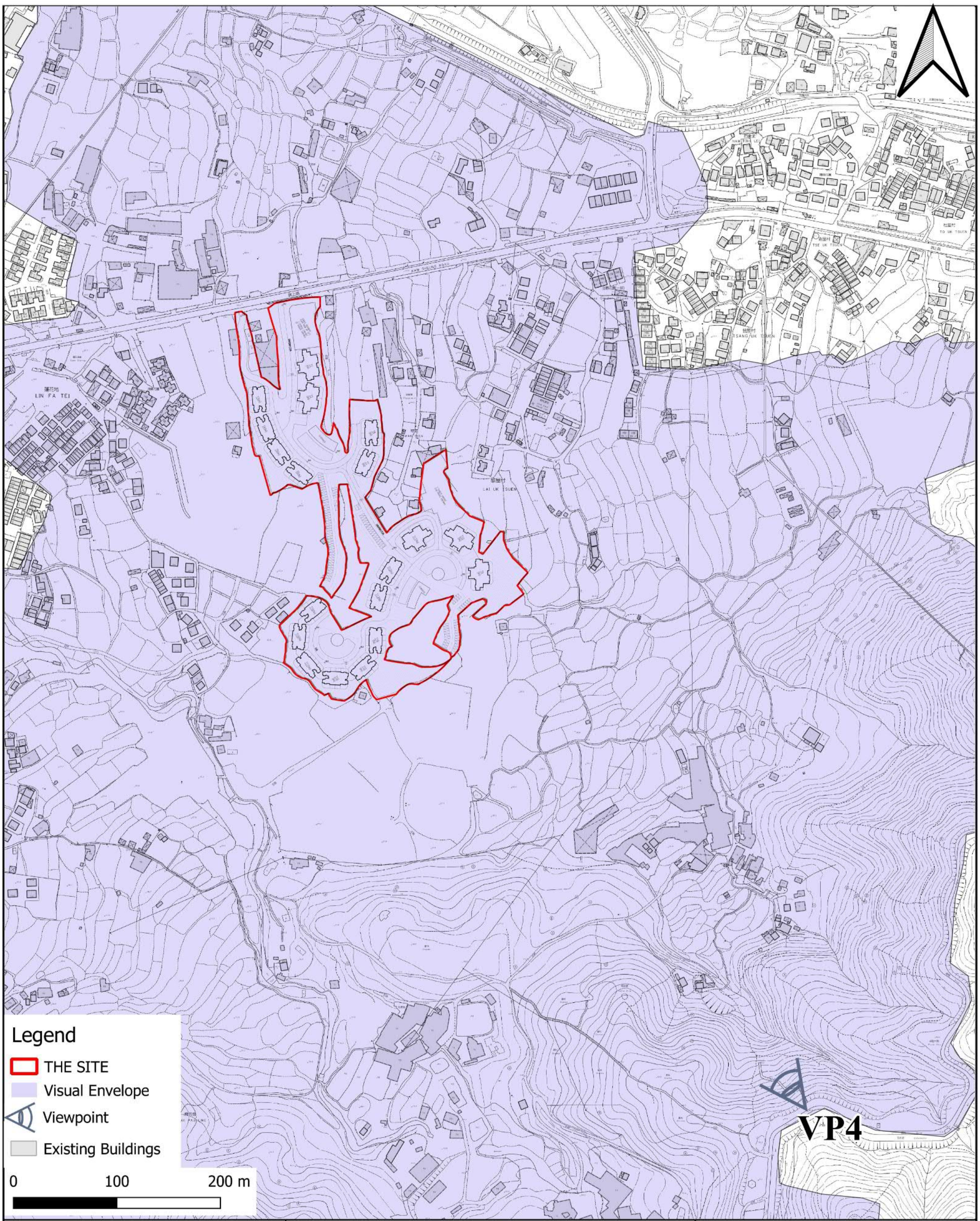
Visual Impact Assessment

LOCAL VISUAL CONTEXT (LOCATIONS OF VPs 1-3)

Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone for Proposed Residential Development at Various Lots in D.D. 112 and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

Figure 5.2

Date: 17/02/2022



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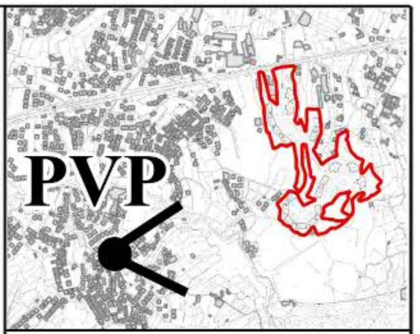
Visual Impact Assessment

DISTANT VISUAL CONTEXT (LOCATIONS OF VP 4)

Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone for Proposed Residential Development at Various Lots in D.D. 112 and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

Figure 5.3

Date: 17/02/2022



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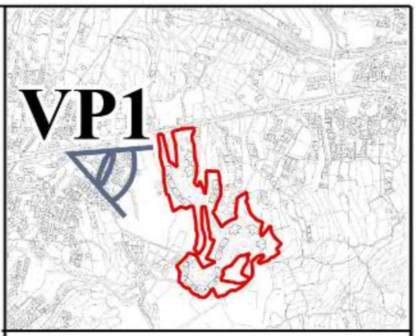
POTENTIAL VIEWPOINT- PUBLIC OPEN SPACE OUTSIDE NGAU KENG VILLAGE OFFICE

Rezoning from "Residential (Group D)" to "Residential (Group C)" zone for Proposed Residential Development at Various Lots in D.D. 112 and Adjoining Government Land, Lin Fa Tei, Yuen Long, New Territories

Visual Impact Assessment

Figure 5.4

Date: 17/02/2022



DM3: Careful use of building façade materials with the appearance of lightweight and treatment with natural colors to be in harmony with the greenery context and the sky

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VP1- LIN FA TEI BUS STOP (WESTBOUND) ALONG KAM SHEUNG ROAD

Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone for Proposed Residential Development at Various Lots in D.D. 112 and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

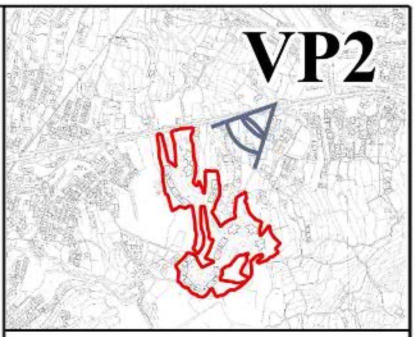
Visual Impact Assessment

Figure 6.1

Date: 04/03/2022

Existing Condition

With Proposed Development



DM1: The building block being setback by at least 50 meters from the kerb line of the major arterial route, Kam Sheung Road

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VP2- LAI UK TSUEN BUS STOP (EASTBOUND) ALONG KAM SHEUNG ROAD

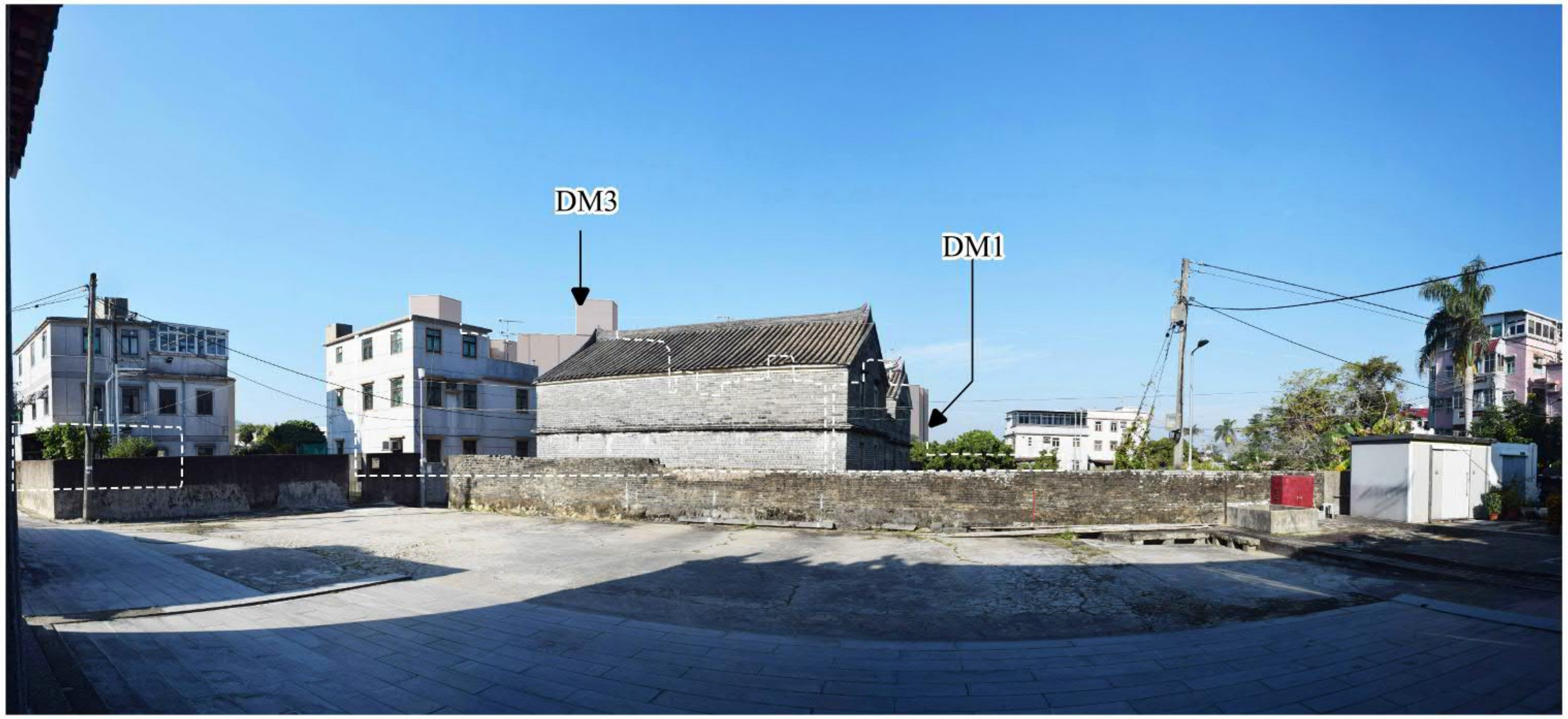
Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone for Proposed Residential Development at Various Lots in D.D. 112 and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

Visual Impact Assessment

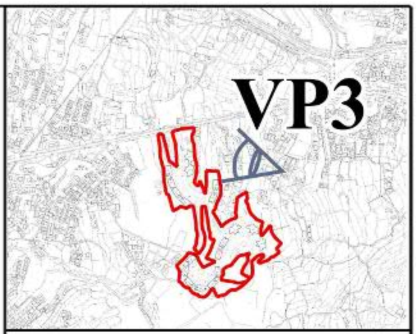
Figure 6.2

Date: 17/02/2022

Existing Condition



With Proposed Development



DM1: The building block being setback by at least 50 meters from the kerb line of the major arterial route, Kam Sheung Road

DM3: Careful use of building façade materials with the appearance of lightweight and treatment with natural colors to be in harmony with the greenery context and the sky

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VP3- FRONT ENTRANCE OF THE CHIK KWAI STUDY HALL

Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone for Proposed Residential Development at Various Lots in D.D. 112 and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

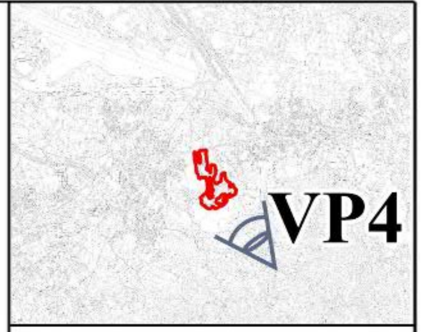
Visual Impact Assessment

Figure 6.3

Date: 17/02/2022

Existing Condition

With Proposed Development



DM2: Providing a green buffer along the periphery of the Site to soften the building edge of building blocks and to provide visual relief with surrounding domestic structures

DM3: Careful use of building façade materials with the appearance of lightweight and treatment with natural colors to be in harmony with the greenery context and the sky

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VP4- HIKING TRAIL NEAR SHEK KONG BARBEQUE SITE

Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone for Proposed Residential Development at Various Lots in D.D. 112 and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

Visual Impact Assessment

Figure 6.4

Date: 17/02/2022

Appendix 5

Noise Impact Assessment

Report No: 22458-N2 Rev A

PROPOSED REZONING FROM “RESIDENTIAL (GROUP D)” TO “RESIDENTIAL (GROUP C)” ZONE FOR PROPOSED RESIDENTIAL DEVELOPMENT AT VARIOUS LOTS AND ADJOINING GOVERNMENT LAND IN D.D.112, KAM SHEUNG ROAD, SHEK KONG, YUEN LONG, NEW TERRITORIES

ENVIRONMENTAL NOISE IMPACT ASSESSMENT

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JULY 2024

WHA

CONTENTS

AIMS

To assess noise impacts on the proposed residential development at Various Lot in DD112 on Kam Sheung Road, Kam Tin, Yuen Long.

To recommend noise mitigation measures for the proposed Development, if necessary; and to assess the suitability of the proposed building layout and the recommended noise mitigation measures according to relevant requirements in the Hong Kong Planning Standards & Guidelines (HKPSG).

SUMMARY

Noise assessments have been conducted to predict the noise impacts at the proposed Development.

For road traffic noise, the predicted road traffic noise level of the residential flats will be within the stipulated 70dB(A) noise criterion. Therefore, no noise mitigation measures are required.

For the fixed noise sources impact, the assessment results indicate that all the residential flats will be within the stipulated noise limits.

For the aircraft and helicopter noise, the measured noise levels on site were within the noise criterion in HKPSG.

According to the above assessment results, adverse environmental noise impacts for the proposed Development is not anticipated.

1. INTRODUCTION

1.1 Westwood Hong & Associates Ltd (WHA) was commissioned to conduct an environmental noise impact assessment for the proposed residential Development at Lin Fa Tei, Yuen Long (the "proposed Development"). Figure 1 shows the location of the proposed Development.

1.2 This environmental noise impact assessment report supports the Rezoning Application for the proposed Development.

1.3 This report has been prepared based on the architectural drawings provided by the Client (Appendix 1).

1.4 This report comprises the following assessments:-

- Road traffic noise affecting the proposed Development
- Fixed noise sources affecting the proposed Development
- Fixed noise sources from the proposed Development
- Aircraft noise affecting the proposed Development

2. SITE LOCATION & BUILDING LAYOUT

Site Location

2.1 The project site is located south of Kam Sheung Road. The residential developments Lotus Hill and Hoi Tong Garden are located to the west, and Jazz Garden is located to the east. The location of the project site is shown in Figure 1.

Development Layout

2.2 The proposed Development comprises nineteen 6-storey low-rise blocks and 2 carports with 3-storey. The building layouts are shown in Appendix 1.

2.3 The two clubhouses would be equipped with central air-conditioning and would not rely on opened windows for ventilation. The proposed Development will not give rise to an adverse noise impact on existing or planned NSRs.

3. NOISE CRITERIA

Road Traffic Noise Criterion

3.1 According to the HKPSG[1], road traffic noise criterion for domestic premises is 70dB(A) L10(1 hour) at the external facades for the hour having the peak traffic flow. The noise criterion applied to the domestic premises which rely on opened windows for ventilation.

Aircraft Noise Criteria

3.2 The recommended NEF25 contour of the Chek Lap Kok Airport in the HKPSG should not be exceeded for the proposed Development.

Helicopter Noise Criteria

3.3 According to the HKPSG, the criteria for helicopter noise is Lmax 85dB(A) for domestic premises during 0700 – 1900 hours. The standards apply to uses that rely on openable window for ventilation and the standards should be viewed as the maximum permissible noise levels assessed at 1m from the external façade.

Noise Criteria for Fixed Noise Sources

3.4 With reference to the "Technical Memorandum for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites" (TM – DP)[2], an Area Sensitivity Rating (ASR) of "A" was assumed for the proposed Development (in rural area and not being affected by the Influencing Factor). The Acceptable Noise Levels (ANLs) are shown in Table 3.1.

Table 3.1 ANLs for Day, Evening and Night Time Periods

Time Period	**ANLs** dB(A), Leq (30 mins)		
	ASR “A”	**ASR “B"**	**ASR “C"**
Day (0700 to 1900 hours) and evening (1900 to 2300 hours)	60	65	70
Night (2300 to 0700 hours)	50	55	60

Note: In any event, the ASR and the ANLs adopted in this report are only indicative and they are used for assessment only. It should be noted that noise from fixed noise sources is controlled under section 13 of the Noise Control Ordinance. Therefore, the ASRs and ANLs determined in this report shall not prejudice the Noise Control Authority’s discretion to determine noise impact due to fixed noise sources on the basis of prevailing legislation and practices being in force, and taking account of contemporary conditions/ situations of adjoining land uses. The assessment of noise impacts due to fixed noise sources in this report shall not bind the Noise Control Authority in the context of law enforcement against any of the noise from fixed noise sources being assessed.

3.5 The noise criteria for the design of noise sensitive developments near fixed noise sources shall refer to the TM – DP. Therefore, the assessment criteria for existing fixed noise sources in the vicinity of the proposed Development should refer to the ANLs in Table 3.1

3.6 The HKPSG also states that in order to plan for a better environment, all planned fixed noise sources should be so located and designed that when assessed in accordance with the TM, the level of the intruding noise at the façade of the nearest sensitive use should be at least 5dB(A) below the appropriate ANL shown in Table 2 of the TM – DP or, in the case of the background being 5dB(A) lower than the ANL, should not be higher than the background.

3.7 Site measurements were made at the nearby noise sensitive receivers on 17 November 2021, 12 July 2024 and 18 July 2024 respectively, the prevailing background noise levels are summarised in Table 3.2 below. The measurement locations are provided in Figure 3.

Table 3.2 Prevailing Background Noise Measurement Details and Results

Noise Sensitive Receiver	**Date**	**Personnel**	**Equipment**	**Weather**	**Field Observations**	**Measurement Results,** dB(A), L90 (1 hour)
Loc 2, Hoi Tong Garden	17 Nov 2021	Mr. Samuel Lee	Ono Sokki, LA-5111 (Serial No.: 14700785)	Sunny, calm	Mainly community noise, and slight road traffic noise from Kam Sheung Road	Daytime: 58 – 60 Night-time: 47 – 49 (Façade)
Loc 3, Lin Fa Tei Village	12 July 2024, 18 July 2024	Mr. Samuel Lee	Ono Sokki, LA-5560 (Serial No.: 16300618)	Sunny, calm	Mainly community noise, parking noise from the Lin Fa Tei Village's parking spaces and road traffic noise from Kam Sheung Road	Daytime: 60 – 63 Night-time: 49 – 51 (Façade)

3.8 The prevailing background noise levels of the identified noise sensitive receivers were higher than ANL – 5dB(A). Therefore, the ANL – 5dB(A) are used as the criteria for noise from planned fixed sources (i.e. 55dB(A) for daytime, and 45dB(A) for nighttime).

4. SITE SURVEYS

Dates and Time

4.1 Site surveys were conducted on the following dates and time:-

- 17 November 2021 (10:00am – 6:00pm)
- 10 February 2022 (10:00am – 3:00pm)
- 12 July 2024 (10:00am – 6:00pm)
- 18 July 2024 (10:00pm – 1:00am)

4.2 Photographs taken on site are given in Appendix 2.

Instrumentation

4.3 The instruments used by WHA for the surveys comply with International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1), as listed in Table 4.1 below.

Table 4.1 Instruments Used for the Noise Surveys

Manufacturer	Type
Ono Sokki	Precision Integrating Sound Level Meter
Ono Sokki	Foam Windshield
Bruel and Kjaer	Noise Calibrator Type 4231

4.4 The sound level meter was calibrated before use and further checks on completion of the survey, and confirmed that the calibration levels from before and after the noise measurement agree to within 1.0dB.

4.5 The site measurements including measurement equipment, calibration procedure, measurement methodology and weather conditions were conducted in accordance with the TM – DP.

Fixed Noise Sources in the Vicinity

4.6 The identified fixed noise sources are summarised in Table 4.2 below and given in Figure 2. Detailed discussion on the noise impact from these fixed noise sources is given in Section 7. The photos of the identified fixed noise sources are provided in Appendix 5.

Table 4.2 Identified Potential Fixed Noise Sources

Source ID	Industrial Site	Previous Operation	Current Operation	Identified Fixed Noise Sources	Location of Fixed Noise Sources	Operation Hours
A	Kee Wah Workshop	Car equipment trading	Car equipment trading (no change)	forklift	On ground level	1000 – 1800 (advised by the staff of the workshop)
B	Vacant	Small Vehicle Repairing Workshop	No noisy activity was observed	-	-	-
C	Small Vehicle Repairing Workshop	Car Washing Centre	Provide car repairing service	Noise from hand tools	On ground level, within the steel cover	1000 – 1800 (advised by the staff of the workshop)
D	Sun Shing, Vehicle Repairing Workshop	Provide car repairing service	Provide car repairing service (no change)	Car washing, and occasionally hammering noise	On ground level, within the steel cover	0900 – 1800 (advised by the staff of the workshop)
E	國全汽車, Vehicle Repairing Workshop	-	No operation was observed	-	-	1000 – 1800 (advised by the staff of the workshop)
F	Logistic Yard	-	Closed	-	-	-

4.7 Kee Wah workshop (Source ID: A) is located to the west of the proposed Development. The workshop was mainly providing trading of the car equipment during both previous and latest site surveys. A forklift was observed during the previous site survey. However, no operation was observed during the latest site survey. For conservative, the previous finding (i.e. noise from forklift) will be adopted in the assessment.

4.8 A small vehicle repairing workshop (Source ID: B) was previously located to the north of the proposed Development. The workshop was removed and the site was currently vacant, with no noisy activity observed during the latest site survey.

4.9 The car washing centre (Source ID: C) was previously located to the north of the proposed Development. The centre was removed and the site is currently occupied by a small vehicle repairing workshop. The workshop was providing minor car repairing services, some insignificant operation noise from taking up / putting down the hand tools was observed during the latest site survey, lasting about 5 seconds per 2 minutes. The operations were taken place within the steel cover and the operation noise was just audible outside the workshop, where the road traffic noise from Kam Sheung Road would be dominant.

4.10 The Sun Shing vehicle repairing workshop (Source ID: D) is adjoining the proposed Development. The workshop was mainly for storage use of old vehicles and providing car repairing service. Both previous and latest site surveys revealed that occasionally hammering noise was observed, lasting about 10 seconds per 2 minutes, and all the operations were taken place within the steel cover. Car washing was only observed at the entrance of the workshop at the previous site surveys.

4.11 國全汽車, vehicle repairing workshop (Source ID: E) is located about 280m to the west of the proposed Development. No operation from the workshop was observed during the latest site survey.

4.12 By desktop review, a logistic yard (Source ID: F) is located to the north of the proposed Development, however, it is closed during the whole period of the latest site survey.

4.13 Site surveys have confirmed that there is no significant noise was emitted from the other fixed noise sources apart from those listed in Table 4.2. All the significant fixed noise sources within the assessment area are identified and considered in the assessment.

Night-time Operation

4.14 The operation hours were advised by the staff of the workshops, as summarised in Table 4.2. The night-time survey also confirmed that all the workshops did not have night-time operations. The photos of night-time survey are provided in Appendix 5.

5. NOISE MITIGATING MEASURE ADOPTED IN THE PROPOSED DEVELOPMENT

5.1 Noise mitigating measures have been investigated and considered for the proposed Development during the design stage, as mentioned in the following sections. The noise compliance rate for road traffic noise and noise due to fixed noise sources would be lower without these noise mitigation measures.

Building Setback

5.2 The residential blocks have been designed with a minimum of 50m setback distance from the Kam Sheung Road. Given the shape and the size of the site, it is not possible to incorporate additional setback distance such that the noise impacts will be significantly further reduced.

6. ROAD TRAFFIC NOISE IMPACT ASSESSMENT

6.1 The noise prediction was conducted by employing the WS Atkins RoadNoise 2000[3] computer software.

Traffic Forecast

6.2 The anticipated occupation year of the proposed Development is 2031, the maximum traffic in 15 years after occupation of the proposed Development (i.e. 2046) has been adopted for the purpose of the road traffic noise assessment.

6.3 The traffic forecast for Year 2046 was provided by the Traffic Consultant (CTA Consultants Limited). The definition of heavy vehicles in the U.K. Department of Transport’s “Calculation of Road Traffic Noise” (CRTN)[4] has been adopted. The traffic flow data for the main roads adopted in the noise prediction models are shown in Figure 4 and Appendix 3. Review of the data indicates that the AM peak is in general higher than the PM peak. Therefore, the set of AM peak traffic data is employed for the assessment, representing the worst-case scenario. The endorsement from Transport Department (TD) is provided in Appendix 3. The Traffic Consultant also confirmed that the TD’s endorsed methodology has been strictly adopted in preparing the traffic forecast data, and hence the validity of traffic data can be confirmed (Appendix 3).

Noise Assessment Points for Road Traffic Noise Assessment

6.4 The assessment points are taken at the height of 1.2m above each residential floor and 1m away from the façade of openable windows of the noise sensitive rooms. The locations of the assessment points for the noise sensitive rooms are illustrated in Appendix 4. The clubhouse will be equipped with central air-conditioning and would not rely on opened windows for ventilation. No adverse noise impact is anticipated.

Methodology of Road Traffic Noise Impact Assessment

6.5 The road traffic noise levels at the proposed Development were predicted, based on the predicted traffic flows in Year 2046 and in accordance with the procedures given in the CRTN. The predicted road traffic noise levels at the building facades include a 2.5dB(A) facade reflection and correction factors for gradient, distance, view angle, barriers and road surface material.

6.6 The study area of the road traffic noise assessment would be 300m from the site boundary. The roads within the study area are included in the assessment. In this assessment, all roads are assumed to be of impervious surface.

Predicted Road Traffic Noise Levels (Base Scenario)

6.7 The predicted road traffic noise levels are presented in Appendix 4 for all Noise Sensitive Receivers (NSRs) of the proposed Development. All residential flats will comply with stipulated 70dB(A) noise criterion. Therefore, noise mitigation measure is not required.

7. NOISE IMPACT ASSESSMENT FOR FIXED NOISE SOURCES

7.1 The identified fixed noise sources in the vicinity were summarised in Table 4.2, and illustrated in Figure A6-1 in Appendix 6.

Noise Assessment Points for Fixed Noise Assessment

7.2 With consideration the location of the identified fixed noise sources, representative assessment points of worst affected (with shortest distance to the fixed noise sources) are assigned for the fixed noise sources assessment. The location of the assessment points are illustrated in Figure A6-2 in Appendix 6.

7.3 The assessment points are taken at the height of 1.2m above each residential floor and 1m away from the façade of openable windows of the noise sensitive rooms.

Methodology of Noise Impact Assessment from Fixed Noise Sources

7.4 For the assessment of noise from fixed noise sources, the noise level at NSR was predicted using the standard acoustic principles:

Predicted Noise Level = Sound Power Level of fixed noise source – Distance Attenuation + Façade Correction + Tonal Correction + Impulsiveness Correction

Where
Distance Attenuation = 20 log D + 8 [where D is the distance in meters]
Façade Correction = 3dB(A)
Tonal Correction = 3dB(A)
Impulsiveness Correction = 3dB(A)

7.5 The operations of the Sun Shing car repair workshop (Source ID: D) and the small vehicle repairing workshop (Source ID: C) are taken place within the steel cover. However, there are gaps between the cover and the side walls, the noise would emit through the gap. In addition, there is no substantial barrier between the proposed Development and the identified fixed noise sources. Therefore, no barrier correction is considered for all fixed noise sources.

7.6 Although it is unlikely that all the identified fixed noise sources will be in operation simultaneously, to be conservative, it has been assumed that all the identified fixed noise sources are in operation at the same time, which also represents a worst-case scenario. Fixed noise sources are assumed to operate continuously instead of in occasion as observed on-site and all fixed noise sources are regarded as point source.

SWLs Adopted in the Fixed Noise Sources Calculation

7.7 For 國全汽車, vehicle repairing workshop (Source ID: E), since no operation from the workshop was observed during the latest site survey, for conservative, the SWL would be based on the onsite noise measurement at other fixed noise source with similar industrial activities (i.e. vehicle repairing works) (Source ID: D).

7.8 For the logistic yard (Source ID: F), since it is closed during the whole period of the latest site survey, for conservative, the SWL would be based on the onsite noise measurement at other fixed noise source with similar industrial activities (i.e. noise from forklift) (Source ID: A).

7.9 For the vehicle repairing workshops with operations observed, on-site noise measurements were made. The Sound Pressure Levels (SPLs) obtained during survey were then converted to SWLs with reference to basic acoustic principle. The SPLs at NSRs were calculated based on the distance attenuation, tonality correction, impulsiveness correction, intermittency correction, barrier correction and façade correction. Tonal noise was not identified by on-site measurements and fluctuation of noise was not observed during the site surveys, also there was no night-time operation for the identified fixed noise sources, hence, tonality correction, impulsiveness correction and intermittency correction are not required to be applied to the fixed noise sources based on site observation and measurements. The calculation of tonality is provided in Appendix 5.

7.10 For conservatism, 3dB(A) tonality correction and 3dB(A) impulsiveness correction are considered in the calculation.

7.11 The summary of the SWLs adopted in the assessment are provided in Table 7.1 below.

Table 7.1 SWLs of Identified Fixed Noise Sources Adopted in Assessment

Source ID	**Name**	**Fixed Noise Sources**	**Nos.**	**SWL,** dB(A)	**Operation hours**	**Reference**
A	Kee Wah Workshop	Forklift	1	80	Day and evening time periods	Site measurements
C	Small Vehicle Repairing Workshop	Noise from hand tools	1	82	Day and evening time periods	Site measurements
D	Sun Shing, Vehicle Repairing Workshop	Car washing, and occasionally hammering noise	1	87	Day and evening time periods	Site measurements
E	國全汽車, Vehicle Repairing Workshop	Car washing, and occasionally hammering noise (Assumed)	1	87	Day and evening time periods	Referenced to Source ID: D
F	Logistic Yard	Forklift (Assumed)	1	80	Day and evening time periods	Referenced to Source ID: A

Predicted Noise Levels from Fixed Noise Sources (Base Scenario)

7.12 The predicted façade noise levels from fixed noise sources at the representative NSRs are in the range of 52 – 55 dB(A) Leq(30min) during day and evening time periods. These predicted noise levels are within the stipulated noise limits as mentioned in Section 3. The summary of the predicted noise levels is provided in Table 7.2 below.

Table 7.2 Predicted Façade Noise Level from Fixed Noise Sources

Representative NSRs	**Maximum Predicted Façade Noise Level,** dB(A)	**Noise Criteria,** dB(A)	**Compliance**	**Time Period**
NSR 101	55	60	Yes	Day and evening time periods
NSR 106	54	60	Yes	Day and evening time periods
NSR 301	52	60	Yes	Day and evening time periods

7.13 Sample calculations and summary of the predicted noise levels are given in Appendix 6.

Fixed Noise Sources in the Proposed Development

7.14 The planned fixed noise sources such the ventilating systems of the clubhouses, the noise impact would be accordance with HKPSG standard (i.e. ANL – 5dB(A) as mentioned in Section 3).

7.15 As mentioned in Section 3.7, the prevailing background noise levels of the identified noise sensitive receivers were higher than ANL – 5dB(A). Therefore, the ANL – 5dB(A) are used as the criteria for noise from planned fixed sources (i.e. 55dB(A) for daytime, and 45dB(A) for nighttime)

7.16 The acoustic performance of the planned fixed noise sources would be reviewed during detailed design stage. In order to comply with the relevant noise requirements in the HKPSG, acoustic treatments such as provision of acoustic silencers and acoustic enclosures shall be proposed for the planned fixed noise sources, if necessary.

8. AIRCRAFT AND HELICOPTER NOISE IMPACT ASSESSMENT

8.1 The proposed Development lies beyond the NEF25 contour of the Chek Lap Kok Airport. Hence, adverse aircraft noise impact on the proposed Development is not anticipated.

8.2 The Shek Kong Airfield is located at more than 300m north of the proposed Development. On-site noise measurements were carried out at the location of the future residential block in the project site and nearest to the Shek Kong Airfield to determine the potential helicopter noise impact. The details noise measurements are provided in the Table 8.1 below.

Table 8.1 Noise Measurements and Observations for Helicopter Noise

Date	**Personnel**	**Equipment**	**Weather**	**Observations**	**Measurement Results,** dB(A)
17 Nov 2021	Mr Samuel Lee	Ono Sokki, LA-5111 (Serial No.: 14700785)	Sunny, calm	3 hours observations, only 1 helicopter was observed.	Daytime 47 – 52dB(A) Leq 50 – 54dB(A) Lmax Night-time 46 – 51dB(A) Leq 48 – 52dB(A) Lmax
10 Feb 2022	Mr Samuel Lee	-	Sunny, calm	3 hours observations, no helicopter was observed.	-
12 July 2024	Mr Samuel Lee	-	Sunny, calm	4 hours observations, no helicopter was observed.	-

8.3 According to the on-site noise measurement results, the maximum measured helicopter noise level Lmax 54dB(A) within the project site is well within the criteria for helicopter noise stated in HKPSG, which is Lmax 85dB(A) for domestic premises. In this regard, adverse impact from helicopter noise to the proposed Development is not anticipated.

9. CONCLUSION

9.1 Noise assessments have been conducted to predict the noise impacts at the proposed Development.

9.2 For road traffic noise, the predicted road traffic noise level of the residential flats will be within the stipulated 70dB(A) noise criterion. Therefore, no noise mitigation measures are required.

9.3 For the fixed noise sources impact, the assessment results indicate that all the residential flats will be within the stipulated noise limits.

9.4 For the aircraft and helicopter noise, the measured noise levels on site were within the noise criterion in HKPSG.

9.5 According to the above assessment results, adverse environmental noise impacts for the proposed Development is not anticipated.

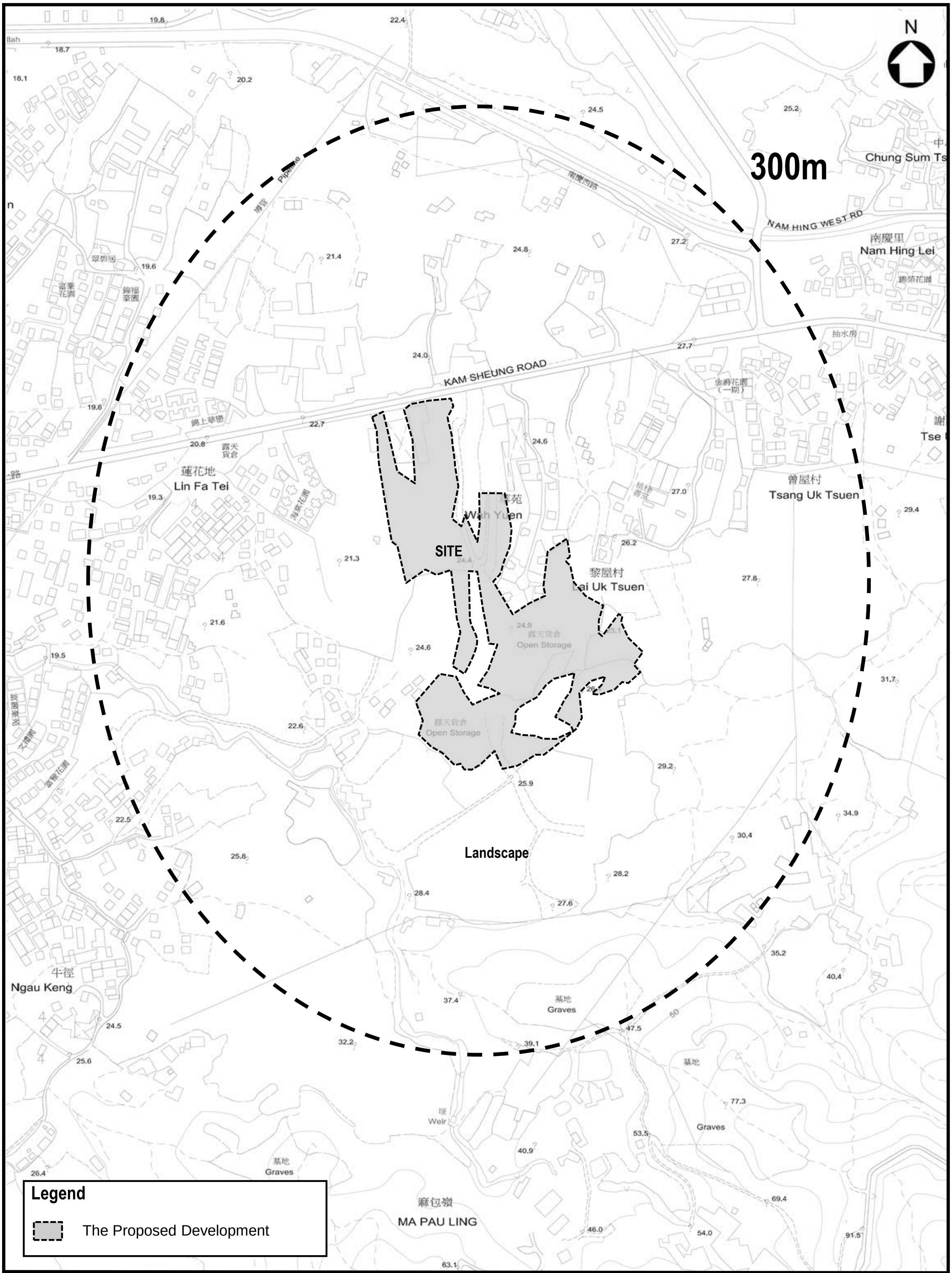
10. REFERENCES

[1] "Hong Kong Planning Standards & Guidelines" of March 2014 of Hong Kong Government.

[2] "Technical Memorandum for the Assessment of Noise from Places Other Than Domestic Premises, Public Places or Construction Sites" (TM - DP) issued under the Noise Control Ordinance.

[3] "RoadNoise 2000" Computer Software of WS Atkins Noise and Vibration, England.

[4] "Calculation of Road Traffic Noise" of the Department of Transport, Welsh Office, UK.



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PROJECT: 22458

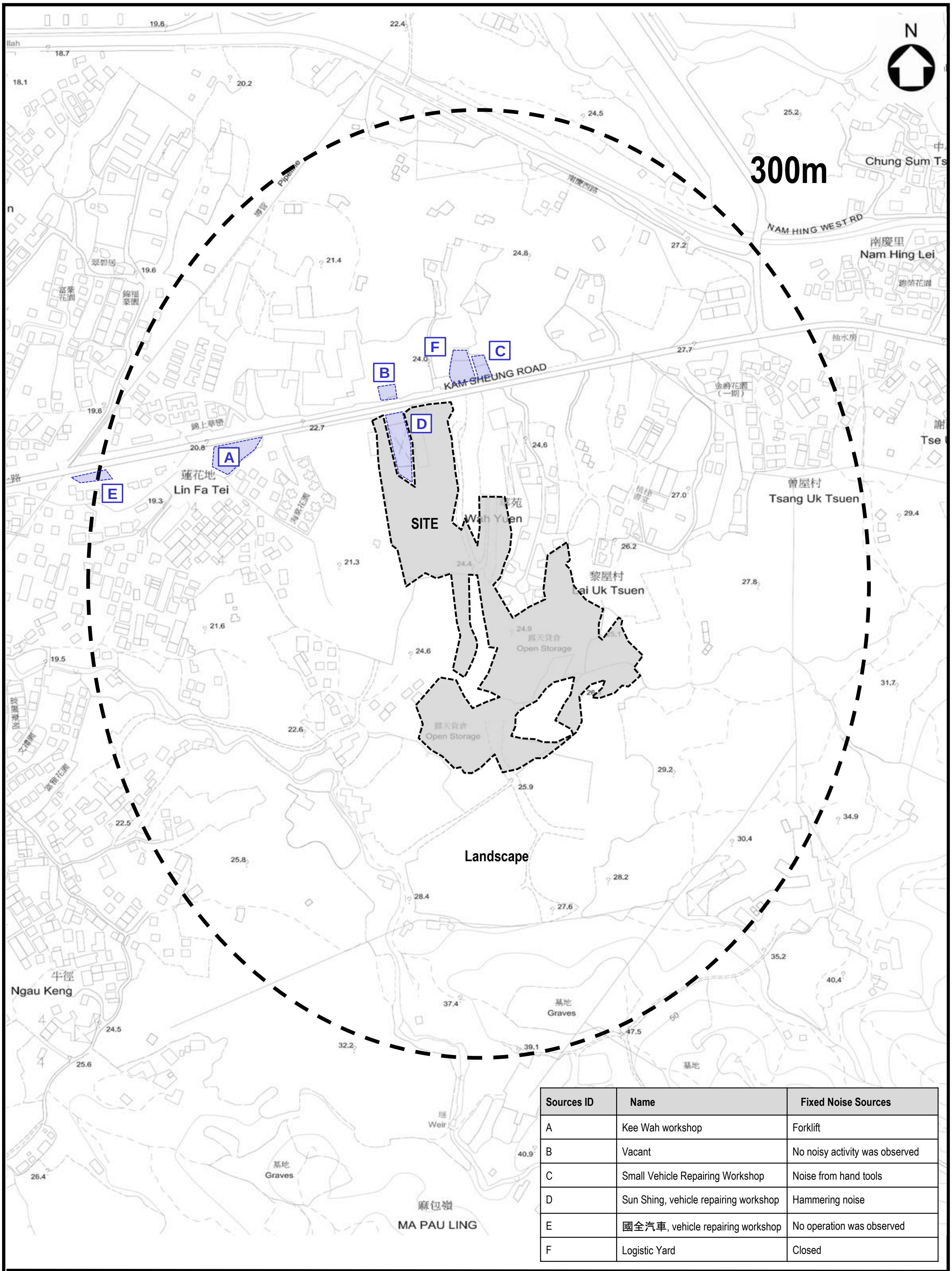
Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Site Location

FIGURE

1



Sources ID	Name	Fixed Noise Sources
A	Kee Wah workshop	Forklift
B	Vacant	No noisy activity was observed
C	Small Vehicle Repairing Workshop	Noise from hand tools
D	Sun Shing, vehicle repairing workshop	Hammering noise
E	國全汽車, vehicle repairing workshop	No operation was observed
F	Logistic Yard	Closed

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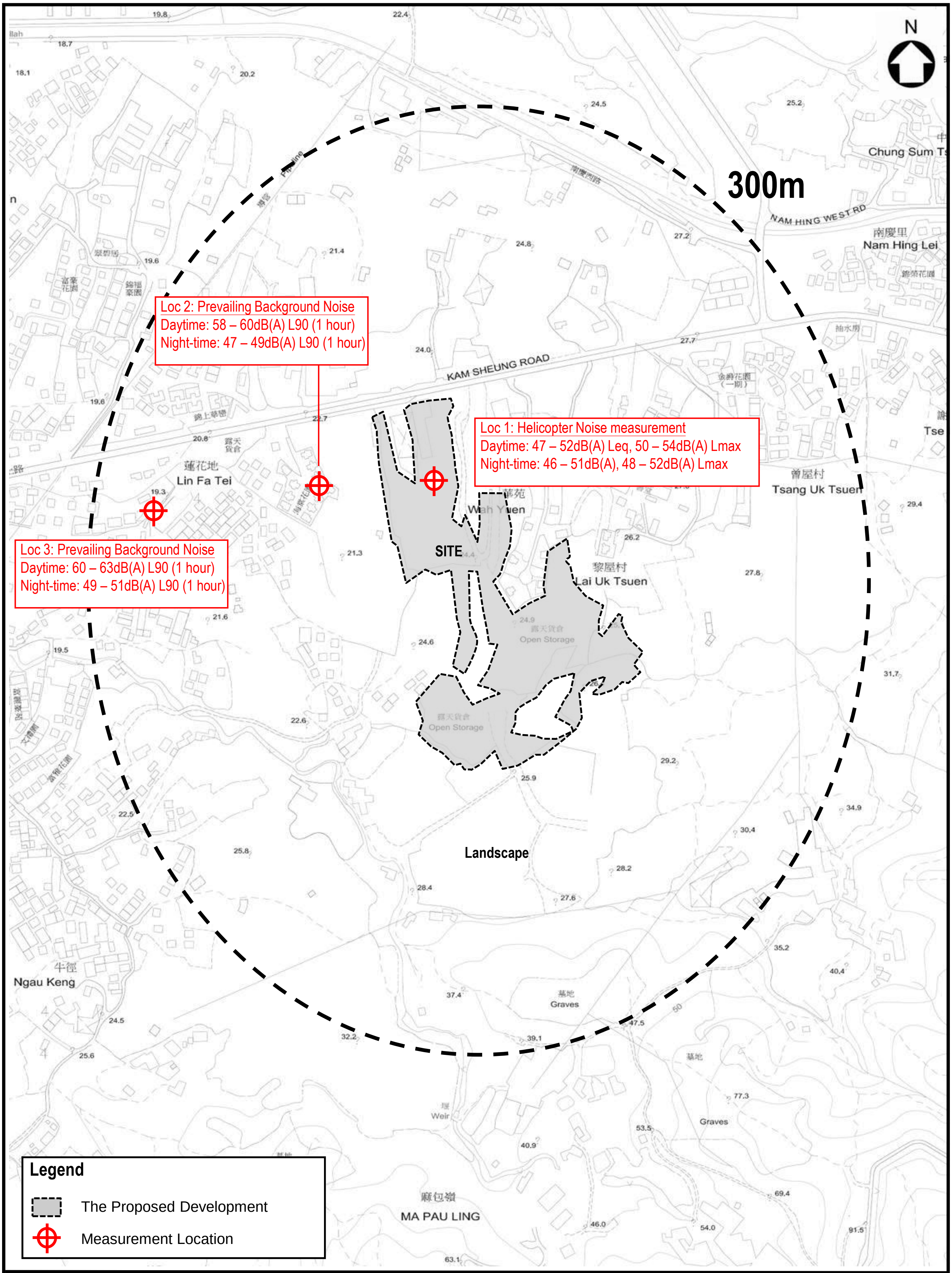
Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Identified Fixed Noise Sources

FIGURE

2



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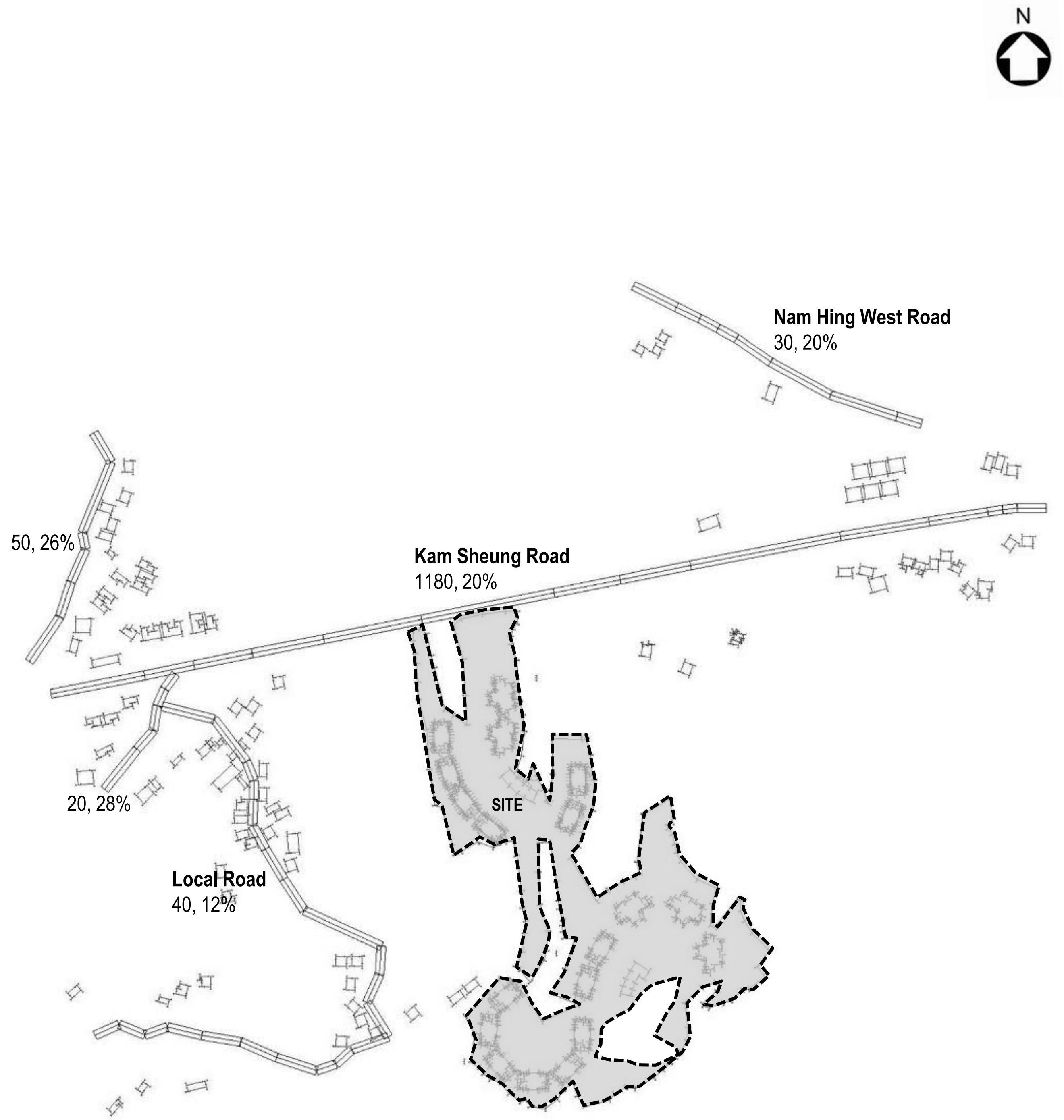
TITLE:

Noise Measurement

FIGURE

3



Legend

▭	Proposed Development
40, 12%	40 vehicles per hour, 12% heavy goods vehicles

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TITLE:

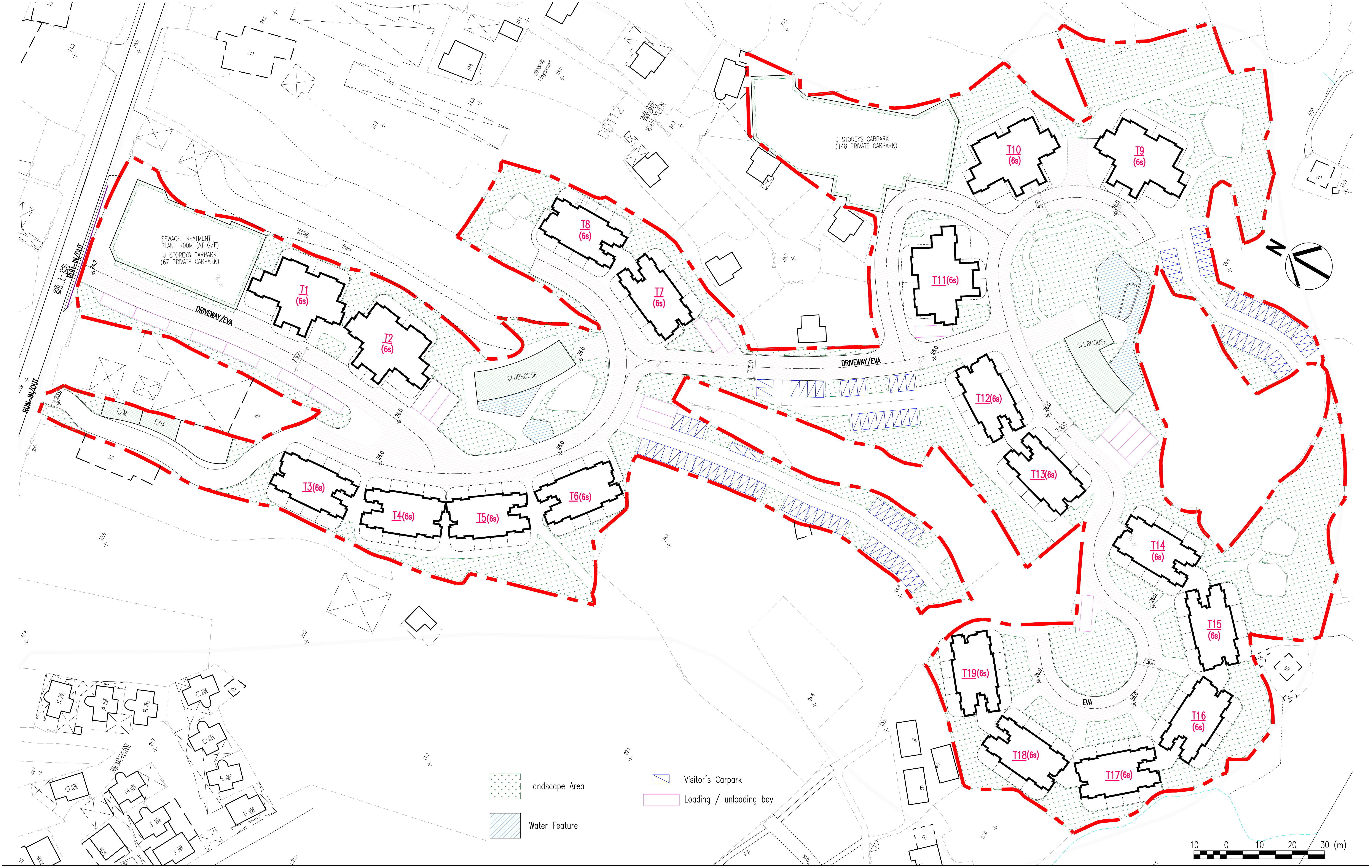
Computer Plot of Road Scheme (with Year 2042 traffic forecast, AM Peak Hour Traffic Flows)

FIGURE

4

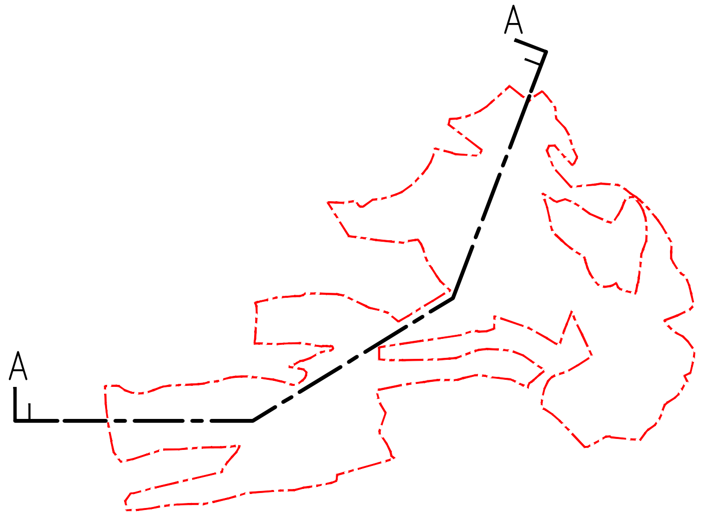
APPENDIX 1

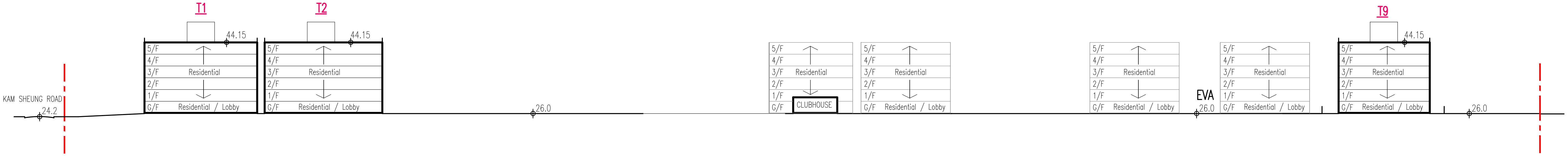
ARCHITECTURAL DRAWINGS



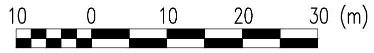
Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone
For Proposed Residential Development at Various Lots and Adjoining Government Land
in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

INDICATIVE MASTER LAYOUT PLAN (1:1000)





SECTION A

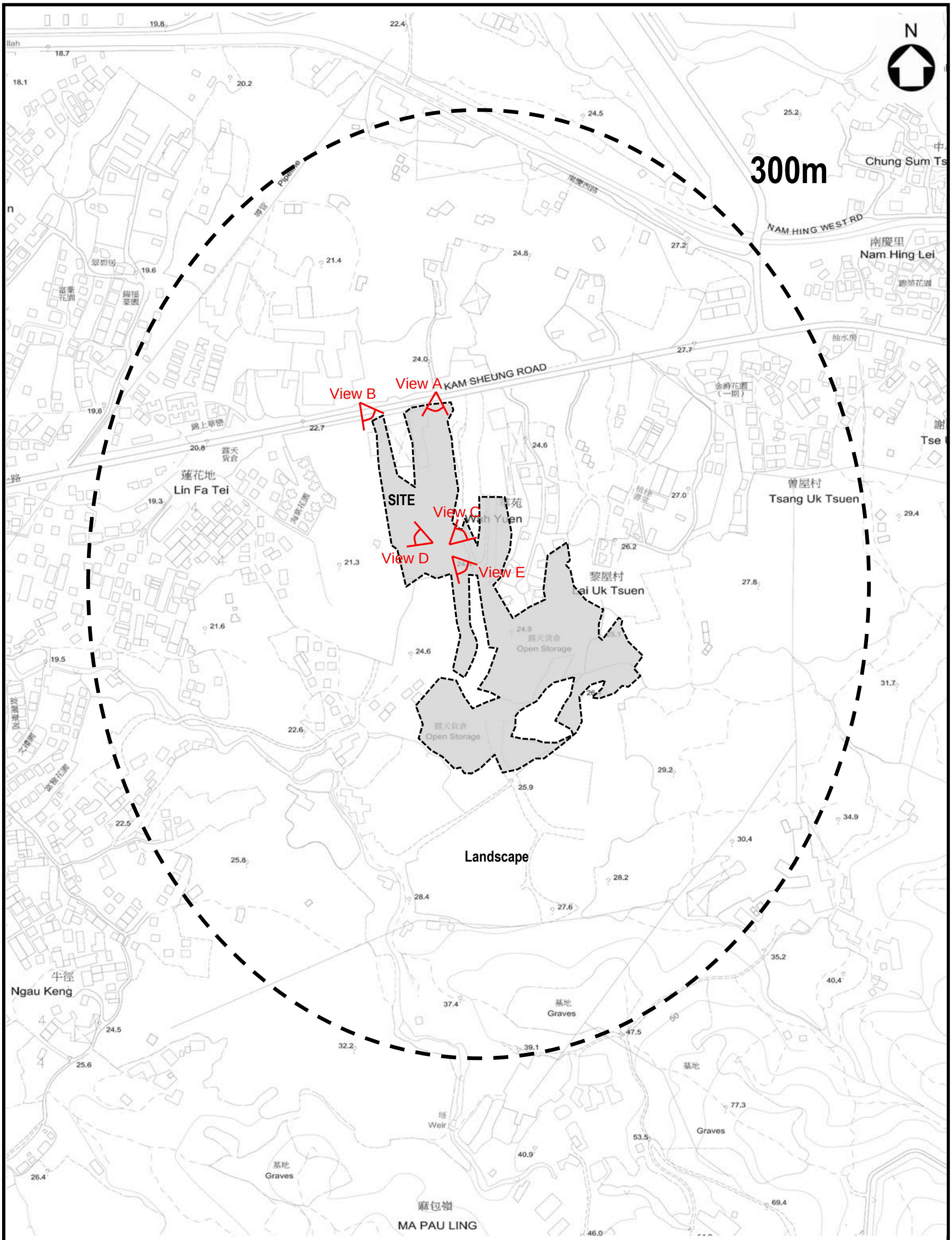


Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone
For Proposed Residential Development at Various Lots and Adjoining Government Land
in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

INDICATIVE SCHEMATIC SECTION (1:1000)

APPENDIX 2

PHOTOS TAKEN ON SITE



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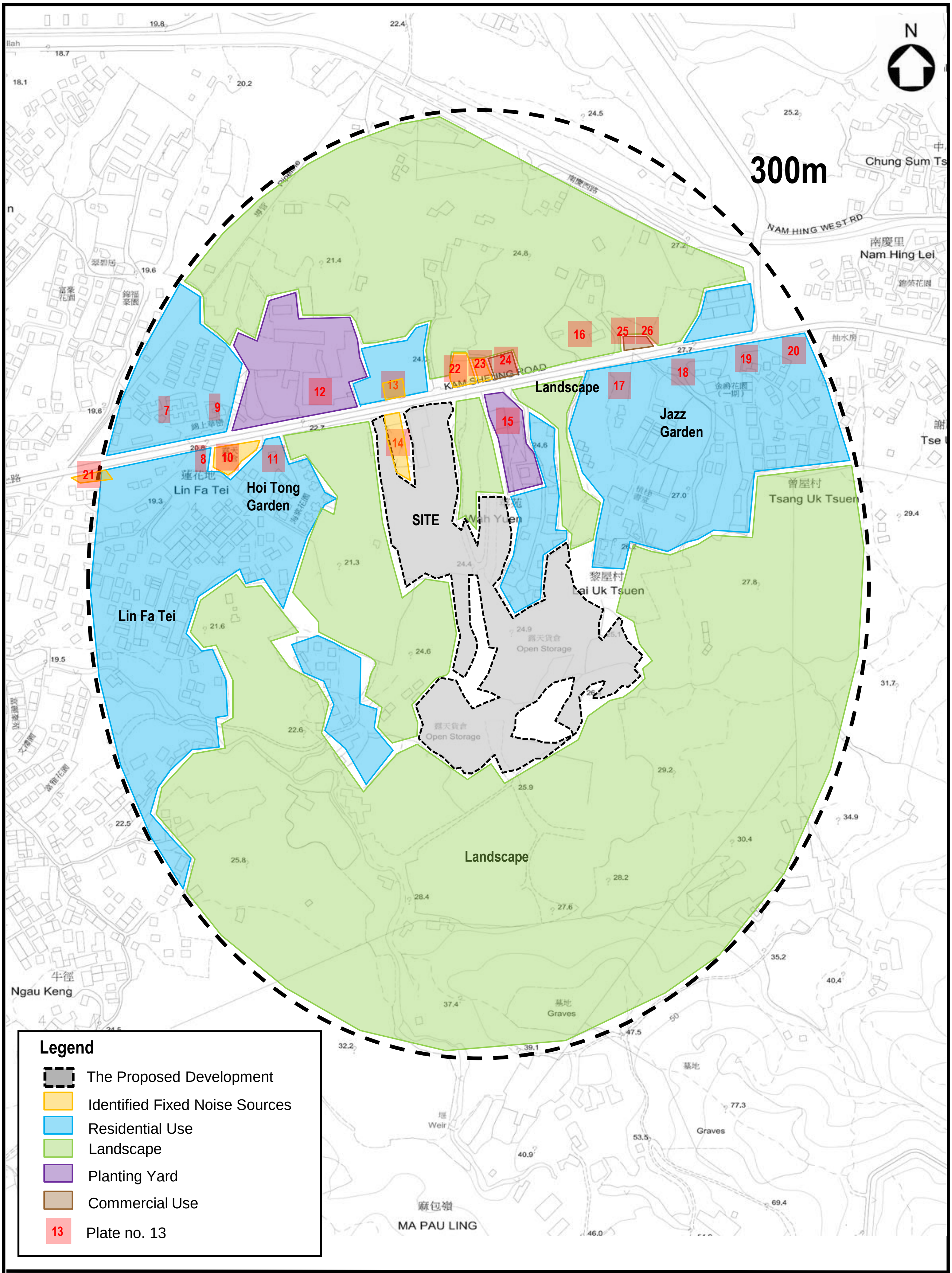
Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

View Points of Site Photos

FIGURE

A2-1



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Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Land Uses in 300m Study Area

FIGURE

A2-2

Plate 1: Project Site

Plate 2: View A, existing uses of the project site

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TITLE:

Photographs taken on Site

FIGURE

A2-3

Plate 3: View B, existing situation of the project site

Plate 4: View C, existing situation of the project site

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Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Photographs taken on Site

FIGURE

A2-4

Plate 5: View D, existing situation of the project site

Plate 6: View E, existing situation of the project site

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Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Photographs taken on Site

FIGURE

A2-5

Plate 7: Village houses

Plate 8: Property agent, office use

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Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Photographs taken on Site

FIGURE

A2-6

Plate 9: Residential Development, Lotus Hill

Plate 10: Kee Wah workshop

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Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Photographs taken on Site

FIGURE

A2-7

Plate 11: Hoi Tong Garden

Plate 12: Planting yard

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Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Photographs taken on Site

FIGURE

A2-8

Plate 13: **Previous** Car repairing workshop, currently vacant

Plate 14: Sun Shing car repairing workshop

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TITLE:

Photographs taken on Site

FIGURE

A2-9

Plate 15: Planting yard

Plate 16: Village houses

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TITLE:

Photographs taken on Site

FIGURE

A2-10

Plate 17: Village houses

Plate 18: Village houses

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TITLE:

Photographs taken on Site

FIGURE

A2-11

Plate 19: Village houses

Plate 20: Village houses

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Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Photographs taken on Site

FIGURE

A2-12

Plate 21: Village houses

*Identified as a logistic yard based on desktop study, closed during site survey.

Plate 22: Logistic Yard

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Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Photographs taken on Site

FIGURE

A2-13

Plate 23: Small Vehicle Repairing Workshop

*No noisy activity was observed

Plate 24: RC Car Trading Company

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Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Photographs taken on Site

FIGURE

A2-14

Plate 25: Vacant Office for sale/rent

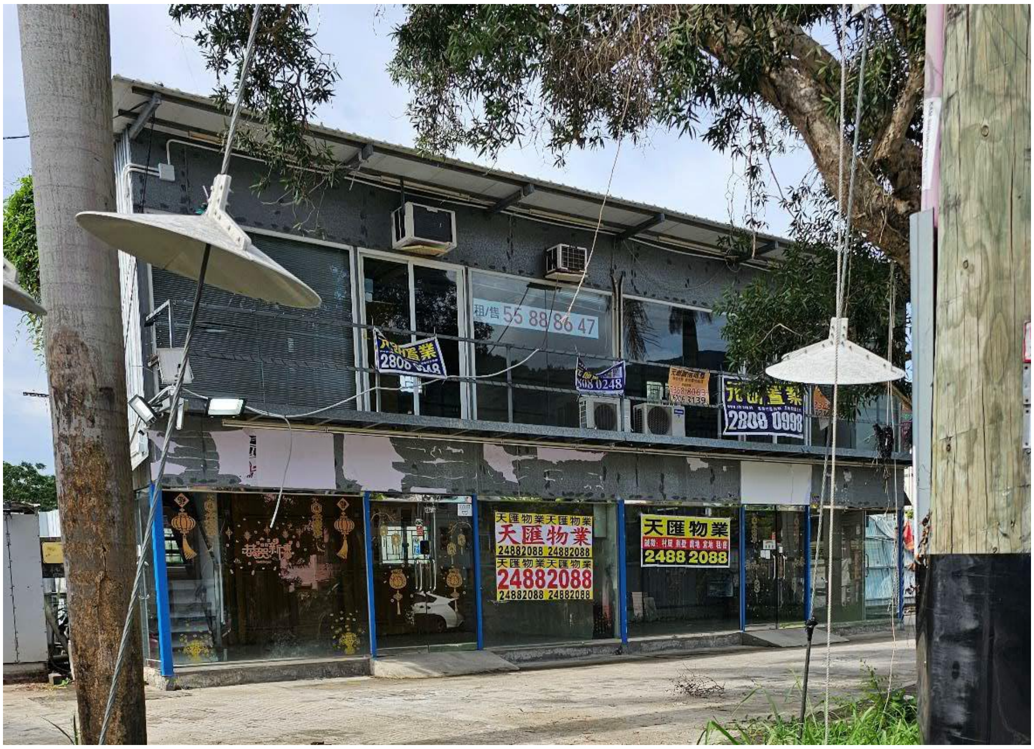

Plate 26: Vacant Office for sale/rent

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Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Photographs taken on Site

FIGURE

A2-15

APPENDIX 3

YEAR 2046 TRAFFIC FORECAST
(provided by CTA CONSULTANTS LTD.)

CTA Consultants Limited
Transportation, Planning, Engineering, Research and Development
We commit We deliver
用心以誠

Our Ref: 21134HK-DD112/kvl/wkk/03

By E-mail
(Email: kitwong@wha.com.hk)

26 July 2024

Westwood Hong & Associates Ltd
2404, Tung Wai Commercial Building
109-111 Gloucester Road, Wanchai, H.K.

Attn: Ms. Kit Wong

Dear Kit,

**"Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone
For Proposed Residential Development at Various Lots
and Adjoining Government Land in D.D. 112, Kam Sheung Road,
Shek Kong, Yuen Long, New Territories"
(Planning Application No. Y/YL-SK/1)**

Technical Note on Methodology for Estimating Traffic Forecasts for Traffic Noise Impact Assessment (TNIA)

We refer to the endorsement letters from Transport Department [Ref No. (NL2U6) in TD NR157/161/YLDD-112] dated 30 August 2022 regarding to the captioned subject as per attached.

We write to confirm that Transport Department's endorsed methodology prepared by us has been strictly adopted in preparing the traffic forecast for the Noise Impact Assessment Report prepared by Westwood Hong & Associates Ltd.

Should you have any queries or require further information, please do not hesitate to contact the undersigned or Mr. W K Kwong at 2214 0849.

Yours Faithfully,
For and on behalf of
CTA Consultants Ltd.

Kelvin Leung
CEO
Encl.

By Fax
2214 0817

運輸署
Transport Department

本署檔案 Our Ref. : (NL2U6) in TD NR157/161/YLDD-112
來函檔號 Your Ref. : 21134HK-DD112/kvl/wkk/02
電　話 Tel. : 2399 2421
圖文傳真 Fax : 2381 3799
電　郵 Email : haocai@td.gov.hk

30 August 2022

CTA Consultants Limited
Unit 801, 8/F
Technology Plaza
651 King's Road
North Point, Hong Kong
(Attn: Mr Kelvin LEUNG)

Dear Kelvin,

Proposed Rezoning of the Site from "Residential (Group D)" to "Residential (Group C)" zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112 Kam Sheung Road, Shek Kong, Yuen Long, New Territories
(Planning Application No. Y/YL-SK/1)

Technical Note on Methodology for Estimating Traffic Forecasts for Traffic Noise Impact Assessment (TNIA)

I refer to your above referenced letter dated 30 June on the subject.

I have no adverse comments on the TNIA. Please note that Noise Impact Assessment is not under our purview. We are not in a position to provide comments on the traffic figures tailor-made for the environmental assessment study.

Notwithstanding the above, we have no objection in principle to the methodology of traffic forecast.

Yours sincerely,

(Phil CAI)
for Commissioner for Transport

新界分區辦事處
NT Regional Office
九龍聯運街三十號旺角政府合署七樓
7th Floor, Mong Kok Government Offices, 30 Luen Wan Street, Kowloon.
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Traffic Data for Noise Assessment for S12 Application for DD112 in Kam Tin, Yuen Long

2046 Traffic Flow

Link ID	Road Name	Direction	1 way/ 2 ways	Speed	2046 Traffic forecast			
					AM Peak Hour Traffic Flows (in veh/hr)	**% of HV**	**PM Peak Hour Traffic Flows (in veh/hr)**	**% of HV**
A	Kam Sheung Road	-	2 ways	50	1200	20%	1100	10%
B1(3)	Local Road	-	2 ways	50	50	26%	40	9%
B2(3)	Local Road	-	2 ways	50	20	28%	20	6%
B3(3)	Local Road	-	2 ways	50	40	12%	40	3%
C	Nam Hing West Road	-	2 ways	50	30	20%	30	5%

Notes : *(1) Please refer to the Location Plan (i.e. Figure 1) attached in Appendix A.*
(2) HV includes Light Van, Public Light Bus, Light Goods Vehicle, Medium Goods Vehicle, Heavy Goods Bus includes Coach and Bus
(3) B1, B2 and B3 are local access not managed by TD, the traffic flows are for reference only

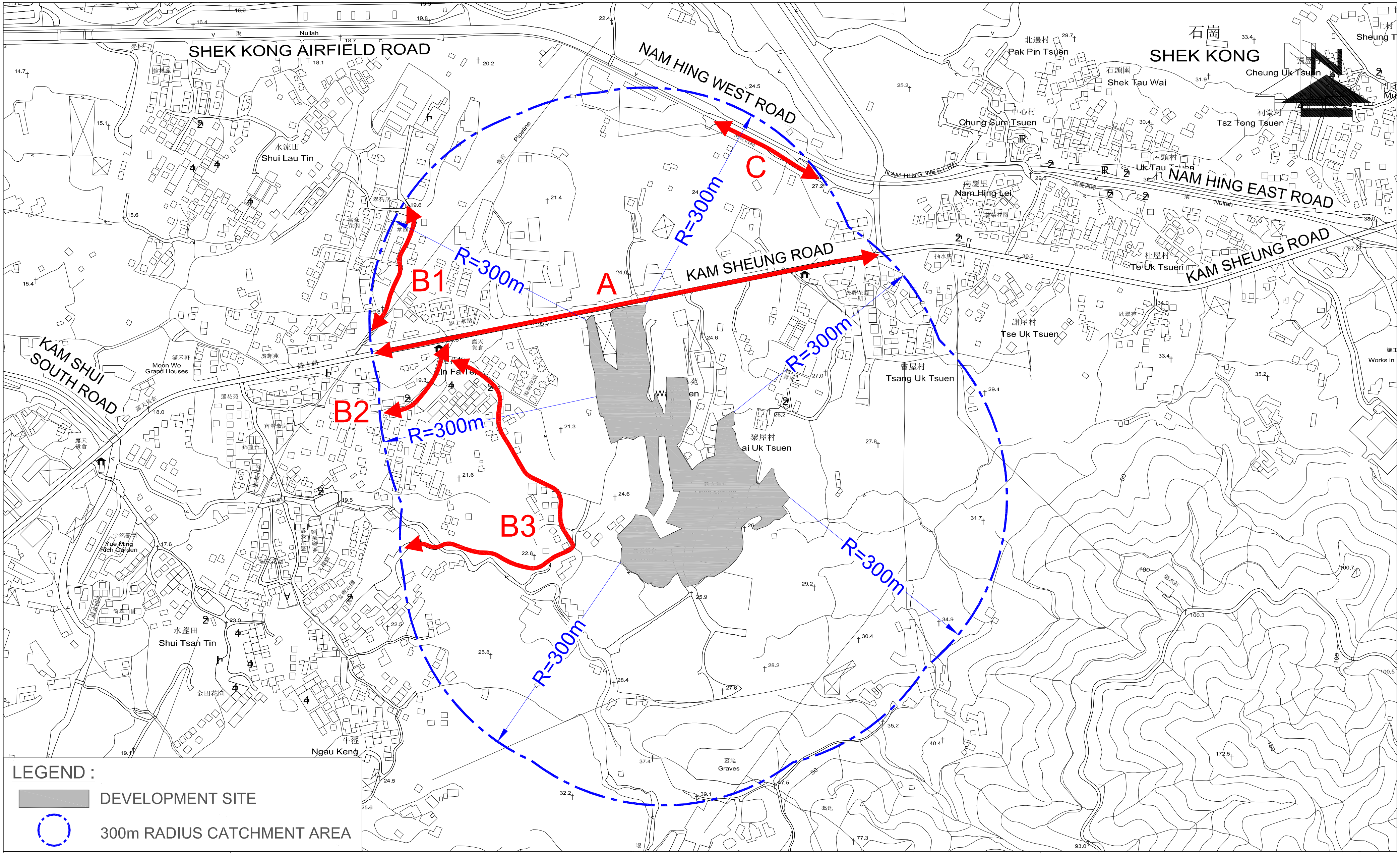


FIGURE NO.: **TNIA**

PROJECT TITLE: S12A Rezoning Application Various lots (DD112) in Kam Tin, Yuen Long

PROJECT NO.: 21134HK-DD112

DRAWING TITLE:

INDEX PLAN

SCALE: 1 : 7000 @A4

DATE: 26 NOV 2021

CTA Consultants Limited
志達顧問有限公司

APPENDIX 4

PREDICTED FAÇADE NOISE LEVELS FOR ROAD TRAFFIC NOISE (BASE SCENARIO)

Westwood Hong & Associates Ltd

PROJECT: 22458

Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Location of Assessment Points for Road Traffic Noise Assessment (Northern part)

FIGURE

A4-1

Westwood Hong & Associates Ltd

PROJECT: 22450

Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Location of Assessment Points for Road Traffic Noise Assessment (Southern part)

FIGURE

A4-2

Job No. : 22458
Job Title : Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories
Scenario: Unmitigated, 2046 Traffic Forecast

Percentage of flats in the development within the facade noise level

Noise level in dB(A)	No. of flats	Total No. of flats	%
<70	850	850	100
71	0	850	0
72	0	850	0
73	0	850	0
74	0	850	0
75	0	850	0
76	0	850	0

% OF EXCEEDANCE = 0.0%

Job No. : **22458**

Job Title : **Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories**

Scenario: **Unmitigated, 2046 Traffic Forecast**

	Height of Assessment Point (mPD)	**Receiver**																				
		T1																				
Floor		**101**	**102**	**103**	**104**	**105**	**106**	**107**	**108**	**109**	**110**	**111**	**112**	**113**	**114**	**115**	**116**	**117**	**118**	**119**	**120**	**121**
1	27	68.6	67.8	67.0	66.6	66.8	67.6	62.6	64.8	65.9	36.4				64.9	65.2	65.5	64.4	61.8	66.3	67.3	68.1
2	30	68.6	67.8	67.0	66.6	66.9	67.6	62.6	64.8	65.9	36.5	53.1	60.6	61.4	64.9	65.2	65.5	64.4	61.8	66.3	67.2	68.1
3	33	68.6	67.8	66.9	66.6	66.8	67.5	62.6	64.8	65.9	36.6	53.1	60.6	61.4	64.8	65.2	65.4	64.4	61.8	66.3	67.2	68.0
4	36	68.6	67.8	66.9	66.5	66.8	67.5	62.6	64.7	65.9	36.8	53.2	60.6	61.4	64.8	65.2	65.4	64.3	61.8	66.3	67.2	68.0
5	39	68.5	67.7	66.9	66.5	66.8	67.5	62.5	64.7	65.8	37.0	53.2	60.6	61.4	64.9	65.2	65.4	64.3	61.7	66.2	67.2	68.0
6	42	68.5	67.7	66.8	66.5	66.7	67.4	62.5	64.7	65.8	37.2	53.3	60.6	61.4	64.9	65.2	65.4	64.3	61.7	66.2	67.1	67.9
		Number of flats within the noise level																				
Noise level in dB(A)		**Number of flats**																				
<70		6	0	0	0	0	6	0	0	6	0	0	0	5	0	0	6	0	0	0	0	6
71		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

		T2																				
Floor	Height of Assessment Point (mPD)	**201**	**202**	**203**	**204**	**205**	**206**	**207**	**208**	**209**	**210**	**211**	**212**	**213**	**214**	**215**	**216**	**217**	**218**	**219**	**220**	**221**
1	27				63.9	64.7	62.6	63.8	63.7	31.1	43.8	57.8	59.9	60.1	62.1	62.5	62.6	60.9	58.1	63.1	63.3	63.4
2	30	62.7	63.3	63.4	63.9	64.7	62.6	63.8	63.7	31.8	43.9	57.8	59.9	60.1	62.1	62.5	62.6	60.9	58.1	63.1	63.3	63.4
3	33	62.6	63.3	63.4	63.9	64.7	62.6	63.8	63.7	33.0	44.2	57.8	59.9	60.1	62.1	62.5	62.6	61.0	58.1	63.1	63.3	63.4
4	36	62.6	63.3	63.4	63.9	64.6	62.6	63.8	63.7	34.5	44.5	57.9	59.9	60.1	62.1	62.5	62.6	61.0	58.2	63.1	63.3	63.4
5	39	62.6	63.3	63.5	63.9	64.6	62.6	63.8	63.7	36.5	45.0	57.9	59.9	60.1	62.1	62.5	62.6	61.0	58.4	63.2	63.4	63.5
6	42	62.8	63.4	63.4	63.9	64.7	62.6	63.8	63.8	39.0	45.9	58.0	60.0	60.2	62.2	62.6	62.8	61.2	58.8	63.3	63.5	63.6
Noise level in dB(A)																						
<70		0	0	5	0	6	0	6	0	0	0	0	0	6	0	0	6	0	0	0	0	6
71		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Floor	Height of Assessment Point (mPD)	T3																			
		301	**302**	**303**	**304**	**305**	**306**	**307**	**308**	**309**	**310**	**311**	**312**	**313**	**314**	**315**	**316**	**317**	**318**	**319**	**320**
1	27	67.1	66.7	65.3	65.6	65.3	65.0	64.8	63.5	64.2	63.7	59.8	60.5	58.5	61.3	61.9	62.4	62.8	62.5	65.0	66.2
2	30	67.1	66.7	65.3	65.6	65.3	64.9	64.7	63.5	64.2	63.7	59.8	60.5	58.5	61.3	61.9	62.4	62.8	62.5	65.0	66.2
3	33	67.1	66.7	65.3	65.6	65.3	64.9	64.7	63.5	64.2	63.7	59.8	60.5	58.5	61.3	61.8	62.4	62.9	62.5	65.0	66.2
4	36	67.0	66.6	65.3	65.6	65.2	64.9	64.7	63.5	64.2	63.7	59.8	60.5	58.6	61.3	61.8	62.3	62.9	62.6	65.0	66.1
5	39	67.0	66.6	65.3	65.6	65.2	64.9	64.7	63.5	64.2	63.7	59.9	60.6	58.6	61.4	61.9	62.3	62.8	62.6	65.0	66.1
6	42	67.0	66.7	65.4	65.6	65.2	65.0	64.7	63.6	64.2	63.7	59.9	60.6	58.7	61.4	61.9	62.3	62.8	62.6	65.0	66.1
Noise level in dB(A)																					
<70		6	0	0	6	0	6	0	0	6	0	0	6	0	0	6	0	6	0	0	6
71		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Floor	Height of Assessment Point (mPD)	T4																			
		401	**402**	**403**	**404**	**405**	**406**	**407**	**408**	**409**	**410**	**411**	**412**	**413**	**414**	**415**	**416**	**417**	**418**	**419**	**420**
1	27	62.5	62.6	62.2	62.3	62.1	61.9	61.7	60.8	61.2	60.7	59.2	59.1	58.9	59.3	59.5	59.7	59.9	59.9	60.1	60.0
2	30	62.5	62.6	62.2	62.3	62.1	61.9	61.7	60.8	61.2	60.7	59.2	59.2	58.9	59.3	59.5	59.7	59.9	59.9	60.1	60.0
3	33	62.5	62.6	62.2	62.3	62.1	61.9	61.7	60.7	61.2	60.7	59.2	59.2	58.9	59.3	59.5	59.7	59.9	59.9	60.1	60.0
4	36	62.5	62.6	62.3	62.3	62.1	61.9	61.7	60.8	61.2	60.7	59.2	59.2	59.0	59.4	59.6	59.8	60.0	60.0	60.2	60.0
5	39	62.5	62.6	62.3	62.3	62.1	61.9	61.7	60.7	61.2	60.7	59.2	59.2	59.0	59.4	59.6	59.8	60.0	60.0	60.1	60.1
6	42	62.5	62.6	62.3	62.3	62.1	61.9	61.8	60.8	61.2	60.8	59.2	59.3	59.1	59.5	59.7	59.9	60.0	60.0	60.2	60.3
Noise level in dB(A)																					
<70		0	6	0	6	0	6	0	0	6	0	0	6	0	6	0	0	6	0	0	6
71		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Floor	Height of Assessment Point (mPD)	T5																			
		501	**502**	**503**	**504**	**505**	**506**	**507**	**508**	**509**	**510**	**511**	**512**	**513**	**514**	**515**	**516**	**517**	**518**	**519**	**520**
1	27	60.0	60.2	59.5	59.8	59.4	59.3	58.9	53.2	58.1	56.7	58.3	58.8	59.1	59.4	59.5	59.6	59.6	59.3	59.2	59.1
2	30	60.0	60.2	59.5	59.8	59.4	59.3	58.9	53.3	58.1	56.7	59.1	59.4	59.5	59.7	59.7	59.7	59.6	59.3	59.2	59.1
3	33	60.0	60.2	59.5	59.8	59.4	59.3	58.9	53.4	58.1	56.7	60.1	60.1	60.0	60.0	60.0	59.7	59.6	59.4	59.2	59.1
4	36	60.0	60.3	59.6	59.8	59.5	59.3	59.0	53.5	58.1	56.7	60.3	60.2	60.1	60.0	60.0	59.8	59.6	59.5	59.3	59.2
5	39	60.1	60.3	59.6	59.9	59.5	59.4	59.0	53.6	58.2	56.8	60.3	60.2	60.1	60.1	60.0	59.8	59.7	59.5	59.3	59.2
6	42	60.2	60.3	59.6	60.0	59.6	59.4	59.1	53.9	58.2	56.9	60.3	60.2	60.1	60.1	60.0	59.9	59.8	59.5	59.5	59.4
Noise level in dB(A)																					
<70		0	6	0	6	0	6	0	0	6	0	0	6	0	0	6	6	0	6	0	0
71		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

		T6																			
Floor	Height of Assessment Point (mPD)	**601**	**602**	**603**	**604**	**605**	**606**	**607**	**608**	**609**	**610**	**611**	**612**	**613**	**614**	**615**	**616**	**617**	**618**	**619**	**620**
1	27	56.9	56.5	55.5	56.2	55.9	55.6	55.2	50.1	53.6	51.4	57.3	57.2	56.4	56.7	56.8	57.1	57.2	57.4	57.6	57.7
2	30	56.9	56.5	55.6	56.2	55.9	55.6	55.2	50.2	53.6	51.5	58.3	58.4	57.9	58.1	58.2	58.4	58.5	58.6	58.7	58.7
3	33	56.9	56.6	55.6	56.2	55.9	55.7	55.2	50.2	53.6	51.5	59.7	60.0	59.9	60.0	60.0	60.1	60.1	60.1	60.1	60.1
4	36	57.0	56.6	55.6	56.3	55.9	55.7	55.2	50.4	53.7	51.6	60.2	60.4	60.4	60.5	60.5	60.5	60.5	60.5	60.5	60.3
5	39	57.0	56.7	55.7	56.3	56.0	55.7	55.3	50.5	53.7	51.7	60.3	60.4	60.5	60.6	60.6	60.6	60.6	60.6	60.5	60.4
6	42	57.1	56.8	55.8	56.4	56.0	55.8	55.3	50.7	53.8	51.8	60.3	60.5	60.5	60.6	60.6	60.7	60.6	60.6	60.6	60.5
Noise level in dB(A)																					
<70		6	0	0	6	0	6	0	0	6	0	0	0	6	0	6	0	6	6	0	0
71		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Height of Assessment Point (mPD)	**T7**																			
Floor		**701**	**702**	**703**	**704**	**705**	**706**	**707**	**708**	**709**	**710**	**711**	**712**	**713**	**714**	**715**	**716**	**717**	**718**	**719**	**720**
1	27	58.0	58.3	58.1	58.4	58.4	58.2	58.2	57.9	58.1	57.9	54.3	54.9	49.9	55.5	55.9	56.5	57.0	55.2	57.6	57.4
2	30	58.0	58.3	58.1	58.4	58.4	58.3	58.2	58.0	58.2	58.0	54.3	55.0	50.0	55.6	55.9	56.6	57.0	55.2	57.5	57.4
3	33	58.0	58.3	58.1	58.5	58.4	58.4	58.4	58.2	58.4	58.2	54.3	55.0	50.0	55.7	55.9	56.6	57.0	55.3	57.6	57.5
4	36	58.0	58.3	58.2	58.4	58.5	58.5	58.6	58.4	58.6	58.4	54.3	55.1	50.1	55.7	55.9	56.6	57.1	55.3	57.6	57.5
5	39	58.1	58.3	58.2	58.5	58.5	58.6	58.7	58.5	58.7	58.5	54.4	55.1	50.1	55.7	56.0	56.6	57.1	55.4	57.7	57.6
6	42	58.3	58.5	58.3	58.6	58.7	58.7	58.8	58.6	58.7	58.6	54.5	55.1	50.3	55.8	56.1	56.8	57.2	55.6	57.9	57.9
Noise level in dB(A)																					
<70		0	6	0	0	6	0	6	0	6	0	0	6	0	0	6	0	6	0	6	0
71		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Height of Assessment Point (mPD)	**T8**																			
Floor		**801**	**802**	**803**	**804**	**805**	**806**	**807**	**808**	**809**	**810**	**811**	**812**	**813**	**814**	**815**	**816**	**817**	**818**	**819**	**820**
1	27	62.9	61.9	60.0	60.4	59.9	59.4	59.0	58.2	58.4	57.5	58.9	59.5	59.2	59.9	60.1	60.6	61.0	60.3	62.3	63.1
2	30	62.9	61.9	60.0	60.4	59.9	59.4	59.0	58.2	58.4	57.5	58.9	59.5	59.3	59.9	60.2	60.6	61.0	60.3	62.3	63.1
3	33	62.9	61.9	60.0	60.4	59.9	59.4	59.0	58.2	58.5	57.6	58.9	59.5	59.3	59.9	60.2	60.6	61.0	60.4	62.3	63.2
4	36	62.9	62.0	60.0	60.5	59.9	59.4	59.1	58.2	58.5	57.6	58.9	59.6	59.3	60.0	60.2	60.6	61.0	60.4	62.3	63.2
5	39	63.0	62.0	60.0	60.4	59.9	59.4	59.1	58.3	58.5	57.6	59.0	59.6	59.4	60.0	60.3	60.7	61.1	60.4	62.4	63.2
6	42	62.9	62.0	60.0	60.4	59.9	59.4	59.1	58.3	58.5	57.6	59.1	59.7	59.5	60.2	60.4	60.8	61.2	60.6	62.5	63.3
Noise level in dB(A)																					
<70		6	0	0	6	0	6	0	0	6	0	0	6	0	0	6	0	6	0	0	6
71		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Floor	Height of Assessment Point (mPD)	T9						T10						T11					
		901	**902**	**903**	**904**	**905**	**906**	**1001**	**1002**	**1003**	**1004**	**1005**	**1006**	**1101**	**1102**	**1103**	**1104**	**1105**	**1106**
1	27	54.7	53.1	51.2	47.1	53.5	57.1	51.5	49.1	36.2	23.5	58.9	59.1	43.0	39.9	48.1	50.5	58.5	58.9
2	30	54.8	53.1	51.3	47.3	53.5	57.1	51.6	49.2	36.6	24.7	58.9	59.2	43.0	39.9	48.2	50.5	58.5	58.9
3	33	54.8	53.1	51.4	47.4	53.5	57.1	51.7	49.2	37.2	26.5	58.9	59.2	43.0	39.9	48.2	50.5	58.6	59.0
4	36	54.9	53.2	51.5	47.5	53.6	57.1	51.8	49.2	38.0	28.6	58.9	59.2	43.0	39.9	48.2	50.6	58.6	59.0
5	39	55.1	53.4	51.7	47.7	53.5	57.1	51.9	49.4	39.0	31.5	58.9	59.2	43.0	40.0	48.3	50.6	58.7	59.1
6	42	55.4	53.8	52.0	48.0	53.5	57.2	52.1	49.5	40.1	35.6	58.9	59.2	43.0	40.1	48.4	50.6	58.7	59.1
Noise level in dB(A)																			
<70		6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
71		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Height of Assessment Point (mPD)	T12								T13							
Floor		**1201**	**1202**	**1203**	**1204**	**1205**	**1206**	**1207**	**1208**	**1301**	**1302**	**1303**	**1304**	**1305**	**1306**	**1307**	**1308**
1	27	34.3	28.3	29.1	49.0	58.3	58.5	58.5	58.2	34.2	34.3	34.7	51.2	57.9	57.8	57.4	56.6
2	30	34.7	29.9	30.9	49.0	58.4	58.5	58.5	58.2	35.2	35.4	35.7	51.2	57.9	57.8	57.4	56.6
3	33	35.1	31.6	32.8	49.1	58.4	58.6	58.5	58.2	36.3	36.7	36.9	51.3	57.9	57.9	57.4	56.6
4	36	35.8	33.3	35.1	49.2	58.4	58.6	58.6	58.2	37.6	38.3	38.5	51.3	58.0	57.9	57.5	56.6
5	39	36.5	35.3	37.5	49.5	58.5	58.7	58.6	58.2	39.2	40.2	40.5	51.5	58.0	57.9	57.5	56.7
6	42	37.5	37.3	40.4	50.2	58.6	58.7	58.6	58.3	40.9	42.5	43.1	52.0	58.1	58.0	57.5	56.7
Noise level in dB(A)																	
<70		6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
71		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Height of Assessment Point (mPD)	**T14**								**T15**							
Floor		**1401**	**1402**	**1403**	**1404**	**1405**	**1406**	**1407**	**1408**	**1501**	**1502**	**1503**	**1504**	**1505**	**1506**	**1507**	**1508**
1	27	46.2	46.3	45.3	54.0	55.2	55.1	54.7	54.5	12.8	19.1	28.3	45.2	54.2	54.3	53.7	53.4
2	30	46.4	46.4	45.5	54.0	55.2	55.2	54.7	54.5	13.4	20.7	29.2	45.5	54.3	54.3	53.7	53.5
3	33	46.7	46.6	45.7	54.1	55.2	55.2	54.8	54.5	15.3	22.6	30.2	46.1	54.3	54.4	53.8	53.5
4	36	47.0	46.9	46.1	54.2	55.3	55.2	54.8	54.5	17.6	25.1	31.3	46.4	54.3	54.4	54.3	54.8
5	39	47.2	47.2	46.6	54.8	55.5	55.3	54.8	54.6	20.9	28.1	33.0	46.7	54.4	54.5	54.4	54.9
6	42	47.5	47.6	47.2	55.0	55.6	55.4	54.9	54.6	24.9	31.9	35.8	47.3	54.6	54.7	54.6	55.0
Noise level in dB(A)																	
<70		6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
71		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

		T16								T17							
Floor	Height of Assessment Point (mPD)	**1601**	**1602**	**1603**	**1604**	**1605**	**1606**	**1607**	**1608**	**1701**	**1702**	**1703**	**1704**	**1705**	**1706**	**1707**	**1708**
1	27	46.5	42.8	34.0	13.6	53.5	53.4	53.3	52.8	52.1	51.2	50.0	48.7	52.5	51.9	51.3	50.3
2	30	46.5	42.8	34.0	13.6	53.6	53.4	53.3	52.9	52.2	51.2	50.0	48.7	52.6	52.0	51.3	50.3
3	33	46.5	42.7	34.0	14.9	53.6	53.5	53.7	54.6	52.5	51.3	50.0	48.7	54.8	52.1	51.4	50.4
4	36	46.5	42.7	34.0	17.0	54.9	55.3	55.0	54.8	53.2	51.4	50.0	48.7	54.9	54.5	54.2	53.5
5	39	46.5	42.6	34.0	20.0	55.0	55.4	55.4	54.8	54.1	51.7	50.1	48.6	55.0	54.6	54.3	53.6
6	42	46.6	42.6	34.4	25.1	55.1	55.5	54.8	55.0	55.5	51.9	50.1	48.6	55.1	54.8	52.3	51.4
Noise level in dB(A)																	
<70		6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
71		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Floor	Height of Assessment Point (mPD)	**T18**								**T19**							
		1801	**1802**	**1803**	**1804**	**1805**	**1806**	**1807**	**1808**	**1901**	**1902**	**1903**	**1904**	**1905**	**1906**	**1907**	**1908**
1	27	55.4	55.6	54.7	52.3	48.6	47.0	34.2	32.4	58.7	58.6	58.3	58.0	20.0	37.5	36.8	53.0
2	30	55.6	55.7	54.8	52.5	48.7	47.0	35.2	34.4	58.7	58.7	58.4	58.1	21.3	37.5	36.9	53.0
3	33	56.1	56.1	55.2	53.1	48.7	47.1	36.5	37.4	58.8	58.7	58.4	58.2	23.1	37.5	37.0	53.0
4	36	57.5	57.1	56.4	54.5	48.9	47.3	38.2	41.4	58.8	58.7	58.5	58.5	25.5	37.5	37.1	53.0
5	39	58.1	57.7	57.0	55.5	49.0	47.7	40.6	43.5	58.9	58.9	58.7	58.7	28.6	37.6	37.2	53.0
6	42	58.3	57.8	57.3	55.8	49.4	48.3	49.8	52.6	58.9	59.0	58.8	58.8	32.6	37.6	37.3	53.0
Noise level in dB(A)																	
<70		6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
71		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

APPENDIX 5

JUSTIFICATION OF SWLs

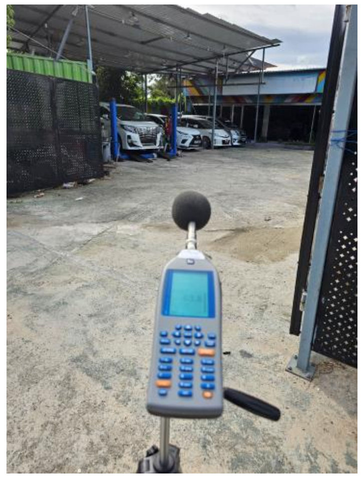
Project Title: Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories
Job no.: 22458

Table A5-1: Summary of Sound Power Levels of Fixed Noise Sources

Source ID	Site Survey Date	Industrial Site	Photo	Description	Fixed Noise Sources	Measured Sound Pressure Levels, dB(A)	Measured Distance from noise source (m)	Correction to single no. of source, dB(A)	Distance Correction, dB(A)	Correction for Tonal, dB(A)	Sound Power Levels, dB(A)	Sound Power Levels adopted in the Assessment, dB(A)	Remark
A	17-Nov-21	Kee Wah workshop		Car equipment trading	Forklift	62	3	0	18	0	**80**	80	**For conservative, the previous finding (i.e. noise from forklift) will be adopted in the assessment.**
	12-Jul-24		 	Car equipment trading	No operation was observed	measurement was not conducted							
B	17-Nov-21	Small vehicle repairing workshop		Vehicle repairing workshop	Noise from hand tools was observed	62	3	0	18	0	**80**	-	**Will not be included in the assessment**
	12-Jul-24	Vacant	 	the vehicle repairing workshop was removed, the site is currently vacant	No noisy activity was observed	measurement was not conducted							

Project Title: Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories
Job no.: 22458

Table A5-1: Summary of Sound Power Levels of Fixed Noise Sources

Source ID	Site Survey Date	Industrial Site	Photo	Description	Fixed Noise Sources	Measured Sound Pressure Levels, dB(A)	Measured Distance from noise source (m)	Correction to single no. of source, dB(A)	Distance Correction, dB(A)	Correction for Tonal, dB(A)	Sound Power Levels, dB(A)	Sound Power Levels adopted in the Assessment, dB(A)	Remark
C	17-Nov-21	CaRwaSH		Car washing workshop	Air compressor noise	60	5	0	22	0	**82**	**82**	**The SWL of the small vehicle repairing workshop will be adopted in the assessment.**
	12-Jul-24	Small vehicle repairing workshop	 	The previous car washing workshop was removed, the site is currently occupied by a car repairing workshop	Noise from hand tools was observed	54	10	0	28	0	**82**		
D	17-Nov-21	Sun Shing		Vehicle repairing workshop	Car washing, and occasionally hammering noise was observed	65	5	0	22	0	**87**	**87**	**For conservative, the larger SWL (i.e. from previous site measurement) will be adopted in the assessment.**
	12-Jul-24	Sun Shing	 	Vehicle repairing workshop	Noise from hand tools and occasionally hammering noise was observed was observed	52	20	0	34	0	**86**		

Project Title: Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories
Job no.: 22458

Table A5-1: Summary of Sound Power Levels of Fixed Noise Sources

Source ID	Site Survey Date	Industrial Site	Photo	Description	Fixed Noise Sources	Measured Sound Pressure Levels, dB(A)	Measured Distance from noise source (m)	Correction to single no. of source, dB(A)	Distance Correction, dB(A)	Correction for Tonal, dB(A)	Sound Power Levels, dB(A)	Sound Power Levels adopted in the Assessment, dB(A)	Remark
E	17-Nov-21	-	-	-	-	measurement was not conducted						**87**	**For conservative, the SWL would be based on the onsite noise measurement at other fixed noise source with similar industrial activities (i.e. vehicle repairing works) (Source ID: D)**
	12-Jul-24	國全汽車		Vehicle repairing workshop	No operation was observed	measurement was not conducted							
F	17-Nov-21	-	-	-	-	measurement was not conducted						**80**	**For conservative, the SWL would be based on the onsite noise measurement at other fixed noise source with similar industrial activities (i.e. noise from forklift) (Source ID: A)**
	12-Jul-24	Logistic Yard		Logistic Yard	Closed	measurement was not conducted							

TONAL CORRECTION FOR MEASURED 1/3 OCTAVE NOISE LEVELS - SINGLE BAND

DATE : 25/7/2024
JOB NO.: 22458 Lin Fa Tei
SUBJECT: Source ID: C

location	store name	store no.
	manual_0913	66

Freq, Hz	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1k	1.25k	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
Lp, dB	60.5	58.0	55.8	52.5	47.5	45.3	43.7	45.0	45.0	41.7	40.3	39.6	41.5	39.7	41.6	43.9	44.6	45.9	44.4	42.2	41.6	42.0	39.4	37.5	35.8	32.4	28.2	23.8	18.8	14.6
A-Weighting, dB	-44.7	-39.4	-34.6	-30.2	-26.2	-22.5	-19.1	-16.1	-13.4	-10.9	-8.6	-6.6	-4.8	-3.2	-1.9	-0.8	0.0	0.6	1.0	1.2	1.3	1.2	1.0	0.5	-0.1	-1.1	-2.5	-4.3	-6.6	-9.3
Lp, dB(A)	15.8	18.6	21.2	22.3	21.3	22.8	24.6	28.9	31.6	30.8	31.7	33.0	36.7	36.5	39.7	43.1	44.6	46.5	45.4	43.4	42.9	43.2	40.4	38.0	35.7	31.3	25.7	19.5	12.2	5.3

A-Wt Sound Pr. Level = 53.8 dB(A)

CORRECTION FOR TONALITY

CORRECTION (a) : MAX = 46.5

Max - X < 15

Freq, Hz	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1k	1.25k	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
Lp, dB(A)	15.8	18.6	21.2	22.3	21.3	22.8	24.6	28.9	31.6	30.8	31.7	33.0	36.7	36.5	39.7	43.1	44.6	46.5	45.4	43.4	42.9	43.2	40.4	38.0	35.7	31.3	25.7	19.5	12.2	5.3
	0	0	0	0	0	0	0	0	31.6	0	31.7	33.0	36.7	36.5	39.7	43.1	44.6	46.5	45.4	43.4	42.9	43.2	40.4	38.0	35.7	0	0	0	0	0
CORRECTION (b) :																														
X - adjacent bands >1																														
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46.5	0	0	0	0	0	0	0	0	0	0	0	0
CORRECTION (c) :																														
X - mean of adjacent bands >3																														
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.5	0	0	0	0	0	0	0	0	0	0	0	0
Ftone=	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TONAL CORRECTION :																														
dB(A)		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	

TONAL CORR.= **0** dB(A)

TONAL CORRECTION FOR MEASURED 1/3 OCTAVE NOISE LEVELS - PAIR OF BANDS

DATE : 25/7/24
JOB NO.: 22458 Lin Fa Tei
PROJECT: Source ID: C

MEASURED NOISE LEVELS :

Freq, Hz	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1k	1.25k	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
Lp, dB	60.5	58.0	55.8	52.5	47.5	45.3	43.7	45.0	45.0	41.7	40.3	39.6	41.5	39.7	41.6	43.9	44.6	45.9	44.4	42.2	41.6	42.0	39.4	37.5	35.8	32.4	28.2	23.8	18.8	14.6
A-Weighting, dB	-44.7	-39.4	-34.6	-30.2	-26.2	-22.5	-19.1	-16.1	-13.4	-10.9	-8.6	-6.6	-4.8	-3.2	-1.9	-0.8	0.0	0.6	1.0	1.2	1.3	1.2	1.0	0.5	-0.1	-1.1	-2.5	-4.3	-6.6	-9.3
Lp, dB(A)	15.8	18.6	21.2	22.3	21.3	22.8	24.6	28.9	31.6	30.8	31.7	33.0	36.7	36.5	39.7	43.1	44.6	46.5	45.4	43.4	42.9	43.2	40.4	38.0	35.7	31.3	25.7	19.5	12.2	5.3

A-Wt Sound Pr. Level = 53.8 dB(A)

CORRECTION FOR TONALITY

CORRECTION (a) : MAX = 46.5

Max - Max of Xs < 15

Freq, Hz	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1k	1.25k	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
Lp, dB(A)	15.8	18.6	21.2	22.3	21.3	22.8	24.6	28.9	31.6	30.8	31.7	33.0	36.7	36.5	39.7	43.1	44.6	46.5	45.4	43.4	42.9	43.2	40.4	38.0	35.7	31.3	25.7	19.5	12.2	5.3
Ave. Lp of pair	0	19.9	21.8	21.8	22.1	23.7	26.8	30.3	31.2	31.3	32.4	34.9	36.6	38.1	41.4	43.9	45.6	46.0	44.4	43.2	43.1	41.8	39.2	36.9	33.5	28.5	22.6	15.9	8.8	0
	0	0	0	0	0	0	0	30.3	31.2	31.3	32.4	34.9	36.6	38.1	41.4	43.9	45.6	46.0	44.4	43.2	43.1	41.8	39.2	36.9	33.5	0	0	0	0	0
CORRECTION (b) :																														
Mean of X - adjacent bands >1																														
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46.0	0	0	0	0	0	0	0	0	0	0	0	0
CORRECTION (c) :																														
Mean of X - mean of adjacent bands >3																														
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.0	0	0	0	0	0	0	0	0	0	0	0	0
Ftone=	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TONAL CORRECTION :

Pair of 1/3 octave bands starting with, Hz

	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1k	1.25k	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k
dB(A)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

TONAL CORR.= **0** dB(A)

TONAL CORRECTION FOR MEASURED 1/3 OCTAVE NOISE LEVELS - SINGLE BAND

DATE :	25/7/2024				
JOB NO.:	22458 Lin Fa Tei	location		store name	store no.
SUBJECT:	Source ID: D			manual_0913	89

Freq, Hz	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1k	1.25k	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
Lp, dB	60.8	56.0	57.3	52.9	53.7	56.3	48.3	48.5	48.7	46.7	45.0	44.6	41.6	41.1	43.3	42.6	42.9	41.5	41.3	39.1	37.4	37.2	35.6	33.3	30.7	26.6	22.0	16.1	12.7	12.3
A-Weighting, dB	-44.7	-39.4	-34.6	-30.2	-26.2	-22.5	-19.1	-16.1	-13.4	-10.9	-8.6	-6.6	-4.8	-3.2	-1.9	-0.8	0.0	0.6	1.0	1.2	1.3	1.2	1.0	0.5	-0.1	-1.1	-2.5	-4.3	-6.6	-9.3
Lp, dB(A)	16.1	16.6	22.7	22.7	27.5	33.8	29.2	32.4	35.3	35.8	36.4	38.0	36.8	37.9	41.4	41.8	42.9	42.1	42.3	40.3	38.7	38.4	36.6	33.8	30.6	25.5	19.5	11.8	6.1	3.0

A-Wt Sound Pr. Level = 51.8 dB(A)

CORRECTION FOR TONALITY

CORRECTION (a) : MAX = 42.9

Max - X < 15

Freq, Hz	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1k	1.25k	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
Lp, dB(A)	16.1	16.6	22.7	22.7	27.5	33.8	29.2	32.4	35.3	35.8	36.4	38.0	36.8	37.9	41.4	41.8	42.9	42.1	42.3	40.3	38.7	38.4	36.6	33.8	30.6	25.5	19.5	11.8	6.1	3.0
	0	0	0	0	0	33.8	29.2	32.4	35.3	35.8	36.4	38.0	36.8	37.9	41.4	41.8	42.9	42.1	42.3	40.3	38.7	38.4	36.6	33.8	30.6	0	0	0	0	0

CORRECTION (b) :

X - adjacent bands >1

	0	0	0	0	0	33.8	0	0	0	0	0	38.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

CORRECTION (c) :

X - mean of adjacent bands >3

	0	0	0	0	0	5.5	0	0	0	0	0	1.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ftone=	0	0	0	0	0	5.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TONAL CORRECTION :

dB(A)		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	

TONAL CORR.= **0** dB(A)

TONAL CORRECTION FOR MEASURED 1/3 OCTAVE NOISE LEVELS - PAIR OF BANDS

DATE : 25/7/24
JOB NO.: 22458 Lin Fa Tei
PROJECT: Source ID: D

MEASURED NOISE LEVELS :

Freq, Hz	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1k	1.25k	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
Lp, dB	60.8	56.0	57.3	52.9	53.7	56.3	48.3	48.5	48.7	46.7	45.0	44.6	41.6	41.1	43.3	42.6	42.9	41.5	41.3	39.1	37.4	37.2	35.6	33.3	30.7	26.6	22.0	16.1	12.7	12.3
A-Weighting, dB	-44.7	-39.4	-34.6	-30.2	-26.2	-22.5	-19.1	-16.1	-13.4	-10.9	-8.6	-6.6	-4.8	-3.2	-1.9	-0.8	0.0	0.6	1.0	1.2	1.3	1.2	1.0	0.5	-0.1	-1.1	-2.5	-4.3	-6.6	-9.3
Lp, dB(A)	16.1	16.6	22.7	22.7	27.5	33.8	29.2	32.4	35.3	35.8	36.4	38.0	36.8	37.9	41.4	41.8	42.9	42.1	42.3	40.3	38.7	38.4	36.6	33.8	30.6	25.5	19.5	11.8	6.1	3.0

A-Wt Sound Pr. Level = 51.8 dB(A)

CORRECTION FOR TONALITY

CORRECTION (a) : MAX = 42.9

Max - Max of Xs < 15

Freq, Hz	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1k	1.25k	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
Lp, dB(A)	16.1	16.6	22.7	22.7	27.5	33.8	29.2	32.4	35.3	35.8	36.4	38.0	36.8	37.9	41.4	41.8	42.9	42.1	42.3	40.3	38.7	38.4	36.6	33.8	30.6	25.5	19.5	11.8	6.1	3.0
Ave. Lp of pair	0	19.7	22.7	25.1	30.7	31.5	30.8	33.9	35.6	36.1	37.2	37.4	37.4	39.7	41.6	42.4	42.5	42.2	41.3	39.5	38.6	37.5	35.2	32.2	28.1	22.5	15.7	9.0	4.6	0
	0	0	0	0	30.7	31.5	30.8	33.9	35.6	36.1	37.2	37.4	37.4	39.7	41.6	42.4	42.5	42.2	41.3	39.5	38.6	37.5	35.2	32.2	28.1	0	0	0	0	0
CORRECTION (b) :																														
Mean of X - adjacent bands >1																														
	0	0	0	0	30.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CORRECTION (c) :																														
Mean of X - mean of adjacent bands >3																														
	0	0	0	0	4.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ftone=	0	0	0	0	4.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TONAL CORRECTION :

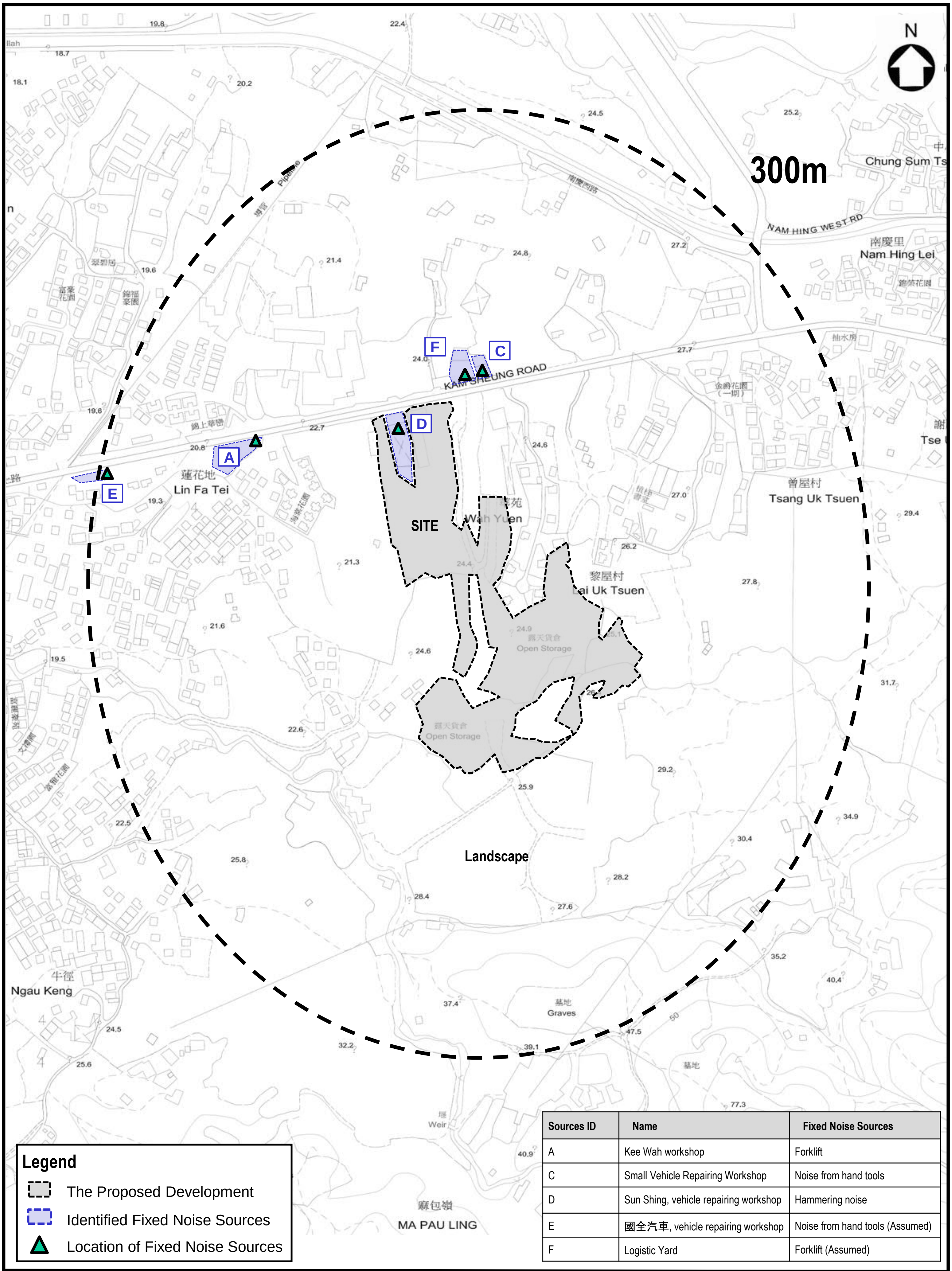
Pair of 1/3 octave bands starting with, Hz

	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1k	1.25k	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k
dB(A)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

TONAL CORR.= **0** dB(A)

APPENDIX 6

FIXED NOISE SOURCES ASSESSMENT FOR THE PROPOSED DEVELOPMENT



Legend

▨ The Proposed Development

▨ Identified Fixed Noise Sources

▲ Location of Fixed Noise Sources

Sources ID	Name	Fixed Noise Sources
A	Kee Wah workshop	Forklift
C	Small Vehicle Repairing Workshop	Noise from hand tools
D	Sun Shing, vehicle repairing workshop	Hammering noise
E	國全汽車, vehicle repairing workshop	Noise from hand tools (Assumed)
F	Logistic Yard	Forklift (Assumed)

Westwood Hong & Associates Ltd

PROJECT: 22458

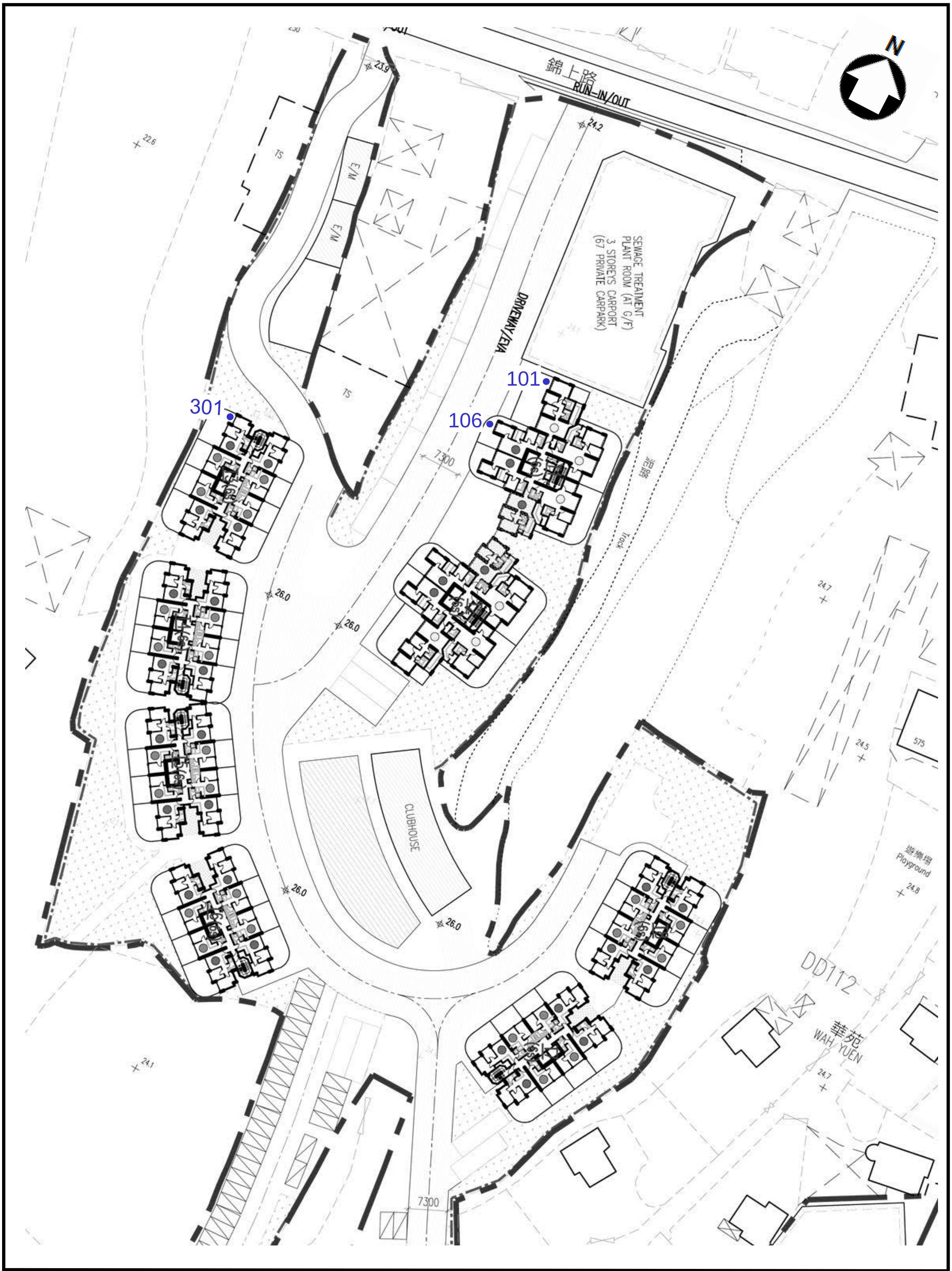
Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Location of Fixed Noise Sources

FIGURE

A6-1



Westwood Hong & Associates Ltd

PROJECT: 22458

Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Location of Assessment Points for Fixed Noise Sources Assessment

FIGURE

A6-2

Predicted Industrial Noise Levels in Daytime Period

Job Title.: Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories
Job No.: 22458
Date: 25/7/2024

Floor	**NSR 101**	**NSR 106**	**NSR 301**
1/F	54.7	53.8	52.4
2/F	54.6	53.8	52.3
3/F	54.6	53.8	52.3
4/F	54.5	53.7	52.3
5/F	54.4	53.6	52.2
6/F	54.2	53.5	52.1
Max:	54.7	53.8	52.4
Noise Criterion	60.0	60.0	60.0
Compliance	YES	YES	YES

Remark: The predicted noise levels were assessed at the height of 1.2m above each residential floor and 1m away from the façade of the opened windows of the noise sensitive receivers as stated in Section 7.3

Calculation of Industrial Noise Levels (Daytime Period)

Westwood Hong & Associates Ltd.

Job Title.:	Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories
Job No.:	22458
Date:	25/07/24

NSR	NSR 101 1/F			Xr : 827270 Yr : 832165 Hr : 27.2									
				Source location & distance				Corrections					CNL
Source ID	Description	SWL	No.	Xs	Ys	Hs	Lsr	Cno	CLsr	Cton	Cimp	Cfac	dB(A)
A	Kee Wah Workshop	80	1	827086	832180	25	183.9	0	-53.3	3.0	3.0	3	35.7
C	Small vehicle repairing workshop	82	1	827318	832257	25	103.7	0	-48.3	3.0	3.0	3	42.7
D	Sun Shing, vehicle repairing workshop	87	1	827230	832196	25	50.3	0	-42.0	3.0	3.0	3	54.0
E	國全汽車, vehicle repairing workshop	87	1	826912	832139	25	359.1	0	-59.1	3.0	3.0	3	36.9
D	Logistic Yard	80	1	827307	832246	25	89.0	0	-47.0	3.0	3.0	3	42.0
												TOTAL	**54.7**

Definition of terms:

SWL	- the sound power level of a source, dB(A)	Cno	- correction for no. of plant items
LAeq	- the equivalent continuous noise level over a 30 minute period, dB(A)	CLsr	- the correction for slant distance between the source and the NSR, dB(A)
No.	- the number of items of plant operating simultaneously	Cton	- the tonality correction, dB(A)
Xr, Yr, Hr	- the coordinates of the NSR, m	Cfac	- the facade correction, dB(A)
Xs, Ys, Hs	- the coordinates of the source, m	Cimp	- the impulsiveness correction, dB(A)
Lsr	- the slant distance between the source and NSR, m	CNL	- the corrected noise level, dB(A)(30 minutes)

Calculation of Industrial Noise Levels (Daytime Period)

Westwood Hong & Associates Ltd.

Job Title.:	Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories
Job No.:	22458
Date:	25/07/24

NSR: NSR 106, 1/F

Xr : 827265
Yr : 832153
Hr : 27.2

				Source location & distance				Corrections					CNL
Source ID	Description	SWL	No.	Xs	Ys	Hs	Lsr	Cno	CLsr	Cton	Cimp	Cfac	dB(A)
A	Kee Wah Workshop	80	1	827086	832180	25	180.2	0	-53.1	3.0	3.0	3	35.9
C	Small vehicle repairing workshop	82	1	827318	832257	25	117.0	0	-49.4	3.0	3.0	3	41.6
D	Sun Shing, vehicle repairing workshop	87	1	827230	832196	25	55.2	0	-42.8	3.0	3.0	3	53.2
E	國全汽車, vehicle repairing workshop	87	1	826912	832139	25	353.2	0	-59.0	3.0	3.0	3	37.0
D	Logistic Yard	80	1	827307	832246	25	102.3	0	-48.2	3.0	3.0	3	40.8
												TOTAL	**53.8**

Definition of terms:

SWL	- the sound power level of a source, dB(A)
LAeq	- the equivalent continuous noise level over a 30 minute period, dB(A)
No.	- the number of items of plant operating simultaneously
Xr, Yr, Hr	- the coordinates of the NSR, m
Xs, Ys, Hs	- the coordinates of the source, m
Lsr	- the slant distance between the source and NSR, m
Cno	- correction for no. of plant items
CLsr	- the correction for slant distance between the source and the NSR, dB(A)
Cton	- the tonality correction, dB(A)
Cfac	- the facade correction, dB(A)
Cimp	- the impulsiveness correction, dB(A)
CNL	- the corrected noise level, dB(A)(30 minutes)

Calculation of Industrial Noise Levels (Daytime Period)

Westwood Hong & Associates Ltd.

Job Title.:	Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories
Job No.:	22458
Date:	25/07/24

NSR: NSR 301
1/F
Xr : 827222
Yr : 832130
Hr : 27.2

				Source location & distance				Corrections					CNL
Source ID	Description	SWL	No.	Xs	Ys	Hs	Lsr	Cno	CLsr	Cton	Cimp	Cfac	dB(A)
A	Kee Wah Workshop	80	1	827086	832180	25	144.7	0	-51.2	3.0	3.0	3	37.8
C	Small vehicle repairing workshop	82	1	827318	832257	25	158.7	0	-52.0	3.0	3.0	3	39.0
D	Sun Shing, vehicle repairing workshop	87	1	827230	832196	25	65.8	0	-44.4	3.0	3.0	3	51.6
E	國全汽車, vehicle repairing workshop	87	1	826912	832139	25	310.8	0	-57.9	3.0	3.0	3	38.1
D	Logistic Yard	80	1	827307	832246	25	143.3	0	-51.1	3.0	3.0	3	37.9
												TOTAL	**52.4**

Definition of terms:

SWL	- the sound power level of a source, dB(A)	Cno	- correction for no. of plant items
LAeq	- the equivalent continuous noise level over a 30 minute period, dB(A)	CLsr	- the correction for slant distance between the source and the NSR, dB(A)
No.	- the number of items of plant operating simultaneously	Cton	- the tonality correction, dB(A)
Xr, Yr, Hr	- the coordinates of the NSR, m	Cfac	- the facade correction, dB(A)
Xs, Ys, Hs	- the coordinates of the source, m	Cimp	- the impulsiveness correction, dB(A)
Lsr	- the slant distance between the source and NSR, m	CNL	- the corrected noise level, dB(A)(30 minutes)

Report No: 22458-S1 Rev A

PROPOSED REZONING FROM “RESIDENTIAL (GROUP D)” TO “RESIDENTIAL (GROUP C)” ZONE FOR PROPOSED RESIDENTIAL DEVELOPMENT AT VARIOUS LOTS AND ADJOINING GOVERNMENT LAND IN D.D.112, KAM SHEUNG ROAD, SHEK KONG, YUEN LONG, NEW TERRITORIES

SENSITIVITY STUDY FOR NOISE BARRIER

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JULY 2024

WHA

CONTENTS

1. INTRODUCTION

1.1 According to the Traffic Impact Assessment (TIA) under this Planning Application, improvement work is proposed at the junction of Kam Sheung Road / Kam Tin Road. The proposed noise barrier at this junction is required to setback. Westwood Hong & Associates Ltd (WHA) was commissioned to conduct a sensitive study to assess the noise implication for the adjustment of the noise barrier.

1.2 The noise barrier proposed in the EIA Report "Upgrading of Remaining Sections of Kam Tin Road and Lam Kam Road" ("the EIA Report", which is also 6820TH Project) aims to mitigate the road traffic noise. Hence, only road traffic noise would be considered in this sensitivity study.

1.3 Further to our meeting with the Highways Department on 8 July 2024, it is our understanding that the implementation programmes of both 6820TH Project and 6892TH Project are still under review and will be subject to change by the Highways Department. To ensure certainty of the Applicant's proposal, the Applicant would like to bring forward two implementation scenarios (i.e. BEFORE the implementation of the improvement works carried out by HyD and AFTER the implementation of the improvement works carried out by HyD).

Before the implementation of the improvement works carried out by HyD

1.4 The Applicant will undertake necessary junction improvement works at Junction Kam Sheung Road/ Kam Tin Road to avoid adverse traffic impact generated from the proposed Development. With the proposed improvement works carried by the Applicant (before the implementation of improvement works carried out by HyD), there will be no interface issues between the proposed improvement works with HyD's 6820TH Project and 6892TH Project.

After the implementation of the improvement works carried out by HyD

1.5 Under this scenario, the implementation programme of 6820TH Project and 6892TH Project would be able to match with the anticipated completion year of the project. The Applicant will implement the improvement works together with the relocation of the noise barrier at his own expense after the implementation of junction improvement works carried out by HyD. This Sensitivity Study for the Noise Barrier has been conducted to demonstrate that the relocation of the noise barrier would not lead to any adverse impact to the identified noise sensitive receivers.

2. SITE LOCATION & BUILDING LAYOUT

Site Location

2.1 The project site is located south of Kam Sheung Road. The residential developments Lotus Hill and Hoi Tong Garden are located to the west, and Jazz Garden is located to the east. The location of the project site is shown in Figure 1. The concerned road junction is located at about 1.4km to the east of the project site.

Development Layout

2.2 The proposed Development comprises nineteen 6-storey low-rise blocks and 2 carports with 3-storey.

3. NOISE CRITERIA

Road Traffic Noise Criterion

3.1 According to the HKPSG, road traffic noise criterion for domestic premises is 70dB(A) L10(1 hour) at the external facades for the hour having the peak traffic flow. The noise criterion applied to the domestic premises which rely on opened windows for ventilation.

4. IMPROVEMENT PROPOSAL UNDER TIA

4.1 According to the TIA, improvement proposal includes junction widening and converting the priority junction to a signalized junction, as shown in Appendix 1. The associated noise barrier is proposed to be adjusted along the proposed road alignment.

5. NOISE RESULTS IN APPROVED EIA REPORT

Identified Noise Sensitive Receivers

5.1 According to the EIA Report "Upgrading of Remaining Sections of Kam Tin Road and Lam Kam Road", the identified Noise Sensitive Receivers (NSRs) near the concerned road section is provided in the Table 5.1 below.

Table 5.1 Representative Noise Sensitive Receivers

NAP ID	NSRs Descriptions	No. of Storeys	Height of Assessment Points (mPD)	Use	Road Traffic Noise Criteria
Existing NSRs					
N43	Village house next to Pat Heung Sheung Tsuen Village Office	3	49.5 52.3 55.1	Residential	70
N44	Village house, 4 Sheung Tsuen	3	51.0 53.8 56.6	Residential	70
N45	Village house, 3 Sheung Tsuen	3	52.4 55.2 58.0	Residential	70
N46	Village house, 9B Sheung Tsuen	3	56.4 59.2 62.0	Residential	70
Planned NSR					
P14	Planned Village Type Development (V Zone) at Shek Kong OZP (Statutory Plan No. S/YL-SK/9)	3 [1]	51.9 54.7 57.5	Residential	70

Remark:-

[1] Permitted maximum building height or number of storey stated in the approved Outline Zoning Plan

Predicted and Evaluation of Operation Noise Impact

5.2 The noise results of unmitigated scenario are summarised in Table 5.2 below.

Table 5.2 Predicted Maximum Road Traffic Noise Levels of Representative NSRs (Unmitigated Scenario)

NAP ID	NSRs Descriptions	Noise Criteria, dB(A)	Predicted Maximum Nosie Levels (L10(1 hour)), dB(A)
N43	Village house next to Pat Heung Tsuen Village Office	70	**<u>76</u>**
N44	Village house, 4 Sheung Tsuen	70	**<u>76</u>**
N45	Village house, 3 Sheung Tsuen	70	**<u>75</u>**
N46	Village house, 9B Sheung Tsuen	70	**<u>75</u>**
P14	Planned Village Type Development (V Zone) at Shek Kong OZP (Statutory Plan No. S/YL-SK/9)	70	**<u>82</u>**

Note: Noise levels exceeding the road traffic noise criteria are **<u>bolded and underlined</u>**.

Mitigation of Operation Noise Impact

5.3 According to the EIA report, direct noise mitigation measure of vertical noise barrier is proposed at the concerned road section, as summarised in Table 5.3 and provided in Appendix 2.

Table 5.3 Details of the Proposed Noise Barrier

Noise Barrier ID	Barrier Type	Height, m	Approximate Length, m
NB94	Vertical (reflective)	5	25

Mitigated Scenario

5.4 With the implementation of noise mitigation measures (i.e. NB94), the predicted road traffic noise levels at the representative NSRs under the mitigated scenario are summarised in Table 5.4 below.

Table 5.4 Predicted Traffic Noise Levels at the Representative NSRs

NAP ID	NSRs Descriptions	Noise Criteria, dB(A)		Predicted Overall Noise Level without Project (L10(1 hour)), dB(A)	Predicted Overall Noise Level in Mitigated Scenario with Project (L10(1 hour)), dB(A)	Difference
N43	Village house next to Pat Heung Sheung Tsuen Village Office	70	1/F 2/F 3/F	**<u>76.1</u>** **<u>76.0</u>** **<u>76.0</u>**	**<u>75.9</u>** **<u>75.8</u>** **<u>75.6</u>**	-0.2 -0.2 -0.4
N44	Village house, 4 Sheung Tsuen	70	1/F 2/F 3/F	**<u>75.1</u>** **<u>75.8</u>** **<u>76.0</u>**	65.3 65.7 66.8	-9.8 -10.1 -9.2
N45	Village house, 3 Sheung Tsuen	70	1/F 2/F 3/F	**<u>73.7</u>** **<u>74.6</u>** **<u>74.9</u>**	64.7 65.2 66.0	-9.0 -9.4 -8.9
N46	Village house, 9B Sheung Tsuen	70	1/F 2/F 3/F	**<u>74.6</u>** **<u>74.6</u>** **<u>74.5</u>**	**<u>73.7</u>** **<u>73.7</u>** **<u>73.6</u>**	-0.9 -0.9 -0.9
P14	Planned Village Type Development (V Zone) at Shek Kong OZP (Statutory Plan No. S/YL-SK/9)	70	1/F 2/F 3/F	**<u>82.1</u>** **<u>82.2</u>** **<u>81.5</u>**	64.5 68.2 **<u>77.0</u>**	-17.6 -14.0 -4.5

Note:
- Noise levels exceeding the road traffic noise criteria are **<u>bolded and underlined</u>**.
- The detailed predicted noise levels are extracted from Appendix 4.15 of the EIA report

5.5 According to the EIA report, the increase of road traffic noise levels from the Project are mainly due to the widening of the existing road traffic lane which moves the road traffic noise source closer to the existing NSRs. The increase in road traffic noise level due to the Project is considered not significant (less than 1.0dB(A)) increase in all NSRs) after implementation of noise mitigation measures when comparing to the without Project scenario. The mitigated road traffic noise levels with the Project at NSRs are less than that of the without the Project.

6. SENSITIVITY STUDY

6.1 Due to the proposal of minor adjustment to the noise barrier NB94, sensitivity study of noise impact is conducted.

Traffic Forecast

6.2 The same set of Traffic Forecast in the EIA report is adopted in this sensitivity study. The year 2040 traffic forecast is provided in Appendix 3.

Noise Assessment Points for Road Traffic Noise Assessment

6.3 The assessment points are taken at the height of 1.2m above each residential floor and 1m away from the façade of openable windows of the noise sensitive rooms. The locations of the assessment points are same as the EIA report in order to compare the noise results.

Methodology of Road Traffic Noise Impact Assessment

6.4 The road traffic noise levels at the proposed Development were predicted, based on the predicted traffic flows in Year 2040 and in accordance with the procedures given in the CRTN. The predicted road traffic noise levels at the building facades include a 2.5dB(A) facade reflection and correction factors for gradient, distance, view angle, barriers and road surface material.

6.5 The study area of the road traffic noise assessment would be 300m from the identified NSRs near to the concerned road section. According to the EIA report, the Low Noise Road Surfacing (LNRS) will be adopted for CHB35+20.00 to CHB36+50.00 (both lane), CHB36+50.00 to CHB37+50.00 (southbound single lane) and CHB37+50.00 to CHB38+00.00 (both lane), all other roads are assumed to be impervious surface.

Predicted Road Traffic Noise Levels for Base Scenario

6.6 Base scenario (without any noise mitigation measures) is conducted to validate the prediction noise model by comparing the predicted noise results. The noise results of the unmitigated scenario are provided in Appendix 4 and summarised in Table 6.1.

Table 6.1 Predicted Traffic Noise Levels at the Representative NSRs for Base Scenario

NAP ID	NSRs Descriptions	Noise Criteria, dB(A)		EIA report - Predicted Overall Noise Level in Base Scenario with Project (L10(1 hour)), dB(A) [1]	In this Sensitivity Study - Predicted Overall Noise Level in Base Scenario with Project (L10(1 hour)), dB(A) [2]	Remark
N43	Village house next to Pat Heung Sheung Tsuen Village Office	70	1/F 2/F 3/F	**76.1** **76.0** **76.0**	**76.3** **76.2** **76.0**	Difference are <1dB(A)
N44	Village house, 4 Sheung Tsuen	70	1/F 2/F 3/F	**75.1** **75.8** **76.0**	**76.0** **76.1** **76.1**	Difference are <1dB(A)
N45	Village house, 3 Sheung Tsuen	70	1/F 2/F 3/F	**73.7** **74.5** **74.9**	**73.6** **74.4** **74.6**	Difference are <1dB(A)
N46	Village house, 9B Sheung Tsuen	70	1/F 2/F 3/F	**74.6** **74.6** **74.5**	**74.6** **74.5** **74.3**	Difference are <1dB(A)
P14	Planned Village Type Development (V Zone) at Shek Kong OZP (Statutory Plan No. S/YL-	70	1/F 2/F 3/F	**82.1** **82.2** **81.5**	**82.1** **81.7** **81.1**	Difference are <1dB(A)

Note:

[1] Extracted from Appendix 4.11 of EIA report.

[2] The predicted noise results prepared by WHA.

6.7 The difference may be due to the minor variance of input and assumption of the noise prediction model. However, as the difference are less than 1dB(A), it is considered as minimal and acceptable.

Predicted Road Traffic Noise Levels for the Noise Barrier at Original Location

6.8 Noise prediction is also conducted for the mitigated scenario (the noise barrier at the original location) to further validate the prediction noise model by comparing the predicted noise results. The noise results of the mitigated scenario are provided in Appendix 5 and summarised in Table 6.2.

Table 6.2 Predicted Traffic Noise Levels at the Representative NSRs for Mitigated Scenario

NAP ID	**NSRs Descriptions**	**Noise Criteria, dB(A)**		**EIA report - Predicted Overall Noise Level with Mitigation Measures (L10(1 hour)), dB(A) [1]**	**In this Sensitivity Study -Predicted Overall Noise Level with Mitigation Measures (L10(1 hour)), dB(A) [2]**	**Remark**
N43	Village house next to Pat Heung Sheung Tsuen Village Office	70	1/F 2/F 3/F	**75.9** **75.8** **75.6**	**75.6** **75.5** **75.3**	Difference are <1dB(A)
N44	Village house, 4 Sheung Tsuen	70	1/F 2/F 3/F	65.3 65.7 66.8	67.2 67.5 68.3	All comply
N45	Village house, 3 Sheung Tsuen	70	1/F 2/F 3/F	64.7 65.2 66.0	63.0 64.1 65.4	All comply
N46	Village house, 9B Sheung Tsuen	70	1/F 2/F 3/F	**73.7** **73.7** **73.6**	**73.4** **73.3** **73.1**	Difference are <1dB(A)
P14	Planned Village Type Development (V Zone) at Shek Kong OZP (Statutory	70	1/F 2/F 3/F	64.5 68.2 **77.0**	65.2 68.0 **77.1**	Difference are <1dB(A)

Note:
[1] Extracted from Appendix 4.13 of EIA report.
[2] The predicted noise results prepared by WHA.

6.9 According to the predicted noise results in Table 6.2, the difference between the EIA report and this sensitivity study are less than 1dB(A) and the findings are similar.

6.10 The predicted noise levels in Tables 6.1 and 6.2 indicate that the noise prediction model is considered as accurate and referenceable.

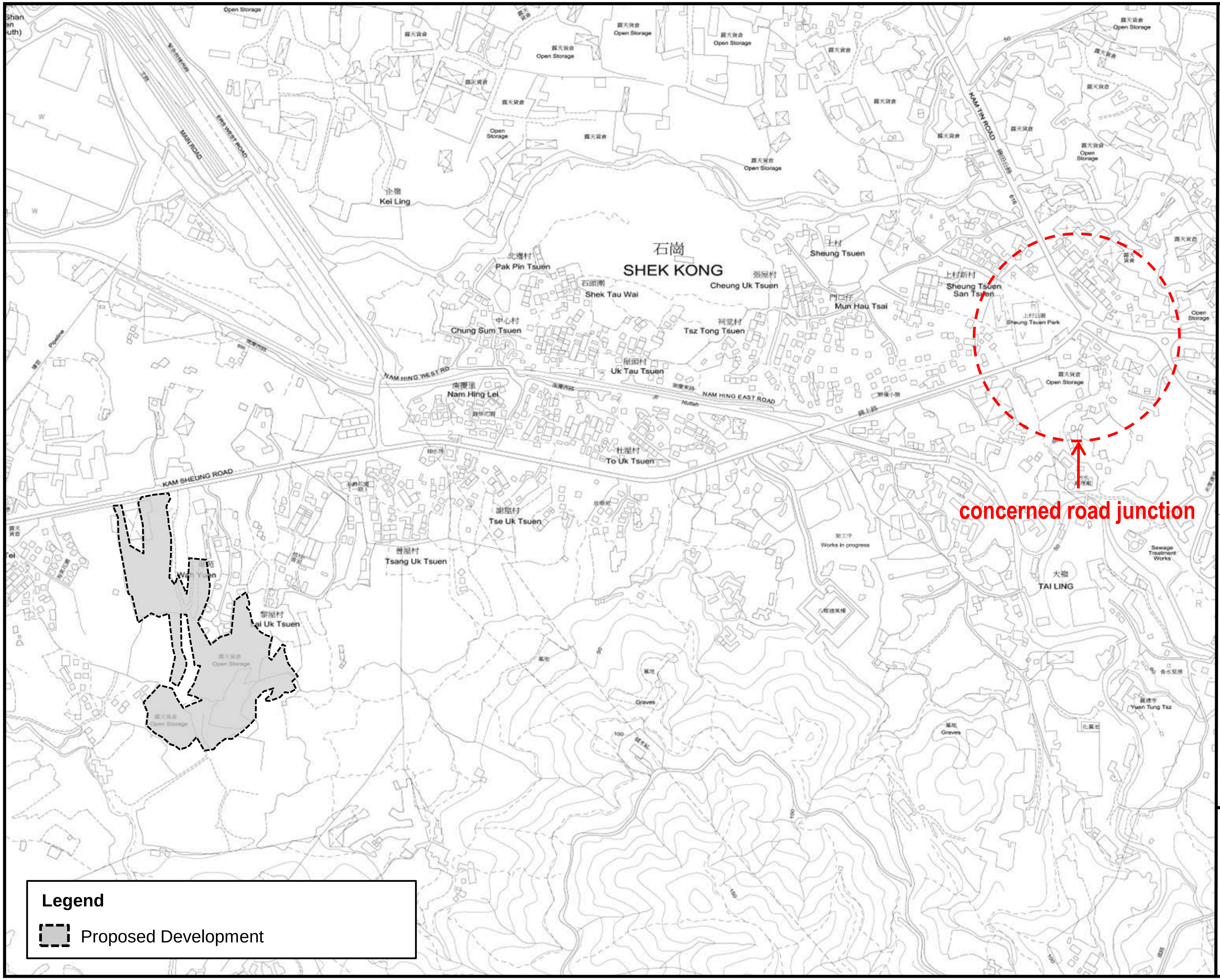
Predicted Road Traffic Noise Levels with Adjustment of Noise Barrier NB94

6.11 With the minor adjustment of the noise barrier, the predicted road traffic noise levels are provided in Appendix 6 and summarised in Table 6.3.

Table 6.3 Predicted Traffic Noise Levels at the Representative NSRs with Adjustment of the Noise Barrier

NAP ID	**NSRs Descriptions**	**Noise Criteria, dB(A)**		**Predicted Overall Noise Level for the Original Location of Noise Barrier (Table 6.2) (L10(1 hour)), dB(A)**	**Predicted Overall Noise Level for the Proposed Location of Noise Barrier (L10(1 hour)), dB(A)**	**Difference**	**Remark**
N43	Village house next to Pat Heung Sheung Tsuen Village Office	70	1/F 2/F 3/F	**75.6** **75.5** **75.3**	**75.6** **75.5** **75.3**	0.0 0.0 0.0	No difference
N44	Village house, 4 Sheung Tsuen	70	1/F 2/F 3/F	67.2 67.5 68.3	67.3 67.7 68.8	+0.1 +0.2 +0.5	All comply
N45	Village house, 3 Sheung Tsuen	70	1/F 2/F 3/F	63.0 64.1 65.4	63.0 64.2 65.7	0.0 +0.1 +0.3	All comply
N46	Village house, 9B Sheung Tsuen	70	1/F 2/F 3/F	**73.4** **73.3** **73.1**	**73.4** **73.3** **73.1**	0.0 0.0 0.0	No difference
P14	Planned Village Type Development (V Zone) at Shek Kong OZP (Statutory Plan No. S/YL-SK/9)	70	1/F 2/F 3/F	65.2 68.0 **77.1**	64.7 67.7 **77.3**	-0.5 -0.3 +0.2	Similar noise results

6.12 With the adjustment of the noise barrier, the noise results are similar and findings are the same. Therefore, the noise results indicate that the proposed adjustment of the noise barrier NB94 would not have significant noise implication to the nearby NSRs.



Westwood Hong & Associates Ltd

PROJECT: 22458

Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

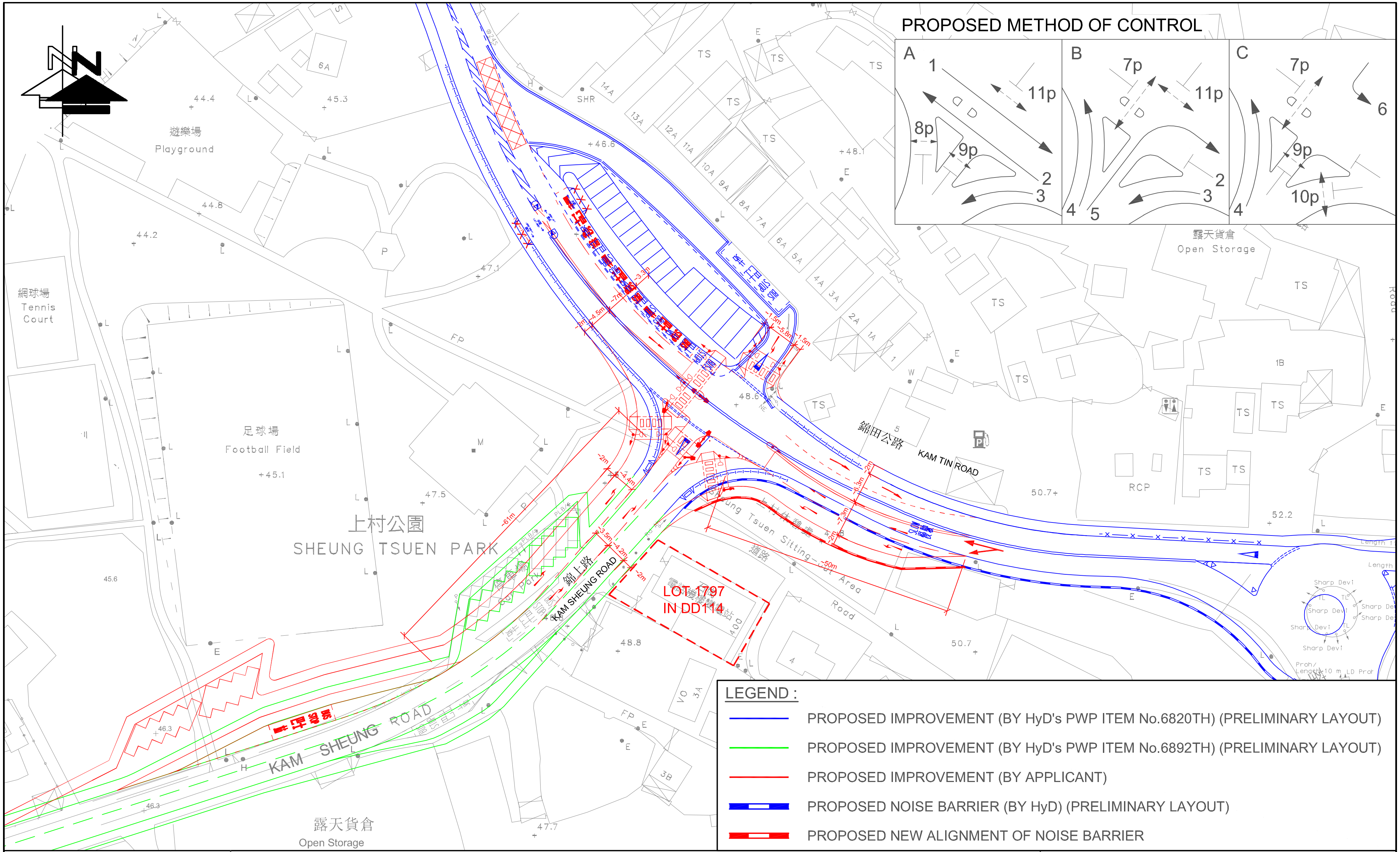
Location of the Project Site and the Concerned Road Junction

FIGURE

1

APPENDIX 1

EXTRACTED FROM TIA



LEGEND :

🟦	PROPOSED IMPROVEMENT (BY HyD's PWP ITEM No.6820TH) (PRELIMINARY LAYOUT)
🟩	PROPOSED IMPROVEMENT (BY HyD's PWP ITEM No.6892TH) (PRELIMINARY LAYOUT)
🟥	PROPOSED IMPROVEMENT (BY APPLICANT)
🟦	PROPOSED NOISE BARRIER (BY HyD) (PRELIMINARY LAYOUT)
🟥	PROPOSED NEW ALIGNMENT OF NOISE BARRIER

FIGURE NO.: 5.1

PROJECT TITLE:
S12A Application for DD112 in Kam Tin

PROJECT NO.: 21134HK-DD112

DRAWING TITLE:
PROPOSED FURTHER IMPROVEMENT LAYOUT ON HYD'S PWP SCHEME
OF JUNCTION KAM SHEUNG ROAD / KAM TIN ROAD (C)

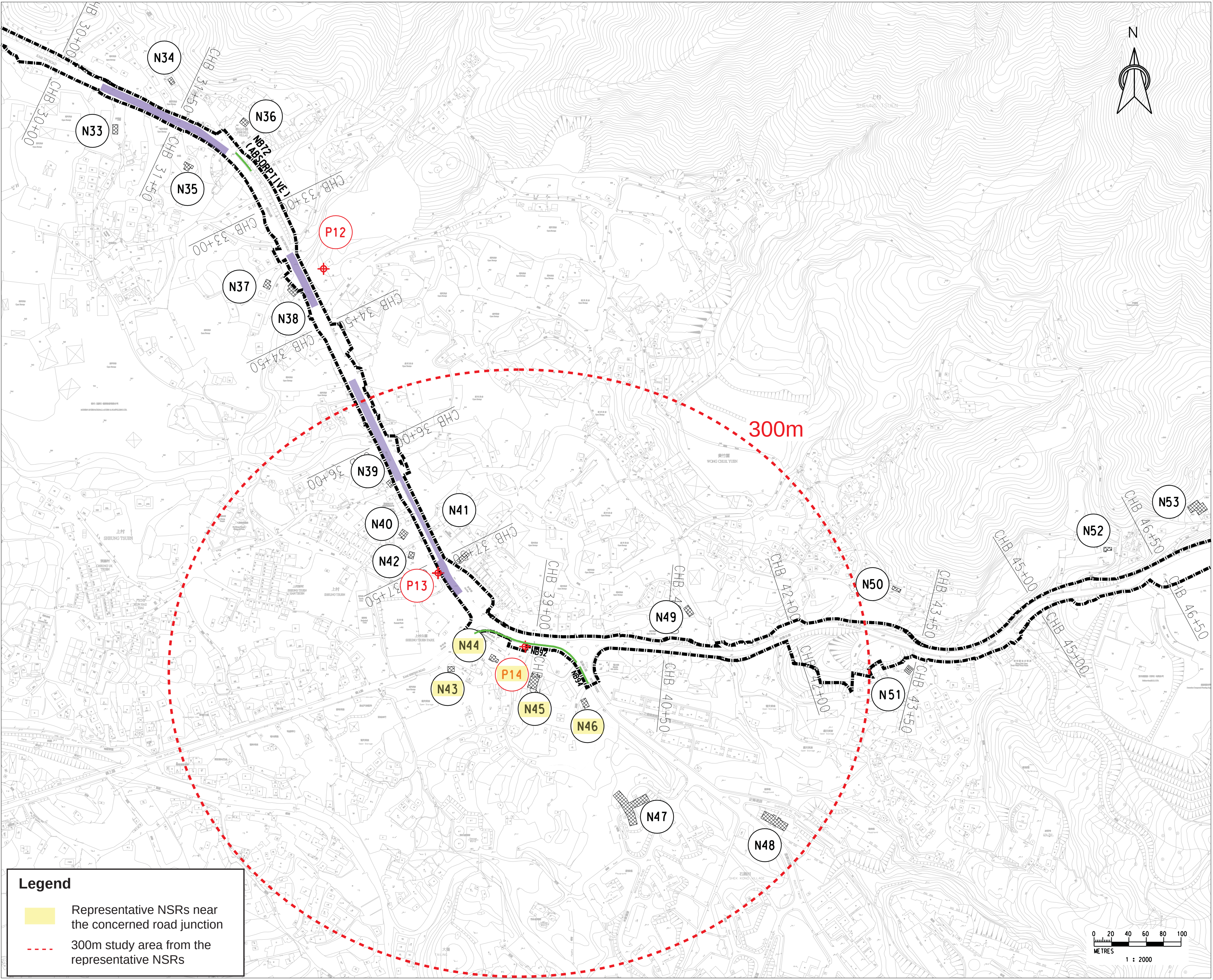
SCALE: 1 : 1000 @A4

DATE: 26 JUL 2024

CTA Consultants Limited
志達顧問有限公司

APPENDIX 2

LOCATION OF NOISE BARRIER NB94



LEGEND :

▨	Representative Noise Sensitive Receiver
⌖	Planned Noise Sensitive Receiver
— · —	Project Boundary
—	3.0m High Proposed Vertical Noise Barrier
—	4.0m High Proposed Vertical Noise Barrier
—	5.0m High Proposed Vertical Noise Barrier
▬	Proposed LNRS

Rev.	Description of Revision	Date	Ckd.

Client

路政署
HIGHWAYS DEPARTMENT
WORKS DIVISION

The Engineer

MANNINGS
(Asia) Consultants Limited

Project

Agreement No. CE 76/2017 (HY)
Upgrading of Remaining
Sections of Kam Tin Road and
Lam Kam Road

Title

Location of Proposed Low-noise
Road Surfacing and Noise Barriers

(Sheet 4 of 5)

Scale in A1
1 : 2000

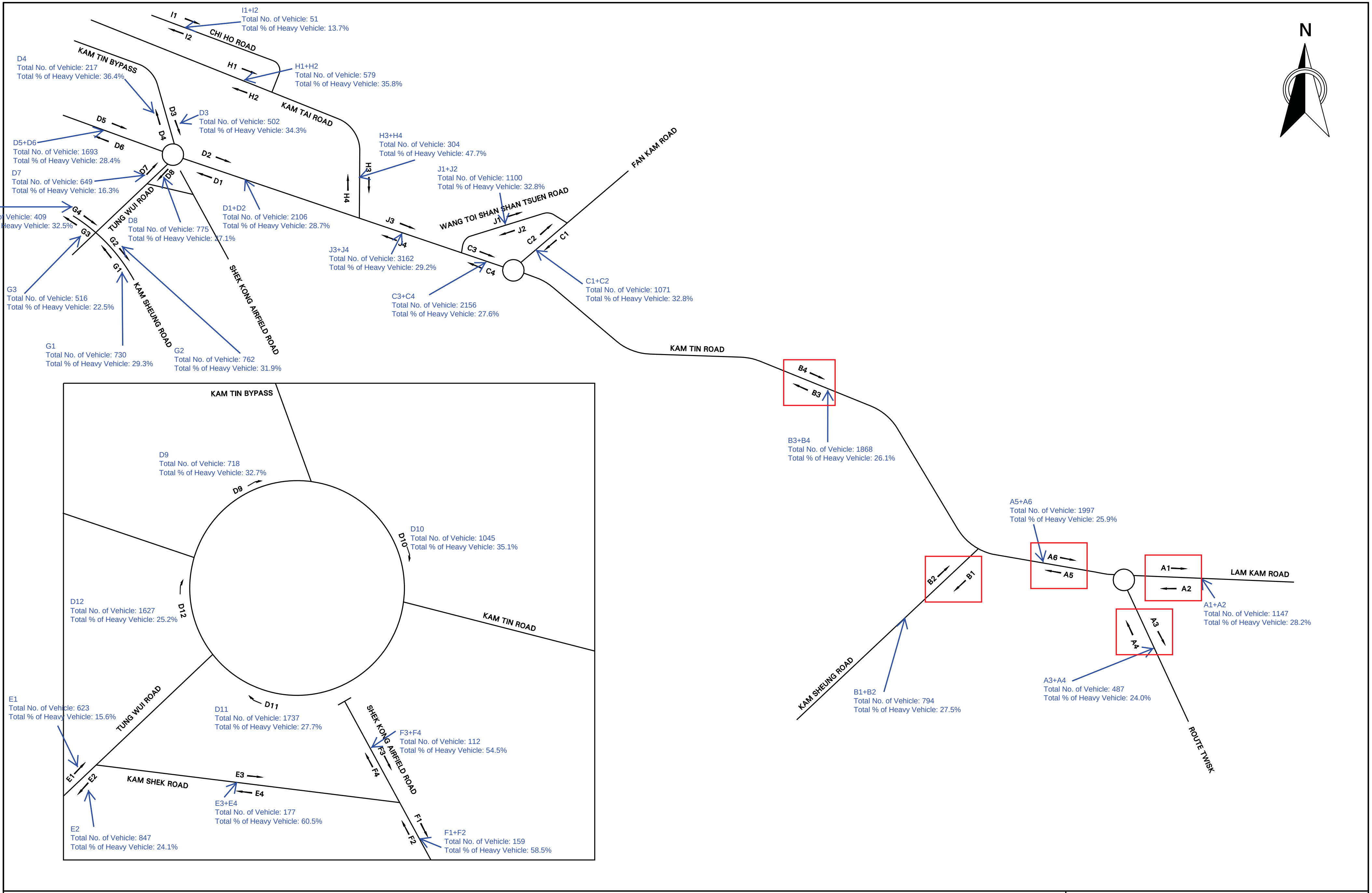
Drawing No.	Stage	Rev.
Figure 4.5d		

$DATE$ $TIME$

$FILE$

APPENDIX 3

YEAR 2040 TRAFFIC FORECAST
(ADOPTED IN APPROVED EIA REPORT)



Legend:

Symbolized Traffic Flow

Drawing number
P1062/TF/001

N.T.S. @A3

A

Appendix 4.8 Traffic Flow Data of Year 2040 (With and Without Project Scenarios)

A1		
Daily Traffic Flow Data in 2040		
Index	Vehicle Class	1800-1900
1	Private Car	365
2	Taxi	14
3	Light Goods Vehicles (<=2.5t)	101
4	Light Goods Vehicles (2.5-3.5t)	5
5	Light Goods Vehicles (3.5-5.5t)	17
6	Medium & Heavy Goods Vehicles (5.5-15t)	2
7	Medium & Heavy Goods Vehicles (>=15t)	17
8	Public Light Buses	20
9	Private Light Buses (<=3.5t)	0
10	Private Light Buses (>3.5t)	0
11	Non-franchised Buses (<6.4t)	0
12	Non-franchised Buses (6.4-15t)	0
13	Non-franchised Buses (>15t)	2
14	Single Deck Franchise Buses	0
15	Double Deck Franchise Buses	5
16	Motor Cycles	21
	Total No. of Vehicle	569
	No. of Heavy Vehicle	169
	%HV	29.7%

A2		
Daily Traffic Flow Data in 2040		
Index	Vehicle Class	1800-1900
1	Private Car	393
2	Taxi	12
3	Light Goods Vehicles (<=2.5t)	59
4	Light Goods Vehicles (2.5-3.5t)	27
5	Light Goods Vehicles (3.5-5.5t)	23
6	Medium & Heavy Goods Vehicles (5.5-15t)	5
7	Medium & Heavy Goods Vehicles (>=15t)	14
8	Public Light Buses	18
9	Private Light Buses (<=3.5t)	0
10	Private Light Buses (>3.5t)	0
11	Non-franchised Buses (<6.4t)	2
12	Non-franchised Buses (6.4-15t)	0
13	Non-franchised Buses (>15t)	2
14	Single Deck Franchise Buses	0
15	Double Deck Franchise Buses	5
16	Motor Cycles	18
	Total No. of Vehicle	578
	No. of Heavy Vehicle	155
	%HV	26.8%
A1A2	Total No. of Vehicle	1147
	Total %HV	28.2%

A3

Daily Traffic Flow Data in 2040

Index	Vehicle Class	1800-1900
1	Private Car	101
2	Taxi	0
3	Light Goods Vehicles (<=2.5t)	8
4	Light Goods Vehicles (2.5-3.5t)	21
5	Light Goods Vehicles (3.5-5.5t)	5
6	Medium & Heavy Goods Vehicles (5.5-15t)	8
7	Medium & Heavy Goods Vehicles (>=15t)	2
8	Public Light Buses	11
9	Private Light Buses (<=3.5t)	0
10	Private Light Buses (>3.5t)	0
11	Non-franchised Buses (<6.4t)	0
12	Non-franchised Buses (6.4-15t)	0
13	Non-franchised Buses (>15t)	0
14	Single Deck Franchise Buses	2
15	Double Deck Franchise Buses	2
16	Motor Cycles	0
	Total No. of Vehicle	160
	No. of Heavy Vehicle	59
	%HV	36.9%

A4

Daily Traffic Flow Data in 2040

Index	Vehicle Class	1800-1900
1	Private Car	244
2	Taxi	5
3	Light Goods Vehicles (<=2.5t)	38
4	Light Goods Vehicles (2.5-3.5t)	2
5	Light Goods Vehicles (3.5-5.5t)	3
6	Medium & Heavy Goods Vehicles (5.5-15t)	0
7	Medium & Heavy Goods Vehicles (>=15t)	2
8	Public Light Buses	11
9	Private Light Buses (<=3.5t)	0
10	Private Light Buses (>3.5t)	0
11	Non-franchised Buses (<6.4t)	0
12	Non-franchised Buses (6.4-15t)	0
13	Non-franchised Buses (>15t)	0
14	Single Deck Franchise Buses	2
15	Double Deck Franchise Buses	0
16	Motor Cycles	20
	Total No. of Vehicle	327
	No. of Heavy Vehicle	58
	%HV	17.7%
A3A4	Total No. of Vehicle	487
	Total %HV	24.0%

A5

Daily Traffic Flow Data in 2040

Index	Vehicle Class	1800-1900
1	Private Car	764
2	Taxi	29
3	Light Goods Vehicles (<=2.5t)	124
4	Light Goods Vehicles (2.5-3.5t)	21
5	Light Goods Vehicles (3.5-5.5t)	29
6	Medium & Heavy Goods Vehicles (5.5-15t)	2
7	Medium & Heavy Goods Vehicles (>=15t)	15
8	Public Light Buses	32
9	Private Light Buses (<=3.5t)	0
10	Private Light Buses (>3.5t)	0
11	Non-franchised Buses (<6.4t)	2
12	Non-franchised Buses (6.4-15t)	0
13	Non-franchised Buses (>15t)	2
14	Single Deck Franchise Buses	3
15	Double Deck Franchise Buses	23
16	Motor Cycles	42
	Total No. of Vehicle	1088
	No. of Heavy Vehicle	253
	%HV	23.3%

A6

Daily Traffic Flow Data in 2040

Index	Vehicle Class	1800-1900
1	Private Car	593
2	Taxi	26
3	Light Goods Vehicles (<=2.5t)	136
4	Light Goods Vehicles (2.5-3.5t)	18
5	Light Goods Vehicles (3.5-5.5t)	24
6	Medium & Heavy Goods Vehicles (5.5-15t)	6
7	Medium & Heavy Goods Vehicles (>=15t)	18
8	Public Light Buses	33
9	Private Light Buses (<=3.5t)	0
10	Private Light Buses (>3.5t)	0
11	Non-franchised Buses (<6.4t)	0
12	Non-franchised Buses (6.4-15t)	0
13	Non-franchised Buses (>15t)	2
14	Single Deck Franchise Buses	3
15	Double Deck Franchise Buses	24
16	Motor Cycles	26
	Total No. of Vehicle	909
	No. of Heavy Vehicle	264
	%HV	29.0%
A5A6	Total No. of Vehicle	1997
	Total %HV	25.9%

B1		
Daily Traffic Flow Data in 2040		
Index	Vehicle Class	1800-1900
1	Private Car	253
2	Taxi	11
3	Light Goods Vehicles (<=2.5t)	50
4	Light Goods Vehicles (2.5-3.5t)	3
5	Light Goods Vehicles (3.5-5.5t)	17
6	Medium & Heavy Goods Vehicles (5.5-15t)	2
7	Medium & Heavy Goods Vehicles (>=15t)	11
8	Public Light Buses	14
9	Private Light Buses (<=3.5t)	0
10	Private Light Buses (>3.5t)	2
11	Non-franchised Buses (<6.4t)	0
12	Non-franchised Buses (6.4-15t)	0
13	Non-franchised Buses (>15t)	2
14	Single Deck Franchise Buses	2
15	Double Deck Franchise Buses	6
16	Motor Cycles	24
	Total No. of Vehicle	397
	No. of Heavy Vehicle	109
	%HV	27.5%

B2		
Daily Traffic Flow Data in 2040		
Index	Vehicle Class	1800-1900
1	Private Car	253
2	Taxi	11
3	Light Goods Vehicles (<=2.5t)	50
4	Light Goods Vehicles (2.5-3.5t)	3
5	Light Goods Vehicles (3.5-5.5t)	17
6	Medium & Heavy Goods Vehicles (5.5-15t)	2
7	Medium & Heavy Goods Vehicles (>=15t)	11
8	Public Light Buses	14
9	Private Light Buses (<=3.5t)	0
10	Private Light Buses (>3.5t)	2
11	Non-franchised Buses (<6.4t)	0
12	Non-franchised Buses (6.4-15t)	0
13	Non-franchised Buses (>15t)	2
14	Single Deck Franchise Buses	2
15	Double Deck Franchise Buses	6
16	Motor Cycles	24
	Total No. of Vehicle	397
	No. of Heavy Vehicle	109
	%HV	27.5%
B1B2	Total No. of Vehicle	794
	Total %HV	27.5%

B3		
Daily Traffic Flow Data in 2040		
Index	Vehicle Class	1800-1900
1	Private Car	654
2	Taxi	36
3	Light Goods Vehicles (<=2.5t)	100
4	Light Goods Vehicles (2.5-3.5t)	21
5	Light Goods Vehicles (3.5-5.5t)	39
6	Medium & Heavy Goods Vehicles (5.5-15t)	14
7	Medium & Heavy Goods Vehicles (>=15t)	26
8	Public Light Buses	36
9	Private Light Buses (<=3.5t)	0
10	Private Light Buses (>3.5t)	0
11	Non-franchised Buses (<6.4t)	2
12	Non-franchised Buses (6.4-15t)	2
13	Non-franchised Buses (>15t)	9
14	Single Deck Franchise Buses	2
15	Double Deck Franchise Buses	9
16	Motor Cycles	41
	Total No. of Vehicle	991
	No. of Heavy Vehicle	260
	%HV	26.2%

B4		
Daily Traffic Flow Data in 2040		
Index	Vehicle Class	1800-1900
1	Private Car	572
2	Taxi	54
3	Light Goods Vehicles (<=2.5t)	104
4	Light Goods Vehicles (2.5-3.5t)	2
5	Light Goods Vehicles (3.5-5.5t)	51
6	Medium & Heavy Goods Vehicles (5.5-15t)	2
7	Medium & Heavy Goods Vehicles (>=15t)	14
8	Public Light Buses	42
9	Private Light Buses (<=3.5t)	0
10	Private Light Buses (>3.5t)	0
11	Non-franchised Buses (<6.4t)	0
12	Non-franchised Buses (6.4-15t)	0
13	Non-franchised Buses (>15t)	5
14	Single Deck Franchise Buses	3
15	Double Deck Franchise Buses	5
16	Motor Cycles	23
	Total No. of Vehicle	877
	No. of Heavy Vehicle	228
	%HV	26.0%
B3B4	Total No. of Vehicle	1868
	Total %HV	26.1%

APPENDIX 4

PREDICTED FAÇADE NOISE LEVELS FOR ROAD TRAFFIC NOISE, BASE SCENARIO

Job No. : **22458**
Job Title : **Lin Fa Tei**
Scenario: **Base Scenario, 2040 Traffic Forecast**

	Receiver				
Floor	N43	N44	N45	N46	P14
1	76.3	76.0	73.6	74.6	82.1
2	76.2	76.1	74.4	74.5	81.7
3	76.0	76.1	74.6	74.3	81.1

APPENDIX 5

PREDICTED FAÇADE NOISE LEVELS FOR ROAD TRAFFIC NOISE WITH NOISE BARRIER AT ORIGINIAL LOCATION

Job No. : 22458

Job Title : Lin Fa Tei

Scenario: With noise barrier at original location and LNRS, 2040 Traffic Forecast

	Receiver				
Floor	**N43**	**N44**	**N45**	**N46**	**P14**
1	**75.6**	67.2	63.0	**73.4**	65.2
2	**75.5**	67.5	64.1	**73.3**	68.0
3	**75.3**	68.3	65.4	**73.1**	**77.1**

APPENDIX 6

PREDICTED FAÇADE NOISE LEVELS FOR ROAD TRAFFIC NOISE WITH ADJUSTMENT OF NOISE BARRIER

Job No. : **22458**
Job Title : **Lin Fa Tei**
Scenario: **With adjustment of noise barrier and LNRS, 2040 Traffic Forecast**

	Receiver				
Floor	**N43**	**N44**	**N45**	**N46**	**P14**
1	**75.6**	67.3	63.0	**73.4**	64.7
2	**75.5**	67.7	64.2	**73.3**	67.7
3	**75.3**	68.8	65.7	**73.1**	**77.3**

S12A AMENDMENT OF PLAN APPLICATION
APPROVED SHEK KONG OUTLINE ZONING PLAN NO. S/YL-SK/9

Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

Supporting Planning Statement (Volume 2)

MARCH 2025

Applicant:

Tenox Development Limited

Consultancy Team:

KTA Planning Limited
China Hong Kong Ecology Consultants Limited
Stephen Lai Studio Limited
CTA Consultants Ltd.
Westwood Hong & Associates Ltd.
Mott MacDonald Hong Kong Ltd.

KTA
PLANNING LIMITED
規劃顧問有限公司

S3046_PS_V09

Appendix 6

Drainage Impact Assessment

MOTT MACDONALD

Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” zone For Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

Drainage Impact Assessment (Rev. J)

Feb 2025

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Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” zone For Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

Drainage Impact Assessment (Rev. J)

Feb 2025

Mott MacDonald Hong Kong Limited
registered in Hong Kong no. 236497

Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
A	Mar 2022	Edith CHOW	May TSE	May TSE	For submission
B	Jun 2022	Edith CHOW	May TSE	May TSE	For submission
C	Jan 2023	Edith CHOW	May TSE	May TSE	For submission
D	Mar 2023	Edith CHOW	May TSE	May TSE	For submission
E	Jun 2023	Edith CHOW	May TSE	May TSE	For submission
F	Aug 2023	Edith CHOW	May TSE	May TSE	For submission
G	Nov 2023	Edith CHOW	May TSE	May TSE	For submission
H	Feb 2024	Edith CHOW	May TSE	May TSE	For submission
I	Jun 2024	Edith CHOW	May TSE	May TSE	For submission
J	Aug 2024	Edith CHOW	May TSE	May TSE	For submission

Document reference: 426079 | 002 | J |

Contents

1 Introduction

1.1 General

1.1.1 Mott MacDonald Hong Kong Limited (hereinafter as “MMHK”) was commissioned by the Applicant to prepare a Drainage Impact Assessment (DIA) for supporting the proposed residential development at Lin Fa Tei, Yuen Long (the Site). The location of the proposed residential development is shown in **Appendix A1**. This Drainage Impact Assessment (DIA) is prepared to support the planning application under Section 12A of the Town Planning Ordinance.

1.1.2 This report forms part of the application document and will demonstrate that the proposed residential project at the Site is feasible in terms of its impact on the drainage system.

1.2 Objectives of the Assignment

1.2.1 The DIA focuses on the potential drainage impacts due to the implementation of the residential project at the Site. The objective of the DIA is to identify, assess and mitigate potential adverse drainage impacts which may arise from the Site.

1.3 Structure of the Report

1.3.1 This DIA Report contains the following sections in addition to this introduction (Section 1):-

Section 2 – Methodology and Design Parameters for Drainage Impact Assessment

Discuss the methodology adopted and the design parameters used in the drainage impact assessment.

Section 3 – Existing Drainage System

Describe the drainage conditions and catchment characteristics of the existing drainage system.

Section 4 – Drainage Impact Assessment and Proposed Drainage System

Briefly discuss the catchment characteristics of the proposed development and neighbouring area, assess the potential drainage impacts arising from the proposed development, and propose the necessary drainage mitigation works as necessary.

Section 5 – Conclusion

Summarise the findings and conclude the drainage impact arising from the Development.

2 Methodology and Design Parameters for Drainage Impact Assessment

2.1 General Approach

2.1.1 The DIA is conducted by comparing the existing drainage condition (Baseline Condition) against the drainage condition after the implementation of the proposed development (Proposed Condition) to identify potential drainage impacts to the existing drainage system near the Site. Appropriate mitigation measures will be proposed to reduce potential drainage impacts, if necessary.

2.1.2 Potential drainage impacts are identified by comparing the baseline drainage condition against the proposed drainage condition after the implementation of the proposed development in respect of the flow, catchment area and water levels.

2.2 Assessment Methodology

<u>Assessment Method</u>

2.2.1 As discussed in the above section, potential drainage impacts are identified by comparing the baseline drainage condition against the proposed drainage condition. The existing drainage systems and its catchments likely to be affected by the proposed development are presented in **Appendix B1** and **Appendix C** respectively.

2.2.2 The following approach and methodology will be adopted in the drainage impact assessment:-

- Carry out desktop study to collect the relevant information for the assessment, relevant information collected including drainage record plans and drainage model boundary information, planned drainage improvement information from Drainage Services Department (DSD), topographical information from basemap and Topographic Survey received from the Applicant in **Appendix H**;
- Based on desktop information, identify the existing drainage systems in the vicinity of the Site;
- Estimate the change in runoff generated from the proposed development; and
- Assess the drainage impacts arising from the proposed development.

2.2.3 Due to the implementation of the proposed development site, the catchment characteristic within the Site will be changed to partly paved areas and partly landscaped areas. It is anticipated that the surface runoff shall be varied after the implementation of the proposed development. For analysing the implications of the proposed condition, hydraulic model software “InfoWorks ICM” was adopted in the assessment.

2.2.4 To perform the drainage impact assessment, a localised model (Baseline model, the extent of model refers to **Appendices E1** and **E2**) is developed for existing drainage condition under this assessment. The baseline model of the existing drainage system is then used to establish hydraulic model for the proposed development under proposed condition.

2.3 Assessment Criteria, Design Parameters and Assumptions

Assessment Criteria

2.3.1 The assessment criteria are based on the recommendations set out in the Stormwater Drainage Manual (SDM) – 5th Edition issued by DSD, Corrigendum No.1/2022 and Corrigendum No. 1/2024. Flood event of 1 in 10 years return period, 1 in 50 years return period and 1 in 200 years return period for village drainage, branch and trunk drains respectively as recommended in Table 10 of SDM has been adopted in the design and assessment of drainage system for the Site.

2.3.2 The flood combinations in accordance with Section 6.4 and Table 11 of the SDM and repeated in **Table 2.1** are adopted to assess the existing and proposed drainage systems.

Table 2.1: Flood combinations

Flood Level Return Period (Years)	Rainfall Return Period (Years)	Sea Level Return Period (Years)	Flood Return Event Case
10	10	2	a
	2	10	b
50	50	10	a
	10	50	b
200	200	10	a
	10	200	b

Design Parameters and Assumptions for modelling

Modelling Approach

2.3.3 As mentioned above, the hydraulic performance of the drainage system near the Site has been assessed using InfoWorks ICM software. The assumptions and various parameters used in the modelling are presented in this section.

Baseline Model Scenario

2.3.4 To perform the DIA, a localised baseline model for the existing drainage system where the Site located has been developed based on the boundary information from Drainage Services Department (DSD), topographical information from basemap and Topographic Survey received from the Applicant. The extent of baseline model is showed in **Appendix E1** and the extent of model with the catchment included in the model is shown in **Appendix E2**. Design rainfall in accordance with SDM and downstream water boundary condition based on the collected boundary from DSD have been applied in the localised model.

2.3.5 The localised baseline model has also been refined to incorporate the following:-

- Catchment delineation and discharge points for catchments adjacent to the Site have been reviewed according to topographic data shown in basemap. The existing catchment plan can be referred to **Appendix C**;
- Segment of the stream course within and near the site has been surveyed and cross sections along the segment have been incorporated in the model according to the survey data;
- Detailed survey along existing stream course segment within and near the Stie has been carried and incorporated into model. Details can be referred to **Appendix H**;
- Blockage of existing channel in private lots is observed from site inspection and details referred to Section 3.2. For determining the hydraulic performance of the existing drainage system, the hydraulic model has assumed no blockage in existing channel.

2.3.6 SCS-Curve Number (CN) method has been used to calculate the runoff from the assessed upland, urban and rural catchments. In order to assess any drainage impact caused by the development for engineering channels in the vicinity of the Site, a one-dimensional (1D) hydraulic model covering the concerned area has been used. Drainage system including the engineering channels and conduits are modelled through the 1D network.

Proposed Model Scenario

2.3.7 Based on the localised model under baseline condition, a localised model under proposed condition was established. The changes incorporated in the model under proposed condition with reference to the latest master layout plan in **Appendix A2** are:

- The change of CN for the Site due to the proposed development;
- A new drainage system within the Site which will replace the section of existing northern channel within the development and connect back to the existing engineering channel outside the Site;
- Five sets of new channels and associated conduits to collect runoff from nearby catchments;
- A set of pipes with size ranged from 900mm to 1,200mm to intercept excessive runoff collected from the new channels (i.e. Channels 1, 2, 3 and 4) to stormwater storage tank;
- A stormwater storage tank with storage capacity of 12,000m^3 is built within the development;
- The development area is set to its formation level in a range of 23.9 to 26mPD; and
- A constant peak flow of 2746.6m^3/d (round up to 0.032m^3/s) has been allowed for the discharge of treated effluent from the proposed sewage treatment plant.

2.3.8 The extent of the proposed model will be same as the baseline model and can be referred to **Appendix E3**. A set of hydraulic models including baseline and proposed models used in this assessment is included in **Appendix I**.

Design Rainfall

2.3.9 A 4-hour duration rainfall profile has been used in model simulation and the rainfall profile is determined based on the equation as mentioned in Clause 4.3.5 of SDM where storm constants for different return period of HKO Headquarters (a, b, c) and Tai Mo Shan Area (a, b, c) are given in Table 3a and Table 3b of SDM as well as SDM Corrigendum No. 1/2024 and repeated in **Table 2.2**.

$$F(t) = \begin{cases} \dfrac{a[b+2(1-c)t]}{(2t+b)^{c+1}} & , \quad 0 \le t \le \dfrac{t_d}{2} \\ F(-t) & , \quad -\dfrac{t_d}{2} \le t \le 0 \end{cases}$$

where

F(t) = rate of rainfall or instantaneous intensity in mm/hr at time t (in minutes)

t_d = rainstorm duration (in minutes) (t_d <= 240)

a, b, c = storm constants given in Table 3a and Table 3b of SDM as well as SDM Corrigendum No. 1/2024 and repeated in the following table.

Table 2.2: Storm constants for different return periods

Rainfall Zones	Return Period T (years)	10	50	200
HKO Headquarters	a	485.0	505.5	508.8
	b	3.11	3.29	3.46
	c	0.397	0.355	0.322
Tai Mo Shan Area	a	2251.3	1740.1	1005.0
	b	27.46	19.78	7.01
	c	0.661	0.570	0.434

2.3.10 Rainfall duration of 240 minutes has been adopted for the assessment.

Design Modification due to Climate Change

2.3.11 According to SDM, climate change effect will be considered in this assessment. To take account of climate change effect, the rainfall increase percentage and sea level rise projected to end of 21st Century (2081 – 2100) as recommended in SDM Corrigendum No.1/2022 presented in **Table 2.3** have been adopted in this assessment for proposing the required drainage works for the development. Besides, storm surge increase due to climate change at Tsim Bei Tsui as recommended in SDM Corrigendum No.1/2022 presented in **Table 2.4** is also adopted in this assessment.

2.3.12 Considering the uncertainties in the range of possible future climate change development and global actions among nations on reducing carbon emissions, design allowance as recommended in SDM Corrigendum No.1/2022 presented in Table 2.5 have been adopted in this assessment.

Table 2.3: Percentage of rainfall increase and sea level rise due to climate change

	Rainfall Increase	Sea Level Rise (m)
End of 21st Century (2081 – 2100)	16.0%	0.47

Table 2.4: Storm Surge Increase due to Climate Change in End-21st Century

Return Period (Years)	Storm Surge Increase (m)
2	0.09
10	0.15
50	0.20
200	0.26

Table 2.5: Design Allowance in End-21st Century

Return Period (Years)	Extreme Sea Level Rise (m)	Rainfall Increase
2	0.20	12.1%
10	0.23	
50	0.25	
200	0.27	

Design Water Level for Downstream Boundary

2.3.13 In order to assess the hydraulic performance of the existing drainage system, the downstream water level boundary conditions obtained from DSD (**Appendix G**) has been adopted. To take account of the sea level rise, the downstream water level boundary has been increased for mean sea level rise, storm surge increase due to climate change and design allowance recommended in SDM Corrigendum No.1/2022. The downstream boundary conditions received by DSD and adopted in the model are summarised in **Table 2.6**. The location of the boundary is presented in the model extent in **Appendix E1**.

Table 2.6: Design water levels for different return periods

		Channel at the North to the Site (Model ID: 826481832112)		Channel at the South to the Site (Model ID: 1602)		Channel where the DSD planned pipes to be connected (Model ID: 826555832001) – only applied for model scenario with DSD planned drainage works	
Return Period T (years)	Flood Return Event Case	Water Level Boundary received from DSD (mPD)	Water Level with Climate Change (mPD) for Model	Water Level Boundary received from DSD (mPD)	Water Level with Climate Change (mPD) for Model	Water Level Boundary received from DSD (mPD)	Water Level with Climate Change (mPD) for Model
10	A	14.341	15.101	18.289	19.049	15.013	15.773
	B	13.903	14.753	17.872	18.722	14.519	15.369
50	A	14.694	15.544	18.594	19.444	15.375	16.225
	B	14.341	15.261	18.289	19.209	15.013	15.933
200	A	15.021	15.871	18.815	19.665	15.649	16.499
	B	14.341	15.341	18.289	19.289	15.013	16.013

2.3.14 As shown in **Table 2.6**, the flood level of flood return event case A in 10-year, 50-year and 200-year return period are the worst-case scenarios. Therefore, hydraulic assessment will be conducted for 10A, 50A and 200A scenarios with the worst-case downstream water level boundary.

Runoff Estimation

2.3.15 The Soil Conservation Services (SCS) Curve Number method of InfoWorks ICM rainfall runoff module has been used to compute the runoff hydrograph. The SCS "Curve Number" CN is a characteristic of the soil type, land use and the initial degree of saturation. In this assessment, weighed average SCS curve numbers is estimated based on the existing land use. The following CN values for the corresponding land uses area adopted in this DIA has been presented in **Table 2.7** below:

Table 2.7: Curve Numbers (CN) Adopted for Each Land Use

Land use	CN
Agriculture	70
Upland	65
Grassed	70
Village	90
Open Storage	90
Residential	95
Commercial	95
Roads / Footpath	100
River	100

2.3.16 For the proposed development, based on the indicative master layout plan, there will be about 39.9% of residential/ buildings (i.e. CN 95), 27.5% of landscaping areas (i.e. CN 70) and 32.6% of paved areas such as roads, footpath/ carparks/ water features (i.e.

CN 100). The calculated weighted CN value of 90 has been assumed for the proposed Site under the proposed condition.

Roughness

2.3.17 There are two approaches available in the ICM which can be used in modelling hydraulic roughness of the drainage system, i.e. Colebrook-White equation (ks) for underground drains or the Manning formula (n) for open channel or river.

2.3.18 For existing drainage system, the following roughness values have been adopted:-

- Colebrook-White ks value of 1.5mm has been adopted for box culverts; and
- Manning’s n value of 0.016 has been adopted for existing engineering channel and 0.020 has been adopted for existing engineering channel with some weeds. For the existing watercourse near to Wah Yuen, manning’s n value of 0.03 has been adopted.

2.3.19 For the proposed drainage system, concrete pipes and box culverts will be used and a Colebrook-White ks value of 3mm and 1.5mm has been adopted respectively. For any proposed channel, a Manning roughness of 0.016 has been used for concrete channels.

Sediment

2.3.20 For existing pipeline system and proposed pipeline system, siltation follows the recommendation given in SDM, which suggests allowing for 5% reduction in flow area if the gradient is greater than 1 in 25 or 10% reduction in flow area in other areas.

3 Existing Drainage System

3.1 Site Condition

3.1.1 The Site covers an area of about 41,290 square metres and is located next to Lin Fa Tei and Wah Yuen, Kam Sheung Road. In general, the existing ground level of the development site is ranging from approximately +22.3 to +26.7 mPD. According to desktop study, the Site is found to be composed with sparse vegetation. Meanwhile, site inspection has found that part of the Site is rented to a construction material company for storage and construction material processing. Villages, open storage operations and farmlands are scattered in the surrounding area of the Site. The location of the Site is shown in **Appendix A1**.

3.2 Existing Drainage System and Catchment

3.2.1 The surface runoff running on the existing catchments at the existing Development Site is currently discharged to into an existing watercourse and two existing engineering channels, one passing through the Site (hereafter the northern channel) and one in the south of the Site (hereafter the southern channel). The northern channel is then run through Lin Fa Tin with an engineering channel at the south side of the Kam Sheung Road, while the southern channel is then run through Lin Fa Tin and Ngau Keng. The existing watercourse passing through the Site is mainly collecting runoff from Wah Yuen and it finally connects to the northern channel. Location of the channels refers to **Appendix B1**.

3.2.2 Based on the recent site inspection and aerial photos, blockage of the northern channel is identified within the nearby private lots. The blockage location of the northern channel can be referred to recent aerial photos as shown in **Figure 3.1**.Due to the blockage of existing drain in nearby private lots, there is currently no proper drainage system connecting the upstream portion of northern channel to downstream channel. At the southern part of the Site, the southern channel conveys the runoff from the Site to the downstream engineering channel. Photos indicate the blockage location and condition of the southern channel can be referred to **Figure 3.1**. **Figure 3.2** is a photo took on Site demonstrating the blockage of the northern channel under existing condition.

Figure 3.1: Blockage of the Northern Channel from Aerial Photo Taken in 2021

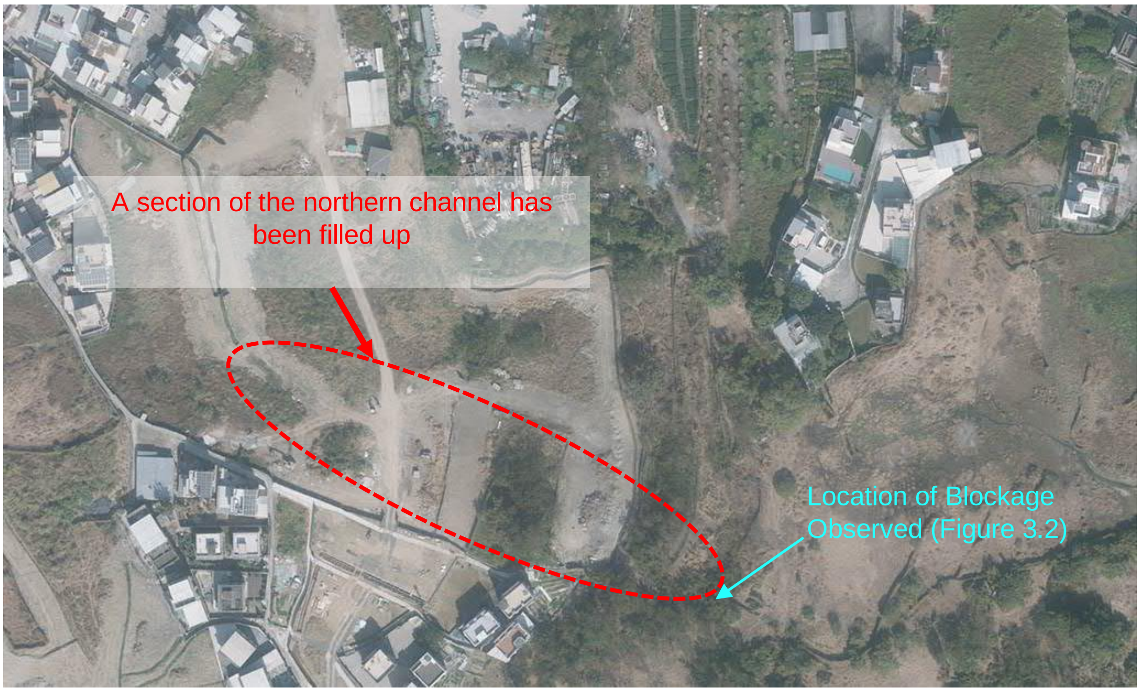


Figure 3.2: Blockage of the Northern Channel Taken on Site

3.2.3 As advised by DSD, the existing watercourse near to Wah Yuen is now severing both the catchments of nearby area of Wah Yuen and part of the Development Site under the existing condition. To identify the alignment of the existing watercourse, further site inspection and survey were carried for the accessible sections of existing watercourse concerned. The information of additional survey is shown in **Appendix J**. In view of that the downstream of the existing watercourse is passing through the nearby private lots, survey could not be carried out for the downstream section due to inaccessible to the private lots. The existing condition of the downstream section of that existing watercourse is assessed with the best available information collected on-site and desktop review. The existing condition of the downstream section which passing through nearby private lots was verified by site inspection. The alignment of the downstream section of the existing watercourse near to Wah Yuen is shown in **Figure 3.3.**

Figure 3.3: The alignment of the downstream section of the existing watercourse near to Wah Yuen

3.3 Existing Land Use Surface Characteristics

3.3.1 The existing drainage system currently conveys runoff from several catchments. Based on the topographic data in basemap, the delineation of local catchments discharging into the engineering channel has been carried out. The local catchments of the existing drainage system and its catchment properties have been summarised in **Table 3.1**. The existing catchment plan and their discharge points is shown in **Appendix C**.

3.3.2 The CN values for the corresponding land uses are summarised in **Table 2.7** and are used to calculate the weighted CN for the following sub-catchments.

Table 3.1: Catchment properties of existing catchments

Model ID	Area (ha)	Weighted CN
Cat_001	3.920	81.85
Cat_002	45.411	67.16
Cat_003AA	0.140	70.00
Cat_003AB	0.115	70.00
Cat_003C	0.153	90.00
Cat_003D	3.897	73.19
Cat_004A	8.022	80.19
Cat_004B	1.971	76.14
Cat_004C	1.048	80.14
Cat_006	42.862	65.00
Cat_007	21.148	69.05
Cat_008	1.198	70.00
Cat_009	2.499	84.22
Cat_010	21.432	78.52
Cat_011	16.646	85.86
Cat_012A	1.773	73.74
Cat_012B	1.509	73.74
Cat_013	0.223	70.00
Cat_014	0.605	70.00

3.3.3 The existing catchments of the development site (as indicated with Model ID: Cat_012A, Cat_012B, Cat_013 and Cat_014) have weighted CNs of 72.99 based on existing topography and land use. The runoff of the existing catchments of the development site is mainly discharged to the existing northern channel(i.e. Model ID: Cat_012B) or discharged to the existing northern channel via the existing watercourse near to Wah Yuen (Model ID: Cat_012A), except for the runoff of southern part of the Site (Model ID: Cat_013 and Cat_014) which are discharged to the existing southern channel.

3.3.4 For other sub-catchments, weighted average CN values ranging from about 65.00 to 90.00.

3.4 Hydraulic Performance of Existing Drainage System

3.4.1 The hydraulic performance of the existing channels assuming there is no blockage to the northern channel has been assessed by the model with the network containing the channels in the existing drainage system including the existing watercourse near to Wah Yuen, the northern channel and the southern channel. Result showed that the existing drainage system will be flooded even in a return period of 10 years and there is no blockage of the northern channel. It is expected that the flooding risk will be higher after the blockage of the northern channel in private lots outside the Site. Details of hydraulic model results can be referred to the hydraulic model included in **Appendix I**.

4 Drainage Impact Assessment and Proposed Drainage System

4.1 The Development

4.1.1 The Site will be developed as a residential area with paved condition and some landscaping area. As mentioned in **Section 3**, a portion of existing northern channel has been blocked in private lots adjacent to the Site and there is no proper drainage connecting the upstream of northern channel to downstream channel at Lin Fa Tei. As an enhancement opportunity of the existing blocked drainage system, the proposed development will construct a 3.0m(W) x 2.5m(H) box culvert within the Site and a concrete channel with general wide of 2.6m and channel depth of 0.8m to 2.6m in association with flood walls and 2 sections of box culverts within government lands in village zone to re-connect the upstream of channel to the downstream of the northern channel at Lin Fa Tei. The proposed drainage system will replace the existing blocked portion of northern channel outside the Site and the portion of disconnected northern channel within the Site. To allow public access from/ to areas on the south and north sides as well as from/ to areas on the east and west sides, the proposed channel will have two sections of box culverts as shown in **Appendix B5.1**. Due to land constraints, a few sections of the 2.6m wide concrete channel will be reduced to 1.4m wide. With the provision of this new drainage system, the connectivity of northern channel can be restored and enhanced. The proposed new drainage system replacing the existing blocked drainage system is shown in **Appendix B2**. Based on recent aerial photo, filling works are identified within the government lands and the adjacent private lots. The existing ground levels along the proposed channel has been generally increased by about 1m according to the released more recent LiDAR data from Civil Engineering and Development Department. Thus, the height of associated flood walls of the proposed channel will be about 0.40m to 1m above ground in general except for a short section of flood wall connecting to the existing northern channel at the downstream end which will be about 1.65m high due to constraints of the high water level at the existing northern channel. The profile of proposed channel is shown in **Appendix L**.

4.1.2 For discharging the runoff from the proposed development, the runoff from the Site will be discharged to the new drainage system consists of peripheral surface channels and pipelines. In view of the increase of paved area in the Site, additional runoff from the Site is anticipated. Runoff from the Development Site will be collected and discharged via an internal drain with 1350mm diameter. To mitigate the impact due to the additional runoff generated from the Site, a storage tank with a size of about 12,000m^3 will be provided to temporally store the additional runoff during extreme storm and the runoff will be discharged after the peak of storm. Under extreme rainfall events, additional runoff collected in the internal 1350mm diameter pipe will overflow into the storage tank and temporarily stored in the storage tank. The proposed drainage arrangement is also shown in **Appendices B2** and **B5**. For the runoff originally discharged to the southern channel under existing condition, a catchment with an equivalent runoff of the existing catchment is discharged to the southern channel so that the amount of runoff that will be discharged to the southern channel is remained unchanged.

4.1.3 It is noted that the existing vegetated watercourse near to Wah Yuen within the site, which is collecting runoff from large areas of catchments (about 5 hectares as shown in **Appendix M.1**), is expected to be flooded even in 10 years rainfall event. After the development, the runoff from the Site area of the proposed development (about 2 hectares), which is part of the original catchments of the existing vegetated watercourse near Wah Yuen, will be collected by internal drainage system and temporarily stored in the proposed stormwater storage tank during extreme events and discharged to proposed box culvert after the peak of the storm. To properly collect and discharge the runoff from the remaining catchments of the existing vegetated watercourse near to Wah Yuen (about 3 hectares as shown in **Appendix M.2**), it is suggested to replace the existing vegetated watercourse near to Wah Yuen by five sets of independent new concrete channels (namely Channels 1 to 5) and associated conduits (refers to **Appendix B5**) under the proposed condition. Instead of discharging the runoff into a single drainage facility as in the existing condition, the five sets of independent new concrete channels and associated conduits will collect runoff from corresponding catchments according to the topography as shown in **Appendix M.2**. The routes for collecting the runoff from Channels 1, 2, 3 and 4 in proposed condition under normal flow condition and under extreme weather condition can be referred to **Appendix N**. A catchment plan showing the corresponding catchment discharging routes is shown in **Appendix C.3**.

4.1.4 Under normal condition, the runoff collected by Channels 1 to 4 will be mainly conveyed to the proposed box culvert via the associated pipes (i.e. Pipes 1 to 4) which have lower invert levels than the interception pipeline; while the runoff collected by Channel 5 will be conveyed to the remaining section of existing watercourse near to Wah Yuen. A schematic drawing showing the connection of the proposed box culvert and the associated pipes (i.e. Pipes 1 to 4) is provided in **Appendix L**. The design will be further developed in the next detail design stage.

4.1.5 Due to the constraints of the high water level at downstream northern channel under the extreme rainfall event with considering the climate change effect in the end of century, apart from to the five sets of new channels and associated conduits, installation of flap valves at the associated pipes (i.e. Pipes 1 to 4) connected to the proposed box culvert and an additional set of interception pipes with diameters of 900mm to 1200mm are also proposed to intercept flow from channels 1, 2, 3 and 4 to the proposed stormwater storage tank under extreme weather events (i.e. the assessed 10 years, 50 years and 200 years rainfall events) with taking account of the climate change effect at the end of century so that the five sets of proposed new channels will have at least 300mm freeboard under the 50 years rainfall or below and will be within bank level under the 200 years rainfall. The interception system will be triggered for extreme rainfall events with considering the climate change effect in the end of century such as 1 in 10 years or above rainfall events. Due to the high water level at downstream northern channel under the extreme rainfall event, pipes 1, 2, 3 and 4 will be submerged. In this connection, runoff collected from Channels 1, 2, 3 and 4 will be flowed to the proposed 900mm to 1200mm diameter interception pipeline with a higher invert level than Pipes 1, 2, 3 and 4, and temporarily stored in the proposed storage tank. After the peak of storm, the stored runoff will be discharged to the proposed box culvert and then to the proposed channel via internal drains. An enlarged plan showing the 900mm to 1200mm dia. proposed interception pipeline is provided in **Appendix B5.3**. A schematic drawing of the proposed storage tank, 1350mm internal pipe and the proposed 900mm – 1200mm interception pipeline under extreme weather event is provided in **Appendix L**.

4.1.6 The water level at the remaining downstream section of the existing watercourse near Wah Yuen is lower than the water level at the proposed box culvert which is connected to Pipes 1, 2, 3 and 4 and Channel 5 will have more than 300mm freeboard even in extreme rainfall event. Therefore, an additional inception pipe for Channel 5, which is connected to the concerned downstream section of the existing watercourse, is considered not necessary.

4.1.7 Based on hydraulic calculation as shown in **Appendix K.1**, the proposed five sets of new channels and associated conduits will have adequate capacity to discharge the 200-year rainfall under normal flow condition. During extreme weather events with high downstream water level, based on predicted water levels from hydraulic model as shown in **Appendix K.2**, the new channels will have 300mm freeboard under the 50 years rainfall event or below and will be within bank under the 200 years rainfall event which shall be adequate for village zone. Thus, it is considered that no adverse drainage impact will be caused by the proposed development.

4.1.8 The layout of the proposed development is shown in **Appendix A2**.

4.2 Changes in Catchment and Existing Drainage Network due to the Proposed Development

4.2.1 As discussed in Section 3, most of the runoff generated from the Site (Model ID: Cat_012A & Cat_012B) under the existing condition is discharged to the existing northern channel, whilst the runoff generated from part of the Site (Model ID: Cat_013 and Cat_014) is discharged to the existing southern channel under existing condition. For the proposed development, the runoff generated from Site will also be discharged to the northern channel via an internal drainage system consists of peripheral surface channels and pipelines, as well as the new drainage system as discussed **in Section 4.1**, except for a catchment with an equivalent runoff of the existing catchment is discharged to the southern channel as mentioned in **Section 4.1.2**.

4.2.2 Due to the change in paved condition of the proposed development, a CN value of 90 has been assigned for the Site (Model ID: Cat_012A, Cat_012B, Cat_013 and Cat_014) after implementation of the Development and details given in **Table 4.1**. The total catchment area under proposed condition will be same as the existing condition and can be referred to **Appendix C**, except for (1) the change of weighted CN value for catchments of the Site (Model ID, Cat_012A, Cat_012B, Cat_013 and Cat_014) (i.e. from 72.99 to 90) and (2) the changes of runoff discharge route for existing catchments Cat_004B, Cat_004C and Cat_003C as discussed in **Section 4.2.3**.

Table 4.1: Catchment properties of proposed condition

Model ID	Area (ha)	Weighted CN
Cat_012A	1.773	90.00
Cat_012B	1.509	90.00
Cat_013	0.223	90.00
Cat_014	0.605	90.00
Cat_004B1	1.784	76.14
Cat_004B2	0.188	76.14
Cat_004C1	0.681	80.14
Cat_004C2	0.341	80.14
Cat_004C3	0.026	80.14

4.2.3 Since the existing watercourse near to Wah Yuen will be replaced by five sets of new channels and associated conduits under the proposed condition as shown in **Appendix**

B5, there are changes of runoff discharge route for Cat_004B, Cat_004C and Cat_003C. According to topography, the existing catchments near to Wah Yuen (i.e. Cat_004B and Cat_004C) are further delineated into five sub-catchments including Cat_004B1, Cat_004B2, Cat_004C1, Cat_004C2 and Cat_004C3 under proposed condition. For existing catchment Cat_004B, Cat_004C and Cat_003C, the runoff from those catchments is now discharged to the existing watercourse near to Wah Yuen under existing condition. Under the Proposed Condition, a section of the existing watercourse within the Development Site will be replaced by five sets of new channel and associated pipe (refer to **Appendix B5**). The proposed new channels (Channels 1, 2, 3 and 4) will intercept the flow from proposed catchments of Cat_004B (i.e. Cat_004B1 and Cat_004B2) and partial Cat_004C (i.e. Cat_004C2 and Cat_004C3), and discharge to the proposed box culvert under normal flow condition. For existing catchments, partial Cat_004C (i.e. Cat_004C1) and Cat_003C, their runoff also originally discharges to the existing watercourse near to Wah Yuen under existing condition. Under the proposed condition, the runoff from Cat_004C1 and Cat_003C will be intercepted by the proposed new Channel 5 and its associated conduits that will be laid along the site boundary. The collected runoff by Channel 5 will be conveyed to the downstream of the existing natural watercourse near to Wah Yuen. The proposed drainage system of the Development can be referred to **Appendix B5**.

4.2.4 As there is no change to other catchments served by the assessed drainage system, thus, the catchment properties for other catchments in **Table 3.1** are also applicable to the proposed condition.

4.2.5 The localised model under the proposed condition has incorporated the change in CN value arising from additional paved condition. Also, the model has included a constant flow of $0.032m^3/s$ for the discharged of treated effluent from the proposed sewage treatment plant.

4.3 Drainage Impact Assessment

4.3.1 The drainage impact to the existing drainage system due to the development has been assessed with hydraulic model. The assessed drainage system is similar to the baseline model for existing condition which includes the existing watercourse near to Wah Yuen, the northern and southern channels, except for (1) the re-connection of the northern channel by a 3.0m(W) x 2.5m(H) box culvert within the Site, (2) a channel with two box culvert sections within government lands, (3) replacement of the existing watercourse near to Wah Yuen by five sets of new channels and associated conduits along boundary of Wah Yuen, and (4) a set of interception pipes to intercept runoff collected from Channels 1, 2, 3 and 4 as shown in **Appendix B5**. The proposed channel in government lands will be 2.6m wide and 0.8m to 2.6m deep from the ground in association with flood walls and 2 sections of box culverts. Since a few bottlenecks are identified within the governmental lands, the proposed channel will be narrowed to 1.4m wide where necessary. The water profile of the proposed channel is shown in **Appendix F1**. The increased in CN for the Site due to the proposed development and the discharge for the treated effluent discussed above were also incorporated in the proposed condition model. The Proposed model extent can be referred to **Appendices E3**.

4.3.2 The change in peak flow at the discharge point of the drain of the proposed development (Control point 2) is shown in the table below:

Table 4.2: Change in peak flow at the outlet of the drain (Control point 2)

Return period (Years)	Flow (Existing) (m^3/s)	Flow (Proposed) (m^3/s)	Change (m^3/s)	Change (%)
10	12.916	12.453	-0.462	-3.58%
50	17.282	15.788	-1.495	-8.65%
200	19.809	18.088	-1.721	-8.69%

4.3.3 In light of the changes of runoff discharge route for Cat_004B1 and Cat_004B2 as discussed in **Section 4.2.3**, the runoff from Cat_004B1 and Cat_004B2 will be intercepted and discharged to the proposed box culvert, passing Control point 2. As discussed in **Section 4.1**, to cope with additional runoff due to the increase of paved area in the Site as shown in **Table 4.2a** below, a storage tank with a size of about 12,000m^3 will be provided to temporally store the additional runoff from the Site as well as the runoff collected from Channels 1, 2, 3 and 4 via the proposed interception pipes under extreme weather events. The stored runoff will be discharged after the peak of storm. Despite that an additional flow from Cat_004B1 and Cat_004B2 will be discharged to the proposed box culvert, the proposed development with the storage tank would lead to a significant improvement (i.e. reduced about 8.7% of the original flow) to the hydraulic at the discharge point (i.e. Control point 2) under the 200 years flood return period. With the storage tank to mitigate the additional runoff, the peak runoff discharged from the proposed development will be slightly reduced as compared with the baseline condition.

Table 4.2a: Additional runoff from the proposed development with consideration of climate change effect at end of century

Return period (Years)	Total runoff generated from the Site (m^3)		Additional runoff (m^3)
	Existing condition	Proposed condition	
10	7,716	10,097	2,381
50	11,676	14,286	2,610
200	14,443	17,160	2,717

4.3.4 To assess the drainage impacts on the assessed drainage system, control points at upstream and downstream of assessed drainage system have been placed to observe changes in predicted water level between existing and proposed conditions for concerned drainage system. Location of control points can be found in **Appendix D1**. The predicted water levels under the 10 years, 50 years and 200 years flood return period under the existing and proposed conditions are presented in **Table 4.3**.

Table 4.3: Predicted peak water levels and freeboard of engineering channels near the Site under 10, 50 and 200 years flood events

Case	Control Points	Cross Section line ID	Existing Condition without DSD planned works			Proposed Condition without DSD planned works			Change in Water Level (m) (i.e. Proposed Condition - Existing Condition)
			Bank Level (mPD)	Water Level (mPD)	Freeboard (m)	Bank Level (mPD)	Water Level (mPD)	Freeboard (m)	Water level (m)
10A	1	Section V-Section U	26.408	26.686	-0.278	26.408	26.599	-0.191	-0.087
	2	Section G-1	21.150	22.725	-1.575	21.150	22.438	-1.288	-0.287
	3	Section C-1	19.820	20.804	-0.984	19.820	20.694	-0.874	-0.110
	4	Section 1-A.1	18.300	19.357	-1.057	18.300	19.259	-0.959	-0.098
	5	Section 1-B	17.540	16.829	0.711	17.540	16.782	0.758	-0.047
	WY-1	Section-7	20.880	22.690	-1.810	20.880	22.396	-1.516	-0.294
	6	AC-AB	23.570	24.223	-0.653	23.570	24.221	-0.651	-0.002
	7	Section H	19.630	19.131	0.499	19.630	19.130	0.500	-0.001
50A	1	Section V-Section U	26.408	26.843	-0.435	26.408	26.725	-0.317	-0.118
	2	Section G-1	21.150	23.543	-2.393	21.150	23.076	-1.926	-0.467
	3	Section C-1	19.820	21.238	-1.418	19.820	21.053	-1.233	-0.185
	4	Section 1-A.1	18.300	19.726	-1.426	18.300	19.572	-1.272	-0.154
	5	Section 1-B	17.540	17.005	0.535	17.540	16.931	0.609	-0.074
	WY-1	Section-7	20.880	23.509	-2.629	20.880	23.037	-2.157	-0.472
	6	AC-AB	23.570	24.417	-0.847	23.570	24.415	-0.845	-0.002
	7	Section H	19.630	19.507	0.123	19.630	19.507	0.123	0.000
200A	1	Section V-Section U	26.408	26.928	-0.520	26.408	26.791	-0.383	-0.137
	2	Section G-1	21.150	24.003	-2.853	21.150	23.494	-2.344	-0.509
	3	Section C-1	19.820	21.483	-1.663	19.820	21.279	-1.459	-0.204
	4	Section 1-A.1	18.300	19.923	-1.623	18.300	19.760	-1.460	-0.163
	5	Section 1-B	17.540	17.102	0.438	17.540	17.024	0.516	-0.078
	WY-1	Section-7	20.880	23.969	-3.089	20.880	23.455	-2.575	-0.514
	6	AC-AB	23.570	24.480	-0.910	23.570	24.478	-0.908	-0.002
	7	Section H	19.630	19.718	-0.088	19.630	19.717	-0.087	-0.001

Remarks:-

1. Location of control points refers to **Appendix D1.**
2. The bank levels refer to the lower bank level.
3. -ve freeboard means water level will be above channel bank level, +ve freeboard means water level below channel bank level.
4. -ve in change in water level means the water level is lower under the proposed condition as compared with the existing condition.

4.3.5 With reference to results in **Table 4.3**, the predicted water level of the existing northern channel (i.e. Control points 1 to 5) will be higher than the existing river bank under 1 in 10 years, 1 in 50 years and 1 in 200 years flood events in both baseline condition and proposed condition. However, with the proposed new drainage system and the storage tank provided in the proposed development, an improvement of hydraulic of the existing drainage system is observed in the northern channel. The predicted peak water level for northern channel has been reduced by about 80 to 510mm under the 200 years flood event as compared with the baseline condition. For the southern channel, the predicted water level at Control points 6 and 7 is similar to or slightly lower than the baseline condition. For the remaining section of the existing watercourse near to Wah Yuen (i.e. Control points WY-1), the predicted water level has been reduced by about 510mm under the 200 years flood event as compared with the baseline condition. Based on the hydraulic model results, the assessed drainage system will generally have improvement on the existing drainage system and it is anticipated that there will be no adverse drainage impacts arising from the proposed development with the proposed drainage system and stormwater storage tank.

4.3.6 The predicted peak water level in the proposed channel within village zone under 10A scenario is shown in **Appendix F1**. According to the results, the proposed channel in village zone will have at least 300mm freeboard under 10A scenario. Compared to the original alignment under Baseline condition which is expected to be flooded from about +130mm to +350mm for most of the sections under 10A, the proposed channel provided a significant improvement on this section of the northern channel.

4.3.7 For the five set of proposed new channels and associated conduits as shown in **Appendix B5**, there will be more than 300mm freeboard under 1 in 10 years and 50 years and within bank under 1 in 200 years. As mentioned in Section 4.1.3, a set of interception pipes is proposed to intercept flow from channels 1, 2, 3 & 4 to proposed stormwater storage tank under extreme weather events taking account of climate change effect at end of century. The proposed interception pipes with a size of 900mm to 1200mm diameter is classified as urban drainage branch system and shall be designed for 1 in 50 years protection level. Based on the results of hydraulic model, the proposed interception pipes will also have more than 300mm freeboard under 1 in 10 years and 50 years and the water level will be below ground level under 1 in 200 years. The predicted water level and freeboard of the proposed five set of new channels and associated pipes, and the proposed interception pipes under 1 in 10-Year, 50-Year and 200-Year rainfall events are extracted in **Appendix K.2**.

4.3.8 Based on the assessment, there is an improvement to the existing channels in the maximum water levels for the 10 years, 50 years and 200 years flood event for all the control points. Therefore, it is concluded that there is no adverse impact from the proposed development with the proposed drainage system.

4.4 Proposed Drainage Arrangement under DSD and HAD Planned Improvement Works

4.4.1 From Environmental Impact Assessment Report of the Drainage Improvement Works Near Four Villages in Yuen Long – Sung Shan New Village, Tai Wo, Lin Fa Tei and Ha Che (Register No. AEIAR-229/2021) and the latest information from DSD, 1650mm diversion pipe and floodwalls are proposed for a section of the northern channel at Lin Fa Tei. As advised by DSD, the proposed diversion pipes at Kam Sheung Road were proposed to be changed from 1650mm to 1350mm in diameter. The updated proposed drainage arrangement with DSD and HAD planned improvement works has also been assessed with hydraulic model and is shown in **Appendix B3**. Two scenarios including baseline model with DSD and HAD planned works and proposed model with DSD and HAD planned works have been considered using hydraulic model.

4.4.2 Similar to **Section 4.3**, to assess the drainage impacts on the assessed drainage system for condition with DSD and HAD planned drainage works, control points at upstream and downstream of assessed drainage system have been placed to observe changes in predicted water level between existing and proposed conditions for concerned drainage system upon implementation of DSD and HAD planned drainage improvement works. Location of control points can be found in **Appendix D**.

Table 4.4: Predicted peak water levels and freeboard of engineering channels near the Site under 10, 50 and 200 years flood events (with DSD and HAD Planned Improvement Works)

Case	Control Points	Cross Section line ID	Existing Condition with DSD and HAD planned works			Proposed Condition with DSD and HAD planned works			Change in Water Level (m) (i.e. Proposed Condition - Existing Condition)
			Bank Level (mPD)	Water Level (mPD)	Freeboard (m)	Bank Level (mPD)	Water Level (mPD)	Freeboard (m)	Water level (m)
10A	1	Section V-Section U	26.408	26.686	-0.278	26.408	26.599	-0.191	-0.087
	2	Section G-1	21.150	22.411	-1.261	21.150	22.177	-1.027	-0.234
	3a	DSD-1	20.500	21.060	-0.560	20.500	20.946	-0.446	-0.114
	4a	Section 1-A	18.300	19.303	-1.003	18.300	19.207	-0.907	-0.097
	5	Section 1-B	17.540	16.800	0.740	17.540	16.755	0.785	-0.045
	WY-1	Section-7	20.880	22.362	-1.482	20.880	22.114	-1.234	-0.249
	6	AC-AB	23.570	24.223	-0.653	23.570	24.221	-0.651	-0.002
	7	Section H	19.630	19.131	0.499	19.630	19.130	0.500	-0.001
50A	1	Section V-Section U	26.408	26.843	-0.435	26.408	26.725	-0.317	-0.119
	2	Section G-1	21.150	23.016	-1.866	21.150	22.625	-1.475	-0.391
	3a	DSD-1	20.500	21.528	-1.028	20.500	21.344	-0.844	-0.184
	4a	Section 1-A	18.300	19.579	-1.279	18.300	19.430	-1.130	-0.149
	5	Section 1-B	17.540	16.932	0.608	17.540	16.860	0.680	-0.072
	WY-1	Section-7	20.880	22.964	-2.084	20.880	22.564	-1.684	-0.401
	6	AC-AB	23.570	24.417	-0.847	23.570	24.415	-0.845	-0.002
	7	Section H	19.630	19.507	0.123	19.630	19.507	0.123	-0.001
200A	1	Section V-Section U	26.408	26.928	-0.520	26.408	26.791	-0.383	-0.137
	2	Section G-1	21.150	23.361	-2.211	21.150	22.953	-1.803	-0.408
	3a	DSD-1	20.500	21.787	-1.287	20.500	21.595	-1.095	-0.192
	4a	Section 1-A	18.300	19.788	-1.488	18.300	19.638	-1.338	-0.150
	5	Section 1-B	17.540	17.035	0.505	17.540	16.961	0.579	-0.074
	WY-1	Section-7	20.880	23.307	-2.427	20.880	22.890	-2.010	-0.417
	6	AC-AB	23.570	24.480	-0.910	23.570	24.478	-0.908	-0.002
	7	Section H	19.630	19.718	-0.088	19.630	19.717	-0.087	0.000

Remarks:-

Case	Control Points	Cross Section line ID	Existing Condition with DSD and HAD planned works			Proposed Condition with DSD and HAD planned works			Change in Water Level (m) (i.e. Proposed Condition - Existing Condition)
			Bank Level (mPD)	Water Level (mPD)	Freeboard (m)	Bank Level (mPD)	Water Level (mPD)	Freeboard (m)	Water level (m)

1. Location of control points refers to **Appendix D2.**
2. The bank levels refer to the lower bank level.
3. -ve freeboard means water level will be above channel bank level, +ve freeboard means water level below channel bank level.
4. -ve in change in water level means the water level is lower under the proposed condition as compared with the existing condition.
5. Bank level for Control Point 3a has been revised to include the crest level of proposed flood wall in accordance with design information collected from DSD for the northern channel.

4.4.3 With reference to results in **Table 4.4**, the predicted water levels of the northern channel at Control points 1 to 5 under the proposed condition are all reduced in 10 years, 1 in 50 years and 1 in 200 years flood events with the presence of DSD and HAD planned improvement works. The predicted water level for northern channel has been reduced by about 70 to 410mm under the 200 years flood event for the proposed condition as compared with the baseline condition with planned DSD and HAD works. Therefore, it is concluded that there is no adverse impact from the proposed development, indeed, there will be an improvement in the existing drainage condition from the proposed development with the proposed drainage system even under the condition with DSD and HAD planned works.

4.4.4 The predicted peak water level in the proposed channel within village zone under 10A scenario is shown in **Appendix F2**. According to the results, the proposed channel in village zone will still have at least 300mm freeboard under 10A scenario. A significant improvement on this section of the northern channel is anticipated.

5 Conclusion

5.1.1 The surface runoff running on the existing catchments at the existing development site is currently discharged to into two existing engineering channels (northern and southern channels) and existing watercourse passing through the Site. Based on the recent site inspection and aerial photos, blockage of the northern channel is identified within the nearby private lots. Due to the blockage of existing drain in nearby private lots, there is currently no proper drainage system connecting the upstream portion of northern channel to downstream channel.

5.1.2 As an enhancement opportunity of the existing blocked drainage system, the proposed development will construct a 3.0m(W) x 2.5m(H) box culvert within the Site and a concrete channel with general wide of 2.6m and channel depth of 0.8m to 2.6m in association with flood walls and 2 sections of box culverts within government lands in village zone to re-connect the upstream of channel to the downstream of the northern channel at Lin Fa Tei. The proposed drainage system will replace the existing blocked portion of northern channel outside the Site and the portion of disconnected northern channel within the Site. To allow public access from/ to areas on the south and north sides as well as from/ to areas on the east and west sides, the proposed channel will have two sections of box culverts as shown in **Appendix B5.1**. With the provision of this new drainage system, the connectivity of northern channel can be restored and enhanced. Under the proposed condition, the section of the existing watercourse within the Development will be replaced by five sets of new channel and associated pipe as shown in **Appendix B5**. In the existing condition, the runoff from the catchments Cat_004B, Cat_004C and Cat_003C is discharged to the existing watercourse near to Wah Yuen. With the proposed drainage facilities, the new channels 1, 2, 3 and 4 will intercept the flow from catchments of Cat_004B (i.e. Cat_004B1 and Cat_004B2 under proposed condition) and partial Cat_004C (i.e. Cat_004C2 and Cat_004C3), and discharge to the proposed box culvert under normal flow condition. For partial catchments Cat_004C (i.e. Cat_004C1 under proposed condition) and Cat_003C, their runoff originally discharges to the existing watercourse near to Wah Yuen under existing condition will be intercepted by new Channel 5 and its associated conduits and the collected runoff will be conveyed to the downstream of the existing natural watercourse near to Wah Yuen. Due to the high water level at the downstream northern channel under extreme rainfall event, a set of interception pipes with diameters of 900mm to 1200mm is proposed to mitigate the high water level under extreme flood event with the effect of climate change in end of century. Interception pipes are provided to intercept the runoff collected from Channels 1, 2, 3 and 4 (as shown in **Appendix B5**) to temporarily store in the proposed storage tank under extreme weather events. With the provision of new channels and associated conduits, as well as the interception pipes, it is considered that no adverse drainage impacts are anticipated from the proposed development.

5.1.3 In view of the increase of paved area in the proposed development, additional runoff from the Site is anticipated and to mitigate the impact due to the additional runoff generated from the Site, a storage tank with a size of about 12,000m^3 will be provided to temporally store the additional runoff from the Site as well as the runoff collected from Channels 1, 2, 3 and 4 via the proposed interception pipes during extreme storm and the runoff will be discharged after the peak of storm.

5.1.4 Hydraulic assessments have been carried out for both baseline and proposed condition. Based on the model results, with the proposed drainage system to restore the connectivity of the northern channel and the stormwater storage tank provided in the proposed development, an improvement of hydraulic is observed in the northern channel. The predicted peak water level for northern channel under the proposed condition has been reduced by about 80 to 510mm under the 200 years flood event as compared with the baseline condition. For the southern channel, the predicted peak water levels are similar to or slightly less than the baseline condition.

5.1.5 Based on the assessment, there is an improvement to the existing channels in the maximum water levels for the 10 years, 50 years and 200 years flood event for all the control points with the proposed drainage system in place. Therefore, it is concluded that there is no adverse impact from the proposed development with the proposed drainage system.

6 Appendices

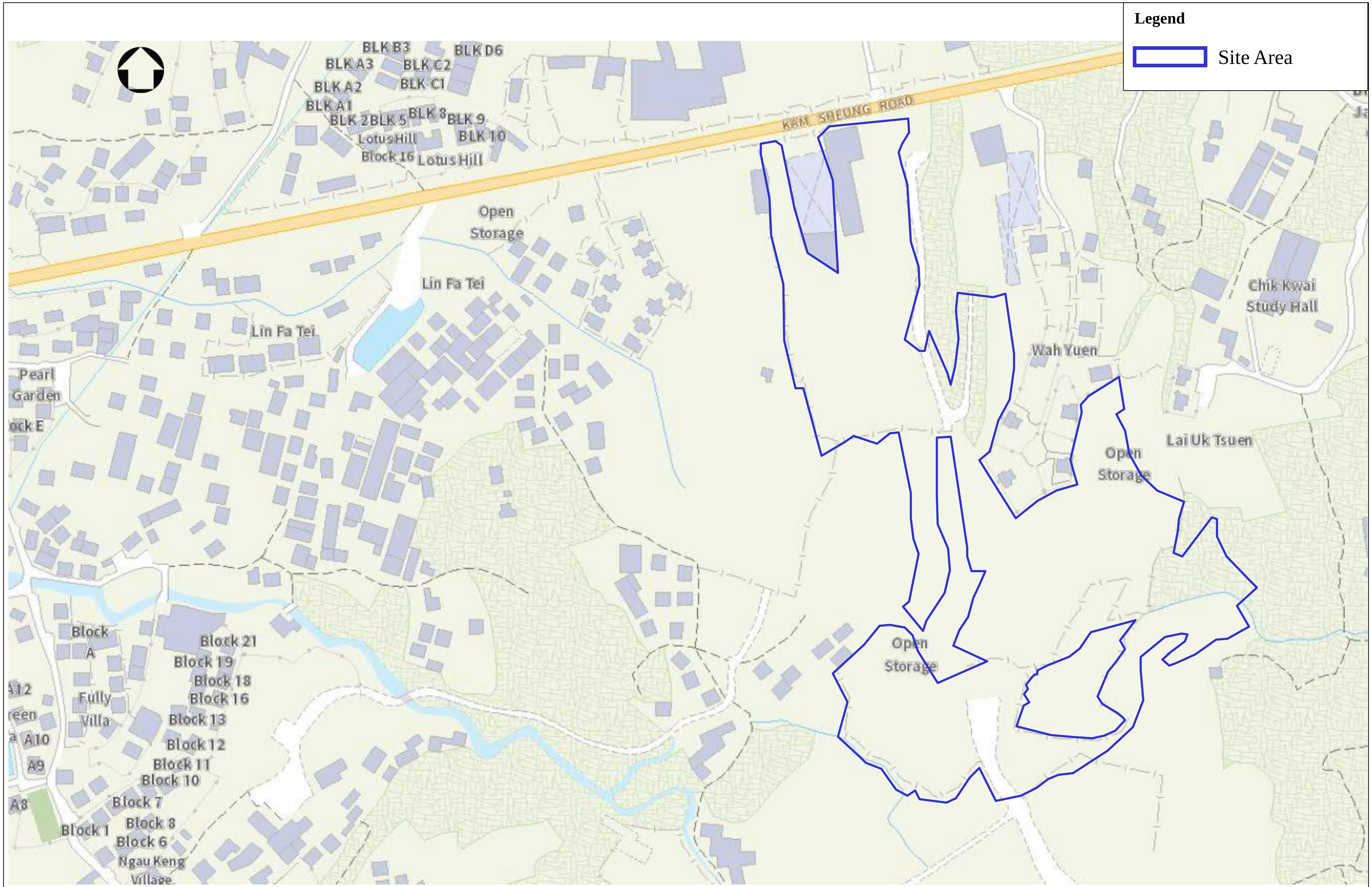
Appendix A1	Location Plan of the Proposed Residential Development
Appendix A2	Master Layout Plan of the Proposed Residential Development
Appendix B1	Existing Drainage System without DSD/ HAD Planned Improvement Works
Appendix B2	Proposed Drainage System without DSD/ HAD Planned Improvement Works
Appendix B3	Existing Drainage System with DSD/ HAD Planned Improvement Works
Appendix B4	Proposed Drainage System with DSD/ HAD Planned Improvement Works
Appendix B5	Proposed Drainage System of the Development
Appendix C	Existing and Proposed Catchment Plan
Appendix D1	Location of Control Points in the Model Results without DSD/ HAD Planned Improvement Works
Appendix D2	Location of Control Points in the Model Results with DSD/ HAD Planned Improvement Works
Appendix E1	Existing Model Extent
Appendix E2	Existing Model Extent with Catchment and Site Boundary
Appendix E3	Proposed Model Extent with Catchment and Site Boundary
Appendix E4	Modelled Nodes and Network Extracted from Hydraulic Model
Appendix F1	Profile of Proposed Channel at Maxima Water Level in the Model Extent in 10A Scenario without DSD/ HAD Planned Improvement Works
Appendix F2	Profile of Proposed Channel at Maxima Water Level in the Model Extent in 10A Scenario with DSD/ HAD Planned Improvement Works
Appendix F3	Profiles of the Blocked Section of Northern Channel Under 1 in 10 Years Rainfall Event
Appendix F4	Profile of the Proposed Box Culvert and Proposed Channel with Flood Wall under 1 in 10 Years Rainfall Event
Appendix G	Downstream Boundary Conditions Obtained from DSD
Appendix H	Topographic Survey received from the Applicant
Appendix I	InfoWorks ICM Hydraulic Model
Appendix J	Additional Survey for the Existing Natural Watercourse near to Wah Yuen
Appendix K	Hydraulic Assessment on the Proposed New Channels, Associated Conduits and Interception Pipelines Under Normal Flow and Extreme Weather Conditions
Appendix L	Schematic Drawing of the Proposed Storage Tank, 1350mm Internal Pipe, the Proposed 900mm – 1200mm Interception Pipeline and the Proposed Channel
Appendix M1	Catchments Served by Existing Watercourse near to Wah Yuen under Existing Condition

Appendix M2 Catchments Served by the Proposed Boundary Channels under Proposed Condition

Appendix N Collection of Runoff from Channels 2, 3 and 4 in Proposed Condition under Normal Flow Condition and Extreme Weather Condition

Appendix A1

Location Plan of the Proposed Residential Development



Project	Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone For Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories
Title	Location Plan of the Proposed Residential Development

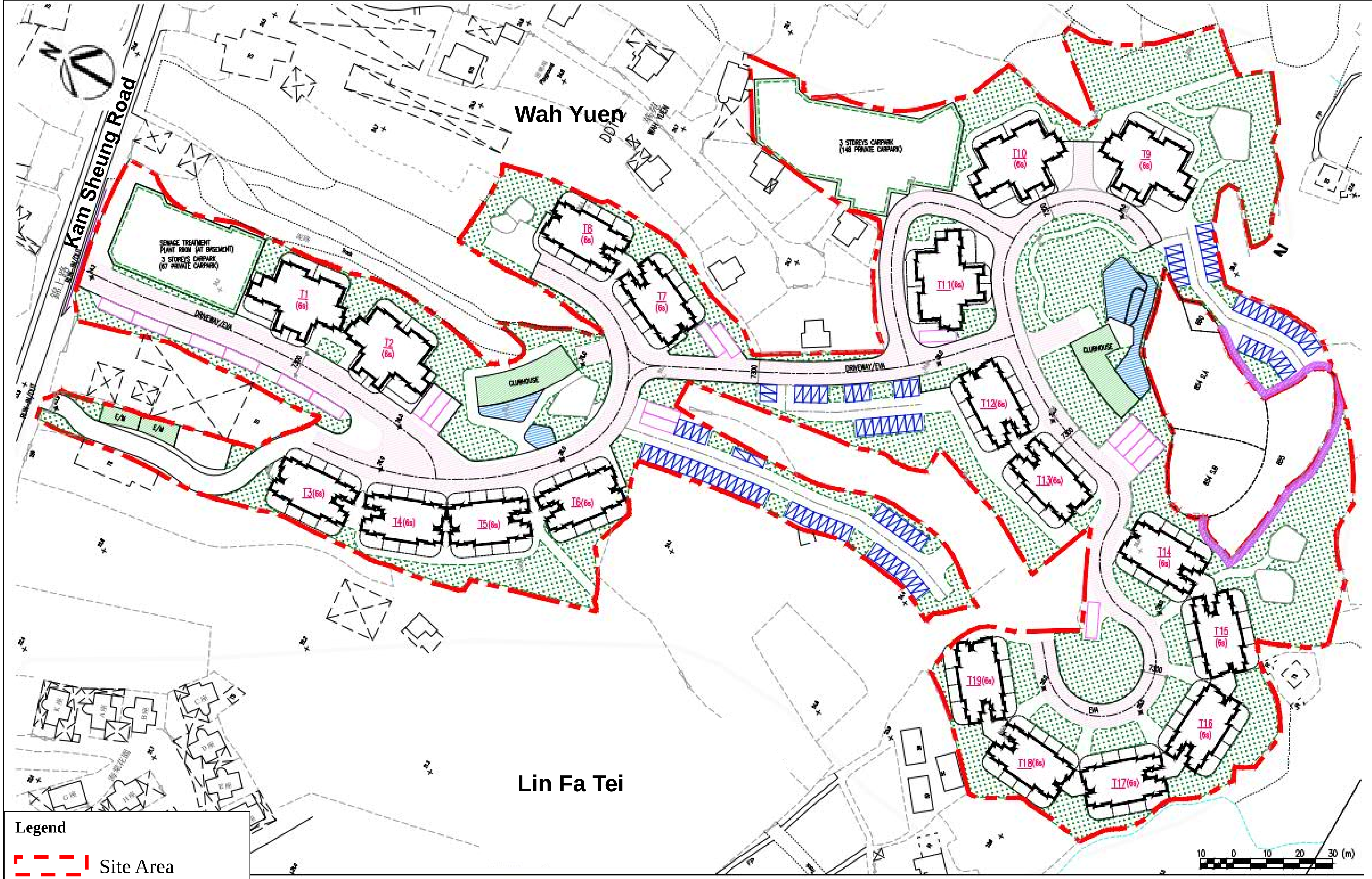
MOTT MACDONALD

Date June 2023 **Scale** N.T.S. **File**

Appendix A1

Appendix A2

Master Layout Plan of the Proposed Residential Development



Legend

🟥 Site Area

Project	Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone For Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories
Title	Master Layout Plan of the Proposed Residential Development

Date June 2023 | Scale N.T.S. | File

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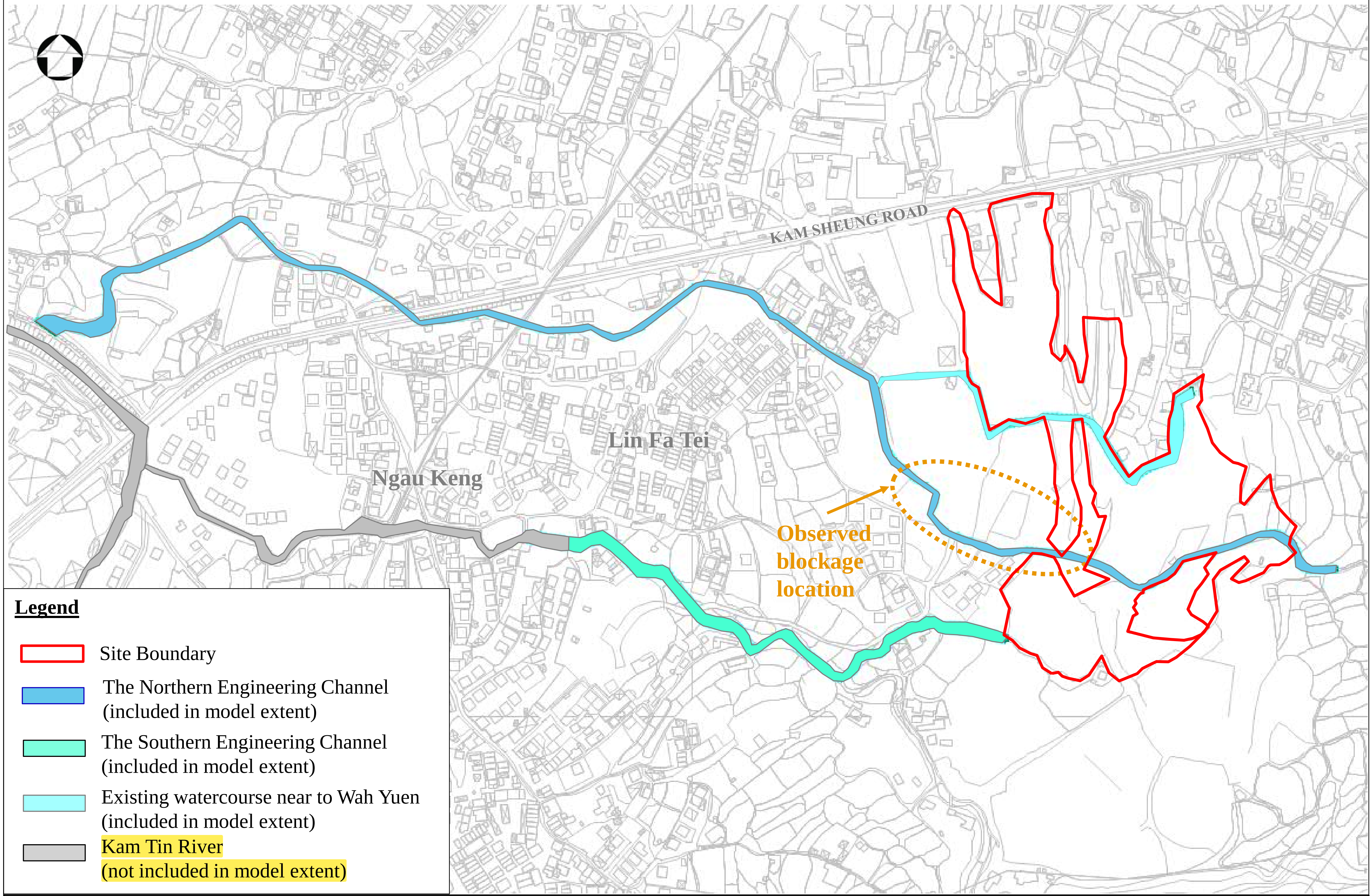
Appendix A2

Appendix B1

Existing Drainage System without DSD/ HAD Planned Improvement Works



Project	**Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone For Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories**
Title	**Existing Drainage System without DSD/ HAD Planned Improvement Works**

Date June 2024 **Scale** N.T.S. **File**

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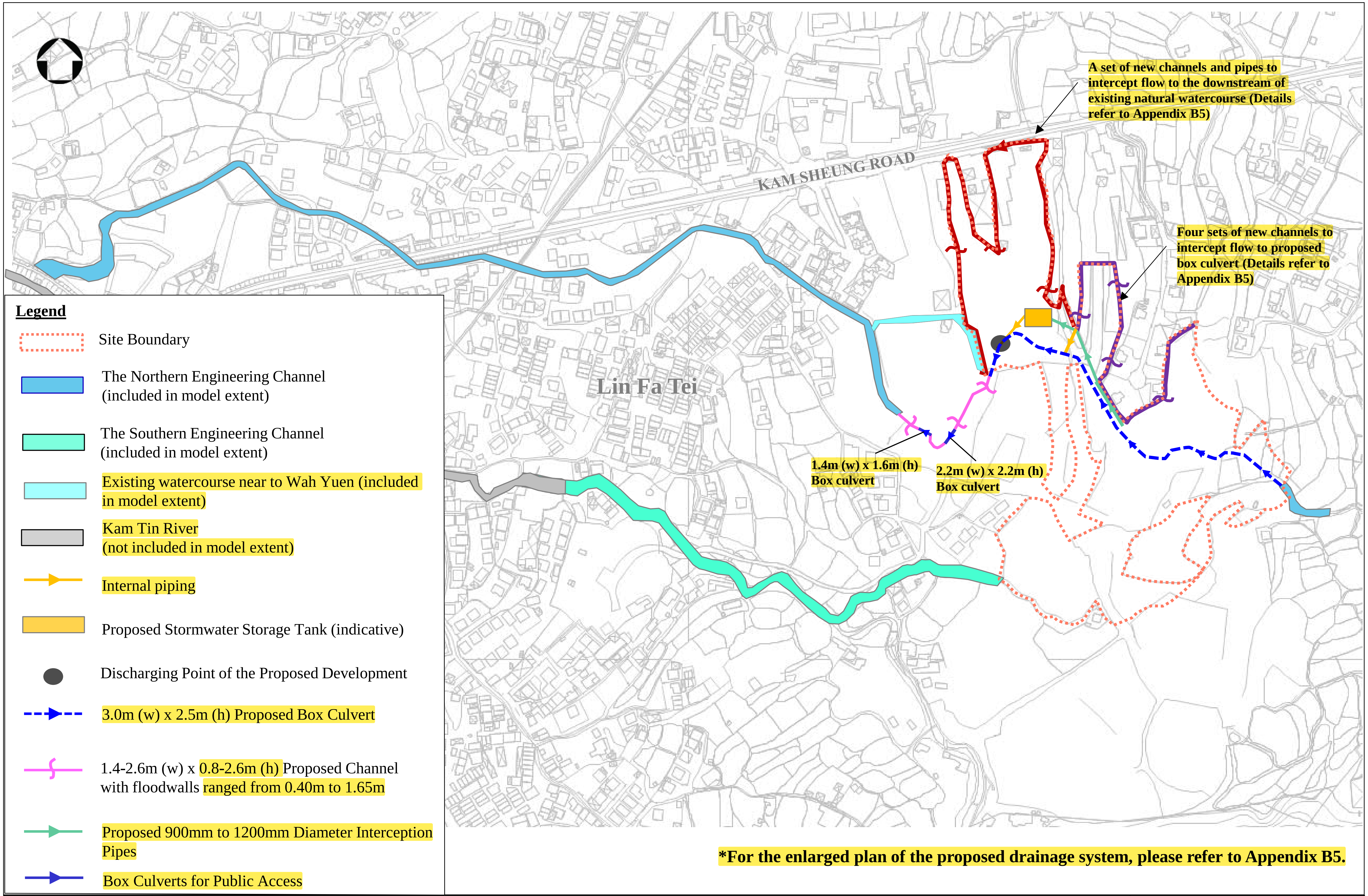
Appendix B1

Appendix B2

Proposed Drainage System without DSD/ HAD Planned Improvement Works



A set of new channels and pipes to intercept flow to the downstream of existing natural watercourse (Details refer to Appendix B5)

Four sets of new channels to intercept flow to proposed box culvert (Details refer to Appendix B5)

1.4m (w) x 1.6m (h) Box culvert

2.2m (w) x 2.2m (h) Box culvert

Legend

▭	Site Boundary
▬	The Northern Engineering Channel (included in model extent)
▬	The Southern Engineering Channel (included in model extent)
▬	Existing watercourse near to Wah Yuen (included in model extent)
▬	Kam Tin River (not included in model extent)
→	Internal piping
▬	Proposed Stormwater Storage Tank (indicative)
●	Discharging Point of the Proposed Development
- - → - -	3.0m (w) x 2.5m (h) Proposed Box Culvert
—{—	1.4-2.6m (w) x 0.8-2.6m (h) Proposed Channel with floodwalls ranged from 0.40m to 1.65m
→	Proposed 900mm to 1200mm Diameter Interception Pipes
→	Box Culverts for Public Access

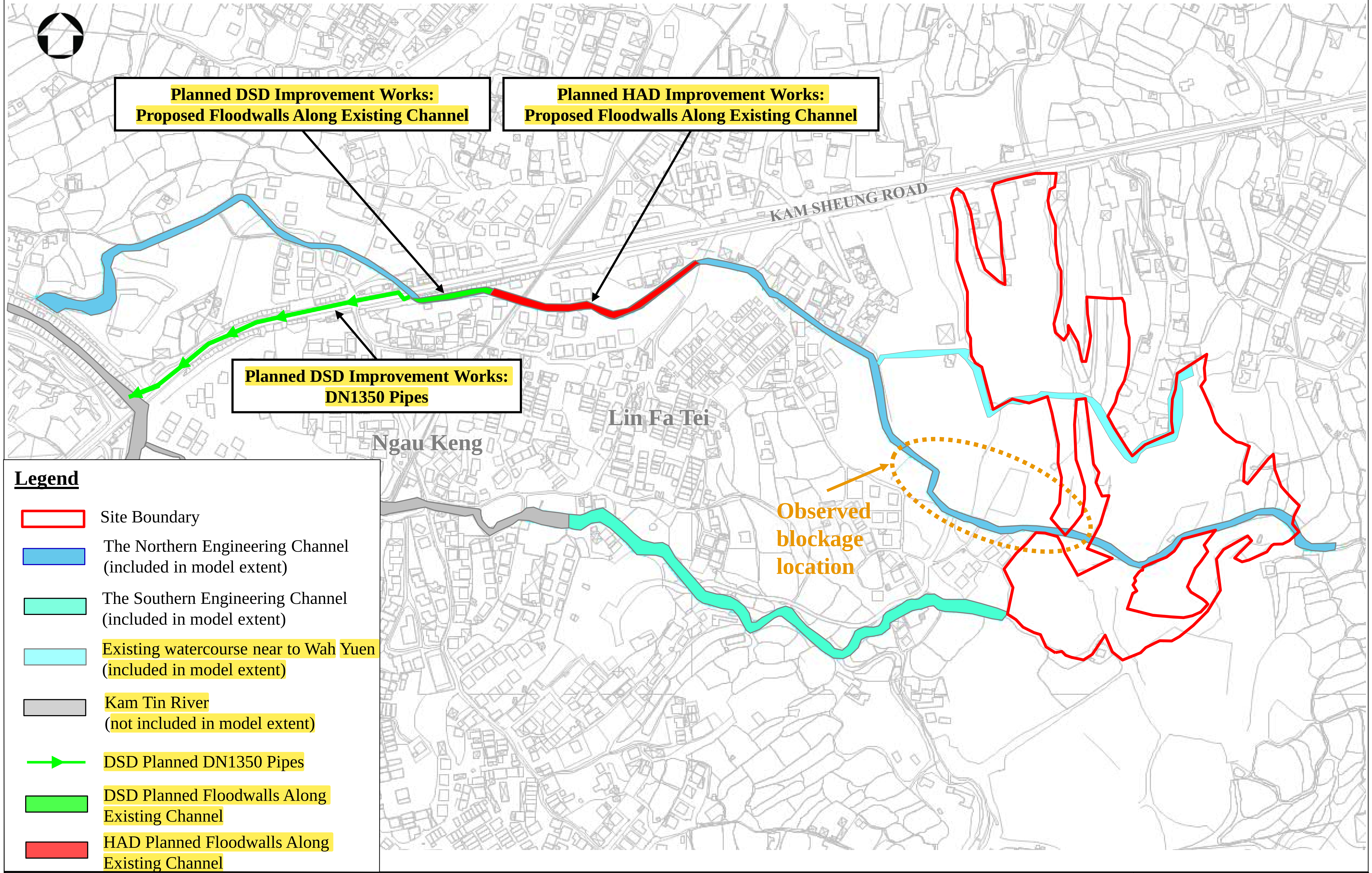
***For the enlarged plan of the proposed drainage system, please refer to Appendix B5.**

Project	**Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone For Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories**	MOTT MACDONALD
Title	**Proposed Drainage System without DSD/HAD Planned Improvement Works**	**Appendix B2**

Date June 2024 **Scale** N.T.S. **File**

Appendix B3

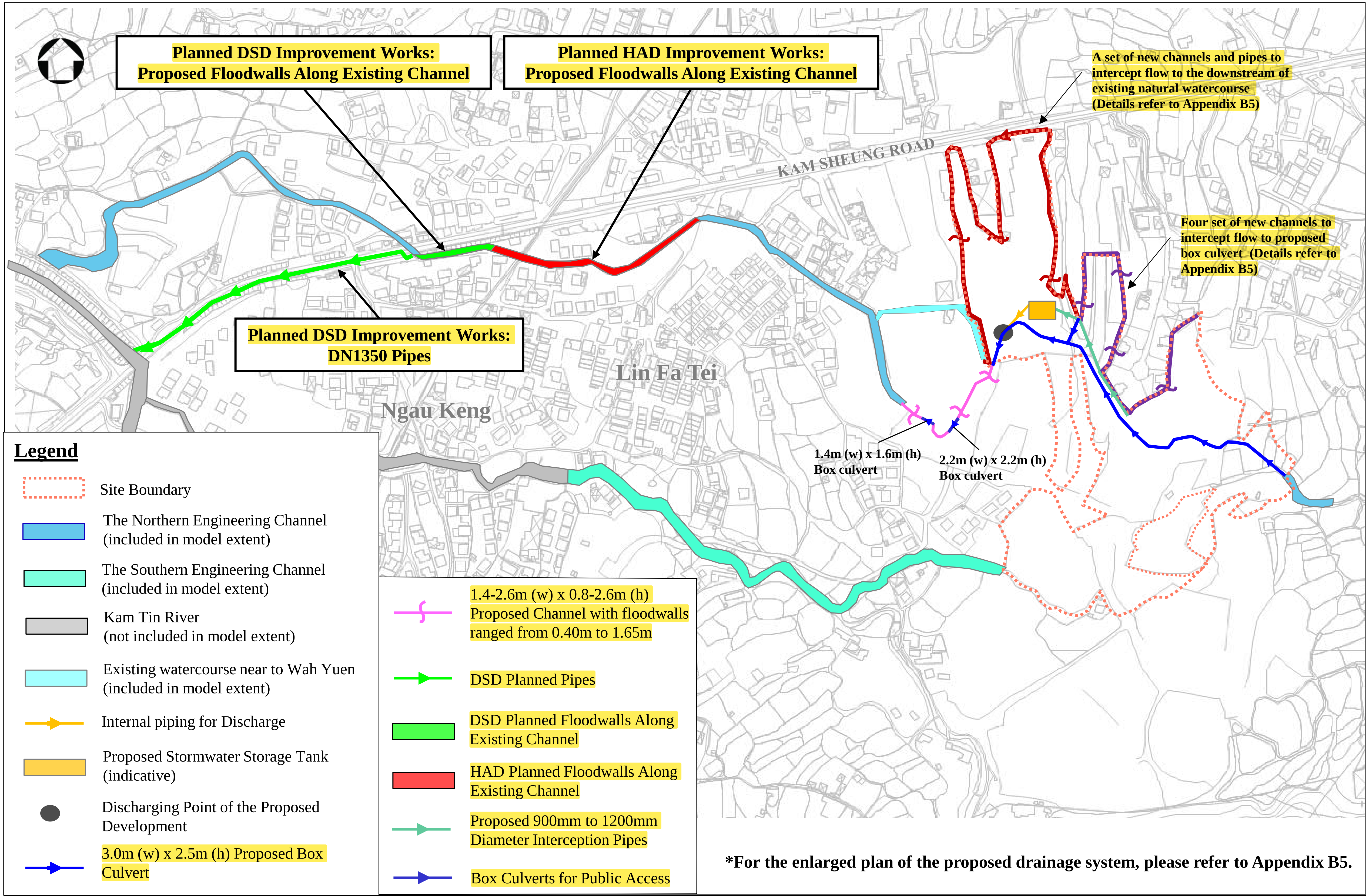
Existing Drainage System with DSD/ HAD Planned Improvement Works



Project	**Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” zone For Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories**	MOTT MACDONALD
Title	**Existing Drainage System with DSD/HAD Planned Improvement Works**	**Appendix B3**
Date Jul 2024	**Scale** N.T.S.	**File**

Appendix B4

Proposed Drainage System with DSD/ HAD Planned Improvement Works



***For the enlarged plan of the proposed drainage system, please refer to Appendix B5.**

Project **Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone For Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories**

Title **Proposed Drainage System with DSD/HAD Planned Improvement Works**

Date Jul 2024 | Scale N.T.S. | File

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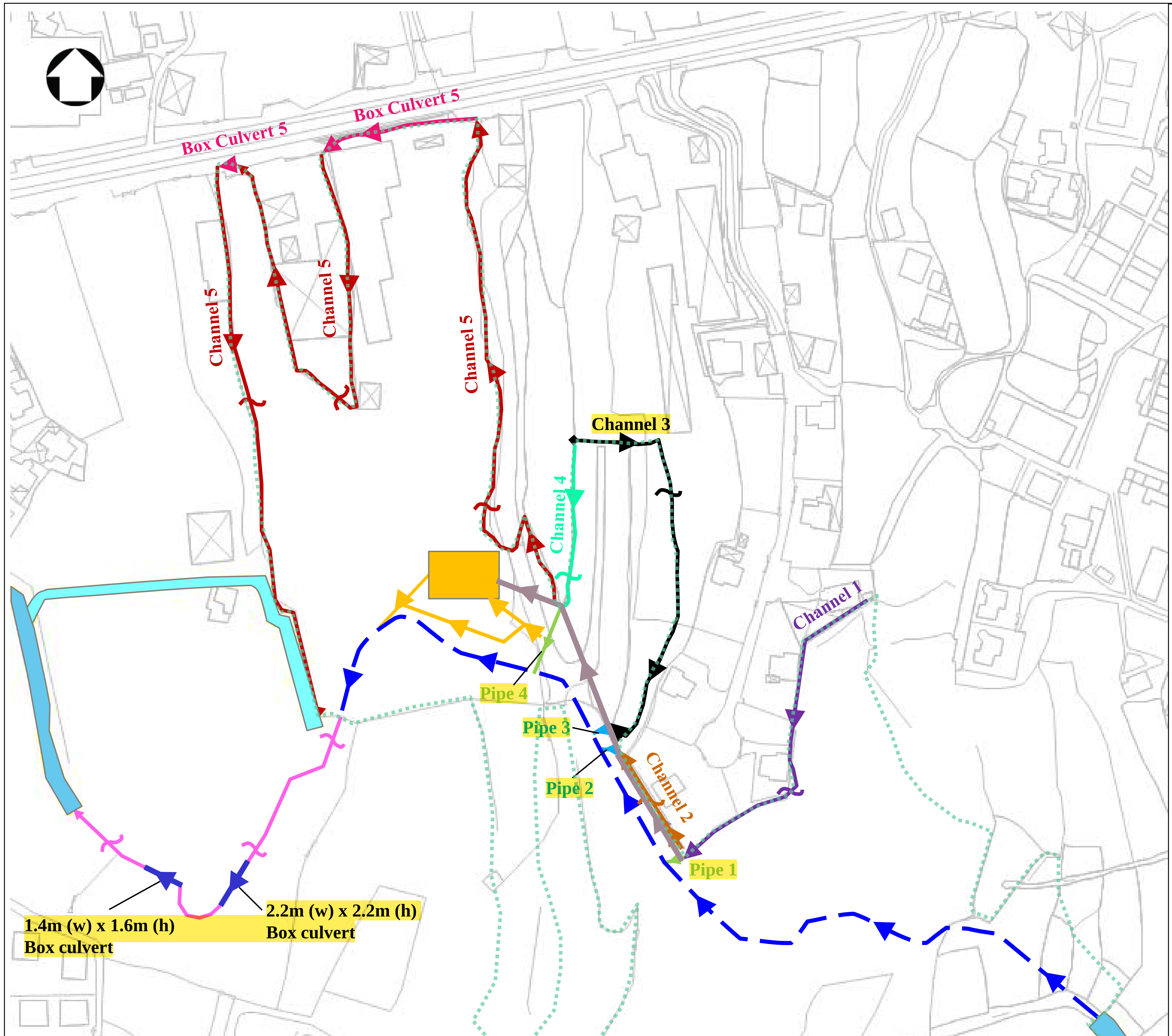
Appendix B4

Appendix B5

Proposed Drainage System of the Development



Remark:
 # Flap valves are proposed to be installed for Pipes 1, 2, 3 and 4.
***The proposed drainage system will be adopted in both the scenario without DSD/HAD planned improvement works and the scenario with DSD planned improvement works.**

Legend

- Site Boundary
- Internal piping for Discharge
- Proposed Stormwater Storage Tank (indicative)
- 3.0m (w) x 2.5m (h) Proposed Box Culvert
- 1.4-2.6m (w) x 0.8-2.6m (h) Proposed Channel with floodwalls ranged from 0.40m to 1.65m
- 1.3m (w) x 1-1.01m (h) Proposed Channel for intercepting runoff from nearby catchments of Wah Yuen (i.e. Channel 1)
- 1.2m (w) x 1.09-1.10m (h) Proposed Channel for intercepting runoff from nearby catchments of Wah Yuen (i.e. Channel 2)
- 1m (w) x 1.5-1.63m (h) Proposed Channel for intercepting runoff from nearby catchments of Wah Yuen (i.e. Channel 3)
- 1.4m (w) x 0.76-1.51m (h) Proposed Channel for intercepting runoff from nearby catchments of Wah Yuen (i.e. Channel 4)
- 1200mm dia. Proposed Pipes (i.e. Pipes 1 & 4)#
- 1050mm dia. Proposed Pipes (i.e. Pipes 2 & 3)#
- 1.2m (w) x 0.9-0.1.63m (h) Proposed Channel for intercepting runoff from nearby catchments (i.e. Channel 5)
- 0.8-1.0m (w) x 0.5m (h) Proposed Box Culvert for intercepting runoff from nearby catchments (i.e. Box Culvert 5)
- Existing watercourse near to Wah Yuen
- The Northern Engineering Channel
- 900mm to 1200mm dia. Proposed Interception Pipes for intercepting runoff from Channels 1, 2, 3 & 4 to proposed stormwater storage tank during extreme weather events
- Box Culvert for Public Access

Project	**Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone For Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories**
Title	**Proposed Drainage System of the Development**

Date June 2024 **Scale** N.T.S. **File**

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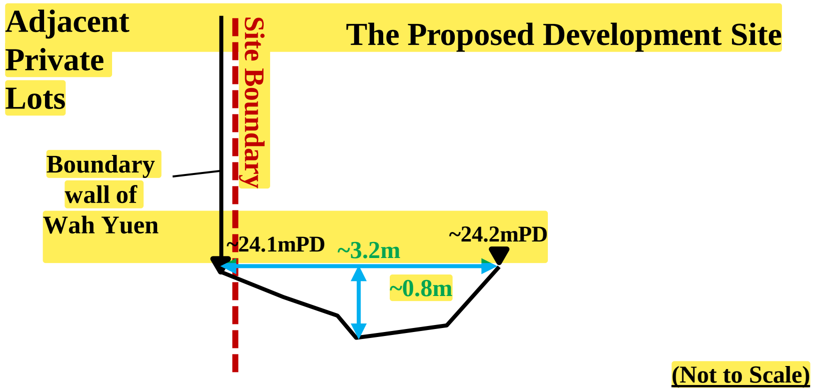
Appendix B5.1

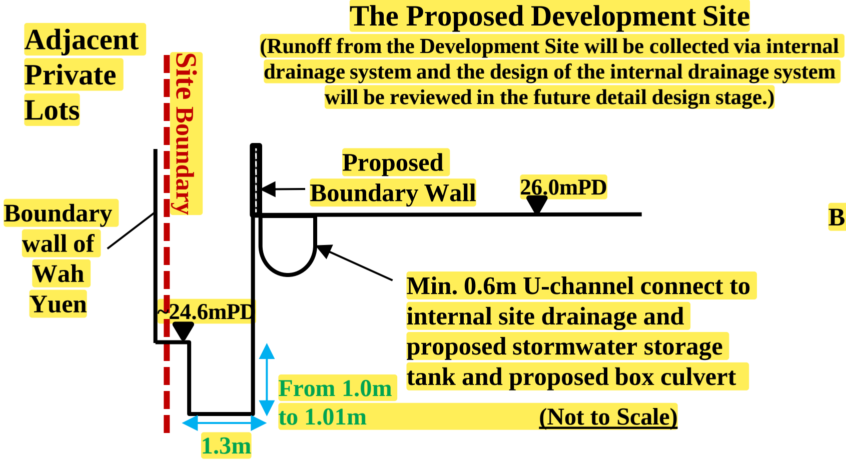
Existing Condition



(Not to Scale)

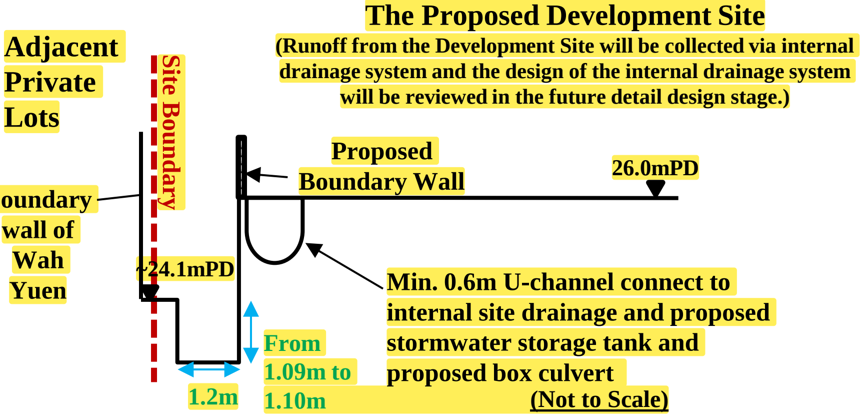
A SINGLE existing watercourse, with vegetation surface, is currently serving the areas of Wah Yuen and nearby catchments under existing condition.

Proposed Condition



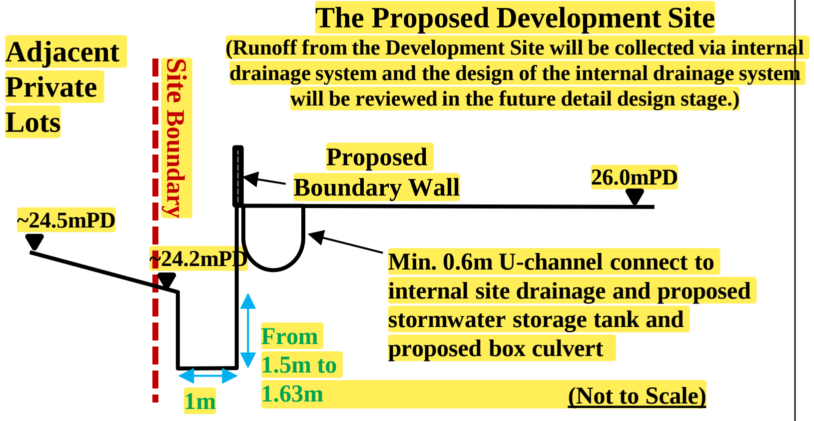
(Not to Scale)

Proposed Channel 1 connected to Pipe 1 (1200ø)



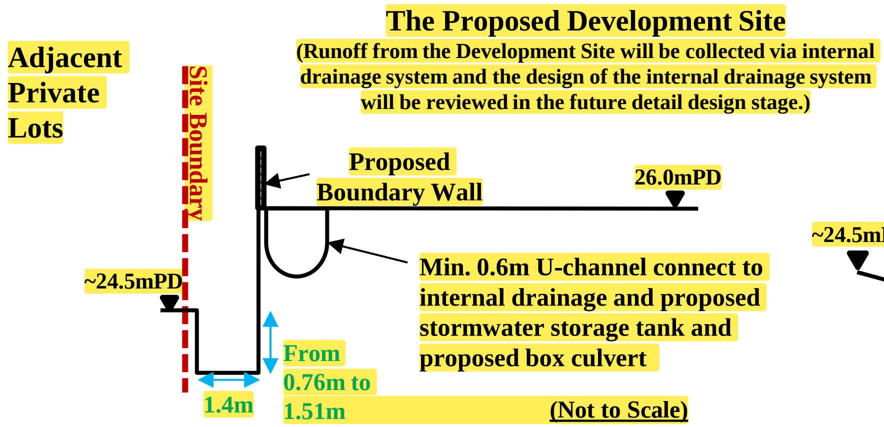
(Not to Scale)

Proposed Channel 2 connected to Pipe 2 (1500ø)



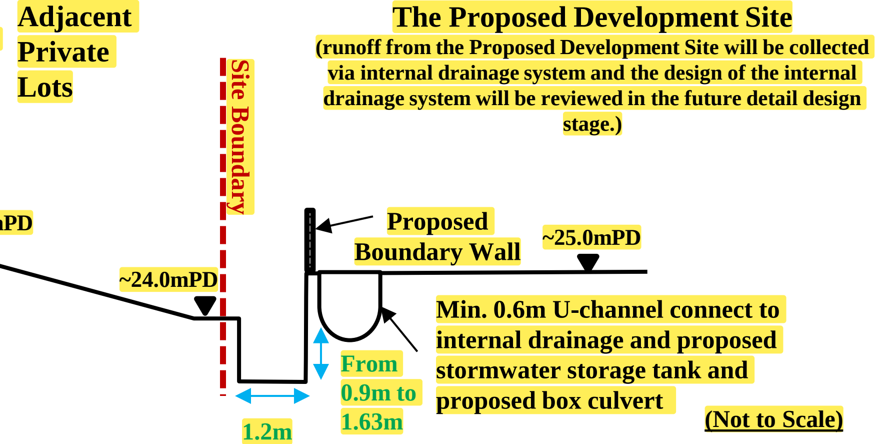
(Not to Scale)

Proposed Channel 3 connected to Pipe 3 (1500ø)



(Not to Scale)

Proposed Channel 4 connected to Pipe 4 (1200ø)



(Not to Scale)

Proposed Channel 5 connected to existing watercourse near to Wah Yuen

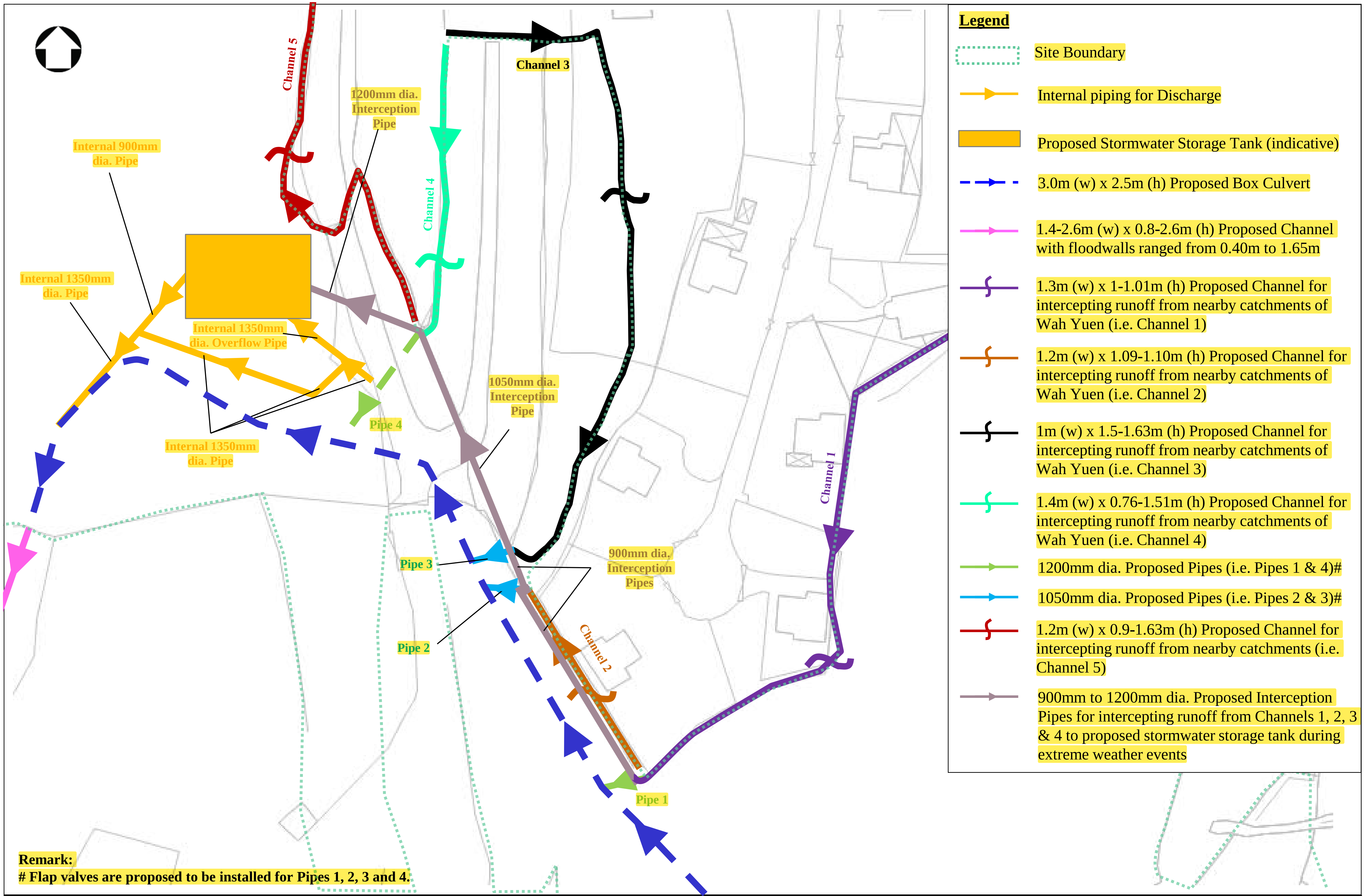
FIVE sets of standalone boundary concrete channel and associated conduits are proposed to replace the SINGLE existing vegetated watercourse near to Wah Yuen

Project Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone For Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

Title Proposed Drainage System of the Development

Date June 2024
Scale N.T.S.
File

Appendix B5.2



Legend

▨	Site Boundary
→	Internal piping for Discharge
▬	Proposed Stormwater Storage Tank (indicative)
- → -	3.0m (w) x 2.5m (h) Proposed Box Culvert
→	1.4-2.6m (w) x 0.8-2.6m (h) Proposed Channel with floodwalls ranged from 0.40m to 1.65m
∫	1.3m (w) x 1-1.01m (h) Proposed Channel for intercepting runoff from nearby catchments of Wah Yuen (i.e. Channel 1)
∫	1.2m (w) x 1.09-1.10m (h) Proposed Channel for intercepting runoff from nearby catchments of Wah Yuen (i.e. Channel 2)
∫	1m (w) x 1.5-1.63m (h) Proposed Channel for intercepting runoff from nearby catchments of Wah Yuen (i.e. Channel 3)
∫	1.4m (w) x 0.76-1.51m (h) Proposed Channel for intercepting runoff from nearby catchments of Wah Yuen (i.e. Channel 4)
→	1200mm dia. Proposed Pipes (i.e. Pipes 1 & 4)#
→	1050mm dia. Proposed Pipes (i.e. Pipes 2 & 3)#
∫	1.2m (w) x 0.9-1.63m (h) Proposed Channel for intercepting runoff from nearby catchments (i.e. Channel 5)
→	900mm to 1200mm dia. Proposed Interception Pipes for intercepting runoff from Channels 1, 2, 3 & 4 to proposed stormwater storage tank during extreme weather events

Remark:
 # Flap valves are proposed to be installed for Pipes 1, 2, 3 and 4.

Project **Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone For Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories**

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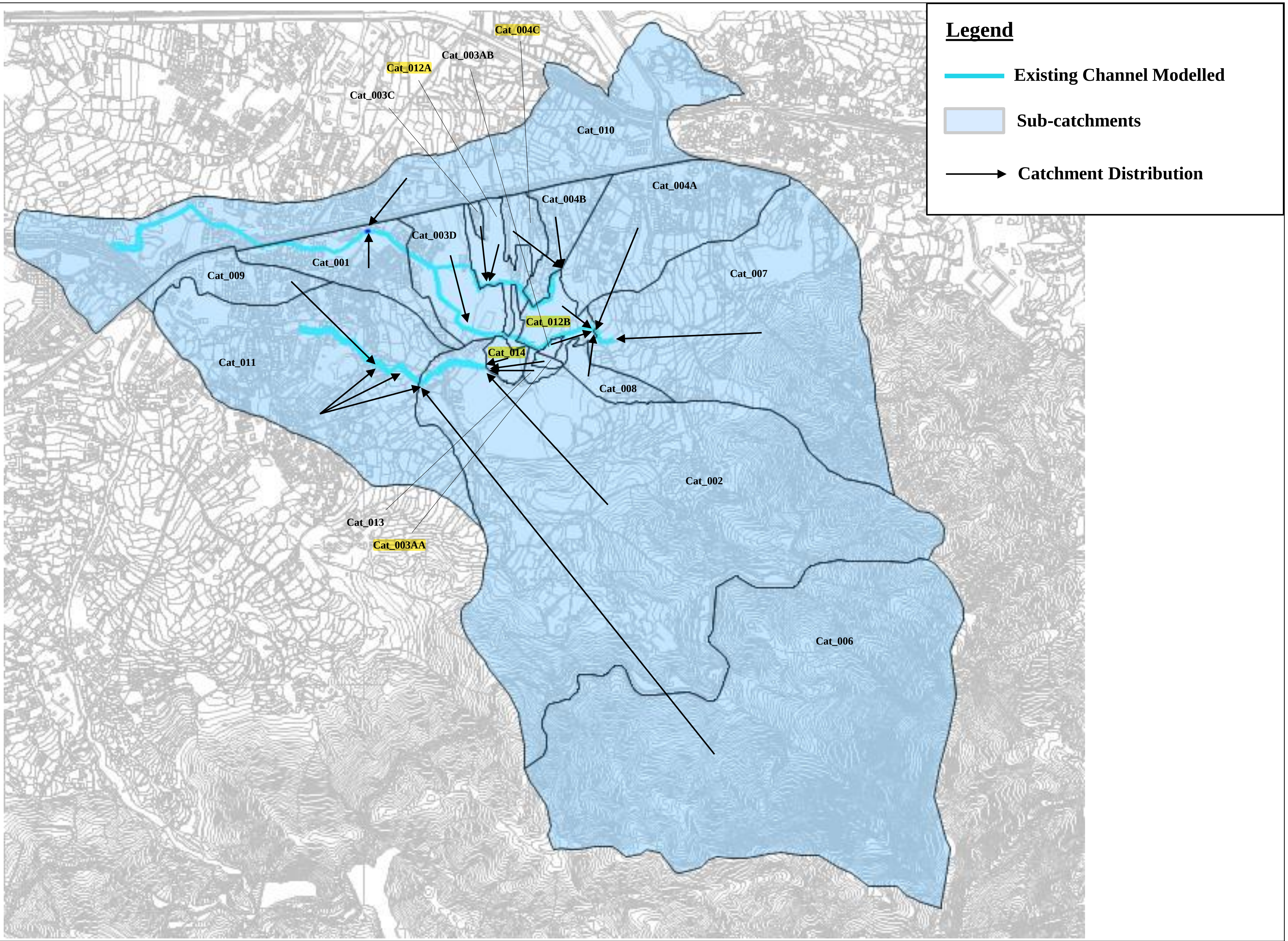
Title **Proposed Drainage System of the Development**

Appendix B5.3

Date **June 2024** **Scale** **N.T.S.** **File**

Appendix C

Existing and Proposed Catchment Plan

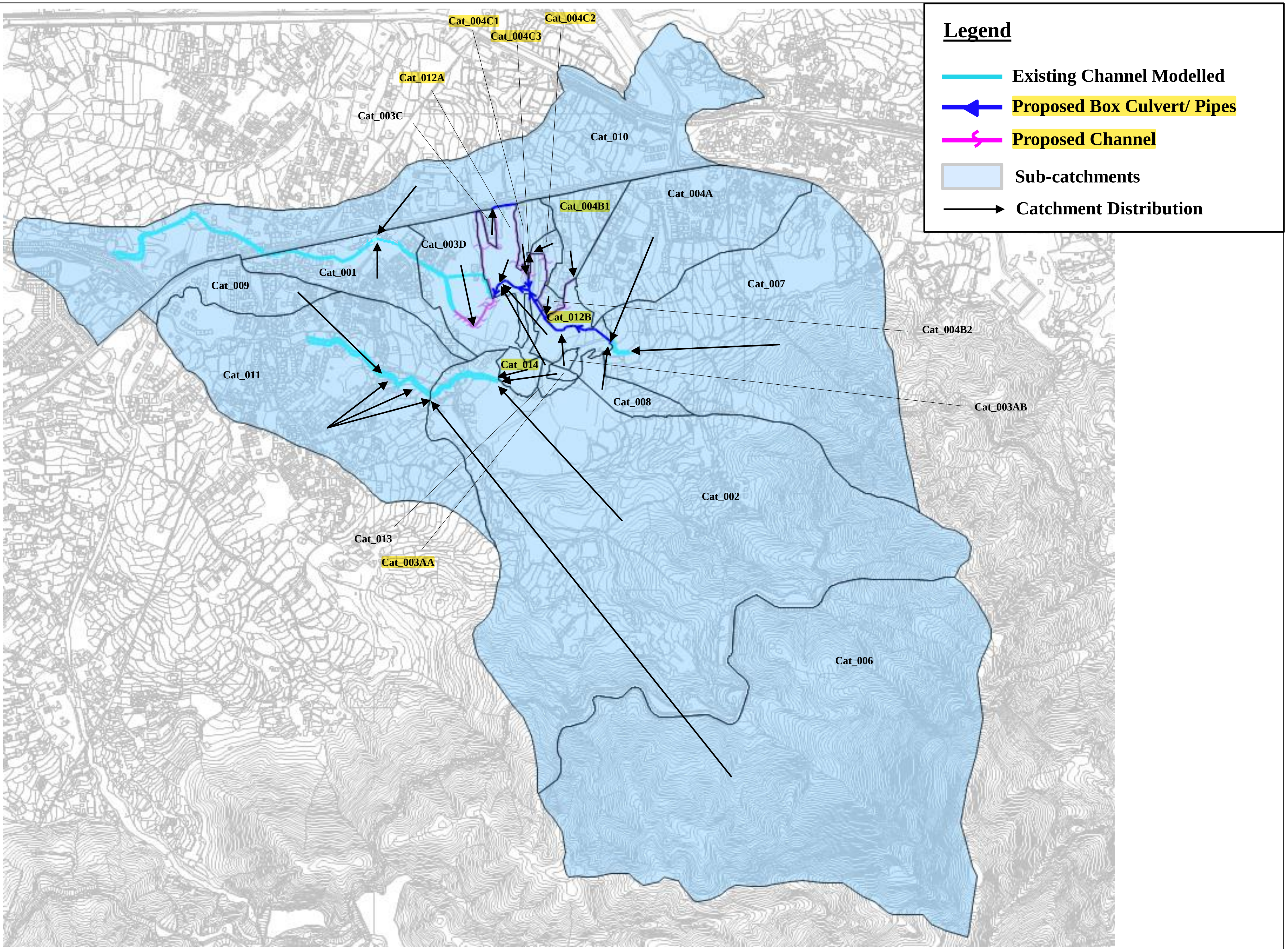


Project	**Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone For Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories**
Title	**Existing Catchment Plan**

MOTT MACDONALD

Appendix C.1

Date June 2024 | **Scale** N.T.S. | **File**



Project	Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” zone For Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories
Title	Proposed Catchment Plan

Date June 2024 | **Scale** N.T.S. | **File**

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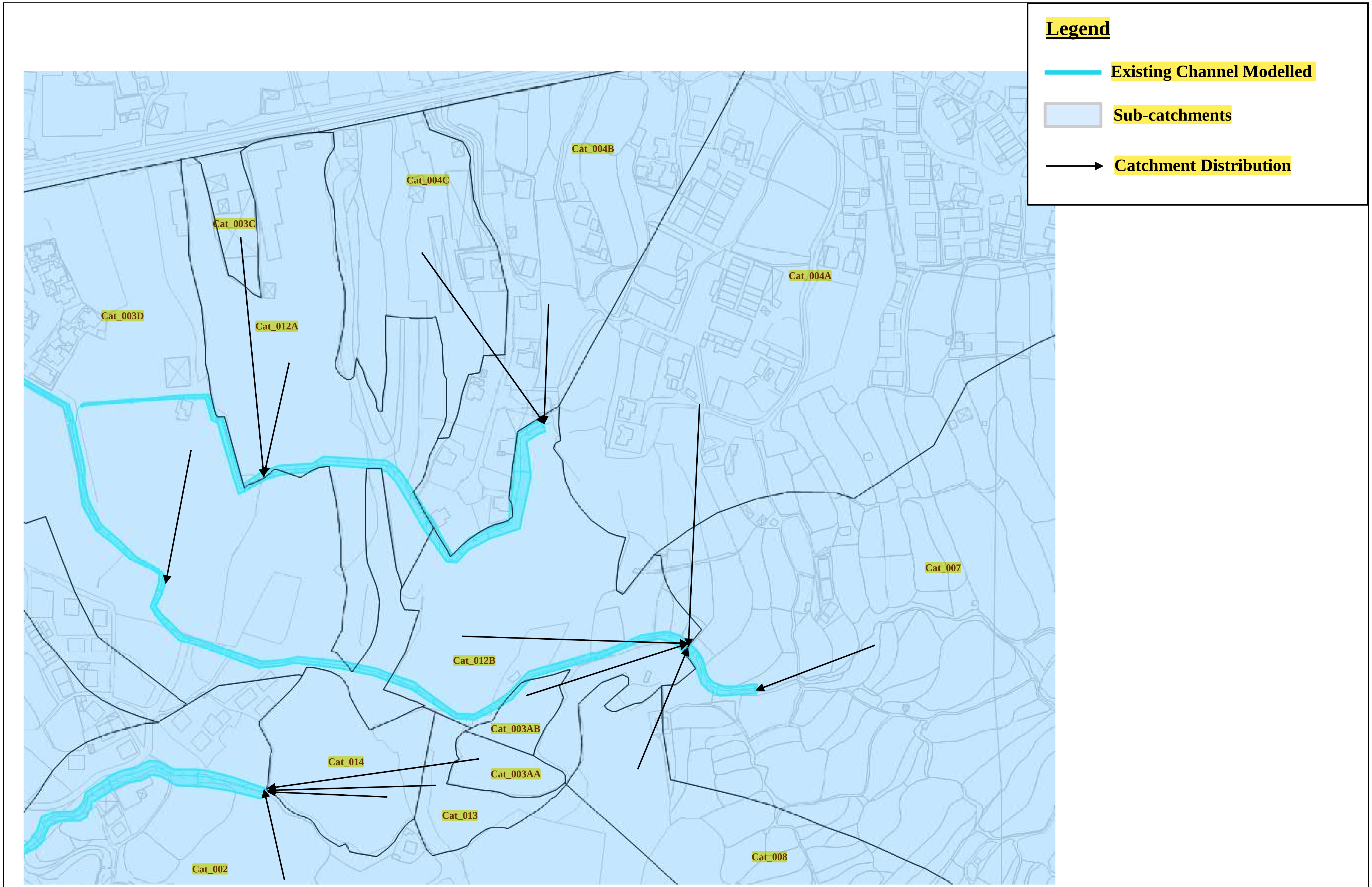
Appendix C.2



Project Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” zone For Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

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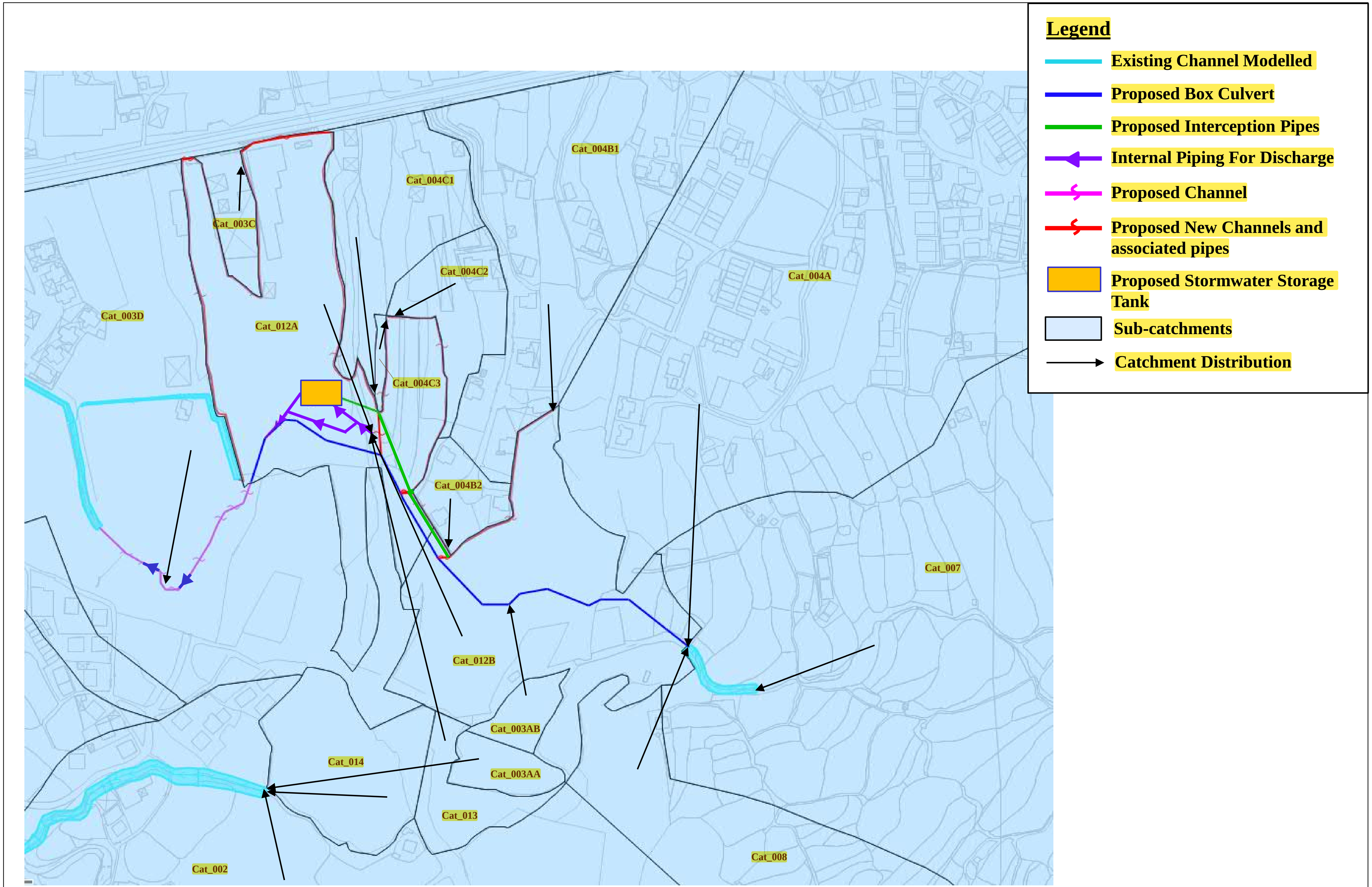
Title Existing Catchment Plan (Enlarged Plan)

Appendix C.3

Date	November 2023	Scale	N.T.S.	File	



Project	Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” zone For Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories
Title	Proposed Catchment Plan (Enlarged Plan)

Date June 2024 | Scale N.T.S. | File

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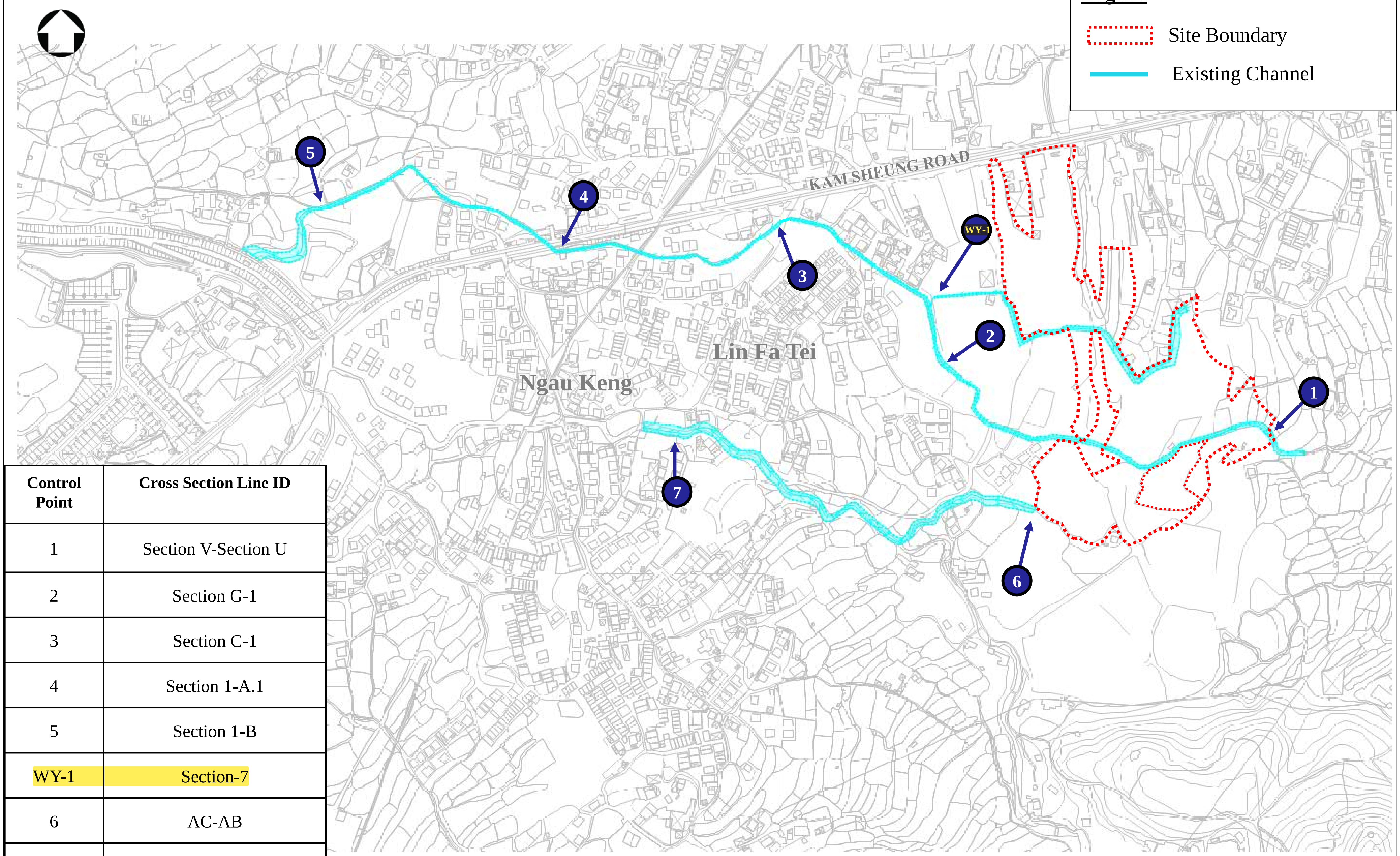
Appendix C.4

Appendix D1

Location of Control Points in the Model Results without DSD/ HAD Planned Improvement Works



Control Point	Cross Section Line ID
1	Section V-Section U
2	Section G-1
3	Section C-1
4	Section 1-A.1
5	Section 1-B
WY-1	Section-7
6	AC-AB
7	Section H

Project Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone For Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

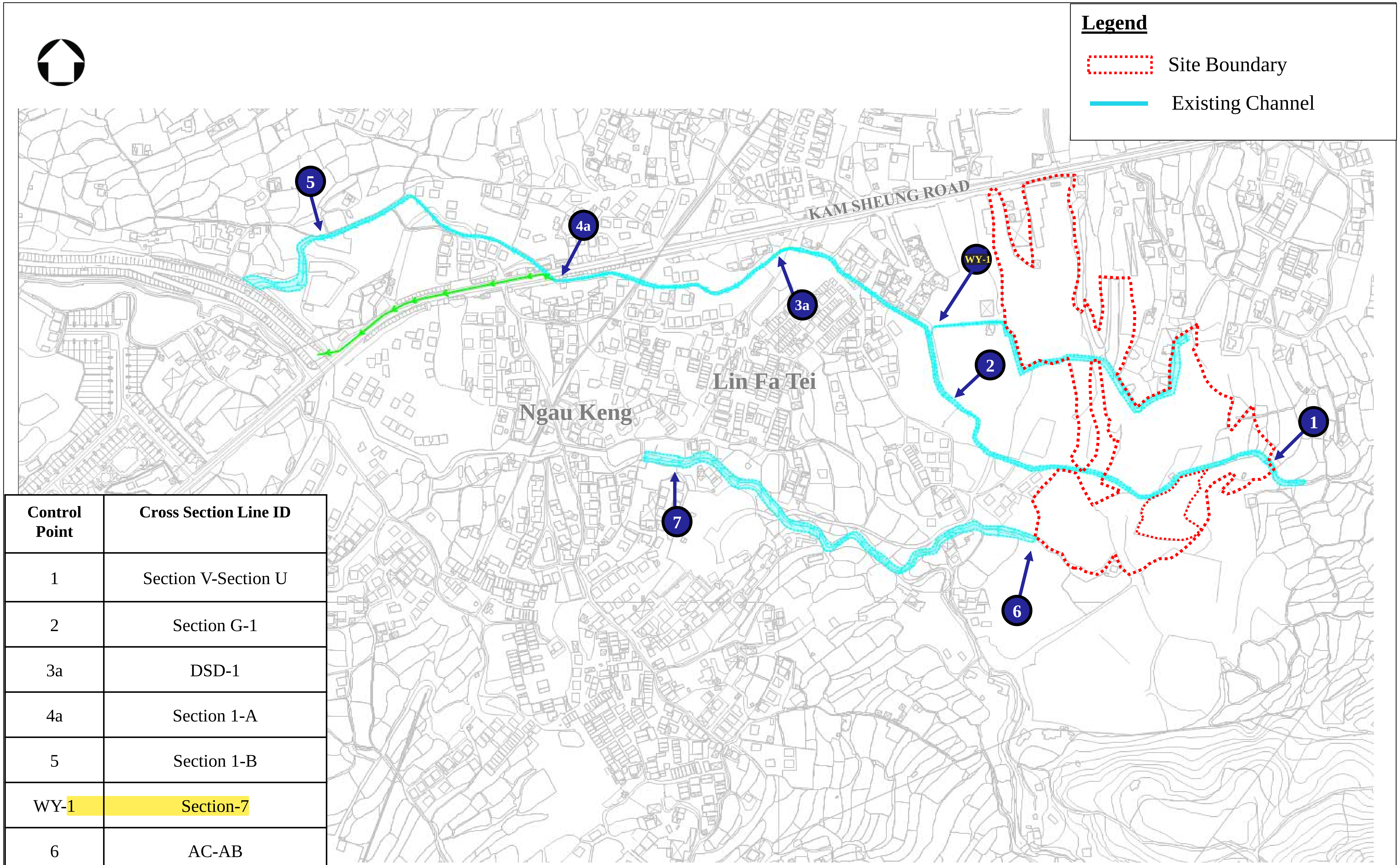
Title Location of Control Points in the Model Results without DSD/ HAD Planned Improvement works

Date June 2024 Scale N.T.S. File

Appendix D1

Appendix D2

Location of Control Points in the Model Results with DSD/ HAD Planned Improvement Works



Control Point	Cross Section Line ID
1	Section V-Section U
2	Section G-1
3a	DSD-1
4a	Section 1-A
5	Section 1-B
WY-1	Section-7
6	AC-AB
7	Section H

Project Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone For Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

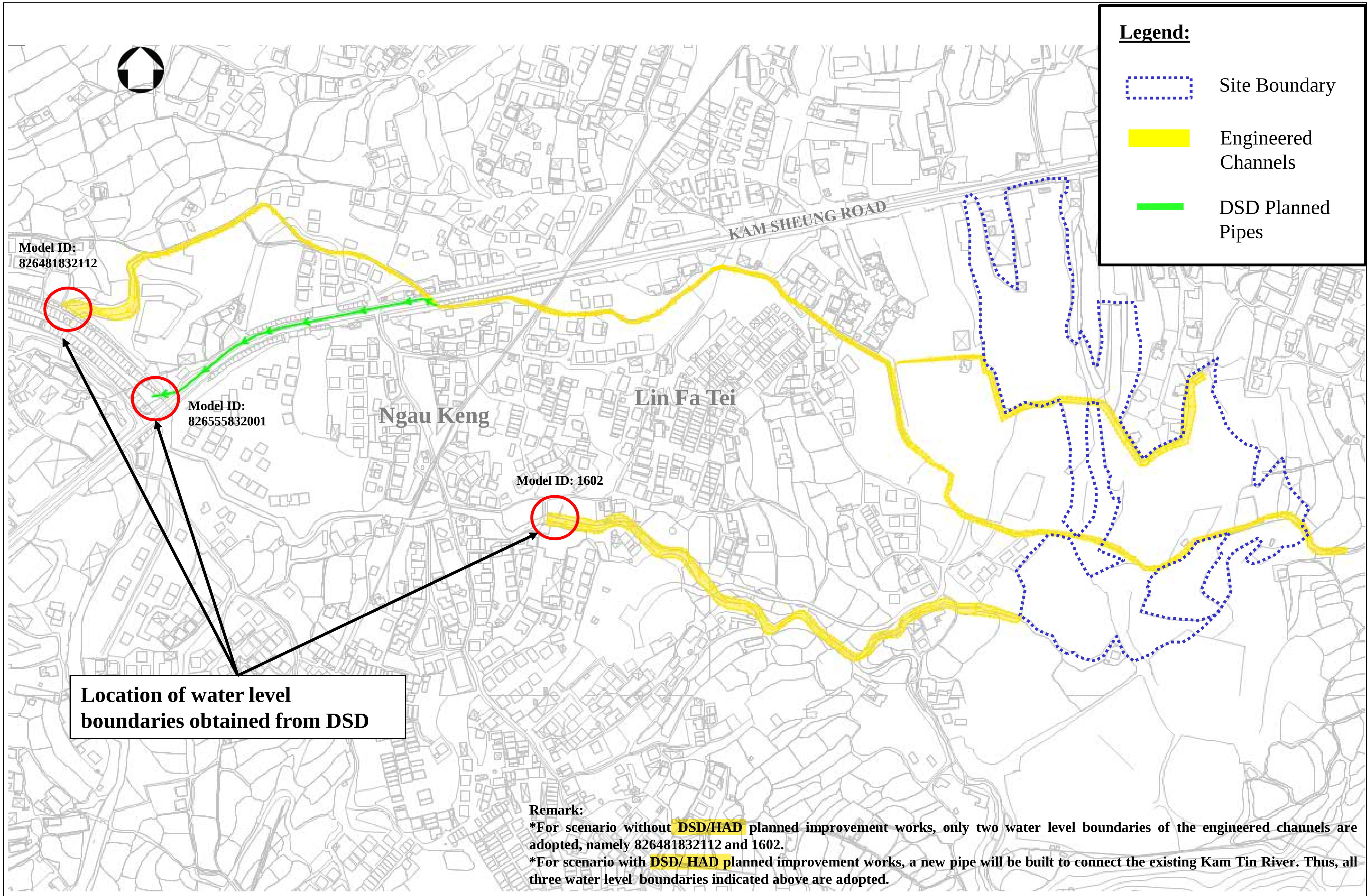
Title Location of Control Points in the Model Results with DSD/HAD Planned Improvement works

Date June 2024 **Scale** N.T.S. **File**

Appendix D2

Appendix E1

Existing Model Extent



Remark:

*For scenario without DSD/HAD planned improvement works, only two water level boundaries of the engineered channels are adopted, namely 826481832112 and 1602.

*For scenario with DSD/ HAD planned improvement works, a new pipe will be built to connect the existing Kam Tin River. Thus, all three water level boundaries indicated above are adopted.

Project	Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone For Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories
Title	Existing Model Extent

Date June 2024 | Scale N.T.S. | File

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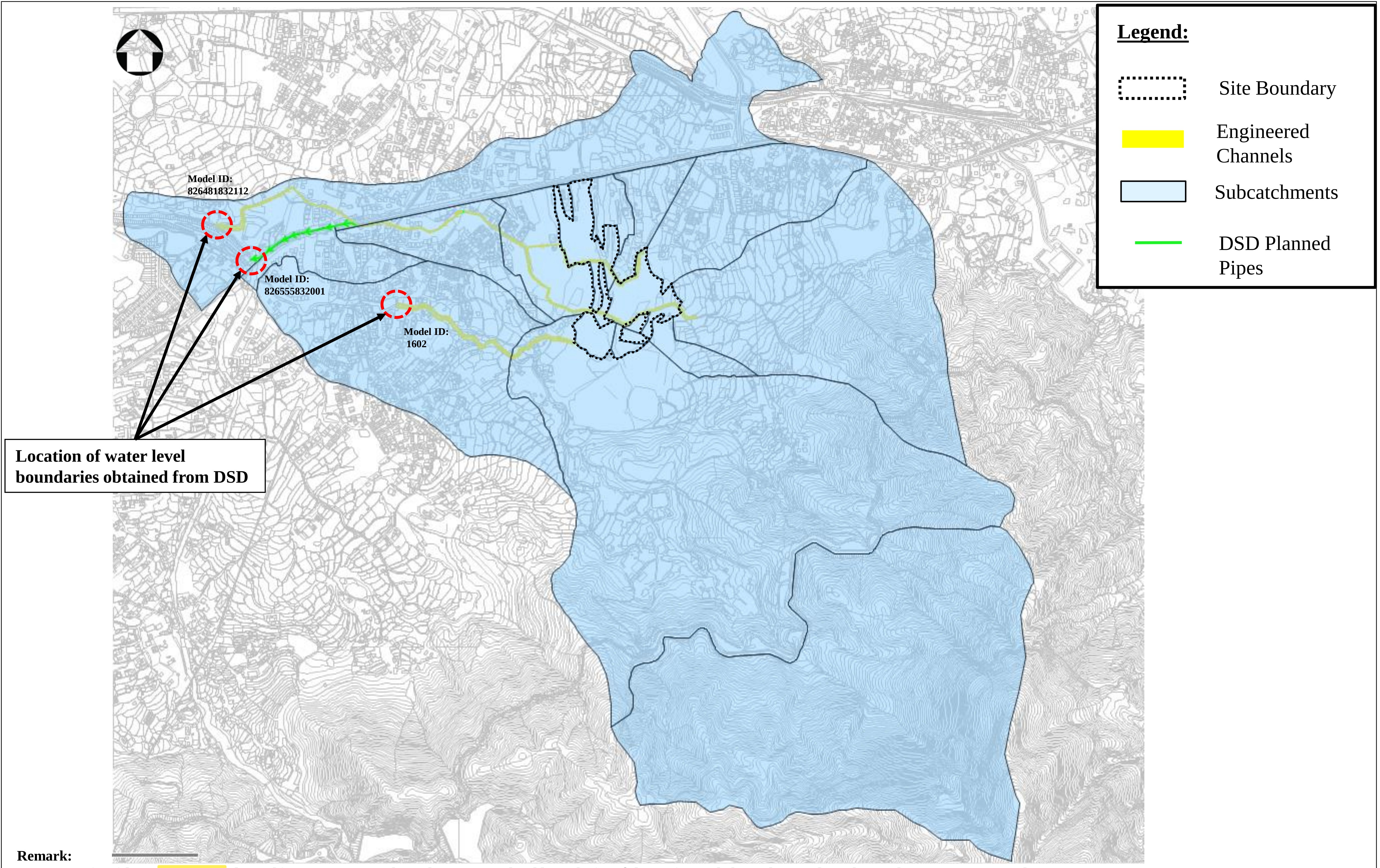
Appendix E1

Appendix E2

Existing Model Extent with Catchment and Site Boundary



Remark:

*For scenario without DSD/HAD planned improvement works, only two water level boundaries of the engineered channels are adopted, namely 826481832112 and 1602.

*For scenario with DSD/HAD planned improvement works, a new pipe will be built to connect the existing Kam Tin River. Thus, all three water level boundaries indicated above are adopted.

Project	Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone For Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories
Title	Existing Model Extent with Sub-Catchments and Site Boundary

Date June 2024 | **Scale** N.T.S. | **File**

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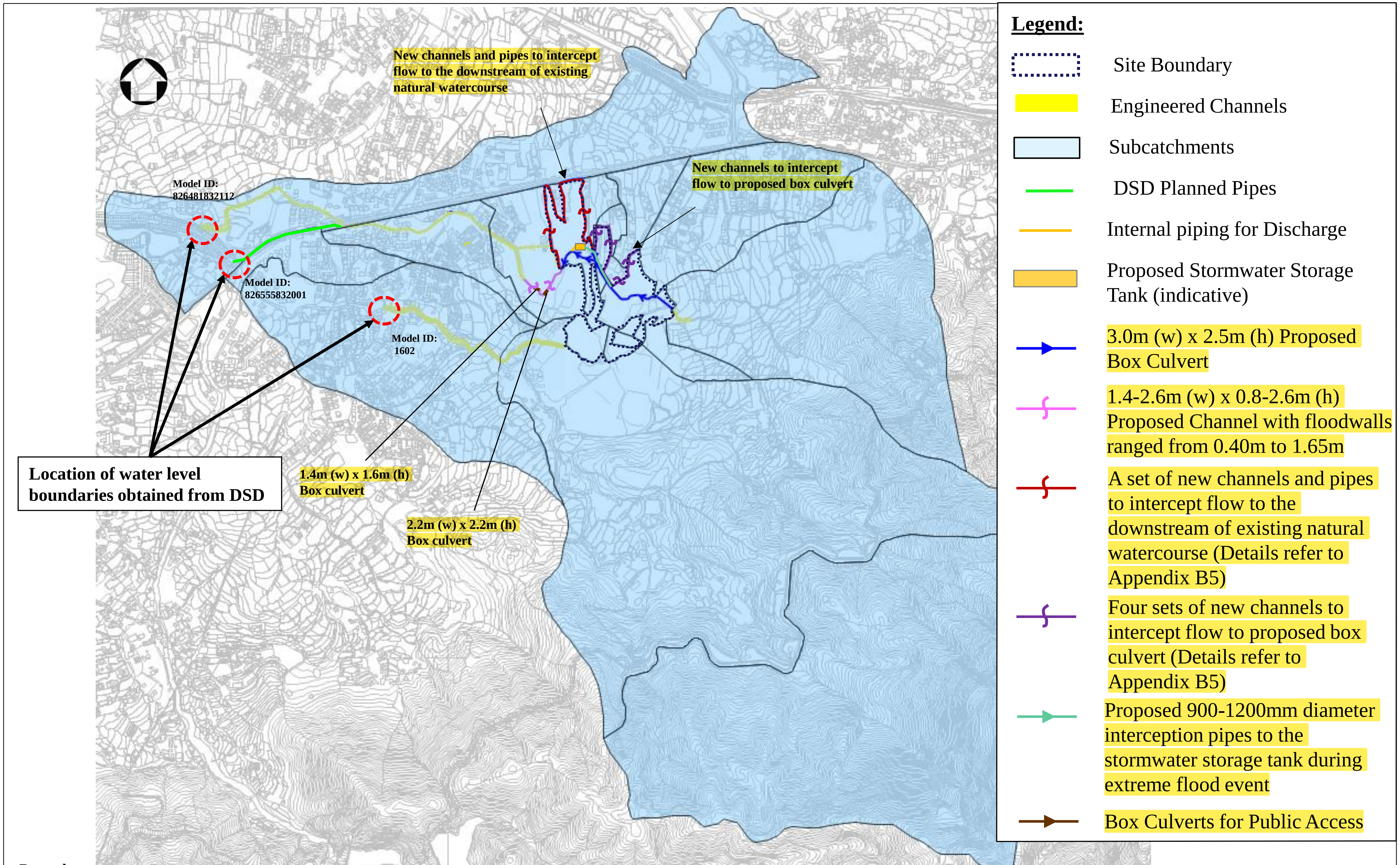
Appendix E2

Appendix E3

Proposed Model Extent with Catchment and Site Boundary



Remark:

***For scenario without DSD/HAD planned improvement works, only two water level boundaries of the engineered channels are adopted, namely 826481832112 and 1602.**

***For scenario with DSD/HAD planned improvement works, a new pipe will be built to connect the existing Kam Tin River. Thus, all three water level boundaries indicated above are adopted.**

Project Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone For Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

Title Proposed Model Extent with Sub-Catchments and Site Boundary

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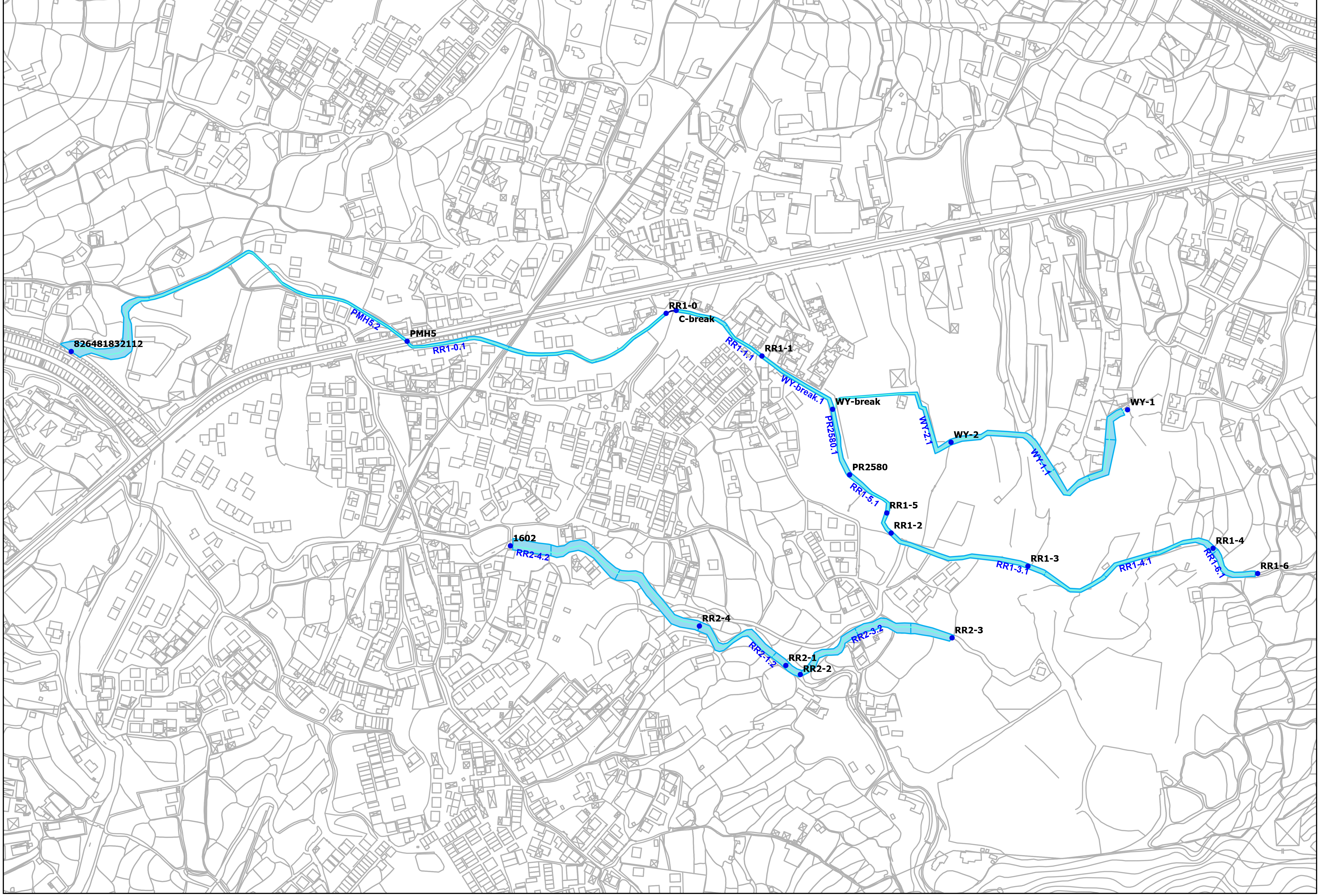
Appendix E3

Date June 2024
Scale N.T.S.
File

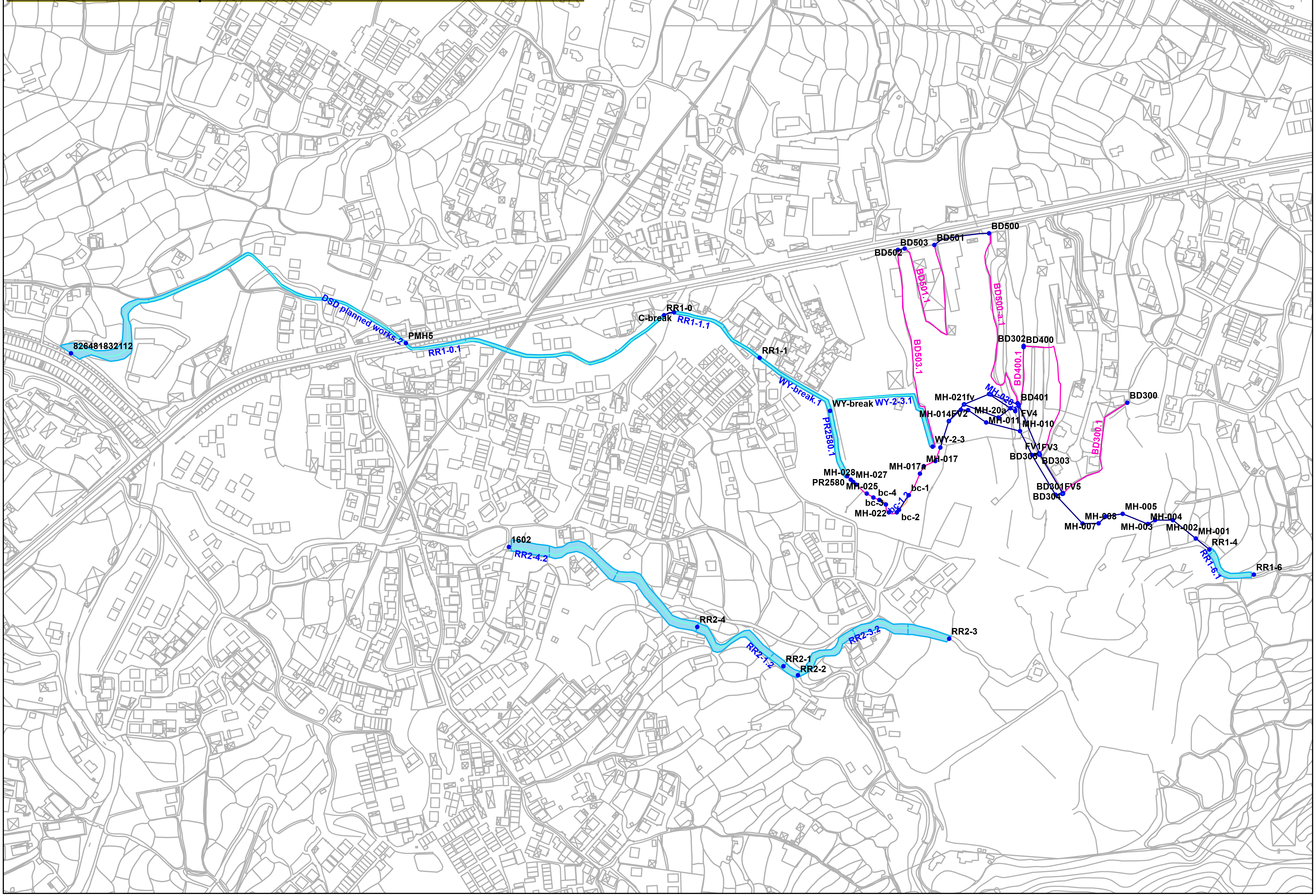
Appendix E4

Modelled Nodes and Network Extracted from Hydraulic Model

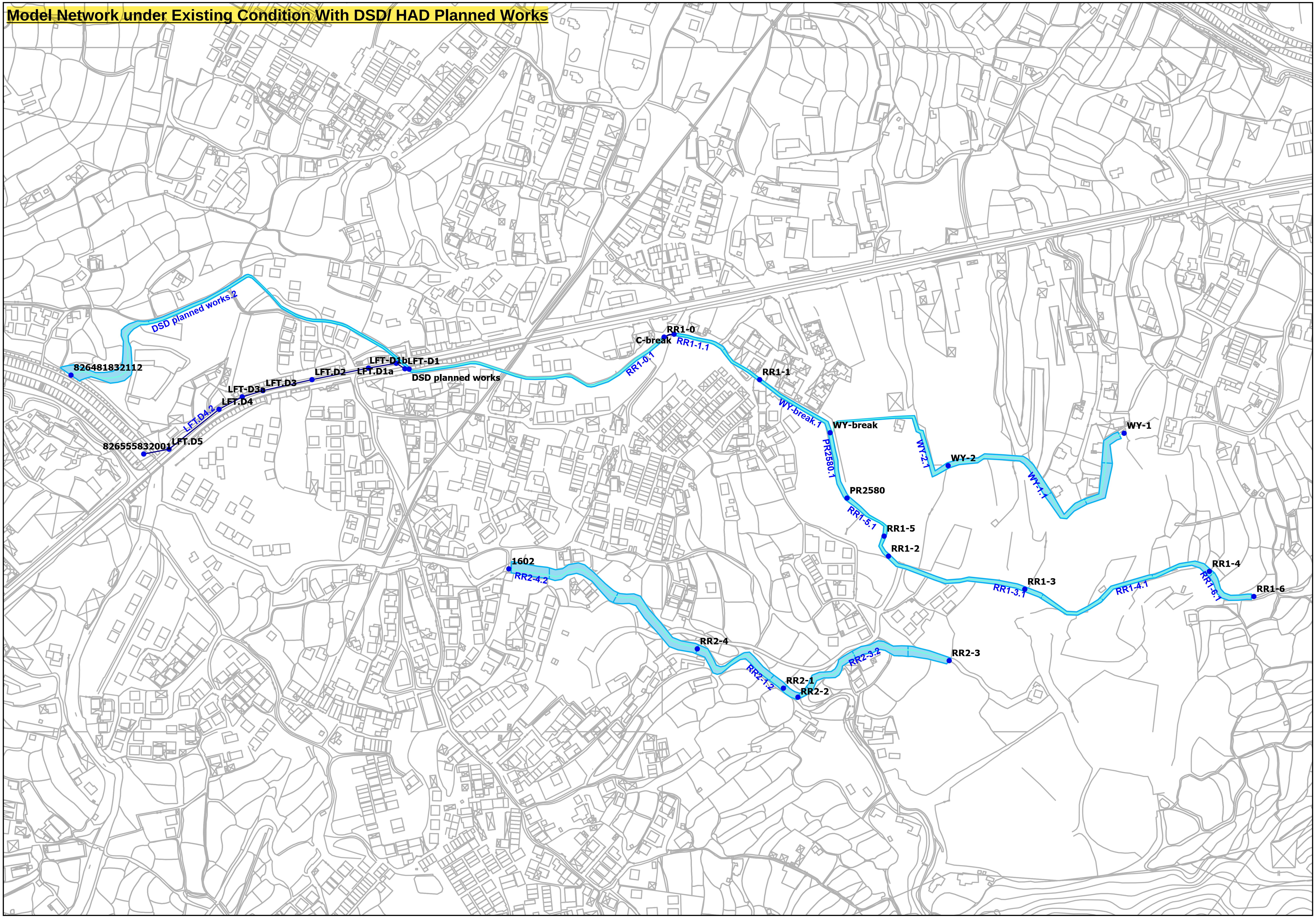
Model Network under Existing Condition Without DSD/ HAD Planned Works



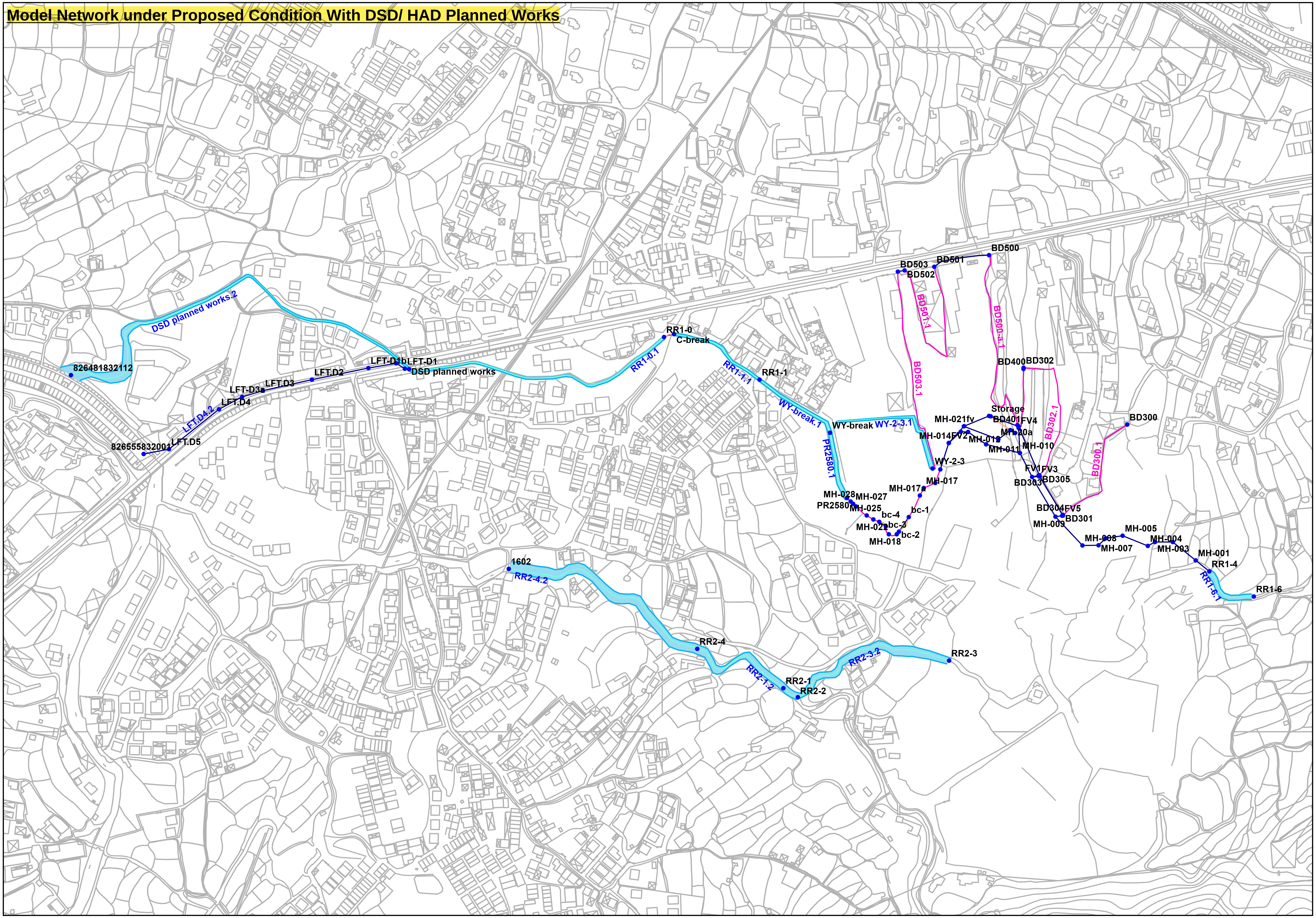
Model Network under Proposed Condition Without DSD/ HAD Planned Works



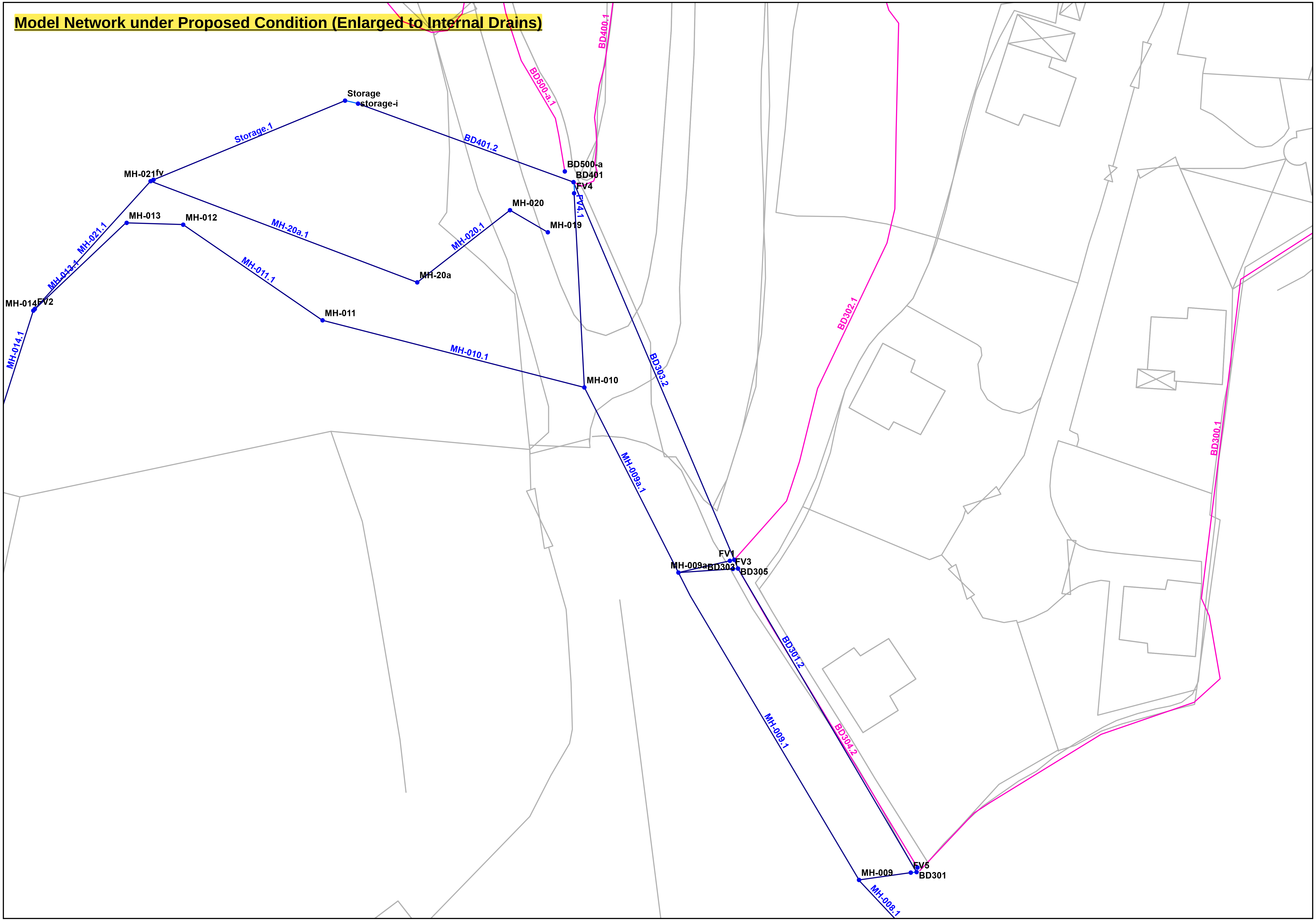
Model Network under Existing Condition With DSD/ HAD Planned Works



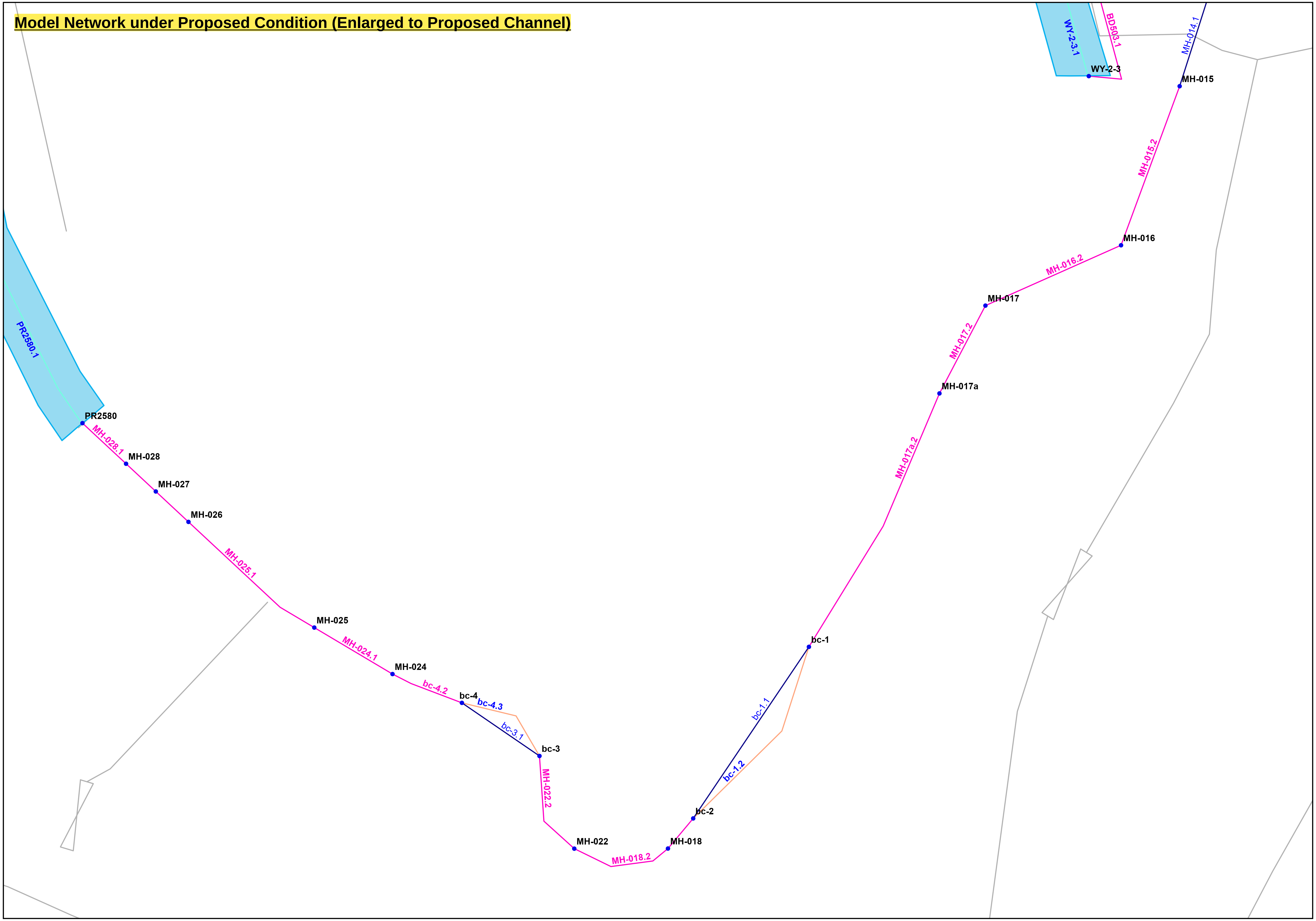
Model Network under Proposed Condition With DSD/ HAD Planned Works



Model Network under Proposed Condition (Enlarged to Internal Drains)

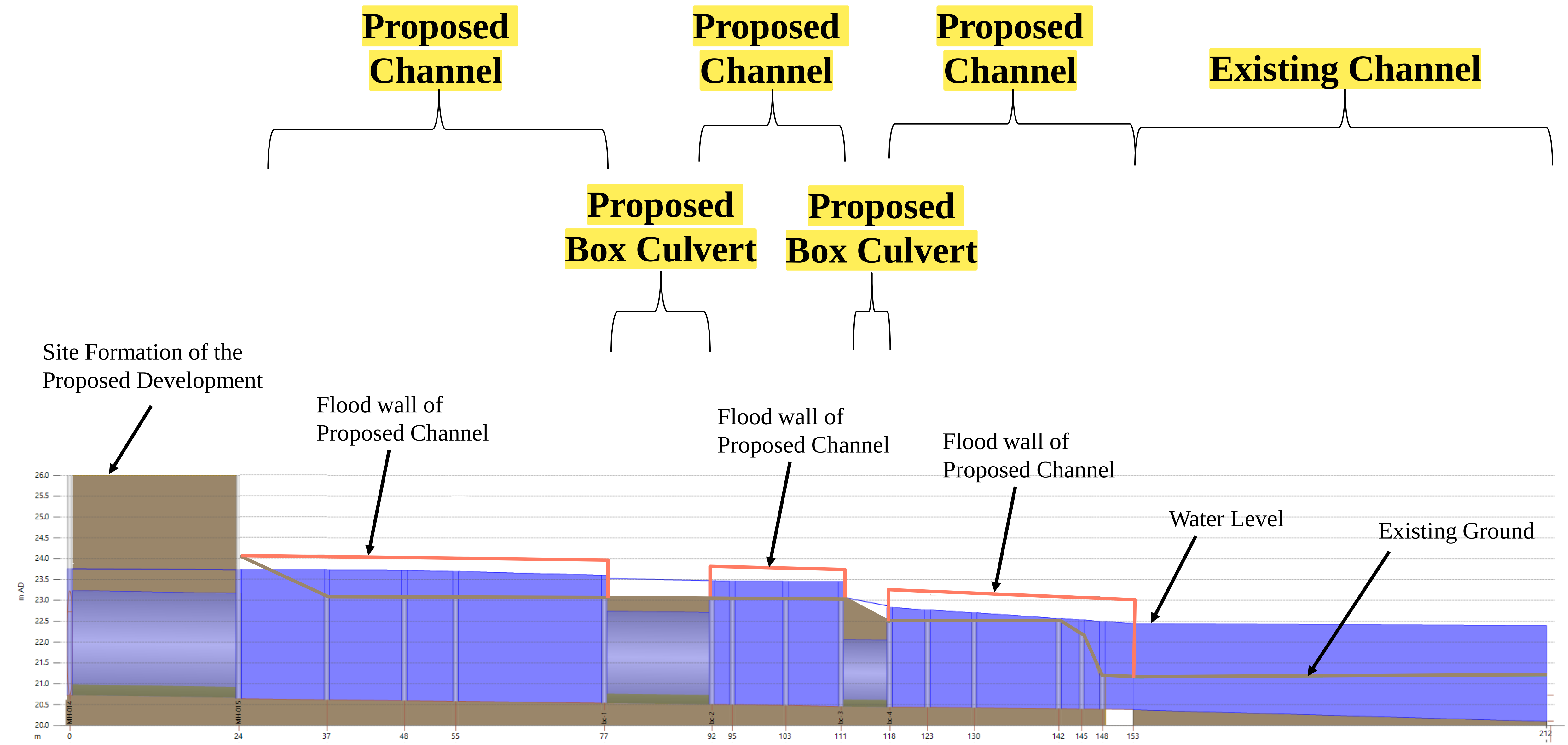


Model Network under Proposed Condition (Enlarged to Proposed Channel)



Appendix F1

Profile of Proposed Channel at Maxima Water Level in the Model Extent in 10A Scenario without DSD/ HAD Planned Improvement Works



Link	MH-014.1	MH-015.2	MH-016.2	MH-017.2	MH-017a.2	bc-1.1	bc-2.2	MH-018.2	MH-022.2	bc-3.1	bc-4.2	MH-024.1	MH-025.1	MH-026.1	MH-027.1	MH-028.1	PR2580.1
width (mm)	3000					2200				1400							
height (mm)	2500					2200				1600							
us inv (m AD)	20.730	20.641	20.616	20.594	20.579	20.537	20.506	20.500	20.483	20.457	20.446	20.440	20.426	20.402	20.395	20.389	20.380
ds inv (m AD)	20.665	20.616	20.594	20.579	20.537	20.506	20.500	20.483	20.457	20.446	20.440	20.426	20.402	20.395	20.389	20.380	20.100
US depth (m)	3.027	3.091	3.110	3.126	3.110	2.987	2.964	2.956	2.969	2.615	2.382	2.329	2.272	2.162	2.132	2.103	2.058
DS depth (m)	3.067	3.110	3.126	3.110	3.062	2.971	2.956	2.969	2.990	2.426	2.329	2.272	2.162	2.132	2.103	2.058	2.296

Node	MH-014	MH-015	MH-016	MH-017	MH-017a	bc-1	bc-2	MH-018	MH-022	bc-3	bc-4	MH-024	MH-025	MH-026	MH-027	MH-028	PR2580	WY-break
ground (m AD)	26.000	26.000	23.070	23.070	23.070	23.070	23.070	23.070	23.070	23.070	22.500	22.500	22.500	22.500	22.190	21.190		
level (m AD)	23.757	23.732	23.726	23.720	23.689	23.598	23.470	23.456	23.452	23.447	22.827	22.769	22.698	22.564	22.527	22.492	22.438	22.396

Project Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone For Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

Title Profile of Proposed Channel at Maxima Water Level in the Model Extent in 10A Scenario without DSD/HAD Planned Improvement Works

Date June 2024 **Scale** N.T.S. **File**

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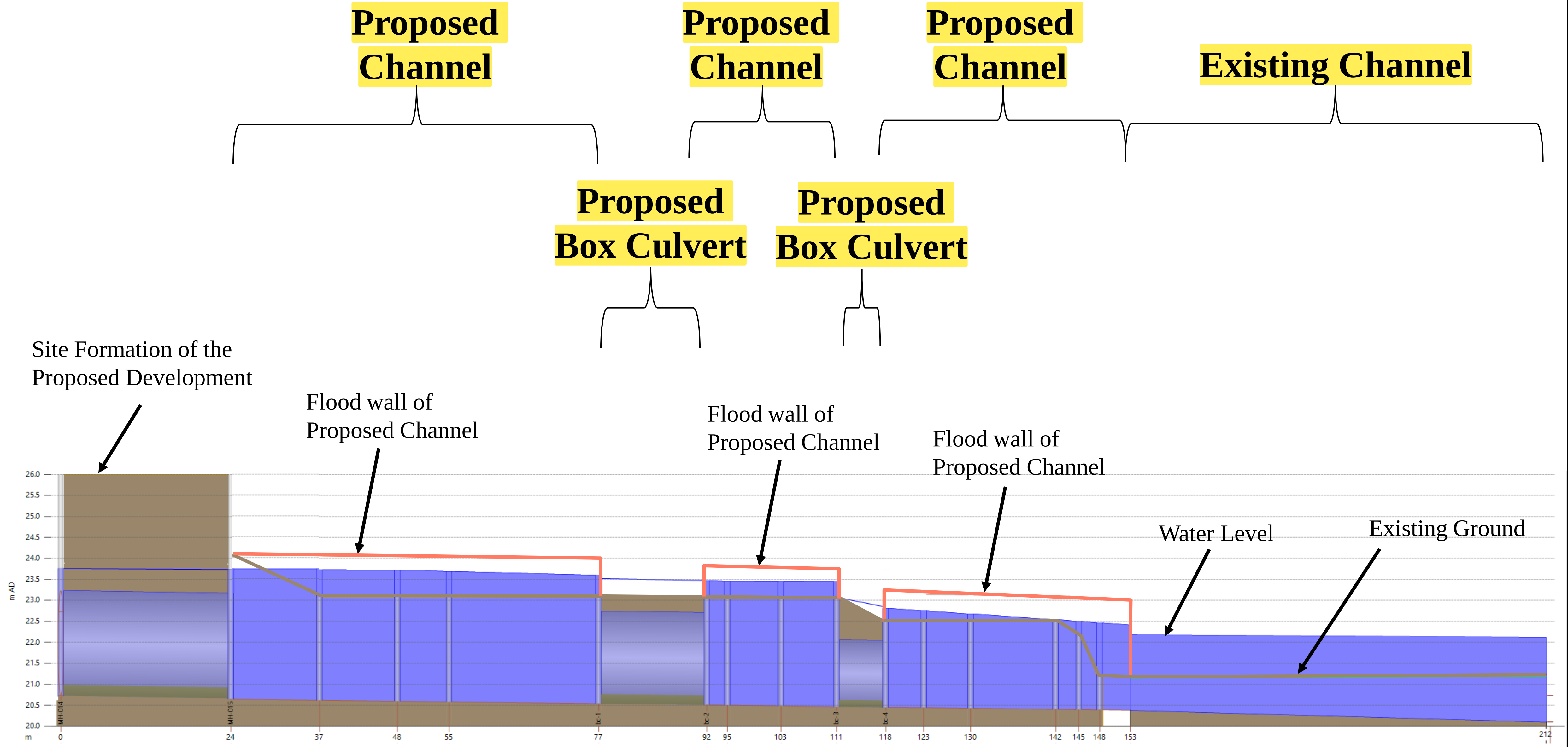
Appendix F1

Appendix F2

Profile of Proposed Channel at Maxima Water Level in the Model Extent in 10A Scenario with DSD/ HAD Planned Improvement Works



Link	MH-014.1	MH-015.2	MH-016.2	MH-017.2	MH-017a.2	bc-1.1	bc-2.2	MH-018.2	MH-022.2	bc-3.1	bc-4.2	MH-024.1	MH-025.1	MH-026.1	MH-027.1	MH-028.1	PR2580.1
width (mm)	3000					2200				1400							
height (mm)	2500					2200				1600							
us inv (m AD)	20.730	20.641	20.616	20.594	20.579	20.537	20.506	20.500	20.483	20.457	20.446	20.440	20.426	20.402	20.395	20.389	20.380
ds inv (m AD)	20.665	20.616	20.594	20.579	20.537	20.506	20.500	20.483	20.457	20.446	20.440	20.426	20.402	20.395	20.389	20.380	20.100
US depth (m)	3.025	3.089	3.107	3.124	3.107	2.982	2.958	2.949	2.962	2.601	2.362	2.308	2.245	2.133	2.101	2.069	1.797
DS depth (m)	3.065	3.107	3.124	3.107	3.057	2.965	2.949	2.962	2.983	2.407	2.308	2.245	2.133	2.101	2.069	2.024	2.014

Node	MH-014	MH-015	MH-016	MH-017	MH-017a	bc-1	bc-2	MH-018	MH-022	bc-3	bc-4	MH-024	MH-025	MH-026	MH-027	MH-028	PR2580	WY-break
ground (m AD)	26.000	26.000	23.070	23.070	23.070	23.070	23.070	23.070	23.070	23.070	22.500	22.500	22.500	22.500	22.190	21.190		
level (m AD)	23.755	23.730	23.723	23.718	23.686	23.594	23.463	23.449	23.445	23.440	22.808	22.748	22.672	22.535	22.527	22.492	22.177	22.114

Project	**Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone For Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories**
Title	**Profile of Proposed Channel at Maxima Water Level in the Model Extent in 10A Scenario with DSD/HAD Planned Improvement Works**

Date **June 2024** **Scale** **N.T.S.** **File**

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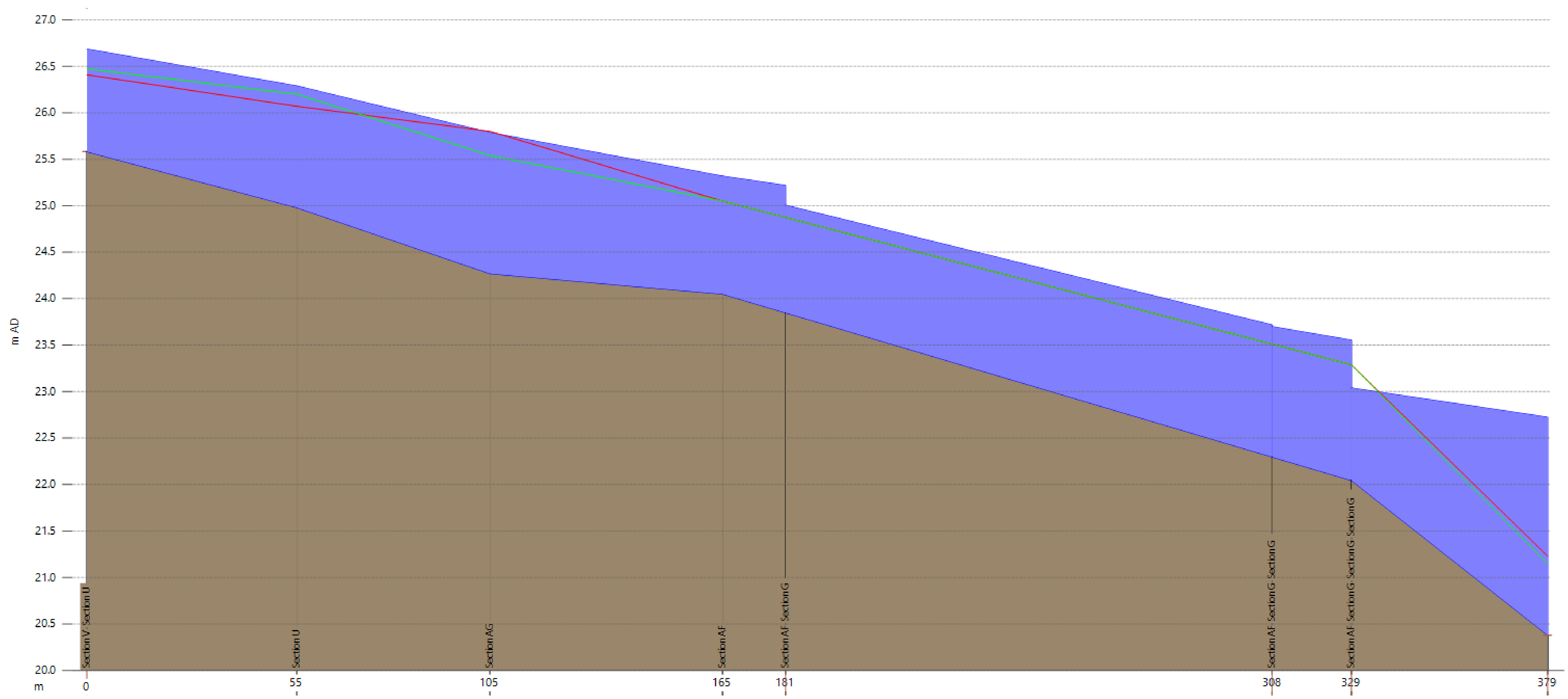
Appendix F2

Appendix F3

Profiles of the Blocked Section of Northern Channel Under 1 in 10 Years Rainfall Event



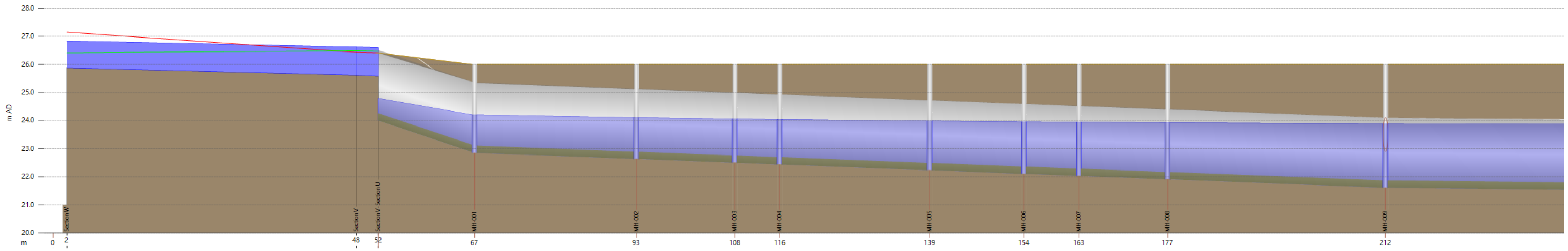
Link	RR1-4.1	RR1-3.1	RR1-2.1	RR1-5.1
us inv (m AD)	25.581	23.849	22.298	22.045
ds inv (m AD)	23.849	22.298	22.045	20.380
US depth (m)	1.104	1.156	1.401	0.994
DS depth (m)	1.370	1.419	1.509	2.345

Node	RR1-4	RR1-3	RR1-2	RR1-5	PR2580
ground (m AD) level (m AD)	26.686	25.005	23.699	23.039	22.725

Project	**Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone For Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories**		MOTT MACDONALD
Title	**Profiles of the Blocked Section of Northern Channel Under 1 in 10 Years Rainfall Event**		**Appendix F3**
Date June 2024	**Scale** N.T.S.	**File**	

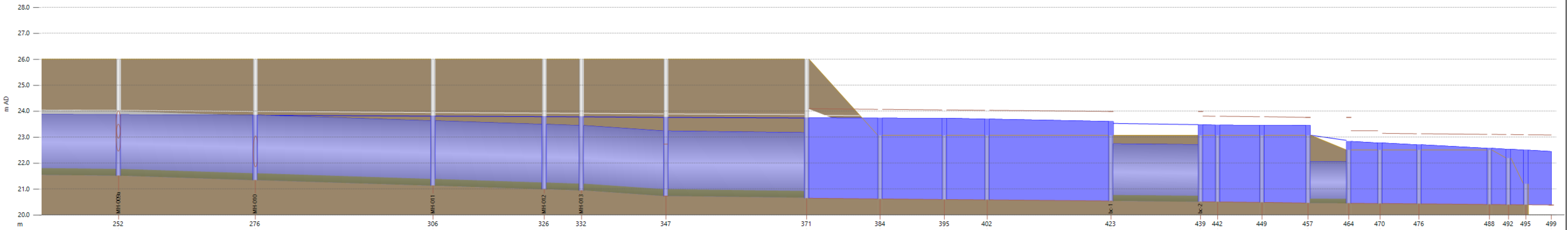
Appendix F4

Profile of the Proposed Box Culvert and Proposed Channel with Flood Wall under 1 in 10 Years Rainfall Event



Link		RR1-6.1	RR1-4.2	MH-001.2	MH-002.1	MH-003.1	MH-004.1	MH-005.1	MH-006.1	MH-007.1	MH-008.1	MH-009.1
width (mm)			3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
height (mm)			2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
us inv (m AD)		25.880	24.000	22.851	22.630	22.497	22.436	22.232	22.103	22.028	21.907	21.611
ds inv (m AD)		25.581	22.879	22.630	22.497	22.436	22.232	22.103	22.028	21.907	21.611	21.510
US depth (m)		0.949	0.787	1.350	1.470	1.556	1.598	1.748	1.850	1.911	2.013	2.272
DS depth (m)		1.017	1.322	1.470	1.556	1.598	1.748	1.850	1.911	2.013	2.272	2.351

Node	RR1-6	RR1-4	MH-001	MH-002	MH-003	MH-004	MH-005	MH-006	MH-007	MH-008	MH-009	
ground (m AD)		26.408	26.000	26.000	26.000	26.000	26.000	26.000	26.000	26.000	26.000	
level (m AD)	26.829	24.787	24.201	24.100	24.052	24.034	23.980	23.953	23.940	23.920	23.883	
flood dep (m)	26.829	-1.621	-1.799	-1.900	-1.948	-1.966	-2.020	-2.047	-2.060	-2.080	-2.117	



Link		MH-009a.1	MH-010.1	MH-011.1	MH-012.1	MH-013.1	MH-014.1	MH-015.2	MH-016.2	MH-017.2	MH-017a.2	bc-1.1	-	MH-018.2	MH-022.2	bc-3.1	bc-4.2	MH-024.1	MH-025.1	-	-	-	
width (mm)		3000	3000	3000	3000	3000	3000					2200				1400							
height (mm)		2500	2500	2500	2500	2500	2500					2200				1600							
us inv (m AD)		21.510	21.342	21.124	20.987	20.942	20.730	20.641	20.616	20.594	20.579	20.537	-	20.500	20.483	20.457	20.446	20.440	20.426	-	-	20.389	
ds inv (m AD)		21.342	21.124	20.987	20.942	20.730	20.665	20.616	20.594	20.579	20.537	20.506	-	20.483	20.457	20.446	20.440	20.426	20.402	-	-	20.380	
US depth (m)		2.351	2.496	2.681	2.797	2.836	3.027	3.091	3.110	3.126	3.110	2.987	-	2.956	2.969	2.615	2.382	2.329	2.272	2.162	2.132	2.103	
DS depth (m)		2.496	2.681	2.797	2.836	3.027	3.067	3.110	3.126	3.110	3.062	2.971	-	2.969	2.990	2.426	2.329	2.272	2.162	2.132	2.103	2.058	

Node	MH-009a	MH-010	MH-011	MH-012	MH-013	MH-014	MH-015	MH-016	MH-017	MH-017a	bc-1	bc-2	MH-018	MH-022	bc-3	bc-4	MH-024	MH-025	MH-026	-	-	-
ground (m AD)	26.000	26.000	26.000	26.000	26.000	26.000	26.000	23.070	23.070	23.070	23.070	23.070	23.070	23.070	23.070	22.500	22.500	22.500	22.500	-	-	
level (m AD)	23.861	23.838	23.805	23.784	23.777	23.757	23.732	23.726	23.720	23.689	23.598	23.470	23.456	23.452	23.447	22.827	22.769	22.698	22.564	-	-	-
flood dep (m)	-2.139	-2.162	-2.195	-2.216	-2.223	-2.243	-2.268	0.656	0.650	0.619	0.528	0.400	0.386	0.382	0.377	0.327	0.269	0.198	0.064	-	-	-

Project Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” zone For Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

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Title Profile of the Proposed Box Culvert and Proposed Channel with Flood Wall under 1 in 10 Years Rainfall Event

Appendix F4

Date June 2024 **Scale** N.T.S. **File**

Appendix G

Downstream boundary conditions obtained from DSD

Drainage Services Department
Mainland North Division
11/F, Kowloon Government Offices,
405 Nathan Road, Kowloon

渠務署
新界北渠務部
九龍彌敦道 405 號
九龍政府合署 11 樓

本署檔號 Our Ref : (00RPNG) in MN 10/YL/DD112
來函檔號 Your Ref : EC/MT/426079/L-0003
電 話 Tel : (852) 2781 4107
傳 真 Fax : (852) 2770 4761

By Post

15 November 2021

MOTT MACDONALD HONG KONG LIMITED
3/F, International Trade Tower,
348 Kwun Tong Road,
Kowloon,
Hong Kong
(Attn.: May TSE)

	To	Action	Information	Copy	Sign	Date
1						
2						
Rec'd	19 NOV 2021					
3						
4						
File No. 426079				MOTT MACDONALD	M	M

Dear Sir/Madam,

S12A Planning Application for Proposed Residential Development at Various Lots in DD112 Lin Fa Tei, Kam Tin, Yuen Long, New Territories
<u>Request for Information</u>

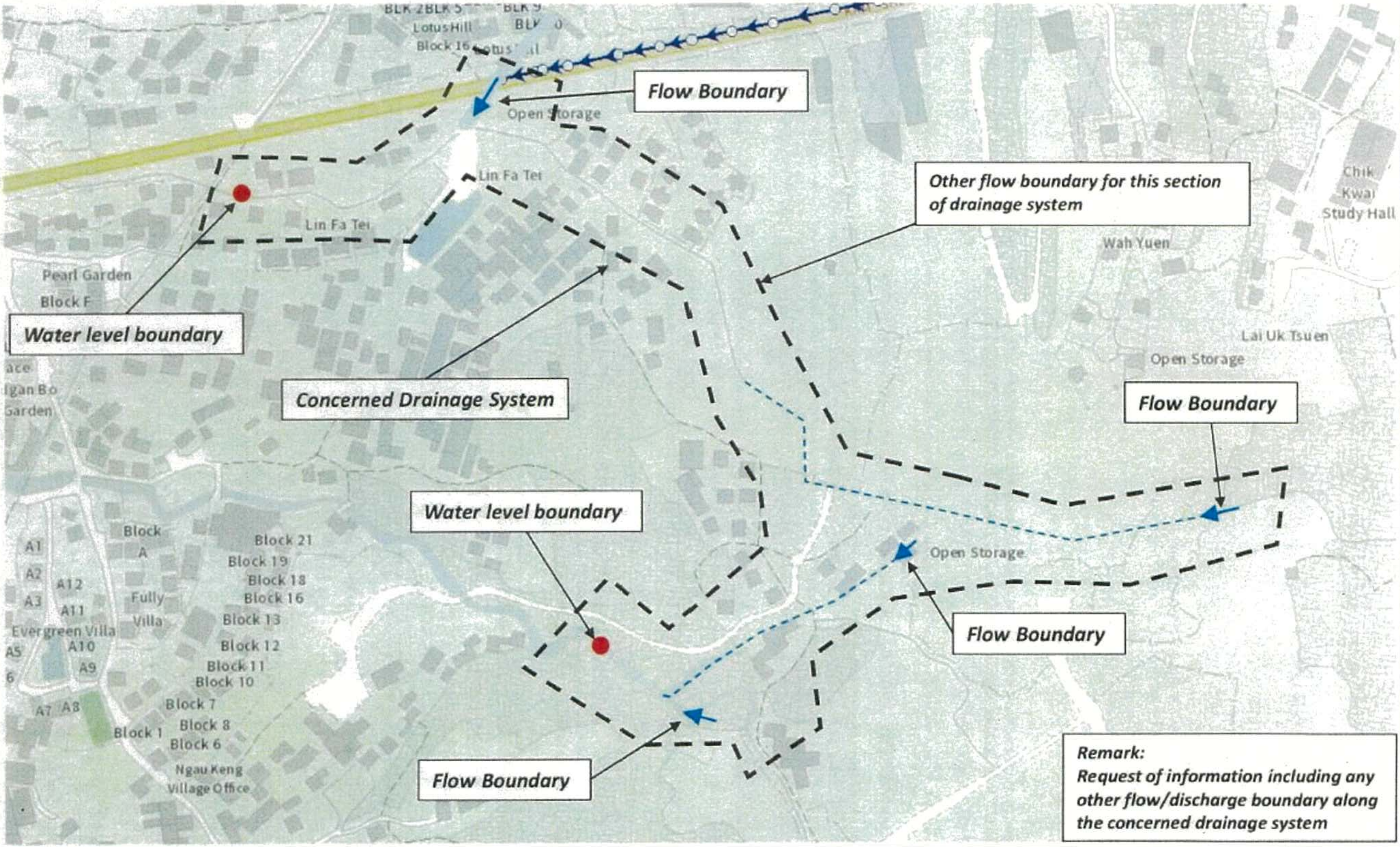
I refer to your letter dated 28 October 2021 requesting for drainage information.

The requested information is enclosed for your reference.

Yours faithfully,

(Bill C H CHAN)
for Chief Engineer / Mainland North
Drainage Services Department

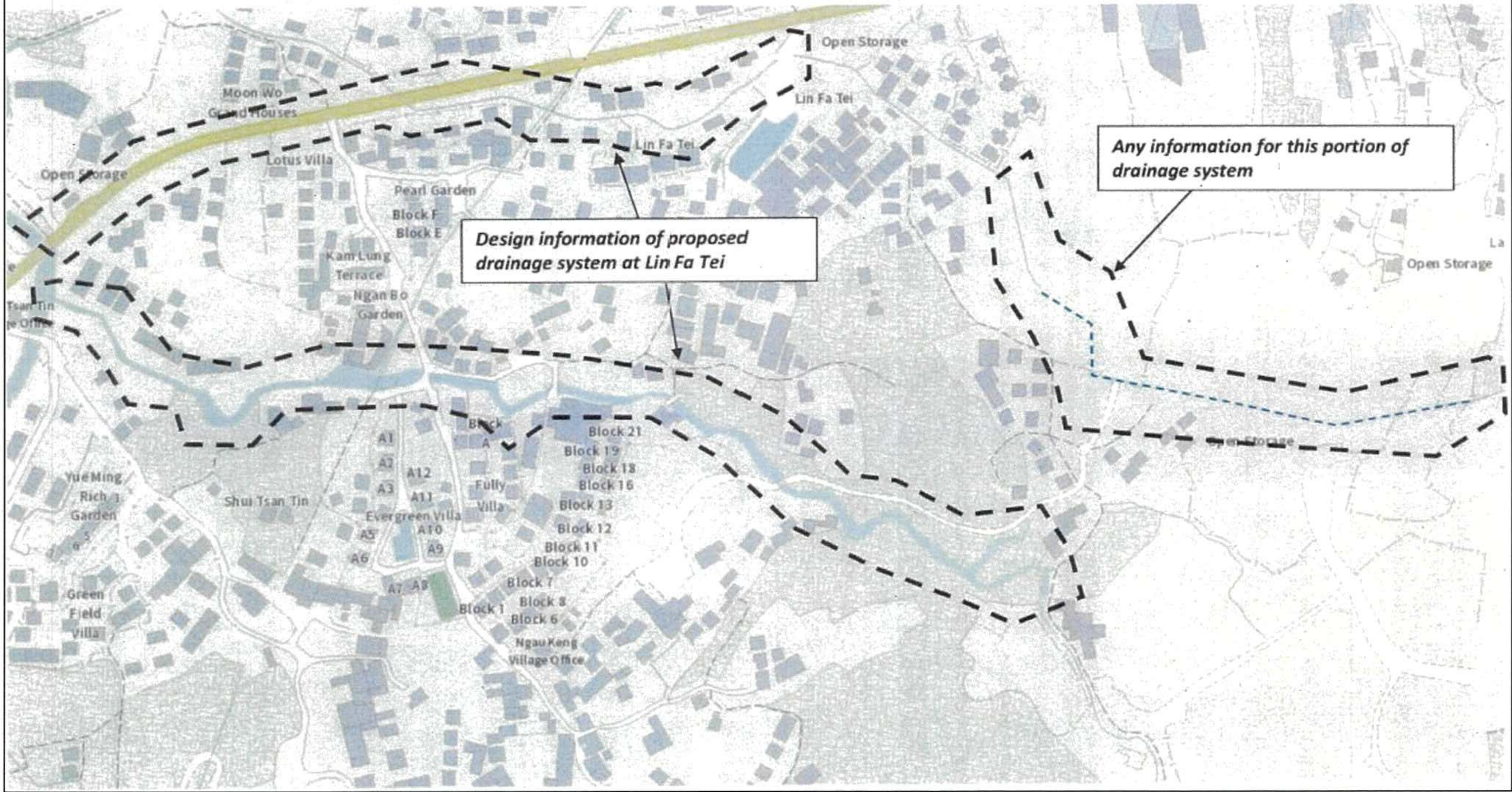
Sketch 1 - Request for Information (Boundary & Catchment Information)



Remark:
Request of information including any other flow/discharge boundary along the concerned drainage system

Location of Request

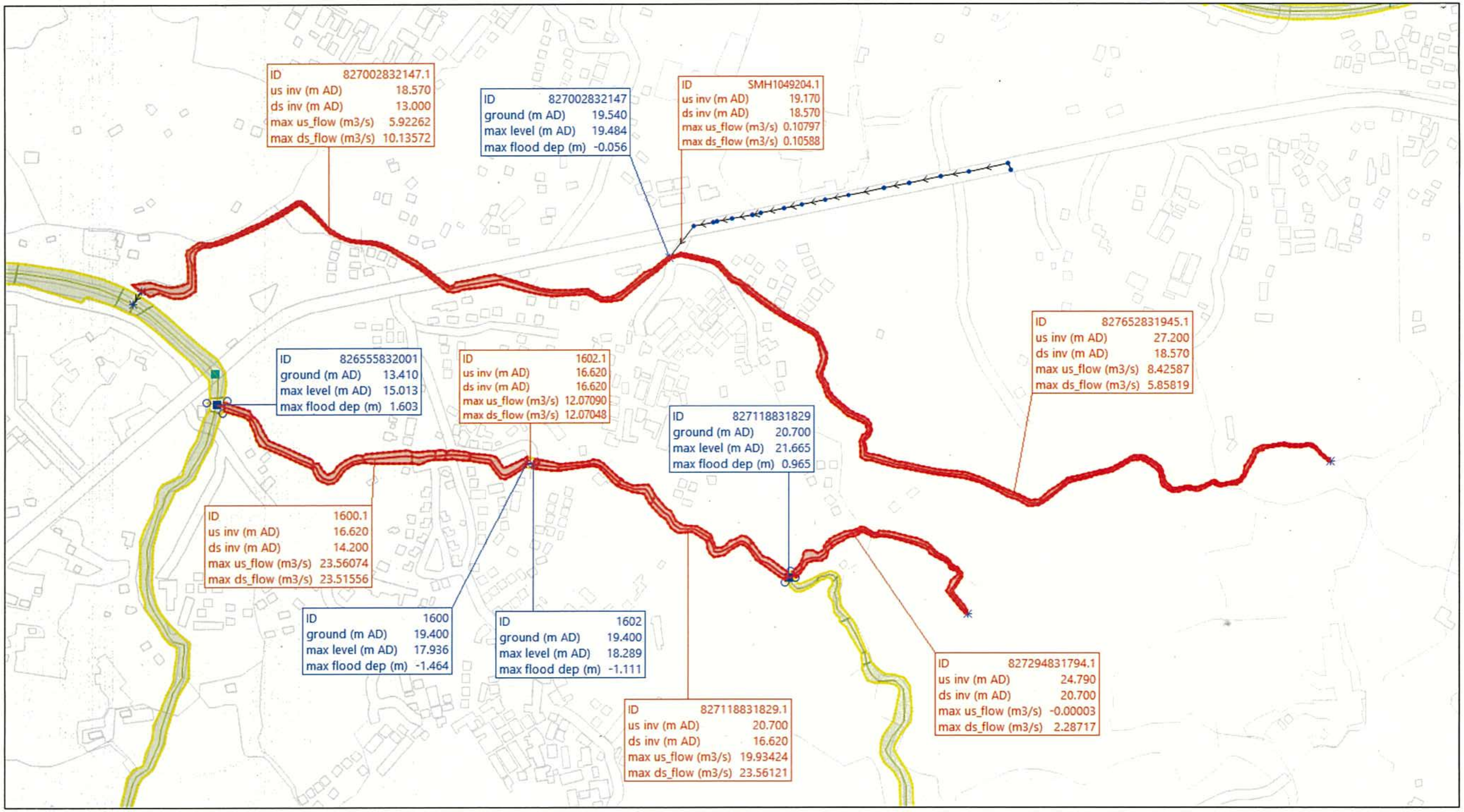
Sketch 2 - Request for Information (Drainage System Information)



Design information of proposed drainage system at Lin Fa Tei

Any information for this portion of drainage system

Location of Request



ID	827002832147.1
us inv (m AD)	18.570
ds inv (m AD)	13.000
max us_flow (m3/s)	5.92262
max ds_flow (m3/s)	10.13572

ID	827002832147
ground (m AD)	19.540
max level (m AD)	19.484
max flood dep (m)	-0.056

ID	SMH1049204.1
us inv (m AD)	19.170
ds inv (m AD)	18.570
max us_flow (m3/s)	0.10797
max ds_flow (m3/s)	0.10588

ID	827652831945.1
us inv (m AD)	27.200
ds inv (m AD)	18.570
max us_flow (m3/s)	8.42587
max ds_flow (m3/s)	5.85819

ID	826555832001
ground (m AD)	13.410
max level (m AD)	15.013
max flood dep (m)	1.603

ID	1602.1
us inv (m AD)	16.620
ds inv (m AD)	16.620
max us_flow (m3/s)	12.07090
max ds_flow (m3/s)	12.07048

ID	827118831829
ground (m AD)	20.700
max level (m AD)	21.665
max flood dep (m)	0.965

ID	1600.1
us inv (m AD)	16.620
ds inv (m AD)	14.200
max us_flow (m3/s)	23.56074
max ds_flow (m3/s)	23.51556

ID	1600
ground (m AD)	19.400
max level (m AD)	17.936
max flood dep (m)	-1.464

ID	1602
ground (m AD)	19.400
max level (m AD)	18.289
max flood dep (m)	-1.111

ID	827294831794.1
us inv (m AD)	24.790
ds inv (m AD)	20.700
max us_flow (m3/s)	-0.00003
max ds_flow (m3/s)	2.28717

ID	827118831829.1
us inv (m AD)	20.700
ds inv (m AD)	16.620
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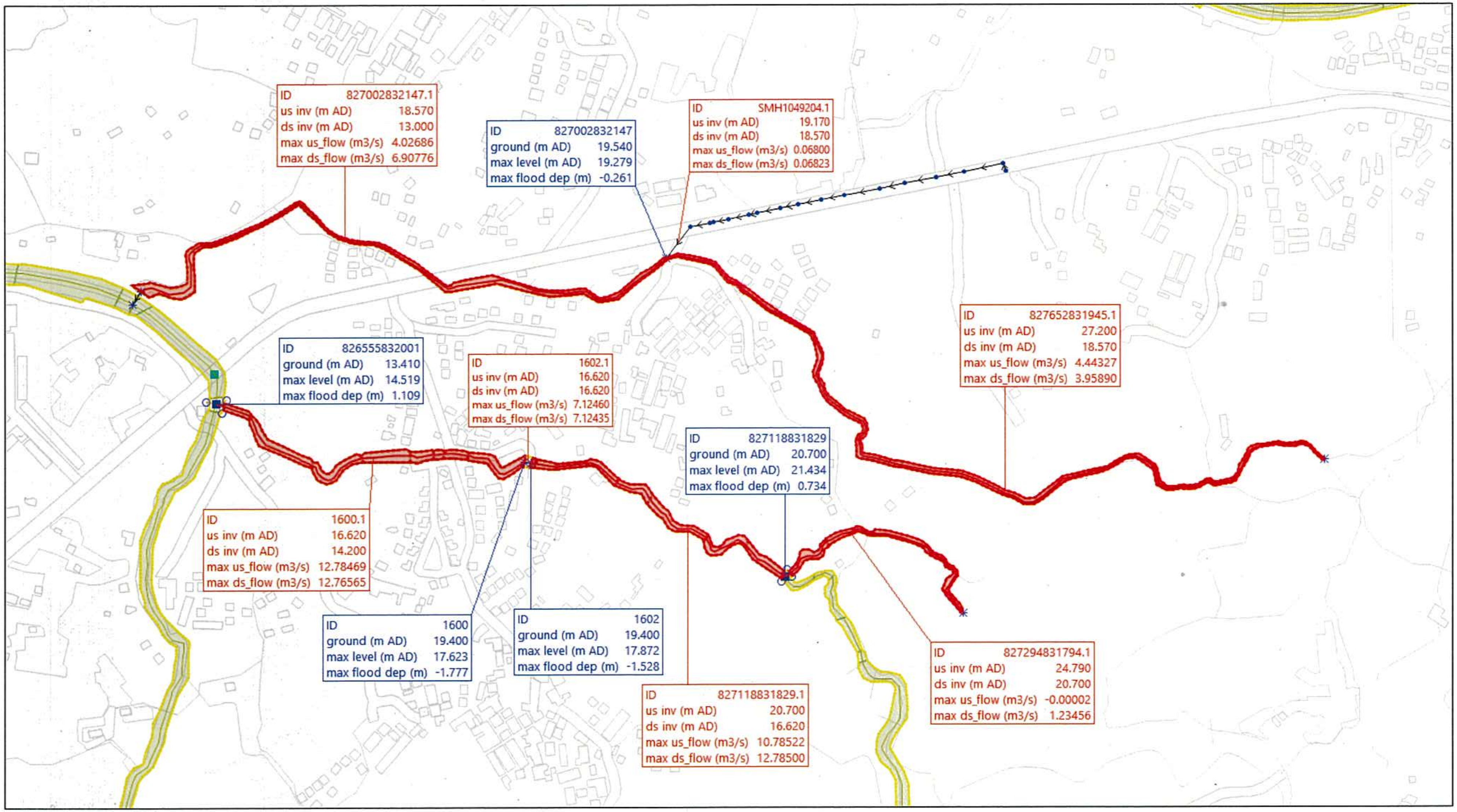
10A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max level (m AD) 19.279
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max ds_flow (m3/s) 3.95890
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ground (m AD) 13.410
max level (m AD) 14.519
max flood dep (m) 1.109
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ds inv (m AD) 16.620
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max flood dep (m) -1.777
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ground (m AD) 19.400
max level (m AD) 17.872
max flood dep (m) -1.528
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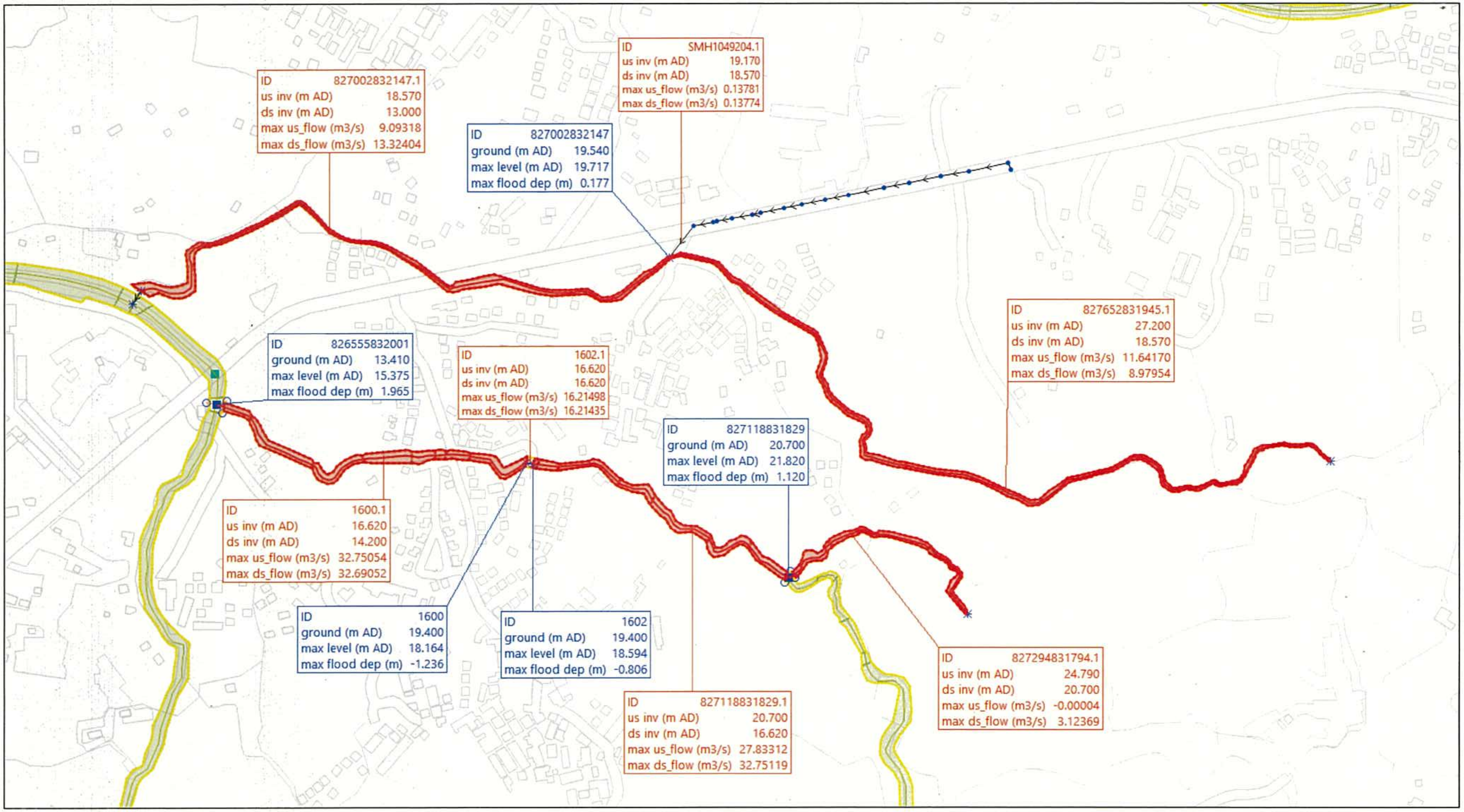
10B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max level (m AD) 19.717
max flood dep (m) 0.177
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ds inv (m AD) 18.570
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max ds_flow (m3/s) 8.97954
ID 826555832001
ground (m AD) 13.410
max level (m AD) 15.375
max flood dep (m) 1.965
ID 1602.1
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ds inv (m AD) 16.620
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max ds_flow (m3/s) 16.21435
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ground (m AD) 20.700
max level (m AD) 21.820
max flood dep (m) 1.120
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max flood dep (m) -1.236
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max level (m AD) 18.594
max flood dep (m) -0.806
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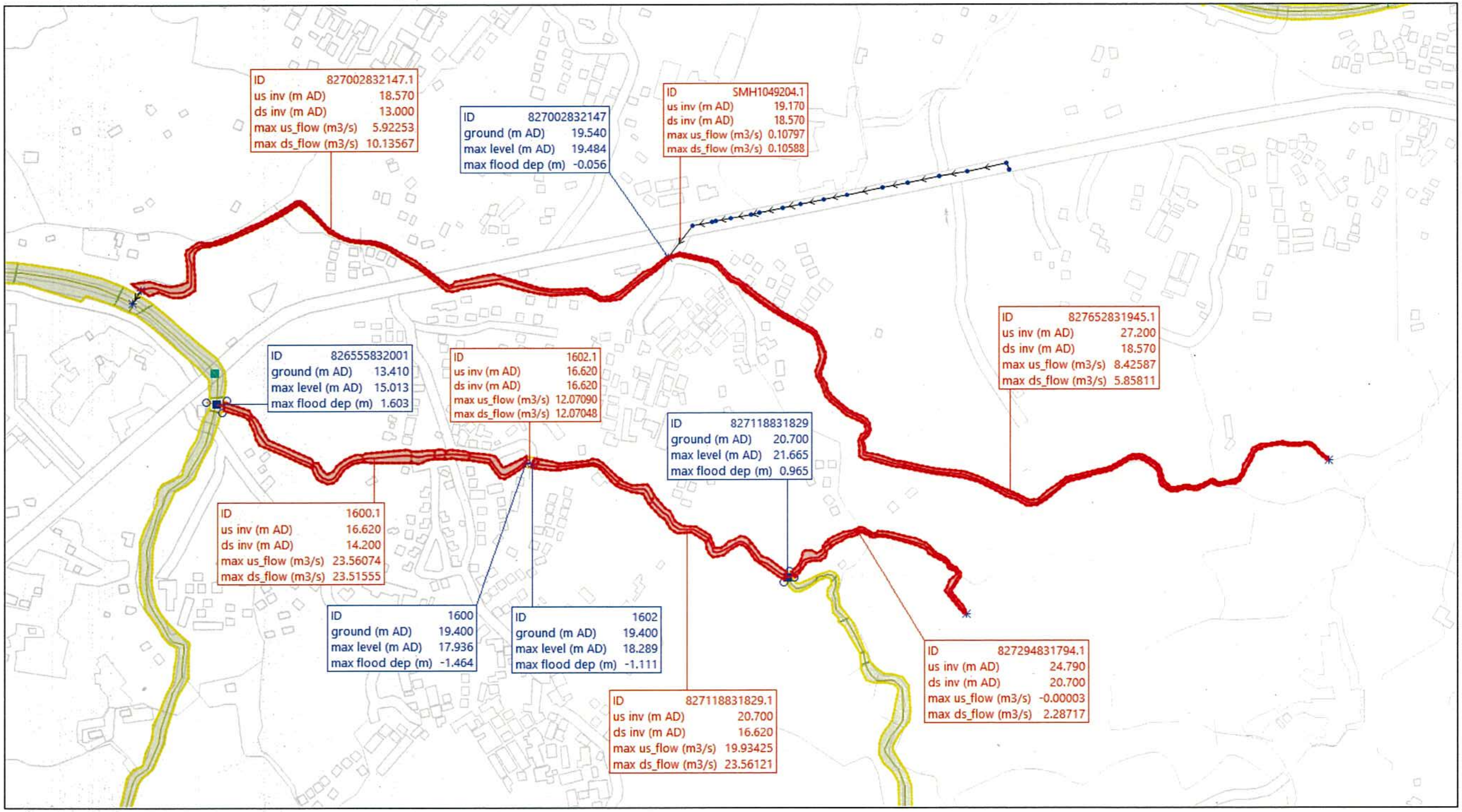
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us inv (m AD) 27.200
ds inv (m AD) 18.570
max us_flow (m3/s) 8.42587
max ds_flow (m3/s) 5.85811
ID 826555832001
ground (m AD) 13.410
max level (m AD) 15.013
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ID 1602.1
us inv (m AD) 16.620
ds inv (m AD) 16.620
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ground (m AD) 20.700
max level (m AD) 21.665
max flood dep (m) 0.965
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ds inv (m AD) 14.200
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max ds_flow (m3/s) 23.51555
ID 1600
ground (m AD) 19.400
max level (m AD) 17.936
max flood dep (m) -1.464
ID 1602
ground (m AD) 19.400
max level (m AD) 18.289
max flood dep (m) -1.111
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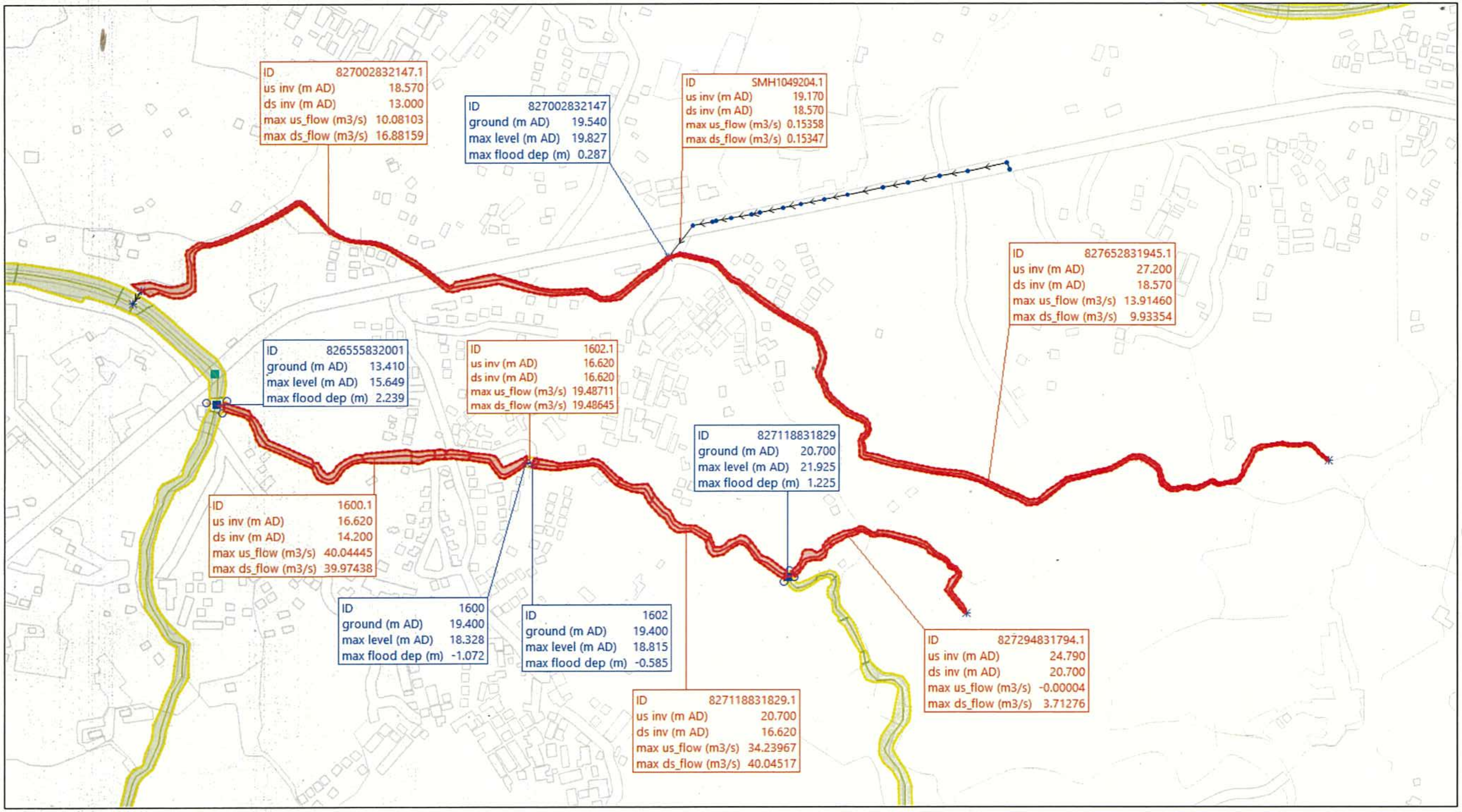
50B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ds inv (m AD) 18.570
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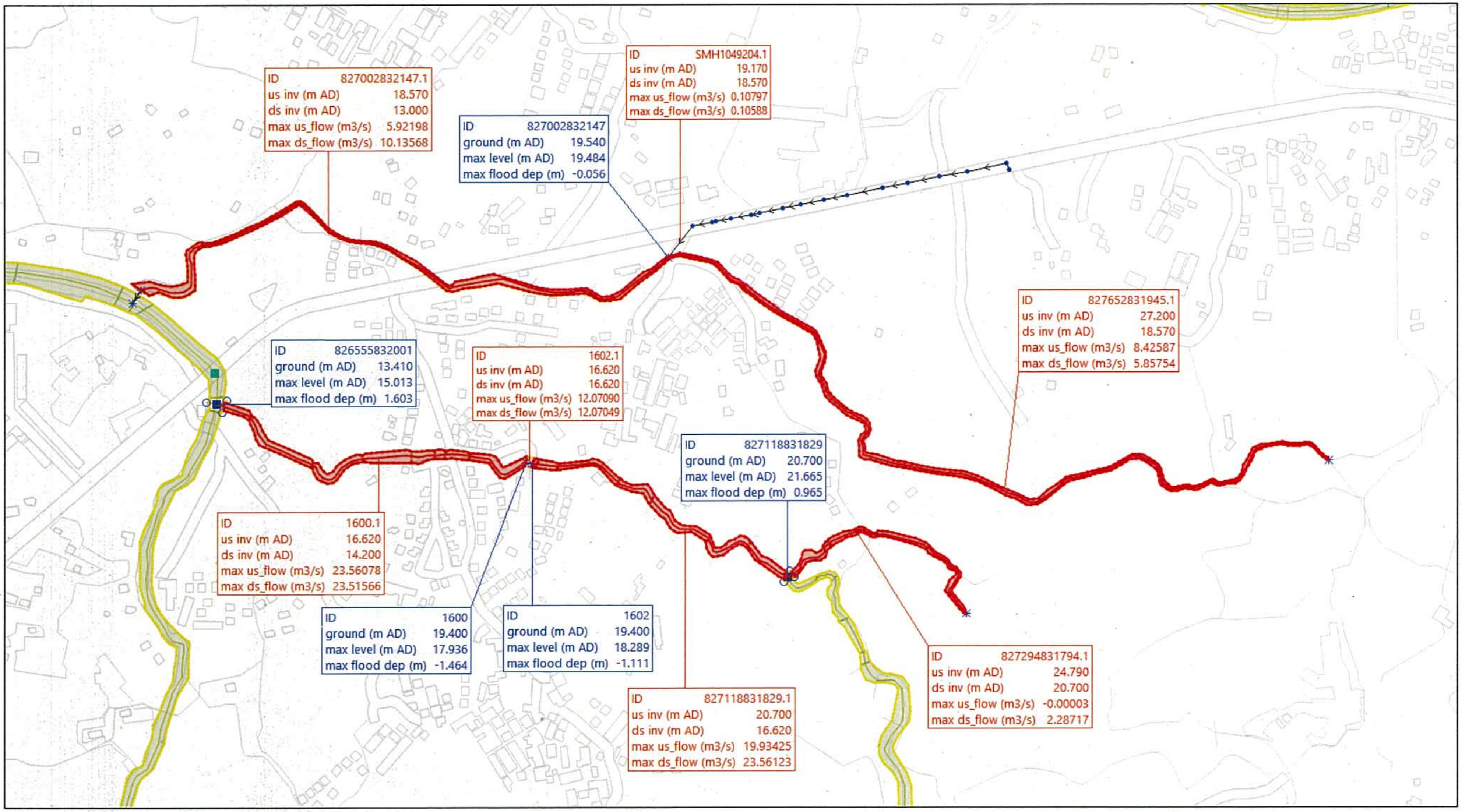
max ds_flow (m3/s) 9.93354
ID 826555832001
ground (m AD) 13.410
max level (m AD) 15.649
max flood dep (m) 2.239
ID 1602.1
us inv (m AD) 16.620
ds inv (m AD) 16.620
max us_flow (m3/s) 19.48711
max ds_flow (m3/s) 19.48645
ID 827118831829
ground (m AD) 20.700
max level (m AD) 21.925
max flood dep (m) 1.225
ID 1600.1
us inv (m AD) 16.620
ds inv (m AD) 14.200
max us_flow (m3/s) 40.04445
max ds_flow (m3/s) 39.97438
ID 1600
ground (m AD) 19.400
max level (m AD) 18.328
max flood dep (m) -1.072
ID 1602
ground (m AD) 19.400
max level (m AD) 18.815
max flood dep (m) -0.585
ID 827118831829.1
us inv (m AD) 20.700
ds inv (m AD) 16.620
max us_flow (m3/s) 34.23967
max ds_flow (m3/s) 40.04517
ID 827294831794.1
us inv (m AD) 24.790
ds inv (m AD) 20.700
max us_flow (m3/s) -0.00004
max ds_flow (m3/s) 3.71276

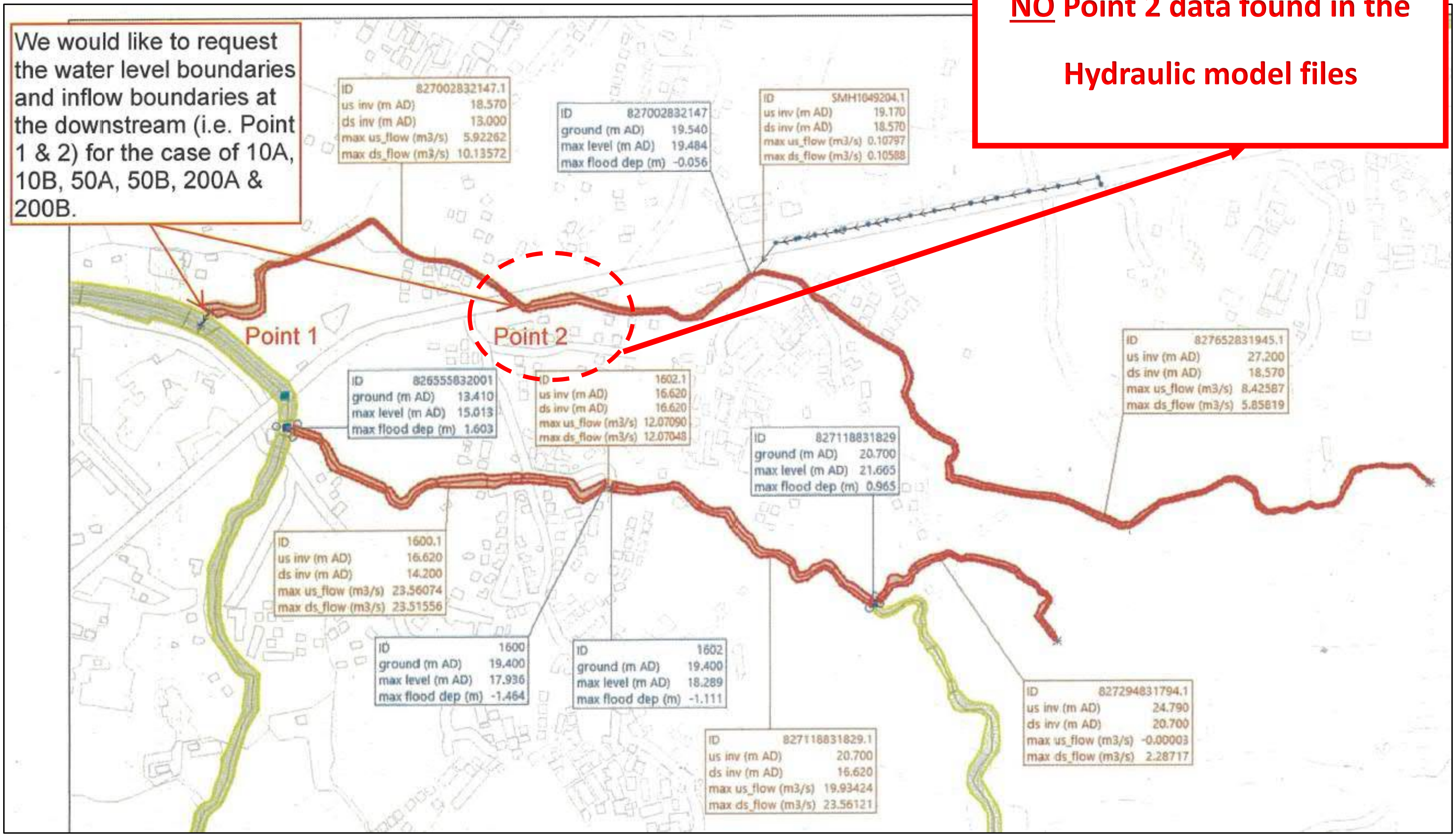
200A


ID 827002832147.1
us inv (m AD) 18.570
ds inv (m AD) 13.000
max us_flow (m3/s) 5.92198
max ds_flow (m3/s) 10.13568
ID 827002832147
ground (m AD) 19.540
max level (m AD) 19.484
max flood dep (m) -0.056
ID SMH1049204.1
us inv (m AD) 19.170
ds inv (m AD) 18.570
max us_flow (m3/s) 0.10797
max ds_flow (m3/s) 0.10588
ID 827652831945.1
us inv (m AD) 27.200
ds inv (m AD) 18.570
max us_flow (m3/s) 8.42587
max ds_flow (m3/s) 5.85754
ID 826555832001
ground (m AD) 13.410
max level (m AD) 15.013
max flood dep (m) 1.603
ID 1602.1
us inv (m AD) 16.620
ds inv (m AD) 16.620
max us_flow (m3/s) 12.07090
max ds_flow (m3/s) 12.07049
ID 827118831829
ground (m AD) 20.700
max level (m AD) 21.665
max flood dep (m) 0.965
ID 1600.1
us inv (m AD) 16.620
ds inv (m AD) 14.200
max us_flow (m3/s) 23.56078
max ds_flow (m3/s) 23.51566
ID 1600
ground (m AD) 19.400
max level (m AD) 17.936
max flood dep (m) -1.464
ID 1602
ground (m AD) 19.400
max level (m AD) 18.289
max flood dep (m) -1.111
ID 827118831829.1
us inv (m AD) 20.700
ds inv (m AD) 16.620
max us_flow (m3/s) 19.93425
max ds_flow (m3/s) 23.56123
ID 827294831794.1
us inv (m AD) 24.790
ds inv (m AD) 20.700
max us_flow (m3/s) -0.00003
max ds_flow (m3/s) 2.28717

200B

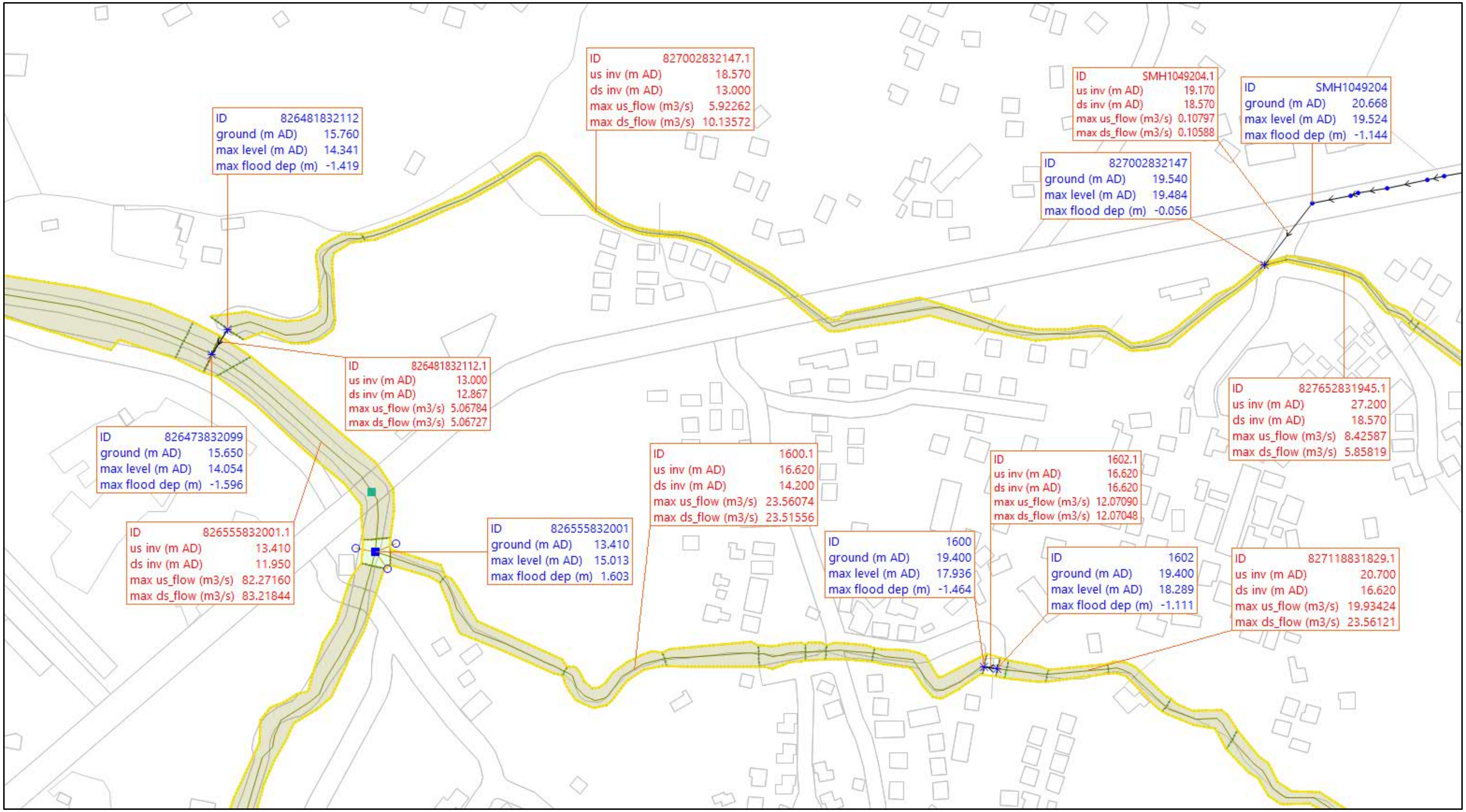
<u>NO</u> Point 2 data found in the

Hydraulic model files

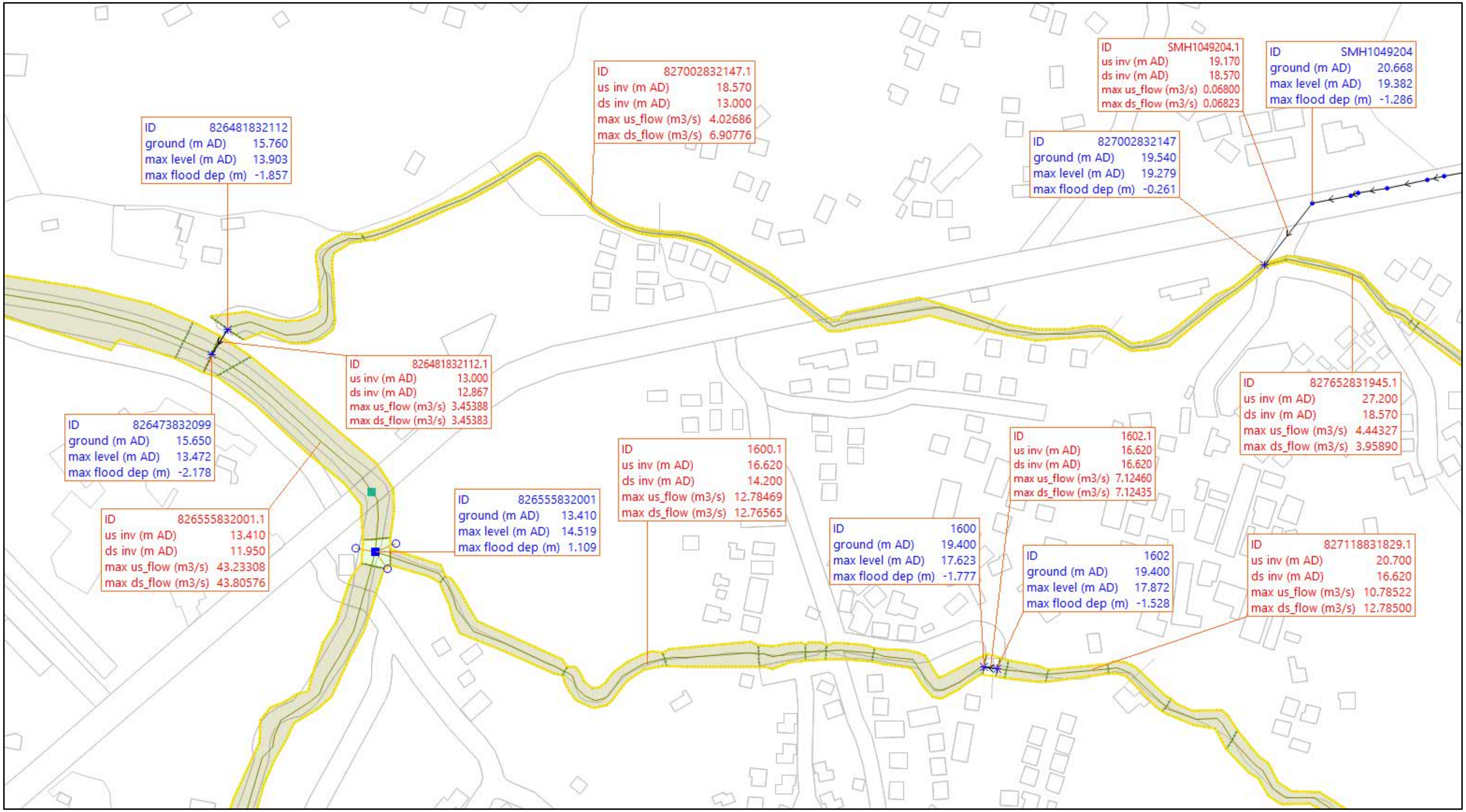


We would like to request the water level boundaries and inflow boundaries at the downstream (i.e. Point 1 & 2) for the case of 10A, 10B, 50A, 50B, 200A & 200B.

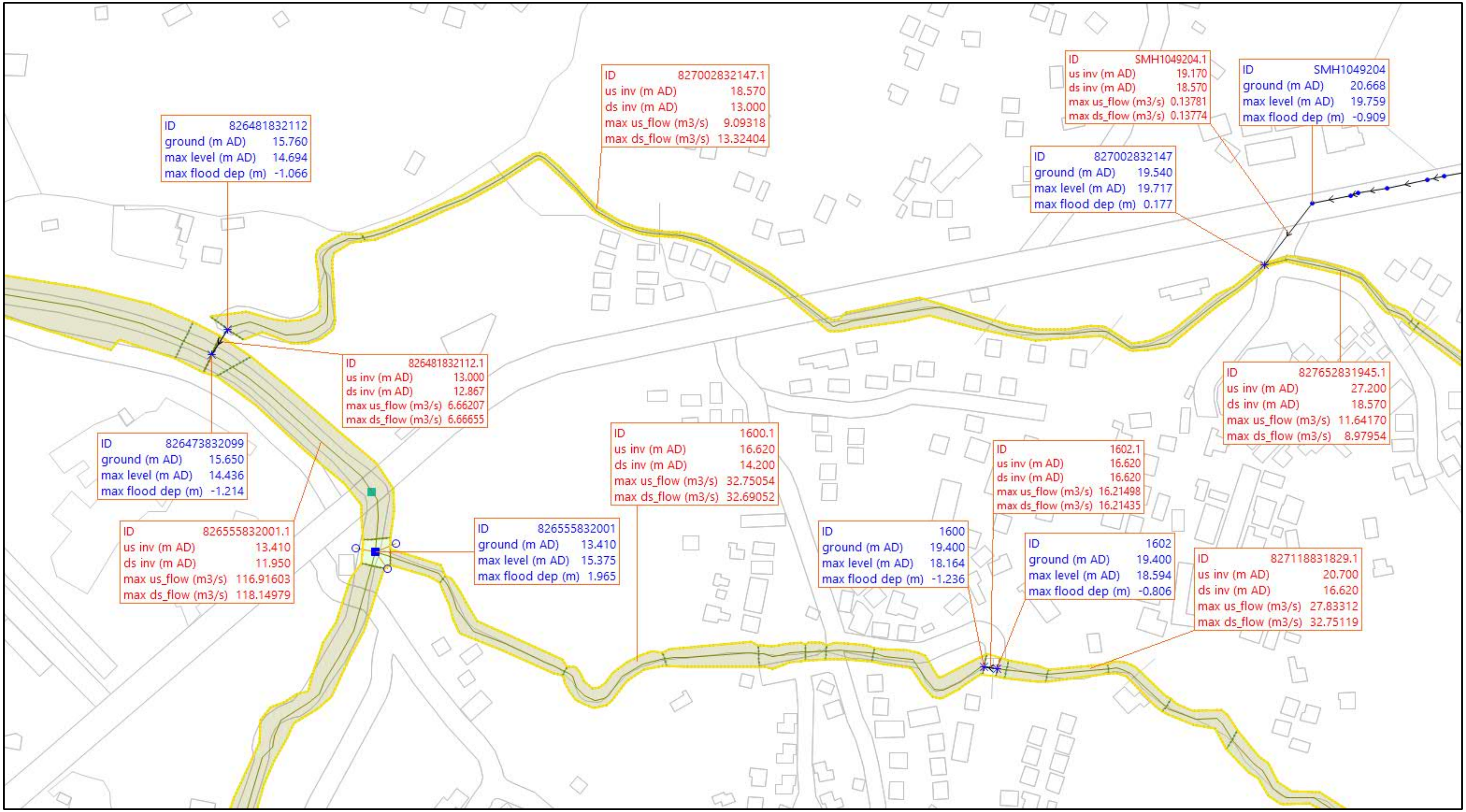
<u>Location of Request</u>


ID 827002832147.1
us inv (m AD) 18.570
ds inv (m AD) 13.000
max us_flow (m3/s) 5.92262
max ds_flow (m3/s) 10.13572
ID SMH1049204.1
us inv (m AD) 19.170
ds inv (m AD) 18.570
max us_flow (m3/s) 0.10797
max ds_flow (m3/s) 0.10588
ID SMH1049204
ground (m AD) 20.668
max level (m AD) 19.524
max flood dep (m) -1.144
ID 826481832112
ground (m AD) 15.760
max level (m AD) 14.341
max flood dep (m) -1.419
ID 827002832147
ground (m AD) 19.540
max level (m AD) 19.484
max flood dep (m) -0.056
ID 826481832112.1
us inv (m AD) 13.000
ds inv (m AD) 12.867
max us_flow (m3/s) 5.06784
max ds_flow (m3/s) 5.06727
ID 827652831945.1
us inv (m AD) 27.200
ds inv (m AD) 18.570
max us_flow (m3/s) 8.42587
max ds_flow (m3/s) 5.85819
ID 826473832099
ground (m AD) 15.650
max level (m AD) 14.054
max flood dep (m) -1.596
ID 1600.1
us inv (m AD) 16.620
ds inv (m AD) 14.200
max us_flow (m3/s) 23.56074
max ds_flow (m3/s) 23.51556
ID 1602.1
us inv (m AD) 16.620
ds inv (m AD) 16.620
max us_flow (m3/s) 12.07090
max ds_flow (m3/s) 12.07048
ID 826555832001.1
us inv (m AD) 13.410
ds inv (m AD) 11.950
max us_flow (m3/s) 82.27160
max ds_flow (m3/s) 83.21844
ID 826555832001
ground (m AD) 13.410
max level (m AD) 15.013
max flood dep (m) 1.603
ID 1600
ground (m AD) 19.400
max level (m AD) 17.936
max flood dep (m) -1.464
ID 1602
ground (m AD) 19.400
max level (m AD) 18.289
max flood dep (m) -1.111
ID 827118831829.1
us inv (m AD) 20.700
ds inv (m AD) 16.620
max us_flow (m3/s) 19.93424
max ds_flow (m3/s) 23.56121

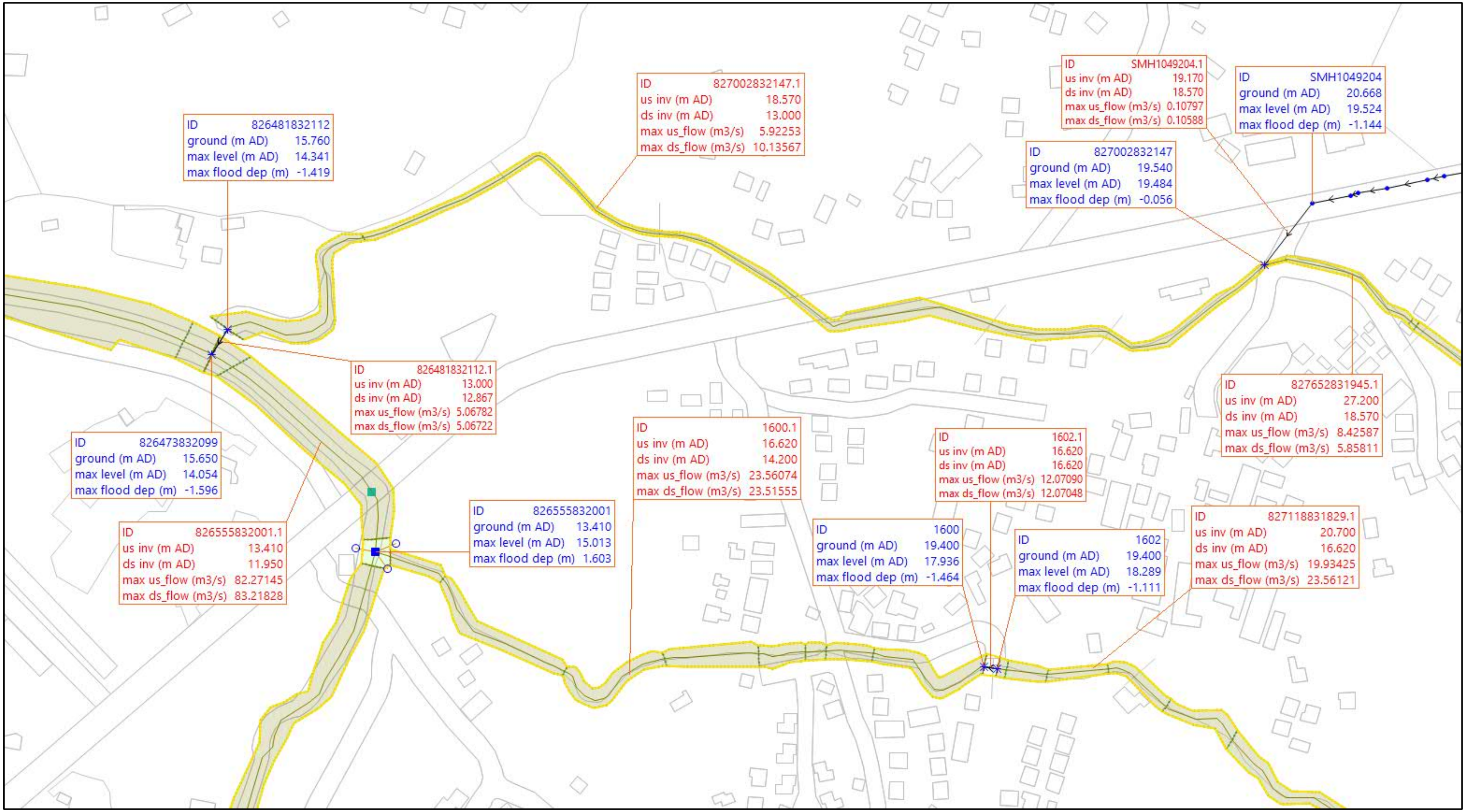
10A


ID 827002832147.1
us inv (m AD) 18.570
ds inv (m AD) 13.000
max us_flow (m3/s) 4.02686
max ds_flow (m3/s) 6.90776
ID SMH1049204.1
us inv (m AD) 19.170
ds inv (m AD) 18.570
max us_flow (m3/s) 0.06800
max ds_flow (m3/s) 0.06823
ID SMH1049204
ground (m AD) 20.668
max level (m AD) 19.382
max flood dep (m) -1.286
ID 826481832112
ground (m AD) 15.760
max level (m AD) 13.903
max flood dep (m) -1.857
ID 827002832147
ground (m AD) 19.540
max level (m AD) 19.279
max flood dep (m) -0.261
ID 826481832112.1
us inv (m AD) 13.000
ds inv (m AD) 12.867
max us_flow (m3/s) 3.45388
max ds_flow (m3/s) 3.45383
ID 827652831945.1
us inv (m AD) 27.200
ds inv (m AD) 18.570
max us_flow (m3/s) 4.44327
max ds_flow (m3/s) 3.95890
ID 826473832099
ground (m AD) 15.650
max level (m AD) 13.472
max flood dep (m) -2.178
ID 1602.1
us inv (m AD) 16.620
ds inv (m AD) 16.620
max us_flow (m3/s) 7.12460
max ds_flow (m3/s) 7.12435
ID 1600.1
us inv (m AD) 16.620
ds inv (m AD) 14.200
max us_flow (m3/s) 12.78469
max ds_flow (m3/s) 12.76565
ID 826555832001
ground (m AD) 13.410
max level (m AD) 14.519
max flood dep (m) 1.109
ID 826555832001.1
us inv (m AD) 13.410
ds inv (m AD) 11.950
max us_flow (m3/s) 43.23308
max ds_flow (m3/s) 43.80576
ID 1600
ground (m AD) 19.400
max level (m AD) 17.623
max flood dep (m) -1.777
ID 1602
ground (m AD) 19.400
max level (m AD) 17.872
max flood dep (m) -1.528
ID 827118831829.1
us inv (m AD) 20.700
ds inv (m AD) 16.620
max us_flow (m3/s) 10.78522
max ds_flow (m3/s) 12.78500

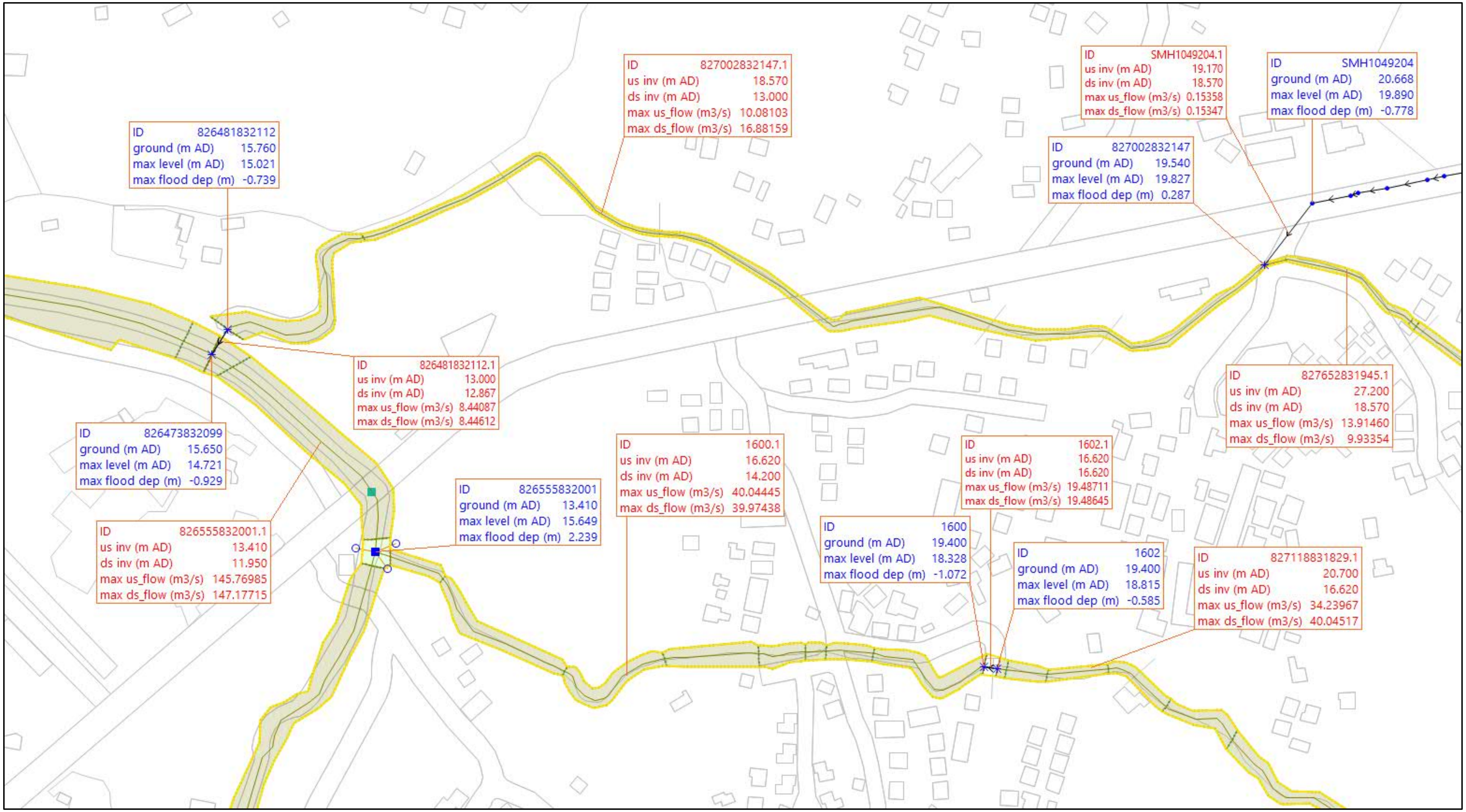
10B


ID 827002832147.1
us inv (m AD) 18.570
ds inv (m AD) 13.000
max us_flow (m3/s) 9.09318
max ds_flow (m3/s) 13.32404
ID SMH1049204.1
us inv (m AD) 19.170
ds inv (m AD) 18.570
max us_flow (m3/s) 0.13781
max ds_flow (m3/s) 0.13774
ID SMH1049204
ground (m AD) 20.668
max level (m AD) 19.759
max flood dep (m) -0.909
ID 826481832112
ground (m AD) 15.760
max level (m AD) 14.694
max flood dep (m) -1.066
ID 827002832147
ground (m AD) 19.540
max level (m AD) 19.717
max flood dep (m) 0.177
ID 826481832112.1
us inv (m AD) 13.000
ds inv (m AD) 12.867
max us_flow (m3/s) 6.66207
max ds_flow (m3/s) 6.66655
ID 827652831945.1
us inv (m AD) 27.200
ds inv (m AD) 18.570
max us_flow (m3/s) 11.64170
max ds_flow (m3/s) 8.97954
ID 826473832099
ground (m AD) 15.650
max level (m AD) 14.436
max flood dep (m) -1.214
ID 1600.1
us inv (m AD) 16.620
ds inv (m AD) 14.200
max us_flow (m3/s) 32.75054
max ds_flow (m3/s) 32.69052
ID 1602.1
us inv (m AD) 16.620
ds inv (m AD) 16.620
max us_flow (m3/s) 16.21498
max ds_flow (m3/s) 16.21435
ID 826555832001.1
us inv (m AD) 13.410
ds inv (m AD) 11.950
max us_flow (m3/s) 116.91603
max ds_flow (m3/s) 118.14979
ID 826555832001
ground (m AD) 13.410
max level (m AD) 15.375
max flood dep (m) 1.965
ID 1600
ground (m AD) 19.400
max level (m AD) 18.164
max flood dep (m) -1.236
ID 1602
ground (m AD) 19.400
max level (m AD) 18.594
max flood dep (m) -0.806
ID 827118831829.1
us inv (m AD) 20.700
ds inv (m AD) 16.620
max us_flow (m3/s) 27.83312
max ds_flow (m3/s) 32.75119

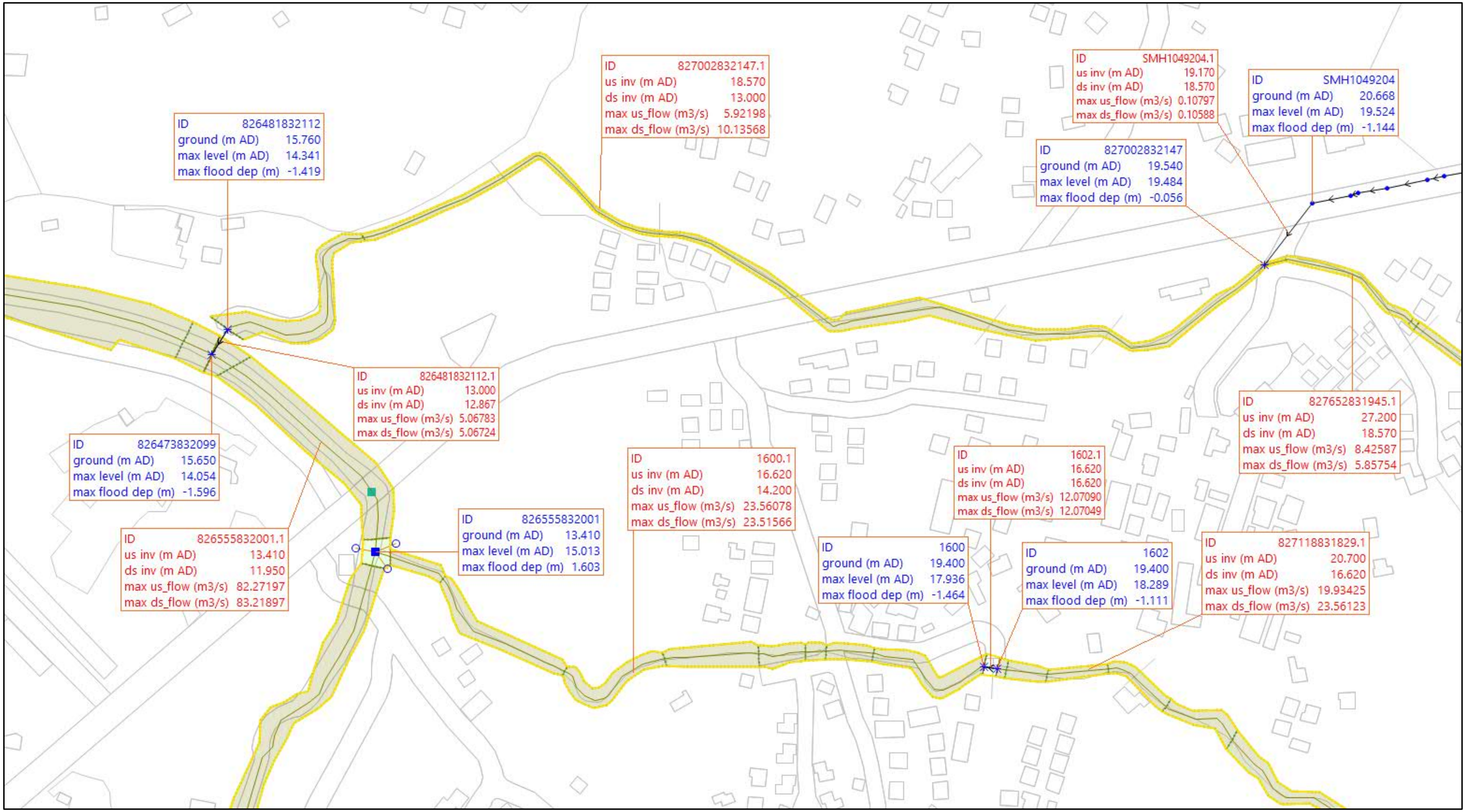
50A


ID 826481832112
ground (m AD) 15.760
max level (m AD) 14.341
max flood dep (m) -1.419
ID 827002832147.1
us inv (m AD) 18.570
ds inv (m AD) 13.000
max us_flow (m3/s) 5.92253
max ds_flow (m3/s) 10.13567
ID SMH1049204.1
us inv (m AD) 19.170
ds inv (m AD) 18.570
max us_flow (m3/s) 0.10797
max ds_flow (m3/s) 0.10588
ID SMH1049204
ground (m AD) 20.668
max level (m AD) 19.524
max flood dep (m) -1.144
ID 827002832147
ground (m AD) 19.540
max level (m AD) 19.484
max flood dep (m) -0.056
ID 826481832112.1
us inv (m AD) 13.000
ds inv (m AD) 12.867
max us_flow (m3/s) 5.06782
max ds_flow (m3/s) 5.06722
ID 827652831945.1
us inv (m AD) 27.200
ds inv (m AD) 18.570
max us_flow (m3/s) 8.42587
max ds_flow (m3/s) 5.85811
ID 826473832099
ground (m AD) 15.650
max level (m AD) 14.054
max flood dep (m) -1.596
ID 1600.1
us inv (m AD) 16.620
ds inv (m AD) 14.200
max us_flow (m3/s) 23.56074
max ds_flow (m3/s) 23.51555
ID 1602.1
us inv (m AD) 16.620
ds inv (m AD) 16.620
max us_flow (m3/s) 12.07090
max ds_flow (m3/s) 12.07048
ID 826555832001
ground (m AD) 13.410
max level (m AD) 15.013
max flood dep (m) 1.603
ID 826555832001.1
us inv (m AD) 13.410
ds inv (m AD) 11.950
max us_flow (m3/s) 82.27145
max ds_flow (m3/s) 83.21828
ID 1600
ground (m AD) 19.400
max level (m AD) 17.936
max flood dep (m) -1.464
ID 1602
ground (m AD) 19.400
max level (m AD) 18.289
max flood dep (m) -1.111
ID 827118831829.1
us inv (m AD) 20.700
ds inv (m AD) 16.620
max us_flow (m3/s) 19.93425
max ds_flow (m3/s) 23.56121

50B


ID 827002832147.1
us inv (m AD) 18.570
ds inv (m AD) 13.000
max us_flow (m3/s) 10.08103
max ds_flow (m3/s) 16.88159
ID SMH1049204.1
us inv (m AD) 19.170
ds inv (m AD) 18.570
max us_flow (m3/s) 0.15358
max ds_flow (m3/s) 0.15347
ID SMH1049204
ground (m AD) 20.668
max level (m AD) 19.890
max flood dep (m) -0.778
ID 826481832112
ground (m AD) 15.760
max level (m AD) 15.021
max flood dep (m) -0.739
ID 827002832147
ground (m AD) 19.540
max level (m AD) 19.827
max flood dep (m) 0.287
ID 826481832112.1
us inv (m AD) 13.000
ds inv (m AD) 12.867
max us_flow (m3/s) 8.44087
max ds_flow (m3/s) 8.44612
ID 827652831945.1
us inv (m AD) 27.200
ds inv (m AD) 18.570
max us_flow (m3/s) 13.91460
max ds_flow (m3/s) 9.93354
ID 826473832099
ground (m AD) 15.650
max level (m AD) 14.721
max flood dep (m) -0.929
ID 1600.1
us inv (m AD) 16.620
ds inv (m AD) 14.200
max us_flow (m3/s) 40.04445
max ds_flow (m3/s) 39.97438
ID 1602.1
us inv (m AD) 16.620
ds inv (m AD) 16.620
max us_flow (m3/s) 19.48711
max ds_flow (m3/s) 19.48645
ID 826555832001
ground (m AD) 13.410
max level (m AD) 15.649
max flood dep (m) 2.239
ID 826555832001.1
us inv (m AD) 13.410
ds inv (m AD) 11.950
max us_flow (m3/s) 145.76985
max ds_flow (m3/s) 147.17715
ID 1600
ground (m AD) 19.400
max level (m AD) 18.328
max flood dep (m) -1.072
ID 1602
ground (m AD) 19.400
max level (m AD) 18.815
max flood dep (m) -0.585
ID 827118831829.1
us inv (m AD) 20.700
ds inv (m AD) 16.620
max us_flow (m3/s) 34.23967
max ds_flow (m3/s) 40.04517

200A



ID	827002832147.1
us inv (m AD)	18.570
ds inv (m AD)	13.000
max us_flow (m3/s)	5.92198
max ds_flow (m3/s)	10.13568

ID	SMH1049204.1
us inv (m AD)	19.170
ds inv (m AD)	18.570
max us_flow (m3/s)	0.10797
max ds_flow (m3/s)	0.10588

ID	SMH1049204
ground (m AD)	20.668
max level (m AD)	19.524
max flood dep (m)	-1.144

ID	826481832112
ground (m AD)	15.760
max level (m AD)	14.341
max flood dep (m)	-1.419

ID	827002832147
ground (m AD)	19.540
max level (m AD)	19.484
max flood dep (m)	-0.056

ID	826481832112.1
us inv (m AD)	13.000
ds inv (m AD)	12.867
max us_flow (m3/s)	5.06783
max ds_flow (m3/s)	5.06724

ID	827652831945.1
us inv (m AD)	27.200
ds inv (m AD)	18.570
max us_flow (m3/s)	8.42587
max ds_flow (m3/s)	5.85754

ID	826473832099
ground (m AD)	15.650
max level (m AD)	14.054
max flood dep (m)	-1.596

ID	1600.1
us inv (m AD)	16.620
ds inv (m AD)	14.200
max us_flow (m3/s)	23.56078
max ds_flow (m3/s)	23.51566

ID	1602.1
us inv (m AD)	16.620
ds inv (m AD)	16.620
max us_flow (m3/s)	12.07090
max ds_flow (m3/s)	12.07049

ID	826555832001
ground (m AD)	13.410
max level (m AD)	15.013
max flood dep (m)	1.603

ID	826555832001.1
us inv (m AD)	13.410
ds inv (m AD)	11.950
max us_flow (m3/s)	82.27197
max ds_flow (m3/s)	83.21897

ID	1600
ground (m AD)	19.400
max level (m AD)	17.936
max flood dep (m)	-1.464

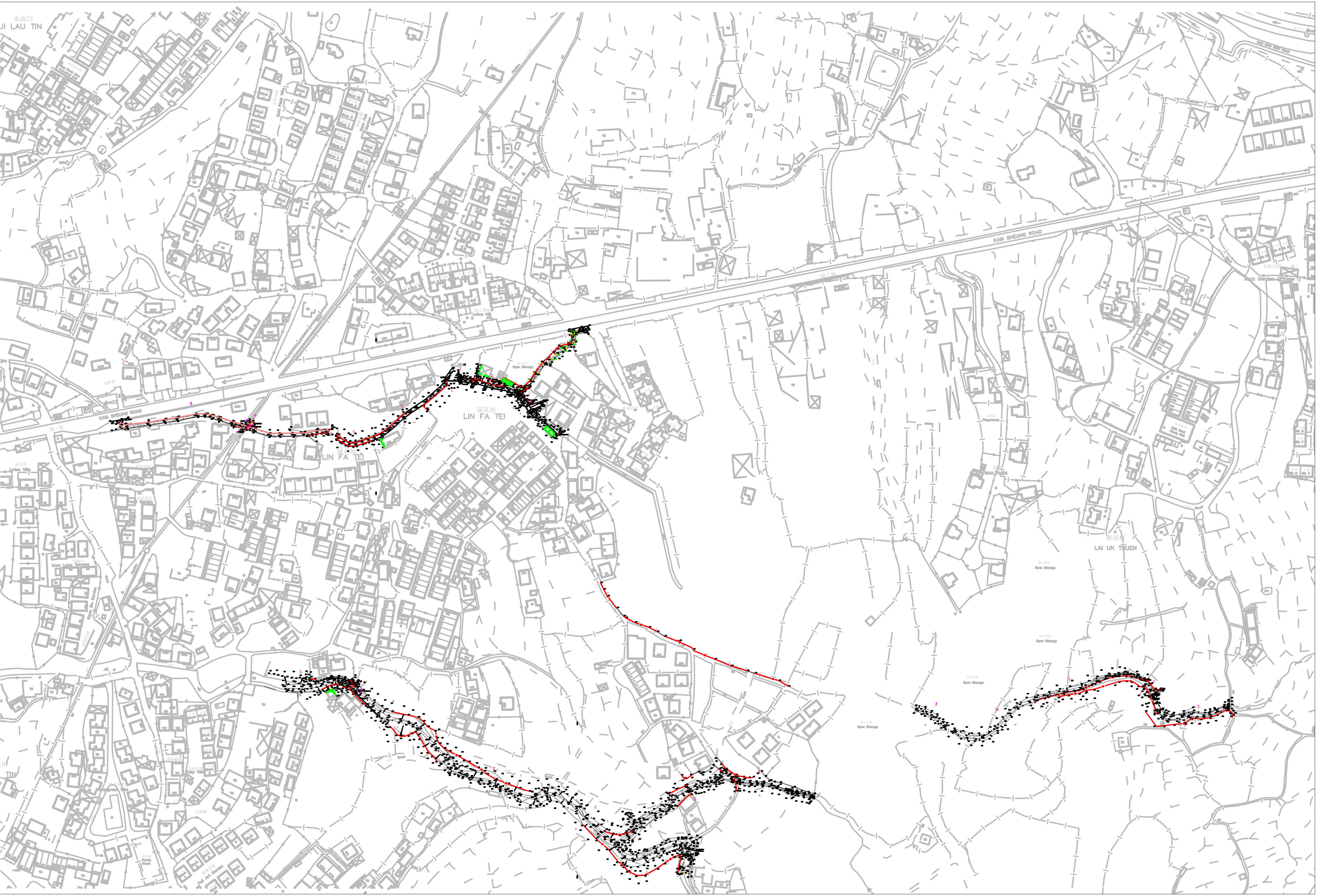
ID	1602
ground (m AD)	19.400
max level (m AD)	18.289
max flood dep (m)	-1.111

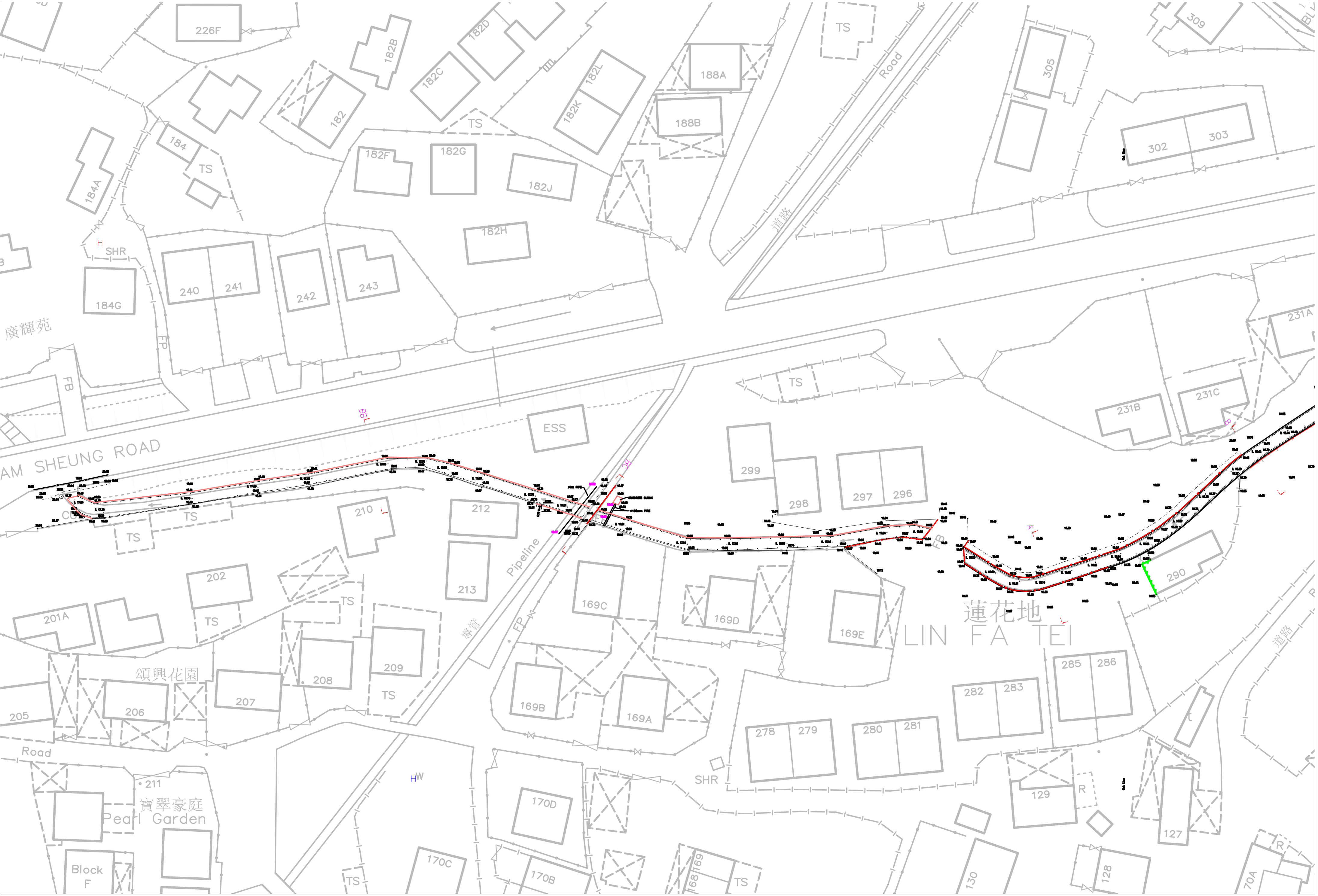
ID	827118831829.1
us inv (m AD)	20.700
ds inv (m AD)	16.620
max us_flow (m3/s)	19.93425
max ds_flow (m3/s)	23.56123

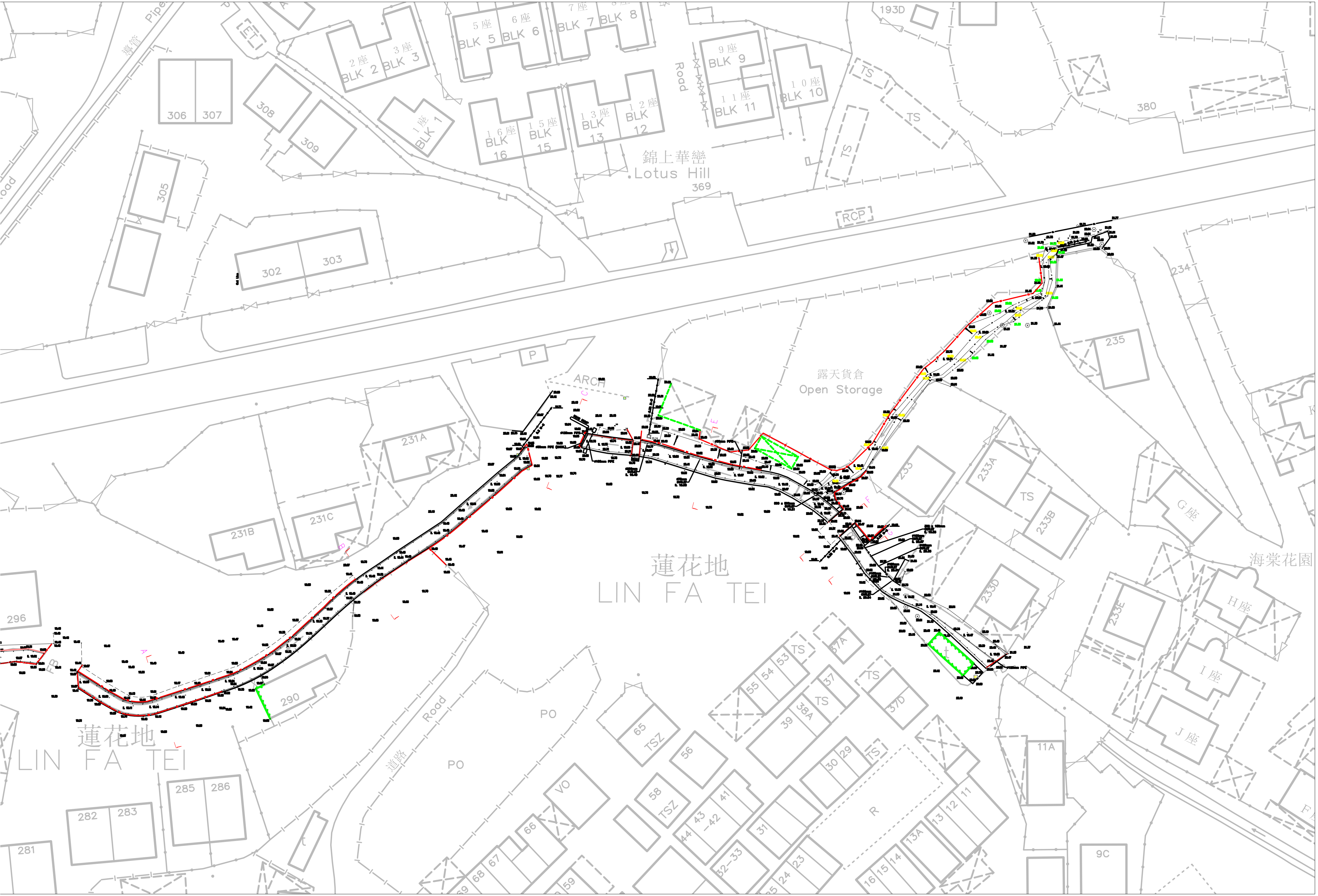
200B

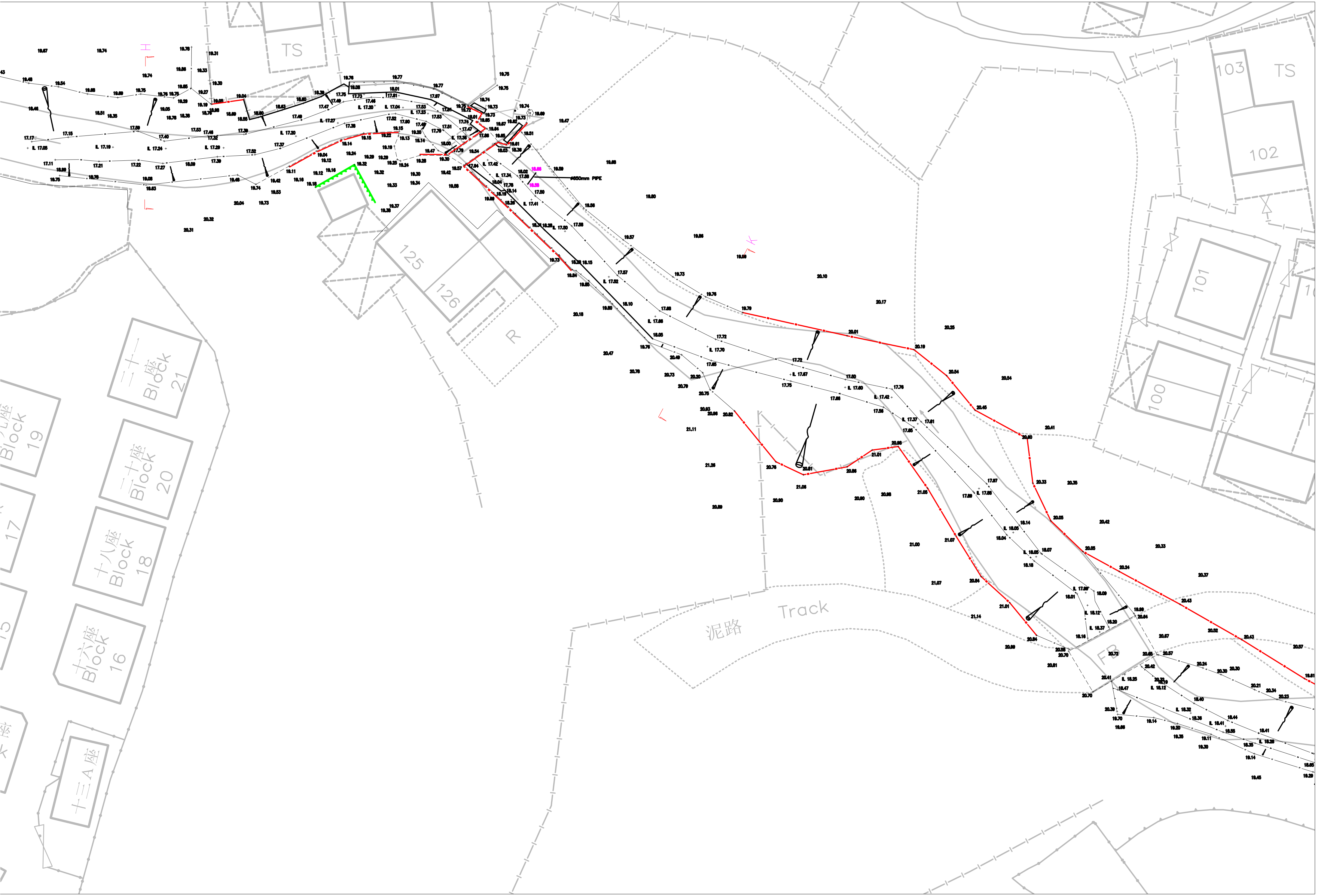
Appendix H

Topographic Survey received from the Applicant


水流田
JI LAU TIN
KAM SHEUNG ROAD
錦上華藝
Lotus Hill
蓮花地
LIN FA TEI
露天貨倉
Open Storage
金爵花園（一期）
Jazz Garden (Phase 1)
A座
B座
C座
D座
LAI UK TSUEN
Kam Lung Terrace
Lotus Villa


226F
182D
182B
182C
182
182L
182K
188A
188B
TS
Road
309
305
302
303
184
184A
182F
182G
182J
182H
道路
SHR
240
241
242
243
184G
廣輝苑
FP
FB
231A
231C
231B
BB
ESS
AM SHEUNG ROAD
299
298
297
296
210
212
213
CONCRETE BLOCK
Pipeline
導管
FP
202
201A
TS
169C
169D
169E
290
蓮花地
LIN FA TEI
道路
頌興花園
205
206
207
208
209
169B
169A
285
286
282
283
278
279
280
281
Road
211
寶翠豪庭
Pearl Garden
Block F
SHR
170D
170C
170B
169
168
129
R
127
130
128
70A
W


Pipe
導管
Road
306
307
308
309
305
302
303
2 座
BLK 2
3 座
BLK 3
1 座
BLK 1
5 座
BLK 5
6 座
BLK 6
7 座
BLK 7
BLK 8
9 座
BLK 9
1 0 座
BLK 10
1 1 座
BLK 11
1 2 座
BLK 12
1 3 座
BLK 13
1 5 座
BLK 15
1 6 座
BLK 16
Road
錦上華巒
Lotus Hill
369
193D
TS
TS
TS
380
RCP
234
235
P
ARCH
露天貨倉
Open Storage
231A
231B
231C
233
233A
TS
233B
233D
233E
G 座
H 座
I 座
J 座
海棠花園
蓮花地
LIN FA TEI
296
290
蓮花地
LIN FA TEI
Road
道路
PO
PO
65
TSZ
56
55
54
53
TS
37A
37
TS
38A
39
TS
37D
30
29
TS
VO
58
TSZ
66
67
68
69
59
44
43
42
41
31
32-33
25
24
23
R
13A
13
12
11
16
15
14
11A
9C
285
286
282
283
281
A
B
C
E
F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126
R
Ø650mm PIPE
泥路 Track
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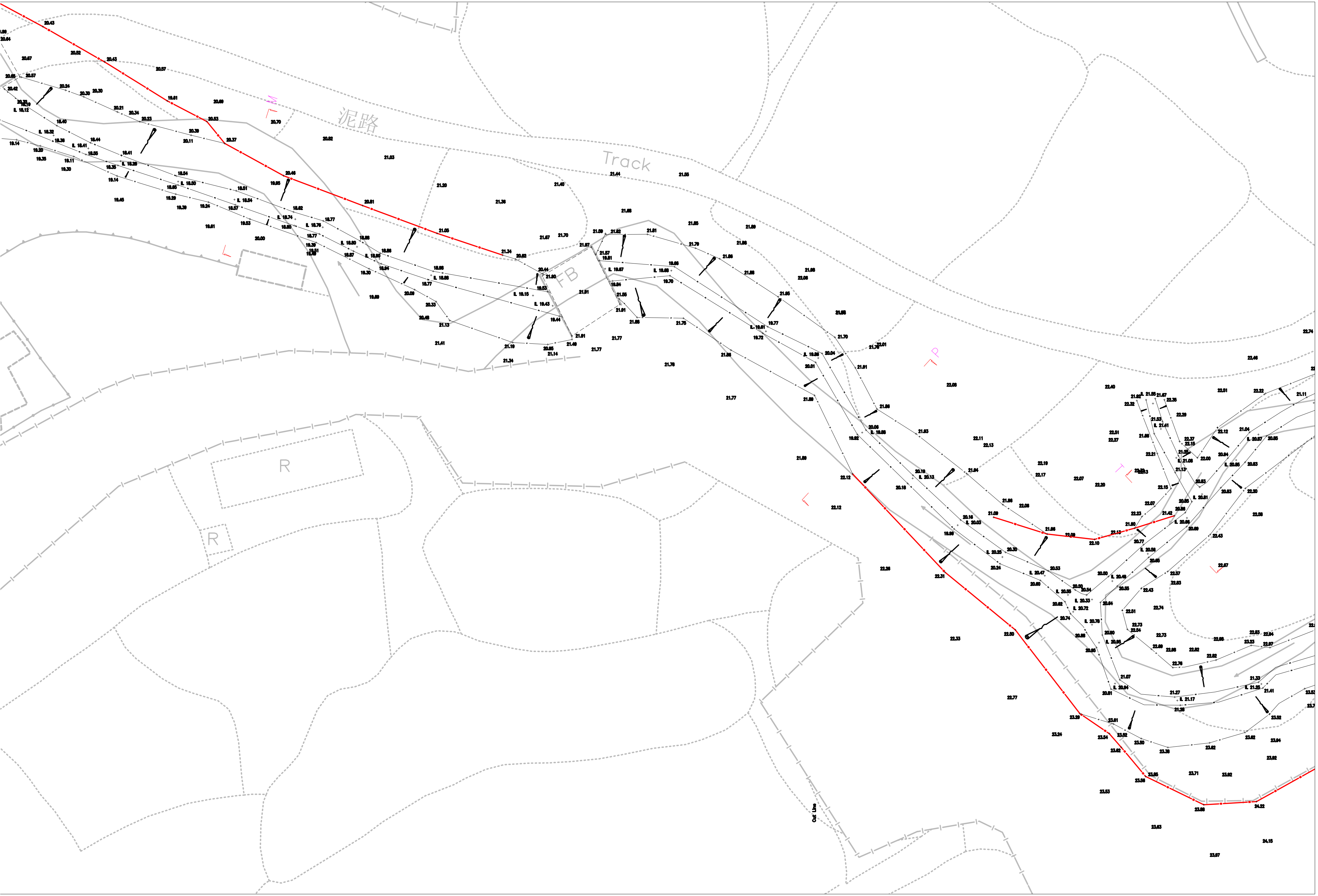
泥路
Track
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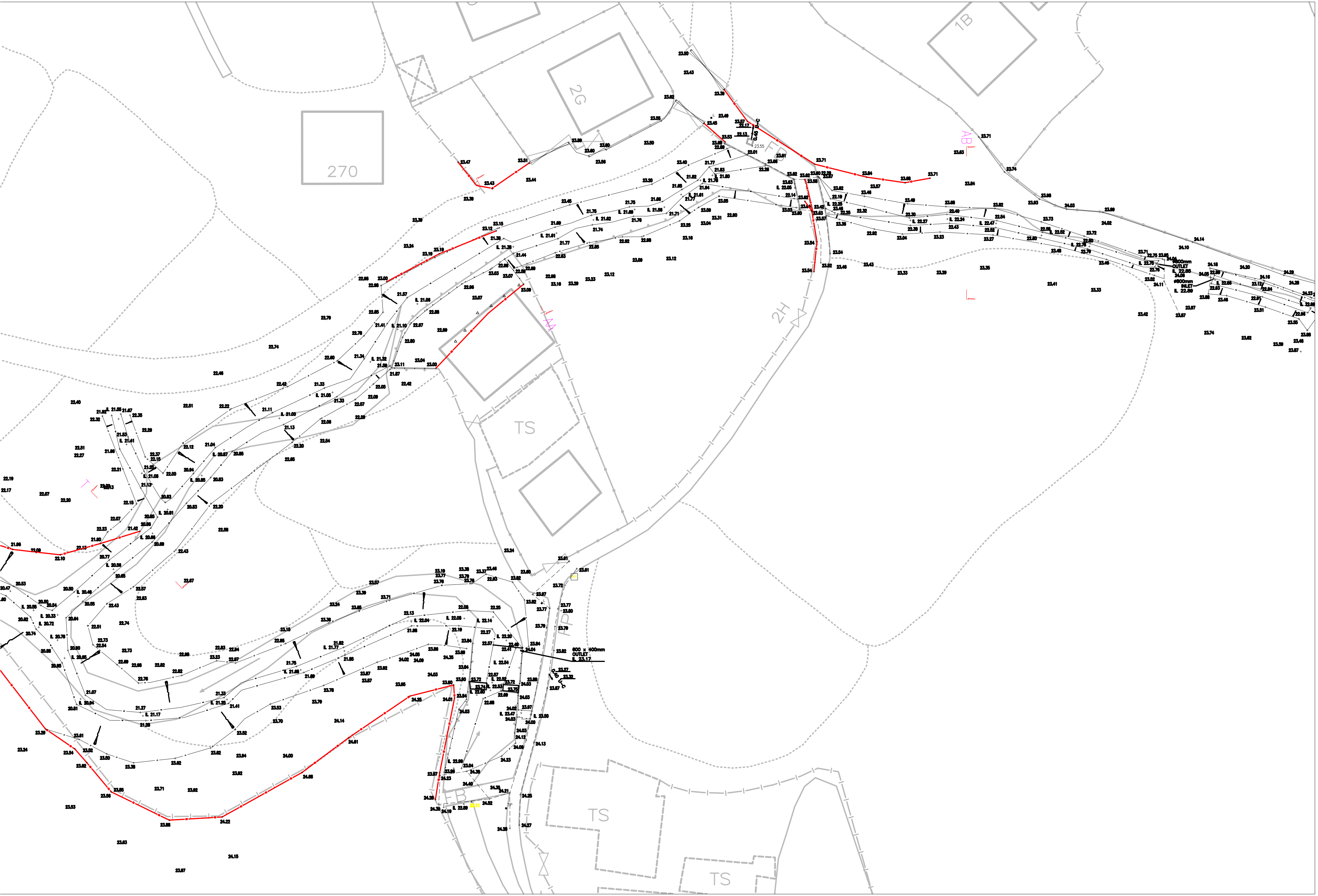
Cut Line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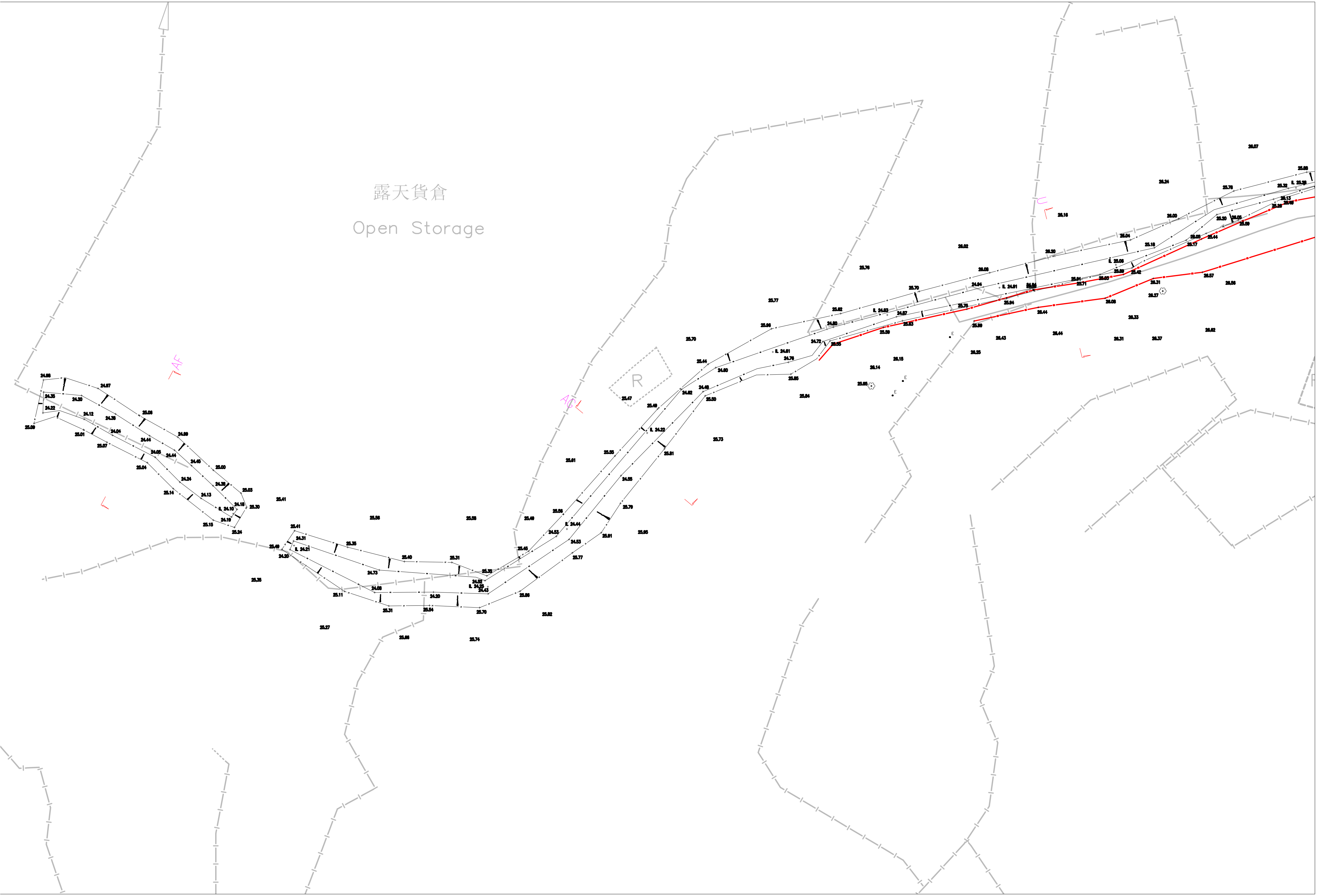
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Appendix I

InfoWorks ICM Hydraulic Model

Appendix J

Additional Survey for the Existing Natural Watercourse near to Wah Yuen


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Appendix K

Hydraulic Assessment on the Proposed New Channels, Associated Conduits and Interception Pipelines Under Normal Flow and Extreme Weather Conditions

Appendix K.1 - Calculation of capacity of the proposed new channels, associated pipes and the proposed box culvert connected to the associated pipes under free flow condition

Ref. **Calculation**

Objective Determine the utilization of proposed new channels, associated pipes and the proposed box culvert connected to the associated pipes under free flow condition

Methodology

1. Determine the runoff from subcatchments by extracting from the results of hydraulic model
2. Use Manning Equation to determine the capacity of the proposed open channel and check against the design flow
3. Use the Colebrook-White Equation to determine the drainage capacity and check against the design flow
4. According to the Stormwater Drainage Manual (SDM), the design return period of drainage system within village area is 10-year. To prevent flooding in the nearby village area and Wah Yuen area, this hydraulic check will also be checked for the design return periods of 50-year and 200-year.

1. Runoff from Nearby Catchments Extracted from the Hydraulic Model

Refer to Appendix C.2 and Appendix C.3 for the catchment plan for proposed condition.
Runoff is extracted from hydraulic model as attached in Appendix I of this DIA Report. Climate change effect at the end of century has been considered in the hydraulic model.

		Peak runoff from rainfall event (m^3/s)			
Sub Catchment ID	**Total Catchment Areas(m^2)**	**10-year**	**50-year**	**200-year**	**Collected By Proposed Drainage System**
Cat_007	211,476	8.0467	10.1807	11.9808	100% of runoff to the northern channel according to topography
Cat_004A	80,225	2.7737	3.4607	4.0686	100% of runoff to the northern channel according to topography
Cat_008	11,985	0.4503	0.5692	0.6700	100% of runoff to the northern channel according to topography
Cat_003AB	1,145	0.0684	0.0821	0.0926	100% of runoff to proposed box culvert according to topography
Cat_012B (the Site)	15,092	1.0236	1.1527	1.2536	100% of runoff to 1350mm internal pipe
Cat_012A (the Site)	17,731	1.2026	1.3542	1.4728	100% of runoff to 1350mm internal pipe
Cat_013 (the Site)	2,235	0.1516	0.1707	0.1856	100% of runoff to 1350mm internal pipe
Cat_004B1	17,836	0.7121	0.8794	1.0211	100% runoff to Channel 1 according to topography and than to proposed box culvert via pipe 1
Cat_004B2	1,876	0.0749	0.0925	0.1074	100% runoff to Channel 2 according to topography and than to proposed box culvert via pipe 2
Cat_004C2	3,406	0.1239	0.1535	0.1794	100% runoff to Channel 3 according to topography and than to proposed box culvert via pipe 3
Cat_004C1	6,813	0.2477	0.3070	0.3588	100% runoff to Channel 5.1 according to topography and than to remaining section of existing watercourse near to Wah Yuen via box culvert 5
Cat_004C3	258	0.0094	0.0116	0.0136	100% runoff to Channel 4 according to topography and than to proposed box culvert via pipe 4. As a conservative design, the runoff of Cat_004C3 will be included in both Channel 4 and Channel 5
Cat_003C	1,527	0.0789	0.0916	0.1021	100% runoff to Channel 5.2 according to topography and than to remaining section of existing watercourse near to Wah Yuen via box culvert 5

Appendix K.1 - Calculation of capacity of the proposed new channels, associated pipes and the proposed box culvert connected to the associated pipes under free flow condition

Ref. **Calculation**

2. Determine the capacity of proposed new channels

Alignment of the proposed new channels refers to Appendix B5.1 of this DIA Report.

SDM Table 12

Using Manning equation for calculate the channel Free Flow Full Bore Capacity

$$\bar{V} = \frac{R^{1/6}}{n}\sqrt{RS_f}$$

where

= Velocity (m/s)
R = Hydraulic Radius (m)
S_f = Slope (m/m)
n = Manning's Coefficient of Roughness (Dimensionless)

Assumptions:

1 surface roughness coefficient (n) = 0.016 (assume poor concrete surface)
2 Siltation = 10% of Area

For Rainfall Return Period 10 years - Proposed new channels under free flow condition

Channel Name	Design Channel Width m	Min. Channel Height m	Upstream Actual Height m	Downstream Actual Height m	Area m^2	Wet Perimeter m	Channel Length m	Hydraulic Radius m	Upstream Ground Level mPD	Downstream Ground Level mPD	Upstream Invert mPD	Downstream Invert mPD	Min. slope of the channel bed (So) 1 in	Flow from Catchment m^3/s	Free Flow Full-bore Capacity m^3/s	Full-bore Velocity m/s	Utilization %	Flow Capacity Check	Remark(s)
Channel 1	1.3	1.00	1.00	1.01	1.30	3.30	110.3	0.39	25.34	24.52	24.34	23.52	134	0.712	3.399	2.90	20.95	OK	Model ID: BD300.1
Channel 2	1.2	1.09	1.10	1.09	1.31	3.38	39.5	0.39	24.50	24.10	23.40	23.01	101	0.075	3.882	3.30	1.93	OK	Model ID: BD304.2
Channel 3	1.0	1.50	1.50	1.63	1.50	4.00	126.2	0.38	24.10	24.10	22.60	22.47	978	0.124	1.403	1.04	8.83	OK	Model ID: BD302.1
Channel 4	1.4	0.76	0.76	1.51	1.06	2.92	53.2	0.36	24.10	24.50	23.34	22.99	151	0.009	2.487	2.60	0.38	OK	Model ID: BD400.1
Channel 5.1	1.2	0.90	0.90	1.10	1.08	3.00	184.1	0.36	24.37	24.20	23.47	23.10	498	0.257	1.378	1.42	18.66	OK	First section of Channel 5 Model ID: BD500-a.1
Channel 5.2	1.2	1.27	1.27	1.41	1.52	3.74	170.0	0.41	24.20	23.90	22.93	22.49	386	0.336	2.397	1.75	14.02	OK	Second section of Channel 5 Model ID: BD501.1
Channel 5.3	1.2	1.43	1.43	1.63	1.72	4.06	182.0	0.42	23.90	23.61	22.47	21.98	371	0.336	2.821	1.83	11.91	OK	Third section of Channel 5 Model ID: BD503.1

For Rainfall Return Period 50 years - Proposed new channels under free flow condition

Channel Name	Design Channel Width m	Min. Channel Height m	Upstream Actual Height m	Downstream Actual Height m	Area m^2	Wet Perimeter m	Channel Length m	Hydraulic Radius m	Upstream Ground Level mPD	Downstream Ground Level mPD	Upstream Invert mPD	Downstream Invert mPD	Min. slope of the channel bed (So) 1 in	Flow from Catchment m^3/s	Free Flow Full-bore Capacity m^3/s	Full-bore Velocity m/s	Utilization %	Flow Capacity Check	Remark(s)
Channel 1	1.3	1.00	1.00	1.01	1.30	3.30	110.3	0.39	25.34	24.52	24.34	23.52	134	0.879	3.399	2.90	25.88	OK	Model ID: BD300.1
Channel 2	1.2	1.09	1.10	1.09	1.31	3.38	39.5	0.39	24.50	24.10	23.40	23.01	101	0.092	3.882	3.30	2.38	OK	Model ID: BD304.2
Channel 3	1.0	1.50	1.50	1.63	1.50	4.00	126.2	0.38	24.10	24.10	22.60	22.47	978	0.153	1.403	1.04	10.94	OK	Model ID: BD302.1
Channel 4	1.4	0.76	0.76	1.51	1.06	2.92	53.2	0.36	24.10	24.50	23.34	22.99	151	0.012	2.487	2.60	0.47	OK	Model ID: BD400.1
Channel 5.1	1.2	0.90	0.90	1.10	1.08	3.00	184.1	0.36	24.37	24.20	23.47	23.10	498	0.319	1.378	1.42	23.12	OK	First section of Channel 5 Model ID: BD500-a.1
Channel 5.2	1.2	1.27	1.27	1.41	1.52	3.74	170.0	0.41	24.20	23.90	22.93	22.49	386	0.410	2.397	1.75	17.11	OK	Second section of Channel 5 Model ID: BD501.1
Channel 5.3	1.2	1.43	1.43	1.63	1.72	4.06	182.0	0.42	23.90	23.61	22.47	21.98	371	0.410	2.821	1.83	14.54	OK	Third section of Channel 5 Model ID: BD503.1

For Rainfall Return Period 200 years - Proposed new channels under free flow condition

Channel Name	Design Channel Width m	Min. Channel Height m	Upstream Actual Height m	Downstream Actual Height m	Area m^2	Wet Perimeter m	Channel Length m	Hydraulic Radius m	Upstream Ground Level mPD	Downstream Ground Level mPD	Upstream Invert mPD	Downstream Invert mPD	Min. slope of the channel bed (So) 1 in	Flow from Catchment m^3/s	Free Flow Full-bore Capacity m^3/s	Full-bore Velocity m/s	Utilization %	Flow Capacity Check	Remark(s)
Channel 1	1.3	1.00	1.00	1.01	1.30	3.30	110.3	0.39	25.34	24.52	24.34	23.52	134	1.021	3.399	2.90	30.04	OK	Model ID: BD300.1
Channel 2	1.2	1.09	1.10	1.09	1.31	3.38	39.5	0.39	24.50	24.10	23.40	23.01	101	0.107	3.882	3.30	2.77	OK	Model ID: BD304.2
Channel 3	1.0	1.50	1.50	1.63	1.50	4.00	126.2	0.38	24.10	24.10	22.60	22.47	978	0.179	1.403	1.04	12.79	OK	Model ID: BD302.1
Channel 4	1.4	0.76	0.76	1.51	1.06	2.92	53.2	0.36	24.10	24.50	23.34	22.99	151	0.014	2.487	2.60	0.55	OK	Model ID: BD400.1
Channel 5.1	1.2	0.90	0.90	1.10	1.08	3.00	184.1	0.36	24.37	24.20	23.47	23.10	498	0.372	1.378	1.42	27.02	OK	First section of Channel 5 Model ID: BD500-a.1
Channel 5.2	1.2	1.27	1.27	1.41	1.52	3.74	170.0	0.41	24.20	23.90	22.93	22.49	386	0.475	2.397	1.75	19.80	OK	Second section of Channel 5 Model ID: BD501.1
Channel 5.3	1.2	1.43	1.43	1.63	1.72	4.06	182.0	0.42	23.90	23.61	22.47	21.98	371	0.475	2.821	1.83	16.82	OK	Third section of Channel 5 Model ID: BD503.1

Notes: (1) Upstream Height and Downstream Height are based on the differences in ground levels and invert levels.

		(Min. Width)			(Min. Channel Height)		(Design Width)			**(Min. Channel Height)**		
Channel 1	- from	0.8	m	X	1.00 m	to	**1.3**	**m**	X	**1.00**	**m**	**with a min. design flow area of 1.3 m2**
Channel 2	- from	0.6	m	X	1.09 m	to	**1.2**	**m**	X	**1.09**	**m**	**with a min. design flow area of 1.3 m2**
Channel 3	- from	0.6	m	X	1.50 m	to	**1**	**m**	X	**1.50**	**m**	**with a min. design flow area of 1.5 m2**
Channel 4	- from	0.6	m	X	0.76 m	to	**1.4**	**m**	X	**0.76**	**m**	**with a min. design flow area of 1.1 m2**
Channel 5.1	- from	0.8	m	X	0.90 m	to	**1.2**	**m**	X	**0.90**	**m**	**with a min. design flow area of 1.1 m2**
Channel 5.2	- from	1	m	X	1.27 m	to	**1.2**	**m**	X	**1.27**	**m**	**with a min. design flow area of 1.5 m2**
Channel 5.3	- from	1	m	X	1.43 m	to	**1.2**	**m**	X	**1.43**	**m**	**with a min. design flow area of 1.7 m2**

* Minimum Height refers to the smaller height at upstream/ downstream of the channels.

Appendix K.1 - Calculation of capacity of the proposed new channels, associated pipes and the proposed box culvert connected to the associated pipes under free flow condition

Ref. **Calculation**

3. Determine the capacity of the Proposed associated pipes and the proposed box culvert connected to the associated pipes under free flow condition

Alignment of the proposed associated pipes and the proposed box culvert connected to the associated pipes refers to Appendix B5.1 of this DIA Report.

SDM
Table 12

$$V = -\sqrt{32gRSf}\,\log[\frac{ks}{14.8R} + \frac{1.255v}{R\sqrt{32gRSf}}]$$

Use the Colebrook-White Equation to Determine the Drainage Capacity

Assumptions:

1. Pipe Roughness is 3.00 mm
2. Transitional flow and water at 15 degree Celsius, i.e. kinematic viscosity is 1.14 x 10-6 m^2/s.
3. Siltation = 10% of Area

For Rainfall Return Period 10 years - Proposed associated pipes and the proposed box culvert connected to the associated pipes under free flow condition

Conduit Name	Conduit Width mm	Conduit Height mm	Conduit Length m	Hydraulic Radius m	Upstream Ground Level mPD	Downstream Ground Level mPD	Upstream Invert mPD	Downstream Invert mPD	Min. slope of the channel bed (So) 1 in	Flow from Catchment m^3/s	Free Flow Full-bore Capacity m^3/s	Full-bore Velocity m/s	Utilization %	Flow Capacity Check	Remark(s)
Pipe 1	1200	1200	7.00	0.30	26.00	26.00	22.96	22.91	132	0.712	2.722	2.67	26.16	OK	Model ID: BD301.1
Proposed Box Culvert connected to Pipe 1	3000	2500	40.40	0.94	26.00	26.00	21.61	21.51	400	12.051	21.200	3.14	56.85	OK	Model ID: MH-009.1
Pipe 2	1050	1050	6.80	0.26	26.00	26.00	23.01	22.96	142	0.075	1.847	2.37	4.05	OK	Model ID: BD305.1
Pipe 3	1050	1050	6.50	0.26	26.00	26.00	22.47	22.45	325	0.124	1.219	1.56	10.16	OK	Model ID: BD303.1
Proposed Box Culvert connected to Pipes 2 and 3	3000	2500	23.50	0.94	26.00	26.00	21.51	21.34	140	12.250	35.864	5.31	34.16	OK	Model ID: MH-009a.1
Pipe 4	1200	1200	23.30	0.30	26.00	26.00	21.99	21.84	151	0.009	2.543	2.50	0.37	OK	Model ID: BD401.1
Proposed Box Culvert connected to Pipe 4	3000	2500	30.60	0.94	26.00	26.00	21.34	21.12	140	12.259	35.802	5.30	34.24	OK	Model ID: MH-010.1
Box Culvert 5.1	800	500	49.90	0.22	26.00	26.00	23.10	22.93	294	0.257	0.532	1.48	48.29	OK	First section of Box Culvert 5 Model ID: BD500.1
Box Culvert 5.2	1000	500	6.00	0.25	26.00	26.00	22.49	22.47	300	0.336	0.710	1.58	47.32	OK	Second section of Box Culvert 5 Model ID: BD502.1

For Rainfall Return Period 50 years - Proposed associated pipes and the proposed box culvert connected to the associated pipes under free flow condition

Conduit Name	Conduit Width mm	Conduit Height mm	Conduit Length m	Hydraulic Radius m	Upstream Ground Level mPD	Downstream Ground Level mPD	Upstream Invert mPD	Downstream Invert mPD	Min. slope of the channel bed (So) 1 in	Flow from Catchment m^3/s	Free Flow Full-bore Capacity m^3/s	Full-bore Velocity m/s	Utilization %	Flow Capacity Check	Remark(s)
Pipe 1	1200	1200	7.00	0.30	26.00	26.00	22.96	22.91	132	0.879	2.722	2.67	32.31	OK	Model ID: BD301.1
Proposed Box Culvert connected to Pipe 1	3000	2500	40.40	0.94	26.00	26.00	21.61	21.51	400	15.172	21.200	3.14	71.57	OK	Model ID: MH-009.1
Pipe 2	1050	1050	6.80	0.26	26.00	26.00	23.01	22.96	142	0.092	1.847	2.37	5.01	OK	Model ID: BD305.1
Pipe 3	1050	1050	6.50	0.26	26.00	26.00	22.47	22.45	325	0.153	1.219	1.56	12.59	OK	Model ID: BD303.1
Proposed Box Culvert connected to Pipes 2 and 3	3000	2500	23.50	0.94	26.00	26.00	21.51	21.34	140	15.418	35.864	5.31	42.99	OK	Model ID: MH-009a.1
Pipe 4	1200	1200	23.30	0.30	26.00	26.00	21.99	21.84	151	0.012	2.543	2.50	0.46	OK	Model ID: BD401.1
Proposed Box Culvert connected to Pipe 4	3000	2500	30.60	0.94	26.00	26.00	21.34	21.12	140	15.430	35.802	5.30	43.10	OK	Model ID: MH-010.1
Box Culvert 5.1	800	500	49.90	0.22	26.00	26.00	23.10	22.93	294	0.319	0.532	1.48	59.84	OK	First section of Box Culvert 5 Model ID: BD500.1
Box Culvert 5.2	1000	500	6.00	0.25	26.00	26.00	22.49	22.47	300	0.410	0.710	1.58	57.76	OK	Second section of Box Culvert 5 Model ID: BD502.1

For Rainfall Return Period 200 years - Proposed associated pipes and the proposed box culvert connected to the associated pipes under free flow condition

Conduit Name	Conduit Width mm	Conduit Height mm	Conduit Length m	Hydraulic Radius m	Upstream Ground Level mPD	Downstream Ground Level mPD	Upstream Invert mPD	Downstream Invert mPD	Min. slope of the channel bed (So) 1 in	Flow from Catchment m^3/s	Free Flow Full-bore Capacity m^3/s	Full-bore Velocity m/s	Utilization %	Flow Capacity Check	Remark(s)
Pipe 1	1200	1200	7.00	0.30	26.00	26.00	22.96	22.91	132	1.021	2.722	2.67	37.51	OK	Model ID: BD301.1
Proposed Box Culvert connected to Pipe 1	3000	2500	40.40	0.94	26.00	26.00	21.61	21.51	400	17.833	21.200	3.14	84.12	OK	Model ID: MH-009.1
Pipe 2	1050	1050	6.80	0.26	26.00	26.00	23.01	22.96	142	0.107	1.847	2.37	5.81	OK	Model ID: BD305.1
Pipe 3	1050	1050	6.50	0.26	26.00	26.00	22.47	22.45	325	0.179	1.219	1.56	14.72	OK	Model ID: BD303.1
Proposed Box Culvert connected to Pipes 2 and 3	3000	2500	23.50	0.94	26.00	26.00	21.51	21.34	140	18.120	35.864	5.31	50.52	OK	Model ID: MH-009a.1
Pipe 4	1200	1200	23.30	0.30	26.00	26.00	21.99	21.84	151	0.014	2.543	2.50	0.53	OK	Model ID: BD401.1
Proposed Box Culvert connected to Pipe 4	3000	2500	30.60	0.94	26.00	26.00	21.34	21.12	140	18.133	35.802	5.30	50.65	OK	Model ID: MH-010.1
Box Culvert 5.1	800	500	49.90	0.22	26.00	26.00	23.10	22.93	294	0.372	0.532	1.48	69.94	OK	First section of Box Culvert 5 Model ID: BD500.1
Box Culvert 5.2	1000	500	6.00	0.25	26.00	26.00	22.49	22.47	300	0.475	0.710	1.58	66.83	OK	Second section of Box Culvert 5 Model ID: BD502.1

Appendix K.2 - Water Level of the proposed new channels, associated pipes and the proposed interception pipes under 1 in 10-Year, 50-Year and 200-Year rainfall events

Ref. **Calculation**

Objective Determine water level of proposed new channels, associated pipes and the proposed box culvert connected to the associated pipes under 1 in 10-Year, 50-Year and 200-Year rainfall event by extracting from hydraulic model in Appendix I

Methodology

1. Extract water of the proposed new channels, associated pipes and the proposed box culvert connected to the associated pipes under submerged condition (with backwater effect) from the results of hydraulic model. Climate change effect at the end of century has been considered in the hydraulic model.
2. Determine the freeboard of proposed new channels, associated pipes and the proposed box culvert connected to the associated pipes under 1 in 10-Year, 50-Year and 200-Year rainfall event
3. According to the Stormwater Drainage Manual (SDM), the design return period of drainage system within village area is 10-year. To prevent flooding in the nearby village area and Wah Yuen area, this hydraulic check will also be checked for the design return periods of 50-year and 200-year.

Proposed new channels, associated pipes and the proposed box culvert connected to the associated pipes under submerged condition (with backwater effect)

Channel Name	Upstream End								Downstream End								Remark(s)	Upstream Channel Height m	Downstream Channel Height m
	Ground Level mPD	Invert Level mPD	Water Level at 1 in 10 years rainfall event	Water Level at 1 in 50 years rainfall event	Water Level at 1 in 200 years rainfall event	Freeboard at 1 in 10 years rainfall event m	Freeboard at 1 in 50 years rainfall event m	Freeboard at 1 in 200 years rainfall event m	Ground Level mPD	Invert Level mPD	Water Level at 1 in 10 years rainfall event	Water Level at 1 in 50 years rainfall event	Water Level at 1 in 200 years rainfall event	Freeboard at 1 in 10 years rainfall event m	Freeboard at 1 in 50 years rainfall event m	Freeboard at 1 in 200 years rainfall event m			
Channel 1	25.34	24.34	24.65	24.71	24.75	0.69	0.63	0.59	24.52	23.52	23.94	24.15	24.19	0.58	0.37	0.33	Model ID: BD300.1	1.00	1.01
Pipe 1	26.00	22.96	23.88	24.54	24.79	2.12	1.46	1.21	26.00	22.91	23.88	24.54	24.79	2.12	1.46	1.21	Model ID: BD301.1	-	-
Proposed Box Culvert connected to Pipe 1	26.00	21.61	23.25	23.57	24.13	2.75	2.44	1.87	26.00	21.51	23.16	23.50	24.07	2.84	2.50	1.93	Model ID: MH-009.1	-	-
Channel 2	24.50	23.40	23.50	23.54	24.02	1.00	0.96	0.48	24.10	23.01	23.38	23.47	24.02	0.72	0.63	0.08	Model ID: BD304.2	1.10	1.09
Pipe 2	26.00	23.01	23.86	24.47	24.70	2.14	1.53	1.30	26.00	22.96	23.86	24.47	24.70	2.14	1.53	1.30	Model ID: BD305.1	-	-
Channel 3	24.10	22.60	23.04	23.30	24.02	1.06	0.80	0.08	24.10	22.47	23.02	23.29	24.02	1.08	0.81	0.08	Model ID: BD302.1	1.50	1.63
Pipe 3	26.00	22.47	23.86	24.47	24.70	2.14	1.53	1.30	26.00	22.45	23.86	24.47	24.70	2.14	1.53	1.30	Model ID: BD303.1	-	-
Proposed Box Culvert connected to Pipes 2 and 3	26.00	21.51	23.16	23.50	24.07	2.84	2.50	1.93	26.00	21.34	23.11	23.46	24.03	2.89	2.54	1.97	Model ID: MH-009a.1	-	-
Channel 4	24.10	23.34	23.39	23.39	24.00	0.72	0.71	0.10	24.50	22.99	23.03	23.26	24.00	1.47	1.25	0.50	Model ID: BD400.1	0.76	1.51
Pipe 4	26.00	21.99	23.84	24.43	24.64	2.16	1.57	1.36	26.00	21.84	23.84	24.43	24.64	2.16	1.57	1.36	Model ID: BD401.1	-	-
Proposed Box Culvert connected to Pipe 4	26.00	21.34	23.11	23.46	24.03	2.89	2.54	1.97	26.00	21.12	23.07	23.43	23.98	2.93	2.57	2.02	Model ID: MH-010.1	-	-
Channel 5.1	24.37	23.47	23.73	23.78	23.82	0.64	0.59	0.55	24.20	23.10	23.40	23.45	23.65	0.80	0.75	0.55	First section of Channel 5 Model ID: BD500-a.1	0.90	1.10
Box Culvert 5.1	26.00	23.10	23.40	23.45	23.65	2.60	2.55	2.35	26.00	22.93	23.20	23.28	23.54	2.80	2.73	2.47	First section of Box Culvert 5 Model ID: BD500.1	-	-
Channel 5.2	24.20	22.93	23.20	23.27	23.53	1.00	0.93	0.67	23.90	22.49	22.77	23.10	23.50	1.13	0.80	0.41	Second section of Channel 5 Model ID: BD501.1	1.27	1.41
Box Culvert 5.2	26.00	22.49	22.77	23.09	23.49	3.23	2.91	2.51	26.00	22.47	22.75	23.08	23.48	3.25	2.92	2.52	Second section of Box Culvert 5 Model ID: BD502.1	-	-
Channel 5.3	23.90	22.47	22.75	23.08	23.48	1.15	0.82	0.42	23.61	21.98	22.46	23.05	23.46	1.15	0.56	0.15	Third section of Channel 5 Model ID: BD503.1	1.43	1.63

Proposed interception pipes under submerged condition (with backwater effect)

Channel Name	Upstream End								Downstream End								Remark(s)
	Ground Level mPD	Invert Level mPD	Water Level at 1 in 10 years rainfall event	Water Level at 1 in 50 years rainfall event	Water Level at 1 in 200 years rainfall event	Freeboard at 1 in 10 years rainfall event m	Freeboard at 1 in 50 years rainfall event m	Freeboard at 1 in 200 years rainfall event m	Ground Level mPD	Invert Level mPD	Water Level at 1 in 10 years rainfall event	Water Level at 1 in 50 years rainfall event	Water Level at 1 in 200 years rainfall event	Freeboard at 1 in 10 years rainfall event m	Freeboard at 1 in 50 years rainfall event m	Freeboard at 1 in 200 years rainfall event m	
900mm interception pipe	26.00	23.60	23.94	24.14	24.17	2.06	1.86	1.83	26.00	23.10	23.44	23.64	24.02	2.56	2.36	1.98	The interception pipe will be construction with the Site at the revised site formation level. Model ID: BD301.2
900mm interception pipe	26.00	23.10	23.38	23.47	24.02	2.62	2.53	1.98	26.00	23.00	23.28	23.37	24.02	2.72	2.63	1.98	The interception pipe will be construction with the Site at the revised site formation level. Model ID: BD305.2
1050mm interception pipe	26.00	22.57	23.02	23.28	24.02	2.98	2.72	1.98	26.00	22.33	22.78	23.26	24.00	3.22	2.75	2.00	The interception pipe will be construction with the Site at the revised site formation level. Model ID: BD303.2
1200mm interception pipe	26.00	22.23	22.71	23.26	24.01	3.29	2.75	1.99	26.00	22.13	22.60	23.25	24.00	3.40	2.75	2.01	The interception pipe will be construction with the Site at the revised site formation level. Model ID: BD401.2

Notes: (1) Upstream Height and Downstream Height are based on the differences in ground levels and invert levels.

(2) As requested by DSD, in order to enhance the robustness of the system, the design width of channels will be enlarged as follow:-

		(Min. Width)			(Min. Channel Height)		(Design Width)			**(Min. Channel Height)**		
Channel 1	- from	0.8	m	X	1.00 m	to	**1.3**	**m**	X	**1.00**	**m**	**with a min. design flow area of 1.3 m2**
Channel 2	- from	0.6	m	X	1.09 m	to	**1.2**	**m**	X	**1.09**	**m**	**with a min. design flow area of 1.3 m2**
Channel 3	- from	0.6	m	X	1.50 m	to	**1**	**m**	X	**1.50**	**m**	**with a min. design flow area of 1.5 m2**
Channel 4	- from	0.6	m	X	0.76 m	to	**1.4**	**m**	X	**0.76**	**m**	**with a min. design flow area of 1.1 m2**
Channel 5.1	- from	0.8	m	X	0.90 m	to	**1.2**	**m**	X	**0.90**	**m**	**with a min. design flow area of 1.1 m2**
Channel 5.2	- from	1	m	X	1.27 m	to	**1.2**	**m**	X	**1.27**	**m**	**with a min. design flow area of 1.5 m2**
Channel 5.3	- from	1	m	X	1.43 m	to	**1.2**	**m**	X	**1.43**	**m**	**with a min. design flow area of 1.7 m2**

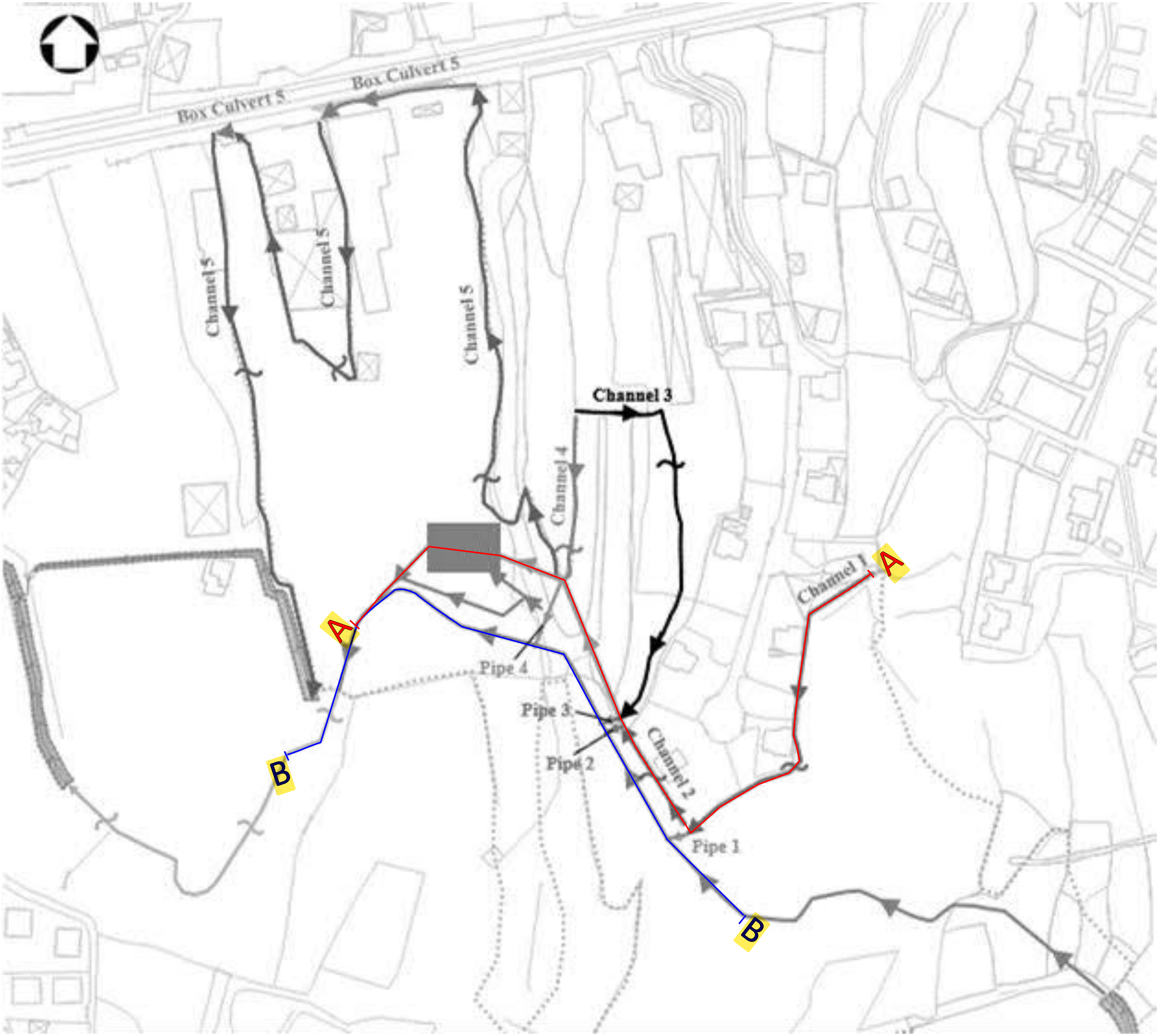
* Minimum Height refers to the smaller height at upstream/ downstream of the channels.

(3) Flap valves are proposed to be installed for Pipes 1, 2, 3 and 4.

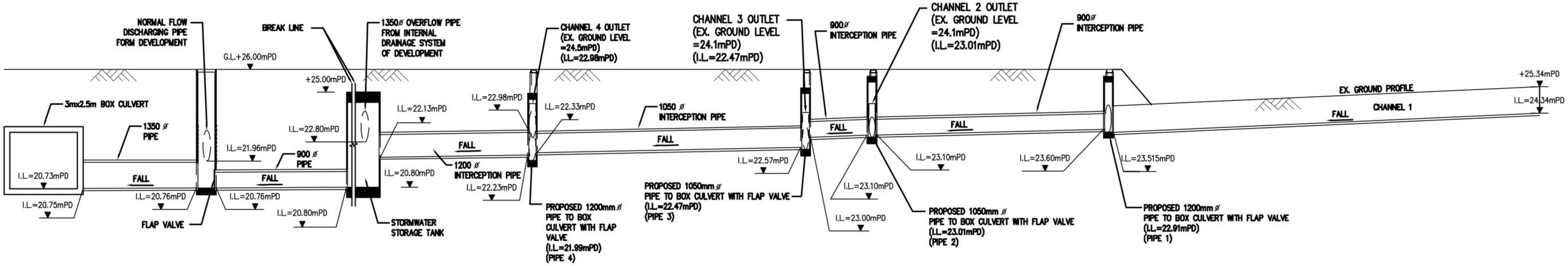
Appendix L

Schematic Drawing of the Proposed Storage Tank, 1350mm Internal Pipe, the Proposed 900mm – 1200mm Interception Pipeline and the Proposed Channel

Appendix L - Schematic Drawing of the Proposed Storage Tank, 1350mm Internal Pipe and the Proposed 900mm – 1200mm Interception Pipeline and the Proposed Channel



Appendix L - Schematic Drawing of the Proposed Storage Tank, 1350mm Internal Pipe and the Proposed 900mm – 1200mm Interception Pipeline and the Proposed Channel



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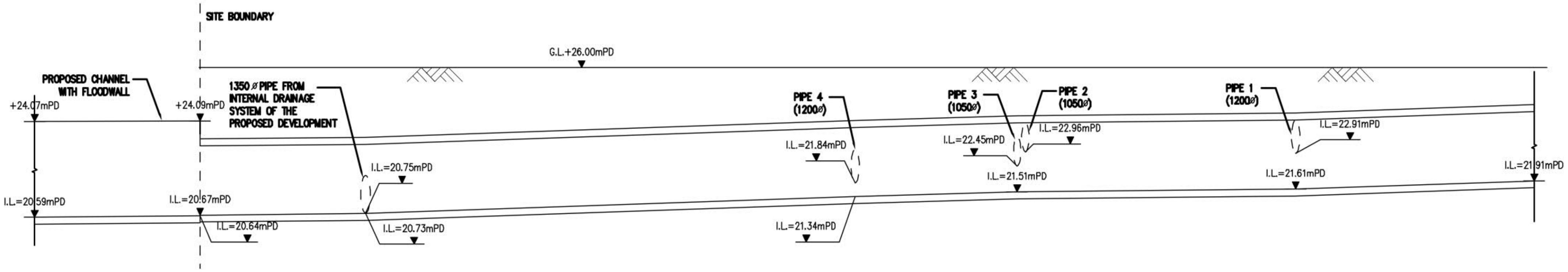
SECTION A-A



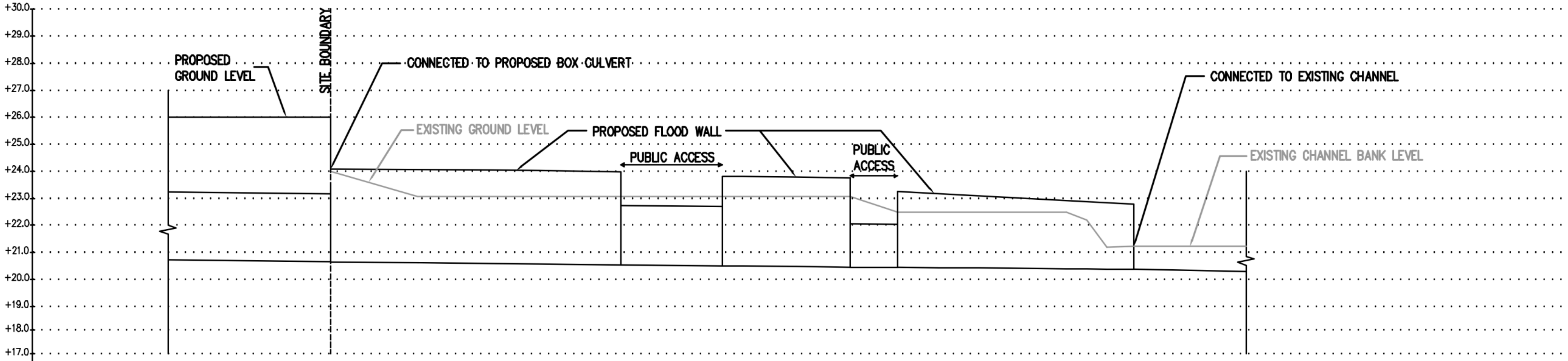
(Not to Scale)

SECTION B-B

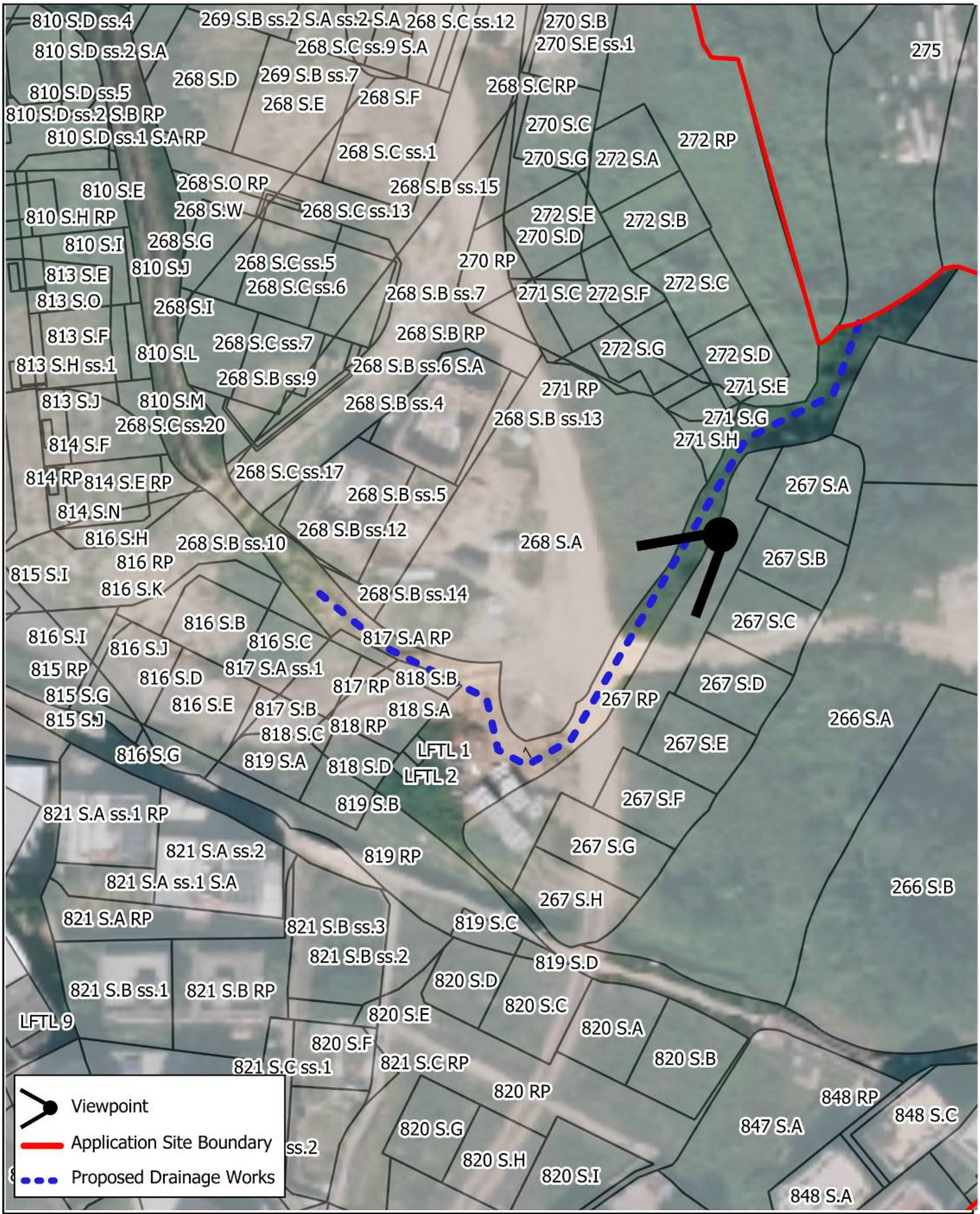
Note:

1. The schematic design of the proposed drainage system will be fine-tunned and reviewed to suit the future detailed design of the proposed development.

Appendix L - Schematic Drawing of the Proposed Storage Tank, 1350mm Internal Pipe and the Proposed 900mm – 1200mm Interception Pipeline and the Proposed Channel



APPROXIMATE LENGTH (m)		0	13	53	68	87	94	119	122	125	129	
PROPOSED LEVEL AT TOP OF FLOOD WALLS (mPD)		24.09	24.07	23.99	23.81	23.76	23.25			22.84	22.78	
GROUND LEVEL (mPD)	26.00	24.00	23.07	23.07	23.07	23.07	22.50	22.50	22.19	21.19		21.23
PROPOSED INVERT LEVEL (mPD)		20.64		20.54 20.54	20.51 20.51	20.46 20.46	20.45 20.45				20.38	
REMARKS	PROPOSED 3m(W) x 2.5m(H) BOX CULVERT INSIDE DEVELOPMENT	PROPOSED FLOOD WALL MAX HEIGHT 1m		PROPOSED 2.2m(W) x 2.2m(H) BOX CULVERT	PROPOSED FLOOD WALL MAX HEIGHT 0.74m	PROPOSED 1.4m(W) x 1.6m(H) BOX CULVERT	PROPOSED FLOOD WALL MAX HEIGHT 0.75		PROPOSED FLOOD WALL 0.74 TO 1.65m HIGH			EXISTING CHANNEL



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Location Plan

(For Proposed Drainage Works)

Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone for Proposed Residential Development at Various Lots in D.D. 112 and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories


2.2m wide x 2.2m high box culvert
1.4m wide channel with ~1m high floodwall
1.4m wide channel with ~0.7m high floodwall
1.4m wide x 1.6m high box culvert (underground)
2.6m wide channel with ~0.7m high floodwall

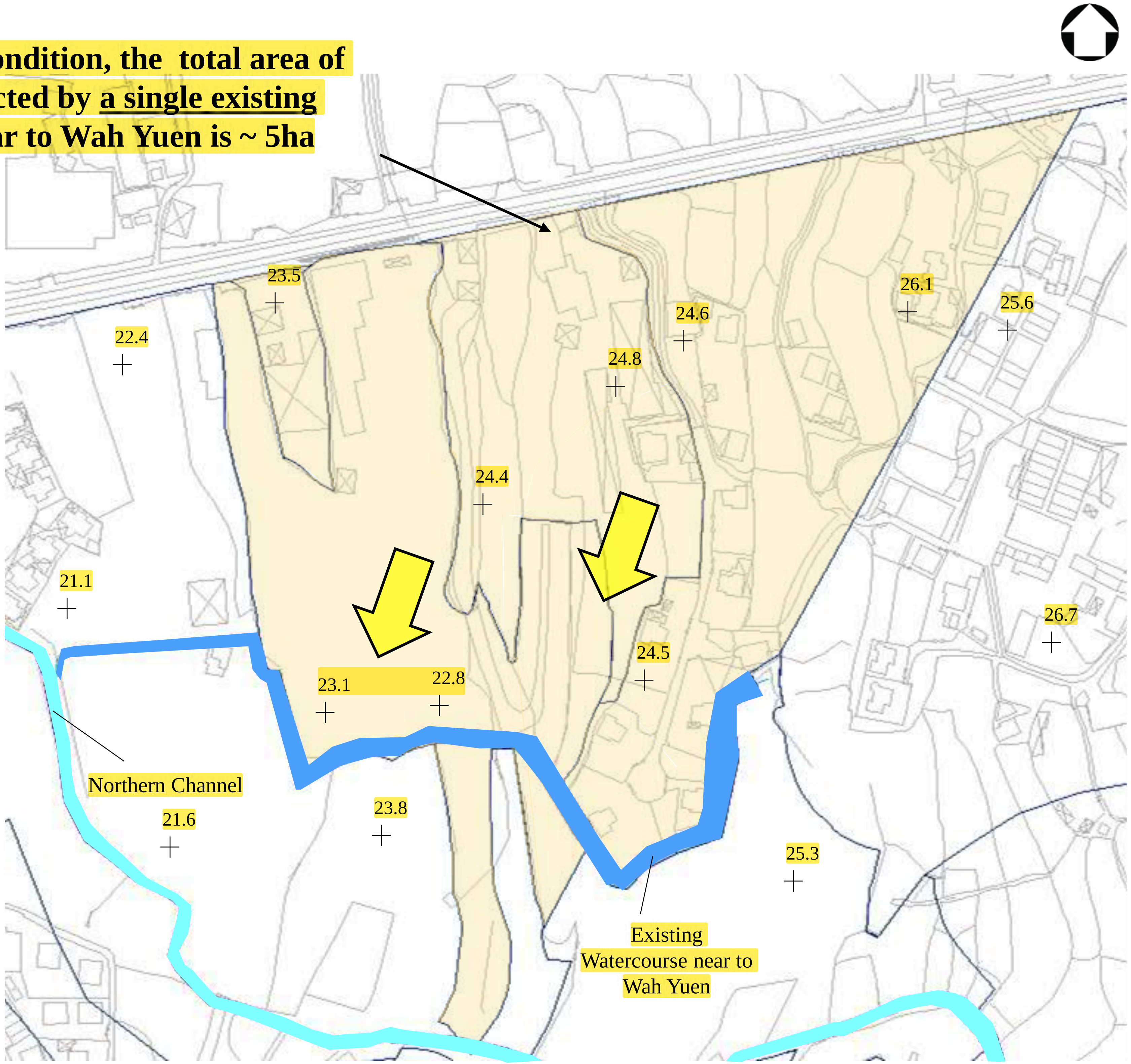
Appendix M1

Catchments Served by Existing Watercourse near to Wah Yuen under Existing Condition

Appendix M1

Catchments served by Existing Watercourse near to Wah Yuen under Existing Condition

Under Existing Condition, the total area of catchment collected by a single existing watercourse near to Wah Yuen is ~ 5ha



Legend

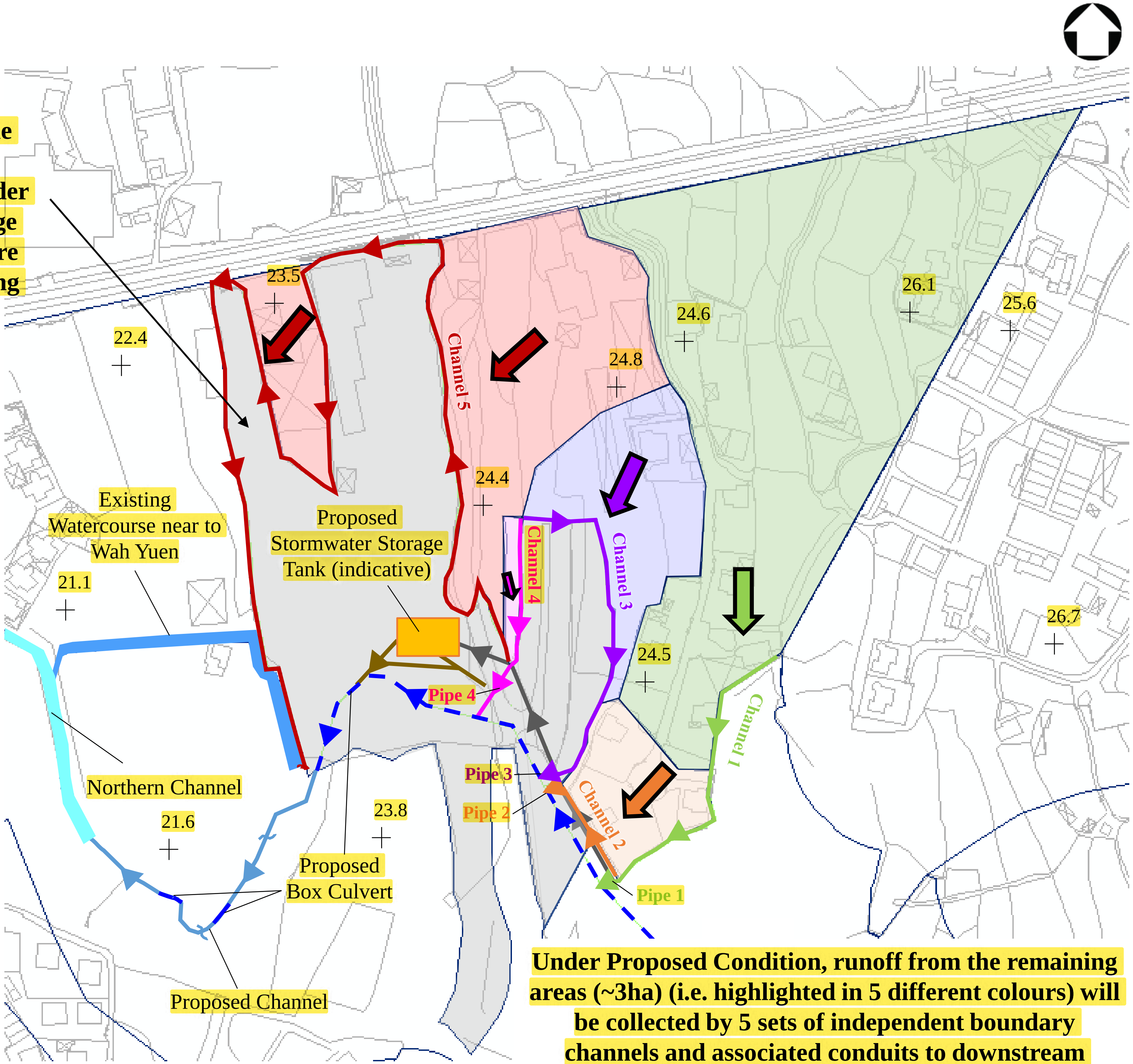
🟦	Existing watercourse near to Wah Yuen
▬	Northern Channel
⇦	Overland flow to existing watercourse near to Wah Yuen
🟨	Catchments where runoff collected by existing watercourse near to Wah Yuen based on topography

Appendix M2

Catchments Served by the Proposed Boundary Channels under Proposed Condition

Appendix M2
Catchments served by the Proposed Boundary Channels under Proposed Condition

Under Proposed Condition, the runoff from the area of the Application Site boundary (~ 2 ha), which is originally collected by the existing watercourse near to Wah Yuen under existing condition, will be collected by the internal drainage system under proposed condition and will temporarily store in the proposed stormwater storage tank before discharging to proposed box culvert



Under Proposed Condition, runoff from the remaining areas (~3ha) (i.e. highlighted in 5 different colours) will be collected by 5 sets of independent boundary channels and associated conduits to downstream drainage system as shown in Appendix N

Legend

- 🟦 Existing watercourse near to Wah Yuen
- 🟦 Northern Channel
- ▨ Runoff from the Development Site that discharging to existing watercourse near Wah Yuen (~ 2 ha) under the existing condition will be collected by internal drainage system consisting of peripheral surface channels, pipeline and stormwater storage tank before discharging to proposed box culvert that will finally be connected to Northern Channel on the west of the site
- ▥ Remaining catchments (~3 ha) where runoff collected by the five sets of independent proposed boundary channels and associated conduits
- ⇨ Flow Path of Catchment

Appendix N

Collection of Runoff from Channels 2, 3 and 4 in Proposed Condition under Normal Flow Condition and Extreme Weather Condition

Appendix N1

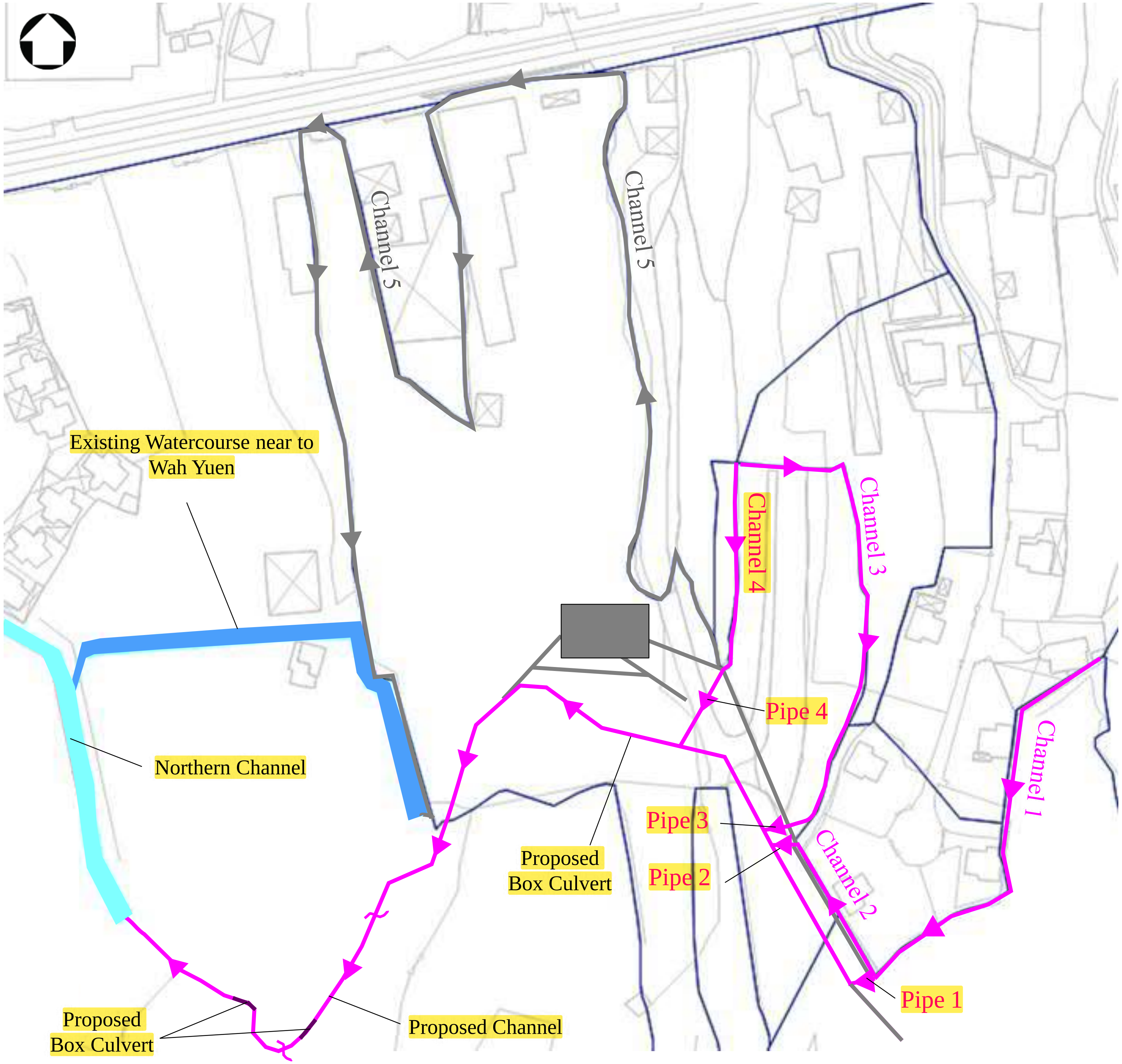
Route 1 – Collection of Runoff from Channels 1, 2, 3 and 4 in Proposed Condition under Normal Flow Condition

Route 1 of Channels 1, 2, 3 and 4 discharge

Under normal flow condition, the runoff collected by Channels 1 to 4 will be mainly conveyed to the proposed box culvert and then to the proposed channel via the associated pipes (i.e. Pipes 1 to 4) (i.e. **the route is highlighted in Pink**) which have lower invert levels than the 900mm to 1200mm proposed interception pipeline

For Channel 5

Under normal condition, the runoff collected by Channel 5 will be conveyed to the remaining section of existing watercourse near to Wah Yuen.



Appendix N2

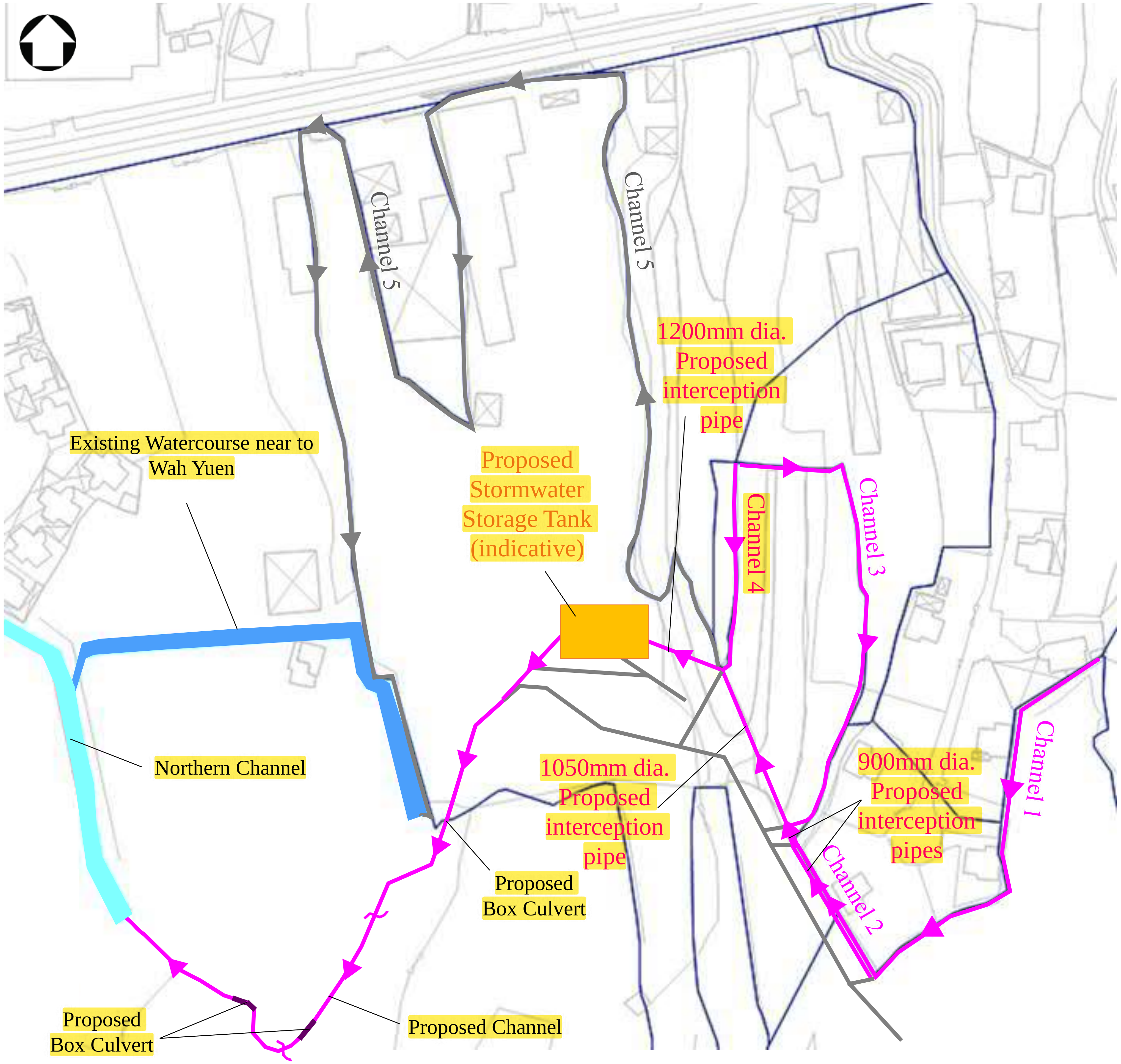
Route 2 – Collection of Runoff from Channels 1, 2, 3 and 4 in Proposed Condition under Extreme Weather Condition (1 in 10 Years Rainfall Event or above)

Route 2 of Channels 1, 2, 3 and 4 discharge

Due to the high water level at downstream northern channel under the extreme rainfall event with considering the climate change effect in the end of century (i.e. the assessed 10 years, 50 years and 200 years rainfall events) , pipes 1, 2, 3 and 4 will be submerged. In this connection, runoff collected from Channels 1, 2, 3 and 4 will be flowed to the proposed 900mm to 1200mm diameter interception pipeline with a higher invert level than Pipes 1, 2, 3 and 4, and temporarily stored in the proposed storage tank. After the peak of storm, the stored runoff will be discharged to the proposed box culvert and then to the proposed channel with two sections of crossing box culverts via internal drains (i.e. **the route is highlighted in pink**)

For Channel 5

Under extreme weather condition ,the runoff collected by Channel 5 will still be conveyed to the remaining section of existing watercourse near to Wah Yuen.



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Appendix 7

Sewerage Impact Assessment

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Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

Sewerage Impact Assessment (Revision B)

Feb 2025

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Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

Sewerage Impact Assessment (Revision B)

Feb 2025

Mott MacDonald Hong Kong Limited
registered in Hong Kong no. 236497

Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
A	Feb 2022	Jack CHEUNG	May TSE	May TSE	For Submission
B	Jun 2022	Edith CHOW	May TSE	May TSE	For Submission

Document reference: 426079 | 02 | B |

Information class: Standard

Contents

1 Introduction

1.1 Background

1.1.1 The Applicant is planning for a residential development at Shek Kong, Yuen Long (the Site). The Application Site, covers a total area of about 41,290 m^2, is abutting Kam Sheung Road to its north and sitting between Wah Yuen to its east and Lin Fa Tei to its west. It is currently zoned as “Residential (Group D) under the Approved Shek Kong Outline Zoning Plan (OZP) No. S/YL-SK/9. The location of the Site is shown in **Appendix A**. This report serves as a supportive document for the Section 12A Application.

1.2 Key Development Parameters

1.2.1 The layout of the proposed residential development is provided in **Appendix B** and the development data is given in **Table 1.1** below:-

Table 1.1: Data of the proposed residential development

Items	Details
Application Site Area	About 41,290 m^2
Proposed Plot Ratio	0.8
Proposed GFA	About 33,032 m^2
Development	Residential Development
No. of Units	850

1.3 Objectives of Report

1.3.1 This Sewerage Impact Assessment (SIA) Report focuses on the potential sewerage impacts caused by the implementation of the proposed residential development. The objective of the SIA is to identify, assess and mitigate potential adverse sewerage impacts which may arise from the development in the vicinity of the Site.

1.4 Structure of the Report

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

Section 2 – Methodology and Design Parameters for Sewerage Impact Assessment

Discuss the methodology adopted and the design parameters used in the sewerage impact assessment.

Section 3 –Estimation of Sewage Flow for the Existing Site

Estimate the sewage flow generated from the Existing Site.

Section 4 – Estimation of Sewage Flow for the Proposed Residential Development

Estimate the sewage flow generated from the proposed residential development.

Section 5 – Proposed Sewerage Disposal Arrangement

Discuss the proposed sewerage disposal arrangement for the proposed residential development.

Section 6 – Conclusion

Summarise the findings and conclusions of the Sewerage Impact Assessment.

2 Methodology and Design Parameters for Sewerage Impact Assessment

2.1 General Approach

2.1.1 This SIA is carried out to identify, assess, and propose mitigation measure to any potential adverse sewerage impacts due to the proposed residential development.

2.2 Methodology

Assessment Approach

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

- Carry out a desktop study to collect the relevant information for assessment;
- Determine the potential sewage generated from the proposed residential development; and
- Propose option(s) to mitigate the sewerage impacts.

Collected Information

2.2.2 Desktop study has been undertaken to collect the relevant information for the assessment. The relevant information collected is summarised below:-

- The layout plan for the proposed residential development as provided in **Appendix B**;
- Drainage record plans in vicinity of the development site; and
- Sewerage Impact Assessment Report attached in Rural and New Town Planning Committee (RNTPC) Paper No. 8/17 – Proposed Amendments to the Approved Kam Tin South Outline Zoning Plan No. S/YL-KTS/13.

Design Standards, Guidelines and Reference

2.2.3 The sewage flow generated from the proposed residential development is estimated based on the following standards, guidelines, and reference for the sewerage and sewage treatment design:-

- Sewerage Manual published by Drainage Services Department (DSD);
- Guidelines for Estimating Sewage Flows (GESF) for Sewerage Infrastructure (EPD);
- Commercial and Industrial Floor Space Utilization Survey (CIFSUS);
- Hong Kong Planning Standards and Guidelines (HKPSG); and

- Technical Memorandum on Effluent Standards, Water Pollution Control Ordinance Cap358 Section 21 (EPD).

2.3 Design Parameters and Assumptions

Design Population and Employee Data

Planned Population and Employee Data for the Proposed Residential Development

2.3.1 The design population of the proposed residential development is shown in **Table 2.1**.

Table 2.1: Population data for domestic waste flow for the proposed residential development

No. of Unit	Population (i)
850	2,380

Remark:-
i. It is assumed that there are 2.8 persons per unit.

2.3.2 The employee data of the proposed residential development is shown in **Table 2.2**.

Table 2.2: Estimated employee number for the development

Category	Type	GFA (m^2)	No. of Employee
J11 – Community, Social and Personal Services	Staff for clubhouse	1,487	50 (i)
J10 – Restaurants & Hotels	Staff for restaurant	180	10 (ii)

Remark:-
i. For number of staff for clubhouse, it is assumed that 3.3 staff per $100m^2$ of GFA according to Table 8 of Commercial and Industrial Floor Space Utilization Survey (CIFSUS).
ii. For number of staff for restaurant, it is assumed that 5.1 staff per $100m^2$ of GFA according to Table 8 of Commercial and Industrial Floor Space Utilization Survey (CIFSUS).

Unit Flow Factors

2.3.3 The Unit Flow Factors (UFFs) for Domestic Flow and Commercial Flow are adopted in accordance with Table T-1 and Table T-2 of the GESF. The category of the components and the UFFs adopted in the assessment are indicated in **Table 2.3**.

Table 2.3: Unit flow factors

Component	Category Use	Unit Flow Factors ($m^3/d/p$)
Domestic Flow (i)	Residential (R3)	0.37
Commercial Flow	J11 – Community, Social and Personal Services	0.28
Commercial Flow	J10 – Restaurants & Hotels	1.58

Remark:-
i. The plot ratio of the proposed residential development is 0.8. In accordance with HKPSG (Chapter 2: Residential Densities, Table 2: Maximum Domestic Plot Ratios – New Towns (excluding Tsuen Wan)), the house type between plot ratio 0.8 - 3.6 is R3.

3 Estimation of Sewage Flow for the Existing Site

3.1 Estimated Sewage Flow from the Existing Site

3.1.1 There is currently no existing public sewerage system in the vicinity of the proposed development.

3.1.2 According to information provided by the current operator of the existing site, some area of the existing site is presently occupied by open storage uses and part of the existing site is currently vacant. As informed by the operator of the open storage uses space, there are 10 workers, and the estimated sewage flow are shown in **Table 3.1**. It is said that the existing sewage flow are handled by a septic system.

Table 3.1: Estimated sewage flow under Open Storage Uses

Type of Sewage Flow	Population	Unit Flow Factors $m^3/d/p$	ADWF m^3/d
Worker (**J3 Transport, Storage & Communication**)	10	0.18	1.8
		Estimated ADWF in m^3/d	1.8
		Estimated ADWF in l/s	0.021

4 Estimation of Sewage Flow for the Proposed Residential Development

4.1 Estimated Sewage Flow from the Proposed Residential Development

4.1.1 Based on the design population of the proposed residential development and sewage unit flow factors as mentioned in **Section 2**, the estimated Average Dry Weather Flow (ADWF) for the proposed residential development including sewage flow from backwashing of swimming pool is approximately 915.52 m^3/d (10.6 l/s).

Table 4.1: Estimated sewage flow for the proposed residential development

Type of Sewage Flow		Population	UFF $m^3/d/p$	ADWF m^3/d
Domestic	R3	2,380	0.37	880.60
Commercial	J11	50	0.28	14.00
Commercial	J10	10	1.58	15.8
			Estimated ADWF in m^3/day	**910.4**
			Estimated Average Design Flow for swimming pool in m^3/d	**5.12**
			Total ADWF in m^3/day	**915.52**
			Total ADWF in l/s	**10.6**

Remark:

(i) Estimation of sewage flow from swimming pool refers to **Appendix E**.

4.1.2 Further to the SIA report attached in RNTPC Paper No. 8/17 – Proposed Amendments to the Approved Kam Tin South Outline Zoning Plan No. S/YL-KTS/13, there is proposed sewerage system provided for Kam Tin South (KTS) Development to convey the sewage flow to the existing Kam Tin Sewage Pumping Station (KTSPS) and then discharge to YLSTW ultimately. The sewerage system is expected to serve a total sewage flow of 13,900 m^3/day to the KTSPS which is approximate 81% of the design capacity of KTSPS (i.e. 17,133 m^3/day). However, as the existing KTSPS is reaching its limits for the existing developments and reserved sewage flow for planned development, a sewage treatment plant will be proposed as the sewerage disposal scheme for the proposed residential development and will be discussed in **Section 5.**

5 Proposed Sewerage Disposal Arrangement

5.1 Proposed Sewage Treatment Plant

5.1.1 As discussed in **Section 4.1.2**, the existing Kam Tin Sewage Pumping Station is already reaching its limits, therefore, an onsite sewage treatment plant (STP) (with plan area of about 800 m^2) should be adopted for the Site to treat the sewage flow of 10.6 l/s (i.e. ADWF plus backwashing flow from swimming pool) generated from the proposed development and then discharging it to the proposed drainage system for the proposed development that will eventually connected to nearby stormwater drainage system (refer to **Appendix D**). The STP will be designed to treat sewage generated from the proposed residential development, as a sewerage disposal measure until public sewer and capacity of downstream sewerage are available for discharge. The internal facilities of the STP will also be designed to cater for a peak flow of 31.8 l/s (a peaking factor of 3). Membrane Bioreactor (MBR) technology with ultra-filtration will be used for the proposed sewage treatment plant for meeting EPD's effluent discharge standard. The proposed STP should provide tertiary effluent treatment standard as shown in **Table 5.1**. The proposed sewage treatment plant for the development locates at the northeast of the Site. The location is shown in the layout plan in **Appendix B**. The sludge from the STP as a by-product from the MBR treatment process will be removed off-site by licensed sludge collection vehicles. A discharge license under WPCO will be obtained for the operation of the STP.

Table 5.1: Tertiary Effluent Standard for Proposed Sewage Treatment Plant

Parameter	Tertiary Effluent Standards (Upper Limit)
SS (mg/l)	10
Total Nitrogen (TN) (mg/l)	20
BOD (mg/l)	10
Ammonia nitrogen (NH_3N) (mg/l)	2
E. coli (count/100ml)	100
Total Phosphorous (TP) (mg/l)	2

5.1.2 Dual source electricity supply as an emergency measures of STP will be provided to prevent power failure. Standby pumps, in addition to the duty pumps will be provided as backup solution during operation when the duty pump is failure to be operated or for maintenance inspection. The pump may also be used to recycle the plant effluent to maintain the STP in a working condition when incoming flow is low. In view that the risk of these two emergency measures failure at the same time is extreme low. The emergency measures as mentioned in **Table 5.2** is considered appropriate for the proposed STP for the Site.

Table 5.2: Proposed emergency measures for sewage treatment plant

Failure	Emergency Measures
Power Failure	Dual Source Electricity Supply
Pump Failure	Duty and Standby Pumps

5.1.3 Apart from the provision of standby pump and dual power supply, an emergency storage tank with storage capacity of 230m^3 (about storage capacity for 6 hours of ADWF) will be provided to storge the overflow of raw sewage during maintenance or the plant failure. In case of necessary and emergency, provision of tanker service to tank away the excessive raw sewage by licensed collector will be arranged and mobilized. The emergency response plan will be further developed in detailed design stage.

5.2 Maintenance Responsibilities

5.2.1 The Operator of the proposed residential development will maintain the internal sewerage system including the STP and associated sewers.

5.2.2 Should public sewer be available for connection and discharge in the future, the sewerage treatment plant will be decommissioned and removed, and the sewage will be disposal to public sewer via a sewage terminal manhole at the boundary of the site.

6 Conclusion

6.1.1 The estimated ADWF for the proposed residential development approximately 915.6 m^3/d (10.60 l/s).

6.1.2 Since the existing KTSPS is reaching its limits for the existing developments and reserved sewage flow for planned development, as well as there are no existing public sewers in vicinity of the site, an onsite sewage treatment plant (plan area of about 800 m^2) will be adopted for the Site to treat the sewage flow (915.6 m^3/d) generated from the proposed development and the treated effluent will be discharged to the nearby stormwater drainage system. The proposed sewage treatment plant will adopt Membrane Bioreactor (MBR) technology with ultra-filtration to meet EPD's effluent discharge standard.

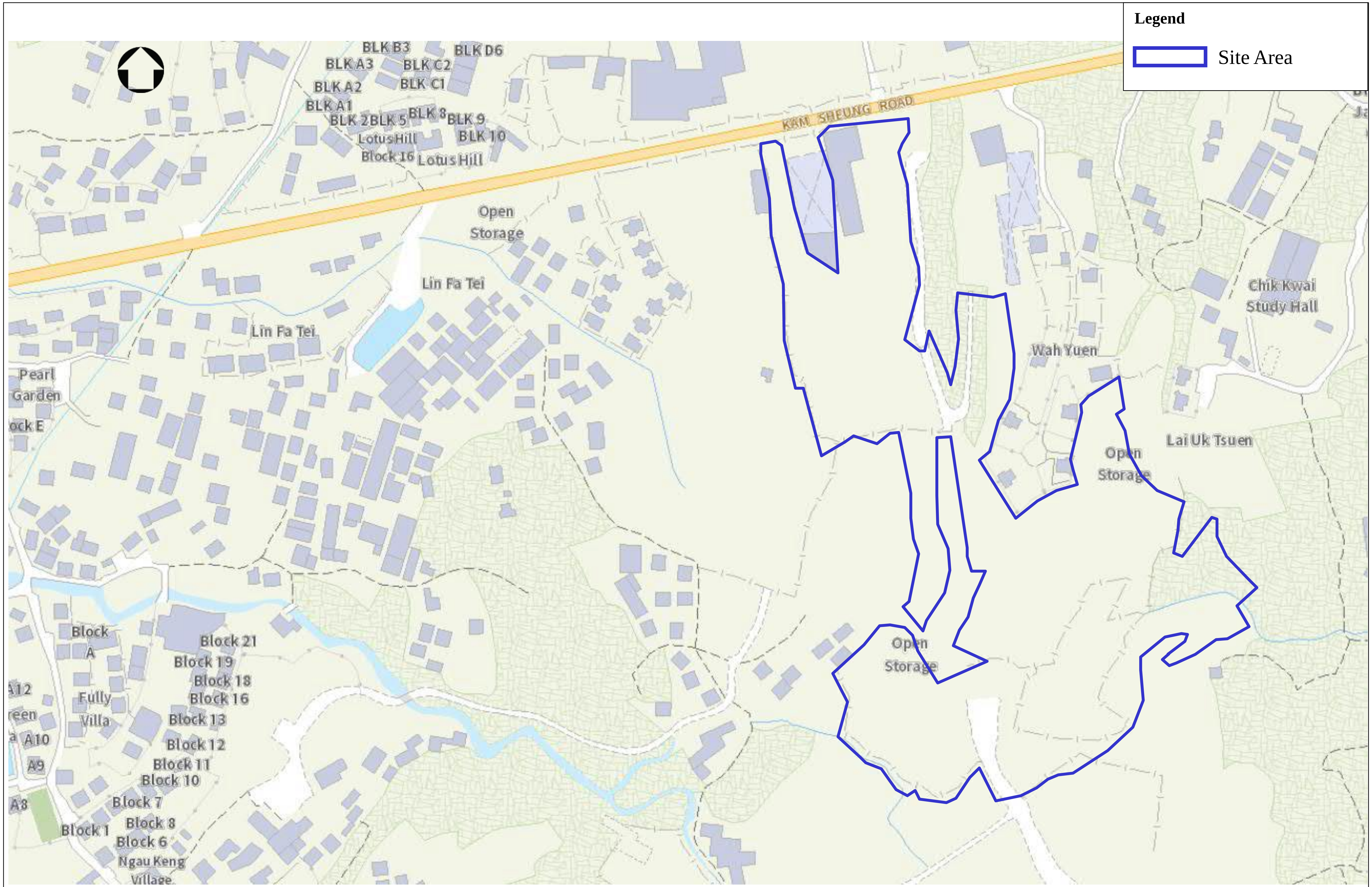
6.1.3 The Operator of the residential development will be responsible for maintaining the internal sewerage system including the STP and associated sewers.

7 Appendices

Appendix A	Location Plan of Application Site
Appendix B	Layout Plan for the Proposed Residential Development
Appendix C	Schematic Layout Plan of the Proposed Tertiary Sewerage Treatment Plant
Appendix D	Location of the Proposed Discharge Point
Appendix E	Sewage Estimation of Swimming Pool

Appendix A

Location Plan of Application Site



Project Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development At Various Lots and Adjoining Government Land, in D.D. 112 Kam Sheung Road, Shek Kong, Yuen Long, New Territories

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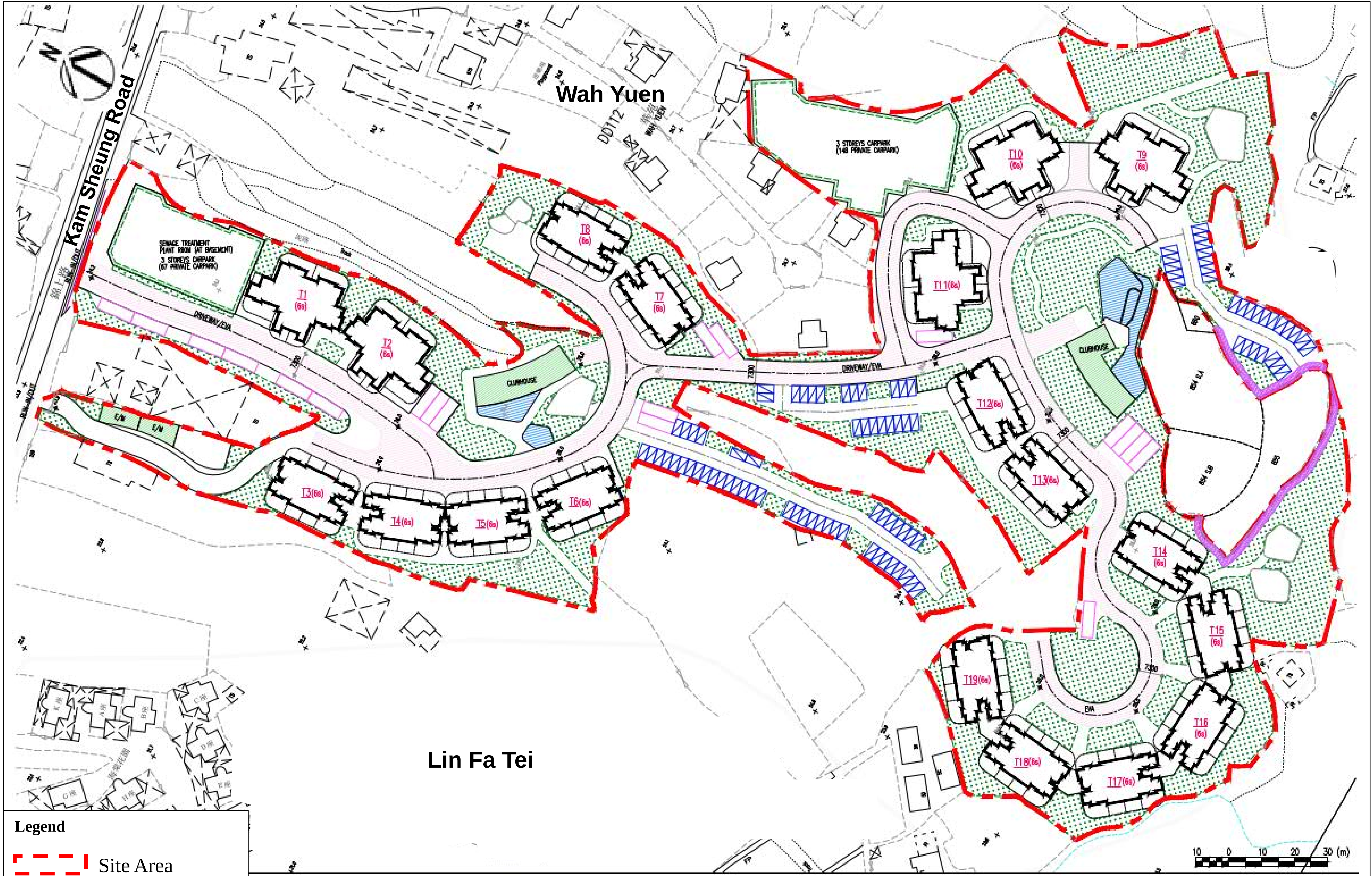
Title Location Plan of Application Site

Appendix A

Date Jun 2022 **Scale** N.T.S. **File**

Appendix B

Layout Plan for the Proposed Residential Development



Legend

🟥 Site Area

Project	**Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development At Various Lot in D.D. 112 and Adjoining Government Land, Kam Sheung Road, Shek Kong, Yuen Long, New Territories**
Title	**Layout Plan for the Proposed Development**

Date June 2022 | **Scale** N.T.S. | **File**

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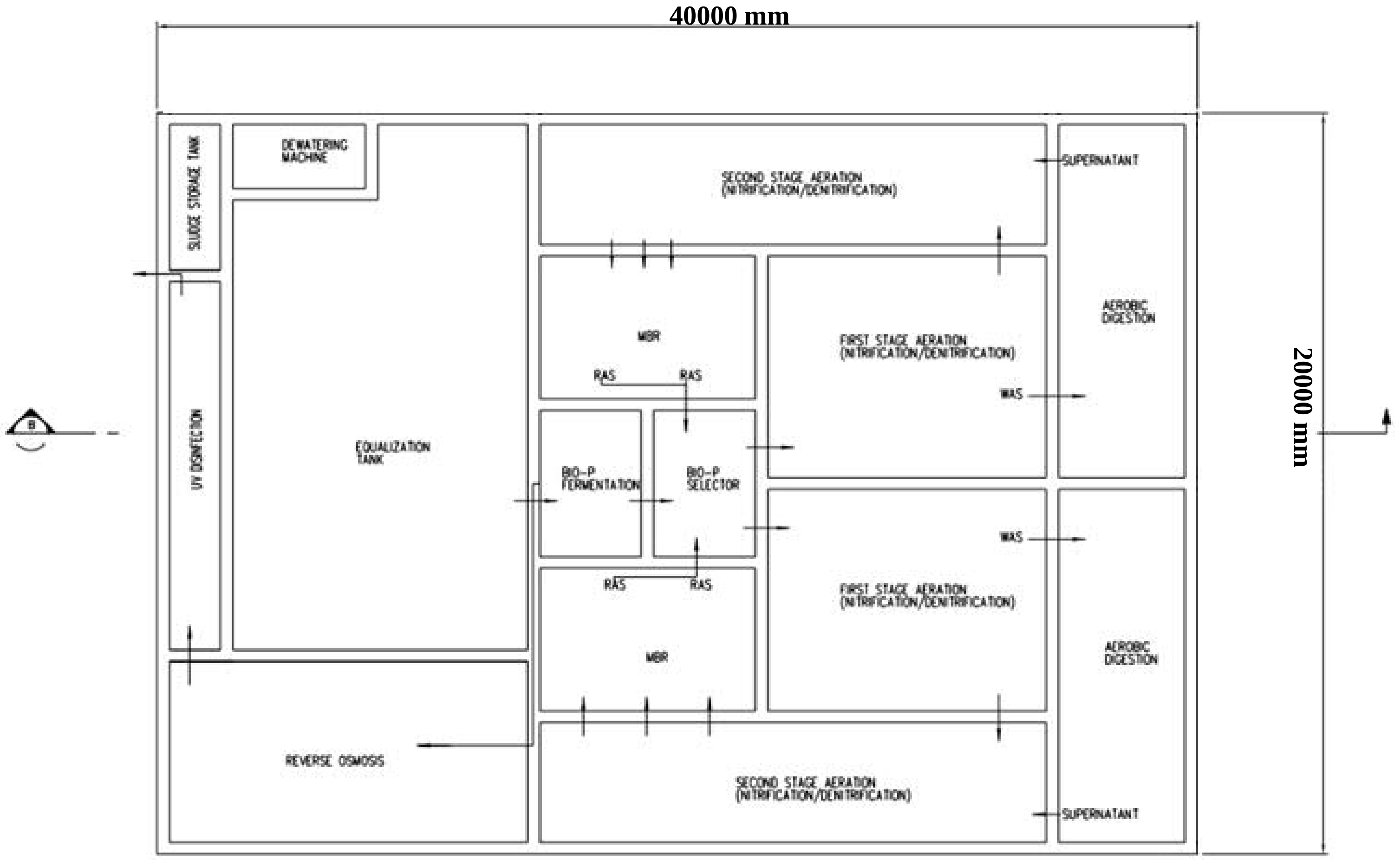
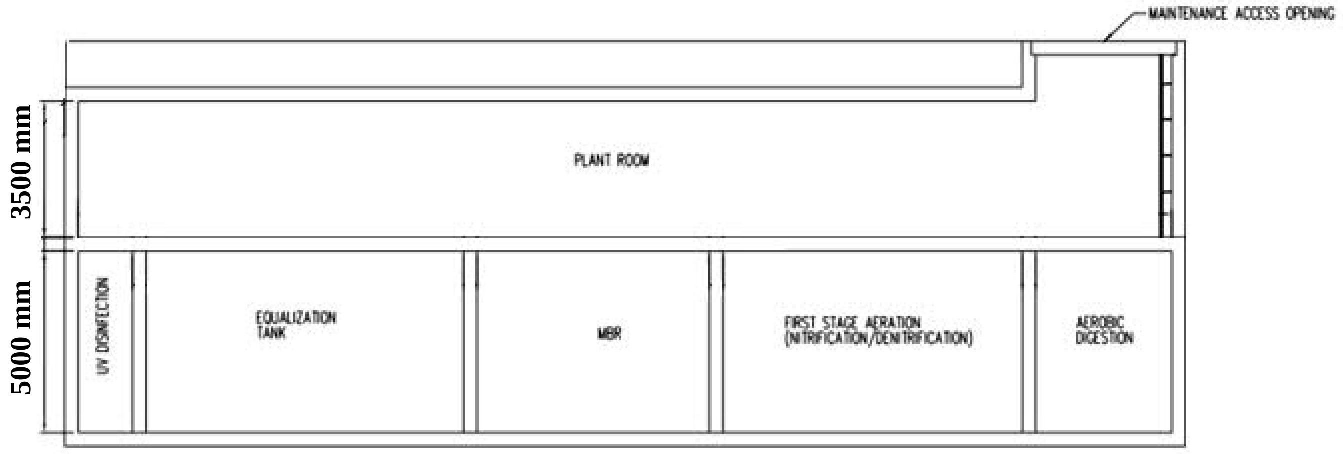
Appendix B

Appendix C

Schematic Layout Plan of the Proposed Tertiary Sewerage Treatment Plant



SEWAGE TREATMENT PLANT UNDERGROUND TANK LAYOUT



SECTION B-B

Project	**Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development At Various Lot in D.D. 112 and Adjoining Government Land, Kam Sheung Road, Shek Kong, Yuen Long, New Territories**
Title	**Schematic Layout Plan of the Proposed Tertiary Sewerage Treatment Plant**

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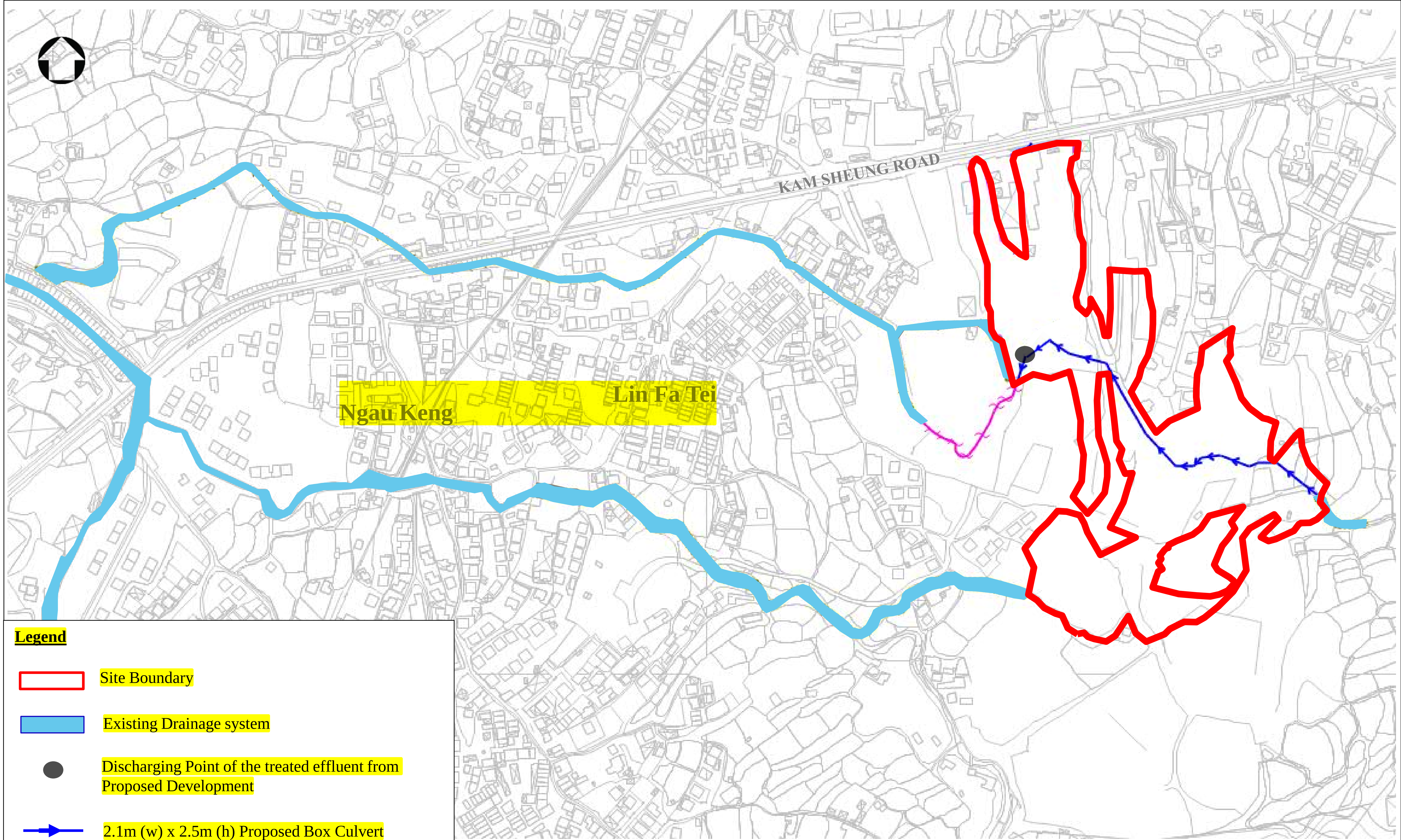
Appendix C

Date Jun 2022 | **Scale** N.T.S. | **File**

Appendix D

Location of the Proposed Discharge Point



Legend

🟥 Site Boundary

🟦 Existing Drainage system

● Discharging Point of the treated effluent from Proposed Development

→ 2.1m (w) x 2.5m (h) Proposed Box Culvert

—ʃ— 1.4-2.6m (w) x 1-1.25m (h) Proposed Channel with 1.3m floodwall

Project	**Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone For Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories**
Title	**Location of the Proposed Discharge Point**

Date June 2022 | **Scale** N.T.S. | **File**

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Appendix D

Appendix E

Sewage Estimation of Swimming Pool

Appendix E - Sewage Flow for Swimming Pool

	Swimming Pool		Reference/ Assumption
Pool Volume =	983	m^3	
Turnover Rate =	6	hrs	Chapter 132 – Swimming Pools Bylaws Subsidiary Legislation
Surface Loading Rate of Filter =	48	$m^3/m^2/hr$	Filteration Rate = 48 m3/m2/h
Filter Areas Required =	3.41	m^2	
Backwash Duration =	3	min/day	
Backwash Flow Rate =	30	$m^3/m^2/hr$	
Average Design Flow for swimming pool backwashing =	5.12	m^3/day	
	0.06	l/s	
Instant peak flow =	102.38	m^3/hr	
	28.44	l/s	

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Appendix 8

Water Supply Impact Assessment

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Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

Water Supply Impact Assessment (Revision B)

Feb 2025

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Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

Water Supply Impact Assessment (Revision B)

Mott MacDonald Hong Kong Limited
registered in Hong Kong no. 236497

Feb 2025

Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
A	Feb 2022	Jack CHEUNG	May TSE	May TSE	For Submission
B	Jun 2022	Edith CHOW	May TSE	May TSE	For Submission

Document reference: 426079 | 03 | B |

Information class: Standard

Contents

Tables

1 Introduction

1.1 Background

1.1.1 The Applicant is planning for a residential development at Shek Kong, Yuen Long (the Site). The Application Site, covers a total area of about 41,290 m^2, is abutting Kam Sheung Road to its north and sitting between Wah Yuen to its east and Lin Fa Tei to its west. It is currently zoned as "Residential (Group D) under the Approved Shek Kong Outline Zoning Plan (OZP) No. S/YL-SK/9. The location of the Site is shown in **Appendix A**. This report serves as a supportive document for the Section 12A Application.

1.2 Key Development Parameters

1.2.1 The layout of the proposed residential development is provided in **Appendix B** and the development data is given in **Table 1.1** below:-

Table 1.1: Data of the proposed residential development

Items	Details
Application Site Area	About 41,290 m^2
Proposed Plot Ratio	0.8
Proposed GFA	About 33,032 m^2
Development	Residential Development
No. of Units	850

1.3 Objectives of Report

1.3.1 This WIA 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 salt water where available.

1.4 Structure of the Report

1.4.1 This WIA 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. The estimation of future demand due to the Development will be illustrated based on the parameters.

Section 3 –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 4 – Proposed Water Supply Arrangement

Discussing the potential water supply system for the Development.

Section 5 – Conclusion

Summarising the findings and concluding the water supply impact arising from the Development.

2 Methodology and Design Parameters for Water Supply Impact Assessment

2.1 General Approach

2.1.1 This WSIA is carried out to estimate the water demand required for the proposed Development and identify the water supply connection point for the Development.

2.2 Methodology

Assessment Approach

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

- Estimating the water demand of the Development;
- Identifying the existing and planned water supply systems within the Study Area;
- Identify the water supply arrangement for the Development.

2.2.2 The unit demands used in estimating the fresh water and flushing water consumption for the Development are presented in **Table 2.1**. The unit demands are based on unit water demand in Departmental Instruction (WSD DI) 1309 issued by Water Supply Department. The following design parameters are adopted for the design for the proposed water supply system:

Table 2.1: Unit demand for the development

Development Type	Unit	Fresh Water Demand	Flushing Water Demand
Residential Use (R3)	m^3/h/d	0.39	0.07
Service Trade (Residential)	m^3/h/d	0.04	-
Remarks:- i. The plot ratio of the Proposed Residential Development is 0.8. In accordance with HKPSG (Chapter 2: Residential Densities, Table 2: Maximum Domestic Plot Ratios – New Towns (excluding Tsuen Wan)), the house type within plot ratio 0.8 is R3.			

2.3 Design Parameter

Peaking Factor

2.3.1 In accordance with the WSD’s DI 1309, the following design parameters and peak demand factors are adopted for the design of proposed water supply system:

2.3.2 The minimum capacity of the distribution system should be sufficient for the following peak demands.

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

2.4 Planned Population and Employee Data of the Proposed Residential Development

2.4.1 The design population of the proposed residential development is shown in **Table 2.2** below. The layout plan of the Proposed Residential Development could be referred to **Appendix B**.

Table 2.2: Population data of the proposed residential development

Type	Unit	Household Size	Population (nos.)
Residential Use (R3)	850	2.8[(i)]	2,380
Residential (Service Trade)	-	-	2,380

Remark:-
i. It is assumed that there are 2.8 persons per unit.

2.5 Existing Water Supply System

2.5.1 According to the WSD's watermain record, salt watermain is not available in the Kam Tin area.

2.5.2 Portable water of the Proposed Residential Development as well as the surrounding area are currently falls within the direct supply zone of Au Tau / Ngau Tam Mei Fresh Water Primary Service Reservoirs (AT/NTM FWPSRs). The Proposed Residential Development will later fall within the supply zone of Au Tau Fresh Water Service Reservoirs (AT FWSRs) subject to the operation of shifting supply zone carried out by NTW Region. Au Tau Fresh Water Primary Service Reservoir currently has a capacity of 330 million litres per day (MLD).

2.5.3 Series of distribution mains ranging from DN1400 to DN450 convey the fresh water supply to the area. Existing water supply system is shown in **Appendix C**.

3 Estimation of Water Demand of the Proposed Residential Development

3.1 Estimated Water Demand from the Proposed Residential Development

3.1.1 Based on the Development option and the unit water demand listed in **Table 2.1** and the estimated population presented in **Table 2.2**, the total mean daily fresh water and flushing water demand for the Development is estimated to be about 1,300 m^3/day. The details of the water demand estimation are shown in **Table 3.1**.

Table 3.1: Summary table of water demand estimation

Development Type	Population (nos.)	Unit	Fresh Water Demand	Flushing Water Demand	Total Mean Fresh Water Demand (m^3/d)	Total Mean Flushing Water Demand (m^3/d)
Residential Use (R3)	2,380	m^3/h/d	0.39	0.07	928.20	166.60
Service Trade (Residential)	2,380	m^3/h/d	0.04	-	95.20	-
Landscape Gardens	-	-	-	-	99.10	-
				Sub-Total =	1,122.5	166.6
				Sub-Total =	1289.10 (say 1,300)	

Remark:-

i. Water demand for irrigation normally ranges from 6 to 10L/m^2/day, as such an average irrigation water demand of 8L/m^2/day is adopted. The landscape area of the Development is assumed to be 30% of the total development site, i.e 41,290 m^2 x 30% = 12,387 m^2

4 Proposed Water Supply Arrangment

4.1 Water Demand and Water Supply Arrangement

4.1.1 As discussed in Section 3, the estimated fresh and flushing water demands for the proposed Residential Development are approximately 1,300 m^3/d in total. For supplying water to the Development under this planning application, it is proposed to branch off an DN150 fresh water main from the existing DN450 fresh water main at Kam Sheung Road. The proposed watermains are shown in **Appendix D**.

5 Conclusion

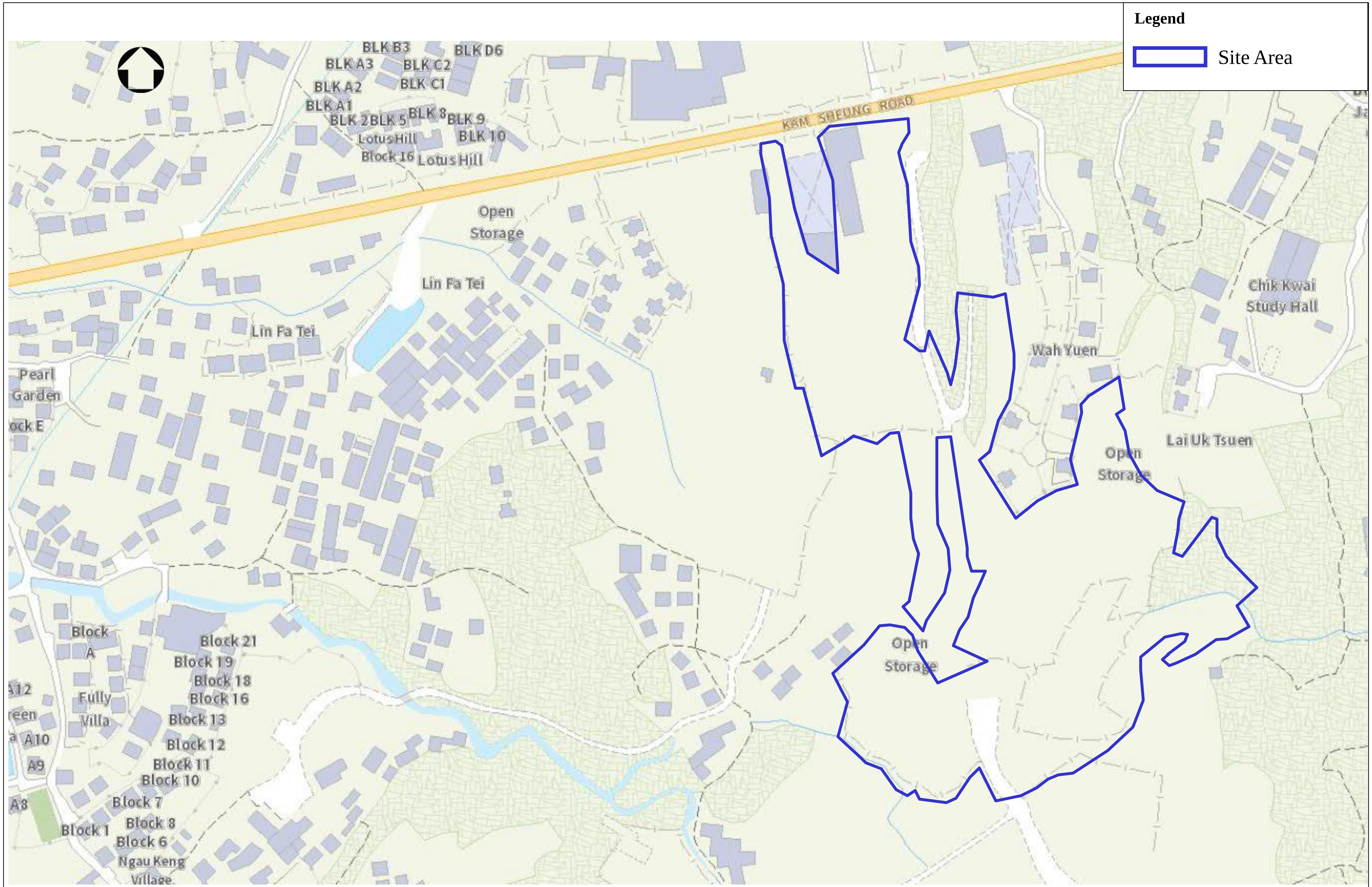
5.1.1 Based on the unit water demand and the estimated population, the total fresh and flushing water demand required for the Proposed Residential Development are approximately 1,300 m^3/d. For supplying water to the Development under this planning application, it is proposed to branch off an DN150 fresh water main from the existing DN450 fresh water main at Kam Sheung Road.

6 Appendices

Appendix A	Location Plan
Appendix B	Layout Plan
Appendix C	Existing Water Main Layout Plan
Appendix D	Proposed Water Main Layout Plan

Appendix A

Location Plan of Application Site



Project S12A Rezoning Application for the Proposed Residential Development at Various Lot in D.D. 112, Lin Fa Tei, Kam Tin, Yuen Long, N.T.

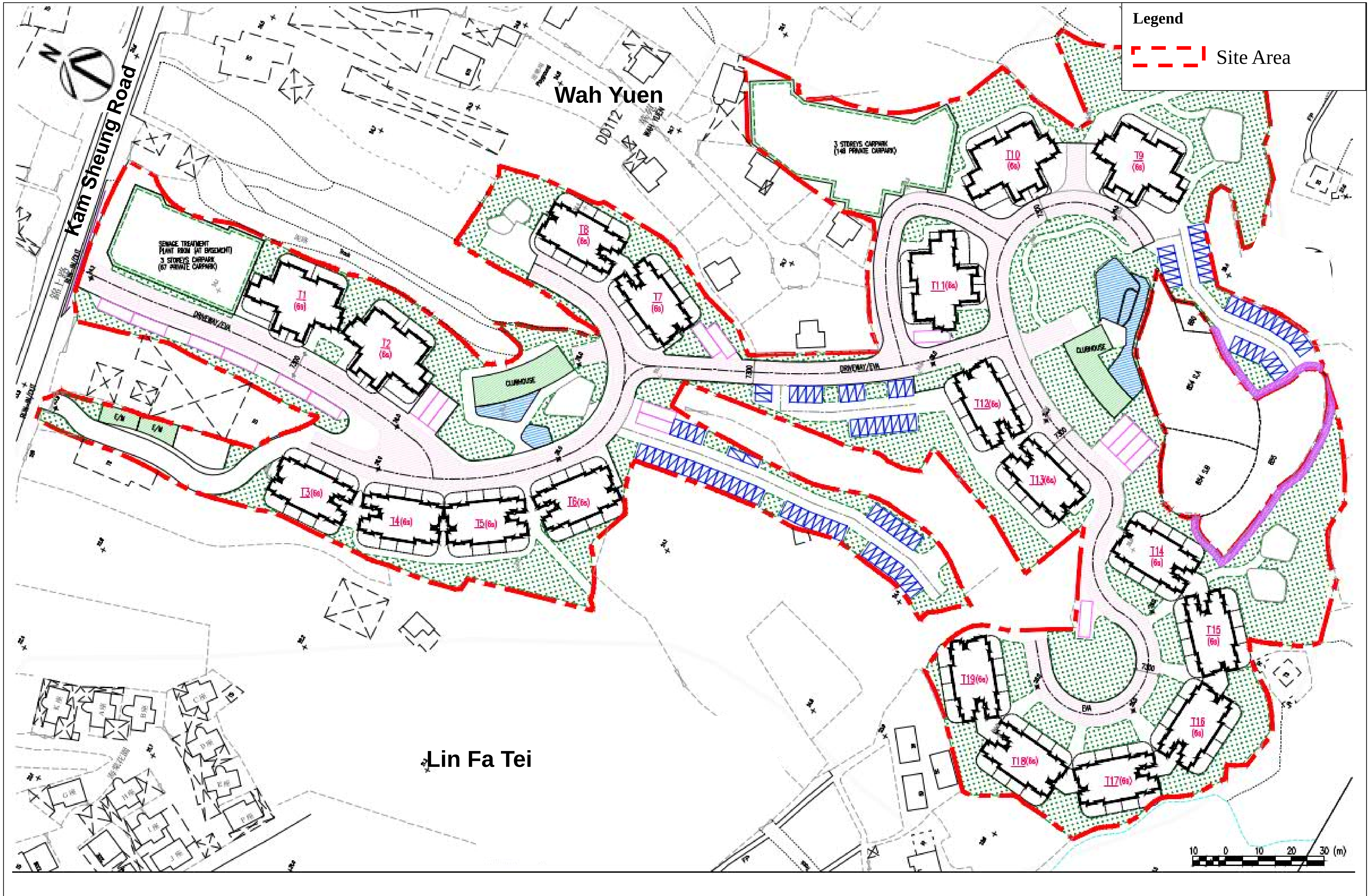
Title Location Plan of Application Site

Date Jun 2022 **Scale** N.T.S. **File**

Appendix A

Appendix B

Layout Plan for the Proposed Residential Development



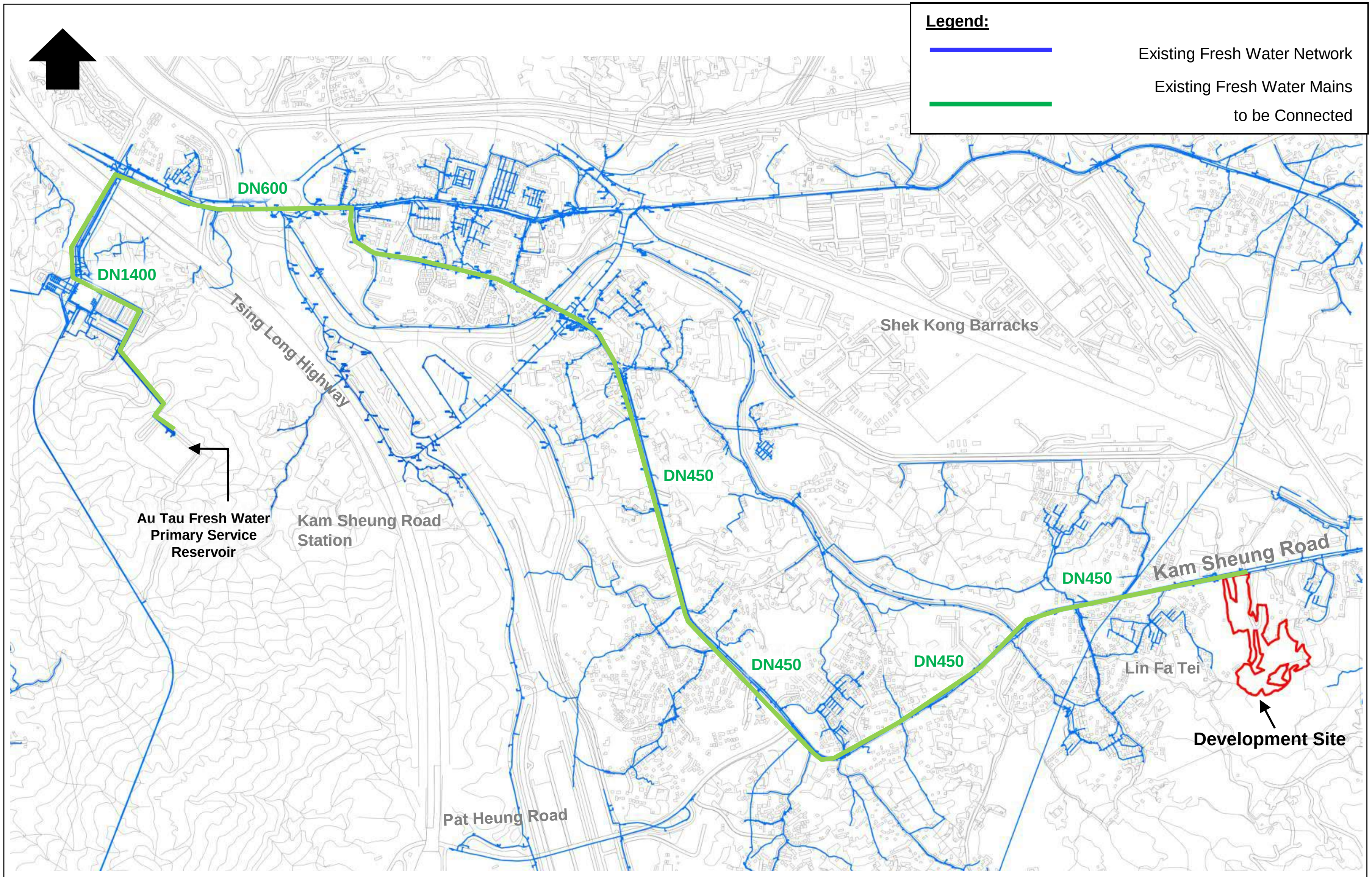
Project	**S12A Rezoning Application for the Proposed Residential Development at Various Lot in D.D. 112, Lin Fa Tei, Kam Tin, Yuen Long, N.T.**
Title	**Layout Plan for the Proposed Development**

Date Feb 2022 | **Scale** N.T.S. | **File**

Appendix B

Appendix C

Existing Watermain Layout Plan



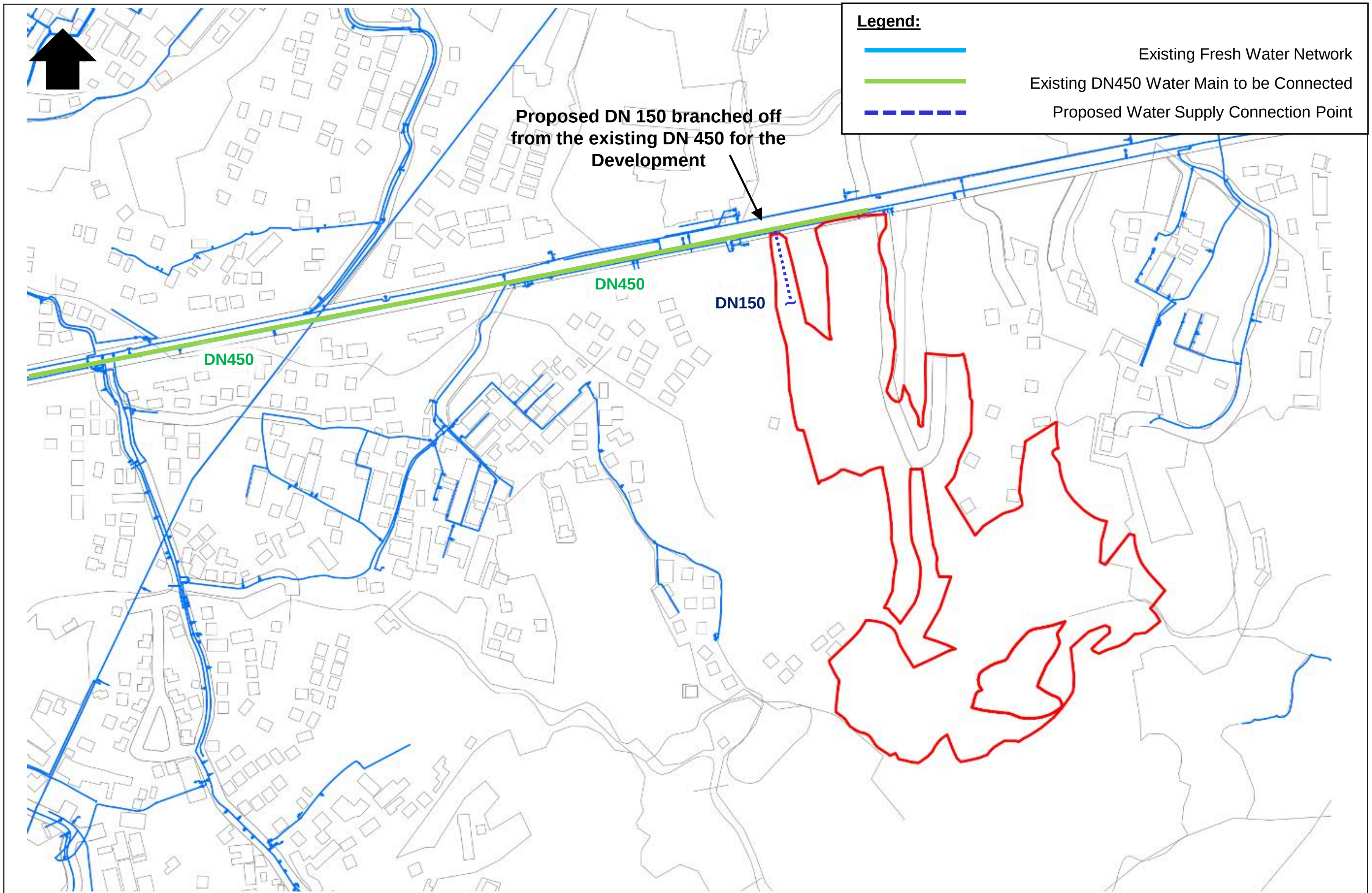
Project	Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development At Various Lot in D.D. 112 and Adjoining Government Land, Kam Sheung Road, Shek Kong, Yuen Long, New Territories
Title	Existing Water Main Layout Plan

Date Jun 2022 | Scale N.T.S. | File

Appendix C

Appendix D

Proposed Watermain Layout Plan



Project Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development At Various Lot in D.D. 112 and Adjoining Government Land, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

Title Proposed Water Main Layout Plan

Date Jun 2022 **Scale** N.T.S. **File**

Appendix D

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Appendix 9

Ecological Impact Assessment

Prepared for

Tenox Development Ltd.

Prepared by

China Hong Kong Ecology Consultants Limited

REZONING FROM “RESIDENTIAL (GROUP D)” TO RESIDENTIAL (GROUP C)” ZONE FOR PROPOSED RESIDENTIAL DEVELOPMENT AT VARIOUS LOTS IN D.D. 112 AND ADJOINING GOVERNMENT LAND, KAM SHEUNG ROAD, SHEK KONG, YUEN LONG, NEW TERRITORIES

ECOLOGICAL IMPACT ASSESSMENT

File: CHKEC2158-220626 CS LHD Eco IA R

REZONING FROM "RESIDENTIAL (GROUP D)" TO RESIDENTIAL (GROUP C)" ZONE FOR PROPOSED RESIDENTIAL DEVELOPMENT AT VARIOUS LOTS IN D.D. 112 AND ADJOINING GOVERNMENT LAND, KAM SHEUNG ROAD, SHEK KONG, YUEN LONG, NEW TERRITORIES

Date	**June 2022**
Prepared by	**Dr. Mark Shea**
Signed	

Project Reference	**CHKEC2158**
Document No.	**2158-2206 –CK LHD eco IA Report**

China Hong Kong Ecology Consultants Limited

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1. INTRODUCTION

1.1 Background

1.1.1 This ecological impact assessment presents the findings of the ecological baseline survey and evaluates the ecological value of the Rezoning Site at various Lots in D.D.112 and adjoining government land, Kam Sheung Road, Shek Kong, Yuen Long, New Territories ("The Rezoning Site") in support of the S12A Planning Application for proposed rezoning from Residential (Group D)" to "Residential (Group C)" zone.

1.1.2 The location of the Re-zoning Site is shown in the location Map **Figure 1**.

1.2 Description of the Site

1.2.1 The Rezoning Site, with a site area of approximate 41,290 square metres. The Re-zoning Site is a flat piece of land, which is located to the south of Shek Kong Airfield and Shek Kong Stabling Sidings. The Site is also situated about 3.5km southeast of Kam Sheung Road Station and about 2.4km east of the MTR Pat Heung Maintenance Centre. The Site is bounded by Kam Sheung Road to the north. The Rezoning Site currently falls within area zoned "Residential (Group D)" ("R(D)") on the Approved Shek Kong Outline Zoning Plan (OZP) No. S/YL-SK/9.

1.2.2 The surrounding context is in general in rural setting with low-rise village settlements, open storage sites and scattered active farmland. The areas to the East and West of the Site are mainly surrounded by different villages' zoned "Village Type Development" ("V"). The area zoned "Agriculture" with temporary structures is situated to the North of Site across Kam Sheung Road. The area to the immediate south is mainly zoned "Agriculture", which is in general abandoned farmland.

1.3 Proposed Development

1.3.1 The proposed development consists of 19 nos. of residential blocks with 6 storeys. It also comprises of two stand-alone 1-storey clubhouses and two stand-alone 3-stroey carports. The proposed development seeks to develop and upgrade the present environment and condition of the Site through the implementation of high-quality low-rise residential development with generous landscape and amenity provisions for an improved living environment for the future residents as well as visual amenity to neighbourhoods.

1.3.2 The indicative master layout plan updated in June 2022 is presented in Figure 2.

2. LITERATURE REVEW

2.1 Relevant Legislation, Standards and Guidelines

2.1.1 Guidelines, standards, documents and HKSAR Government ordinances and regulations listed in the following sections were referred to during the course of the ecological baseline survey:

- Forests and Countryside Ordinance (Cap. 96) and its subsidiary legislation the Forestry Regulations;
- Wild Animals Protection Ordinance (Cap. 170);
- Town Planning Ordinance (Cap. 131);
- Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586);
- Hong Kong Planning Standards and Guidelines (HKPSG), Chapter 10 'Conservation';
- Environmental Impact Assessment Ordinance (EIAO) (Cap. 499), the associated Technical Memorandum (EIAO-TM) (Annex 8 and Annex 16) and Guidance Notes;
- Site of Special Scientific Interest (SSSI) Register;
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES);
- United Nations Convention on Biodiversity (1992); and
- IUCN Red Data Books

The Forest and Countryside Ordinance

2.1.2 The Forests and Countryside Ordinance (Cap. 96) prohibits felling, cutting, burning or destroying of trees and growing plants in forests and plantations on Government land. Related subsidiary Regulations prohibit the selling or possession of listed restricted and protected plant species. The list of protected species in Hong Kong that come under the Forestry Regulations was last amended on 11 June 1993 under the Forestry (Amendment) Regulation 1993 made under Section 3 of the Forests and Countryside Ordinance Construction phase air quality impact.

Wild Animals Protection Ordinance

2.1.3 Under the Wild Animals Protection Ordinance (Cap. 170), designated wild animals are protected from being hunted, whilst their nests and eggs are protected from injury, destruction and removal. All birds and most mammals, including marine cetaceans, are protected under this Ordinance. The Second Schedule of the Ordinance, which lists all the animals protected, was last revised in June 1992.

Town Planning Ordinance (TPO)

2.1.4 According to the Town Planning Ordinance (TPO) (Cap. 131), the Town Planning Board shall undertake the preparation and amendments to statutory plans. The statutory plans may show of making provision for, among others, country parks, coastal protection areas, Sites of Special Scientific Interest, green belts or other specified uses that promote conservation or protection of the environment.

Protection of Endangered Species of Animals and Plants Ordinance

2.1.5 The Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586) give effect to CITES in Hong Kong. The Ordinance requires a license to be issued in advance by the Agriculture, Fisheries and Conservation Department (AFCD) for the import, introduction from the sea, export, re-export, and possession of specimens of scheduled species.

Hong Kong Planning Standard and Guideline

2.1.6 Chapter 10 of the HKPSG covers planning considerations relevant to conservation. This section details the principles of conservation, the conservation of natural landscape and habitats, historic buildings, archaeological sites and other antiquities. It also describes enforcement issues. The appendices list the legislation and administrative controls for conservation, other conservation-related measures in Hong Kong and government departments involved in conservation.

Environmental Impact Assessment Ordinance (EIAO)

2.1.7 Annex 16 of the EIAO-TM sets out the general approach and methodology for assessment of ecological impacts arising from a project or proposal, to allow a complete and objective identification, prediction and evaluation of the potential ecological impacts. Annex 8 recommends the criteria that can be used for evaluating habitat and ecological impact.

EIAO Guidance Note No. 6/2010

2.1.8 EIAO Guidance Note No. 6/2010 clarifies the requirements of ecological assessments under the EIAO.

EIAO Guidance Note No. 7/2010

2.1.9 EIAO Guidance Note No. 7/2010 provides general guidelines for conducting ecological baseline surveys in order to fulfill requirements stipulated in the EIAO-TM.

EIAO Guidance Note No. 10/2010

2.1.10 EIAO Guidance Note No. 10/2010 provides general guidelines for conducting terrestrial and freshwater ecological baseline surveys in order to fulfill requirements stipulated in the EIAO-TM.

Sites of Special Scientific Interest (SSSI) Register

2.1.11 SSSIs are designated according to a site's special faunal, floral, ecological or geographical features. SSSIs are designated for protection under the TPO. These are less well protected than country parks and are not actively managed. A register of sites is held by Planning Department.

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITIES)

2.1.12 CITES is an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival.

United Nations Convention on Biological Diversity

2.1.13 The Peoples' Republic of China (PRC) is a Contracting Party to the United Nations Convention on Biological Diversity of 1992. The Convention requires signatories to make active efforts to protect and manage their biodiversity resources. The Government of the Hong Kong Special Administrative Region has stated that it will be "committed to meeting the environmental objectives" of the Convention.

World Conservation Union (IUCN)

2.1.14 The World Conservation Union (IUCN) Data Books (and Red List) is an inventory of the global conservation status of plants and animals. It uses a set of criteria to evaluate the extinction risk of species. These criteria are relevant to all species and regions of the world.

2.1.15 In 1988 the PRC ratified the Wild Animal Protection Law of the PRC, which lays down basic principles for protecting wild animals. The Law prohibits killing of protecting animals, controls hunting, and protects the habitats of wild animals, both protected and non-protected. The Law also provides for the creation of lists of animals protected at the state level, under Class I and Class II. There are 96 animal species in Class I and 156 in Class II. Class I provides a higher level of protection for animals considered to be more threatened.

2.2 Literature Review

2.2.1 The literature review is undertaken to identify existing information on the habitats and species present within and in adjacent to the Rezoning Site.

2.2.2 The other relevant literature reviewed included:

- Hong Kong Biodiversity (AFCD Newsletter) (AFCD, 2002-2015);
- Check List of Hong Kong Plants (AFCD, 2004);
- A Field Guide to the Terrestrial Mammals of Hong Kong (Shek, 2006);
- A Field Guide to the Amphibians of Hong Kong (Chan et al, 2005);
- A Field Guide to the Venomous Land Snakes of Hong Kong (Chan et al, 2006);
- The Avifauna of Hong Kong (Carey et al, 2001); and
- Register of Site of Special Scientific Interest (SSSI) (Planning Department).

2.2.3 The existing literature provides a good baseline for species assessments of vascular plants (Siu, 2000; Wu and Lee, 2000; Xing et al., 2000) and Hong Kong Herbarium (2020) presents an updated list of the Hong Kong flora.

2.2.4 Standard references for the species groups which were the subject of the present study include Shek (2006) for mammals; Karsen et al. (1998) and Lau and Dudgeon (1999) for *herpetofauna*; Lee et al. (2004) for freshwater fishes; Wilson (2003) for odonata; Young and Yiu (2002), Lo (2005) for butterflies.

2.2.5 Evaluation on the conservation status of the flora and flora were made in accordance with the local ordinances including Wild Animals Protection Ordinance (Cap. 170), Protection of Endangered Species of Animals and Plants Ordinance (Cap.586) and Forest and Countryside Ordinance (Cap.96). References are also made to the IUCN Red List of Threatened Species (2020), CITES, China Red Data Book of Endangered Animals, China Plant Red Data Book and China Species Red List.

2.2.6 An attempt to provide information on the conservation status of certain local fauna has been made by Fellowes et al. (2002). This paper is designed to objectively facilitate ecological evaluations based on faunal species of conservation interest and can assist in assessments conducted in accordance with the Technical Memorandum (TM) of the Environmental Impact Assessment Ordinance (EIAO-TM). The paper examines the local (Hong Kong), regional (southern China) and global restrictedness of native fauna species occurring in a wild state in Hong Kong, combined with an assessment of the vulnerability of populations, using the most reliable and up to date information available, and assigns a rating to each species accordingly. Thus, a species of 'Local Concern' may not be particularly threatened globally or regionally, but is rare or restricted in Hong Kong. A species of 'Regional Concern' may not be particularly threatened globally, but is rare or restricted in the region, while a species of 'Global Concern' is globally restricted to Hong Kong and southern China. Some species are regarded as being of 'Potential Regional Concern' or 'Potential Global Concern'. The paper was adopted in the present study in order to complement the species evaluations derived from other the published literature.

2.2.7 For the conservation status of plants and fauna species (including birds, mammals, herpetofauna, butterflies, odonata and aquatic fauna), Their protection status follows the threatened species listed in IUCN (2020), AFCD (2020), China Red Data Book and local ordinance.

2.3 Relevant Findings of Literature Review

2.3.1 The EIA Report by Atkins (2021) for 'Drainage Improvement Works Near Four Villages in Yuen Long - Sung Shan New Village, Tai Wo, Lin Fa Tei and Ha Che (EIA-074/2002), 2021' is found relevant to current study. This EIA report included an Ecological Baseline Survey report by AEC (2015) as Appendix 5-1, in which part of the survey areas for Lin Fa Tei village included current Rezoning Site. Three types of habitats were identified in the current Rezoning Site near Lin Fa Tei village, which included urban/residential area, waste ground and plantation.

2.3.2 A freshwater crab species *Cryptopotamon anacoluthon* of conservation concern was recorded in the above mentioned report. The species was listed as Potential Global Concern by Fellowes et al. (2002) and is considered to be Vulnerable and Endangered respectively by IUCN (2015). The location of the recorded crab species was outside the current Rezoning Site.

2.3.3 AEC (2015) also discussed conservation area in adjacent to Lin Fa Tei. An area at the southeast of the Study Area is zoned as "conservation area" ("CA"). Under the approved Shek Kong OZP No. S/YL-SK/9, the planning intention of this zoning is to protect and retain the existing natural landscape, ecological or topographical features of the area for conservation, educational and research purposes and to separate sensitive natural environment such as Country Park from the adverse effects of development. There is a presumption against development in this zoning in general. Only development, such as, essential infrastructure with overriding public interest or those that are required to support the conservation of the existing natural landscape or scenic quality may be permitted. The CA is located at approximately 300m away from the Rezoning Site boundary.

2.3.4 Tai Lam Country Park is the second largest country park in Hong Kong, which is on southern side of Lin Fa Tei. The Country Park is more than 500m away from the current Rezoning Site.

2.3.5 Other conservation concerned areas including two recognized Egretries in Kam Tin areas, i.e., Ho Pui Egretry, Ma On Kong Egretry and a few fung shui woods in Kam Tin area are all more than 500m away from the current Rezoning Site. There is no SSSI site within 500m from the current Rezoning Site.

3. FIELD SURVEY METHODOLOGY

3.1 Survey Programme

3.1.1 The ecological surveys were carried out in both dry season and wet season within the Rezoning Site and the areas within approximately 100m from the Rezoning Site. The survey components and survey dates are presented in **Table 3.1** below:

Table 3.1 Summary of Baseline Survey Schedule

Component	Dry Season	Wet Season
Vegetation and Habitat	17 Nov 2021 25 Jan 2022 14 Feb 2022	17 May 2022 13 Jun 2022
Wildlife Survey		
Terrestrial Mammal	17 Nov 2021 25 Jan 2022 14 Feb 2022	17 May 2022 13 Jun 2022
Herpetofauna	14 Feb 2022	17 May 2022 (Day & night time survey)
Avifauna	17 Nov 2021 25 Jan 2022 14 Feb 2022	17 May 2022 (Day & night time survey) 13 Jun 2022
Insects	14 Feb 2022	17 May 2022 13 Jun 2022
Aquatic fauna	14 Feb 2022	17 May 2022 13 Jun 2022

3.2 Habitats and Vegetation

3.2.1 Habitat survey to characterise the habitats within the Rezoning Site and surrounding area has been conducted for this Assignment. A habitat map has been prepared based on desktop study review and on-site checking during field surveys. Representative areas of each habitat type and the proposed Rezoning Site were surveyed on-site.

3.2.2 Vegetation survey was conducted to characterise vegetation types within the Rezoning Site with a particular focus on the area within the proposed works boundaries and those in proximity to the proposed works areas. Survey was conducted systematically within the Rezoning Site. The dominant and notable plant species, their status in Hong Kong and relative abundance have been identified and recorded. Nomenclature and conservation status of plant species followed Xing et al., (2000), Wu & Lee, (2000) and Siu, (2000).

3.2.3 During the vegetation surveys, the location of rare or protected plant species if found will be noted. Floral characteristics including species list and relative abundance was also recorded. During the course of this study, habitat / vegetation surveys are summarised in **Table 3.1**.

3.3 Herpetofauna (Reptiles and Amphibians)

3.3.1 Herpetofauna (reptiles and amphibians) surveys were conducted in habitats systematically on site and potential hiding places noted through direct observation, active searching, and auditory detection (for frogs). All herpetofauna species were recorded. Nomenclature and status of herpetofauna followed Hong Kong Biodiversity Database (AFCD, 2020) and Chan et al., (2006).

3.3.2 During the course of this study, a night time survey on herpetofauna was undertaken and the survey date is given in **Table 3.1**.

3.4 Avifauna

3.4.1 Avifauna surveys were conducted in survey area for dry season and wet season during the proposed survey period. In general, avifauna survey was taken in the morning or late afternoon when birds are generally active. Besides numerical abundance and species identity, notable behaviour such as feeding, nesting and breeding was also recorded. Binoculars and digital camera was the main instrument used. A night time survey on nocturnal birds was performed on the 17 May 2022. Nomenclature and protection status of the species followed those documented in the AFCD website (www.hkbiodiversity.net) and Carey et al. (2001).

3.5 Insects (Odonata and Butterflies)

3.5.1 The focus of the insect surveys was on dragonfly, damselfly and butterfly groups and was conducted within the Rezoning Site systematically. These insect groups are generally known to be indicators of high-quality habitats as the dragonflies and damselflies require clean freshwater for the successful completion of the larval stages of their lifecycle. Special attention was given to habitats frequented by dragonflies such as streams and riparian. Within these broad habitats, various micro-habitats (riffles, pools, small cut-off ponds, mossy banks, seepages, and overhanging vegetation) support different dragonfly species and all these micro-habitats were investigated. Dragonflies were identified with the aid of binoculars.

3.5.2 Butterfly surveys were conducted in tandem with the dragonfly survey, using a similar methodology. Although most butterflies are readily observed, some species are cryptic and stay close to the ground in shady wooded areas. Others tend to stay on top of the canopy, making only short rapid flights before settling out of view. Accordingly, microhabitats were investigated, by ground searching.

3.5.3 During this study, the surveys were undertaken and the survey dates are summarised in **Table 3.1**.

3.6 Terrestrial Mammals

3.6.1 Mammal surveys were conducted by active searching for all sightings, tracks, and signs systematically in all representative habitats for day and night time. Nomenclature for mammals follows Shek, (2006) and AFCD biodiversity database (AFCD 2020).

3.7 Freshwater Fauna

3.7.1 Survey of aquatic fauna was conducted mainly by hand netting, kick sampling, bank-side observations along the water ditches, sometimes with the aid of binoculars. Live trapping was also performed at one location where the water depth allow submerge the fish trap. Species encountered were identified in situ to the lowest possible taxon and a list of species with abundance has been prepared. Aquatic fauna including invertebrates and fish were recorded and identified.

4. BASELINE ECOLOGICAL CONDITIONS

Habitats and Vegetation

4.1.1 There are three major habitats identified within the Re-zoning Site including **waste ground, water course** and **urban/village** area. The distribution of these three types of habitats is indicated in habitat map **Figure 3**, which is based on aerial photo, desktop study review and field surveys. Representative photographic records of the habitat types are given in **Appendix 1**.

4.1.2 A list of recorded plant species, together with observation of relative abundance, is presented in **Table 4.1** of **Appendix 2**. The conservation status of each plant species recorded was derived primarily from the comprehensive studies by Xing et al. (2000) and the Hong Kong Herbarium (2020).

4.1.3 89 vegetation species were recorded during the survey (**Table 4.1 in Appendix 2**), of which about 70 was recorded within Rezoning Site. Regarding to wild flora, no species of conservation importance or with protection status under protection of Forests and Countryside Ordinance (Cap 96), was recorded.

Waste Ground

4.1.4 The **waste ground** covered approximately 70% of the Rezoning Site. This type of habitat is originated from abandoned farmlands in the land use history. Some areas were used as open storages before (**Photos 1 to 3 in Appendix 1**). Grasses, herbs, shrubs, and some trees gradually covered the waste ground.

4.1.5 Some of the trees in the waste ground were self- seeded or grown naturally and some of them were introduced plants. Common self-seeded trees included *Ficus microcarpus, Ficus hispida*, *Leucaena leucocephala, Macaranga tanarius* and *Ligustrum sinense* and common introduced trees include *Bombax ceiba*, *Ficus genjamina, Ficus rumphii*, fruit tree such as *Psidium guajava, Dimocarpus longan,* and ornamental plants such as *Roystonea regia.* Species list with indicative relative abundance were shown in **Table 4.1 of Appendix 2**.

4.1.6 The **waste ground** showed apparent seasonal flora phenological feature, i.e., with large bare ground in dry season and was flourished with plants cover in wet season (**Photo 3**). Common plants at the habitat included *Brachiaria mutica*, *Commelina diffusa, Ludwigia spp. Hedychium coronarium, Callipteris esculenta, Cyperus spp.* and *Typha angustifolia* (**Photo 3**).

Water Courses/Ditches (Photos 7-8, Figure 3)

4.1.7 Two water courses or ditches (with one in about mid of the Re-zoning Site and the other on southern side) were found run from east to west in water flow direction within the Re-zoning Site. The water ditches were largely with mud button and bank and partially concrete channelized or been covered. The water course in the mid site is relatively larger the depth to the ground level varied from approx. 0.5m to 1.5m and bank-width from 1.5m to 3m at difference sections. The water ditches on the southern site are small with depth to the ground level varied from less than 0.2m to 0.5m and banks width from less than 0.5m to 2m. It is a pretty seasonal one with water in wet season but almost no water in dry season as observed during field surveys.

4.1.8 Common aquatic plants recorded in the water course including *Commelina diffusa*, *Lemna minor* and *Polygonum* spp., refer to plant list given in **Table 4-1** of **Appendix 2**.

Urban and Village Area (Photos 4-6)

4.1.9 The urban and village area is mainly comprised of residential houses and temporal buildings for purpose of storage of construction materials such as sand, rock, brick, paint, metal sheet, machinery and etc., and as well as temporal shelters. Outside the current Rezoning Site, there are similar land users plus some village houses (**Photo 6**).

Herpetofauna (Reptiles and Amphibians)

4.1.10 Herpetofauna surveys were conducted including night time survey **(Photo 9)** in both dry and wet seasons. In total, eight herpetofauna species were recorded comprised of seven amphibians and one reptile species from the surveys within the waste ground habitat of the Rezoning Site. The species list with relative abundance given in **Table 4-2** of **Appendix 2**. The species recorded included the Common Toad, Asiatic Painted Frog, Butler's Pigmy Frog, Brown Tree Frog, Gunther's Frog, and one gecko which is named the Four Clawed Gecko. Among the recorded species, the Greenhouse Frog is commonly seen and widely distributed in the territory of Hong Kong. No herpetofauna with conservation importance was recorded from the surveys.

Insects (Odonata and Butterflies)

4.1.11 The insect surveys of selected insect groups were conducted for all the scheduled date given in **Table 3.1** during both dry and wet seasons in 2021 and 2022. In total, four species of odonata and six species of butterfly species were recorded from the surveys within the Rezoning Site. The species list with relative abundance is given in **Table 4-3 of Appendix 2**. Commonly butterfly species seen during survey included Pale Grass Blue and Small Cabbage White. No species of conservation importance was recorded.

Avifauna

4.1.12 Birds were surveyed within and in adjacent to the Re-zoning Site during the scheduled survey days. In total, 24 species were recorded from dry and wet season surveys, of which a few species including *Pycnonotus jocosus, Pycnonotus sinensis* and *Zosterops japonicus* were more commonly seen from the surveys. These recorded birds were associated with urban fringe habitat with trees and other disturbed habitats including village and farmland areas. The species recorded were mostly common or abundant resident in status and they were widespread in Hong Kong (Carey et al, 2001). One species of conservation interest were recorded within and in adjacent Rezoning Site, i.e. the Black Kite *Milvus migrans*, which is listed in Cap. 170 and Cap. 286, and it is also a species with regional concern according to Fellowes et al (2002). Although the Black Kite is quite common in Hong Kong, especially in Hong Kong Island and some of local coastal areas. The Black Kite was recorded foraging over the current Rezoning Site during the survey. All avifauna were listed in Wild Animals Protection Ordinance (cap. 170). Species list with their status and relative abundance are shown in **Table 4-4** of the **Appendix 2**.

Terrestrial Mammals

4.1.13 Domestic Ox *Bos tauru*, Domestic Cat *Felis catus* and Bat *Pipistrelle* sp. were recorded in the Rezoning Site. The bat *Pipistrelle* sp. is a common species seen in urban and rural areas in Hong Kong and it is an insectivorous species.

Aquatic fauna

4.1.14 Aquatic fauna surveys were conducted during the scheduled dates. In total, nine aquatic fauna species were recorded in two water ditches, i.e. one at mid site and the other on the southern side (**Figure 3**). The species list of aquatic fauna with relative abundance is given in **Table 4-5** included in **Appendix 2**. The recorded species included three species of freshwater snails, which are Red-rimmed Melania, Asian Clam and Apple Snail . Two species of dragonfly larvae, one shrimp species and three common fish species were recorded. Among the recorded aquatic fauna species, there was no species with conservation importance.

5. SPECIES OF CONSERVATION INTEREST

5.1.1 Annex 8 of the EIAO-TM specifies three criteria by which a species of conservation significance may be measured, namely:

- Protection status (local, Chinese or international), with legally protected species afforded higher protected species afforded higher conservation value;
- Geographical distribution, with higher conservation value afforded to species with more restricted geographical ranges; and
- Rarity, with higher conservation value afforded to species which are internationally rare than to species which are only regionally or locally rare.

5.1.2 As mentioned above, the published literature on Hong Kong fauna does not always provide a clearly defined objective basis for the conservation assessment of species and for this reason the assessments below have been complemented by reference to Fellowes et al. (2002). Evaluation on the conservation status of the flora and flora were also made in accordance with the local ordinances and international publications including Wild Animals Protection Ordinance (Cap. 170), Protection of Endangered Species of Animals and Plants Ordinance (Cap.586) and Forest and Countryside Ordinance (Cap.96). International IUCN Red List of Threatened Species (2020), CITES, China Red Data Book of Endangered Animals, China Plant Red Data Book and China Species Red List.

5.1.3 Based on the criteria mentioned above, the species of conservation interest recorded within the Re-zoning Site during the field surveys are listed in **Table 5.1**. A bird named *Milvus migrans* （黑鸢 Black Kite) is a species with conservation interest. The *M. migrans* was observed foraging in the area including the Re-zoning Site.

Table 5.1 Faunal Species of Conservation Interest Recorded during Project Ecological Survey

Fauna Species	Protection status	Distribution	Locations Recorded in this study	Rarity
Avifauna				
All birds was protected under Wild Animals Protection Ordinance (Cap. 170)				
Milvus migrans □ □ Black Kite	Listed in Cap. 170 and Cap.586; Regional concern (Fellowes et al. ,2002)	Populations are recorded from Asia, Europe, Africa, Australia and Indian	Foraging within and outside of Re-zoning Site	Common resident and winter visitor in Hong Kong (AFCD 2020)

6. HABITAT AND SPECIES EVALUATION

6.1.1 In this section, the ecological importance of the habitats identified within the Rezoning Site is evaluated in accordance with the criteria stipulated in Annex 8 of the EIAO-TM.

Waste Ground

6.1.2 An assessment of the waste ground in accordance with the criteria stated in Annex 8 of the EIAO-TM is provided below in **Table 6.1**.

Table 6.1 Ecological Evaluation of the Waste Ground within Re-zoning Site

Criteria	**Waste Ground**
Naturalness	Semi-natural originated from abandoned agricultural land and open storage
Size	About 3ha
Diversity	Moderate vegetation diversity and low fauna diversity
Rarity	A common habitat in Hong Kong; One bird species recorded with conservation concern
Re-creatability	High
Fragmentation	These habitat is fragmented by urban development
Ecological linkage	Not link to any ecologically significant areas
Potential value	Low
Nursery/ breeding ground	Not known to be a significant breeding ground
Age	20 years
Abundance/ Richness of wildlife	Moderate abundance and diversity of flora species and relatively low fauna species richness
Ecological value	**Low**

Water course/water ditch

6.1.3 Re-zoning Site An assessment of the water course in accordance with the criteria stated in Annex 8 of the EIAO-TM is provided below in **Table 6.2**.

Table 6.2 Ecological Evaluation of Water Courses/Ditches within Re-zoning Site

Criteria	**Water Ditches**
Naturalness	Channelised
Size	Small Largely temporal
Diversity	Low vegetation and fauna diversity
Rarity	Common in Hong Kong No species with conservation importance observed
Re-creatability	Re-creatable
Fragmentation	Fragmented by nearby developments
Ecological linkage	Not functionally linked to any highly valued habitat in close proximity.
Potential value	Low
Nursery / breeding ground	No significant nursery or breeding

	ground recorded
Age	Not known
Abundance/ Richness of wildlife	Low vegetation and fauna diversity
Ecological Value	**Low**

Urban and Village Area

6.1.4 The urban and village areas are mainly comprised of temporal buildings and other structures for open and indoor storage of construction materials. Boarded with Kim Sheung Road and similar land uses and village houses, the habitat is considered low in ecological value **Table 6.3**.

Table 6.3 Ecological Evaluation of Urban and Village Area

Criteria	**Urban and Village Area**
Naturalness	**Man-made**
Size	**Medium**
Diversity	**Low**
Rarity	**Common habitat**
Re-creatability	**Re-creatable**
Fragmentation	**Fragmented**
Ecological Linkage	**Limited**
Potential Value	**Low**
Nursery/Breeding Ground	**Low chance**
Age	**N/A**
Abundance / Richness of Wildlife	**Low**
Overall Ecological Value	**Low**

Rezoning Site

6.1.5 The Re-zoning Site was comprised of urban/village area, waste ground with two small water ditches running through it. Based on habitat and species evaluated above, the Re-zoning Site is considered **low** in ecological value.

7. ECOLOGICAL IMPACT ASSESSMENT

Construction Phase

7.1 Direct Impact: Habitat and Vegetation Loss

7.2 There are direct impacts (i.e. the loss of habitats within the Rezoning Site) due to excavation works for site formation. The habitat loss included loss of waste ground with vegetation cover and water ditches.

Overall Impact Evaluation

7.3 As the Rezoning Site (about 4ha) are mainly comprised of urban/village, waste ground plus two small water ditches, with only part of foraging area for one ecological concerned bird species (Black Kite) being noted. The Black Kite is highly mobile with large foraging area and no roosting and nesting habitat was found in the surveyed area. The Re-zoning Site is located at Kam Tin area with densely village houses. The diversity & abundance of flora & fauna species are relatively low within the Re-zoning Site and with no ecological importance. The potential ecological impacts to habitat and its associated flora and fauna were evaluated as low.

7.4 Indirect Impact: Construction Phase Disturbance

7.4.1 Potential disturbance to wildlife due to construction works, such as noise nuisance, are anticipated for the construction programme. Uncontrolled dumping and construction runoff, such as dumping of construction waste and pollutions running into the water courses would cause unacceptable impact on those habitats. Noise disturbance arising from worker and construction activities would cause an indirect impact on the foraging avifauna and herpetofauna/aquatic fauna. However, abundance and diversity of fauna was recorded relatively low within Rezoning Site and no important habitat present within the Rezoning Site. With the implementation of the mitigation measures, the potential impacts to fauna from this source are ranked as minor.

Operation Phase

7.5 Operation Phase Impact Assessment

7.5.1 The main objective of the proposed project is to construct low rise residential buildings. After finished the construction phase, increment of lighting and population would be the source of impact during operation phase. However, the Rezoning site is surrounded by existing villages, wildlife in this area are already habituated to the relatively high levels of human activities. Also, the site is close to existing artificial lighting such as road lights along Kam Sheung Road. The impact is considered to be minor, as the fauna around Rezoning Site adopted urban fringe habitats. Disturbance from the proposed low-rise buildings is considered not a significant impact.

8. RECOMMENDATION OF MITIGATION

8.1 Hierocracy of Impact Mitigations

8.1.1 Annex 16 of the EIAO-TM states that the general policy for mitigation of significant ecological impacts, in order of priority, is:

a) Avoidance: Potential impacts shall be avoided to the maximum extent practicable by adopting suitable alternatives.

b) Minimisation: Unavoidable impacts shall be minimised by taking appropriate and practicable measures such as constraints on intensity of works operations or timing of works operations; and

c) Compensation: The loss of important species and habitats may be provided for elsewhere as compensation. Enhancement and other conservation measures shall always be considered whenever possible.

8.2 Avoidance/Minimisation

Pre-construction

8.2.1 The proposed development (**Figure 2**) offered with generous landscape and amenity provisions. Those landscaped green areas can be planted with a diverse of flora species including grasses, herbs, and shrubs and as well as trees within Re-zoning Site. To minimise the impact on trees loss, a detailed tree survey had carried out in accordance with the Development Bureau Technical Circular (Works) No. 4/2020 issued by Development Bureau in 2020. Some trees shall be retained where possible. However, those that will inevitably be affected by the project will be transplanted as far as practicable.

8.2.2 If transplantation is not applicable, compensatory planting will be carried out using native species which were commonly found in the Re-zoning Site. Replanting for the formation of the landscape area for the subject site will be considered. The tree preservation and removal proposal (TPRP) of the current proposed project would give detailed information on the tree preservation.

8.2.3 In order to minimize disturbance to the nearby habitats and associated wildlife, the following mitigation measures should also be implemented:

- Confining the works within the site boundary;
- Controlling access of site staff to avoid damage to the vegetation in surrounding areas; and
- Using quiet mechanical plant during the construction phase.

Construction Phase

Construction Runoff

8.2.4 Although the water will be diverted from the exiting water ditches within the Re-zoning Site, several measures are still proposed for protecting the watercourses from construction runoff:

- A temporary sewage treatment system or portable chemical toilets shall be designed and installed to collect wastewater and prevent it from entering nearby habitats;
- The proposed works site inside or in the proximity of nearby habitats shall be temporarily isolated, such as by placing of sandbags or silt curtains with a lead edge at the bottom and properly supported props, to prevent adverse impacts on these areas. Other protective measures shall also be taken to ensure that no pollution or siltation occurs in the water gathering grounds of the works site;
- Construction debris and spoil shall be covered up and/or properly disposed of as soon as possible to avoid being washed into nearby habitats by rain;
- Contractors shall adhere to a strict 'clean site' policy, with all construction waste transported to predetermined sites for safe disposal. Under no circumstances shall there be any disposal of waste oil or other materials on site;
- Vehicles and other plant shall be carefully maintained and properly used to minimise the chance for accidental spillage.

Soil Erosion Prevention

- Earth bonding of all areas on which soils have been disturbed or from which vegetation has been cleared to ensure that runoff will not move soils off-site;
- Erection of temporary geotextile silt fences around earth moving works to trap any sediments being washed away and prevent them from entering surrounding areas;
- Installation of silt traps at points where drainage from the Site enters any temporary sewage system;
- Covering of any exposed soil or other loose materials with tarpaulins to prevent erosion; and
- Exposed soil to be covered as quickly as possible following formation works, then seeded and covered with a biodegradable geotextile blanket for erosion control purposes.

<u>Indirect impact due to construction phase disturbance</u>

8.2.5 Noise and light generated from construction work, especially at evening, would interfere birds and herpetofauna nearby. To minimize noise impacts induced by construction works, silencers or mufflers on well-maintained construction equipment should be utilized and properly maintained during the construction program. Noise enclosure or acoustic shed should be effectively utilized, wherever practicable. For the uncontrolled waste dumping, the workers should ensure that all treatment and disposal options comply with best practice and all relevant guidelines and legislation including Waste Disposal Ordinance, the Dumping at Sea Ordinance, the Public Health and Municipal Services Ordinance and the Water Pollution Control Ordinance. Moreover, waste on-site should be handled and stored properly to ensure that they are held securely without loss or leakage thereby avoiding the potential for pollution to nearby habitats.

8.2.6 Standard good site practice measures should be implemented throughout the construction phase:

- Placement of stockpiling into designated area should be selected at disturbed area in order to minimise the disturbance to wildlife.
- The boundary of project boundary should be clearly demarcated. Avoiding human inference to habitats beyond the project boundary by providing temporary barricades.
- General drainage system arrangement should include sediment and oil trapper to collect the site run-off.
- Waste bin should be provided to collect the general refuse and construction waste.

Operation Phase

8.2.7 Storm water run-off: The surface water drainage system of the Project shall be provided and well managed to collect and divert any storm water runoff into the existing storm drains. With such mitigation, no significant ecological impact is envisaged.

8.2.8 Drainage system: proper drainage system should be installed to collect and dispose rainwater.

8.2.9 Flora species selection for landscape planting should consider both visual/amenity benefits for human dwellers and as well as ecological benefit for urban wildlife. Such planting should avoid and minimise human disturbance on surrounding environment. In addition, additional buffer or screen planting would also be included such as tree planting along the local access road and near the periphery of the building area to further reduce the level of disturbance.

Compensation

8.2.10 As habitats within the R-zoning Site are low in ecological value, ecological compensation would not be required.

9. CUMULATIVE IMPACTS

9.1.1 There were no concurrent projects adjacent to the Re-zoning Site and thus no cumulative impact will be anticipated.

10. RESIDUAL IMPACT

10.1 The proposed development within the Re-zoning Site will be developed into a residential area which will result in loss of vegetation cover. In review of the general low ecological value of the habitats and the recorded flora and fauna species are all locally common, no significant residual impact is anticipated.

11. CONCLUSION

The recorded habitats are considered to have low ecological value. With the implementation of mitigation measures during construction and operation phase, the impact will be minimised and thus no significant adverse impact on local ecology would be anticipated for the project.

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Figures

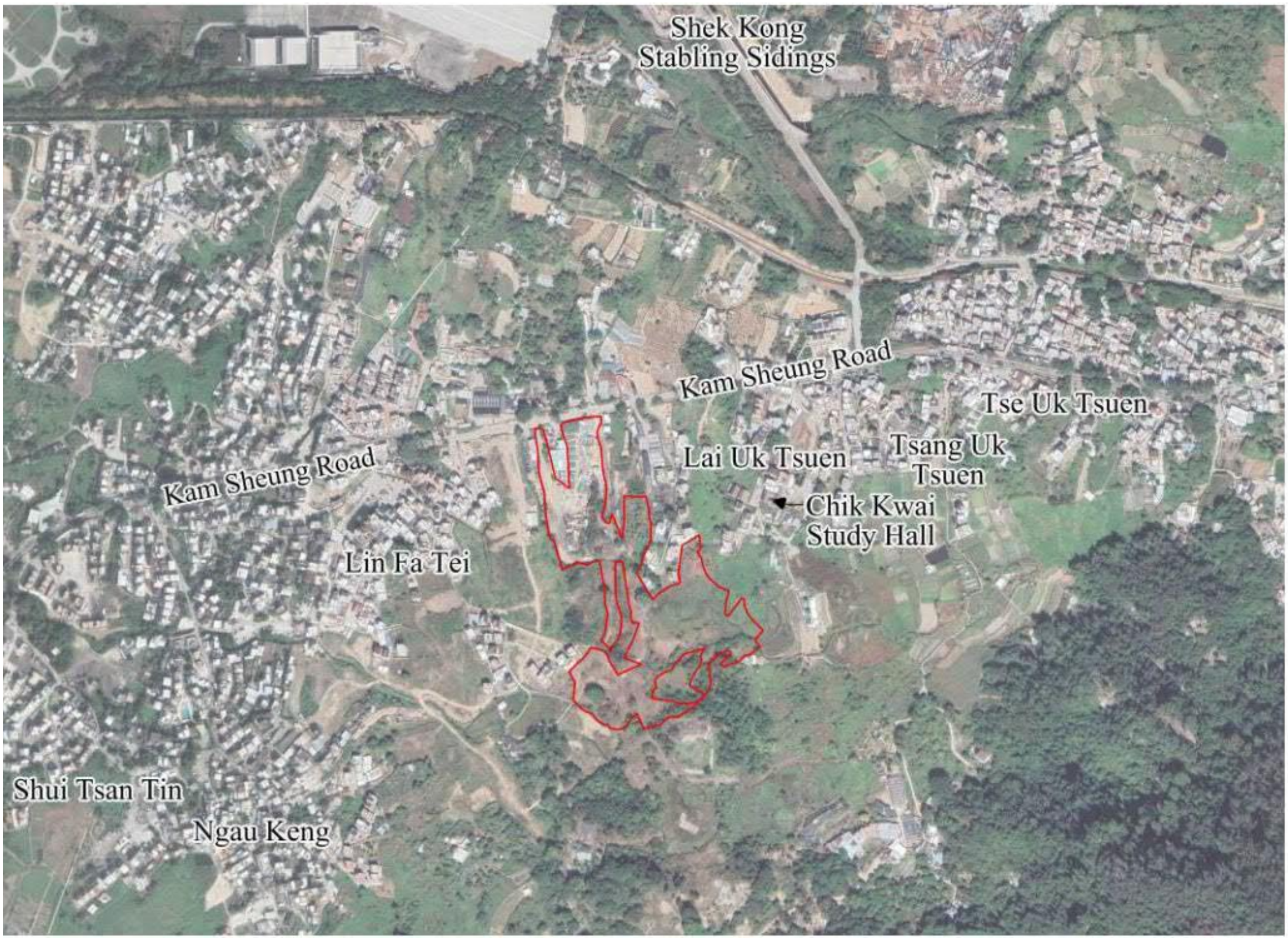

Figure 1 Location of the Application Site.

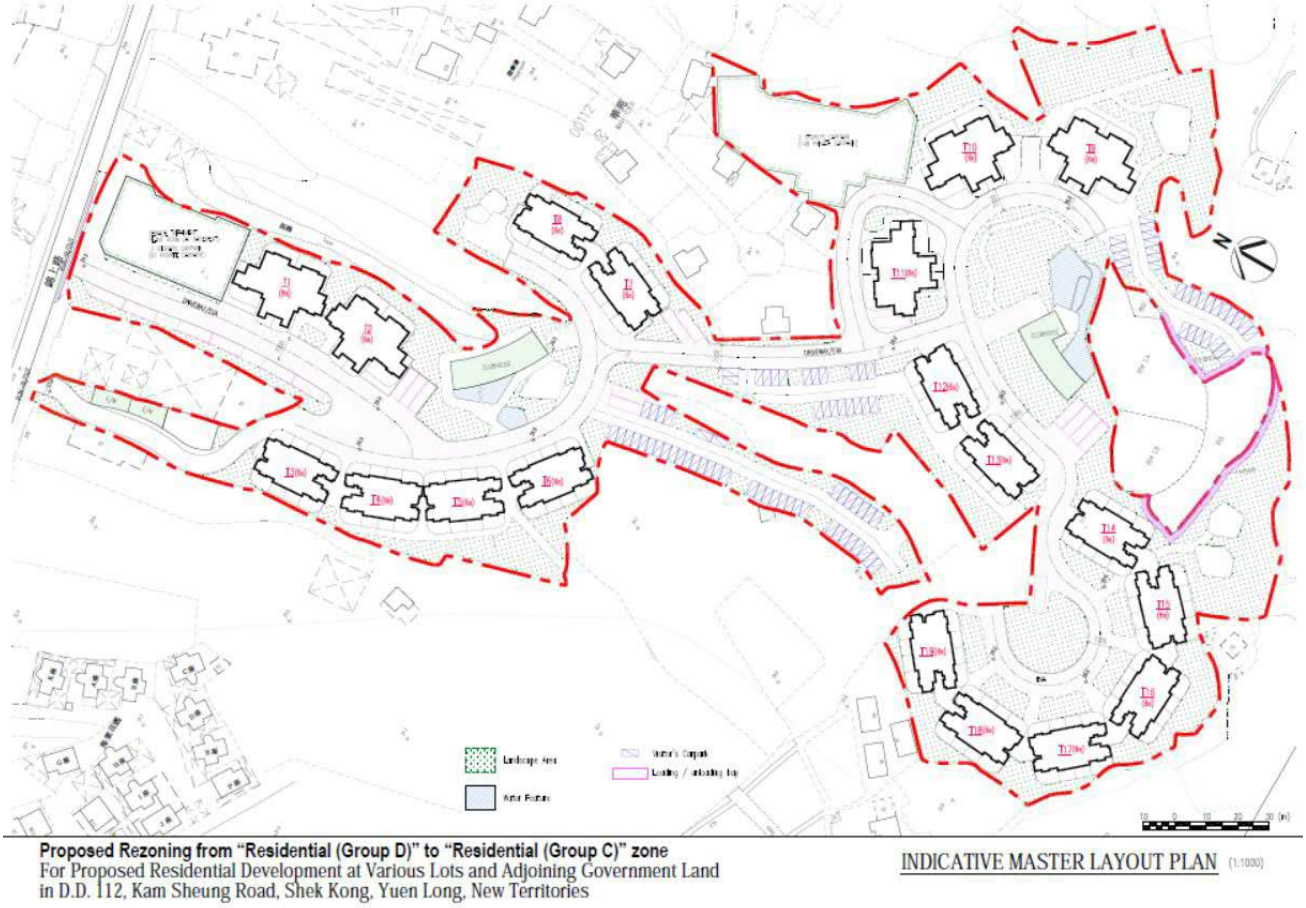

Figure 2 Indicative Master Layout Plan

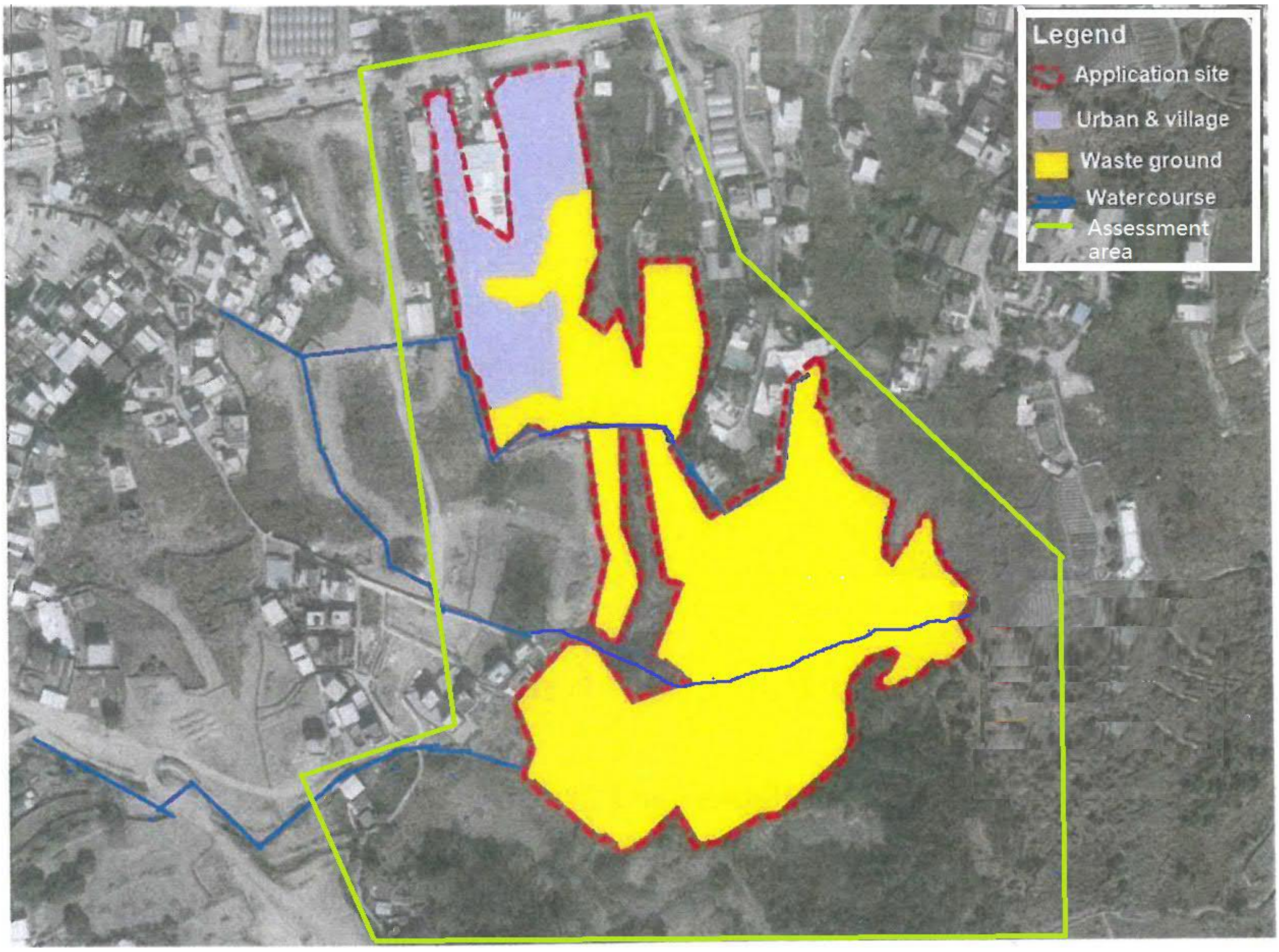

Figure 3 Habitat Map

Appendices

Appendix 1 Photo Record of Habitat and Species

Appendix 2 Tables of Flora and Fauna Data

- Table 4-1 Flora species
- Table 4-2 Herpetofauna species
- Table 4-3 List of Insects
- Table 4-4 Avifauna species
- Table 4-5 List of Aquatic fauna
- Table 4-6 Mammal species

Appendix 1 Photo Record

	
Photo 1. Waste ground	Photo 2. Waste ground in dry season, January 2022
	
Photo 3. Waste ground in wet season, June 2022	Photo 4. Urban and village
	
Photo 5. Urban and village	Photo 6. Urban and village (surrounding area)

Photo 7. Water course, June 2022

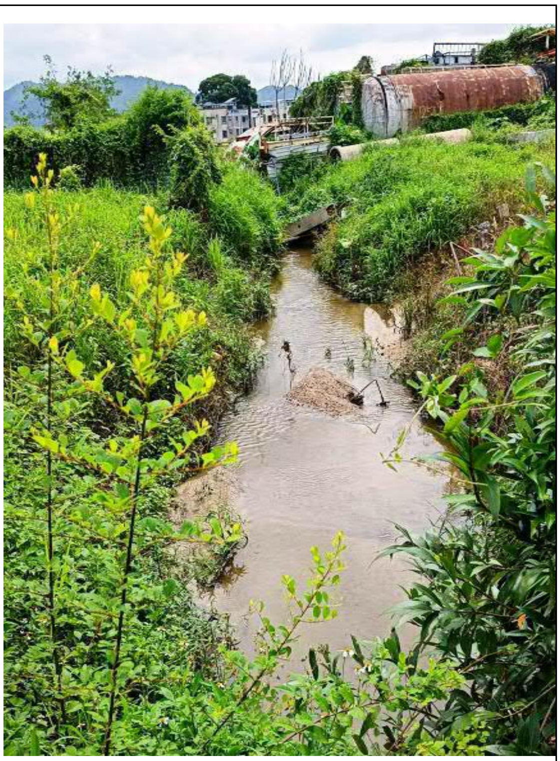

Photo 8. Water course, June 2022

Photo 9 Night time survey

Appendix 2: Tables of Flora and Fauna Species

Table 4-1: Flora species*

Scientific Name	**中文名稱**	Conservation Status in Hong Kong	Waste ground	Urban /village	Water course
Acacia confusa	台灣相思	-		+	
Acridotheres cristatellus	鵝掌藤	-		+	
Ageratum conyzoides	勝紅薊	-	+		
Albizia lebbeck	大葉合歡	-			
Aleurites moluccana	石栗	-	+	+	
Alternanthera philoxeroider	空心蓮子草	-	+		
Arundinella nepalensis	石珍芒	-	+	+	
Bidens alba	白花鬼针草	-	++	++	++
Bombax ceiba	**木棉**	-	+	+	
Brachiaria mutica	**巴拉草**	-	+		+
Bridelia tomentosa	土密樹	-	+		
Callipteris esculenta	菜蕨	-	+		
Carica papaya	番木瓜	-		+	
Casuarina equisetifolia	木麻黃	-		+	
Celtis sinensis	朴樹	-	+	+	
Chenopodium album	藜	-	+		
Cinnamomum burmannii	陰香	-		+	
Cleistocalyx nervosum	**水翁**	-	+	+	
Cocculus orbiculatus	木防己	-	+		
Coix lachryma	薏苡	-	+		
Commelina diffusa	节节草	-	++		+
Copsychus saularis	散尾葵	-		+	
Corvus macrorhynchos	一點紅	-	+	+	
Cyclosorus acuminatus	漸尖毛蕨	-	+		
Cynodon dactylon	狗牙根	-	+		
Cyperus brevifolis	水蜈蚣	-	+		
Cyperus sp.	莎草	-	+		
Dimocarpus longan	龍眼	-	+	+	
Eclipta prostrata	鱧腸	-	++		
Elaeocarpus decipiens	**杜英**	-	+		
Eleusine indica	牛筋草	-	+		
Ficus benjamina	垂葉榕	-	+	+	
Ficus hispida	對葉榕	-	+	+	
Ficus microcarpus	細葉榕	-	+	+	
Ficus rumphii	**心葉榕**	-	+		
Ficus virens	**大葉榕**	-	+	+	
Garrulax perspicillatus	宮粉羊蹄甲	-		+	
Hedychium coronarium	薑花	-	+		
Hibiscus rosa-sinensis	大紅花	-		+	
Ipomoea aquatica	通菜	-	+		+
Ipomoea cairica	五爪金龍	-	+	+	+
Ixora stricta	小葉龍船花	-		+	
Juniperus chinensis var.kaizuca	龍柏	-		+	
Lantana camara	馬纓丹	-	+	+	

Appendix 2: Tables of Flora and Fauna Species

Table 4-1: Flora species*

Scientific Name	**中文名稱**	Conservation Status in Hong Kong	Waste ground	Urban /village	Water course
Lemna minor	**浮萍**	-			++
Leucaena leucocephala	銀合歡	-	++	+	
Ligustrum sinense	山指甲	-	+	+	
Ludwigia erecta	美洲水丁香	-	+		
Ludwigia hyssopifolia	草龙	-	+		
Macaranga tanarius	**血桐**	-	+	+	
Melaleuca quinquenervia	白千層	-		+	
Melia azedarach	苦楝	-	+	+	
Microstegium ciliatum	剛秀竹	-	+		
Mikania micrantha	薇甘菊	-	++	++	++
Miscanthus floridulus	五節芒	-	+		
Miscanthus sinensis	芒	-	+		
Murraya paniculata	九里香	-	+	+	
Musa paradisiaca	蕉	-		+	
Orthotomus sutorius	海芋	-	+		+
Osmanthus fragrans	桂花	-	+	+	
Oxalis corniculata	酢醬草	-	+	+	+
Paederia scandens	雞矢滕	-	+	+	+
Panicum maximum	大黍	-	+	+	
Panicum repens	枯骨草	-			+
Panicum trypheron	毛葉黍	-	+		+
Parthenocissus dalzielii	**爬牆虎**	-	+	+	
Paspalum conjugatum	两耳草	-	+		
Pennisetum purpureum	**象草**	-	+		
Phragmites karka	卡開蘆	-	+		+
Phylloscopus proregulus	地胆草	-	+		
Polygonum chinense	**火炭母**	-	+		+
Polygonum glabrum	光蓼	-	+		+
Polygonum persicaria	马蓼	-	+		+
Psidium guajava	番石榴	-	+	+	
Pueraria lobata	野葛	-	+		
Pycnonotus sinensis	雞蛋花	-	+	+	
Ranunculus sceleratus	石龍芮	-	+		
Roystonea regia	王棕	-	+	+	
Rumex trisetifer	假菠菜	-	+		
Sapium discolor	**山烏桕**	-	+		
Sida acuta	黃花稔	-	+		
Solanum nigrum	龍葵	-	+		
Solanum torvum	水茄	-	+		+
Spathodea campanulata	**火焰木**	-	+	+	
Syzygium jambos	**蒲桃**	-	+		
Typha angustifolia	水燭	-	+		
Wedelia trilobata	美洲蟛蜞菊	-	+		
Zanthoxylum nitidum	兩面針	-	+		

Appendix 2: Tables of Flora and Fauna Species

Table 4-1: Flora species*					
Scientific Name	**中文名稱**	Conservation Status in Hong Kong	Waste ground	Urban /village	Water course
Zosterops japonicus	刺葵	-		+	
No. of Species	89		79	42	17

** Note:*

+' represent species recorded within Study Area

++' represent species commonly recorded within Study Area

+++' represent recorded species is a dominant species within Study Area

Appendix 2: Tables of Flora and Fauna Species

Table 4-2: Herpetofauna species*

Common name	Scientific name	Chinese name	Conservation Status in Hong Kong	Waste ground
	Amphibian			
Asian Common Toad	*Bufo melanostictus*	黑眶蟾蜍	-	+
Asiatic Painted Forg	*Kaloula pulchra pulchra*	花狹口蛙	-	+
Butler's Pigmy Frog	*Microhyla butleri*	畢氏姬蛙	-	++
Brown Tree Frog	*Polypedates megacephalus*	斑腿泛樹蛙	-	++
Gunther's Frog	*Rana guentheri*	貢德氏蛙	-	++
Paddy Frog	*Rana limnocharis*	澤蛙	-	++
Greenhouse frog	*Eleutherodactylus planirostris*	温室蟾	-	++
	Reptile			
Common name	Scientific name	Chinese name		
Four clawed Gecko	*Gehyra mutilata*	截趾虎	-	+
Total number of species				8

* *Note:*

+' represent species recorded within Study Area

++' represent species commonly recorded within Study Area

+++' represent recorded species is a dominant species within Study Area

Appendix 2: Tables of Flora and Fauna Species

Table 4-3: List of Insects*

	Insects information			Survey area / habitat
				Within Application Site
Common Name	Scientific Name	中文名	Conservation Status in Hong Kong	Waste Ground
Butterfly				
Common Mormon	*Papilio polytes polytes*	玉帶鳳蝶	-	+
Indian Cabbage White	*Pieris canidia canidia*	東方菜粉蝶	-	+
Lemon Emigrant	*Catopsilia pomona pomona*	遷粉蝶	-	+
Pale Grass Blue	*Pseudozizeeria maha*	酢漿灰碟	-	++
Red-base Jezebel	*Delias pasithoe*	報喜斑粉蝶	-	+
Small Cabbage White	*Pieris rapae*	菜粉蝶	-	++
Dragonfly				
Crimson Dropwing	*Trithemis aurora*	曉褐蜻	-	+
Orange-tailed Sprite	*Ceriagrion auranticum*	翠胸黃蟌	-	+
Red-faced Skimmer	*Orthetrum chrysis*	華麗灰蜻	-	+
Wandering Glider	*Pantala flavescens*	黃蜻	-	+
No. of species		10		10

** Note:*

+' represent species recorded within Study Area

++' represent species commonly recorded within Study Area

+++' represent recorded species is a dominant species within Study Area

Appendix 2: Tables of Flora and Fauna Species

Table 4-4: Avifauna species*

Common Name	**Scientific Name**	**中文名稱**	**Conservation Status in Hong Kong**	**Habitat**	**Status**	**Commonnes**	**Relative abundance**
Asian Koel	*Eudynamys scolopaceus*	噪鵑	-	Vegetated	R	C	+
Barn Swallow	*Hirundo rustica*	家燕	-	Wetland, urban	PM	C	+
Black Kite	*Milvus migrans*	麻鷹 / 鳶	Listed in Cap. 170 and Cap.586; Regional concern (Fellowes et al. , 2002)	Wooded area, cultivation land, urban	R	C	+
Cattle Egret	*Bubulcus ibis*	牛背鷺	-	Cultivation land, wetland	R	C	+
Chinese Bulbul	*Pycnonotus sinensis*	白頭鵯	-	Wooded area, cultivation land, urban	R	C	+
Chinese Pond Heron	*Ardeola bacchus*	池鷺	-	Wetland	R	C	+
Common Myna	*Acridotheres tristis*	家八哥	-	Wooded area, cultivation land, urban	R	C	+
Common Tailorbird	*Orthotomus sutorius*	長尾縫葉鶯	-	Wooded area, cultivation land	R	C	+
Crested Myna	*Acridotheres cristatellus*	八哥	-	Wooded area, cultivation land, urban	R	C	++
Daurian redstart	*Phoenicurus auroreus*	北紅尾鴝	-	Wooded area, cultivation land	WV	C	+
Eurasian Tree Sparrow	*Passer montanus*	樹麻雀	-	Wooded area, cultivation land, urban	R	C	+
Great Tit	*Parus major(commixtus)*	大山雀	-	Wooded area, cultivation land	R	C	+
Japanese White Eye	*Zosterops japonicus*	暗綠繡眼鳥	-	Wooded area, cultivation land, urban	R	C	+
Little Swift	*Apus affinis*	小白腰雨燕	-	Wetland	R&PM	C	+
Long-tailed Shrikec	*Lanius schach*	棕背伯勞	-	Wooded area, cultivation land	R	C	+
Masked Laughing thrush	*Garrulax perspicillatus*	黑臉噪鶥	-	Wooded area, cultivation land	R	C	+
Oriental Magpie Robin	*Copsychus saularis*	鵲鴝	-	Wooded area, cultivation land, urban	R	C	+
Pallas's Leaf Warbler	*Phylloscopus proregulus*	黃腰柳鶯	-	Wetland	WV	C	+
Plain Prinia	*Prinia inornata*	純色鷦鶯	-	Wetland	R	C	+
Plaintive Cuckoo	*Cacomantis merulinus*	八聲杜鵑	-	Woodland	SV	C	+
Red-whiskered Bulbul	*Pycnonotus jocosus*	紅耳鵯	-	Wooded area, cultivation land, urban	R	C	++
Spotted Dove	*Spilopelia chinensis*	珠頸斑鳩	-	Wooded area, cultivation land, urban	R	C	++
White Wagtail	*Motacilla alba*	白鶺鴒	-	Wetland, cultivation land	WV	C	+
White-breasted Waterhen	*Amaurornis phoenicurus*	白胸苦惡鳥	-	Wetland, cultivation land	R	C	+
No of Species	24						

***Notes:**

+: Represent species existing within habitat

++: Represent species commonly recorded within habitat

+++: Represent species was abundant within habitat

R – Resident bird	PM- Passing migrate
WV- Winter visitor	**SV- Summer visitor**
C- Common	

Appendix 2: Tables of Flora and Fauna Species

Table 4-5: List of Aquatic fauna*

Aquatic fauna information				Water courses within Application Site	
				Mid watercourse	Southern watercourse
Scientific Name	**Common Name**	中文名	**Conservation Status**		
Mollusca					
Melanoides tuberculata	Red-rimmed melania	瘤擬黑螺	-		++
Corbicula fluminea	Asian clam	河蜆	-	+	
Pomacea lineata	Apple snail	苹果螺	-	++	++
Insects					
Orthetrum sp.	Odonata larvae	蜻蜓幼蟲	-		+
Pseudagrion sp.	Odonata larvae	豆娘幼蟲	-		+
Crustacean					
Caridina contonensis	Freshwater shrimp	廣東米蝦	-	+	+
Fish					
Poecilia reticulata	Guppy	孔雀魚	-	+	+
Gambusia affinis	Mosquito fish	食蚊魚	-	+	+
Puntius semifasciolatus	Chinese barb	條紋小鲃	-		+
	No. of species	9		5	8

***Notes:**

+' represent species recorded within Study Area

++' represent species commonly recorded within Study Area

+++' represent recorded species is a dominant species within Study Area

Appendix 2: Tables of Flora and Fauna Species

Table 4-6: Mammal species*

Common name	Scientific name	Chinese name	Conservation Status in Hong Kong	Waste ground
Domestic Ox	*Bos tauru*	黃牛	-	++
Domestic cat	*Felis catus*	家貓	-	+
Bat	*Pipistrelle* sp。	蝙蝠	-	+
Total number of species	3			

* *Note:*

+' represent species recorded within Study Area

++' represent species commonly recorded within Study Area

+++' represent recorded species is a dominant species within Study Area

Appendix 10

Water Quality Impact Assessment

Prepared for

Tenox Development Limited

Prepared by

Ramboll Hong Kong Limited

PROPOSED REZONING FROM “RESIDENTIAL (GROUP D)” TO “RESIDENTIAL (GROUP C)” ZONE FOR PROPOSED RESIDENTIAL DEVELOPMENT AT VARIOUS LOTS AND ADJOINING GOVERNMENT LAND IN D.D. 112, KAM SHEUNG ROAD, SHEK KONG, YUEN LONG, NEW TERRITORIES

WATER QAULITY IMPACT ASSESSMENT

Date **October 2023**

Prepared by **Susan Chan**

Assistant Environmental Consultant

Susan

Signed

Approved by **Calvin CHIU**

Senior Manager

Signed

Project Reference **CKHDD112WI00**

Document No. **R8735_V1.5.docx**

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CHAPTERS

TABLES

FIGURES

APPENDICES

1. INTRODUCTION

1.1 Background of the Project

1.1.1 The applicant is proposing to develop residential development at various Lots in D.D.112 and adjoining government land, Kam Sheung Road, Shek Kong, Yuen Long, New Territories ("the Rezoning Site"). The proposed rezoning (S12A Application No. Y/YL-SK/1) of the Application Site is from "Residential (Group D)" to "Residential (Group C)" Zone.

1.1.2 Ramboll Hong Kong Limited has been commissioned by the Project Proponent to conduct the Water Quality Impact Assessment (WQIA) for the current S12A Planning Application.

1.2 Application Site and its Environs

1.2.1 The Rezoning Site, with a site area of approximate 41,290 square metres is a flat piece of land, which is located to the south of Shek Kong Airfield and Shek Kong Stabling Sidings. The Site is also situated about 3.5km southeast of Kam Sheung Road Station and about 2.4km east of the MTR Pat Heung Maintenance Centre. The Site is bounded by Kam Sheung Road to the north. The Rezoning Site currently falls within area zoned "Residential (Group D)" ("R(D)") on the Approved Shek Kong Outline Zoning Plan (OZP) No. S/YL-SK/9.

1.2.2 **Figure 1.1** shows the location of the Rezoning Site and the environs.

1.3 Project Description

1.3.1 The surrounding context is in general in rural setting with low-rise village settlements, open storage sites and scattered active farmland. The areas to the East and West of the Rezoning Site are mainly surrounded by different villages zoned "Village Type Development" ("V"). The area zoned "Agriculture" with temporary structures is situated to the North of Site across Kam Sheung Road. The area to the immediate south is mainly zoned "Agriculture", which is in general abandoned farmland.

1.4 Proposed Development

1.4.1 The proposed development consists of 19 number of 6-storeys residential blocks. It also comprises two standalone 1-storey clubhouses with swimming pool facilities and two standalone 3-storey carports. The proposed development seeks to develop and upgrade the present environment and condition of the Rezoning Site through the implementation of high-quality low-rise residential development with generous landscape and amenity provisions for an improved living environment for the future residents as well as visual amenity to neighbourhoods.

1.4.2 The indicative master layout plan updated in June 2022 is presented in **Appendix 1.1**.

1.5 Objectives

1.5.1 This report presents the potential water quality impacts arising from the proposed development of the Rezoning Site. The extent of water quality impact assessment was based on an area within 500m radius from the boundary of the Rezoning Site.

1.6 Report Structure

1.6.1 The remaining chapters of this report are shown below:

Chapter 2 – Water Quality Impact Assessment

Chapter 3 – Conclusion

2. WATER QUALITY IMPACT ASSESSMENT

2.1 Legislation

Water Pollution Control Ordinance (Cap. 358)

2.1.1 The Water Pollution Control Ordinance (WPCO) (Cap. 358) provides the major statutory framework for the protection and control of water quality in Hong Kong. According to the Ordinance and its subsidiary legislation, Hong Kong waters are divided into ten Water Control Zones (WCZs). Corresponding statements of Water Quality Objectives (WQOs) are stipulated for different water regimes (marine waters, inland waters, bathing beaches subzones, secondary contact recreation subzones and fish culture subzones) in the WCZ based on their beneficial uses. The assessment area is located within Deep Bay WCZ.

Technical Memorandum

2.1.2 Besides setting the WQOs, discharge of effluents into the WCZs are subject to control under the WPCO through a licensing system. The "Technical Memorandum on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters" (TM-DSS) gives guidance on the permissible effluent discharges based on the type of receiving waters (foul sewers, stormwater drains, inland and coastal waters). The limits control the physical, chemical and microbial quality of effluents. Any sewage from the proposed construction and operation activities must comply with the required discharge standards for effluents discharged into the foul sewers, inland waters and coastal waters of Deep Bay WCZ, as given in the TM-DSS.

Practice Note

2.1.3 A Professional Persons Environmental Consultative Committee Practice Note (ProPECC PN) was issued by the EPD to provide guidelines for handling and disposal of construction site discharges. The ProPECC PN 1/94 "Construction Site Drainage" provides good practice guidelines for dealing with 10 types of discharge from construction sites. These include surface run-off, groundwater, boring and drilling water, bentonite slurry, water for testing and sterilisation of water retaining structures and water pipes, wastewater from building constructions, acid cleaning, etching and pickling wastewater, and wastewater from site facilities. Practices given in the ProPECC PN 1/94 should be followed as far as possible during construction to minimise the water quality impact due to construction site drainage.

2.1.4 The ProPECC PN 5/93 "Drainage Plans subject to Comments by Environmental Protection Department" provides guidelines and practices for handling, treatment and disposal of various effluent discharges to stormwater drains and foul sewers. The design of site drainage and disposal of various site effluents generated within the new development area should follow the relevant guidelines and practices as given in the ProPECC PN 5/93.

2.2 Water Quality Sensitive Receivers

2.2.1 The nullahs/drainage channels and ponds within the 500m assessment area are identified as the water quality sensitive receivers (WSRs) for the construction and operation of the Project. Based on Town Planning Board's (TPB) Outline Zoning Plan No. S/YL-SK/9, there are areas zoned as Conservation Area (CA) within the assessment area to the north of the Rezoning Site. The CA zone is also identified as WSRs. The detailed information and the location of Identified WSRs are shown in **Table 2.1** and **Figure 2.1**.

Table 2.1 Identified Water Sensitive Receivers in the Vicinity

ID	**Description**	**Type**	**Status**	**Remarks**
W1	Conservation Area (CA) in No. S/YL-SK/9	Conservation Area (CA)	NA	Approximately 163m from the Rezoning Site, no direct impact
W2	Ponds near Tsing Tam Village	Pond	Active	Approximately 310m from the Rezoning Site, no direct impact
W3	Pond near Ngau Keng	Pond	Active	Approximately 515m from the Rezoning Site, no direct impact
W4	Ponds near Tsing Tam Village	Pond	Active	Approximately 120m from the Rezoning Site, no direct impact
W5	Pond near Lin Fa Tei	Pond	Active	Approximately 205m from the Rezoning Site, no direct impact
W6	Kam Tin River Tributary	Channelized watercourse	NA	Approximately 6m from the Rezoning Site, no direct impact
W7	Stream near Lai Uk Tsuen	Channelized / Modified watercourse	NA	Existing ditches running from east to west crossing the site, underground drainage system will be constructed to divert the flow from these existing ditches during construction with incorporating relevant mitigation measure from the ETWB TC (Works) No. 5/2005
W8	Kam Tin River Tributary	Channelized watercourse	NA	Approximately 85m from the Rezoning Site, no direct impact
W9	Stream near Wah Yuen	Modified watercourse	NA	Approximately 25m from the Rezoning Site, no direct impact
W10	Stream near Shui Lau Tin	Modified watercourse	NA	Approximately 70m from the Rezoning Site, no direct impact
W11	Stream along Nam Hing West Road	Channelized watercourse	NA	Approximately 275m from the Rezoning Site, no direct impact
W12	Stream along Ko Sheung Road	Channelized watercourse	NA	Approximately 335m from the Rezoning Site, no direct impact
W13	Stream near Lin Fa Tei	Channelized / Modified watercourse	NA	Existing ditches running from east to west crossing the site, underground drainage system will be constructed to divert the flow from these existing ditches during construction with incorporating relevant mitigation measure from the ETWB TC (Works) No. 5/2005

2.2.2 There are two existing ditches running from east to west crossing the site. The ditches are largely with mud bottom and bank and partially concrete channelized or been covered. For the construction of the project, underground drainage system will be constructed to divert the flow from these existing ditches. Relevant mitigation measure from the ETWB TC (Works) No. 5/2005 will be incorporated where applicable. Other watercourses nearby the Rezoning Site are mainly drainage channel collecting flow from surrounding area of rural context.

2.2.3 The CA zone at the south is located at approximately 163m from the Rezoning Site, at a higher altitude. According to the topographical information from basemap, the ground level of the Rezoning Site is lower than the CA zone and the direction of the watercourse is flowing towards the Rezoning Site from CA zone. That is, the CA zone is upstream of the Rezoning Site. Hence, the CA zone is unlikely to be affected by the activities at the Rezoning Site.

2.3 Potential Impacts during Construction Phase

2.3.1 Construction works would inevitably have the potential to generate wastewater. Works should be carried out in such a manner as to minimize adverse impacts on local water bodies. Activities that are likely to cause water pollution include:

- General construction activities;
- Construction activities related to the diversion works of the watercourse passing through the site;
- Construction runoff and drainage;
- Sewage effluent from the workforce; and
- Accidental liquid spillage.

General Construction Activities

2.3.2 Various types of construction activities would generate wastewater. These include general cleaning and polishing, wheel washing, dust suppression and utility installation, which would contain high concentrations of suspended solids. Without proper control, these could lead to increase in suspended solids level, as well as increase in turbidity and reduced dissolved oxygen in the nearby watercourses.

2.3.3 Wastewater would also be generated from the accumulation of solid waste such as plastic package and construction material, and sewage effluent from the construction workforce during the construction phase. If uncontrolled, these could lead to deterioration in water quality. Contaminated discharge and sewage effluent could lead to increase in nutrient levels such as ammonia and nitrogen concentration, and lead to secondary water quality impacts including decreases in DO concentrations.

2.3.4 The Practice Note for Professional Persons (ProPECC Note PN1/94) on Construction Site Drainage provides guidelines on good practice for dealing with discharges from construction sites. It is applicable to this study for control of site runoff and wastewater generated during the construction phase.

Construction Activities related to the Diversion Works

2.3.5 The diversion works of the ditches passing through the site will involve the construction works of excavation of soils and construction and installation of the Proposed Box Culvert. If not properly controlled, the excavated materials and wastewater may enter the watercourse and give rise to water quality impact at the downstream area. Since the works will be carried out during the dry season and the duration of construction would be shortened as much as possible and the potential water quality impact would be minor.

2.3.6 During the construction phase, the diversion works will be carried out in phases. The proposed box culvert will be created and existing water flow is diverted, before the abandoning of existing ditches and construction of the residential buildings. The construction activities connecting the box culvert to the upstream and downstream location of the ditch, if applicable, will be carried out during dry season with no or minimum water flow. Residual debris and other waste will be removed immediately after work. Appropriate mitigation measures shall be taken to prevent / minimise the water quality impact caused.

Construction Runoff

2.3.7 Site runoff may cause potential water quality impacts. During construction, soil surfaces would be exposed. Site runoff would wash away the soil particles on unpaved lands and areas with the topsoil exposed. This site runoff is characterised by high concentrations of suspended solids. Release of site runoff into the water body directly or via drainage channel could lead to increase in SS levels and turbidity in the nearby water environment. Site runoff may also wash away contaminated soil particles and therefore cause water pollution.

2.3.8 Best practice as stipulated in ProPECC Note PN1/94 will be adopted by contractor. As a standard site practice, sufficient site drainage should be provided to collect site runoff for appropriate treatment before discharge. Temporary peripheral drainage should be installed at site perimeter as well as near any watercourses passing through the construction site to avoid polluted construction site runoff from leaving the sites or entering any nearby watercourses or drainage system without appropriate treatment. Silt removal facilities with sufficient capacity, such as sedimentation tanks, should be provided on site to handle all site runoff before discharge. General construction activities including maintaining good housekeeping on site and storing oils, fuels and chemical securely to prevent spillages and leakage should be carried out.

2.3.9 The Contractor would be required to obtain a license from EPD for discharge to the inland waters. With the provision of adequate construction site drainage and sediment removal facilities, no unacceptable water quality impacts would be expected.

Sewage Effluent from Construction Workforce

2.3.10 Sewage effluents will arise from the sanitary facilities provided for the on-site construction workforce. Based on the "Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning" issued by EPD, the sewage production rate for construction workers is estimated at 0.23 m^3 per employee per day. Sewage would consist of high levels of BOD_5, Ammonia and *E. coli* counts.

2.3.11 The sewage would be collected onsite using chemical toilets. Chemical toilets should be provided at a ratio of not less than one for every 25 workers. The facility should be serviced and cleaned by licensed contractor. No direct discharge of sewage effluent would be allowed. No adverse water quality impact from sewage effluent from construction workforce is expected.

Accidental Spillage

2.3.12 Chemicals stored on-site during construction phase such as oil, diesel and solvents may be accidentally spilt or leaked at the construction site. If left unattended, the spilt chemicals may enter the site drainage system and adversely impact stormwater drains outside the site. Site drainage would be well-maintained and good construction practices would be observed to ensure that litter, fuels and solvents are managed, stored and handled properly and do not enter the nearby water streams and coastal water. Therefore, it is expected that no water quality impacts caused by accidental spillage would be generated.

2.4 Potential Impacts during Operation Phase

2.4.1 The potential sources of water quality impacts during the operation phase of the Proposed Development include sewage generated from the proposed development & surface run-off.

Surface runoff

2.4.2 The Rezoning Site is currently no proper drainage system connecting the upstream portion of northern channel to downstream channel due to the blockage of existing drain. Currently, surface runoffs within the area are discharged by means of overland flow into the existing watercourse near to Wah Yuen without any treatment.

2.4.3 During operation, there will be discharge of surface runoff from the proposed development. A proper drainage system would be provided for the proposed development to collect surface runoff and stormwater for discharge to the drainage ditch. The surface runoff will be collected and then discharged via screening facility. There will be no direct discharge without treatment. Proper drainage system would be proposed as the mitigation measures to minimize the potential impacts to the downstream watercourse.

Sewage effluent

2.4.4 According to the Sewerage Impact Assessment (SIA) Report, the estimated Average Dry Weather Flow (ADWF) for the proposed residential development including sewage flow from backwashing of swimming pool is approximately 915.6 m^3/d. Sewage from the proposed development (including domestic, non-domestic discharge, swimming pool backwash, etc.) would be a major source of water quality impact from the operational phase. Without proper arrangement, sewage may enter the nearby water bodies, resulting in an increase in levels of pollutants such as *E. coli*, suspended solids (SS), and ammonia nitrogen (NH_3-N), etc.

2.4.5 Since the existing Kam Tin Sewage Pumping Station (KTSPS) is reaching its limits for the existing developments and reserved sewage flow for planned development, as well as there are no existing public sewers in vicinity of the site, an onsite sewage treatment plant (with plan area of about 800 m^2) will be adopted for the Site to treat the sewage flow (915.6 m^3/d) generated from the proposed development and the treated effluent will be discharged to the nearby stormwater drainage system.

2.4.6 During the interim stage, sewage generated by the proposed development is proposed to be handled by an onsite STP until the public sewer and capacity of downstream sewerage are available for discharge. The effluent from the STP would comply with the typical effluent standards from a private tertiary STP and EPD's effluent discharge standard before discharging to the nearby stormwater drainage system. The key source of pollution during operation phase is the emergency discharge of untreated sewage effluent from the onsite STP.

2.4.7 The proposed sewage treatment plant will adopt Membrane Bioreactor (MBR) technology with ultra-filtration to meet EPD's effluent discharge standard. The operator of the residential development will be responsible for maintaining the internal sewerage system including the STP and associated sewers. With provision of properly design sewers, sewage would be collected and conveyed to the planned public sewerage system via a sewage terminal manhole at the boundary of the site when public sewer is available for connection and discharge in the future. Thus, with proper mitigation measures being implemented, no adverse water quality impact is anticipated from sewage generated by the operation of the proposed development.

2.5 Potential Impacts during Decommissioning Phase

2.5.1 The potential sources of water quality impacts during the decommissioning phase of the proposed development include residual wastewaters generated from the onsite STP.

2.5.2 The onsite STP is proposed as an interim measure to handle the sewage effluents generated by the proposed development, until the public sewer and capacity of downstream sewerage are available for discharge. Once all the sewerage is connected to the permanent Government sewer, the onsite STP would be decommissioned. It is currently proposed that decommissioning would involve only isolation of the sewerage connections to the onsite STP and retirement of the treatment units after the connection to the Government sewer has been established, while the STP building and other structural components would be retained in place.

2.5.3 Arrangements would be made between the Estate Manager and Drainage Services Department (DSD) for activation, transfer and/or testing and commissioning of the relevant sewerage connections to the Government sewer where applicable, and the onsite STP would not be decommissioned until the sewerage connection to the Government sewer has satisfactorily completed these arrangements. Any wastewaters generated from the decommissioning process (e.g., cleaning out of the treatment and storage units) and any residual untreated sewage or reclaimed water would be pumped out and tanked away to the public STW for offsite treatment and disposal.

2.5.4 With these proposed arrangements, no adverse water quality impacts are expected during decommissioning phase.

2.6 Mitigation Measures for Construction Phase

2.6.1 The good practices given in the Practice Notes for ProPECC PN 1/94 in controlling water pollution at construction site shall be implemented during the construction phase of the Project. Soil erosion from the sites can be minimized through good on-site management practices by implementing viable erosion control measures which should be incorporated in contract clauses. The main practices provided in the mentioned document (i.e., ProPECC PN 1/94) area also summarized in the following paragraphs, which should be enforced to prevent unacceptable construction stage impacts and for compliance with the statutory criteria.

General Construction Activities

2.6.2 The site practices outlined in ProPECC PN 1/94 Construction Site Drainage should be adopted as far as practicable to minimise the potential water quality impacts from various construction activities and construction site runoff. Extra attention should be paid for works areas which are in close proximity to the water sensitive receivers.

Wheel washing facilities

2.6.3 The wheels of all vehicles should be washed before they leave a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. A wheel washing bay should be provided at every site exit if practicable. Wash water should be recycled whenever possible to minimise the generation of wastewater and should have sand and silt removed before discharging into storm drains. The section of construction road between the wheel washing bay and the public road should be paved with backfall to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains.

2.6.4 There will be need for the Contractor to apply to the EPD for a wastewater discharge licence for discharge of effluent from the construction site under the WPCO. The discharge quality must meet the requirements specified in the discharge licence. All the runoff and wastewater generated from the works areas should be treated so that it satisfies all the standards listed in the TM-DSS. The beneficial uses of the treated effluent for other on-site activities such as dust suppression, wheel washing and general cleaning can minimise water consumption and reduce the effluent discharge volume. If monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring should be carried out in accordance with the WPCO license.

Wastewater from solid waste

2.6.5 Debris and refuse generated on-site should be collected, handled and disposed of properly to avoid entering to the nearby watercourses. Stockpiles of cement and other construction materials should be kept covered when not being used.

2.6.6 Rubbish and litter from construction sites should also be collected to prevent spreading of rubbish and litter from the site area. It is recommended to clean up the construction waste on a regular basis for good site practice.

Construction Runoff

2.6.7 In order to meet the requirements of the Technical Memorandum standard under the Water Pollution Control Ordinance, surface runoff from construction sites should be discharged into storm drains via adequately designed sand/silt removal facilities such as sand traps, and sedimentation basins.

2.6.8 Exposed slope/soil surfaces should be covered by a tarpaulin or similar material during rainstorms to prevent the washing away of construction materials into any drainage system, watercourses and inshore water. Other measures which are proposed to be implemented before, during, and after rainstorms, as appropriate, are summarized in ProPECC PN 1/94. The surface run-off from construction sites as detailed below shall also be incorporated into the construction site drainage where practicable as an integral part of good practice:

- Surface run-off from construction sites should be discharged into storm drains via adequately designed sand/ silt removal facilities such as sand traps, and sediment basins. Channels or earth bunds or sand bag barriers should be provided on site to properly direct stormwater to such silt removal facilities. Perimeter channels at site boundaries should be provided where necessary.
- Silt removal facilities, channels and manholes should be maintained, and the deposited silt and grit should be removed regularly.
- Construction work should be programmed to minimize soil excavation works in rainy seasons (April to September). If excavation in soil could not be avoided in

these months, temporarily exposed slope surfaces should be covered, and temporary access roads should be protected by crushed stone or gravel, as excavation proceeds.

- Earthworks final surfaces should be well compacted, and the subsequent permanent work or surface protection should be carried out immediately after the final surfaces are formed.
- Measures should be taken to minimize the ingress of rainwater into trenches. If excavation of trenches in wet seasons is necessary, they should be dug and backfilled in short sections. Rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities.
- Open stockpiles of construction materials (e.g., aggregates, sand and fill material) on sites should be covered with tarpaulin or similar fabric. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system.
- Precautions should be taken at any time of year when rainstorms are likely; actions should be taken when rainstorms are imminent or forecasted, and during or after rainstorms.

Construction Activities related to the Diversion Works

2.6.9 The diversion works of the ditches passing through the site will involve the construction works of excavation of soils and construction and installation of the Proposed Box Culvert. If not properly controlled, the excavated materials and wastewater may enter the watercourse and give rise to water quality impact at the downstream area. Since the works will be carried out during the dry season and the duration of construction would be shortened as much as possible and the potential water quality impact would be minor.

2.6.10 During the construction phase, the diversion works will be carried out in phases. The proposed box culvert will be created and diverted first, before the abandoning of existing ditches and construction of the residential buildings. The construction activities connecting the box culvert to the upstream and downstream location of the ditch, if applicable, will be carried out during dry season with no or minimum water flow. Residual debris and other waste will be removed immediately after work.

Sewage Effluent from Construction Workforce

2.6.11 Temporary sanitary facilities, such as sufficient chemical toilets, should be employed in the works areas. The toilet facilities should be more than 30 m away from any watercourses. A licensed contractor would be responsible for cleansing and maintenance of the chemical toilets on a regular basis. The number of the temporary sanitary facilities required for the construction sites would be subject to later detailed design, the capacity of the chemical toilets, and contractor's site practices.

2.6.12 Notices would be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment during the construction phase of the Project. Regular environmental audit on the construction site would be conducted in order to provide an effective control of any malpractices and achieve continual improvement of environmental performance on site.

2.6.13 Provided that sewage is not discharged directly into stormwater drain or inland waters and temporary sanitary facilities are used and properly maintained, no adverse water quality impact is anticipated provided good site practice and the recommendation under this section will be implemented properly by the contractor.

Accidental Liquid Spillage

2.6.14 Oils and fuels should only be used and stored in designated areas which have pollution prevention facilities. All fuel tanks and storage areas should be sited on sealed areas to prevent spillage of fuels and solvents to the nearby watercourses. All waste oils and fuels should be collected in designated tanks prior to disposal.

2.6.15 Drainage serving an open oil filling point should be connected to storm drains via a petrol interceptor with peak storm bypass.

2.6.16 In addition, if the sewerage upgrading works are required to be carried out near the existing nullah, control of runoff and drainage from construction works adjacent to inland water should be implemented to prevent high levels of SS from entering the aquatic environment. Measures recommended in ETWB TC (Works) No. 5/2005 "Protection of natural streams/rivers from adverse impacts arising from construction works" should be adopted where applicable.

2.6.17 In addition, sufficient silt removal facilities shall be installed to settle out sediment prior to discharge. Such facilities shall be properly designed in accordance with guidelines from the Civil Engineering and Development Department (CEDD) to achieve the desired mitigating effect. Typically, a detention time not less than 5 minutes for maximum design flow of inlet should achieve adequate sediment removal. Channels or earth berm or sandbag barriers should be provided on site to properly direct surface runoff to such silt removal facilities. Sediment traps, channels and manholes should be maintained, and the deposited silt and grit should be removed on regular basis.

2.6.18 The "Recommended Pollution Control Clauses for Construction Contracts" is available on EPD website. It contains the recommended appropriate wastewater control measures to be implemented at the construction site by the Contractors.

2.6.19 The above proposed mitigated measures and control measures shall be implemented, and wastewater discharge monitoring should be carried out according to the requirements stipulated in the Wastewater Discharge Licence under WPCO to ensure the effectiveness of the proposed mitigation measures and subsequently ensure the water quality of the nearby water bodies would not be adversely affected by the construction activities of the Project.

2.7 Mitigation Measures for Operation Phase

Onsite Sewage Treatment Plant (STP)

2.7.1 Sewage generated by the proposed development including sewage flow from backwashing of swimming pool is proposed to be handled by an onsite STP until the public sewer and capacity of downstream sewerage are available for discharge. The onsite STP will adopt Membrane Bioreactor (MBR) technology with ultra-filtration. The sludge from the STP as a by-product from the MBR treatment process will be removed off-site by licensed sludge collection vehicles. A discharge license under WPCO will be obtained from the operation of the STP. The indicative layout plan extracted from the Sewerage Impact Assessment (SIA) Report is provided in **Appendix 2.1**. It is intended to provide tertiary treatment of the onsite STP. The effluent from the STP during operational phase would be pre-treated to comply with the EPD's typical effluent standards from a private tertiary STP provided as below and be sited away from natural section of water courses as far as possible.

Table 2.2 Typical Effluent Standards from a Private Tertiary STP

Parameter	**Unit**	**Tertiary Effluent Standards (Upper Limit)(1)**
BOD_5	mg/L	10
SS	mg/L	10
TN	mg/L	20
TP	mg/L	2
Ammonia-N(2)	mg/L	2
E. coli	Count/100ml	100

Remarks:

(1) Depending on the water body receiving the discharge, the more stringent set of the effluent standards (those listed in this table or the WPCO-TM) should be adopted as appropriate.

(2) Ammonia-N standard is applicable for discharge to be made into inland waters of Deep Bay.

2.7.2 The key source of pollution during operation phase is the emergency discharge of untreated sewage effluent from the onsite STP. During emergency situations, such as loss of power supply at the onsite STP, or mechanical faults / equipment failures, untreated sewage effluent may overflow and cause potential impacts at downstream WSRs. To minimise the risk of untreated sewage effluent discharge due to emergency events, dual source electricity supply as an emergency measure of STP will be provided to prevent power failure and the standby pumps, in addition to the duty pumps, will be provided as the backup solution during operation when the duty pump is failure to be operated. According to the Sewerage Impact Assessment (SIA) Report, the estimated Average Dry Weather Flow (ADWF) for the proposed residential development is approximately 915.6 m^3/day. Holding tank with the adequate capacity of 230m^3 (which is equal to about 6 hours of ADWF) will be installed onsite in case the system cannot function to treat the sewage temporarily under emergency. With these contingency measures in place, the risk of untreated sewage effluent discharge to Deep Bay WCZ due to emergency events is considered to be negligible. With provision of properly design sewers, sewage would be collected and conveyed to the public sewerage system when available. Thus, no adverse water quality impact is anticipated from sewage generated by the operation of the proposed development. Drainage in covered carparks, covered transport interchange, covered loading and unloading area should be connected to foul sewer via petrol interceptors in accordance with ProPECC PN 5/93. With the provision of the proposed sewerage system, no associated water quality impact is anticipated.

2.7.3 Measures have also been proposed for emergency. It is proposed that adequate spare parts for the plant and standby pumps will have to be made readily available; qualified personnel will be hired to inspect the plant condition and carry out maintenance on a regular basis; equalization tank to provide temporarily storage; and tank away will be provided in case of prolonged outage of STP for disposal at designated DSD's sewage treatment works. With these measures in place, it is considered that the proposed STP will unlikely cause any adverse water quality impact.

Surface Run-off

2.7.4 Runoff arises from the development due to the increase in paved area. The level of contaminants in this runoff is generally limited for new development area and does not pose a significant threat to the nearby watercourses. With the implementation of the proposed mitigation measures, no adverse water quality from surface runoff would be expected.

2.7.5 As discussed earlier, the existing conditions of the Rezoning Site is unpaved with no engineered drainage system. Surface runoffs carrying sediment laden within the area are discharged by means of overland flow into nearby drainage ditches without any treatment. With the proposed development, proper drainage system will be in place to collect and treat the surface runoff before any discharge following the existing flow regime. As pollutants contributed by non-point source are often bound or adsorbed onto particles, an effective stormwater management system will be the removal of pollution sources prior to rainstorm and the provision of standard gully grating or trash grille that collect debris or sediment. Regular cleaning and sweeping of road surface/ open areas and prior to occurrence of rainstorm is recommended in order to minimize pollutants in stormwater. Standard gully grating or trash grille that collect debris and sediments should be provided to trap pollutants in stormwater.

2.7.6 Surface channels and pipes along the site boundary will be provided to convey the runoffs to the downstream of the existing natural watercourse near to Wah Yuen.

2.7.7 A new drainage system within the site would be used to replace the section of existing northern channel and connect back to the engineering channel. A stormwater storage tank with storage capacity of 12,000 m^3 would be built within the development. With the provision of the new drainage system, the connective of the northern channel can be restored and enhanced. The comparison of the existing and proposed drainage system as extracted from the Drainage Impact Assessment is shown in **Figure 2.2** and **Figure 2.3**.

2.7.8 Stormwater management Best Management Practices (BMPs) as listed below should be implemented as appropriate to reduce runoff and control the quality of runoff.

2.7.9 Exposed surface shall be avoided within the proposed development to minimise soil erosion, thus reduce SS in runoff. The proposed development area should be either paved or covered by plantation.

2.7.10 Preliminary screening facilities such as standard gully grating and trash grille, with spacing which is capable of screening large substances such as fallen leaves and rubbish should be provided at the inlet of drainage system. Road gullies with standard design and manhole device and should be incorporated to remove particles present in stormwater run-off. Drainage outlet of any covered car park should be connected to foul sewers via petrol interceptors or similar facilities.

2.7.11 As for the landscaping area of the proposed development, it is recommended that the agrochemicals, e.g. fertilizers will only be applied when needed and should be avoided during major rainy season. Over dosage should be avoided. Other proper measures in "Good Agricultural Practices for Crop Production" shall be implemented for the use of the fertilizers, pesticides and agrochemicals.

2.7.12 Good management measures such as regular road sweeping, and regular inspection, cleansing and maintenance of the screening facilities of the drainage system should be implemented to ensure normal operation of the drainage system and avoid overflow. Additional inspection and cleansing should be carried out before forecasted heavy rainfall.

2.7.13 With provision of the planned drainage system and proper implementation of the BMPs, the surface runoff from the proposed development would not give rise to significant water quality impact.

2.8 Mitigation Measures for Decommissioning Phase

2.8.1 The onsite STP shall not be decommissioned until the sewerage connection to the Government sewer has been fully established and implemented. Any residual wastewaters generated from cleaning out and decommissioning of the treatment and storage units and any residual reclaimed water would be pumped out and tanked away to the public STW for offsite treatment and disposal with the agreement with DSD.

3. OVERALL CONCLUSION

3.1.1 This report presents the potential water quality impacts arising from the proposed development of the Application Site. The WSRs within the 500m assessment area of the Project are identified.

3.1.2 The construction of the Proposed Development could impact the water bodies through site runoff, diversion works, general construction activities, sewage effluent and accidental spillage. These impacts can be readily mitigated through the construction of a suitable drainage system with silt traps, good site management practices, and proper sewage collection and disposal system.

3.1.3 With the provision of proper drainage and sewerage system together with the contingencies, adverse water quality impact associated with surface runoff and sewage discharge during operation phase is not expected.

3.1.4 In all circumstances, construction and operational stage effluent after pre-treatment to WPCO requirement, should be sited away from natural water course.

3.1.5 According to the Sewerage Impact Assessment (SIA) Report, the estimated ADWF for the proposed residential development is approximately 915.6 m^3/d. Since the existing KTSPS is reaching its limits for the existing developments and reserved sewage flow for planned development, as well as there are no existing public sewers in vicinity of the site, an onsite sewage treatment plant (plan area of about 800 m^2) will be adopted for the Site to treat the sewage flow generated from the proposed development and the treated effluent will be discharged to the nearby stormwater drainage system. The proposed sewage treatment plant will adopt Membrane Bioreactor (MBR) technology with ultra-filtration to meet EPD's effluent discharge standard.

3.1.6 The onsite STP shall not be decommissioned until the sewerage connection to the Government sewer has been fully established and implemented. Should public sewer be available for connection and discharge in the future, the sewerage treatment plant will be decommissioned, and the sewage will be discharged to public sewer via a sewage terminal manhole at the boundary of the site after the connection to the nearest manhole of public sewerage system is completed.

3.1.7 With the implementation of the recommended mitigation measures, no residual water quality impact would be anticipated during construction phase, operation phase and decommissioning phase of the Proposed Development.

3.1.8 From the above findings, it is concluded that the proposed residential use, which is a long-term/ultimate use of the Application Site in line with the planning intention of the Government and sustainable in environmental terms.

Figures

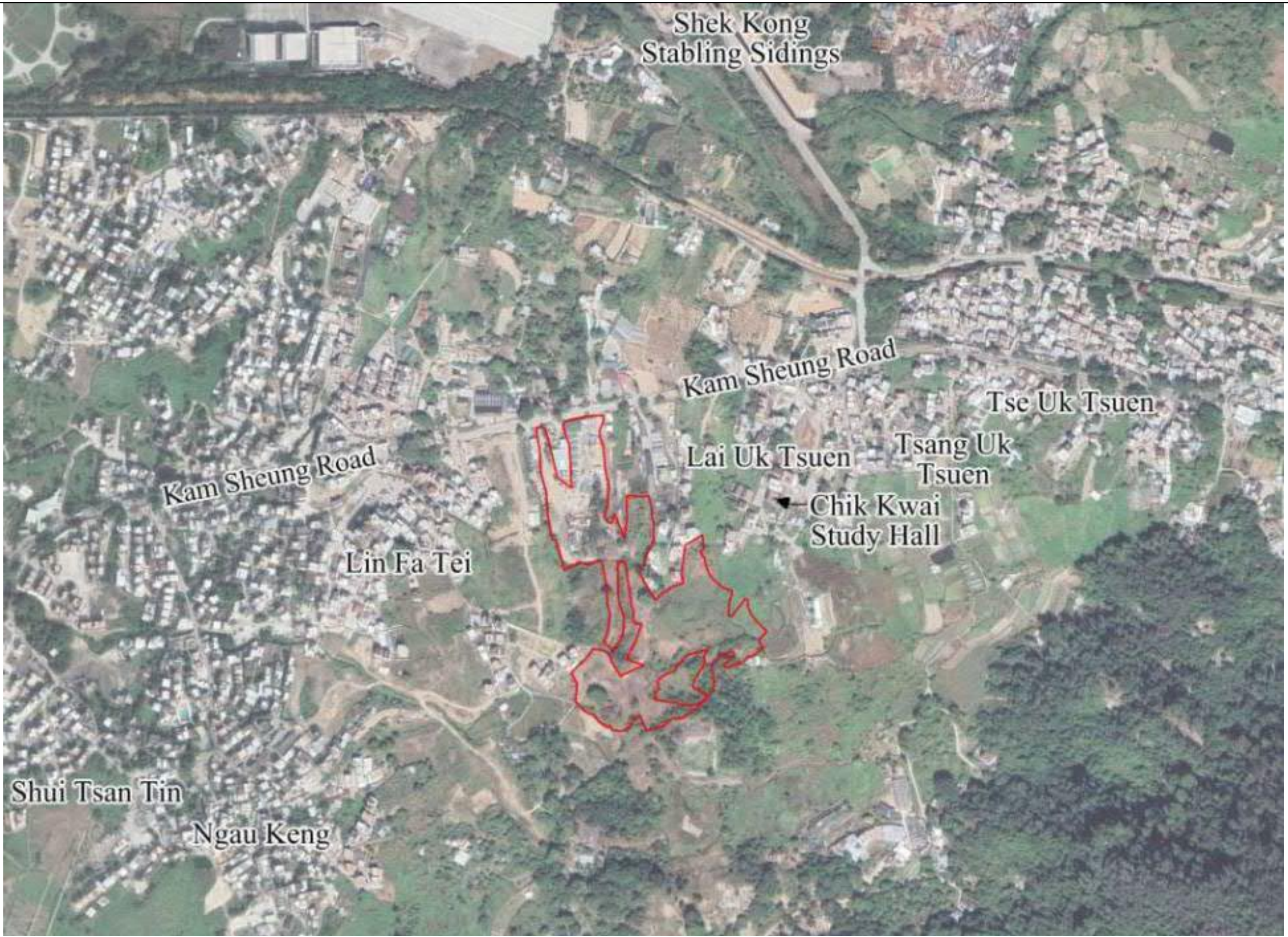

Figure:	1.1	RAMBOLL
Title:	Application Site and its Environs	Drawn by: SC Checked by: CC
Project:	Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories	Rev.: 1.0 Date: Aug 2022

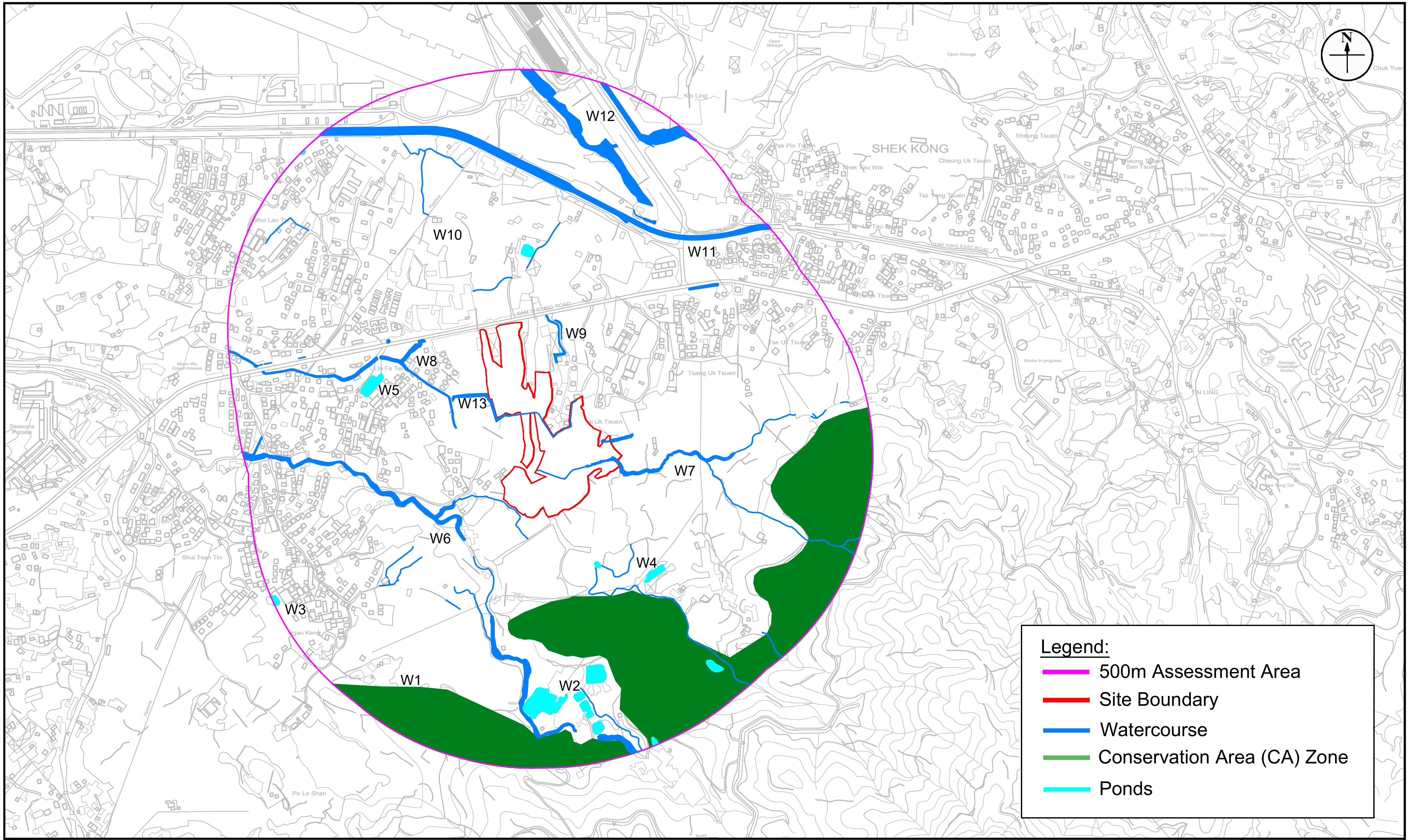

Figure: 2.1

Title: Water Sensitive Receivers

Project: Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

Drawn by:	SC
Checked by:	CC
Rev.:	1.2
Date:	May 2023

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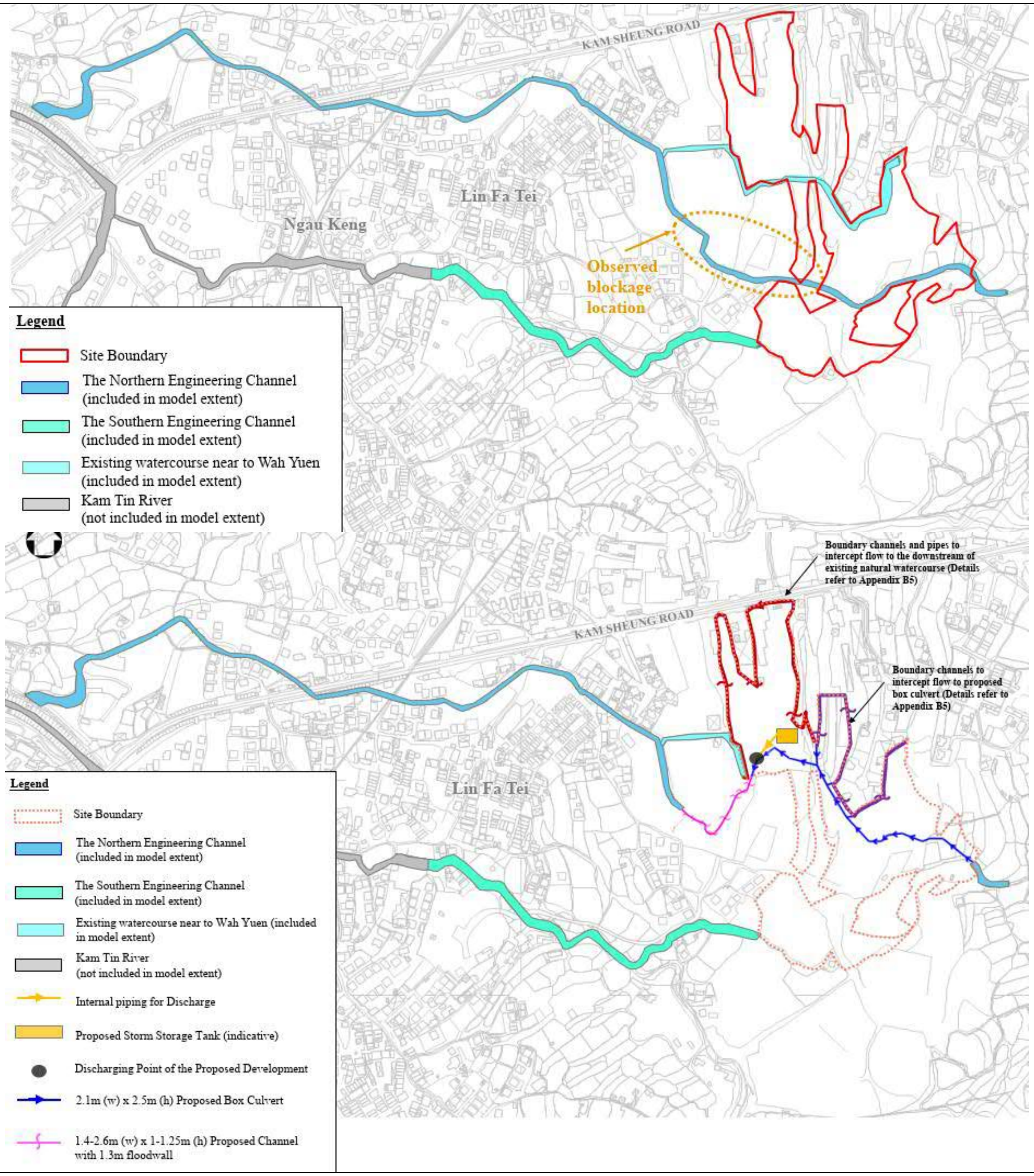


Figure: 2.2

Title: Existing and Proposed Drainage System without DSD Planned Improvement Works

Project: Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

RAMBOLL

Drawn by: SC
Checked by: CC
Rev.: 1.0
Date: Aug 2022

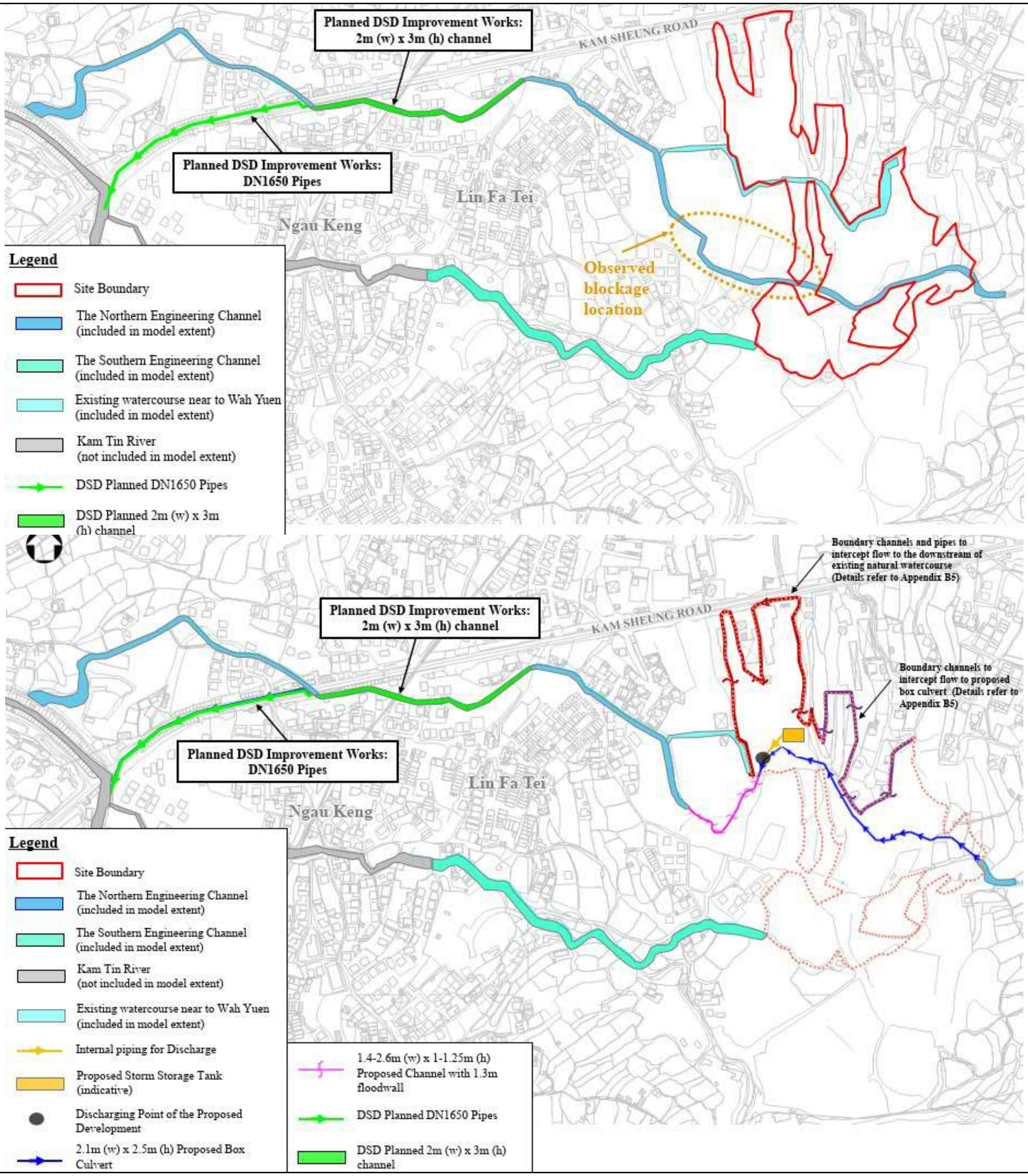


Figure: 2.3

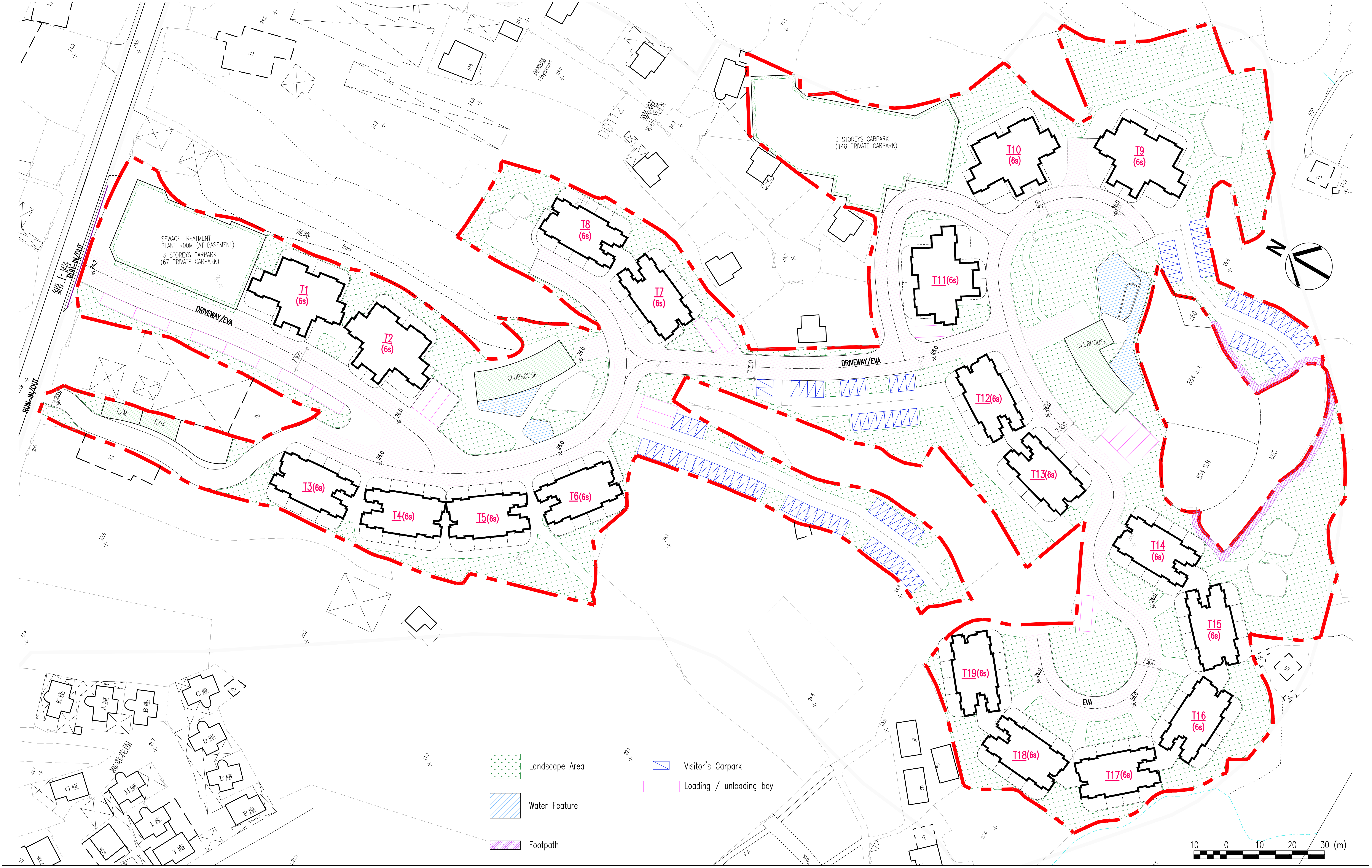
Title: Existing and Proposed Drainage System with DSD Planned Improvement Works

Project: Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

RAMBOLL

Drawn by: SC
Checked by: CC
Rev.: 1.0
Date: Aug 2022

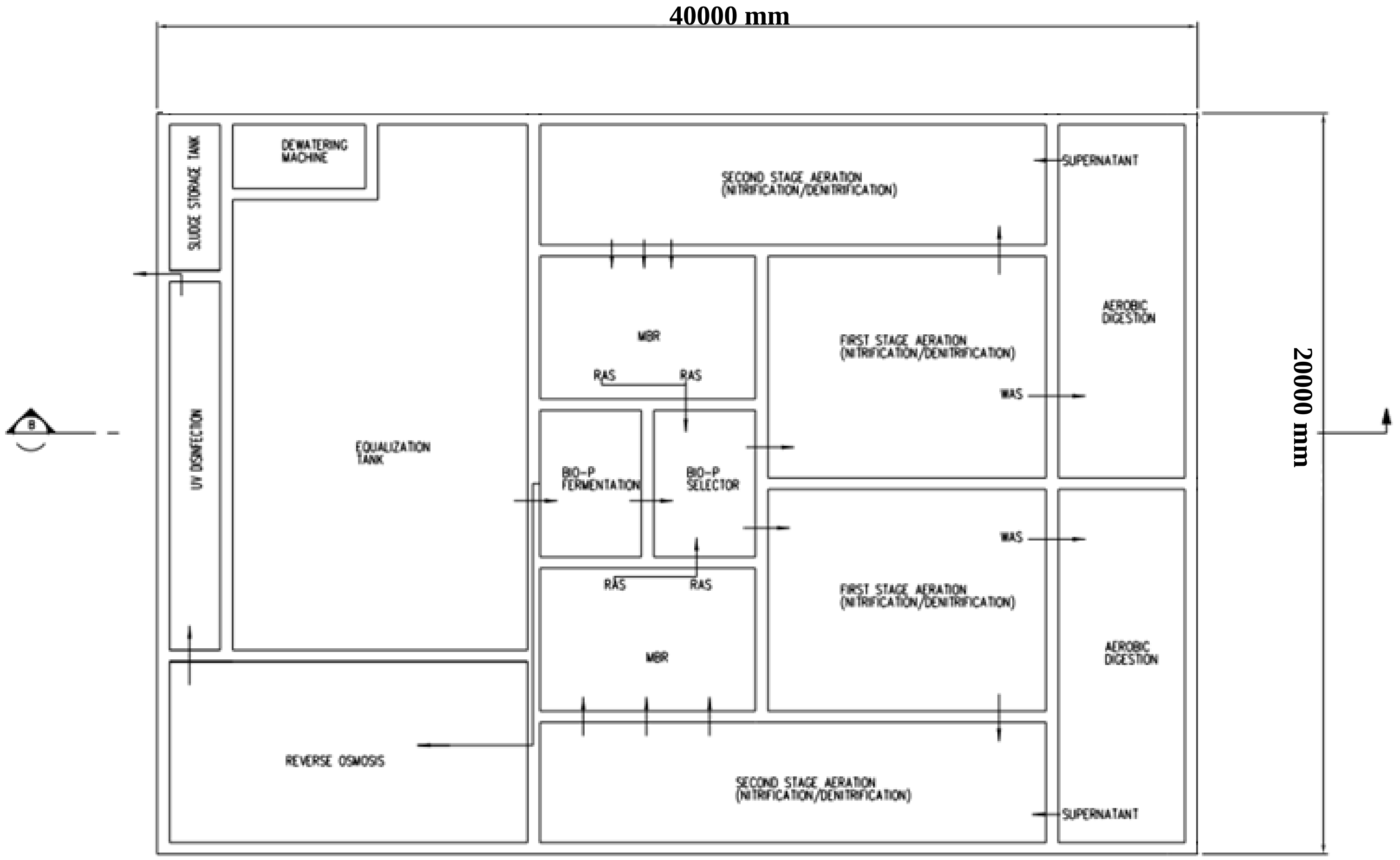
Appendix 1.1 Master Layout Plan of the Proposed Development



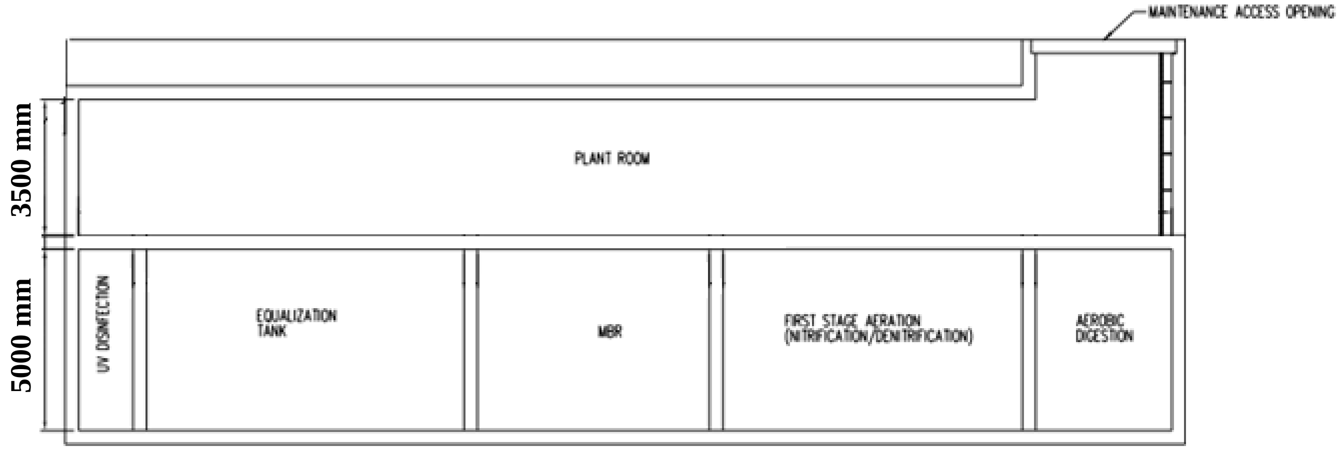
Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone
For Proposed Residential Development at Various Lots and Adjoining Government Land
in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

INDICATIVE MASTER LAYOUT PLAN (1:1000)

Appendix 2.1 Indicative Process Flow Diagram for Onsite Sewage Treatment Plant (Extracted from SIA Report)



SEWAGE TREATMENT PLANT UNDERGROUND TANK LAYOUT



SECTION B-B

Project Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development At Various Lots and Adjoining Government Land, in D.D. 112 Kam Sheung Road, Shek Kong, Yuen Long, New Territories

Title Schematic Layout Plan of the Proposed Tertiary Sewerage Treatment Plant

Date Jan 2022 **Scale** N.T.S. **File**

MOTT MACDONALD

Appendix C

Appendix 11

Land Contamination Assessment

Report No: 22458-C1

PROPOSED REZONING FROM “RESIDENTIAL (GROUP D)” TO “RESIDENTIAL (GROUP C)” ZONE FOR PROPOSED RESIDENTIAL DEVELOPMENT AT VARIOUS LOTS AND ADJOINING GOVERNMENT LAND IN D.D.112, KAM SHEUNG ROAD, SHEK KONG, YUEN LONG, NEW TERRITORIES

LAND CONTAMINATION ASSESSMENT

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JUNE 2022

WHA

Westwood Hong & Associates Ltd

DOCUMENT VERIFICATION

Page 1 of 1

JOB TITLE: Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development at Various Lots in D.D.112 and Adjoining Government Land, Kam Sheung Road, Shek Kong, Yuen Long, NT

JOB NO: 22458

REPORT TITLE: Land Contamination Assessment

REPORT NO: 22458-C1

Revision	Date	Filename	22458-C1.doc		
1st issue	29-Jun-22	**Description**	Land contamination assessment for the proposed Development		
			Prepared by	**Checked by**	**Approved by**
		Name	Samuel Lee / Kit Wong	Kit Wong / Ir K K Iu	Ir K K Iu
		Signature	SL K	K KK	

Revision	Date	Filename			
		Description			
			Prepared by	**Checked by**	**Approved by**
		Name			
		Signature			

Revision	Date	Filename			
		Description			
			Prepared by	**Checked by**	**Approved by**
		Name			
		Signature			

CONTENTS

1. INTRODUCTION

1.1 Westwood Hong & Associates Ltd (WHA) was commissioned to conduct a Land Contamination Assessment on the proposed residential development at Various Lots in DD112 on Kam Sheung Road, Shek Kong, Yuen Long (the “proposed Development”). The location of the proposed Development is provided in Figure 1.

2. GUIDELINES AND EVALUATION CRITERIA

2.1 This assessment was prepared in accordance with the following guidelines:-

- The Guidance Manual for Use of Risk-Based Remediation Goals (RBRGs) for Contaminated Land Management, EPD, 2007 (“Guidance Manual”);
- The Guidance Note for Contaminated Land Assessment and Remediation, EPD, 2007 (“Guidance Note”); and
- Practice Guide for Investigation and Remediation of Contaminated Land, EPD, 2011 (“Practice Guide”).

3. BUILDING LAYOUT

Development Layout

3.1 The proposed Development comprises nineteen 6-storey low-rise blocks, two carports with 3-storey and two clubhouses. The building layouts are shown in Appendix 1.

4. SITE HISTORY

Past Site Condition / Activities

4.1 The total site area is about 41,290m^2. The site was developed from a farmland. According to the aerial photos, the project site had been used for agricultural purpose at least since 1972. The site became storage use during 1982 – 1995, and then became vacant during 2000 – 2005.

Present Site Condition / Activities

4.2 The majority of the project site is vacant and vegetated. The northern part of the project site was used as storage of construction material since 2010.

5. SITE APPRAISAL FINDINGS

5.1 The site appraisal comprises site walkover, review of historical aerial photographs and review of past and present site use.

Site Walkover Findings

5.2 A walkover of the project site was conducted on 17 November 2021. Site observations were summarised in Table 5.1. The photos taken on site are provided in Appendix 2.

Table 5.1 Site Observations

Type of Existing Business	Description of Site Walkover Findings	Off-site Property Affected
Landscape and Vegetation	The site had been used for agricultural purpose at least since 1972. It became storage use during 1982 – 1995 and then became vacant during 2000 – 2005. From 2010, majority of the project site is vacant and vegetated, the northern part of the site was used as storage of construction material. At the time of the site appraisal, the northern part of the site was used as storage of construction material (i.e. Ever Fortune Trading Ltd.), storage of concrete box and cement were observed. The site was used as storage only, no industrial activities were carried out. No potential contamination issue was identified and no underground facilities and transformer were observed. No signs of chemical spills / oil stains were observed. The remaining parts of the project site are vacant and vegetated with some shrubs and trees. The site located to the north is Kam Sheung Road, to the east is the village houses and landscape area, to the south and west are landscape area also. These buildings / areas would not have off-site contamination affecting the site.	No

Review of Past Land Uses

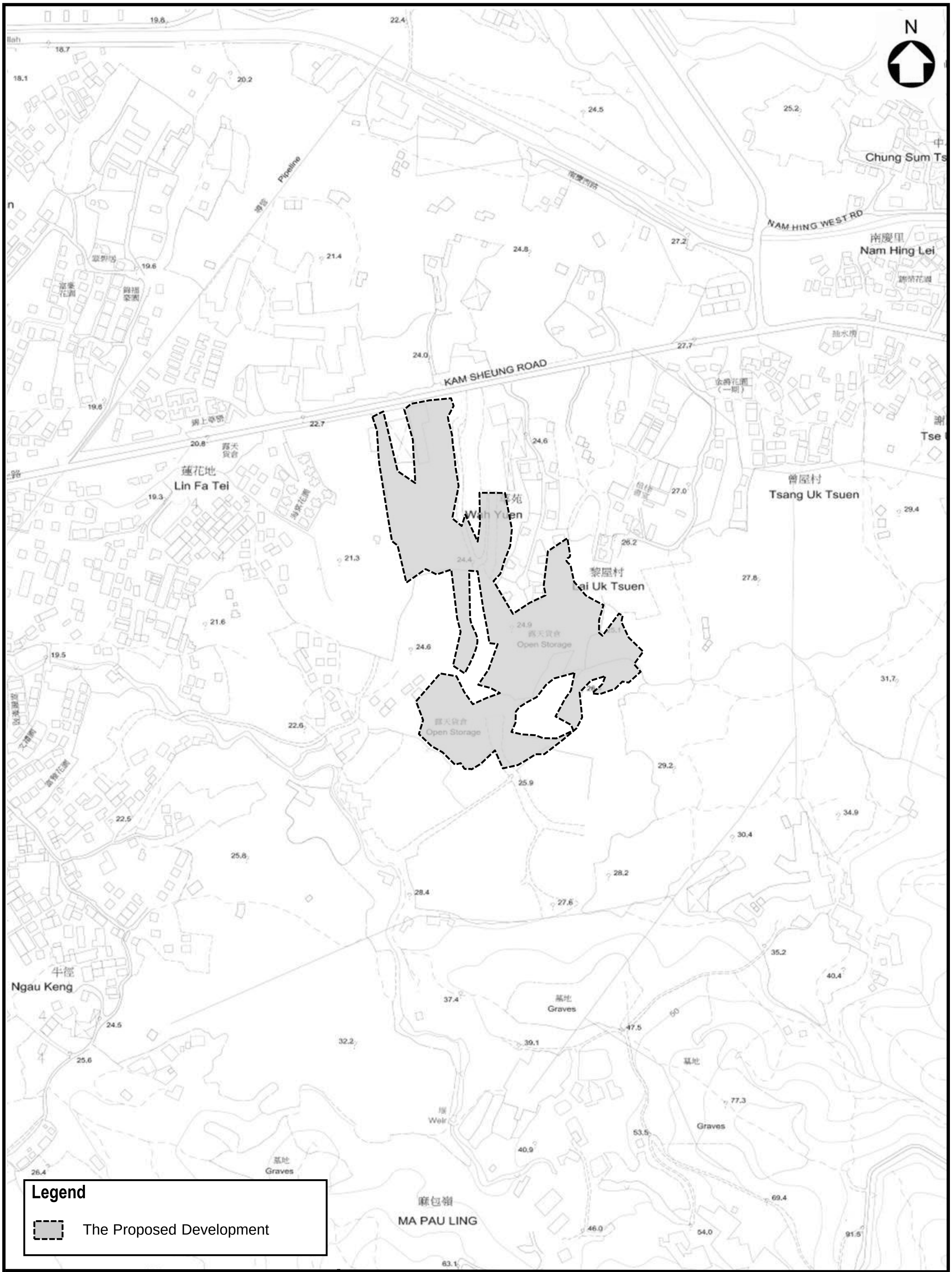
5.3 A review of past land uses of the project site was conducted by reviewing the aerial photographs. The aerial photographs were obtained from the Surveys and Mapping Office of the Lands Department. The referenced aerial photographs are attached in Appendix 3 and summarized in Table 5.2.

Table 5.2 Land Use History for the Project Site

Date	Ref. no	Height (ft)	Land Use
1972	1972-01894	2200	The project site appears to be vegetation and farmland.
1982	1982-42992	4000	The village houses adjoining the western site boundary were developed. The vegetation at the northern part of the project site were removed and some temporary structures were established.
1984	1984-57357	4000	More temporary structures were established at the northern part of the project site, which appears to be used as storage of containers.
1987	A09329	4000	The northern part of the project site appears to be used as storage of containers.
1990	A22964	2000	The whole project site appears to be used as open storage.
1995	CN09423	3000	No significant changes were noted to the uses of the project site. The whole project site appears to be used as open storage.
2000	CN28017	3500	Most of the temporary structures were removed within the project site. The project site appears to be vacant.
2005	CW67815	4000	The project site became vegetated and appears to be vacant.
2010	CW86218	2000	The northern side of the site were temporally used as storage of construction material. Other sides of the site were vegetated.
2021	E131159C	6900	No significant changes were noted to the uses of the project site.

6. LAND CONTAMINATION ASSESSMENT

6.1 Potential land contamination impacts associated with the project site have been reviewed. Based on the observation from the site inspection and the review of historical aerial photographs, the project site was mainly vacant and vegetated. The northern part of the project site was temporally used as storage of construction material and there was no sign of contamination observed during site inspection. However, the project site was previously used as open storage during year 1990 to 1995 which may involve potentially polluting activities. A detailed land contamination assessment will be carried out in the later stage to identify the needs of Contamination Assessment Plan and / or Site Investigation to determine the presence and extent of contamination on site.



Westwood Hong & Associates Ltd

PROJECT: 22458

Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

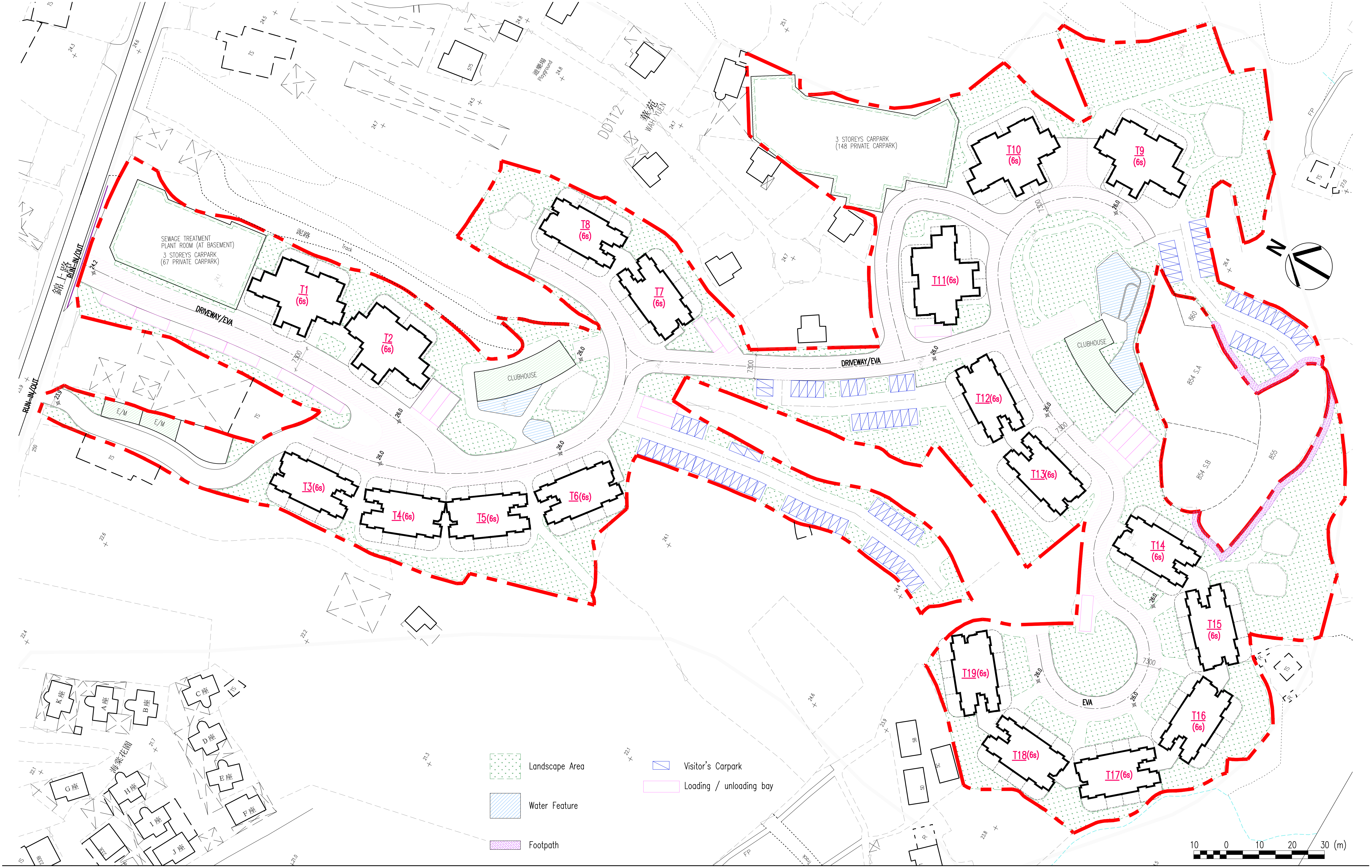
Site Location

FIGURE

1

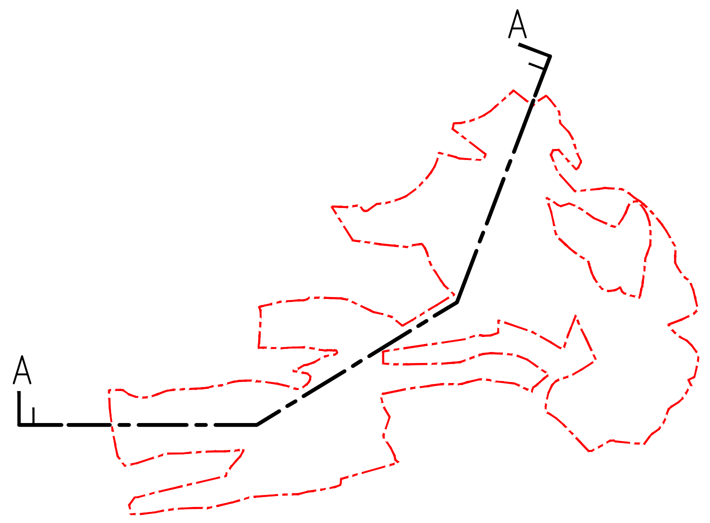
APPENDIX 1

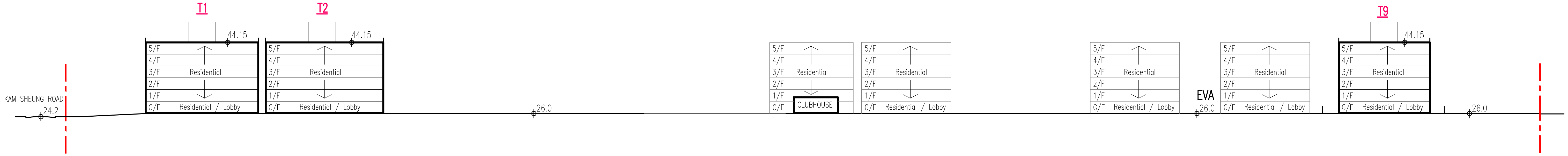
ARCHITECTURAL DRAWING



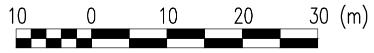
Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone
For Proposed Residential Development at Various Lots and Adjoining Government Land
in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

INDICATIVE MASTER LAYOUT PLAN (1:1000)





SECTION A

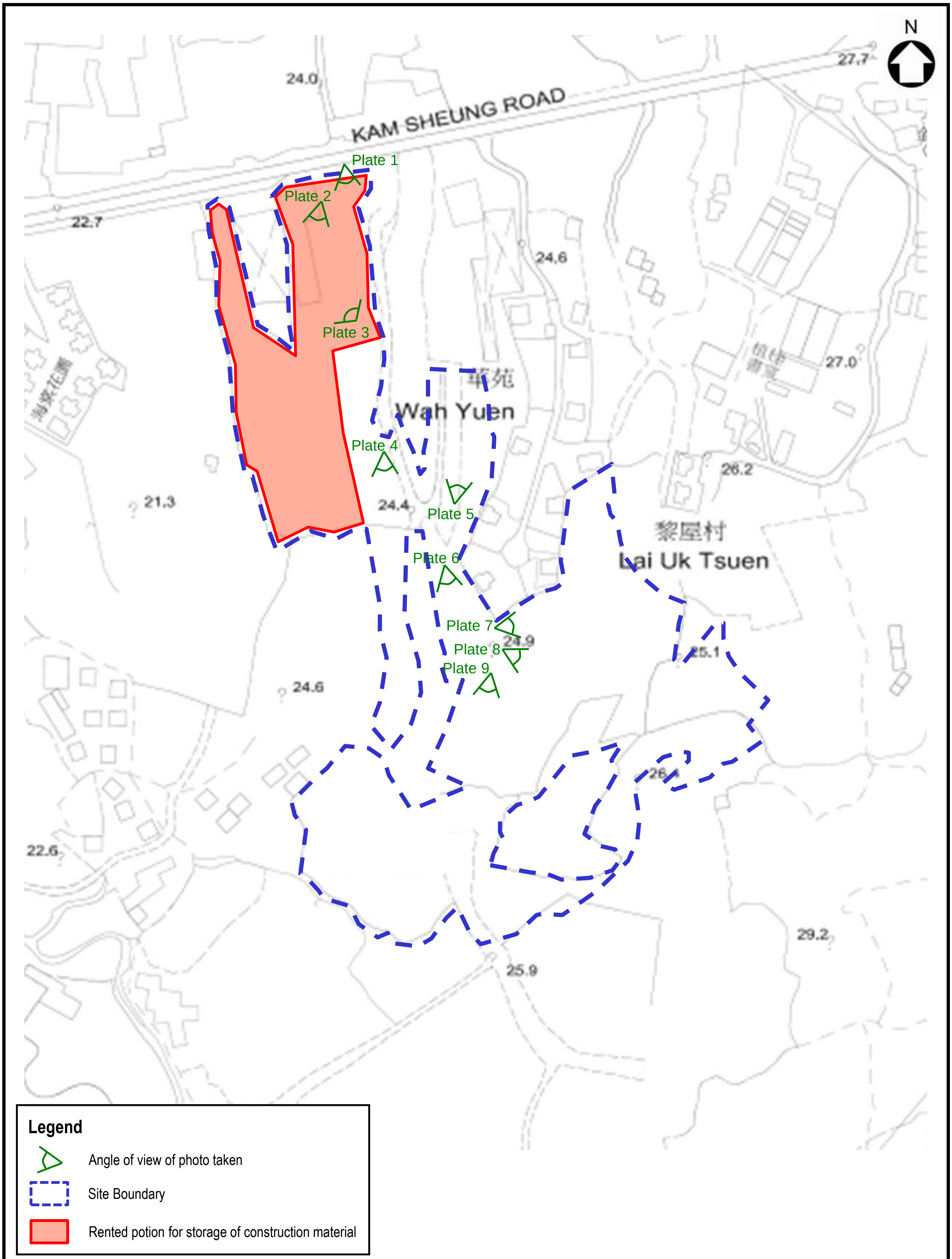


Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone
For Proposed Residential Development at Various Lots and Adjoining Government Land
in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

INDICATIVE SCHEMATIC SECTION (1:1000)

APPENDIX 2

PHOTOGRAPHS TAKEN ON SITE



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PROJECT: 22458

Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Key for Photographs taken on Site

FIGURE

A2

Plate 1 – Photo taken on 17th November 2021 (for storage use)**:**

Observation:
Storage of concrete box and cement were observed, no industrial activities were carried out. No sign of contamination.

Plate 2 – Photo taken on 17th November 2021 (for storage use)**:**

Observation:
Storage of concrete box and cement were observed, no industrial activities were carried out. No sign of contamination.
.

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Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Photographs taken on Site (Plates 1 & 2)

FIGURE

A2-1

Plate 3 – Photo taken on 17th June 2022 (for storage use)**:**

Observation:
Storage of concrete box and cement were observed, no industrial activities were carried out.
No sign of contamination.

Plate 4 – Photo taken on 17th November 2021:

Observation:
Vegetated, in clean condition. No sign of contamination.

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Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Photographs taken on Site (Plates 3 & 4)

FIGURE

A2-2

Plate 5 – Photo taken on 17th November 2021:

Observation: Vegetated, in clean condition. No sign of contamination.

Plate 6 – Photo taken on 17th November 2021:

Observation: Vegetated, in clean condition. No sign of contamination.

.

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Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Photographs taken on Site (Plates 5 & 6)

FIGURE

A2-3

Plate 7 – Photo taken on 17th November 2021:

Observation:
Vegetated, in clean condition. No sign of contamination.
.

Plate 8 – Photo taken on 17th November 2021:

Observation:
Vegetated, in clean condition. No sign of contamination.

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Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Photographs taken on Site (Plates 7 & 8)

FIGURE

A2-4

Plate 9 – Photo taken on 17th November 2021:

Observation: Vegetated, in clean condition. No sign of contamination.

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Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Photographs taken on Site (Plate 9)

FIGURE

A2-5

APPENDIX 3

REFERENCED AERIAL PHOTOGRAPHS

Year 1972 (ref: 1972-01894, height: 2200ft) –The project site appears to be vegetation and farmland.

N

Legend

🟥 The Project Site

Westwood Hong & Associates Ltd

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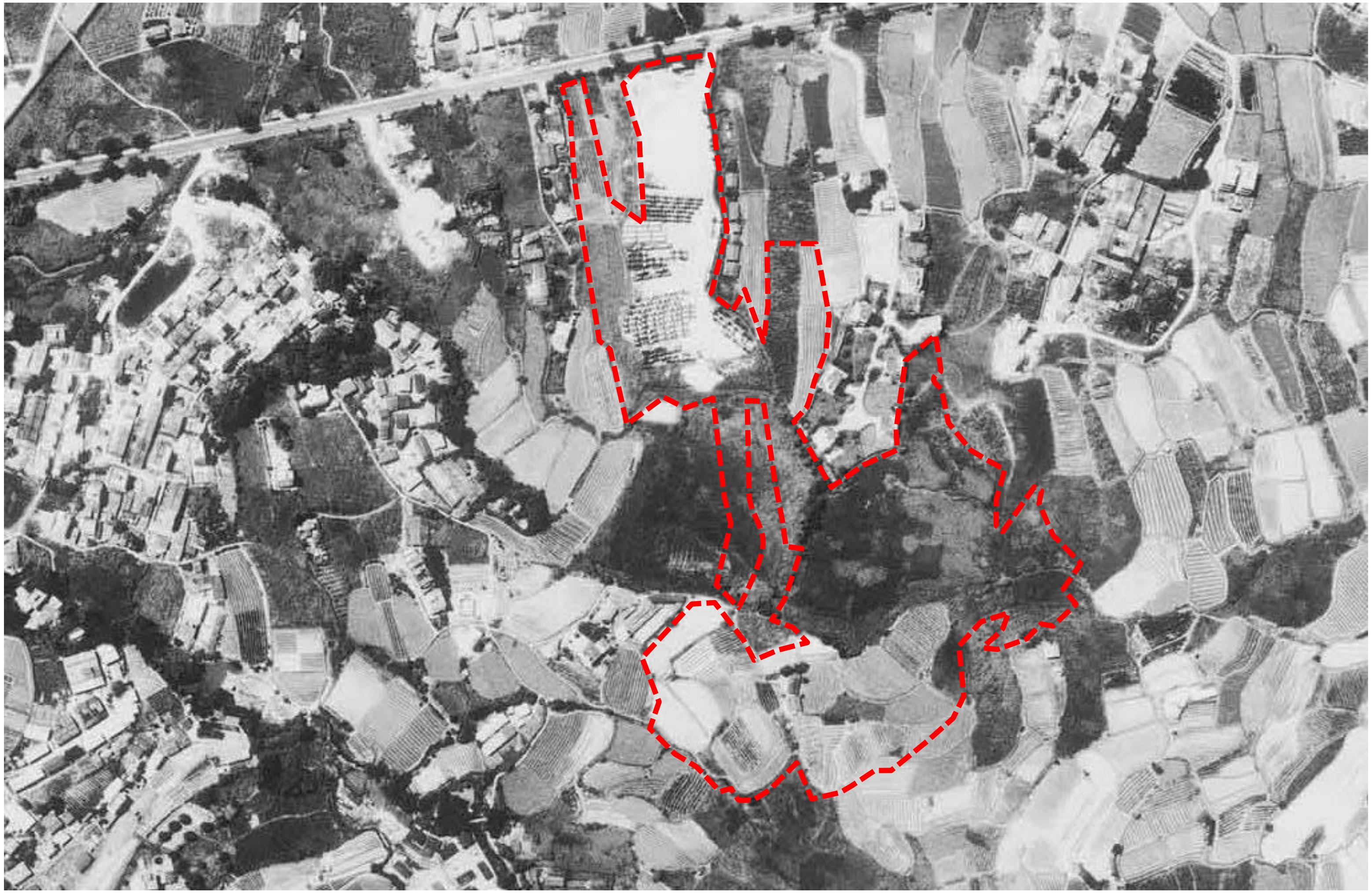
Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Referenced Aerial Photographs

FIGURE

A3-1



Year 1982 (ref: 1982-42992, height: 4000ft) – The village houses adjoining the western site boundary were developed. The vegetation at the northern part of the project site were removed and some temporary structures were established.

N

Legend

🟥 The Project Site

Westwood Hong & Associates Ltd

PROJECT: 22458

Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Referenced Aerial Photographs

FIGURE

A3-2

Year 1984 (ref: 1984-57357, height: 4000ft) – More temporary structures were established at the northern part of the project site, which appears to be used as storage of containers.

N

Legend

🟥 The Project Site

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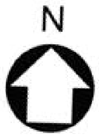
Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

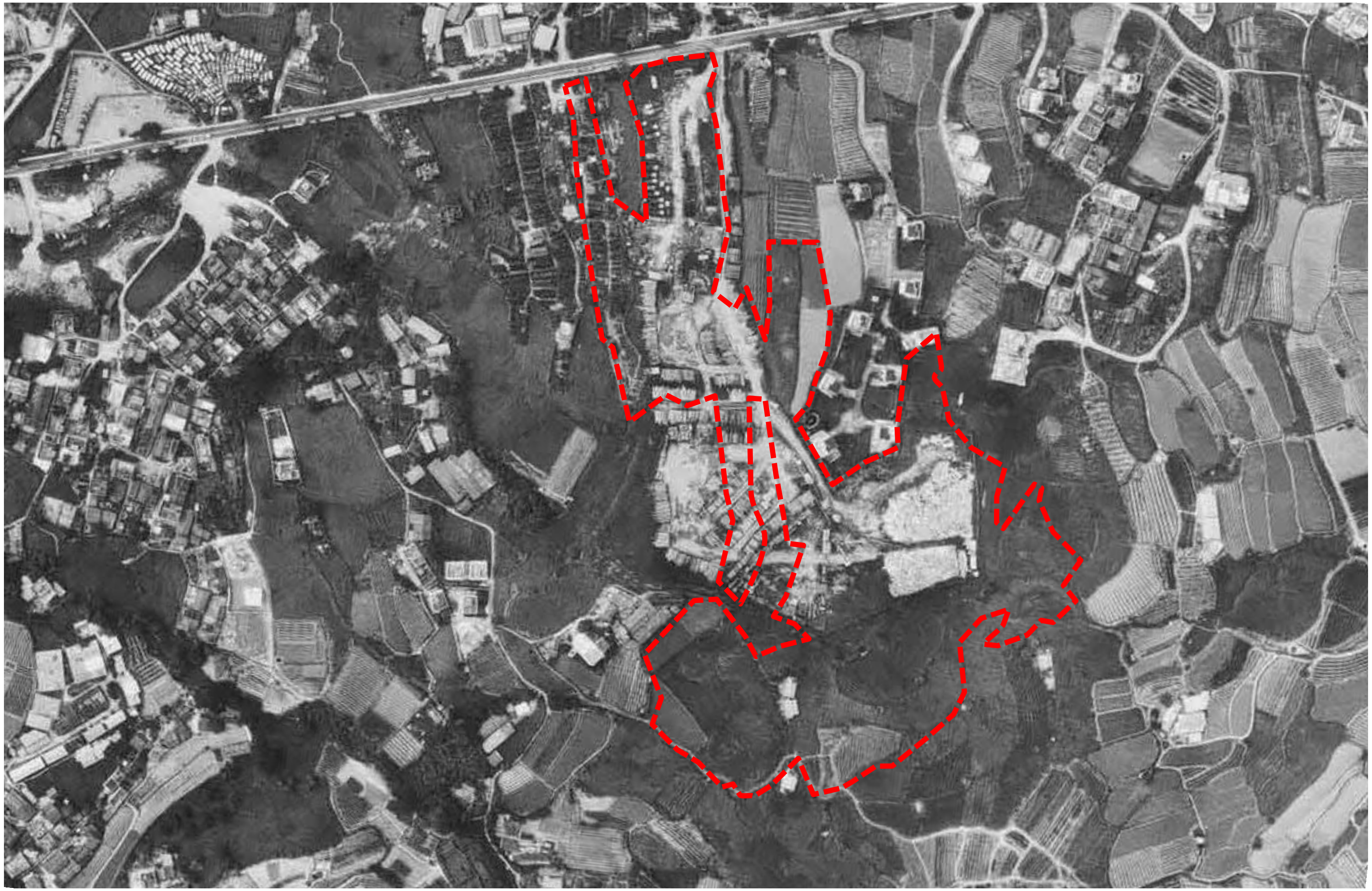
TITLE:

Referenced Aerial Photographs

FIGURE

A3-3





Year 1987 (ref: A09329, height: 4000ft) – The northern part of the project site appears to be used as storage of containers.

Legend

🟥 The Project Site

Westwood Hong & Associates Ltd

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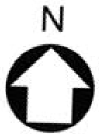
TITLE:

Referenced Aerial Photographs

FIGURE

A3-4



Year 1990 (ref: A22964, height: 2000ft) – The whole project site appears to be used as open storage.

Legend

🟥 The Project Site

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PROJECT: 22458

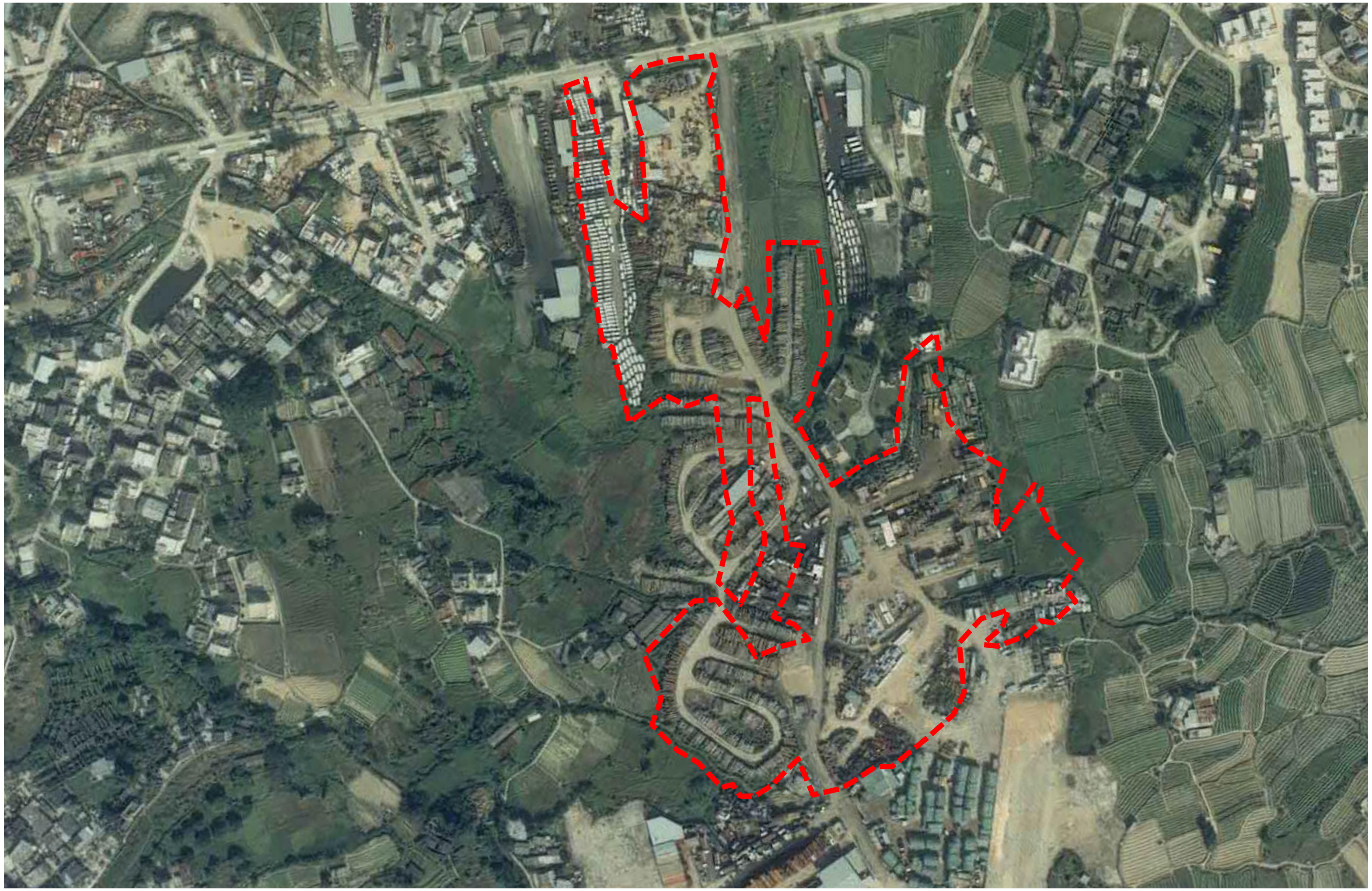
Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Referenced Aerial Photographs

FIGURE

A3-5



Year 1995 (ref: CN09423, height: 3000ft) – No significant changes were noted to the uses of the project site. The whole project site appears to be used as open storage.

Legend

🟥 The Project Site

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Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Referenced Aerial Photographs

FIGURE

A3-6

Year 2000 (ref: CN28017, height: 3500ft) – Most of the temporary structures were removed within the project site. The project site appears to be vacant.

Legend

🟥 The Project Site

Westwood Hong & Associates Ltd

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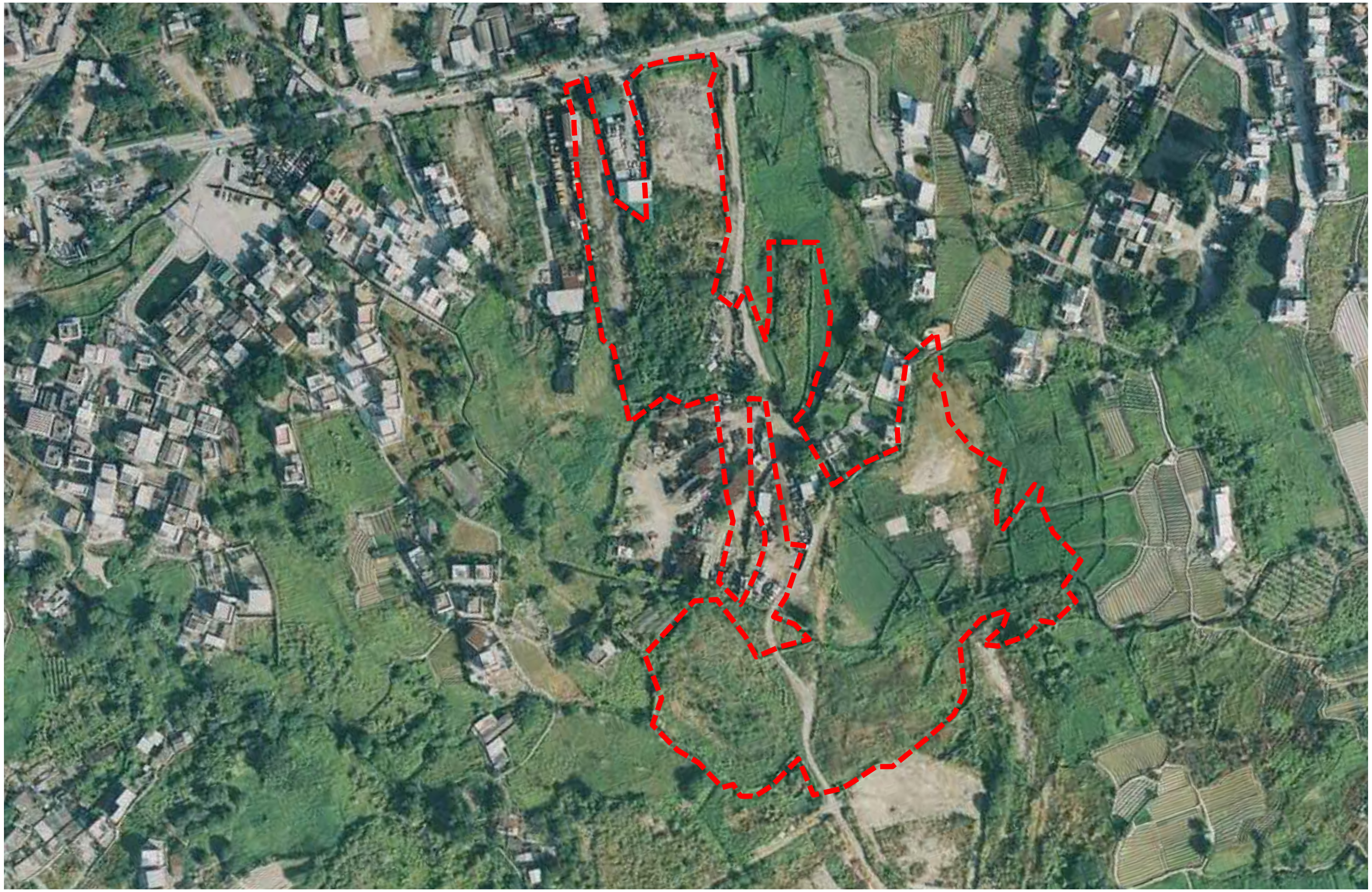
Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Referenced Aerial Photographs

FIGURE

A3-7



Year 2005 (ref: CW67815, height: 4000ft) – The project site became vegetated and appears to be vacant.

N

Legend

▭ The Project Site

Westwood Hong & Associates Ltd

PROJECT: 22458

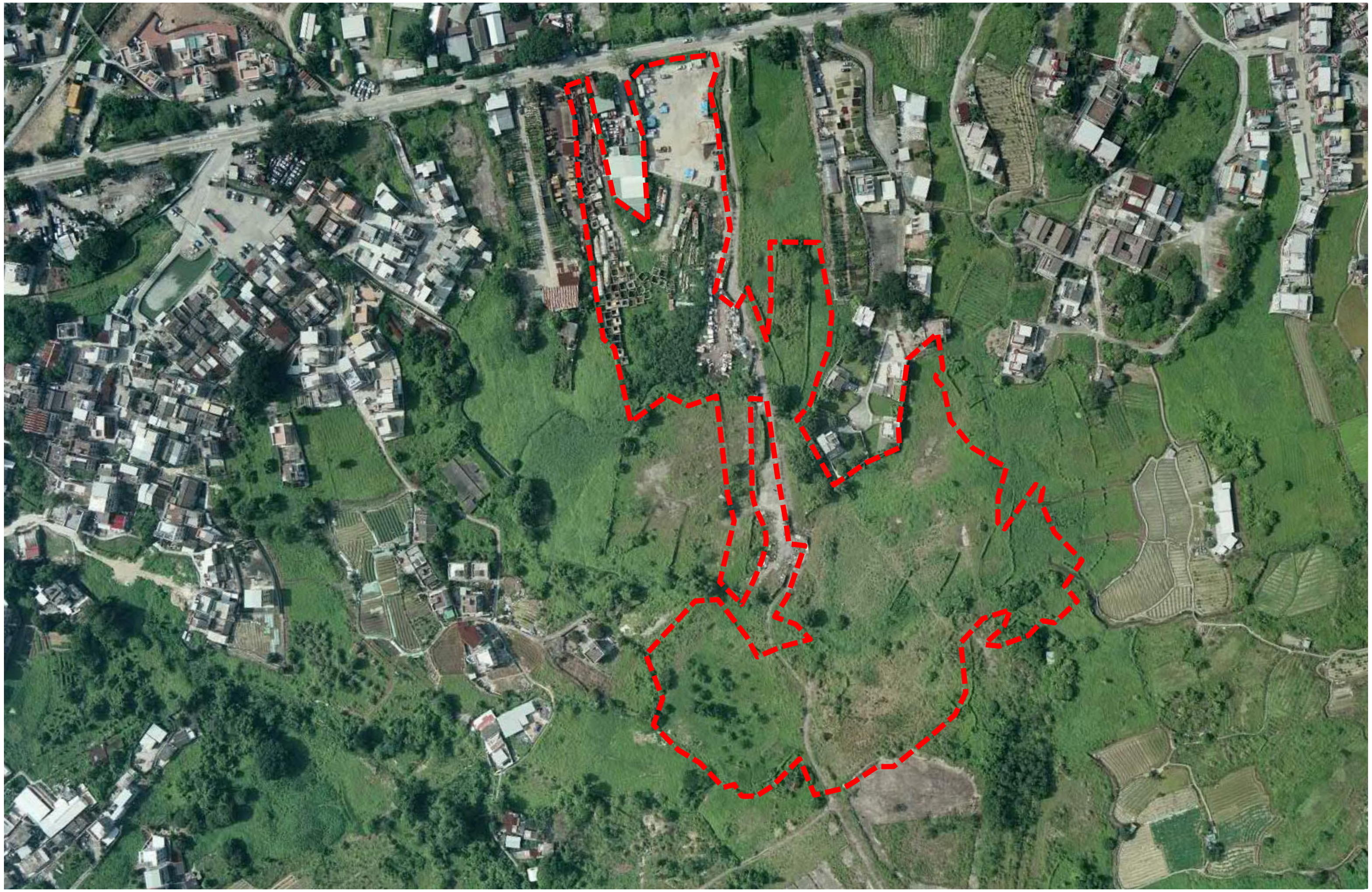
Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Referenced Aerial Photographs

FIGURE

A3-8



Year 2010 (ref: CW86218, height: 2000ft) – The northern side of the site were temporally used as storage of construction material. Other sides of the site were vegetated.

Legend

▭ The Project Site

Westwood Hong & Associates Ltd

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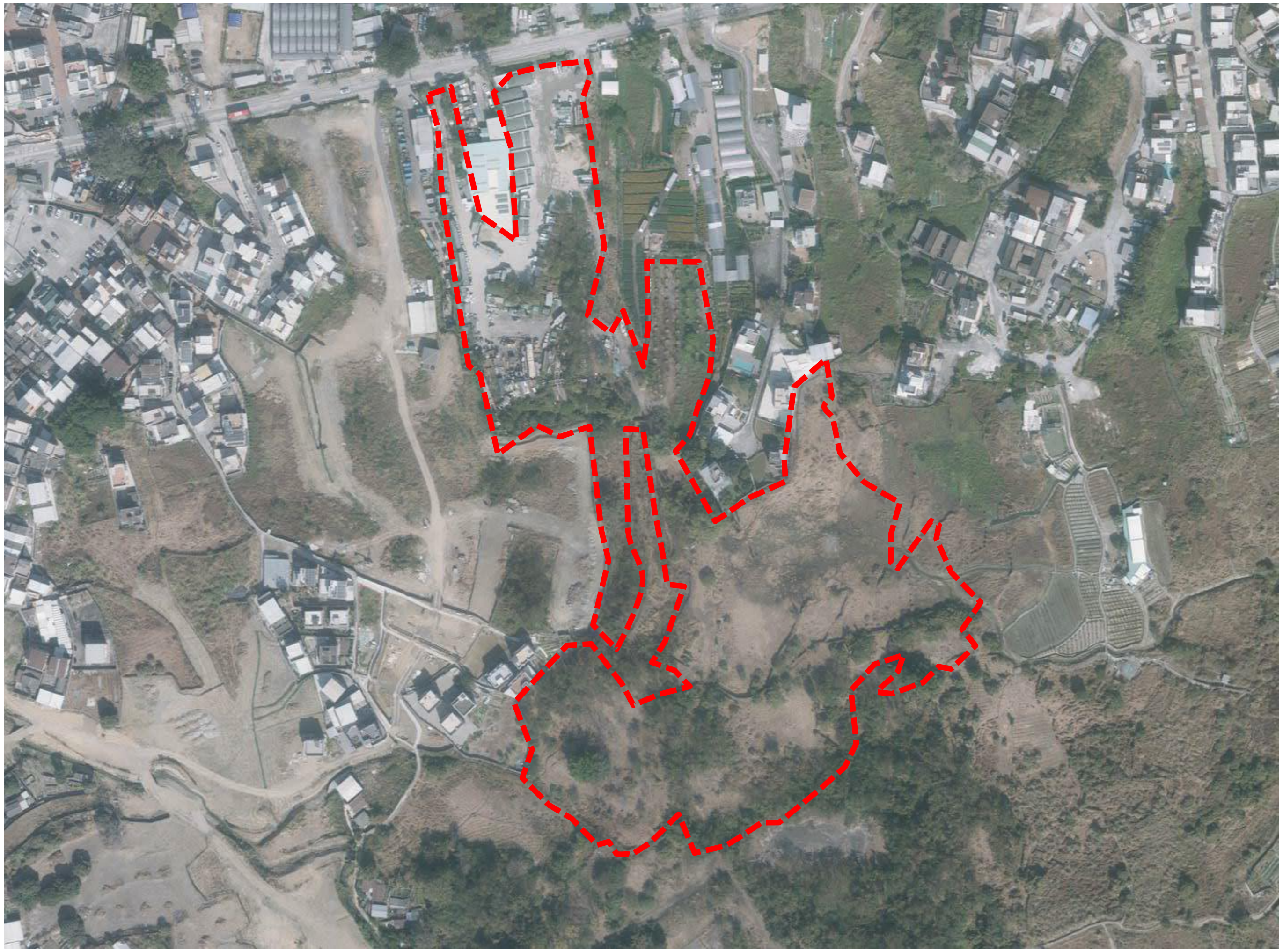
Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

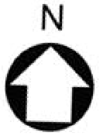
Referenced Aerial Photographs

FIGURE

A3-9



Year 2021 (ref: E131159C, height: 6900ft) – No significant changes were noted to the uses of the project site.



Legend

🟥 The Project Site

Westwood Hong & Associates Ltd

PROJECT: 22458

Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Referenced Aerial Photographs

FIGURE

A3-10

Appendix 12

Waste Management Report

Report No: 22458-W1

PROPOSED REZONING FROM "RESIDENTIAL (GROUP D)" TO "RESIDENTIAL (GROUP C)" ZONE FOR PROPOSED RESIDENTIAL DEVELOPMENT AT VARIOUS LOTS AND ADJOINING GOVERNMENT LAND IN D.D.112, KAM SHEUNG ROAD, SHEK KONG, YUEN LONG, NEW TERRITORIES

WASTE MANAGEMENT

Prepared by:

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Ms Kit Wong	BEng, MHKIEIA
Mr Samuel Lee	BSc

JUNE 2022

WHA

Westwood Hong & Associates Ltd

DOCUMENT VERIFICATION

Page 1 of 1

JOB TITLE:	**Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development at Various Lots in D.D.112 and Adjoining Government Land, Kam Sheung Road, Shek Kong, Yuen Long, NT**	**JOB NO:**	**22458**
REPORT TITLE:	**Waste Assessment**		
REPORT NO:	**22458-W1**		

Revision	**Date**	**Filename**	22458-W1.doc		
1st issue	29-Jun-22	**Description**	Waste assessment for the proposed Development		
			Prepared by	**Checked by**	**Approved by**
		Name	Samuel Lee / Kit Wong	Kit Wong / Ir K K Iu	Ir K K Iu
		Signature	SL		

Revision	**Date**	**Filename**			
		Description			
			Prepared by	**Checked by**	**Approved by**
		Name			
		Signature			

Revision	**Date**	**Filename**			
		Description			
			Prepared by	**Checked by**	**Approved by**
		Name			
		Signature			

1. INTRODUCTION

1.1 Westwood Hong & Associates Ltd (WHA) was commissioned to conduct a Waste Assessment on the proposed residential development at Various Lots in DD112 on Kam Sheung Road, Shek Kong, Yuen Long (the “proposed Development”).

1.2 This report identifies the key waste management issues arising during construction and operation phase of the proposed Development. The major wastes would be construction and demolition (C&D) materials generated from site foundation and superstructure construction works. For wastes arising during operation phase of the proposed development would be mainly municipal wastes. Mitigation measures and good site practice, including waste handling, storage and disposal, are recommended with reference to the applicable legislation and guidelines.

2. STATUTORY LEGISLATION

2.1 Waste collection and disposal are covered by the Waste Disposal Ordinance (Cap. 354) (WDO). Under the WDO, wastes can only be disposed of at designated waste disposal facilities licensed by EPD. The WDO also stipulates the requirements for issuing licenses for the collection and transportation of wastes. The contractor would be responsible for the disposal of waste.

2.2 The following legislation relates to the handling, treatment and disposal of wastes in the Hong Kong SAR and has been used in assessing potential environmental impacts:

- Waste Disposal Ordinance (Cap. 354)
- Waste Disposal (Chemical Waste) (General) Regulation (Cap. 354C)
- Land (Miscellaneous Provisions) Ordinance (Cap. 28)
- Public Health and Municipal Services Ordinance (Cap. 132) – Public Cleansing and Prevention of Nuisances Regulation

2.3 Table 2.1 summarises other documents and guidelines related to waste management and disposal that will be followed by the proposed Development:-

Table 2.1 Other Relevant Documents and Guidelines to be Followed

Bureau / Department	Documents / Guidelines / Technical Circulars
EPD	• Waste Disposal Plan for Hong Kong (December 1989) • Waste Reduction Framework Plan, 1998 to 2008 • A Policy Framework for Management of Municipal Solid Waste (2005-2014), (December 2005) • Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes (1992)
EPD / CEDD	• New Disposal Arrangements for Construction Waste (1992)
PlanD	• Environmental Guidelines for Planning in Hong Kong (2014), Hong Kong Planning Standards and Guidelines
Buildings Department	• ADV-19

3. POTENTIAL IMPACTS AND MITIGATION MEASURES DURING CONSTRUCTION PHASE

Quantity of Waste

3.1 Since there is no structure at the project site and no basement area is proposed, no demolition and excavation works would be involved for the proposed development. The construction works of the proposed development mainly include site foundation works and superstructure construction.

3.2 Construction & Demolition (C&D) materials generated from the construction of the proposed development which comprise inert and non-inert C&D materials. The inert portion, such as soil, rock, concrete etc, namely inert C&D materials, could be reused on-site as filling materials or off-site as public fill at public fill reception facilities. The non-inert portion, such as timber formwork, paper, vegetation, etc, namely non-inert C&D materials will be reused or recycled as far as possible prior to disposal at landfill, and landfill disposal will be considered as the last resort for waste handling.

3.3 The estimated quantity of C&D materials for foundation works and superstructure construction are provided in Table 3.1.

Table 3.1 Estimated Quantity of Waste to be Generated

Development Stage	**Waste Type**	**Total Amount Generated** (m^3)	**Total Amount Reused On-site** (m^3)	**Total Amount Disposed** (m^3)	**Recommended Outlets**
Site Foundation Work	Inert C&D Material [1]	963	963	-	To be reused on-site for site formation
	Non-Inert C&D Materials	73	51	22	To be reused on-site for site formation. Remaining to be disposed to NENT Landfill
Superstructure Construction [2]	Inert C&D Material [1]	2247	2247	-	To be reused on-site for site formation
	Non-Inert C&D Materials	169	118	51	To be reused on-site for site formation. Remaining to be disposed to NENT Landfill

Development Stage	**Waste Type**	**Total Amount Generated** (m^3)	**Total Amount Reused off-site** (m^3)	**Total Amount Disposed** (m^3)	**Recommended Outlets**
General Refuse from Workforce	-	110 tons [3]	5 tons	105 tons	To be disposed to NENT Landfill. And the reused part to be collected by recycler.
Chemical Waste	-	A few hundred kilograms / litres per month	-	A few hundred kilograms / litres per month	To be collected by a licensed chemical waste collector and disposed of at a licensed chemical waste treatment and disposal facility.

Note:

[1] According to the Hong Kong Polytechnic (March 1993) Reduction of Construction Waste Final Report, waste generation rate is $0.1m^3$ per $1m^2$ of GFA constructed. The total GFA of the proposed Development is $34,519m^2$, there would be $3,451.9m^3$ total C&D materials generated.

[2] Wood from formworks and packaging is included in superstructure construction.

[3] It is assumed that the generation rate of general refuse is 0.65kg per worker per day. With approximately 130 workers and 1,300 construction days, there would be total 109,850kg general refuse generated throughout the construction period.

Construction & Demolition Waste

3.4 The reuse and recycling of C&D materials on-site will be maximized. Stockpiling areas of non-inert C&D materials on-site will be provided for subsequent backfilling and reuse on site. For topsoil, they would be reused for site formation and roadworks. For vegetation, felled trees, twigs and branches would be reused as much on-site as far as possible. The C&D materials to be reused on site would stockpile by enclosing and covering, particularly during inclement weather.

3.5 It is presently anticipated that some of the C&D materials will need to be transported off-site for re-use, recycling and disposal by trucks. With the implementation of the dust and noise control / mitigation measures, such as covering and stockpiling materials to avoid dust and other nuisance impacts from truck movements, these secondary environmental factors are not expected to be a concern.

3.6 Measures have been introduced in ADV-19 to enhance the management of C&D materials and to minimize its generation at source. The enhancement measures include the identification of opportunities to prevent waste during both the project planning and design stage as well as construction stage, and preparing of a Waste Management Plan (WMP) to ensure that measures are implemented during the construction stage for reduction of C&D materials. The WMP will be submitted to the Project Engineer / Architect / Authorized Persons for approval according to ADV-19.

3.7 A trip-ticket system according to the ADV-19 will be implemented during the construction phase to monitor the disposal of C&D materials and solid wastes at the public fill reception facilities and landfills and to control fly-tipping.

3.8 The Contractor will adopt good housekeeping practices such as waste segregation prior to disposal. Stockpiling and segregating areas will be provided at the site. Waste storage areas will be well maintained and cleaned regularly.

3.9 Whenever there are excess recyclable construction materials, including bricks, plastics and metals, re-use and recycling will be carried out for waste minimisation. Other recyclable inert C&D materials such as concrete, asphalt, etc. will be sorted and treated as necessary for on-site usage. Non-inert C&D materials will be sorted and delivered to or collected by registered recycle collectors for proper recycling of the waste. C&D materials will be stored on-site before re-use or disposal where possible. Available site area to allow on-site sorting and storage areas will be provided at locations away from public areas.

Chemical Waste

3.10 Chemical waste from maintenance and servicing of construction equipment/plant may be generated. If chemical waste is produced, the Contractor would be required to register with the EPD as a Chemical Waste Producer, and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.

3.11 Appropriate containers with proper labels should be used for storage of chemical wastes. Chemical wastes should be collected and delivered to designated outlet by a licensed collector. Chemical wastes (e.g. spent lubricant oil) should be recycled at an appropriate facility as far as possible, while the chemical wastes that cannot be recycled should be disposed of at either the Chemical Waste Treatment Centre (CWTC) at Tsing Yi, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.

3.12 Any unused chemicals or those with remaining functional capacity should be collected for reuse as far as possible.

General Refuse

3.13 General refuse such as food scraps, wastepaper, empty containers, etc would be generated from the workforce during construction phase. Such refuse will be properly managed so intentional or accidental release to the surrounding environment does not occur. Effective collection of site wastes would be required to prevent waste materials from being blown around by wind, flushed or leached into nearby waters, or creating an odour nuisance or pest and vermin problem. Waste storage areas will be well maintained and cleaned regularly. Table 3.1 shows the estimated quantity of general refuse from workforce to be generated during the construction phase. Recycling will be conducted for the general refuse prior to landfill disposal.

3.14 General refuse will be stored in enclosed bins or compaction units separate from C&D materials. A reputable waste collector will be employed by the Contractor to remove general refuse from the Site, separately from C&D materials. Preferably an enclosed and covered area will be provided to reduce the occurrence of "windblown" light materials.

3.15 With the implementation of the recommended waste management practices at the site, no adverse environmental impact arising from the storage, handling and transportation of refuse is anticipated.

4. POTENTIAL IMPACTS AND MITIGATION MEASURES DURING OPERATION PHASE

4.1 The major type of wastes generated from the operation phase is general refuse. General refuse will be removed on regular basis to minimize odour, pest and litter impacts. Recycling would be proposed prior to landfill disposal. To promote recycling of wastepaper, aluminum cans and plastic bottles, the recycling bins (such as those available from EPD) will be clearly labelled and placed at convenient locations. The recyclable materials will then be collected by reliable waste recycling agents on a regular basis. Waste generated will be disposed to public landfill, either West New Territories Landfill or North East New Territories Landfill.

4.2 Based on the Monitoring of Solid Waste in Hong Kong – Waste Statistics for 2020, the domestic waste generated per capita per day was 0.91 kg/per. The proposed Development consists of 19 low-rise blocks with domestic building height of 6 storeys. With a total of 850 residential units, the estimated overall population intake in the proposed Development will be around 2,380 persons. The estimated quantities of general refuse anticipated during the operation phase will be 2,166 kg/day. Clinical waste and chemical waste would be anticipated from the proposed social welfare facilities, these wastes would be collected by a licensed collector.

5. CONCLUSION

5.1 With the implementation of control measures in Sections 3 and 4, adverse waste management implication is not anticipated during construction and operation phases.

Appendix 13

Air Quality Impact Assessment

Report No: 22458-A1 Rev A

PROPOSED REZONING FROM "RESIDENTIAL (GROUP D)" TO "RESIDENTIAL (GROUP C)" ZONE FOR PROPOSED RESIDENTIAL DEVELOPMENT AT VARIOUS LOTS AND ADJOINING GOVERNMENT LAND IN D.D.112, KAM SHEUNG ROAD, SHEK KONG, YUEN LONG, NEW TERRITORIES

ENVIRONMENTAL AIR QUALITY IMPACT ASSESSMENT REPORT

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WHA

AUGUST 2022

DOCUMENT VERIFICATION

JOB TITLE: Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development at Various Lots in D.D.112 and Adjoining Government Land, Kam Sheung Road, Shek Kong, Yuen Long, NT

JOB NO: 22458

REPORT TITLE: Environmental Air Quality Impact Assessment Report

REPORT NO: 22458-A1 Rev A

Revision	**Date**	**Filename**	22458-A1.doc		
1st issue	29-Jun-22	**Description**	Air quality impact assessment for the proposed Development		
			Prepared by	**Checked by**	**Approved by**
		Name	Samuel Lee / Kit Wong	Kit Wong / Ir K K Iu	Ir K K Iu
		Signature			

Revision	**Date**	**Filename**	22458-A1a.doc		
A	24-Aug-22	**Description**	Air quality impact assessment for the proposed Development		
			Prepared by	**Checked by**	**Approved by**
		Name	Samuel Lee / Kit Wong	Kit Wong / Ir K K Iu	Ir K K Iu
		Signature	SL K	K	

Revision	**Date**	**Filename**			
		Description			
			Prepared by	**Checked by**	**Approved by**
		Name			
		Signature			

CONTENTS

AIMS

To assess the air quality impact due to the surrounding industrial and vehicular emissions on the proposed residential development at Various Lots in DD112 on Kam Sheung Road, Shek Kong, Yuen Long.

To assess the air quality impact in accordance with the air quality requirements set out in the Hong Kong Planning Standards & Guidelines (HKPSG).

SUMMARY

The buffer distance requirements in the proposed Development as set out for vehicular emissions in Table 3.1, Chapter 9 of HKPSG are satisfied. No industrial chimney was identified within 500m of the site. Therefore, no adverse air quality impacts on the proposed Development are anticipated.

Dust control requirements in the Air Pollution Control (Construction Dust) Regulation will be complied with. Relevant mitigation measures for dust emissions, if any, will be implemented accordingly. Under such circumstances, no adverse air quality impacts in association with the proposed Development during construction phase are anticipated.

1. INTRODUCTION

1.1 Westwood Hong & Associates Ltd. was commissioned to prepare an environmental air quality impact assessment report to assess the potential air quality impact caused by air pollution sources in the vicinity of the proposed residential development at DD112 on Kam Sheung Road in Shek Kong, Yuen Long (the "proposed Development").

1.2 This air quality impact assessment report aims to support the Rezoning Application for the proposed Development.

1.3 This report was prepared based on the architectural drawings provided by the Client (Appendix 1).

1.4 The report includes the following assessments:

- Industrial chimney emission impact on the proposed Development;
- Vehicular emission impact on the proposed Development;
- Air quality impact due to carpark of the proposed development;
- Odour impact from on-site sewage treatment plant; and
- Dust impact control during construction.

2. SITE LOCATION

Site Location

2.1 The project site is located south of Kam Sheung Road. The residential developments Lotus Hill and Hoi Tong Garden are located to the west, and Jazz Garden is located to the east. The location of the project site is shown in Figure 1.

Building Layout

2.2 The proposed Development comprises nineteen 6-storey low-rise blocks and 2 carparks with 3-storey. The building layouts are shown in Appendix 1.

2.3 The proposed sewage treatment plant (STP) will be enclosed. Therefore, no adverse odour impact due to the STP is anticipated. The design of the STP would be reviewed during detailed design stage.

3. SITE INSPECTION

Site Surveys

3.1 Site surveys were conducted on 10 February 2022 and 17 November 2021. Photographs taken on site are shown in Appendix 2.

Industrial Emissions in the Vicinity

3.2 The site surveys were conducted covering the whole 500m assessment area of the project site. Findings of the site survey are illustrated in Figure 4. The results of site inspections have revealed that no industrial chimney was identified within 500m of the project site.

3.3 The site inspections were conducted. The nearby industrial uses are vehicle repairing and washing workshops, no air and odour emission sources from these workshops were observed during site surveys. No odour has been detected at the site boundaries and the emission of dust or fluff has not been identified from buildings in the vicinity of the proposed Development.

4. HONG KONG AIR QUALITY OBJECTIVES

4.1 The new Hong Kong Air Quality Objectives (HKAQO), which came into effect on 1 January 2022, are shown in Table 4.1.

Table 4.1 Hong Kong Air Quality Objectives

Pollutant	**Averaging Time**	**AQO concentration** (µg/m^3)	**Number of exceedances allowed**
Sulphur Dioxide	10 minute	500	3
	24 hour	50	3
Respirable Suspended Particulate (PM10) (ii)	24 hour	100	9
	Annual	50	NA
Fine Suspended Particulates (PM2.5) (iii)	24 hour	50	35
	Annual	25	NA
Nitrogen Dioxide	1 hour	200	18
	Annual	40	NA
Carbon Monoxide	1 hour	30,000	0
	8 hour	10,000	0
Ozone	8 hour	160	9
Lead	Annual	0.5	NA

Notes:-

(i) All measurements of the concentration of gaseous air pollutants, i.e., sulphur dioxide, nitrogen dioxide, ozone and carbon monoxide, are to be adjusted to a reference temperature of 293 Kelvin and a reference pressure of 101.325 kilopascal.

(ii) Respirable suspended particulates means suspended particles in air with a nominal aerodynamic diameter of 10 micrometres or less.

(iii) Fine suspended particulates means suspended particles in air with a nominal aerodynamic diameter of 2.5 micrometres or less.

5. EXISTING AND FUTURE AIR QUALITY IN YUEN LONG AREA

5.1 Air quality monitoring data from the Air Quality Monitoring Station (AQMS) operated by EPD were examined. The air quality monitoring data in the nearest AQMS (i.e. Yuen Long) in the past 5 years (i.e. Year 2017 to Year 2021) are tabulated in Table 5.1 below.

Table 5.1 Summary of AQMS Data from Year 2017 to Year 2021

Pollutant	**Year**	**Highest 1-hour Conc. beyond the allowed exceedance** (μg/m^3)	**Annual Conc.** (μg/m^3)	**Highest 10-minutes Conc. beyond the allowed exceedance** (μg/m^3)	**Highest 24-hour Conc. beyond the allowed exceedance** (μg/m^3)
NO$_2$	2017	156	**<u>41</u>**	-	-
	2018	150	**<u>43</u>**	-	-
	2019	161	**<u>44</u>**	-	-
	2020	135	32	-	-
	2021	148	40	-	-
	5-year Mean	150 [75%]	40 [100%]	-	-
	AQOs	**200 (18)**	**40**	N/A	N/A
SO$_2$	2017	-	-	80	20
	2018	-	-	52	16
	2019	-	-	42	11
	2020	-	-	26	10
	2021	-	-	24	14
	5-year Mean	-	-	45 [9%]	14 [28%]
	AQOs	N/A	N/A	**500 (3)**	**50 (3)**
RSP (PM$_{10}$)	2017	-	40	-	87
	2018	-	37	-	75
	2019	-	37	-	83
	2020	-	30	-	77
	2021	-	30	-	73
	5-year Mean	-	35 [70%]	-	79 [79%]
	AQOs	N/A	**50**	N/A	**100 (9)**

Pollutant	**Year**	**Highest 1-hour Conc. beyond the allowed exceedance** (μg/m^3)	**Annual Conc.** (μg/m^3)	**Highest 10-minutes Conc. beyond the allowed exceedance** (μg/m^3)	**Highest 24-hour Conc. beyond the allowed exceedance** (μg/m^3)
FSP ($PM_{2.5}$)	2017	-	22	-	39
	2018	-	20	-	34
	2019	-	20	-	34
	2020	-	16	-	28
	2021	-	17	-	31
	5-year Mean	-	19 [76%]	-	33 [66%]
	AQOs	N/A	**25**	N/A	**50 (35)**

Notes: (i) Underlined and **bold** values mean exceedance of the AQOs.

(ii) Values in ( ) mean the number of exceedances allowed.

(iii) Percentages (%) of the AQOs are shown in [ ]. The 5-year mean is the arithmetic average.

(ii) In consideration of the numbers of exceedances allowance in the AQOs, the 4th highest 10-minute and 24-hr SO_2, 19th highest 1-hr NO_2, 10th highest 24-hour RSP and 36th highest 24-hour FSP concentrations are presented in above table.

(iii) N/A – Not applicable since there are no AQOs for these parameters.

5.2 The future background concentration data predicted by PATH v2.1 in Year 2025 at Grids (31_45) and (32_45) are summarised in Table 5.2 below.

Table 5.2 Summary of PATH v2.1 Background in Year 2025

Pollutant	**PATH Grid**	**Highest 1-hour Conc. beyond the allowed exceedance** (μg/m^3) [1]	**Annual Conc.** (μg/m^3)	**Highest 10-minutes Conc. beyond the allowed exceedance** (μg/m^3) [2] [3]	**Highest 24-hour Conc. beyond the allowed exceedance** (μg/m^3) [4]
NO_2	(31_45)	86	13	-	-
	(32_45)	76	11	-	-
	AQOs	**200 (18)**[5]	**40**	N/A	N/A
SO_2	(31_45)	-	-	56	11
	(32_45)	-	-	56	11
	AQOs	N/A	N/A	**500 (3)**	**50 (3)**

Pollutant	**PATH Grid**	**Highest 1-hour Conc. beyond the allowed exceedance** (µg/m³) [1]	**Annual Conc.** (µg/m³)	**Highest 10-minutes Conc. beyond the allowed exceedance** (µg/m³) [2] [3]	**Highest 24-hour Conc. beyond the allowed exceedance** (µg/m³) [4]
RSP[6]	(31_45)	-	27	-	64
	(32_45)	-	26	-	62
	AQOs	N/A	**50**	N/A	**100 (9)**
FSP[7]	(31_45)	-	16	-	26
	(32_45)	-	15	-	23
	AQOs	N/A	**25**	N/A	**50(35)**

Note:

[1] 19th highest 1-hour concentration of NO_2

[2] 4th Highest 10-minute SO_2 concentration

[3] According to EPD's "Guidelines on the Estimation of 10-minute Average SO_2 Concentration for Air Quality Assessment in Hong Kong".

[4] 4th highest 24-hour concentration of SO_2; 10th highest 24-hour concentration of RSP; 36th highest 24-hour concentration of FSP.

[5] Values in ( ) mean the number of exceedances allowed.

[6] According to Section 2.8 of EPD's "Guideline on Choices of Models and Model Parameters", adjustments of PATH v2.1's output of RSP concentrations by adding 11.0µg/m³ and 10.3µg/m³ into 10th highest daily RSP concentration and annual RSP concentration have been followed respectively.

[7] According to Section 2.8 of EPD's "Guideline on Choices of Models and Model Parameters", adjustments of PATH-v2.1's output of FSP concentrations by adding 3.5µg/m³ into annual FSP concentration have been followed.

5.3 It can be seen from the above Table 5.1 that, the trends of NO_2, RSP, FSP and SO_2 concentrations in the area have been decreasing in recent years. According to the PATH data as shown in Table 5.2, all the pollutants are well within the AQOs.

6. PLUME IMPINGEMENT ASSESSMENT

6.1 According to the HKPSG[1], the buffer distance for industrial chimney is 200m. For the proposed Development, as validated by the site surveys conducted on 10 February 2022 and 17 November 2021, no industrial chimney is being identified within a 500m radius of the project site. Therefore, air quantitative impact assessment due to the industrial emission is hence not necessary. It is confirmed that adverse air quality impact due to industrial chimney is not anticipated for the proposed Development.

7. VEHICULAR EMISSION ASSESSMENT

7.1 According to The Annual Traffic Census 2020 by Transport Department (TD), the Kam Sheung Road is classified as "Rural Road". There is no recommended buffer distance for rural road in HKPSG. For conservative approach, buffer distance for Local Distributor has been adopted in the present application. The required buffer distance as stipulated in the HKPSG is 5m.

7.2 For the proposed Development, the separation between the road and the Air Sensitive Receivers (ASRs) are greater than the required buffer distance as specified in the HKPSG (Figure 3). Table 7.1 summarises the shortest distance between ASRs and the road. No air-sensitive uses including fresh air intake of ventilation system, openable windows and active recreational uses in open space should be located within the buffer zones from the nearby roads. Therefore, adverse air quality impact due to vehicle emission is not anticipated for the proposed Development.

Table 7.1 Separation between ASRs within the Proposed Development and the Road

Road Name	Road Type	Shortest Distance between ASRs and the Road	Remark
Kam Sheung Road	Rural Road [1]	50m	All ASRs comply with the HKPSG requirement

Remark:-

[1] According to The Annual Traffic Census 2020, Kam Sheung Road is classified as Rural Road, which is considered as Local Distributor.

8. AIR QUALITY IMPACT DUE TO CARPARK OF THE PROPOSED DEVELOPMENT

8.1 The detailed design of the proposed carpark is not available at this stage. The location of the exhaust outlet would be designed with reference to the "ProPECC PN 2/96 – Control of Air Pollution in Car Park"[2]. The exhaust air from the carpark would be discharged to the atmosphere with proper mitigation treatments in such a manner and at a location not to result in any air nuisance to occupants in the proposed Development and to the neighboring building and to the public. Hence, adverse air quality impact due to the proposed carpark is not anticipated.

9. ODOUR IMPACT FROM ON-SITE SEWAGE TREATMENT PLANT

9.1 The proposed Sewage Treatment Plant (STP) is located at basement level of the proposed Development and within an enclosed building structure.

9.2 The design of the STP will be reviewed during detailed design stage, the Environmental Consideration specified in EPD Guidelines for the Design of Small Sewage Treatment Plants for minimization of the odour impact from the proposed STP will be observed and followed.

9.3 The separation distances from the proposed STP to the nearest existing ASR (i.e. car repairing workshop adjoining the proposed Development) and the nearest air-sensitive use of the proposed Development (i.e. Tower 1) are 19m and 1m respectively. The exhaust outlet of the proposed STP will be located away from all nearby existing ASRs and air-sensitive use of the proposed Development as far as possible. The exhaust air of the stack will be discharged in a direction facing away from the residential towers of the proposed Development. Also, in order to alleviate the odour impact to the driveway/EVA and the adjoining vehicle repairing workshop locating at ground level, the exhaust air will be discharged in an upward direction. The potential location of the exhaust outlet and its discharge direction are illustrated in Figure 5.

9.4 According to the Sewerage Impact Assessment, the estimated total average dry weather flow (ADWF) to be treated by the proposed STP will be 894.6m^3/day, hence, the sewage treatment capacity of the proposed STP is relatively small. Due to the close proximity of the proposed STP from Tower 1 of the proposed Development, a high-efficiency deodorizer (with at least 99.5% odour removal efficiency) with a forced ventilation system will also be installed at the STP building to remove odour before discharge into open air. In order to achieve and maintain a 99.5% odour removal efficiency, the following odour control measures will be adopted:

- Membrane Bioreactor (MBR) system equipped with deodorizer (at least 99.5% odour removal efficiency) for treating odorous emissions;
- Enclosure of the major process equipment inside building structure, which is equipped with ventilation system to ensure adequate air exchange within the structure (in other words, maintaining negative pressure inside the structure); and
- Regular maintenance of the deodorizer to ensure the odour removal efficiency is maintained at/above the design requirement.

9.5 With STP design according to EPD's guidelines, proper deodorization at the exhaust outlet and locating the exhaust away from the ASRs as far as possible, adverse air quality impact due to the proposed STP is not anticipated.

10. AIR SENSITIVE RECEIVERS

10.1 In accordance with Annex 12 of the TM-EIAO, ASRs include any domestic premises, hotel, hostel, hospital, clinic, nursery, temporary housing accommodation, school, educational institution, office, factory, shop, shopping centre, place of public worship, library, court of law, sports stadium or performing arts centre. Any other premises or places with which, in terms of duration or number of people affected, have a similar sensitivity to the air pollutant as the aforelisted premises and places would also be considered as a sensitive receiver.

10.2 Existing ASRs were identified by means of reviewing topographic maps, aerial photos and supplemented by site inspection. They mainly include developed residential village houses. Representative ASRs within 500m assessment area have been identified in Table 10.1 and shown in Figure 2.

Table 10.1 Representative ASRs

ASR ID	Description	Existing Land Status	Distance from the Proposed Development	Number of Storeys
A01	Village Houses in Lin Fa Tei	Residential	0m	2-3
A02	Village Houses in Lin Fa Tei	Residential	120m	2-3
A03	Hoi Tong Garden	Residential	60m	3
A04	Lotus Hill	Residential	150m	3
A05	Kam Fuk Garden	Residential	270m	3
A06	Gold Field Villa	Residential	320m	3
A07	Evergreen Villa	Residential	390m	3
A08	Full Art Garden	Residential	320m	3
A09	Village Houses in Ngau Keng Tsuen	Residential	350m	2-3
A10	Wah Yuen	Residential	0m	3
A11	Village Houses in Lai Uk Tsuen	Residential	20m	2-3
A12	Village Houses in Tsang Uk Tsuen	Residential	200m	2-3
A13	Village Houses in Tse Uk Tsuen	Residential	340m	2-3
A14	Jazz Garden	Residential	200m	3
A15	Village Houses in Nam Hing Lane	Residential	350m	2-3
A16	Village Houses in Sheung Tsuen	Residential	270m	3

11. DUST CONTROL FOR CONSTRUCTION WORK

11.1 The major construction activities of the proposed Development are foundation and superstructural. There will be no basement area except the STP, with plan area of about $800m^2$. The construction activities will not be taking place concurrently at entire work sites.

11.2 During the construction phase, dust would be generated from construction activities such as vehicles movement on haul roads, excavation, loading or unloading stockpile material, stockpiling of material and wind erosion of exposed areas

11.3 The proposed Development comprises nineteen 6-storeys low-rise residential blocks and two 3-storeys carparks, with site coverage about 30%. Also, the proposed Development currently lies on a relatively flat terrain. Since the size of the project area is not small and construction details are not available at this stage, an EM&A program will be implemented to ensure that the ASRs will not be subject to adverse impact during the construction stage. Also, phasing of dusty works during the construction stages will be taken place to minimize any air quality impact.

11.4 Appropriate dust control measures stipulated in the Air Pollution Control (Construction Dust) Regulation would be implemented during construction stage to reduce the dust emission. These measures include:-

- Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading;
- Any dusty material remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads;
- A stockpile of dusty material should not extend beyond the pedestrian barriers, fencing or traffic cones;
- The load of dusty materials on vehicles leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle;
- Where practicable, vehicles washing facilities including a high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores;
- When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided as far as practicable along the Site boundary with provision for public crossing. Good site practice shall also be adopted by the contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period;

- The portion of any road leading only to construction site that is within 30m of vehicle entrance or exit should be kept clear of dusty materials;
- Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation take place should be sprayed with water or a dust suppression chemical continuously;
- Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding;
- Any skip hoist for material transport should be totally enclosed by impervious sheeting;
- Every stock of more than 20 bags of cement or dry pulverized fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the three sides;
- Immediately before leaving a construction site, all vehicles shall be washed to remove any dusty materials from its body and wheels;
- Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with tan audible high level alarm which is interlocked with the material filling line and no overfilling is allowed;
- Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shortcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies;
- Effective dust screen, sheeting or netting should be provided to enclose the scaffolding, which is erected around the perimeter of a building under construction, from the ground floor level of the buildings; and
- Regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather; and
- Erect higher hoarding at the locations with ASRs in immediate proximity to the project site boundary; and
- Locate all the dusty activities away from any nearby ASRs as far as practicable;
- Provide electric power supply for on-site machinery as far as practicable and avoid using diesel generators to minimize the aerial emissions.

Emission from Fuel Combustion Equipment

11.5 Apart from the dust impact during construction phase, there will be exhaust emissions from the construction plants and machineries. Requirements stipulated in the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation and Air Pollution Control (Fuel Restriction) Regulations (i.e. using liquid fuel with a Sulphur content of less than 0.005% by weight) will be complied with to minimise the exhaust emissions from non-road mobile machineries.

Concurrent Project

11.6 There is no concurrent project within 500m of the proposed Development. With the implementation of dust control measures stipulated in the Air Pollution Control (Construction Dust) Regulation and requirements stipulated in the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation, adverse cumulative air quality impact is not anticipated.

11.7 Therefore, the potential dust and exhaust emission impact from the construction works to the ASRs in the vicinity would be limited.

12. CONCLUSION

12.1 The proposed Development satisfies the buffer distance requirements for vehicular and chimney emissions stipulated under the Hong Kong Planning Standards and Guidelines (re. Table 3.1, Chapter 9, HKPSG). Therefore, no adverse air quality impact associated with the proposed Development during operational phase is anticipated.

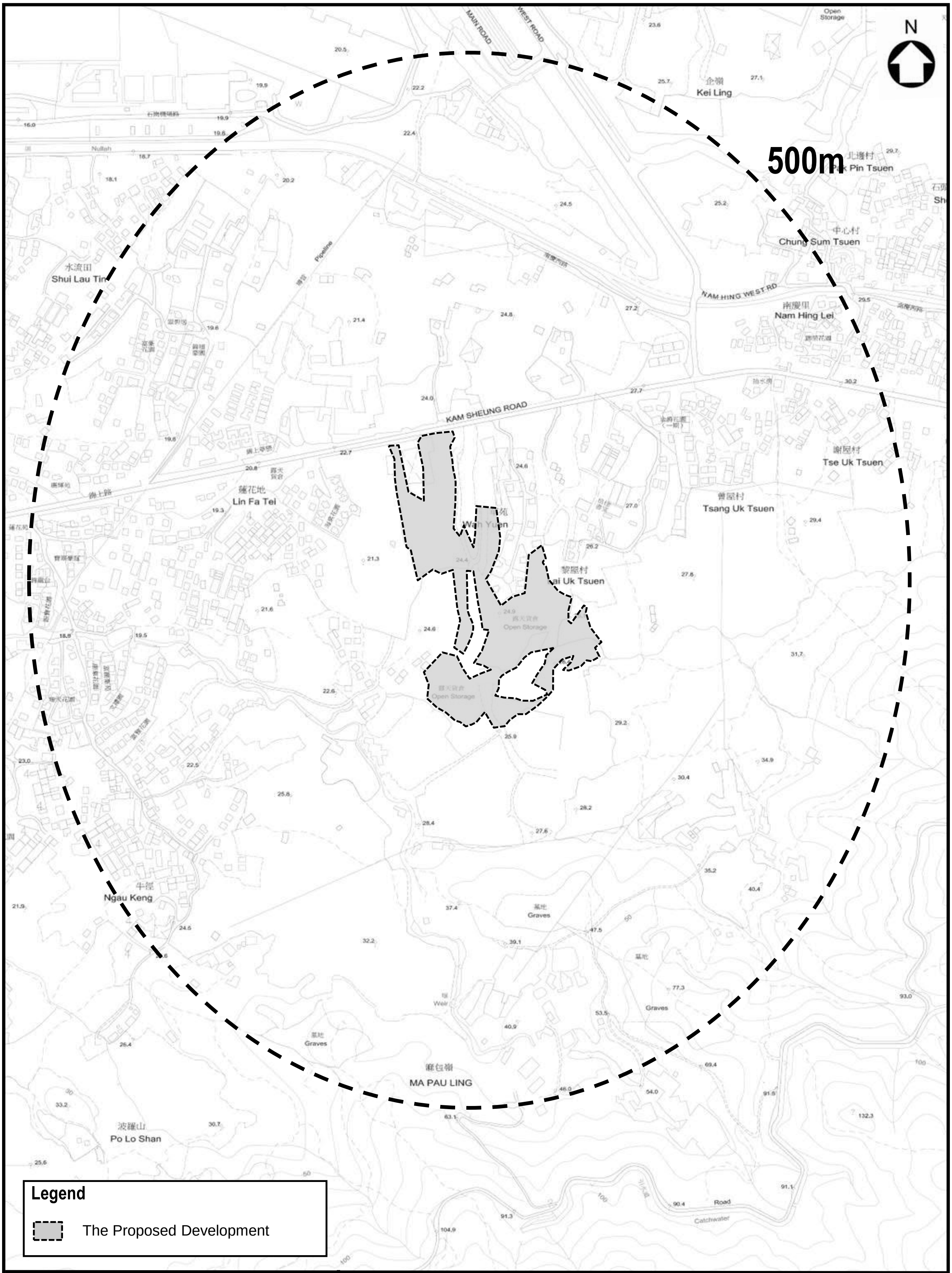
12.2 The proposed STP will be enclosed. With STP design according to EPD’s guidelines, proper deodorization at the exhaust outlet and locating the exhaust away from the ASRs as far as possible, no adverse odour impact due to the proposed STP is anticipated.

12.3 Dust control requirements in the Air Pollution Control (Construction Dust) Regulation will be followed. Relevant mitigation measures for dust emissions will also be implemented. Therefore, no adverse air quality impact associated with the proposed Development during construction phase is anticipated.

13. REFERENCE

[1] "Hong Kong Planning Standards & Guidelines" of March 2014 of Hong Kong Government

[2] PN 2/96 “Control of Air Pollution in Car Park” of the Environmental Protection Department



Westwood Hong & Associates Ltd

PROJECT: 22458

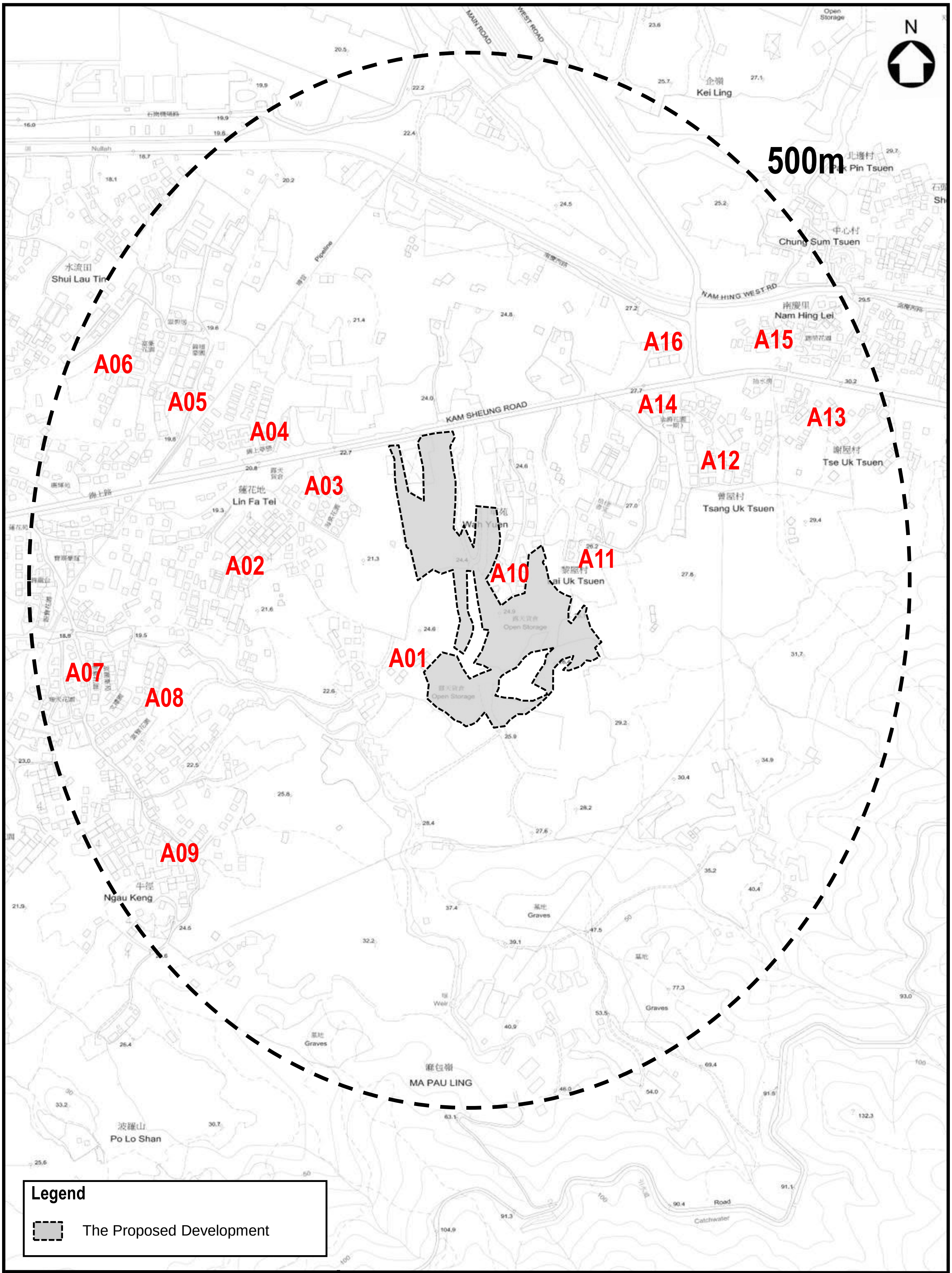
Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Site Location

FIGURE

1



Westwood Hong & Associates Ltd

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Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Locations of Identified ASRs within 500m from the Proposed Development

FIGURE

2

Legend

🟩 5m Buffer Distance from Road

*Remark: no air-sensitive uses including fresh air intake of ventilation system, openable windows of the buildings and active recreational uses in open space shall be located within the buffer zones.

Westwood Hong & Associates Ltd

PROJECT: 22458

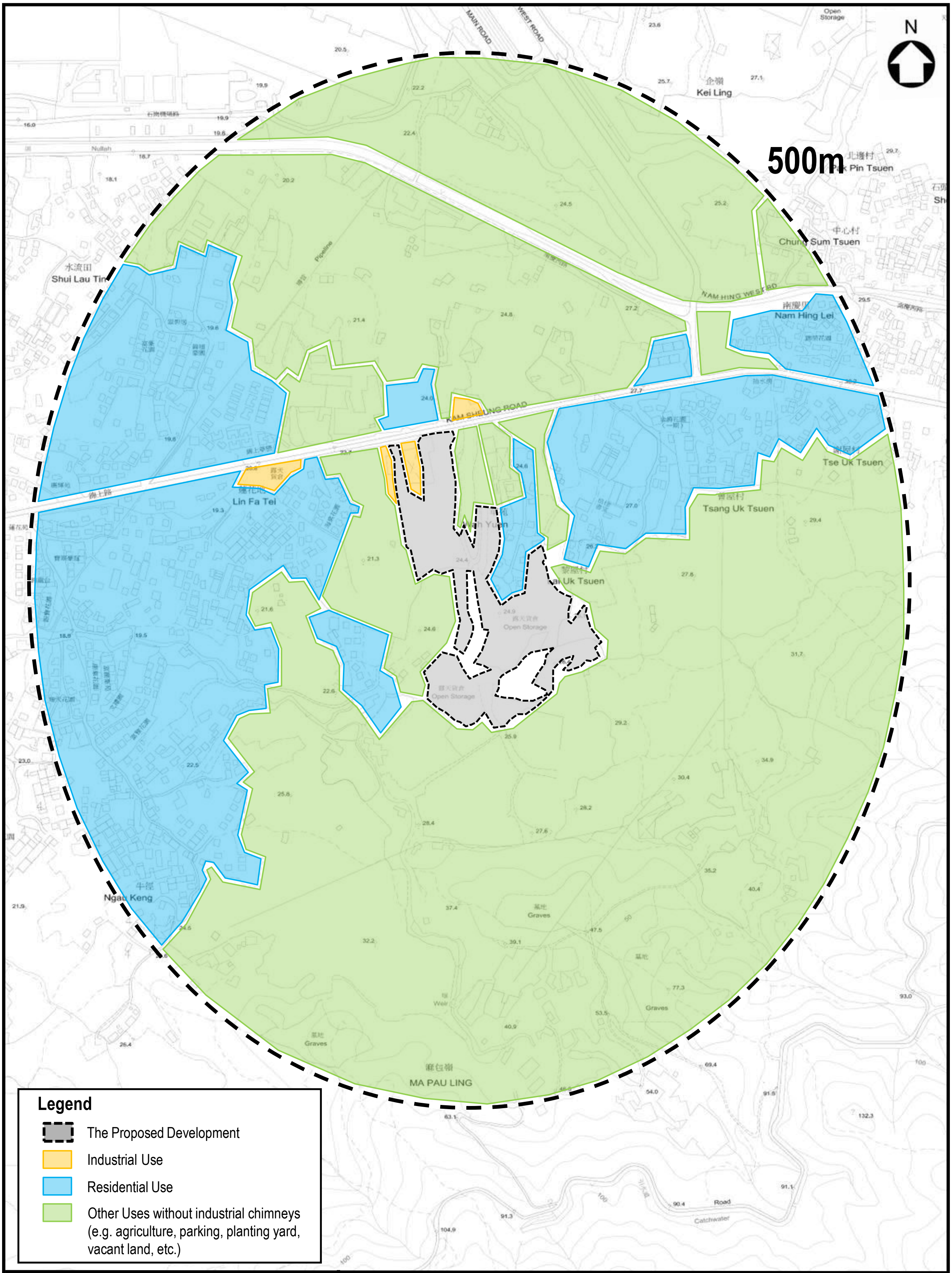
Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Shortest Distance between ASRs within the Proposed Development and the Road

FIGURE

3



Legend

▨ The Proposed Development

🟨 Industrial Use

🟦 Residential Use

🟩 Other Uses without industrial chimneys (e.g. agriculture, parking, planting yard, vacant land, etc.)

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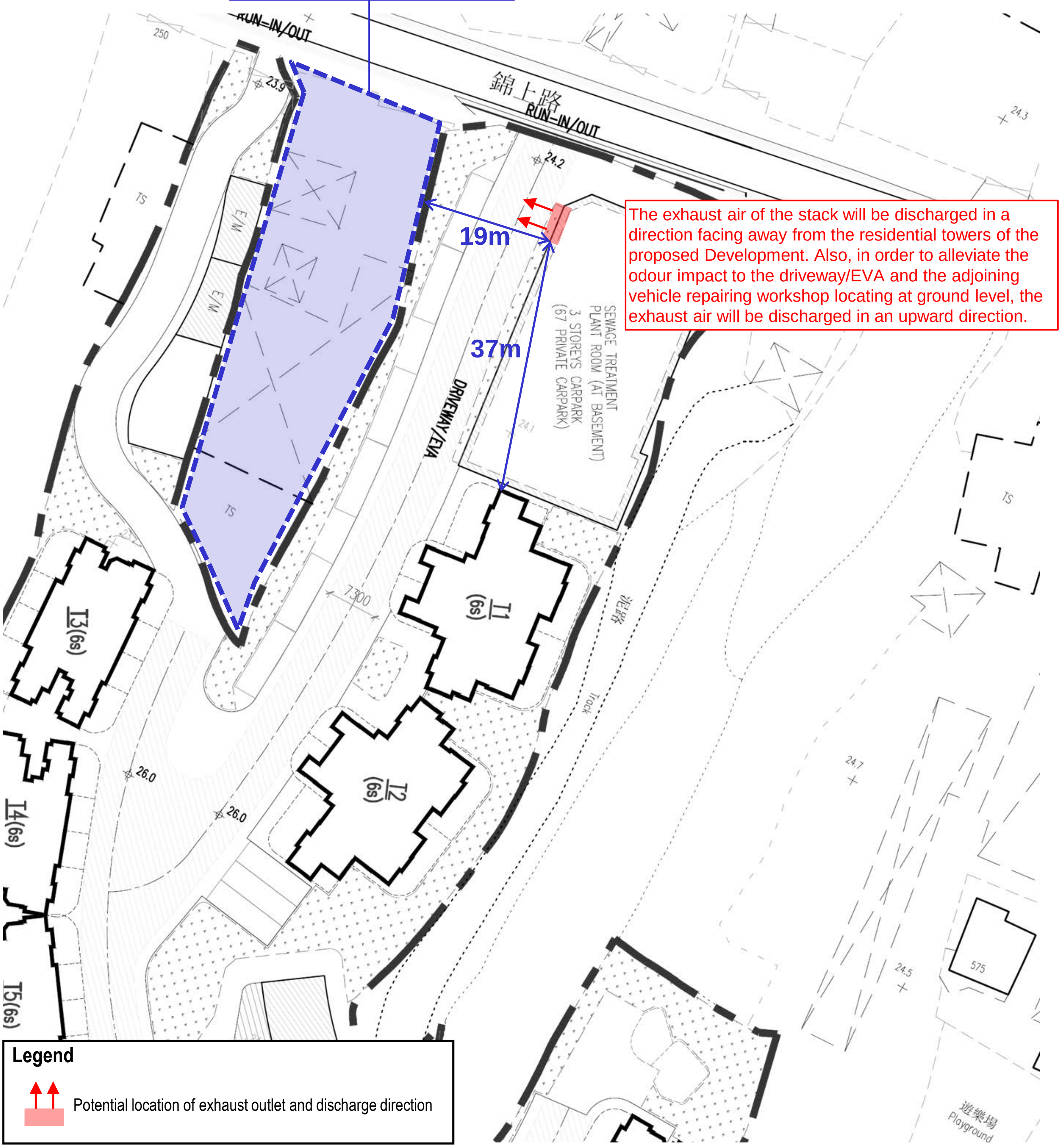
TITLE:

Site Survey Findings

FIGURE

4

Vehicle repairing workshop adjoining the proposed Development



The exhaust air of the stack will be discharged in a direction facing away from the residential towers of the proposed Development. Also, in order to alleviate the odour impact to the driveway/EVA and the adjoining vehicle repairing workshop locating at ground level, the exhaust air will be discharged in an upward direction.

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TITLE:

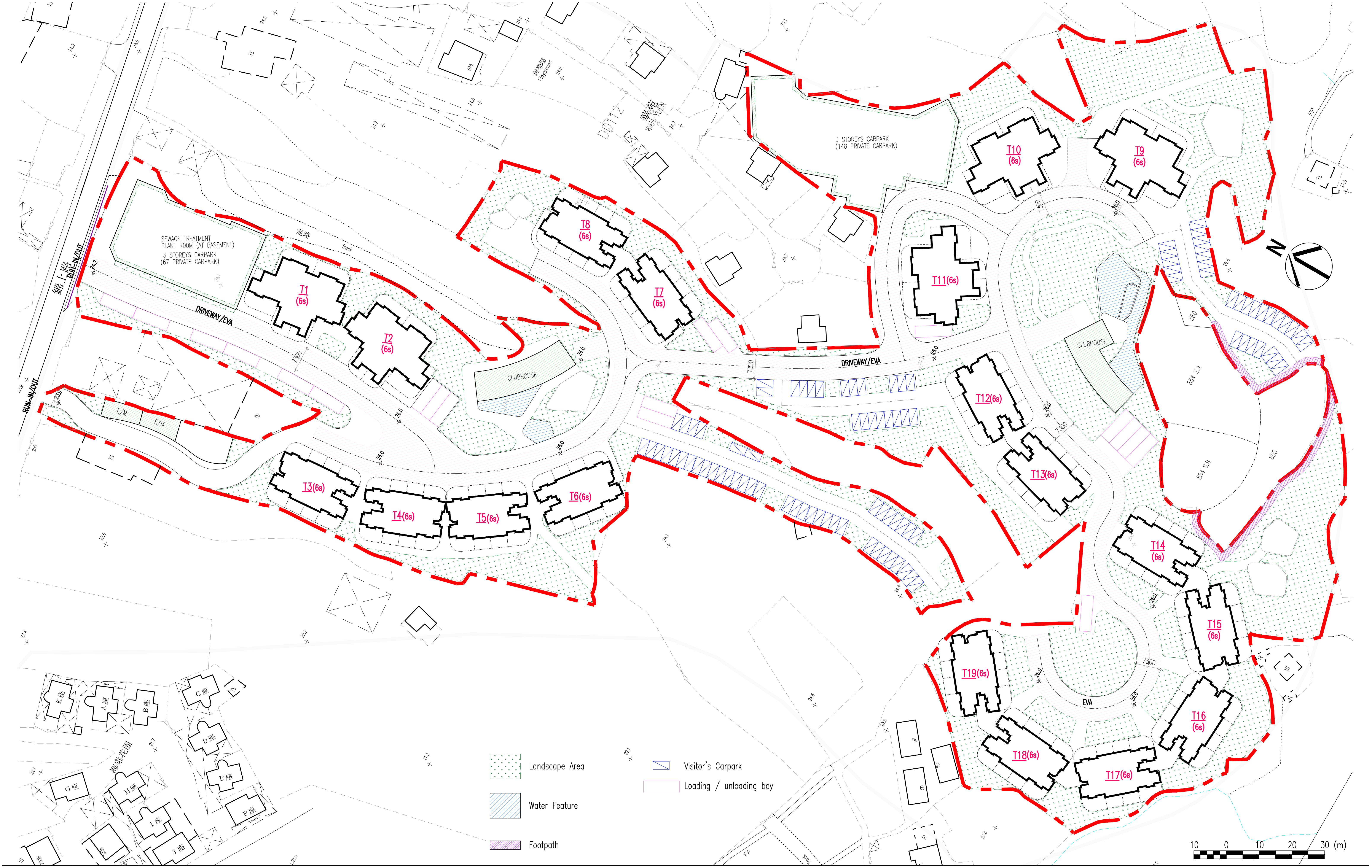
Potential Location of Exhaust Outlet and Discharge Direction

FIGURE

5

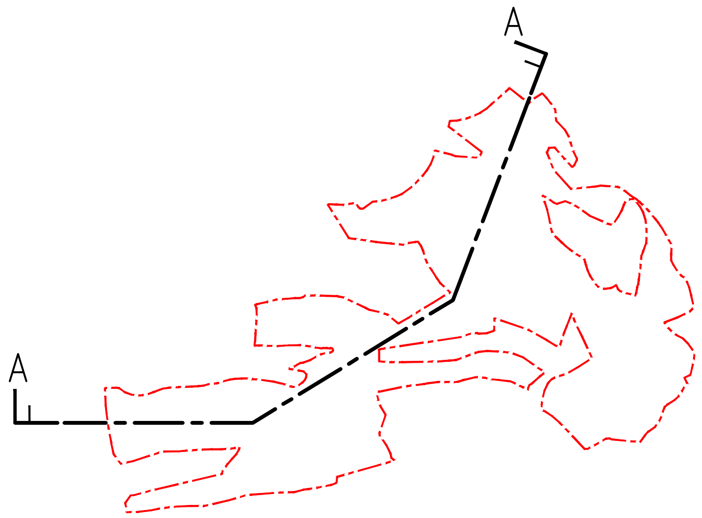
APPENDIX 1

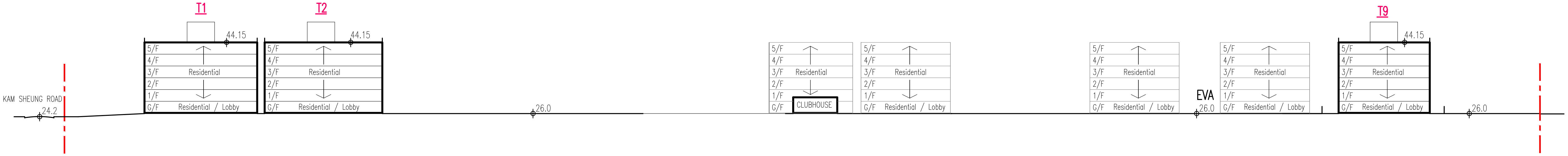
ARCHITECTURAL DRAWINGS



Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone
For Proposed Residential Development at Various Lots and Adjoining Government Land
in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

INDICATIVE MASTER LAYOUT PLAN (1:1000)





SECTION A

Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” zone
For Proposed Residential Development at Various Lots and Adjoining Government Land
in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

INDICATIVE SCHEMATIC SECTION (1:1000)

APPENDIX 2

PHOTOGRAPHS TAKEN ON SITE

Plate 1: Project Site

Plate 2: Village Houses in Lin Fa Tei

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Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Photographs taken on Site

FIGURE

A2-1

Plate 3: Wah Yuen

Plate 4: Hoi Tong Garden

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PROJECT: 22458

Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Photographs taken on Site

FIGURE

A2-2

Plate 5: Lotus Hill

Plate 6: Jazz Garden

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PROJECT: 22458

Proposed Rezoning from “Residential (Group D)” to “Residential (Group C)” Zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D.112 , Kam Sheung Road, Shek Kong, Yuen Long, New Territories

TITLE:

Photographs taken on Site

FIGURE

A2-3

Appendix 14

Responses to Comments

Application for Amendment to the Approved Shek Kong Outline Zoning Plan (OZP) No. S/YL-SK/9
From "Residential (Group D)" to "Residential (Group C)"
At Various Lots in D.D. 112 and Adjoining Government Land, Kam Sheung Road, Shek Kong, Yuen Long, New Territories
S12A Amendment of Plan Application No. Y/YL-SK/1

Items	Comments	Responses
1	**Comments from Chief Town Planner/ Urban Design & Landscape, PlanD received on 27 May 2022: (Contact Person: Mr. Samuel HUI; Tel: 3565 3957)**	
1.1	Supporting Planning Statement (PS) Para. 5.4.1- The sentence "… amongst 41 nos. of existing trees are to be fallen due to poor form…" is advised to be revised to "…amongst 41 nos. of existing trees are to be felled due to poor form…"	Noted and have been rectified. Please refer to **Appendix I** for the replacement page of supporting planning statement. Please note that 41nos. of trees were surveyed, 6nos. of trees are outside site but 2m beyond site boundary which is for reference only. There should have 29 nos. of trees proposed to be felled; 5 nos. of trees proposed to be retained; and 1 no. of tree proposed to be transplanted. There are total 35 nos. existing trees within the site boundary.
1.2	LMP Sufficient self-explanatory information, e.g. more spot levels, compass for indicating direction, vehicular/pedestrian entrance etc. should be shown on all landscape drawings.	Noted. Sufficient self-explanatory information is provided on all landscape drawings.
1.3	The legends for proposed new trees, retained trees and transplanted trees are too similar. The applicant is advised to provide clear legends and symbols.	Noted. Symbols with obvious contrast of proposed new trees, retained trees and transplanted trees are provided.
1.4	The applicant is advised to clarify whether boundary fence walls would be proposed along the application site boundary, and indicate the demarcation of the fence walls on relevant landscape drawings with appropriate legend as necessary.	Boundary fence walls will be provided along the application site boundary, which has been clearly indicated in the drawings. For the fence wall details, please refer to Dwg. No. LD_001 and LD_002 in **Appendix 3** of the LMP&TPRP s in **Appendix III**.
1.5	Landscape sections/elevation with sufficient dimension are advised to be provided to illustrate the interface between the building and the surrounding, and the landscape treatments at various locations. Besides, typical landscape details should also be provided to demonstrate the viability of the landscape treatments.	Noted. Sections and Elevations have now been provided. Please refer to Dwg. No. LP_006, LP_006.1 and LP_007 in **Appendix 1** of the LMP&TPRP (**Appendix III** refers). Relevant landscape details have also been provided, such as Typical Planter Detail, Irrigation Point Detail, Vertical Green Detail in **Appendix 3** of the LMP&TPRP (**Appendix III** refers).

Items	Comments	Responses
1.6	The applicant is advised to indicate in para. 3.1 of LMP if there is no registered OVT, rare/protected species etc. within the development site.	Noted. There is no registered OVT, rare/ protected species, etc. within the development site and this has been clearly indicated in para. 3.1 of LMP.
1.7	In para. 5.4.2 of the PS, it is noted that a row of trees along the EVA is proposed, however, it is not reflected in the LMP.	Noted and has been rectified.
1.8	It is noted that the tree preservation proposal included assessment and treatment for trees within and outside the planning application boundary. Relevant information for trees within the planning application boundary should be clearly indicated in all relevant paragraphs, while for those outside the site should be indicated as "for reference only". Relevant drawings of Appendix 2 and para. 3 of the LMP should be reviewed accordingly.	Noted and has been rectified.
2	**Comments from Director of Agriculture, Fisheries and Conservation received on 30 May 2022: (Contact Person: Ms. C.L. WONG; Tel: 2150 6933)**	
2.1	As the subject site would encroach into existing streams along its southeastern and southwestern boundary, the proposed development will pose direct impact on the streams while stream and watercourse should be preserved as far as possible from nature conservation perspective. As such, the conservation importance of the streams shall be mentioned in paragraph 5.6 of the supporting planning statement and an ecological impact assessment shall be included in the supporting planning statement.	The ecological condition of the concerned watercourse across the Rezoning Site is found to be low. Nevertheless, recommendations on protecting the watercourses from construction runoff during the construction phase will be proposed in the ecological impact assessment report. The ecological impact assessment has been completed. Please refer to **Appendix IV,** enclosed with this submission.
3	**Comments from Chief Engineer/ Mainland North, DSD received on 30 May 2022: (Contact Person: Mr. Bill CHAN; Tel: 2781 4107)**	
	Drainage Impact Assessment	
3.1	Section 2.3.9: “Table 3a of SDM” should read “Table 3a and 3b of SDM”.	Noted. Text has been rectified accordingly.
3.2	Section 4.1.2: Please describe the mechanism of storage tank.	The proposed stormwater storage tank will connect to the internal drain of the site (i.e. a 1350mm diameter pipe, which will discharge the runoff from the development site to the proposed box culvert) via a weir. Under extreme rainfall events, additional runoff collected in the 1350mm diameter pipe will overflow into the storage tank via the weir and the additional run off will temporarily store in the storage tank.

Items	Comments	Responses
		Supplementary description for the mechanism of the storage tank is added in Section 4.1.2 of the DIA in **Appendix V**.
3.3	Section 4.2.1: Please correct a typo-error "Section 4.111".	Noted. A typo has been rectified in Section 4.1.2 of the DIA in **Appendix V**.
3.4	Table 4.1: Please advise on the unit of area.	For Table 4.1, there is a typo for the unit of area. It should be read as 'in hectare (ha)'. Table 4.1 has been revised accordingly.
3.5	Appendix I- Hydraulic model is not included in the submission, please submit for checking.	Hydraulic model has been submitted in form of a CD. Please refer to the CD-ROM enclosed with this submission.
3.6	Section 3.2.2 & Figure 3.1- Please advise if site investigation was carried out to confirm the blockage as mentioned in this section. If this observation is only based on the aerial photos, it is necessary to carry our further inspection to confirm if the concerned watercourse is blocked (i.e. to check if it is discharged by underground drains).	To investigate the existing drainage system, investigation has been carried out according to (1) desktop information; (2) site inspections to accessible area; and (3) survey for accessible drainage system. As shown in **Figure 3.1** of the DIA, a section of the existing channel (northern channel) at the west of the Development Site has been filled up. Site inspection has been carried out and confirmed that there is blockage occurred at the private lots located at the west of the Development Site (**Appendix V** refers). A photo (referred as **Figure 3.2** of the DIA) has been taken at the site to show that there is an existing blockage at the northern channel (**Appendix V** refers).
3.7	Appendix B1 & B3- Please review the appendices as we note that existing natural watercourse running through the proposed site is missing.	As advised by DSD, the existing watercourse near to Wah Yuen is currently severing both of the catchments of the nearby area of Wah Yuen and the Development Site. Under the development proposal, a surface channel and associated pipework will be re-provided and connected to the proposed box culvert and downstream of the watercourse to cater for the runoff from existing serving catchments. Details has been incorporated in **Appendix B5** of the DIA (**Appendix V** refers). To investigate the existing condition of the existing watercourse concerned, additional survey and further site inspection were carried

Items	Comments	Responses
		out for the concerned existing watercourse. Survey could only be carried for the section within the Development Site, as the downstream of that existing watercourse would be passing through the nearby private lots, which are inaccessible for survey. The details of downstream section could mainly rely on desktop information and site observation. The alignment of the downstream section of the existing watercourse near to Wah Yuen identified by site observation is shown in **Figure 3.3** of revised DIA (**Appendix V** refers). The hydraulic model and Sections 3 to 4 have been updated to incorporate the information of the existing watercourse abovementioned. The existing watercourse under the existing condition and the proposed drainage arrangement for this watercourse under the development proposal has also been included in the hydraulic model in Appendix I of the DIA (**Appendix V** refers).
	Sewerage Impact Assessment	
3.8	Section 5.2.2- Please be reminded that further SIA report will be required for making connection to the public sewer, if any, in future.	Noted.
3.9	The SIA report needs to meet the satisfaction of EPD, the planning authority of sewerage infrastructure.	Please be informed that the SIA has been submitted to EPD for departmental comment and their comments have been incorporated in the revised SIA (details refer to attached amended pages of SIA) (**Appendix VI** refers).
4	**Comments from District Lands Office (DLO) received on 1 June 2022: (Contact Person: Ms. Ami KO; Tel: 2443 3300)**	
4.1	According to the Land Registry records, one of the Lots i.e. Lot No. 263 in D.D. 112 has been carved out into Lot No. 263 S.A and Lot No. 263 R.P. under M/N YL534496. Please update the Lots nos.	Noted, Land registry records have indicated that Lot No. 263 in D.D. 112 has been carved out into Lot No. 263 S.A and Lot No. 263 R.P.
4.2	Please note that one of the Lots i.e. Lot No 853 in D.D. 112 is subject to Modification of Tenancy Permit Nos. 9211 and 14024.	Noted.
4.3	As shown on the land status plan, the private lots Lot Nos. 854 S.A, 854 S.B, 855 and 860, which are located near the southeast part of the Application Site, would be land-locked. Please clarify.	Noted, Mater Layout Plan (MLP) has been revised to incorporate 2.5m-wide footpath to the subject private lots which are located near to the south-eastern part of the Application Site (**Appendix II** refers).
5	**Comments from Chief Architect/CMD2, ArchSD, received on 1 June 2022: (Contact Person: Mr. Calvin CHAN; Tel: 2154 2398)**	
5.1	It is noted that the proposed residential development mainly consists of	Your comments are well noted. A Visual Impact Assessment (VIA) has

Items	Comments	Responses
	19 nos. of towers with building height of 6 storeys (about 44.15mPD), which are about 200% higher than adjacent "R(D)" developments with BHR of 2 storeys permitted in OZP. It is undesirable from visual impact point of view and may not be compatible to adjacent developments.	been conducted to assess the visual impact of the Proposed Development. As shown from the photomontages of the selected viewpoints, there would be some visual changes to the surrounding area, but the Proposed Development is not incompatible with the surrounding height profile, which overall does not obstruct the mountain ridgeline and open skyview in the background. The visual impact can be mitigated through appropriate and well through-out design measures (i.e. building setback, providing green buffer along the periphery of the Site, building facades materials). Therefore, the resultant visual change due to the Proposed Development is not significant and is considered acceptable in visual point of view. The development parameters of the Proposed Development have also made reference to other “R(C)” zones with similar PR of 0.8 with 6 storeys under the prevailing Approved / Draft OZPs. It is therefore deemed acceptable from planning and visual point of view.
	The building length of some of the residential towers (e.g. T3 to T6, T14 to T19) appear to exceed 60m which may have adverse impact on the air ventilation and visual permeability. The applicant is advised to comply with the building separation requirements of the design guidelines promulgated in PNAP APP-152.	The scheme has been assessed and was found to comply with the Building Separation requirements as stipulated in PNAP APP-152.
5.3	It is noted that some of the facade area at T3, T8, T13, T14 and T18 are facing west, solar control devices should be considered to reduce solar heat gain and avoid glare as far as practicable.	Noted. Environmental and green features will be further considered in detailed design stage.
6	**Comments from Chief Engineer/ Construction, WSD, received on 13 June 2022: (Contact Person: Mr. CH CHEUK; Tel: 2152 5779)**	
6.1	Section 2.5.2 - Portal water should be read as 'Portable water'.	Noted and text has been revised in Section 2.5.2. Details refer to amended page 4 of WSIA (**Appendix VII** refers).
6.2	Section 2.5.2 - Please be advised that the application site currently falls within the direct supply zone of Au Tau / Ngau Tam Mei Fresh Water Primary Service Reservoirs (AT/NTM FWPSRs). The application site will later fall within the supply zone of Au Tau Fresh Water Service Reservoirs (AT FWSRs) subject to the operation of shifting supply zone carried out by NTW Region. Please update."	Noted and text has been revised in Section 2.5.2. Details refer to amended page 4 of WSIA (**Appendix VII** refers).

Items	Comments	Responses
7	**Comments from Director of Environmental Protection, received on 15 June 2022: (Contact Person: Ms. Ming HE; Tel: 2152 5779)**	
	Air Quality	
7.1	If buffer distance requirement cannot be met, the applicant should submit an AQIA to evaluate the constructional and operational air quality impacts associated with the proposed development in order to demonstrate the environmental acceptability of the project. In particular, there is need to demonstrate the buffer distance requirements for roads, chimneys and odour emission sources (including STP) as stipulated in the HKPSG are met for any air-sensitive uses of the proposed development and address if there is any air and/or odour nuisances arising from the nearby areas on the proposed development.	The AQIA has been prepared and provided in **Appendix VIII**. The proposed Development satisfies the buffer distance requirements for vehicular and chimney emissions stipulated under the HKPSG. Therefore, no adverse air quality impact associated with the proposed Development during operational phase is anticipated. The proposed sewage treatment plant will be enclosed. Therefore, adverse odour impact due to the proposed sewage treatment plant is not anticipated.
	Waste management & land contamination	
7.2	As stated in Section 2.2.1 of the Planning Statement, the Site is currently occupied by an open storage yard with a few numbers of temporary structures for storage of building materials in the north. There is need to address any potential land contamination issues due to the historical and current land uses at the application site.	A Land Contamination Assessment report is prepared and provided in **Appendix IX**. The historical and current land uses at the application site are reviewed and provided in the report.
7.3	The potential waste management issues should also be addressed.	The potential waste management issues are addressed in the Waste Management Report.
	Water quality	
7.4	S.4.1 SIA – Please elaborate whether the estimated sewage flow for the proposed residential development is missing other sources of wastewater, e.g. swimming pool, retail, etc.	Section 4 of SIA has been updated to include the estimated sewage flow from the swimming pool (refer to amended page 6 of SIA) (**Appendix VI** refers). The estimation of sewage flow from swimming pool is shown in **Appendix E** of SIA (**Appendix VI** refers).
7.5	There is lack of information to demonstrate that the project would have no adverse water quality impact. Please identify nearby water sensitive receivers within 500 m of the project site and evaluate whether there would be potential water quality impact from the project, e.g. discharges, runoff or non-point source pollution, etc. during construction and operation phase. Please also elaborate whether the STP would be decommissioned if public sewer would be available in future. If so, please elaborate how to prevent potential water quality impact during	Please note that the sewage from proposed development during construction and operation phase will comply with the *Technical Memorandum (TM) on the Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters* issued under Water Pollution Control Ordinance. The Applicant will adopt proposed mitigation measures below for containing and minimising water quality impacts during construction and operation phases of the proposed development, if necessary.

Items	Comments	Responses
	decommissioning of the STP.	As the project involves land-based works only, the potential water quality impact will be primarily from discharge surface runoff and soil erosion of exposed surface during construction. Potential sources of water quality impact associated with the construction works for the Project include- - Construction site runoff and drainage, which may contain suspended solids (SS), contaminants and increased loads of sediments that can pollute nearby storm water drains if not well managed; - General waste material; and - Sewage effluent from construction workforce that can pollute nearby watercourses if uncontrolled. **Operation Phase:** As the development is a residential project and that, potential sources of water quality impact upon occupation of the development (i.e. operation phase) generally include: - Surface and stormwater runoff; and - Sewage generated from the proposed development. ***Recommended Mitigation Measures:*** **Construction Phase:** Recommended mitigation measures to alleviate potential water quality impacts be implemented during construction phase include: - Temporary peripheral drainage system shall be properly designed and constructed, in accordance with requirements stipulated in ProPECC PN 1/94 along the Project Site boundary; - Construction site drainage system shall be properly designed and constructed, in accordance with requirements stipulated in ProPECC PN 1/94, and the above-mentioned peripheral site drainage system will be equipped with sand/silt removal facilities including containment of site runoff and provision of temporary drains, sedimentation basins, sand/silt removal facilities and similar facilities to properly treat the surface runoff collected prior to discharge;

Items	Comments	Responses
		- The Contractor shall apply for a discharge license under the EPCO and the discharge shall comply with the terms and conditions of the license; - Management of general construction activities including maintaining good housekeeping on site and storing oils, fuels and chemical securely to prevent spillages and leakage will be carried out; and - Management of sewage effluent from the workforce via provision and maintenance of adequate temporary sanitary facilities. **Operation Phase:** Recommended mitigation measures to be implemented during operation phase include: - Provision of adequately designed drainage system; and - Provision of an onsite sewage treatment plant (STP) to treat sewage generated from the proposed residential development, as a sewerage disposal measure until public sewer and capacity of downstream sewerage are available for discharge. The decommissioning would involve only isolation of the sewerage connections to the onsite STP and retirement of the treatment units after the connection to the public sewer has been established, while the STP building and other structural components would be retained in place. With these proposed arrangements, no adverse water quality impacts are expected during decommissioning phase. With the implementation of these recommended mitigation measures, it is anticipated that no unacceptable impacts on water quality due to the project.
	Sewerage	
7.6	**Section 2.3.2:** (i) There is need to confirm if there is a restaurant in the clubhouse. If affirmative, unit flow factor J10 (Restaurants & Hotels) should also be used for estimating the sewage generation.	Sections 2.3.2 and 2.3.3 have been updated to include parameters form sewage flow from restaurants (refer to attached amended page 4 of SIA) **(Appendix VI** refers). The sewage flow from restaurants and swimming pool has been

Items	Comments	Responses
		included in Section 4.1 as shown in amended page 6 of SIA and the estimation of sewage flow from swimming pool is shown in **Appendix E** of the SIA **(Appendix VI** refers**)**.
7.7	**Section 6.1.2:** (ii)(a) It mentioned "as well as there are existing public sewers in vicinity of the site......" and should read "there are no existing public sewers...". Please amend. (b) Please indicate the location of the proposed discharge point which connects to the nearby stormwater drainage system.	Noted and Section 6.1.2 is revised (refer to enclosed amended page 9 of SIA) (**Appendix VI** refers). The treated effluent from Proposed Development will be discharged to the proposed box culvert which will be connected to the existing engineering channel near Lin Fa Tei. This has been added in Section 5.1 (referring to amended page 7 of SIA). **Appendix D** is added to indicate the location of the proposed discharge point (SIA in **Appendix VI** refers).

Enclosure:
Appendix I: Replacement page of Supporting Planning Statement
Appendix II: Revised Master Layout Plan
Appendix III: Revised Landscape Master Plan and Tree Preservation and Removal Proposal (LMP&TPRP)
Appendix IV: Ecological Impact Assessment (EcoIA)
Appendix V: Revised Drainage Impact Assessment (DIA)
Appendix VI: Replacement pages of Sewerage Impact Assessment (SIA)
Appendix VII: Replacement Pages of Water Supply Impact Assessment (WSIA)
Appendix VIII: Air Quality Impact Assessment (AQIA)
Appendix IX: Land Contamination Assessment
Appendix X: Waste Management Assessment

Complied by: KTA Planning Limited
Date: 28 June 2022
File Ref: 20220628_S3046_FI1_V01

Application for Amendment to the Approved Shek Kong Outline Zoning Plan (OZP) No. S/YL-SK/9
From "Residential (Group D)" to "Residential (Group C)"
At Various Lots in D.D. 112 and Adjoining Government Land, Kam Sheung Road, Shek Kong, Yuen Long, New Territories
S12A Amendment of Plan Application No. Y/YL-SK/1

Items	Comments	Responses
1	**Comments from Director of Environmental Protection received on 30 June 2022: (Contact Person: Ms. Ming HE; Tel: 2835 2390)**	
	We have the following observations on the NIA that the applicant should review and refine in the later NIA submission.	
1.1	(a) S.6.3 - Please document TD's agreement on the traffic forecast data in the NIA report once available. In case TD has no comment on the methodology for traffic forecast only, the consultant should provide written confirmation from the respective competent party (e.g. traffic consultant) that TD's endorsed methodology has been strictly adopted in preparing the traffic forecast data, and hence the validity of traffic data can be confirmed.	Noted. Transport Department has no Adverse comments on the Technical Note on Methodology for Estimating Traffic Forecasts for Traffic Noise Impact Assessment (TNIA). Please refer to **Annex I** on the correspondence from Transport Department dated 30 August 2022.
1.2	(b) S.7.12 – For the purpose of determining the noise criteria for fixed noise assessment, prevailing background noise level in L90 should be measured as well. Please update the fixed noise source assessment accordingly.	The prevailing background noise levels at the nearby NSR were measured (S.7.13 and Figure 3). The measured prevailing background noise levels of the identified NSR were higher than ANL – 5dB(A). Hence, ANL – 5dB(A) will be used as the criteria for noise from planned fixed sources.
2	**Comments from District Land Officer (Yuen Long), received on 25 July 2022: (Contact Person: Ms. Amii KO; Tel: 2443 3300)**	
2.1	It is noted that there is no change in the site boundary, our previous comments shall remain valid.	
	(a) According to the Land Registry records, one of the Lots i.e. Lot No. 263 in D.D. 112 has been carved out into Lot No. 263 S.A and Lot No. 263 R.P. under M/N YL534496. Please update the Lots nos.	Noted and the Lots nos. will be updated accordingly.
	(b) Please note that one of the Lots i.e. Lot No 853 in D.D. 112 is subject to Modification of Tenancy Permit Nos. 9211 and 14024.	The Applicant will submit a notice to surrender the Modification of Tenancy Permit Nos. 9211 and 14024 upon the submission of a land exchange application to Lands Department.
	(c) As shown on the land status plan, the private lots Lot Nos. 854 S.A, 854 S.B, 855 and 860, which are located near the southeast part of the Application Site, would be land-locked.	The Applicant will propose reprovisioning of footpath to the land-locked lots when applying for a land exchange.

Items	Comments	Responses
	Please clarify.	
3	**Comments from Chief Town Planner/ Urban Design & Landscape, PlanD, received on 25 July 2022: (Contact Person: Ms. Ming HE; Tel: 2835 2390)**	
3.1	Landscape Master Plan (LMP) i) The orientation of the compass pointing North is incorrect.	Noted. Drawing No. LMP_001, 004 and 005 have been revised accordingly (**Annex II** refers).
3.2	ii) The applicant is advised to clarify whether boundary fence walls would be proposed along the site boundary adjacent to 'Children Play Area' and 'Barbecue Area' in the south of the site."	Yes, the boundary fence wall will be provided along the Site boundary. Drawing No. LMP_001 was revised (**Annex II** refers).
4	**Comments from Director of Agriculture, Fisheries and Conservation received on 25 July 2022: (Contact Person: Ms. Wong Cheuk-ling; Tel: 2150 6933)**	
4.1	S.4.1.5 According to Table 4-1 in Appendix 2, no Ficus genjamina was found in the table. Please check.	Noted, the species *Ficus genjamina* was added to the Table 4-1 of Appendix 2 for the EcoIA (**Annex III** refers).
4.2	S.6.1.4 Please include a habitat assessment table for urban and village area.	The habitat assessment table for urban and village was included in the revised report. Ecological value of this type of habitat is ranked low (**Annex III** refers).
4.3	S.9.1.1 Please delete "10." after S.9.1.1 on page 9-1.	Noted. It has been deleted (**Annex III** refers).
4.4	Rezoning Site (Page 6-2) The section number of rezoning site shall be 6.1.5 instead 1.1.1. Please revise.	Noted. The section number of the EcoIA has been amended (**Annex III** refers).
4.5	Table 4-2 (Appendix 2) Please include total no. of species and conservation status of herpetofauna species in the table.	Noted. Table 4-2 within Appendix 2 of the EcoIA has been amended (**Annex III** refers).
4.6	Table 4-4 (Appendix 2) - Please include conservation status and habitat of avifauna species in the table. - The total no. of species shall be 25 instead of 26. Please check. - The scientific name of black kite shall be *Milvus migrans*. Please check.	Noted. Table 4-4 within Appendix 4 of the EcoIA has been amended (**Annex III** refers).
4.7	Appendix 2 Please include a list of terrestrial mammals in Appendix 2.	A list of terrestrial mammals was presented as Table 4-6 in Appendix 2 of the EcoIA (**Annex III** refers). The conservation status and habitat of

Items	Comments	Responses
		avifauna species were added in the table 4-4 (**Annex III** refers). The total no. of species was corrected as 24 (one repeated name has been deleted). The scientific name of black kite was changed to *Milvus migrans*.
4.8	Figure 3 Please include the boundary of assessment area in the figure.	The boundary of the assessment area was added in the revised version of Figure 3 of EcoIA (**Annex III** refers).
5	**Comments from Director of Environmental Protection received on 1 August 2022: (Contact Person: Ms. Ming HE; Tel: 2835 2390)**	
	Air Quality	
5.1	Section 2.2 (a) Please clarify if the wording of “carports” in line 2 should be revised as “carparks” since there is discrepancy found between Section 2.2 and Appendix 1 (Architectural Drawings).	Section 2.2 of the AQIA has been revised accordingly (**Annex IV** refers).
5.2	(b) The applicant shall observe and follow EPD’s ProPECC PN2/96 on Control of Air Pollution in Car Parks for the design and operation of the car parks. Car Parks should be designed such that the air quality guidelines set out in the PN are met under all conditions. The exhaust (if any) of the proposed car parks shall be directed away from any nearby ASRs.	The detailed design of the proposed carpark will be formulated at the later design stage. The location of the exhaust outlet would be designed with reference to the “ProPECC PN 2/96 – Control of Air Pollution in Car Park”. The exhaust air from the carpark would be discharged to the atmosphere with proper mitigation treatments in such a manner and at a location not to result in any air nuisance to occupants in the proposed Development and to the neighboring building and to the public. Hence, adverse air quality impact due to the proposed carpark is not anticipated (Section 8.1 of the AQIA in **Annex IV** refers).
5.3	Section 2.3 and 10.2 (a) The consultant should provide more information on the design of the proposed STP (e.g. whether de-odourizing units would be installed at the ventilation exhaust and the odour removal efficiency of the de-odourizing units should also be specified) to justify that no adverse odour impact arising from the proposed STP is anticipated. The applicant shall observe and follow the relevant Environmental Considerations specified in EPD's Guidelines for the Design of Small Sewage Treatment Plants for minimization of the odour impact from the proposed STP while the exhaust outlet of the proposed STP should be located away from all nearby ASRs as far as possible. Please also	The design of the STP will be reviewed during detailed design stage, the environmental consideration specified in EPD Guidelines for the Design of Small Sewage Treatment Plants for minimization of the odour impact from the proposed STP will be observed and followed. The proposed STP will be located underneath the carpark nearest Kam Sheung Road (as annotated on Figure 3 and Indicative MLP in Appendix I of AQIA). The separation distance from the proposed STP to the nearest existing ASR (i.e. Wah Yuen) and the nearest air-sensitive use of the proposed Development (i.e. Tower 1) are 80m and 1m respectively. The exhaust outlet of the proposed STP will be

Items	Comments	Responses
	indicate the location of the exhaust of the proposed STP in Figure 3 for clarity.	located away from all nearby existing ASRs and air-sensitive use of the proposed Development as far as possible. With STP design according to EPD's guidelines, proper deodorization at the exhaust outlet and locating the exhaust away from the ASRs as far as possible, adverse air quality impact due to the proposed STP is not anticipated (Sections 9.2 – 9.4 of AQIA in **Annex IV** refers).
5.4	(b) Please also list out the closest separation distances of any nearby existing ASRs and the air-sensitive uses of the proposed development from the exhaust of the proposed STP to support that adverse odour impact is not anticipated.	The separation distances from the proposed STP to the nearest existing ASR (i.e. Wah Yuen) and the nearest air-sensitive use of the proposed Development (i.e. Tower 1) are 80m and 1m respectively. The exhaust outlet of the proposed STP will be located away from all nearby existing ASRs and air-sensitive use of the proposed Development as far as possible (Section 9.3 of AQIA in **Annex IV** refers).
5.5	Section 3.3 Please clarify if there is any air and odour emission sources (e.g. any emissions from nearby open storage areas) within 200 m from the project site boundary and address the potential impact on the proposed development (if any) in this section. Based on Figure 4, there are some industrial uses located in close proximity to the proposed development, please elaborate the nature of these industrial uses and if any potential air quality impacts will be imposed on the air-sensitive uses of the proposed development.	The nearby industrial uses are vehicle repairing and washing workshops. Site surveys conducted on 10 February 2022 and 17 November 2021 have confirmed that no other air and odour emission source was identified within 200m from the project site boundary.
5.6	Section 4.1 Please revise "become effective" as "came into effect" in line 1.	Section 4.1 of the AQIA has been revised accordingly (**Annex IV** refers).
5.7	Table 5.2 The value of 4th highest 10-min SO2 instead of the highest 10-min SO2 of Grid (31,45) and (32,45) should be presented in the table. Please update the table and revise Note [2] under table 5.2 accordingly.	Table 5.2 and its Note [2] of the AQIA have been revised accordingly (**Annex IV** refers).
5.8	Section 5.3 Please note that the data given in Table 5.2 are predicted pollutant concentrations but not the actual ambient pollutant concentrations measured in Year 2025 at Yuen Long station. These data cannot be used to describe the trend of air quality at the subject site. Please revise line 1 as "It can be seen from the above Table 5.1 and Table 5.2 that…"	Section 5.3 of the AQIA has been revised accordingly (**Annex IV** refers).

Items	Comments	Responses
5.9	Section 6.1 We would like to remind the applicant that it should be the responsibility of the applicant and their consultants to ensure the validity of the chimney data by their own site surveys. Should the information of industrial chimneys be subsequently found to be incorrect, the assessment result as presented in the planning application would be invalidated.	Noted. Site surveys conducted on 10 February 2022 and 17 November 2021 have confirmed that no industrial chimney was identified within 500m of the project site.
5.10	Section 7.1 (a) Please rectify the typo "Kam Cheung Road" in line 2.	The Section 7.1 pf AQIA has been revised (**Annex IV** refers).
5.11	(b) Please confirm and state clearly in the text that no air-sensitive uses including fresh air intake of ventilation system, openable windows and active recreational uses in open space should be located within the buffer zones from the nearby roads.	Please note that the text has been clearly stated in Section 7.3 of AQIA (**Annex IV** refers).
5.12	Table 8.1 (a) It seems that the separation distance between A01 and project site boundary is not 0 m as shown in Figure 2. Please check the separation distance.	Figure 2 has been revised to tally with Table 10.1 in the AQIA (**Annex IV** refers).
5.13	(b) Please clarify if A09 is located only 250 m from the project site boundary since Figure 2 shows a large separation distance.	Table 10.1 has been revised to tally with Figure 2 in the AQIA (**Annex IV** refers).
5.14	Section 9 (a) Owing to the large subject site area (about 4.1 ha), the consultant should provide the scale of the dusty activities including site formation and excavation areas, amount of excavated materials to be handled and no. of dump trucks on the site per time, etc. as well as any phrasing of the construction programme to justify that the dust impact would not be adverse with implementation of control measures.	Detailed information of the dusty activities is not available at this stage. The major construction activities of the proposed Development are foundation and superstructure. There will be no basement area except the STP, with planned area of about 800m^2, such that the scale of excavation involved in the proposed Development is relatively small. The construction activities will not be taking place concurrently at entire work sites (Section 11.1 of the AQIA in **Annex IV** refers). The proposed Development comprises nineteen 6-storeys low-rise residential blocks and two 3-storeys carparks, with site coverage about 30%. Also, the proposed Development currently lies on a relatively flat terrain. Therefore, dusty activities such as excavation, site formation and superstructure works are expected to be relatively small in scale (Section 11.3 of the AQIA in **Annex IV** refers). With the implementation of dust control measures stipulated in the Air Pollution Control (Construction Dust) Regulation (Section 11.4 of AQIA refers) and requirements stipulated in the Air Pollution Control (Non-

Items	Comments	Responses
		road Mobile Machinery) (Emission) Regulation (Section 11.5 of AQIA refers), as well as the relatively small scale construction works, adverse air quality impact due to the dusty activities is not anticipated (**Annex IV** refers).
5.15	(b) Please clarify whether there are any concurrent projects in the surrounding area and cumulative air quality impact shall be assessed.	There is no concurrent project within 100m of the proposed Development. With the implementation of dust control measures stipulated in the Air Pollution Control (Construction Dust) Regulation (Section 11.4) and requirements stipulated in the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation (Section 11.5 of AQIA refers), as well as the relatively small scale construction works of the proposed Development, adverse cumulative air quality impact is not anticipated (Section 11.6 of AQIA in **Annex IV** refers).
5.16	(c) Please clarify if a dust monitoring and audit programme will be implemented during the construction stage to ensure that no adverse dust impact will be imposed on the nearby ASRs.	Noted and it will be further reviewed during the detailed design stages.
5.17	Section 9.2 Since some ASRs are found to be in close proximity of the site boundary (< 5 m), additional mitigation measures during construction stage such as erection of higher hoarding and relocation of dusty activities away from the nearest ASRs shall be considered. In addition, it is also recommended that electric power supply shall be provided for on-site machinery as far as practicable to minimize aerial emissions.	Additional mitigation measures during construction stage are included in Section 11.4 of AQIA (**Annex IV** refers).
5.18	Section 9.3 Since the subject site area is about 4.1 ha and excavation works are involved, it is unclear to conclude that the construction scale is small and the number of construction plants would be limited. Please revise the statement accordingly.	Detailed information of the dusty activities is not available at this stage. The major construction activities of the proposed Development are foundation and superstructure. There will be no basement area except the STP, with planned area of about 800m^2, such that the scale of excavation involved in the proposed Development is relatively small. The construction activities will not be taking place concurrently at entire work sites (Section 11.1 of AQIA in **Annex IV** refers). The proposed Development comprises nineteen 6-storeys low-rise residential blocks and two 3-storeys stand-alone carparks, with site coverage about 30%. Also, the proposed Development currently lies on a relatively flat terrain. Therefore, dusty activities such as excavation, site formation and superstructure works are expected to be relatively small in scale (Section 11.3 of AQIA in **Annex IV** refers).

Items	Comments	Responses
5.19	Figure 3 (a) Please provide a remark in Figure 3 to state clearly that no air-sensitive uses including fresh air intake of ventilation system, openable windows of the buildings and active recreational uses in open space shall be located within the buffer zones.	A remark has been added to Figure 3 of AQIA (**Annex IV** refers).
5.20	(b) Please clarify whether there are any access roads close to the proposed development including the one located to the south of the subject site and the track road located to the east of Tower 1 and Tower 2 would be retained during operation phase. If yes, please provide TD's endorsement for the road type of these access roads and evaluate if sufficient buffers are allowed for any air-sensitive uses within the proposed development by showing their buffer zones in Figure 3.	As reviewed from the latest aerial photo, the track road located to the east of Tower 1 and Tower 2, as well as the one located to the south of the subject site, no longer exist.
	Waste management & land contamination	
5.21	Appendix IX (Land Contamination Assessment) The application site was previously used as open storage as revealed from the aerial photos of year 1990 and 1995. According to Table 2.3 of the Practice Guide for Investigation and Remediation of Contaminated Land, open storage may involve potentially polluting activities, e.g. loading, unloading and storage of goods, fuel storage and transfer, maintenance of equipment and vehicles. As such, potential land contamination issue is anticipated for the application site. Please revise accordingly.	A detailed land contamination assessment will be carried out in the later stage to identify the needs of Contamination Assessment Plan and / or Site Investigation to determine the presence and extent of contamination on site. The Section 6.1 of Land Contamination Assessment has been revised accordingly (**Annex V** refers).
5.22	Appendix X (Waste Management), Table 3.1 For General Refuse from Workforce, the figure "110 tons" under 2nd column should be under 3rd column.	Table 3.1 of the Waste Management Assessment is revised (**Annex VI** refers).
5.23	Appendix X (Waste Management), Section 4.2 The per capita disposal rates of domestic waste in 2020 is 0.91 kg/person/day.	Section 4.2 of the Waste Management Assessment is revised (**Annex VI** refers).

Items	Comments	Responses
	Water Quality	
5.24	RtC 7.5 Please consider to include the response into planning application documents, such as planning statement or environmental assessment report, etc. where appropriate.	Noted. A standalone water quality impact assessment (WQIA) report has been prepared (**Annex VII** refers).
5.25	RtC 7.5 (a) Previous comment not fully addressed. Please identify nearby WSRs within 500m and indicates in a figure for better representation.	Noted. The nearby WSRs within 500m are identified in Figure 2.1 in the WQIA report (**Annex VII** refers).
5.26	(b) As it is noted that watercourse is passing through the site, please elaborate whether there would be diversion works and whether there would be adverse water quality impact and propose mitigation measures accordingly.	It is clarified that diversion work is required for the project. The potential impacts during the diversion works and the proposed mitigation measures are discussed in the WQIA report (**Annex VII** refers).
5.27	(c) Construction Phase Mitigation Measures – bullet 3 – Please review and revise typo “EPCO”.	Noted. The typo is revised in the WQIA report (**Annex VII** refers).
5.28	(d) Please review and supplement relevant mitigation measures suggest in the ProPECC PN 1/94 to confirm whether the mitigation measures would be implemented, e.g. wheel washing facilities, bentonite, water testing, etc.	Noted. The relevant mitigation measures suggested in the ProPECC PN 1/94 are supplemented in the WQIA report (**Annex VII** refers).
5.29	(e) Operation Phase – Relevant best practices and guidelines, such as ProPECC PN 5/93 “Drainage Plans subject to Comment by the Environmental Protection Department”, “Guidelines for the Design of Small Sewage Treatment Plants”, etc. shall be followed.	Noted. The relevant best practices and guidelines during the operation phase are included as the mitigation measures. Please refer to **Annex VII**.
5.20	(f) Decommissioning phase – Any residual wastewaters generated from cleaning out and decommissioning of the treatment and storage units and any residual reclaimed water would be pumped out and tanked away to the public STW for offsite treatment and disposal. View from DSD shall be sought in disposing sewage to public STW.	Noted. The potential impacts and the mitigation measure during the decommissioning phase are identified. Please refer to **Annex VII**.
	Sewerage	
5.21	We have no further comments from sewerage planning perspective.	Noted with Thanks.
6	**Comments from Chief Engineer/Mainland North, Drainage Services Department (DSD) received on 1 August 2022: (Contact Person: Mr. Jeff CW Tse; Tel: 2300 1627)**	
	Drainage Impact Assessment	

Items	Comments	Responses
6.1	(a) Section 4.1.1: According to the record, the proposed box culvert and channel with flood wall are not located within Government Land. Please check.	Please note that the proposed box culvert is located within the Development Site, as well as within the private lots owned by the Applicant (or the Applicant's subsidiary companies). The proposed box culvert will be constructed and maintained by the Applicant. For the proposed channel with floodwall, according to the GeoInfo Map of LandsD, the proposed channel is located within Government Land. The alignment of the proposed channel and land lots are showed in **Annex A**- Alignment of the Proposed Channel with Flood Wall (**Annex VIII** refers).
6.2	(b) Section 4.1.1 and Drawings in Appendices B2 and B4: Please provide cross section drawing(s) with level at different locations to demonstrate that the provision of the proposed boundary channels/pipes (in either red or purple color) would not induce any adverse drainage impact to the adjacent private lots/area."	The cross sections of proposed boundary channels are provided in figures under **Annex B**- Cross-sections of the Proposed Boundary Channels (**Annex VIII** refers). As shown in the cross sections, the predicated water levels under the extreme 200 years rainfall are generally within the proposed channels and drainage impact to the adjacent private lots/ areas is not anticipated.
<u>7</u>	**<u>Comments from Chief Architect/ Central Management Division 2, ArchSD received on 17 August 2022: (Contact Person: Mr. Calvin CHAN; Tel: 2154 2398)</u>**	
7.1	Regarding the building height, our previous comments (via PlanD's email dated 1.6.2022) are still valid, i.e. it is noted that the proposed residential development mainly consists of 19 nos. of towers with building height of 6 storeys (about 44.15mPD), which are about 200% higher than adjacent "R(D)" developments with building height restriction (BHR) of 2 storeys permitted in the OZP. It is undesirable from visual impact point of view and may not be compatible to adjacent developments.	Your comments to the building height are well noted. Please note that the Proposed Development is about 700m away from the eastern peripheries of the boundary of Kam Tin South and Pat Heung area, which has been identified by the government to develop the area into the suburban township with PR ranging between 0.8 to 3.0. The proposed building height for the Proposed Development is intended to align with the Land Use Review and to contribute to the suburban township of Kam Tin South and Pat Heung area. A visual impact assessment has also been conducted on the visual impact of the Proposed Development. It is indicated that the Proposed low-rise Development with 6 storeys is not incompatible with the surrounding height profile, especially the adjacent developments, which overall does not obstruct the mountain ridgeline and open skyview in the background. Therefore, the resultant visual change is considered acceptable. The visual impact can be mitigated through appropriate and well through-out design measures (i.e. building setback, providing green buffer along the periphery of the Site, building facades materials).

Items	Comments	Responses
		The development parameters of the Proposed Development have also made reference to other “R(C)” zones with similar PR of 0.8 with 6 storeys under the prevailing Approved / Draft OZPs. It is therefore deemed acceptable from planning and visual point of view.
8	**Comments from Chief Town Planner/ Urban Design & Landscape, PlanD received on 17 August 2022: (Contact Person: Ms Nicole LEE; Tel: 3565 3945)**	
8.1	The Site is located within an area predominantly rural in character, surrounded by village settlements of 1 to 3 storeys to the east, west and northwest (up to about 35mPD) and agricultural land to its north and south. Judging from the photomontages in the VIA and noting from applicant’s assessment, the proposed development of 19 residential blocks with building height of 6 storeys (up to about 44.15mPD) would bring forth visual changes to the surrounding context, resulting in negligible to slightly adverse visual impact.	Your comments are well noted. A Visual Impact Assessment (VIA) has been conducted to assess the visual impact of the Proposed low-rise Development. As shown from the photomontages of the selected viewpoints, there would be some visual changes to the surrounding area, but the Proposed Development is not incompatible with the surrounding height profile, which overall does not obstruct the mountain ridgeline and open skyview in the background. The visual impact can be mitigated through appropriate and well through-out design measures (i.e. building setback, providing green buffer along the periphery of the Site, building facades materials). Therefore, the resultant visual change due to the Proposed Development is not significant and is considered acceptable in visual point of view.

Enclosure:
Annex I: Correspondence from Transport Department on methodology for estimating traffic forecast for TNIA
Annex II: Replacement pages of Landscape Master Plan
Annex III: Revised Ecological Impact Assessment
Annex IV: Revised Air Quality Impact Assessment
Annex V: Replacement Pages of Land Contamination Assessment
Annex VI: Replacement Pages of Waste Management Assessment
Annex VII: Water Quality Impact Assessment
Annex VIII: Replacement pages of Drainage Impact Assessment

Complied by: KTA Planning Limited
Date: 2 September 2022
File Ref: 20220902_S3046_FI2_V01

Application for Amendment to the Approved Shek Kong Outline Zoning Plan (OZP) No. S/YL-SK/9
From “Residential (Group D)” to “Residential (Group C)”
At Various Lots in D.D. 112 and Adjoining Government Land, Kam Sheung Road, Shek Kong, Yuen Long, New Territories
S12A Amendment of Plan Application No. Y/YL-SK/1

Items	Comments	Responses
1	**Comments from Transport Department received on 22 September 2022: (Contact Person: Phil CAI; Tel: 2399 2421)**	
	Layout	
1.1	The proposed separate run-in / out at Kam Sheung Road should be justified. The number of run-in / out should be reduced from traffic engineering perspective.	The proposed run-in / out at the west of the Site will be closed and will not be used for daily operation. It will only be used by vehicles for emergency / occasional E/M maintenance.
1.2	Set-back of 3.5 m at Kam Sheung Road for improved walkability should be considered. In addition, comments from the Highways Department should be sought for the proposed Public Works Project – “Improvement to Kam Sheung Road”	Due to the low pedestrian flow, it is believed that the existing footpath width would be sufficient for future pedestrian movement. The set-back issue would be review in detailed design case. Nevertheless, please kindly note that there is approximately 7m between the proposed carpark building and Kam Sheung Road, and therefore sufficient space could be provided for setback 3.5m in case it is necessary. Based on the preliminary layout of Improvement to Kam Sheung Road from HyD, the works has no significant impact to the Site (**Annex I** refers). The Applicant will further discuss and consult relevant government departments (i.e. TD and HyD) at detailed design stage.
1.3	Loading / unloading spaces for residential blocks as well as the GIC sites should be shown on the Master Layout Plan. These spaces should be located adjacent to the tower blocks as well as without the need to cross the road	The Loading/ Unloading spaces have been revised and shown on the Master Layout Plan to closely locate to the residential blocks, as well as the clubhouse buildings (**Annex II** refers).
1.4	The desirable requirements for internal road layout should be adopted in accordance with PNAP APP-111	Noted. The current road design is up to the ‘desirable requirements’
	Traffic Impact Assessment	
1.5	“Ratio of Flow to Capacity” should be read as “Design Flow / Capacity (DFC)”	Noted. Wording has been revised accordingly in the TIA (**Annex III** refers).
1.6	The following junctions should be assessed: (i) Ko Sheung Road / Kam Sheung Road (ii) Tung Wui Road / Kam Sheung Road;	Noted. These junctions have been included and assessed in the revised TIA (**Annex III** refers).

Items	Comments	Responses
	(iii) Fan Kam Road / Kam Tin Road	
1.7	Link capacity within the area of influence as well as Tai Lam Tunnel should be assessed	Noted. Link capacity has been assessed in shown in **Tables 3.5**, **5.2** and **5.4** of the revised TIA report (**Annex III** refers). All links will operate with ample capacities in both observed and future cases.
1.8	Table 2.3- Please consider to provide private car parking provision under Hong Kong Planning Standards and Guidelines (HKPSG) towards high end of GPS and more motorcycle parking space to satisfy the parking demand	Noted. High end of parking spaces has been provided. Please refer to **Table 2.3** of the revised TIA report (**Annex III** refers).
1.9	The breakdown of ancillary residential and visitors car park should be separated from the total for ease of reference	Noted. The breakdown of ancillary residential and visitors car park has been shown in **Table 2.3** of the revised TIA report (**Annex III** refers).
1.10	Consideration should be given for the provision of loading / unloading space for club house	Noted. 1 HGV loading / unloading space has been provided for each club house. Please refer to **Annex III**.
1.11	Paragraph 3.3.4 – The exact date of the traffic survey should be stated. Verification should also be conducted to check if the evening peak would not extend to 8:00 pm, given that the commute pattern from the urban area may arrive Northwest New Territories at around 7:00 pm.	The survey was carried out on 18 November 2021. The survey was carried out from and 5:30 pm to 7:30pm. It was found that the peak flow occurred at 5:45 pm to 6:45pm and the traffic flows are continuously dropping after that. Besides, with reference from core ATC station No. 5029, the peak PM peak is around 7:00pm and the traffic will drop after that. Therefore, our surveyed evening peak is considered reliable.
1.12	Table 3.3 – The ATC Station at local should also be considered in the assessment of corrected traffic flow figure	As ATC station 5029 is the only Core station with peak hour flow in vicinity, therefore only its traffic flow could be used for estimate COVID-19 factor. As per your comments 1.14 and 1.15, more ATC stations and 2019-based TPEDM Planning Data were considered. New growth rate of 2.73% was adopted for deriving COVID-19 factor. Please refer to **Table 3.3** of the revised TIA report (**Annex III** refers).
1.13	Table 3.4 – The junction performance for Junction C exceeds 0.85. The calculation should be reviewed with consideration of traffic movement banned	The calculation for Junction C has been reviewed. The junction is operated with ample capacity with DFC is below 0.85. Please refer to **Table 3.4** of the revised TIA report (**Annex III** refers).
1.14	Table 4.1 – ATC Stations at local roads such as Kam Sheung Road should also be considered in the derivation of growth rate	Noted. With consideration of 2019-based TPEDM planning data, new growth rate of 2.73% has been adopted. Please refer to **Chapter 4** of revised TIA (**Annex III** refers).

Items	Comments	Responses
1.15	Table 4.2 – As PlanD has published 2019-based TPEDM Planning Data, derivation of growth rate should consider the latest planning data subject to PlanD's comments	Noted. New growth rate of 2.73% has been adopted. Please refer to **Chapter 4** of revised TIA (**Annex III** refers).
1.16	Tables 4.3 and 4.4 – Comments from PlanD should be sought on the concurrent planning applications to be considered in the assessment	Noted and agreed. The Applicant is currently liaising with Fanling, Sheung Shui DPO and pending for comments from PlanD.
1.17	Figure 3.8 – Straight crossing is now proposed under Kam Tin South Development. The assessment should consider such amendment	The junction layout is based on the TIA of Kam Tin South "Sites 1, 4a and 6 for Public Housing Development and Government, Institution or Community Facilities" and CEDD gazette drawing of Contract No. YL/2017/01. The junction arrangement shows that it is a stagger crossing. The gazette drawings are obtained from the link below: https://www.cedd.gov.hk/eng/our-projects/major-projects/index-id-70.html In addition, the preliminary layout plan of "Improvement to Kam Sheung Road" from HyD also shows that the future crossing at this junction are staggered crossings rather than straight crossing.
1.18	Figure 3.6 – The Highways Department is proceeding with the Public Works Project "Upgrading of the Remaining Section of Kam Tin Road / Lam Kam Road. The junction configuration at design year should consider such improvement proposal	Noted. Those junctions have been upgraded under "Upgrading of the Remaining Section of Kam Tin Road / Lam Kam Road" and other projects are considered in the design year. The layouts are shown in **Figures 3.11** to **3.15** and the assessment was updated in the revised TIA report (**Annex III** refers).
1.19	Figure 5.1 – (i) The Highways Department is proceeding with the Public Works Project "Upgrading of the Remaining Section of Kam Tin Road / Lam Kam Road. The junction configuration at design year should consider such improvement proposal; (ii) The Method of Control at the junction should be specified; (iii) The "Give Way" arrangement from Sheung Tsuen Car Park should be reviewed, given that the junction has been converted to	The planned junction configuration is considered at design year and the layout is shown in **Figure 3.12** of the revised TIA report (**Annex III** refers). After review, this junction could operate with ample capacity during design year and thus no further improvement is required.

Items	Comments	Responses
	signals; (iv) The pedestrian crossing at Kam Tin Road (East and West of the junction) and across Kam Sheung Road should be signalised to improve the walkability;	
1.20	Assessment on the public transport and railway should be provided and incorporated in the report	Public transport assessment is included in **Chapter 6** of revised TIA report (**Annex III** refers). There will be sufficient surplus for future public transport demand in design year 2030.
1.21	Development traffic flow diagram should be provided for reference	Noted. The development traffic flow diagram is shown in **Figure 4.4** of the revised TIA report (**Annex III** refers).
2	**Comments from Agriculture, Fisheries and Conservation Department received on 14 October 2022**	
	Please find our comments on the ecological impact assessment as follows:	
2.1	R to C 4.1: The species *Ficus genjamina* is yet to be added in the table 4-1 of Appendix 2. Please check.	The species *Ficus benjamina* is added to Table 4-1 of Appendix 2 of EcoIA (**Annex IV** refers).
2.2	Table 4-4 (Appendix 2): the habitats (e.g. vegetated, wetland and wooded area) that mentioned in the table are not included in the report. Please check and revise.	Noted, the wordings of habitats in the table 4-4 of Appendix 2 of EcoIA have been revised to 'application site', 'water course', and 'surrounding area'. Please refer to **Annex IV**.
3	**Comments from District Lands Officer/ Yuen Long, Lands Department received on 14 October 2022**	
3.1	It is noted that there is no change in the site boundary, our comments as mentioned before shall remain valid.	Noted.
4	**Comments from Drainage Services Department received on 14 October 2022**	
	Annex VIII - Drainage Impact Assessment (DIA)	
4.1	Please advise the maintenance agency for the proposed drainage facilities	The proposed drainage system within the site boundary, such as the proposed 2.1m x 2.5m box culvert and the proposed boundary channels, will be constructed and maintained by the Applicant. For the 1.4-2.6m (w) x 1-1.25m (h) proposed channel with floodwall which is located on government land, the applicant will be responsible for constructing the proposed channel including the floodwall. After the construction, the 1.4-2.6m (w) x 1-1.25m (h) proposed channel with floodwall will be handed back to DSD for maintenance.

Items	Comments	Responses
4.2	Referring to previous submitted DIA (para. 4.1.2), it is noted that the surface runoff from the application site will be discharged to the new drainage system. Please confirm that no surface runoff accrued on the application site will be collect, convey and discharge to the proposed boundary channels. If affirmative, please advise whether any measures to be implemented to prevent the above situation happened.	The surface runoff from the application site will be discharged to the proposed 2.1m x 2.5m box culvert via internal drainage system. Boundary wall and regular maintenance of internal drainage system will be provided, thus no surface runoff accrued on the application site will be collected, conveyed and discharged to the proposed boundary channels.
4.3	Please demonstrate with hydraulic calculation that the proposed boundary channels in Wah Yuen and Lin Fa Tei areas have sufficient to intercept the overland flow from the adjacent lands/the application site.	The hydraulic calculation of the proposed boundary channels in Wah Yuen and Lin Fa Tei areas are included in the submitted Hydraulic model (Appendix I of the DIA Report) (**Annex V** refers). The proposed boundary channels can be referred to model ID: BD300.1, BD301.2, BD302.1, BD400.1, BD500-a.1, BD500.1, BD501.1, BD502.1 and BD503.1. Based on the model results, the proposed channels will have discharge capacity to cater for the 50 years storm.
4.4	According to the cross-section drawings provided in Annex B, the size of the proposed boundary channel at B2 is smaller than B1 due to the diversion of flow. However, if there is any blockage/malfunction of the diversion box culvert(s), the proposed boundary channel at B2 will not have sufficient capacity to cater for the additional flow from B1. Please review.	Please be clarified that the proposed boundary channel B1, and channels B2 and B3 as shown in Annex II of FI2 are connected to the proposed box culvert via two drainage pipes with size of 1200mm diameter and 1050mm diameter respectively. The hydraulic calculation also indicated that the proposed 1200mm pipe and 1050mm pipe would have enough capacity for conveying the runoff collected by boundary channels B1 and B2, and channel B3 to the proposed box culvert. To minimise the risk of possible blockage/ malfunction of the proposed 1050mm pipe for boundary channels B2 and B3, an extra 1050mm pipe has been provided so that boundary channels B1, B2 and B3 will have their own stormwater discharge pipe for connecting to the proposed box culvert at Wah Yuen. The minor updated drainage layout in Appendix B5 of the DIA Report (**Annex V** refers), with the changes highlighting in clouds, is enclosed for ease of reference (refer to attached amended page).

Enclosure:
Annex I: Preliminary Layout of Improvement to Kam Sheung Road from Highways Department
Annex II: Revised Master Layout Plan
Annex III: Revised Traffic Impact Assessment
Annex IV: Replacement page(s) of Ecological Impact Assessment
Annex V: Replacement page of Drainage Impact Assessment
Annex VI: Revised Landscape Master Plans, Tree Treatment Plans and Tree Proposal

Complied by: KTA Planning Limited
Date: 7 November 2022
File Ref: 20221107_S3046_FI3_V01

Application for Amendment to the Approved Shek Kong Outline Zoning Plan (OZP) No. S/YL-SK/9
From “Residential (Group D)” to “Residential (Group C)”
At Various Lots in D.D. 112 and Adjoining Government Land, Kam Sheung Road, Shek Kong, Yuen Long, New Territories
S12A Amendment of Plan Application No. Y/YL-SK/1

Items	Comments	Responses
1	**Comments from Environmental Protection Department received on 9 November 2022:**	
	Air Quality	
1.1	Section 5.3 Please revise "since 2016” as “in recent years" in line 2.	Section 5.3 of the AQIA has been revised (**Annex I** refers).
1.2	Section 9.3 and R-t-C 5.4 It is noted that Tower 1 of the proposed development would be located adjacent to the proposed on-site STP (~ 1m). Please be reminded that the exhaust outlet of the proposed on-site STP should be designed properly and located away from all nearby ASRs including Tower 1 as far as possible to avoid causing any odour impact. In view of the close proximity of the proposed STP from Tower 1 of the proposed development, the applicant shall explore to adopt the highest odour removal efficiency for the deodorizer and specify it in the text.	Due to the close proximity of the proposed STP from Tower 1, highest odour removal efficiency for the deodorizer will be adopted. Please refer to Section 9.4 of the AQIA (**Annex I** refers).
1.3	Section 11 and R-t-C 5.16 Since the work site is large, it is necessary to implement an EM&A program to ensure that the ASRs will not be subject to adverse impact during the construction stage.	The EM&A program will be implemented to ensure that the ASRs will not be subject to adverse impact during the construction stage. Please refer to Section 11.3 of the AQIA (**Annex I** refers).
1.4	Sections 11.3, 11.5 and 11.6 Please estimate the size of active workfront area at a time for the proposed development and whether the works will be conducted in phases to justify the scale of work is small and the number of machinery is limited.	Detailed information of the construction programme is currently not available at this stage. However, the size of active workfront area at a time for the proposed development will be as limited as practicable, in order to limit the scale of work and number of machinery.
1.5	Section 11.6 Please note that 500m assessment area shall be used instead of 100m. The consultant should check if there are any concurrent projects within 500m from the project site boundary and address their cumulative dust impact with the proposed development. Please show the location of the concurrent projects (if any) in a figure/location map with the proposed development and provide their separation distances and the distance of	Please note that there is no concurrent project within 500m of the proposed development.

Items	Comments	Responses
	the identified ASRs for this project from the concurrent projects to justify if adverse cumulative dust impact is not anticipated.	
1.6	Figure 2 Please double check if A11 is only 5m away from the project site boundary as shown in Table 10.1.	Table 10.1 of the AQIA has been revised accordingly (**Annex I** refers).
1.7	Please highlight all the changes/amendments in the next submission for easy review.	Noted.
1.8	**Waste management & land contamination** We have no comment on the FI from waste assessment view.	Noted.
1.9	**Water Quality** Section 1.4.1 – Please review typo “stroey”.	Noted. Section 1.4.1 of WQIA has been amended accordingly (**Annex II** refers).
1.10	Section 2.3.10 – Please review whether the production rate for construction workers would be 0.15 against GESF.	According to Table T-2 in GESF, the production rate for construction workers is 0.23. Section 2.3.10 of the WQIA has been updated accordingly (**Annex II** refers).
1.11	Section 2.4.6 – Please briefly elaborate to clarify conveying the sewage to planned public sewerage system would be conducted in future when public sewer is available.	Noted. Section 2.4.6 has been updated (**Annex II** refers).
1.12	Section 2.6.16 – Please review and clarify whether temporary sewage diversion would be applicable to the current project.	Please note that temporary sewage diversion works are not anticipated for the current project. Relevant description has been removed.
1.13	Table 2.1 – Footnote (2) for Ammonia-N seems to be missing, please review.	Noted. Footnote (2) of Table 2.1 of the WQIA has been updated (**Annex II** refers).
1.14	Section 2.7.2 – Please further review whether the subject site is within Wetland Buffer/Conservation Area as stipulated in TPB PG No.12C or within an area where 'no-net-increase in pollution load' is required in the OZP explanatory statement. Otherwise, please review if 'no-net-increase in pollution load' is really proposed where pollution credit shall be identified.	Please note that the subject site is not within the Wetland Buffer/Conservation Area as stipulated in TPB PG No.12C nor within an area where 'no-net-increase in pollution load' is required in the OZP explanatory statement. Section 2.7.2 of the WQIA has been amended (**Annex II** refers).
1.15	Section 2.7.2 – Please specify the ADWF and the capacity for the holding tank with reference to the ADWF.	Noted. Section 2.7.2 of AQIA has been updated (**Annex II** refers).
1.16	Section 2.4 or Section 2.7 - Please briefly elaborate, where appropriate, whether there would be any wastewater from swimming pool or water features, and how would the wastewater be handled during operation	The sewage flow from backwashing of swimming pool or other water features have been considered in the ADWF. The wastewater would be handled using onsite STP until the public sewer are available

Items	Comments	Responses
	phase and any mitigation measures needed.	during operation phase. Section 2.7.1 of AQIA has been supplemented (**Annex II** refers).
1.17	Section 2.4.3 or Section 2.7.10 – Please briefly elaborate whether there would be any adverse water quality impact from application of agrochemicals, e.g. fertilizers, etc. during operation phase. Please propose mitigation measures accordingly, if any.	Noted. The proposed mitigation measures for the application of agrochemicals have been discussed in the Section 2.7.11 of the AQIA (**Annex II** refers).
1.18	**<u>Noise</u>** From noise planning point of view, we have no objection to the s.12a application provided that the applicant will submit a proper Noise Impact Assessment (NIA) report for the MLP/GBP to achieve full compliance with the relevant noise criteria in a later stage. Having said that, please find our comments below and refine them in the later NIA submission.	Noted. A proper NIA report will be submitted in the later stage.
1.19	RtC item 2 - It is noted that S.7.13 and figure 3 in the previous submission is helicopter noise measurement. The prevailing background noise level in L90 should be measured and included in the NIA report for determining the noise criteria for fixed noise impact assessment. Please update the fixed noise impact assessment in the later NIA report.	The prevailing background noise level will be included in the NIA report at the later stage.
<u>2</u>	**<u>Comments from District Lands Office received on 9 December 2022 (Contact Person: Ms. Ami KO; Tel: 2443 3300):</u>**	
2.1	I refer to the Further Information 3 received on 18.11.2022 (“FI3”) for planning application (No. Y/YL-SK/1) attached to your memo under reference which comprises a table of responses to government departments’ comments and various technical assessments, etc. It is noted that there is no change in the site boundary, our comments as mentioned in our memos dated 27.5.2022, 20.7.2022 and 28.9.2022 under ref. (110< (20) and (22) in the same series shall remain valid.	Noted. Please be advised that Mater Layout Plan (MLP) has been revised to incorporate 2.5m-wide footpath to the subject private lots which are located near to the south-eastern part of the Application Site.
3.	**<u>Comments from Director of Agriculture, Fisheries and Conservation received on 9 December 2022 (Contact Person: Ms. Wong Cheuk-ling; Tel: 2150 6933):</u>**	
3.1	Please find our comments on the ecological impact assessment as follows: RtC Point 2.1 Noting that *Ficus benjamina* is added to Table 4-1 of Appendix 2, while *Ficus genjamina* is found in S.4.1.5 (Page 35) in the last submission dated 2 Sept 2022. Please revise.	Noted. Table 4-1 of Appendix 2 and S4.1.5 of EcoIA has been revised accordingly (**Annex III** refers).
3.2	RtC Point 2.2 According to the habitat map (Page 52) in the last submission dated 2 Sept 2022, the habitats only include urban & village, waste ground and water course instead of application site and surrounding area. Please	Table 4-4 of Appendix 2 has been revised accordingly (**Annex III** refers).

Items	Comments	Responses
	revise in table 4-4 of Appendix 2.	
4.	**Comments from Chief Engineer/Mainland North, Drainage Services Department (DSD) received on 9 December 2022 (Contact Person: Mr. Jeff CW Tse; Tel: 2300 1627):**	
4.1	Annex VIII of Fi No. 2 – Drainage Impact Assessment (DIA) Please advise if any peripheral surface channels provided along the site boundary (at the revised formation level) to collect the surface runoff accrued on the application site and discharge to the proposed box culvert. If affirmative, please indicate the surface channel in the drainage system plan and relevant cross section drawing(s) for clarity.	As mentioned in Section 4.1.2 and Section 4.2.1 of the revised DIA Report, runoff from the Site will be discharged directly to the proposed box culvert via internal drainage system without entering the proposed boundary channels and associated pipework. The internal drainage system will consist of both peripheral surface channels and pipelines and the design of the internal drainage system will be provided in the future detail design stage. Section 4.1.2 and Section 4.2.1 of the revised DIA has been revised and clearly indicate the internal drainage will consist of both peripheral surface channels and pipelines. To ensure no runoff from the Site will be discharged to the proposed boundary channels, boundary walls will be provided at the site boundary at the revised formation level. Maintenance accesses will be provided for the regular maintenance of the proposed boundary channels to prevent blockage of the proposed boundary channels and associated pipework. The cross-sections of the boundary channels with the boundary wall for the concerned channel at Wah Yuen and Lin Fa Tei are shown in **Annex V.**
4.2	In order to prevent any backflow issue happened due to any potential blockage/malfunction of the diversion box culvert(s) happened, please review the design/alignment of the proposed boundary channel at Wah Yuen and Lin Fai Tei.	The proposed boundary channels and the associated pipes at the Wah Yuen are re-arranged to be four sets of standalone drainage system to collect runoff from Wah Yuen and divert the flow to the proposed box culvert; and one standalone drainage system for Lin Fa Tei has been proposed to collect and divert flow from Lin Fai Tei to the proposed box culvert. The alignment of boundary channels and the associated pipes is shown in **Appendix B5** of the revised DIA Report. Hydraulic model in **Appendix I** of the revised DIA Report is also updated to reflect the changes (Please refer to **Annex IV** for revised DIA).
4.3	Please also provide the connection details with level(s) between the proposed 1050/1200mm dia. pipes and the box culvert for comment.	Four sets of boundary channels and associated pipes are proposed for collecting the runoff from nearby Wah Yuen area. Catchpits with sand trap will be adopted for connecting the proposed boundary channels and associated pipes to prevent blockage of the downstream drainage system and details will be provided in the future detail design stage. The profiles with invert levels of the four sets of boundary channels and associated pipes near to Wah Yuen are shown in **Annex V**.

Enclosure:
Annex I: Replacement page of Air Quality Impact Assessment
Annex II: Revised Water Quality Impact Assessment
Annex III: Replacement page of Ecological Impact Assessment
Annex IV: Revised page of Drainage Impact Assessment
Annex V: Information on the Proposed Boundary Channels

Complied by: KTA Planning Limited
Date: 16 January 2023
File Ref: 20230116_S3046_FI4_V01r

Application for Amendment to the Approved Shek Kong Outline Zoning Plan (OZP) No. S/YL-SK/9
From “Residential (Group D)” to “Residential (Group C)”
At Various Lots in D.D. 112 and Adjoining Government Land, Kam Sheung Road, Shek Kong, Yuen Long, New Territories
S12A Amendment of Plan Application No. Y/YL-SK/1

<table>
<tr><th>Items</th><th>Comments</th><th>Responses</th></tr>
<tr><td><u>1</u></td><td colspan="2"><u>Comments from Transport Department received on 8 February 2023: (Contact Person: Phil CAI; Tel: 2399 2421)</u></td></tr>
<tr><td>1.1</td><td>The proposed separate run-in / out at Kam Sheung Road is not justified. Please consider to use one run-in / out only for both daily operation and maintenance;</td><td>Noted. The run-in / out at Kam Sheung Road has been revised with only one run-in / out to be used for both daily operation and maintenance. Please refer to Annex I.</td></tr>
<tr><td>1.2</td><td>Pedestrian assessment shall be carried out to demonstrate the level of service of the adjacent footpath, incorporating the population of the development. Please also consider to add a pedestrian crossing between the site and public transport for better connectivity;</td><td>Noted. Pedestrian assessment has been conducted by incorporating the population of the development, which is added in Chapter 7 of the revised TIA report (Annex II refers). The results are extracted as below:
<table>
<tr><th rowspan="3">Critical Section</th><th colspan="2">Year 2023 Observed Scenario</th></tr>
<tr><th>AM Peak</th><th>PM Peak</th></tr>
<tr><th>LOS</th><th>LOS</th></tr>
<tr><td>F1</td><td>A</td><td>A</td></tr>
<tr><td>F2</td><td>A</td><td>A</td></tr>
</table>
<table>
<tr><th rowspan="3">Critical Section</th><th colspan="2">Year 2030 Reference Scenario</th></tr>
<tr><th>AM Peak</th><th>PM Peak</th></tr>
<tr><th>LOS</th><th>LOS</th></tr>
<tr><td>F1</td><td>A</td><td>A</td></tr>
<tr><td>F2</td><td>A</td><td>A</td></tr>
</table>
<table>
<tr><th rowspan="3">Critical Section</th><th colspan="2">Year 2030 Design Scenario</th></tr>
<tr><th>AM Peak</th><th>PM Peak</th></tr>
<tr><th>LOS</th><th>LOS</th></tr>
<tr><td>F1</td><td>A</td><td>A</td></tr>
<tr><td>F2</td><td>A</td><td>A</td></tr>
</table>
Please note that the widening of Kam Sheung Road will be carried out by HyD under “Upgrading of the Remaining Section of Kam Tin Road / Lam Kam Road” and a 2m footpath will also be provided along both sides of the road. The assessment of the 2m wide footpath has been carried out. The entire footpath would operate with LOS A in design year.</td></tr>
</table>

<table>
<tr><th>Items</th><th>Comments</th><th>Responses</th></tr>
<tr><td></td><td></td><td>To facilitate better connectivity between the site and the public transport, a pedestrian crossing is proposed and shown in Figure 7.1 of the revised TIA report. Please refer to Annex II.</td></tr>
<tr><td>1.3</td><td>Table 3.4 – the calculation for Junction C shall be reviewed;</td><td>The calculation of Junction C has been reviewed and shown below table RC1:

Table RC 1 Operational Performance for Junction C
<table>
<tr><th rowspan="2">Ref.</th><th rowspan="2">Junction
Kam Sheung Road/ Pat Heung Road</th><th colspan="2">DFC</th></tr>
<tr><th>AM Peak</th><th>PM Peak</th></tr>
<tr><td rowspan="4">C</td><td>Observed Scenario</td><td>0.71</td><td>0.58</td></tr>
<tr><td>Reference Scenario$^{(1)}$
(with Proposed Improvement by HyD)</td><td><u>0.87</u></td><td>0.69</td></tr>
<tr><td>Design Scenario
(with Proposed Improvement by HyD) $^{(1)}$</td><td><u>0.96</u></td><td>0.73</td></tr>
<tr><td>Design Scenario
(with Further Improvement by the Applicant) $^{(2)}$</td><td>+19%</td><td>+28%</td></tr>
</table>
(1) Improvement scheme was proposed under Public Works Project “Upgrading of the Remaining Section of Kam Tin Road / Lam Kam Road” as shown in Figure 3.12 of the TIA and also attached in the R to C
(2) Further Improvement by the Applicant.

To improve the operational performance of Junction C, it is proposed to further widen the junction and change the junction from priority control to signalized control. It would continue to operate with ample capacity after improvement. Please refer to Figure 5.1 and Table 5.5 of the revised TIA (Annex II refers).</td></tr>
<tr><td>1.4</td><td>Figure 3.11 – please see attached on the straight crossing and update the figure accordingly;</td><td>Noted. The assessment has been updated by adopting the latest layout. The R.C of Junction A would operate with ample capacity in design year, as shown in Table RC 2 (Annex II refers).</td></tr>
</table>

<table>
<tr><th>Items</th><th>Comments</th><th>Responses</th></tr>
<tr><td></td><td></td><td>Table RC 2 Operational Performance for Junction A in Design Year 2030
<table>
<tr><th rowspan="2">Ref.</th><th rowspan="2">Junction</th><th colspan="2">RC</th></tr>
<tr><th>AM Peak</th><th>PM Peak</th></tr>
<tr><td rowspan="4">A</td><td rowspan="4">Kam Sheung Road/ Pat Heung Road</td><td colspan="2">Reference Scenario</td></tr>
<tr><td>+25%</td><td>+53%</td></tr>
<tr><td colspan="2">Design Scenario</td></tr>
<tr><td>+19%</td><td>+49%</td></tr>
</table></td></tr>
<tr><td>1.5</td><td>The survey results in Tables 6.1 – 6.4 cannot form the basis for public transport demand assessment. For example, Table 6.1 shows the survey results at Stop A (Eastbound), the bus and GMB operating on Eastbound are from Kam Sheung Road Station/ Yuen Long town centre/ Tai Lam Tunnel BBI which the peak hour should be in PM peak, when residents returning home after work. Please be reminded that Stop A in PM peak is mainly an alighting stop for residents returning home. Taking GMB 72 as an example, the PM peak result in Table 6.1 shows a very low occupancy. However, the peak loading point in PM peak for GMB 72 Lui Kung Tin bound (equivalent to Eastbound) should be Kam Sheung Road Station and our survey record showed that the occupancy already over 90%;</td><td>Based on the site observation and survey, GMB 72 would occupy over 90% at Kam Sheung Road Station, passengers dropped off along Kam Sheung Road and few people remaining on GMB when arrived at Stop A near the Site.

As commented by TD, assessment on the demand on the bus and GMB at Kam Sheung Road Station were carried out and included in Chapter 6 of the revised TIA (Annex II refers).

Based on the assessment result, the recommendations are:
i) To increase the frequency of GMB Route no. 72/72M by 2 nos. in PM peak.
ii) The frequency of bus remains unchanged.</td></tr>
<tr><td>1.6</td><td>Distribution of passenger demand by model split is more preferable than directional split of existing on Kam Sheung Road (Eastbound and Westbound);</td><td>Noted. Model split has been used to estimate the distribution of passenger demand. Detail assessment please refers to Chapter 6 of the revised TIA (Annex II refers).</td></tr>
<tr><td>1.7</td><td>Table 6.8 – Please list out the original modal split (%) from 2021 Population Census;</td><td>Noted. Original modal split (%) has been added in Table 6.7 of the revised TIA report (Annex II refers).</td></tr>
<tr><td>1.8</td><td>Table 6.8 – The method of the adjusted modal split is not accepted. MTR and Light Rail should not be regarded as not related modal split. Though there is no MTR and LR in the vicinity, passenger could take feeder service to the nearest MTR Station (i.e. Kam Sheung Road Station). The modal split (%) of MTR and LR should be regarded as feeder demand directly;</td><td>Noted. The modal split of Bus-MTR/LR and GMB-MTR/LR are considered and the revised split is shown in Table 6.7 of the revised TIA report (Annex II refers).</td></tr>
</table>

Items	Comments	Responses
1.9	Para. 6.3.4 to 6.4.1 – the conclusion of these two paragraphs should be reviewed according the revised assessment, and	Noted. Para. 6.3.4 to 6.4.1 have been reviewed accordingly (**Annex II** refers).
1.10	As the additional passenger demand generated by the proposed site is expected to take the public transport services on Kam Sheung Road, please provide assessment and recommendation on the need for improvement of existing public transport facilities thereat.	Bus lay-by has been proposed along Kam Sheung Road near our Site under the "Upgrading of the Remaining Section of Kam Tin Road / Lam Kam Road" carried out by HyD. The operation of bus stop will greatly improve the design year. Please refer to **Figure 7.1** of the revised TIA report (**Annex II** refers).
2.	**Comments from Highway Department received on 9 March 2023:**	
2.1	The proposed access arrangement of the application site from Kam Sheung Road should be commented and approved by TD;	Noted and agreed.
2.2	If the proposed run-in/out is agreed by TD, the applicant should provide the run in/out at Kam Sheung Road to the satisfaction of TD and HyD and in accordance with latest version of Highway Standard Drawing No. H1113 and H1114, or H5133, H5134 and H5136, whichever set is appropriate to match with the existing adjacent pavement; and	Noted and agreed. The design of run-in/out has been designed in accordance with Highway Standard Drawings (**Annex I** refers).
2.3	Adequate drainage measures should be provided at the site access to prevent surface water flowing from the site to nearby public road or exclusive road drains.	Noted. Adequate drainage measures will be provided at the site access in next design and construction stage.

Enclosure:
Annex I: Revised Master Layout Plan in response to the comments from TD on the proposal of ingress/egress from the development
Annex II: Revised Traffic Impact Assessment

Complied by: KTA Planning Limited
Date: 10 March 2023
File Ref: 202303106_S3046_FI5_V01

Application for Amendment to the Approved Shek Kong Outline Zoning Plan (OZP) No. S/YL-SK/9
From “Residential (Group D)” to “Residential (Group C)”
At Various Lots in D.D. 112 and Adjoining Government Land, Kam Sheung Road, Shek Kong, Yuen Long, New Territories
S12A Amendment of Plan Application No. Y/YL-SK/1

Items	Comments	Responses
1	**Comments from Drainage Service Department received on 24 February 2023:**	
1.1	Annex IV - Drainage Impact Assessment (DIA) (a) It is noted that the results were updated in the report, please submit the updated hydraulic model for further checking. A complete set of the revised DIA should be submitted for easy reference.	The revised DIA Report is submitted under this FI (**Appendix 1** refers).
1.2	(b) Please advise if any peripheral surface channels provided along the site boundary (at the revised formation level) to collect the surface runoff accrued on the application site and discharge to the proposed box culvert. If affirmative, please indicate the surface channel with its size in the drainage system plan and relevant cross section drawing(s) (in Annex V) for clarity. Please also demonstrate with hydraulic calculation that the proposed drainage facilities are adequate to collect, convey and discharge the surface runoff accrued on the application site and the overland flow intercepted from the adjacent lands.	To collect the runoff from the nearby catchments such as Wah Yuen and Lin Fa Tei areas, the project proponent has proposed four sets of surface channels and associated pipes near Wah Yuen and a set of surface channels and drains at the north of site (i.e. five sets in total) to replace the existing watercourse near to Wah Yuen. The proposed surface channels and associated pipes are shown in **Appendix B5.1** of the DIA (***Appendix 1*** of this FI refers). With reference to **Appendix B5.2** of the DIA, the existing vegetated watercourse near to Wah Yuen will be replaced by four sets of concrete surface channel and pipes near Wah Yuen. This will result in a net increase on the total flow area of 50% more than the existing watercourse (i.e. the total discharge capacity of the 4 sets of channels and pipes will also be at least 50% greater than the existing vegetated watercourse) (**Annex I** refers). With the provision of surface channels and associated pipes, no adverse drainage impacts are anticipated from the proposed development. As discussed in **Sections 4.1.2 and 4.2.1** of the DIA Report, the runoff generated from the proposed development will be collected by the internal drainage and temporarily stored in the proposed stormwater storage tank during extreme storm, and then discharged to the northern channel after the peak of storm. To ensure there is no runoff generated from the proposed development that will be discharged to the aforesaid proposed surface channels and associated pipes (with the aim to replace the existing vegetated watercourse), boundary walls and another set of internal peripheral surface channels with a size of at least 600mm will be provided at the site formation level along the

Items	Comments	Responses
		boundary walls of the application site. This is to collect the surface runoff accrued on the application site and the run off will be discharged to the proposed box culvert. The cross-sections and the profile of the proposed boundary channels with the boundary wall and internal peripheral surface channels are shown in ***Annexes A and B***. A catchment plan has been provided to illustrate the runoff collected by existing watercourse near to Wah Yuen under existing condition (**Figure 1 of *Annex C***). The existing watercourse near to Wah Yuen is currently collecting the runoff from a large extent of area (highlighted in pink dotted line and areas with black and green dotted lines). Due to blockage of the western portion of the northern channel (highlighted in red), the runoff was originally collected by the northern channel is overflow to the existing watercourse near Wah Yuen shown in red). Under the proposed condition, the provision of proposed box culvert and channel would re-connect the existing northern channel (the runoff from catchments with black dotted line as shown in **Figure 2 of *Annex C*** will be re-collected by the northern channel and proposed box culvert, as per existing condition before blockage of northern channel, instead of overflowing to drainage at Wah Yuen. The proposed four sets of standalone boundary channel and associated pipe near Wah Yuen will be provided and intended to replace the existing watercourse; only collect the runoff from the Wah Yuen area (i.e. pink dotted line in **Figure 2 of *Annex C*** and another set of surface channels and pipes at the north of site will collect the runoff from the catchments with orange dotted line as shown in **Figure 2 of *Annex C***. Furthermore, the runoff from the proposed development site will be collected by separated internal drainage system consists of peripheral surface channels of min. size of 600mm along site boundary as shown in ***Annex C*** and discharged to the proposed box culvert as discussed in above paragraphs. With the re-connection of the northern channel via the proposed box culvert and short channel; and the provision of boundary channels and pipes for concerned area at Wah Yuen and separated internal drainage consisting of peripheral surface channels, stormwater storage tank within the Development site, it is considered that the proposed drainage system is sufficient to cater for the runoff from the

Items	Comments	Responses
		nearby areas and no adverse drainage impact is anticipated from the proposed development.
1.3	(c) Referring to para. 4.3.6, according to DSD's design requirement, a minimum 300mm freeboard should be provided instead of 200mm. Please review the hydraulic calculation/modelling.	The floodwall of the proposed channel which is located within village zone is increased from 1.3m to 1.4m as shown in **Appendix B5.1** and the proposed channel within the village zone will have a minimum 300mm freeboard under 1 in 10 years flood event.
1.4	(d) Appendix B5 - Please advise if the proposed pipes i) 1 & 4 and ii) 2 & 3 are 1200mm dia. and 1050mm dia. respectively. Please clearly indicate the size of the proposed pipes in the drawing.	**Appendix B5.1** has been revised to include the name of channels and pipes in the legend.
1.5	<u>Annex V - Information on the Proposed Boundary Channels</u> (e) Annex A - Please revise Section A-3 and A-4 as the proposed development site should be on the left side.	Section A-3 and A-4 have been revised.
	(a) Annex B - Please indicate the water level for both 50-year and 200-year events at the cross-section drawings in Annex B for reference. Please also check if sufficient freeboard to be provided.	The water levels for both 50-year and 200-year events at the profiles in ***Annex B*** are provided. According to the Stormwater Drainage Manual, the proposed surface channels and associated pipes are designed for 50 years flood event as the proposed surface channels and associated pipes is in a rural area. Based on the hydraulic model results, a minimum 300mm freeboard can be provided in all the proposed surface channels and associated pipes in 50 years flood event and the predicted water profiles are all well within bank in 200 years flood event.

Annex A - Cross-section of the Proposed Boundary Channels
Annex B - Profile of the Four Sets of Boundary Channels and Associated Pipes
Annex C - Catchment Plan(s) under Existing and Proposed Condition

Enclosure:
Appendix 1: Revised Drainage Impact Assessment

Complied by: KTA Planning Limited
Date: 28 March 2023
File Ref: 20230328_S3046_FI6_V01

Application for Amendment to the Approved Shek Kong Outline Zoning Plan (OZP) No. S/YL-SK/9
From "Residential (Group D)" to "Residential (Group C)"
At Various Lots in D.D. 112 and Adjoining Government Land, Kam Sheung Road, Shek Kong, Yuen Long, New Territories
S12A Amendment of Plan Application No. Y/YL-SK/1

Items	Comments	Responses
1	**Comments from Environmental Protection Department received on 9 May 2023:**	
1.1	Air quality *(on FI No. 4)* 1. Section 9.3 - Please show the location of the exhaust of the STP in a map to illustrate that it is located away from all ASRs.	The potential location of the exhaust outlet and its discharge direction has been illustrated in Figure 5 (Section 9.3) of AQIA (**Annex I** refers).
1.2	2. Section 9.4 - Please provide the sewage treatment capacity and the odour removal efficiency of the deodorizer (with supports/justifications) to justify if adverse odour impact is unlikely. In addition, please provide reference/results from some approved EIA reports/AQIA to support that the STP with similar scale and odour removal efficiency shall not result in adverse odour impact for the ASRs in very close proximity.	According to the Sewerage Impact Assessment, the estimated total average dry weather flow (ADWF) to be treated by the proposed STP will be 894.6m^3/day. Hence, the sewage treatment capacity of the proposed STP is relatively small. Due to the close proximity of the proposed STP from Tower 1 of the proposed Development, a high-efficiency deodorizer (with at least 99.5% odour removal efficiency) with a forced ventilation system will also be installed at the STP building to remove odour before discharge into open air. In order to achieve and maintain a 99.5% odour removal efficiency, the following odour control measures will be adopted: ● Membrane Bioreactor (MBR) system equipped with deodorizer (at least 99.5% odour removal efficiency) for treating odorous emissions; ● Enclosure of the major process equipment inside building structure, which is equipped with ventilation system to ensure adequate air exchange within the structure (in other words, maintaining negative pressure inside the structure); and ● Regular maintenance of the deodorizer to ensure the odour removal efficiency is maintained at/above the design requirement. (Section 9.4)

Items	Comments	Responses
1.3	3. Sections 11.3, 11.5 and 11.6 - Please clarify whether the information with respect to the size of site formation/ excavation/ active workfront area, the amount of excavated materials to be handled, no. of dump trucks over the site per time, etc. could be provided at this stage to justify that the dust impact is small in scale. If not, please revise these sections accordingly since it is unjustified to state that the scale of work is small and the number of machinery is limited.	The construction details will be provided and formulated at the later design stage. An EM&A program will be implemented to ensure that the ASRs will not be subject to adverse impact during the construction stage. Sections 11.3, 11.5 and 11.6 of AQIA are revised accordingly (**Annex I** refers).
1.4	<u>Water quality</u> *(on FI No. 4)* It is noted that our previous comments have been addressed and please find our minor comments as below: 1. S2.2.1 Please tabulate the WSRs, the table shall include the WSR ID, description, type (natural watercourse, modified watercourse, channelized, pond etc), status (active, inactive) and estimated distance to the site. And, please indicate the WSR in the figure 1.2.	Noted. The details for the WSRs have been supplemented in the Table 1.2 of WQIA. Figure 1.2 of WQIA has been updated accordingly (**Annex II** refers).
1.5	2. As a general reminder, construction and operational stage effluent after pre-treatment to WPCO requirement, should be sited away from natural water course.	Noted.
<u>2</u>	**<u>Comments from Transport Department received on 19 May 2023:</u>**	
2.1	Kam Sheung Road is not within the project boundary of Upgrading of the Remaining Section of Kam Tin Road and Lam Kam Road. Please review the statement regarding “2m wide footpath at Kam Sheung Road will be provided” and update the pedestrian assessment as necessary.	It should be noted that Kam Sheung Road falls within the project boundary of the another HyD’s project “Improvement to Kam Sheung Road”. The tentative construction programme for Kam Sheung Road would be between 2028 and 2031. Based on the layout obtained from HyD, 2m wide footpath will be provided along Kam Sheung Road under this project.
2.2	Figure 5.1 - footpath shall be provided next to the Sheung Tsuen Sitting out Area. - sufficient space shall be allowed for bus manoeuvring at the bus stop. The taper shall also be designed in accordance with	- Noted. Footpath will be provided next to the Sheung Tsuen Sitting out Area and has been revised in **Figure 5.1** of the TIA (**Annex I** refers). Due to length limit of central island at Kam Tin Road, one of the bus stops is relocated back to Sheung Tsuen bus terminus and therefore

Items	Comments	Responses
	TPDM. In order to facilitate the bus operation, the bus stop shall be shift northwards as much as practicable. The central island could be extended as necessary.	sufficient tapper length could be provided at Kam Tin Road bus stop. Please refer to the updated proposed further junction improvement layout of Kam Sheung Road / Kam Tin Road (C) in **Figure 5.1** of the TIA.
	- the traffic signals, including primary and secondary signals shall be designed according to TPDM and show on drawing.	Noted. The traffic signals, including primary and secondary signals have been designed according to TPDM, It has been revised in **Figure 5.1** of the TIA (**Annex I** refers).
	- pedestrian crossing shall be provided at the exit of existing Sheung Tsuen bus terminus.	Noted. Pedestrian crossing will be provided at the exit of existing Sheung Tsuen bus terminus. It has been revised **Figure 5.1** of TIA (**Annex I** refers).
2.3	Figure 7.1 - the proposed work shall be carried out by applicant;	The proposed works will be carried out by the Applicant.
	- Please consider to provide pedestrian crossing at the western side instead of the eastern side due to greater demand.	Please note that there is another pedestrian crossing at the western side of the Site. It is about 350m away from the Site, which is outside Lotus Hill and next to the bus stops (nos 23 and 24). Therefore, the proposed crossing at the western side is not anticipated. Whilst, there is another pair of bus stops (nos. 25 and 26) locating at the eastern side of the proposed development. With the proposed crossing, it could facilitate pedestrians crossing to these bus stops.
2.4	R-to-C 1.10: The said bus laybys along Kam Sheung Road under the upgrading works carried out by HyD are provided to replace the on-street bus stops, so as to improve the traffic along Kam Sheung Road, and the upgrading works do not take into account the demand of the proposed development. As there would additional passenger demand, the dwell time of bus/ GMB would be increased that the bus laybys should be lengthened, so as to minimize the queueing of bus/GMB affecting the traffic. As such, the proposed development should carry out improvement.	Based on the assessment results in **Chapter 6** of the TIA report, it indicated that the existing public transport services could service the future passenger demand (including the passengers of the proposed development) without increasing the no. of trips. Therefore, the waiting passengers would quickly be picked-up by the PT services. Moreover, as shown in **Figure 7.1**, the proposed development is located in the middle point of the 2 pairs of bus stops, such that the passengers would be distributed into 2 pairs of stops and thus a lower number of passengers would be queuing at each stop.
2.5	Table 6.1-6.4: Please clarify if the GMB 72M refers to the short-working service of GMB 72 operating between Kam Sheung Road and Lui Kung Tin.	Please note that GMB 72M refers to the short-working service of GMB 72 operating between Kam Sheung Road and Lui Kung Tin.

Items	Comments	Responses
2.6	Table 6.3-6.4: Please advise the reason to definite the AM peak hour at 08:30-09:30. Since the public transport service at the westbound bus stop travel to the Kam Sheung Road Station/ Yuen Long directions, passengers taking these services to interchange with rail usually start their journey earlier, due to relatively long journey time. Please justify the definition of AM peak hour with details (e.g. survey report for the whole survey period, etc.)	The AM peak period is defined based on the surveyed no. of passengers. Based on our survey, the peak occurs during 08:30-09:30 The nos. of surveyed passengers are listed below: Period – No. of passenger 07:30-08:30 – 610 08:00-09:00 – 590 08:30-09:30 – 635 Based on the survey result above, the peak occurs at 08:30-09:30 for westbound public transport.
2.7	Subject to the definition of AM peak, the subsequent assessment may need to revise accordingly.	As peak situation was already selected, same assessment result would be maintained as previous.
2.8	Table 6.1-6.4: Please add columns to show the no. of passenger on arrival and on departure and check all calculations.	Noted. No. of passenger on arrival and on departure have been added in Table 6.1-6.4 of the TIA and all calculations have been checked (**Annex III** refers).
2.9	Para. 6.3.4: The assessment assumes all passengers are going to take rail service. However, passenger may take bus/ GMB services to other destinations. Please review and revise the assessment in this para and the subsequent paragraphs.	We have not assumed all passengers will use rail services. The sentence in Para. 6.3.4 of TIA assumed all the passenger trips by railways services (51%) will go to KSR MTR station as this is the nearest MTR station, but not all passengers (**Annex III** refers). The distributions have been adjusted to eastbound and westbound as shown in **Table 6.8** of the TIA and the assessment was carried out based on the above ratio (**Annex III** refers).
2.10	There are two Table 6.9. Please correct.	Noted. The numbering of the tables has been reviewed and revised accordingly (**Annex III** refers).

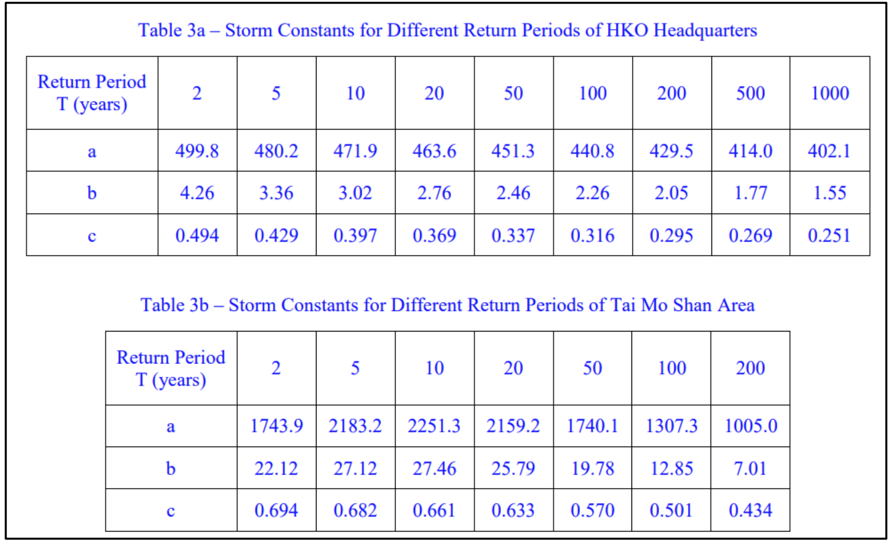
Enclosure:
Annex I: Replacement Page(s) of Air Quality Impact Assessment
Annex II: Replacement Page(s) of Water Quality Impact Assessment
Annex III: Revised Traffic Impact Assessment

Complied by: KTA Planning Limited
Date: 29 May 2023
File Ref: 20230512_S3046_FI7_V01

Application for Amendment to the Approved Shek Kong Outline Zoning Plan (OZP) No. S/YL-SK/9
From "Residential (Group D)" to "Residential (Group C)"
At Various Lots in D.D. 112 and Adjoining Government Land, Kam Sheung Road, Shek Kong, Yuen Long, New Territories
S12A Amendment of Plan Application No. Y/YL-SK/1

Items	Comments	Responses
1	**Comments from Drainage Services Department received on 30 May 2023 (Contact Person: Mr. Jeff TSE; Tel: 2300 1627):**	
1.1	R-to-C on Item 1.2: Please advise and illustrate if there is any change of the extent of catchment area for the i) existing watercourse near to Wah Yuen and ii) the northern channel before and after the proposed development for comparison.	Please be advised that there will be change of catchments before and after the proposed development and they are summarized as below. To collect the runoff from the nearby catchments such as Wah Yuen area, we proposed five sets of surface channels and associated conduits near Wah Yuen to replace the existing watercourse near to Wah Yuen. The proposed surface channels and associated conduits are shown in **Appendix B5** of the revised DIA (**Appendix 1** refers). As shown in **Figure 3 of Annex A** of this FI, the replacement of the existing vegetated watercourse near to Wah Yuen by five sets of concrete surface channel and conduits near Wah Yuen will result in a net increase in total flow area of 75% more than the existing watercourse i.e. the total discharge capacity of the five sets of channels and conduits will be at least 75% greater than the existing vegetated watercourse. Besides, under the extreme weather events with considering the climate change effect in the end of century, an additional set of by-pass pipes of size 900 to 1200mm diameter has been proposed to collect excessive runoff from channels 2, 3 and 4 to the proposed stormwater storage tank for temporary storage and discharging after peak of storms. According to the results of the hydraulic model, there will be more than 300mm freeboard under 1 in 10 years and 50 years and within bank under 1 in 200 years for the five set of proposed surface channels and associated conduits as shown in **Appendix B5** of the revised DIA (**Appendix 1** refers). With the above mitigation measures provided, no adverse drainage impacts are anticipated from the proposed development. Catchment plans showing the serving catchments of the existing watercourse near to Wah Yuen under existing condition and the replaced boundary channels and pipes for serving Wah Yuen area under the proposed conditions is enclosed in **Annex A** of this FI. According to **Figure 1 of Annex A**, the existing watercourse near to

Items	Comments	Responses
		Wah Yuen is currently collecting runoff from catchment area of about 5 hectares (the yellow shaded area in **Figure 1 of Annex A** which consists of both catchments at Wah Yuen and part of site area) under the existing condition. Under the proposed condition, partial of the existing catchment of existing watercourse near to Wah Yuen (grey shaded area, about 2 hectares, in **Figure 2 of Annex A**) will become the Application Site and the runoff from the Application Site will be collected by internal drainage system and held in a proposed stormwater storage tank during extreme storms. With the replacement of the existing watercourse by the five sets of abovementioned standalone surface channels and associated conduits as well as the development of the Application Site, the total catchment area served by the five sets of abovementioned standalone surface channels and associated conduits is greatly reduced to about 3 hectares (see the yellow shaded area in **Figure 2 of Annex A**). In view that the provided five sets of surface channels and associated conduits have an additional flow area of 75% as compared with the existing watercourse near Wah Yuen and the catchment area of the five sets of surface channels and associated conduits is greatly reduced due to the development of the Application Site, it is considered that no adverse drainage impacts are anticipated from the proposed development.
1.2	Table 2.2: Please advise if two set of storm constants were applied in the model and correct the storm constant “a” for Tai Mo Shan Area of 200-year return period.	According to Figure 3 of Stormwater Drainage Manual (SDM), the catchments of the hydraulic model fall into both “rainfall zone of Tai Mo Shan Area” and “Area adopted rainfall statistics of HKO Headquarters”. Thus, two rainfall profiles have been adopted in the hydraulic model according to the delineation of rainfall zones as shown in Figure 3 of SDM.

<table>
<tr><th>Items</th><th>Comments</th><th>Responses</th></tr>
<tr><td></td><td></td><td>
Table 3a – Storm Constants for Different Return Periods of HKO Headquarters
<table>
<tr><th>Return Period T (years)</th><th>2</th><th>5</th><th>10</th><th>20</th><th>50</th><th>100</th><th>200</th><th>500</th><th>1000</th></tr>
<tr><td>a</td><td>499.8</td><td>480.2</td><td>471.9</td><td>463.6</td><td>451.3</td><td>440.8</td><td>429.5</td><td>414.0</td><td>402.1</td></tr>
<tr><td>b</td><td>4.26</td><td>3.36</td><td>3.02</td><td>2.76</td><td>2.46</td><td>2.26</td><td>2.05</td><td>1.77</td><td>1.55</td></tr>
<tr><td>c</td><td>0.494</td><td>0.429</td><td>0.397</td><td>0.369</td><td>0.337</td><td>0.316</td><td>0.295</td><td>0.269</td><td>0.251</td></tr>
</table>
Table 3b – Storm Constants for Different Return Periods of Tai Mo Shan Area
<table>
<tr><th>Return Period T (years)</th><th>2</th><th>5</th><th>10</th><th>20</th><th>50</th><th>100</th><th>200</th></tr>
<tr><td>a</td><td>1743.9</td><td>2183.2</td><td>2251.3</td><td>2159.2</td><td>1740.1</td><td>1307.3</td><td>1005.0</td></tr>
<tr><td>b</td><td>22.12</td><td>27.12</td><td>27.46</td><td>25.79</td><td>19.78</td><td>12.85</td><td>7.01</td></tr>
<tr><td>c</td><td>0.694</td><td>0.682</td><td>0.661</td><td>0.633</td><td>0.570</td><td>0.501</td><td>0.434</td></tr>
</table>
The above storm constants for HKO Headquarters and Tai Mo Shan Area under 1 in 10 years, 50 years and 200 years have been adopted in the hydraulic assessment.

Besides, please be clarified that “Table 3a of SDM” should be read as “Table 3a and Table 3b of SDM” in section 2.3.9.</td></tr>
<tr><td>1.3</td><td>Section 2.3.11: According to Section 6.8 of SDM Corrigendum 1/2022, projection year up to the end of 21st century for rainfall increase and extreme sea level rise plus design allowance should be considered as far as practicable.</td><td>Climate change effect up to the end of 21st century has been considered in the revised DIA Report. Based on the updated hydraulic assessment results, there will be no adverse drainage impact arising from the proposed development with the proposed drainage improvement works.</td></tr>
<tr><td>1.4</td><td>Table 2.6: Please advise how to derive “Water level with climate change (mPD) for model)”.</td><td>The “Water level with climate change (mPD) for model)” shows in Table 2.6 of the DIA Report is based on the water level at boundaries provided by DSD plus the mean sea Level rise plus the storm surge increase plus the design allowance according to SDM Corrigendum No.1/2022.

A table showing the breakdown of the figures of “Water level with climate change (mPD) for model)” is provided in **Annex B of this FI** for ease reference.</td></tr>
</table>

Items	Comments	Responses
2	**Comments from Environmental Protection Department received on 13 June 2023:**	
	Air Quality	
2.1	Section 9.3 and Figure 5 - Other than the proposed development, please confirm if there is any existing ASRs (e.g. some structures are found to the west of the exhaust) located close to the exhaust. If yes, please provide the separation distance from these nearest ASRs. Instead of discharging the exhaust air in a horizontal/parallel direction, please review if it is better to alleviate any potential odour impact by directing the exhaust air in an upward direction.	Section 9.3 and Figure 5 of the AQIA have been revised (**Appendix 2** refers). The separation distance from the proposed STP to the nearest existing ASR (i.e. car repairing workshop adjoining the proposed Development) is 19m, as shown in Figure 5. In order to alleviate the odour impact to the driveway/EVA and the adjoining vehicle repairing workshop locating at ground level, the exhaust air will be discharged in an upward direction.
2.2	Section 11.3 - Apart from on-site monitoring, please clarify if phasing of dusty works during the construction stage will be taken place to minimize any air quality impact.	Section 11.3 of AQIA has been revised (**Appendix 2** refers). Phasing of dusty works during the construction stages will be taken place to minimize any air quality impact.
	Water Quality (With reference to the submission of FI-4)	
2.3	FI-4, S 2.4.6 a. Noted that "With provision of properly design sewers, sewage would be collected and conveyed to the planned public sewerage system in the future when public sewer is available." Please outline the proposed arrangement for the sewage disposal and treatment, indicating the SPS and STP that will be utilized b. c. Please incorporate the recommendation and conclusion from SIA d. The SIA shall be subject to the agreement by SIG.	Noted. The proposed arrangement for sewage disposal and treatment recommended in the SIA has been supplemented in S2.4.5 and S2.4.7 of the revised WQIA (**Appendix 3** refers).; Noted. The recommendation and conclusion in the SIA have been supplemented in S2.4.5 and S2.4.7 of the revised WQIA (**Appendix 3** refers). Noted
2.4	FI-4, S 3.1.4 It is acknowledged that "The onsite STP shall not be decommissioned until the sewerage connection to the Government sewer has been fully established and implemented." Please clarify if such onsite STP will be decommissioned once the	Should public sewer be available for connection and discharge in the future, the sewerage treatment plant will be decommissioned after the connection to the nearest manhole of public sewerage system is completed. This proposed plan has been mentioned now in S3.1.5 of WQIA (**Appendix 3** refers).

Items	Comments	Responses
	connection to the public sewerage system is established. As such, please provide more information on the proposed plan.	
	(For the supplement page in FI-7)	
2.5	FI-7 The construction works will alter to certain watercourses, i.e. W7 and W13, relevant mitigation measure from the ETWB TC (Works) No. 5/2005 shall be incorporated.	Noted. Table 2.1 and Section 2.2.2 of WQIA have been updated (**Appendix 3** refers).
2.6	FI-7, Table 2.1 W13 is missing.	Table 2.1 of WQIA has been updated accordingly (**Appendix 3** refers).

Annex A- Catchment Plan and Proposed Drainage System
Annex B Figures of “Water level with climate change (mPD) for model))

Enclosure:
Appendix 1: Revised Drainage Impact Assessment
Appendix 2: Replacement Page of Air Quality Impact Assessment
Appendix 3: Revised Water Quality Impact Assessment

Complied by: KTA Planning Limited
Date: 13 June 2023
File Ref: 20230530_S3046_FI8_V01

Application for Amendment to the Approved Shek Kong Outline Zoning Plan (OZP) No. S/YL-SK/9
From "Residential (Group D)" to "Residential (Group C)"
At Various Lots in D.D. 112 and Adjoining Government Land, Kam Sheung Road, Shek Kong, Yuen Long, New Territories
S12A Amendment of Plan Application No. Y/YL-SK/1

Items	Comments	Responses
1	**Comments from Environmental Protection Department received on 21 July 2023**	
1.1	S2.1.2: Please delete "Group C and Group D discharge standards are considered relevant to this Project."	S2.1.2 of WQIA has been updated accordingly (**Appendix 1** refers).
1.2	S2.3.11: Typo "25 workers"	S2.3.11 of WQIA has been updated accordingly (**Appendix 1** refers).
1.3	S2.7.1: a) Please delete "(reference is provide by EPD)". b) For the effluent produced from operational stage, pre-treated to compliant with WPCO requirement, should be sited away from natural section of water courses	 S2.7.1 of WQIA has been updated accordingly (**Appendix 1** refers). Noted. S2.7.1 of WQIA has been updated (**Appendix 1** refers).
1.4	Table 2.2: Please revise the title as "Typical Effluent Standards from a Private Tertiary STP"	Noted. The title for Table 2.2 of WQIA has been updated accordingly (**Appendix 1** refers).
1.5	S2.8.1: "The water pollution preventive measures shall be implemented for decommissioning activities." It seems that the said mitigation measures are not included.	Noted. S2.8.1 of WQIA has been updated (**Appendix 1** refers).
1.6	S3.1.4: Typo "natural water course"	S3.1.4 of WQIA has been updated accordingly (**Appendix 1** refers)
2	**Comments from Drainage Services Department received on 28 July 2023**	
2.1	Drainage Impact Assessment (DIA) Section 2.3.16 Table 4.1: Please justify the use of weighted CN value of 90 for the proposed Site for comments.	According to the Sustainable Building Design Guidelines issued by Buildings Department, the required site coverage of greenery is at least 20%. Thus, a weighted CN value of 90 has been assumed for the proposed Site under the proposed condition, assuming a 20% of the landscaping area (grassed area) for the proposed site and 80% of paved area for residential area as mentioned in section 2.3.16 of DIA (**Appendix 2** refers). Nevertheless, the weighted CN value for the proposed development has been reviewed based on the indicative master layout plan of the

<table>
<tr><th>Items</th><th>Comments</th><th>Responses</th></tr>
<tr><td></td><td></td><td>development as summarised in table below and it is considered the use of CN 90 is appropriate for the proposed development. Section 2.3.16 has been updated to include the justification of use of CN90.
<table>
<tr><td>Features</td><td>% of Area</td><td>CN</td><td>Weighted CN</td></tr>
<tr><td>Residential/ buildings</td><td>39.9%</td><td>95</td><td>37.91</td></tr>
<tr><td>Landscaping areas</td><td>27.5%</td><td>70</td><td>19.25</td></tr>
<tr><td>Roads / Footpath/ carparks/ water features</td><td>32.6%</td><td>100</td><td>32.59</td></tr>
<tr><td colspan="3" align="right">Total weighted CN</td><td>89.75 Rounded up to 90</td></tr>
</table></td></tr>
<tr><td>2.2</td><td>Section 4.1.2: Please justify the size of storage tank used considering that there is still negative freeboard as shown in Tables 4.3 and 4.4.</td><td>As shown in Tables 4.3 and 4.4 of DIA, negative freeboard is observed even under 1 in 10 years rainfall event under existing condition which is mainly due to high water level at downstream and the insufficient capacity of the existing northern channel (Appendix 2 refers).
To enhance the drainage condition in Lin Fa Tei, the Applicant has taken an opportunity under the proposed development to reconnect the blocked northern channel by providing a proposed box culvert and a proposed channel with floodwall; and to provide five sets of new channels to collect runoff from nearby catchments to the proposed box culvert.
In order to mitigate the drainage impact caused by the proposed development and relief floodings near the proposed development, a storage tank with storge volume of 12,000m^3 and a by-pass system near Wah Yuen is proposed to temporarily store all the additional runoff from the proposed development (maximum of 2,713 m^3 under the 200 years rainfall with climate change effect at end of century as shown in table below) and some of runoff from nearby catchments under extreme weather events.</td></tr>
</table>

<table>
<tr><th>Items</th><th>Comments</th><th>Responses</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><th rowspan="2">Rainfall return period (years)</th><th colspan="2">Total runoff generated from the Site</th><th rowspan="2">Additional runoff, m^3</th></tr>
<tr><th>Existing condition, m^3</th><th>Proposed condition, m^3</th></tr>
<tr><td>10</td><td>7,441</td><td>9,798</td><td>2,357</td></tr>
<tr><td>50</td><td>10,832</td><td>13,400</td><td>2,568</td></tr>
<tr><td>200</td><td>14,408</td><td>17,121</td><td>2,713</td></tr>
</table>

Please note that all the proposed drainage system, including the proposed box culvert, proposed channel with floodwall, proposed new channels and associated pipes as well as by-pass pipes, have met the relevant standard according to Stormwater Drainage Manual of DSD. Also, with the proposed drainage improvement works, with reference to Table 4.3 and Table 4.4 of DIA, there will be an improvement in the predicted water levels along the northern channel as compared with the existing conditions (**Appendix 2** refers). Thus, it is considered that the proposed drainage system including the size of storage tank is adequate for the proposed residential development.

To eliminate or reduce the magnitude of negative freeboard of existing drainage system arising from high downstream water level (taking into account of the climate changes), the necessary drainage improvement works will be more appropriate to be provided and undertaken by the government.
</td></tr>
<tr><td>2.3</td><td>Section 4.1.2: As noted, additional runoff collected in the 1350mm dia pipe will overflow into the proposed storage tank under extreme rainfall events. Please indicate the location of this pipe and provide its connection details to the storage tank for comments. The extent of the proposed 900mm- 1200mm should be clearly indicated in Appendix B2 for clarity.</td><td>Please note that the proposed 1350mm pipe is an internal pipe used in the hydraulic model for collecting the runoff from the catchments of the Site. The detailed design of internal drainage system for collecting runoff from the Site will be provided in detail design stage. **Appendix B5.1 of the DIA** has been updated to include the internal drainage system in the hydraulic model (**Appendix 2** refers). An enlarged plan showing the internal drainage system including the proposed 900mm-1200mm by-pass system is added in **Appendix B5.3 of DIA (Appendix 2** refers). For the connection details, please refer to schematic drawing in **Annex B**.</td></tr>
</table>

Items	Comments	Responses
2.4	Section 4.1.3: Please elaborate the details of constraints of existing topography at Wah Yuen area leading to the need of an additional set of by-pass pipe. Please also advise the scenario(s) for trigging the by-pass system with the detailed arrangement. Besides the proposed points at existing drainage system as shown in Appendix D2, additional control points should be provided at i) five new channels and ii) the box culvert at the connection point with five new channels. Furthermore, please advise whether the five new channels have already taken into account the by-pass situation and provide relevant assessment for comments. A detailed flow direction under the by-pass situation should be provided.	Under the existing and proposed conditions, the predicted water levels in the existing northern channel (i.e. Control Point 2 to 5) at downstream end of the proposed Site are higher than the bank levels and the high water level in the existing downstream northern channel will have backwater effect to the upstream proposed box culvert and proposed channel, as well as the five sets of new channels. Due to the backwater effect from the high water levels of existing downstream northern channel (i.e. Control Point 2 to 5), the water levels for three of five sets of new channels (channels 2, 3 & 4) will be expected higher than nearby ground level at Wah Yuen (about 24.1mPD to 24.7mPD) under the situation <u>with the absence of the by-pass pipes under 1 in 200 years rainfall event with climate change effect in the end of century</u>. To reduce the flooding risk in the concerned area, apart from the proposed new channels, a set of 900mm to 1200mm diameter by-pass pipeline is proposed to intercept flow from channels 2, 3 & 4 to the proposed stormwater storage tank under extreme weather events with taking the climate change effect at the end of century into account so that the five sets of proposed new channels will have at least 300mm freeboard under the 50 years rainfall or below and will be within bank level under the 200 years rainfall. Section 4.1.3 has been revised to highlight the constraint of backwater effect for high water level at downstream northern channel and hydraulic performance of the 5 sets of new channels and associated pipes. Under normal condition without backwater effect, the runoff collected by Channels 1 to 4 will be mainly conveyed to the proposed box culvert via the associated pipes (i.e. Pipes 1 to 4) which have a lower invert levels than the by-pass pipeline; while the runoff collected by Channel 5 will be conveyed to the remaining section of existing watercourse near to Wah Yuen as shown in **Figure 2 of Annex A**. A schematic drawing showing the connection of the proposed box culvert and the associated pipes (i.e. Pipes 1 to 4) is provided in **Annex B**. The design will be further developed in the next detail design stage. Due to the insufficient capacity of the existing northern channel at downstream, the by-pass system will be trigged for extreme rainfall events such as 1 in 10 years or above rainfall events (all assessed flood event scenarios: 1 in 10 years, 1 in 50 years and 1 in 200 years rainfall). Due to the backwater effect from the downstream northern

Items	Comments	Responses
		channel under extreme events, pipes 2, 3 & 4 will be submerged. In this connection, runoff collected from Channels 2, 3 & 4 will be flowed to the 900mm to 1200mm dia. proposed by-pass pipeline with a higher invert level than Pipes 2, 3 & 4, and temporarily stored in the proposed storage tank. After the peak of storm, the stored runoff will be discharged to the proposed box culvert via internal drains. An enlarged plan showing the 900mm to 1200mm dia. proposed by-pass pipeline is provided in **Appendix B5.3 of DIA (Appendix 2 refers)**. The flow direction under extreme weather event is shown **Figure 3 of Annex A**. A schematic drawing of the proposed storage tank, 1350mm internal pipe and the proposed 900mm – 1200mm by-pass pipeline under extreme weather event is provided in **Annex B**. As mentioned above, as the proposed channels 1 and 5 directly connected to the proposed box culvert via pipe 1 and the remaining section of existing stream will have 300mm freeboard under 1 in 50 years rainfall or below and the predicted water level will be within bank under 1 in 200 rainfall, the discharge routes for the runoff from collected by Channels 1 and 5 will be same as the proposed condition under normal condition (i.e. **Figure 2 of Annex A**). Please be advised that the by-pass situation under high water levels at downstream channel under extreme events (1 in 10 years, 50 years and 200 years) has already been taken into account in the hydraulic assessment of the concerned three sets of new channels (channel 2, 3 and 4) using model. The predicted water levels of the proposed 5 sets of new channels and the connection point of five channel at box culvert have been extracted from hydraulic model and included in **Appendix K.2 of DIA (Appendix 2** refers). As shown in the results, the five sets of proposed new channels will have at least 300mm freeboard under the 50 years rainfall or below and will be within bank level under the 200 years rainfall. Under normal flow condition, the utilization of the proposed new channels, associated pipes and the proposed box culvert (10% siltation has been included to reduce the full-bore capacity) is less than 60 %, 73% and 85% under 1 in 10 years, 50 years and 200 years as shown in **Appendix K.1 of DIA (Appendix 2** refers).

Items	Comments	Responses
		With considering the above results, it is considered that proposed drainage system will not cause adverse drainage impact to Wah Yuen area.
2.5	Section 4.1.3 and Appendix B5.2: According to the section drawings provided in Appendix B5.2, the size of flow area at each proposed channel is smaller than the existing one. Please review whether the sentence “a net increase of 75% total flow area” in Section 4.1.3 is still accurate.	Section 4.1.3 and **Appendix B5.2 of DIA** have been revised to indicate that the single existing watercourse will be replaced by 5 sets of new channels and associated pipes **(Appendix 2** refers**)**. Also, based on hydraulic results included in **Appendices K.1 & K.2 of DIA** and the submitted model (please refer to responses of comment (d)), the proposed 5 sets of new channels and associated pipes shall be adequate to mitigate the drainage impact from the proposed development **(Appendix 2** refers**)**.
2.6	Section 4.2.5: Please adopt the peak flow instead of ADWF for the discharged of treated effluent from the proposed sewerage treatment plant.	Noted and peak sewage flow has been incorporated into the hydraulic model. Section 4.2.5 and model results have been updated. Please also be informed that EPD had no further comments to the SIA of the proposed development from sewerage planning perspective on 1 August 2022.
2.7	Section 4.3.7: Since the five set of proposed surface channels are not part of the control points, please provide substantiation to demonstrate there are sufficient freeboard provided in accordance with DSD’s requirement.	According to the results of hydraulic model, for the 5 sets of new channels and associated conduits, there will be more than 300mm freeboard under 1 in 10 years and 50 years rainfall and the predicted water level will be within bank under 1 in 200 years rainfall event with considering the climate change effect at the end of century. The water level under 1 in 10 years, 50 years and 200 years rainfall events at five new channels and the box culvert at the connection point with five new channels are extracted and presented in **Appendix K.2 of DIA (Appendix 2** refers).
2.8	Section 5.1.2: Please check whether the sentence should be read as ”…. This section of existing watercourse within the Development Site will be replaced by **<u>five</u>** sets of surface channel….”	It should be read as “Under the Proposed Condition, the section of the existing watercourse within the Development Site will be replaced by five sets of new channel and associated pipe as shown in Appendix B5”.
2.9	Appendix B2: Please provide the details of the proposed channel with 1.7m floodwall (in pink color) for comments. Please also advise if any modification works should be carried out to facilitate the proposed works.	The design and details of the proposed channel with 1.7m floodwall will be provided in later detail design stage for DSD comments. Minor modification work to the existing northern channel due to the proposed channel with 1.7m floodwall is expected and the details will be provided in later detail design stage.

Items	Comments	Responses
2.10	Appendix C.2: Please provide a clear plan showing all flow direction at each revised catchment area for clarity. The extent and flow direction of the application site should be also indicated in this catchment plan.	An enlarged catchment plan has been added to **Appendix C.3 of DIA (Appendix 2** refers**)**.
2.11	Appendix F1 and F2: Please advise if the proposed channel with flood wall (with depth of about 2m) refer to the proposed 14-2.6m (w) x 1-1.25m (h) proposed channel with 1.7m floodwall. Please also provide the existing condition for comparison.	Please be clarified that the proposed channel with flood wall (with depth of about 2m) (model ID: MH-015.2, MH-016.2, MH-017.2, MH-017a.2, MH-018.2, MH-022.2, MH-023.2 and MH-024.1) refer as the proposed 1.4-2.6m (w) x 1-1. 25m (h) proposed channel with 1.7m floodwall. As shown in **Appendix B3 of DIA**, a section of the existing northern channel is blocked. Thus, a proposed box culvert and a proposed channel with flood wall are proposed to re-connecting the existing northern channel. Due to the landownership issue, the alignment of proposed box culvert and proposed channel with flood wall could not be aligned along the original alignment of the blocked section of northern channel. Thus, only the profile of the existing northern channel with the assumption of no blockage and the profile for re-provided proposed box culvert and proposed channel with flood wall under 1 in 10 years rainfall event are extracted and the profiles are included in **Appendices F3** and **F4 of DIA**.
2.12	Please provide flood extent maps and a plan showing the nodes and network in the hydraulic model for reference.	The hydraulic model has been formed in term of one-dimension model which contains all relevant catchments and drainage system of the concerned drainage network. The change in formation level of the site has been reflected to the ground levels of the drainage system within the site under the proposed model scenario. The water levels (shown in Tables 4.3 and 4.4 of DIA) are based on results of hydraulic model, as compared to the existing condition, all the control points in the northern channel will be slightly improved after the development of proposed development with the proposed drainage measures. Besides, the Applicant has proposed a number of proposed drainage measures including 5 sets of independent new channels and associated conduits as well as a set of by-pass pipes connecting the 12,000m^3 stormwater storage tank, as discussed in item (d) of the response to comment. The 5 sets of independent new channels and associated conduits will have more than 300mm freeboard under 1 in 10 years and 50 years and the predicted water level will be within bank under 1 in 200 years. Thus, it is considered that the flood risk to

Items	Comments	Responses
		nearby area could be properly mitigated and even reduced. Thus, no adverse drainage impacts are anticipated from the proposed development, and provision of flood extent map is considered not necessary. A plan showing the nodes and network is provided in **Appendix E4 of DIA** (**Appendix 2** refers).
3	**Comments from Highways Department received on 9 August 2023**	
3.1	The proposed access arrangement of the Site from Kam Sheung Road should be commented and approved by C for T.	Noted. Comments and approval would be sought from TD.
3.2	It is noted that a road connection is proposed for the site access. The proposed road connection shall not be maintained by HyD.	Noted and agreed.
3.3	Please clarify if there are any existing road gullies located at the proposed run-in/out. If affirmative, please mark the existing and proposed gullies for his comments.	The Applicant will provide information on the existing and proposed gullies for your comment in the later design stage.
3.4	Please be advised that there is no engineering detail in the submission to show that the run-in/out would be constructed in accordance with the latest version of Highways Standard Drawing No. H1113 and H1114, or H5133, H5134 and H5135, whichever set is appropriate to match with the existing adjacent pavement.	The Applicant will provide the engineering detail in the later design stage and comments would be sought from your office.
3.5	Interception channel should be provided at the site access to prevent surface water from flowing from the Site onto the public roads and drains. It should be marked on plan.	The Applicant will review the design and location of the interception channel for your comment in the later design stage.

Annex A: Existing and Proposed Condition of the Site
Annex B: Schematic Design of the connection network

Enclosure:
Appendix 1: Revised Water Quality Impact Assessment
Appendix 2: Revised Drainage Impact Assessment

Complied by: KTA Planning Limited
Date: 21 August 2023
File Ref: 20230821_S3046_FI9_V01

Application for Amendment to the Approved Shek Kong Outline Zoning Plan (OZP) No. S/YL-SK/9
From “Residential (Group D)” to “Residential (Group C)”
At Various Lots in D.D. 112 and Adjoining Government Land, Kam Sheung Road, Shek Kong, Yuen Long, New Territories
S12A Amendment of Plan Application No. Y/YL-SK/1

<table>
<tr><th>Items</th><th>Comments</th><th>Responses</th></tr>
<tr><td><u>1</u></td><td colspan="2"><u>Comments from Transport Department received on 17 October 2023</u></td></tr>
<tr><td>1.1</td><td>R-to-C Item 2.1 - Since there will be programme uncertainty for HyD's project "Improvement to Kam Sheung Road", the applicant shall demonstrate the existing pedestrian routes between the site and the nearby public transport could meet the demand arisen from the development.</td><td>Assessment results on Footpath without Kam Sheung Road widening were added in Tables 7.2 and 7.3 of the revised TIA report (Annex I refers). LOS A could be maintained even without road widening.</td></tr>
<tr><td>1.2</td><td>Table 2.2 - Please clarify the number of units per block. The proposed number of visitor car parking space seems over-provided. Two number of visitor car parking spaces shall be provided if the number of units per block is 31-45.</td><td>There will be on average 45 units per block. Therefore 19 blocks x 2 = 38 visitor car parking spaces will be provided. Tables 2.2 and 2.3 were updated in the revised TIA (Annex I refers).</td></tr>
<tr><td>1.3</td><td>Table 3.4 - Please review the existing performance and the calculation of Junction H since it is a roundabout.</td><td>Noted. The assessment results of Table 3.4 have been amended in the revised TIA (Annex I refers).</td></tr>
<tr><td>1.4</td><td>Figure 5.1 –
The existing bus stops at Sheung Tsuen were intentionally to relocate to Kam Tin Road to minimise the conflict between the parking space and the bus stops. The current design would revert the situation and shall be reviewed;
Please assess the queue length for Kam Sheung Road northbound;</td><td>Noted. The bus stops arrangement will generally follow the proposed layout by HyD and shown in Figure 5.1 of TIA (Annex I refers).
The queue length for Kam Sheung Road northbound is assessed and shown below and Table 5.6 of revised TIA report (Annex I refers):
<table>
<tr><th rowspan="3">Ref. No.</th><th rowspan="3">Road</th><th rowspan="3">Allowable Queue Length (m)</th><th colspan="2">Queue Length (m) Design Scenario (With Improvement)</th></tr>
<tr></tr>
<tr><th>AM</th><th>PM</th></tr>
<tr><td>C</td><td>Kam Sheung Road NB</td><td>>300</td><td>54</td><td>42</td></tr>
</table></td></tr>
</table>

Items	Comments	Responses
		It is revealed that the queue in Kam Sheung Road Northbound will be within its allowable queue length during AM and PM peaks in design year 2030.
	- The proposed left turn lane from Kam Tin Road westbound would clash with the proposed noise barrier at the junction. Please demonstrate the technical feasibility;	The noise barrier is proposed to be realigned, in order not to clash with the roads and footpath as shown in **Figure 5.1** of TIA (**Annex I** refers), with swept path analysis provided.
	- Please indicate the width of footpath and the carriageway on the drawing.	The width of footpath and the carriageway are shown in revised **Figure 5.1** TIA (**Annex I** refers).
1.5	Figure 5.2 - Please clarify whether the proposed work is under CEDD or HyD. Please also state on drawing that the proposed work would be carried out by the applicant.	The proposed Kam Sheung Road widening is under HyD. The proposed pedestrian crossing will be carried out by the Applicant and stated in revised **Figure 7.1** of TIA (**Annex I** refers).
<u>2</u>	**<u>Comments from Environmental Protection Department received on 17 October 2023</u>**	
	Comments on the revised water quality impact assessment:	
2.1	S2.3.5 & S2.3.6 a. It is acknowledged that the Diversion Works will be carried out in phases. Please be reminded that appropriate mitigation measures shall be taken to prevent / minimise the water quality impact caused. b. Please evaluate the flow regime after the Diversion Works.	Noted. S2.3.6 of WQIA been updated accordingly (**Annex II** refers). It is considered that the flow regime would be maintained the same as the original flow regime as practicable as possible and without change in the upstream and downstream end.
2.2	S2.7.2 With reference to S2.4.4, the estimated ADWF should be 915.6 cu.m per day.	Noted. S2.7.2 of WQIA has been revised accordingly (**Annex II** refers).
2.3	S2.7.7 a. Please clarify the volume of the stormwater storage tank. b. Please check the reference error of the last sentence.	The volume of the stormwater storage tank is 12,000m^3. S2.7.7 of WQIA has been updated. Noted. S2.7.7 of WQIA has been updated (**Annex II** refers).

Items	Comments	Responses
2.4	S2.7.11 a. It is noted that agrochemicals will be used. Please be reminded to follow the "Good Agricultural Practices for Crop Production". Proper measures shall be implemented for the use of the fertilizers, pesticides and agro-chemicals. (https://www.afcd.gov.hk/english/agriculture/agr_useful/agr_useful_gap/agr_useful_gap.html) b. Please confirm the agrochemical is used at the landscape area of the project site.	Noted. S2.7.11 of WQIA has been updated (**Annex II** refers). Ditto
2.5	Please confirm there is a swimming pool at the clubhouse.	It is confirmed that there will be a swimming pool at the clubhouse. S1.4.1 of WQIA has been supplemented accordingly (**Annex II** refers).
2.6	Please incorporate key findings of SIA in conclusion.	The key findings of SIA have been provided in S3.1.5 of WQIA (**Annex II** refers).
2.7	Please provide Full SIA as reference in next submission.	Noted. Full SIA has been provided (**Annex III** refers).
2.8	Regarding the swimming pool a. Please provide the frequency of regular cleansing b. Please elaborate how to treat the discharge of water from swimming pool during regular cleansing, i.e. pool water discharge and wastewater from backwash.	As the planning application is still in the early planning stage, the frequency of regular cleansing of the swimming pool is not confirmed yet. However, the current SIA calculation has allowed sewage generation from daily backwashing of swimming pool filters. The discharge of wastewater from backwash during regular cleansing would be treated by the onsite sewage treatment plant and then discharge it to the proposed drainage system of the proposed development, which will eventually be connected to nearby stormwater drainage system.
3	**Comments from Drainage Service Department received on 19 October 2023**	
	Drainage Impact Assessment (DIA)	
3.1	Please illustrate the proposed discharge path for channels 2, 3 & 4 under both normal condition and different rainfall events for reference.	**Appendix M.1** has been added in DIA to illustrate the collection of runoffs from catchments via the existing watercourse near Wah Yuen under the existing condition (**Annex IV** refers).

Item s	Comments	Responses
		Appendix M.2 has been added in the DIA to show that the existing catchments served by the existing watercourse near Wah Yuen will be split into a few catchments. Its runoff will be collected by 5 sets of independent proposed boundary channels and the internal drainage system of the proposed development (**Annex IV** refers). The discharge path for the runoff collected by the 5 sets of independent proposed boundary channels has also been shown under both normal flow condition in **Appendix M.2** of the DIA (**Annex IV** refers). Extreme weather condition (1 in 10 Years Rainfall Event or above) has also been provided in **Appendix N** of the DIA (**Annex IV** refers).
3.2	The proposed connection between channel 3 and the alternative 1050mm dia. Pipe with about 90 degrees for discharge may induce vortex, which may affect the hydraulic performance of the alternative pipes (both 1050 dia. And 900 dia. Pipes). Please review the connection angle for both i) channel 2 and alternative 900mm dia. Pipe and ii) channel 3 and alternative 1050mm dia. Pipe to provide a smooth discharge flow at the concerned locations.	Please note that the master layout plan for Section 12A application is indicative only, the detailed design for the connection of Channels 2, 3 and its associated pipes will be further reviewed at the detailed design stage when the detailed design of the proposed development is formulated. The **Appendix B5.3** of the DIA has been slightly refined to adjust the angle of not more than 90 degrees between Channels 2, 3 and its associated pipes (**Annex IV** refers).
3.3	Section 3.3.3- Apart from Cat_012A, Cat_012B, Cat_013 and Cat_014, please please check whether Cat_004C3 is also within the development site. The indication of catchment on plan (in particular the changes before and after development, i.e. Cat_004B, Cat_004C and Cat_003C) in Appendix C is still considered unclear.	Please note that Catchment Cat_004C3 is not part of the development site. As shown in **Appendix C.4** of the DIA, the runoff from Cat_004C3 will discharge to Channel 4 followings its local topography (**Annex IV** refers). An enlarged catchment plan under existing and proposed condition has been added for your ease reference in **Appendices C.3** and **C.4** of the DIA (**Annex IV** refers).
3.4	Section 3.3.3- Appendix C. l show that Cat_0l2A di charges to the existing watercourse near Wah Yuen. Please review whether the statement "The runoff of most of the existing catchments of the development site (Model ID: Cat_012A & Cat_012B) is discharged to the exiting northern channel…" is accurate.	**Section 3.3.3** of the DIA has been updated to clarify that the runoff from the catchment Cat_012A will be discharged to the existing watercourse near Wah Yuen and then to the exiting northern channel (**Annex IV** refers).

Items	Comments	Responses
3.5	Section 4.2.2: Please correct an error "... Error! Not a valid bookmark self-reference." In this section.	**Section 4.2.2** of the DIA has been updated accordingly (**Annex IV** refers).
3.6	Section 4.2.2- It states that *"The Catchment plan under proposed condition will be same as the existing condition ...* ". However, Section 4.1.3 states that *"After the development. The runoff from the Site area of the proposed development (about 2 hectare), which is part of the original catchments of the existing vegetated watercourse near to Wah Yuen, will be collected by internal drainage system ...* ". It appears that there is a change of catchment distribution. Please review the statement in Section 4.2.2.	Noted and the text has been amended to "The total catchment area under the proposed condition will be same as the existing condition and can be referred to Appendix C, except for (1) the change of weighted CN value for the Site and (2) the changes of runoff discharge route for existing catchments of the Site (Model ID, Cat_012A, Cat_012B, Cat_013 and Cat_014) (i.e. from 72.99 to 90) and (2) the changes of runoff discharge route for existing catchments Cat_004B, Cat_004C and Cat_003C as discussed in Section 4.2.3." for clarity (**Annex IV** refers).
3.7	Appendix C. 1 – There are two Cat_013 but no Cat_014. Please check.	**Appendix C.1** of DIA has been updated (**Annex IV** refers).
3.8	Appendix B5.2 – It is noted that the cross-sectional areas of Channels 1, 2, 3 4 and 5 are all smaller than that of the existing watercourse (~3.2m wide with ~0.8m deep). To enhance the robustness of the system, please review whether the Channels 1, 2, 3, 4 and 5 can be enlarged as far as practicable.	Noted. In light of that the DIA report has demonstrated sufficient freeboard for the proposed channels, it is considered that the proposed Channels 1, 2, 3, 4 and 5 are adequate for the proposed development in the planning application stage. An enlarged size of Channels 1 to 5 will be reviewed, if practicable, in the future detailed design stage.
3.9	Appendix K.1 and K.2 – Please check the assessment result, in particular the values of freeboard for Channels 1 2, 3 4 and 5 which are larger than the height of the channel in some cases. For instance, Channel 1 (height of 1m) bas 1.04m freeboard at downstream under 1 in 10 years rainfall event, Channel 2 (height of 0.6m) has 0.98m freeboard at upstream under 1 in 10 years rainfall event, etc.	For **Appendix K.2** of DIA, some of the previous water levels are based on the water levels of the node (i.e. modelling objects that connecting pipe-to-pipe/ channel-to-pipe), which only reflect to the water level of the downstream connected pipe (**Annex IV** refers). For clarity, all the water levels extracted from the hydraulic model have been updated and have made reference to the water depth of channels/ pipes (highlighted in green). Please note that there are no changes to the hydraulic model and its results.
3.10	Please confirm whether all proposed drainage system within the site (including all drainage pipes and channels, water tank, Channels 1, 2, 3, 4 and 5, etc.) will be maintained by the developer or the subsequent owner of the development site.	Proposed drainage system within the development, including all drainage pipes and channels, stormwater storage tank, Channels 1 to 5 and its associated pipes, will be maintained by the developer or the subsequent owner of the site.
3.11	It is noted that a channel with 1.7m floodwall is proposed outside the development site. You may wish to consult the relevant stakeholders (e.g.	Noted. Consulting to relevant parties will be carried out when the details of the proposed channel including the floodwall are developed at the later design stage and upon approval of this s12A planning application.

Items	Comments	Responses
	relevant government departments, locals, etc.) in order to ascertain the feasibility of the proposal.	

Enclosure:
Annex I: Revised Traffic Impact Assessment
Annex II: Replacement Pages of Water Quality Impact Assessment
Annex III: Sewerage Impact Assessment
Annex Iv: Revised Drainage Impact Assessment

Complied by: KTA Planning Limited
Date: 9 November 2023
File Ref: 20231020_S3046_FI9_V01

Application for Amendment to the Approved Shek Kong Outline Zoning Plan (OZP) No. S/YL-SK/9
From “Residential (Group D)” to “Residential (Group C)”
At Various Lots in D.D. 112 and Adjoining Government Land, Kam Sheung Road, Shek Kong, Yuen Long, New Territories
S12A Amendment of Plan Application No. Y/YL-SK/1

Items	Comments	Responses
1	**Comments from Transport Department**	
	18 December 2023	
1.1	Figure 5.1 – We observed that the existing queue from Kam Sheung Road eastbound in peak hours exceeds the queue length calculation in Table 5.6. To design a more effective traffic signal junction, consideration shall be given to providing left turn and right turn lane from Kam Sheung Road eastbound.	Noted. Separated left turn and right turn lanes from Kam Sheung Road eastbound as shown in revised **Figure 5.1** of the TIA (**Annex I** refers). Please note that the existing queue occurs due to (1) vehicles are difficult to egress from minor road Kam Sheung Road to the major road Kam Tin Road with high traffic flow and (2) vehicles were blocked by the pick-up / drop-off activities of the bus at Sheung Tsuen Park bus stop as there is only one lane in Kam Sheung Road eastbound. As bus lay-by will be provided at Kam Sheung Road under HyD improvement scheme, the pick-up / drop-off activities of the buses will no longer block other by-pass vehicles. As separated left turn and right turn lanes are now proposed and will be provided and together with the overall improvement scheme, the queue length will greatly be reduced. The operational performance for Junction C is assessed and shown below and **Table 5.5** of TIA (**Annex I** refers): (table below) The queue length for Kam Sheung Road northbound is assessed and shown below and **Table 5.6** of TIA report (**Annex I** refers):

Ref. No.	Junction	RC $^{(1)}$/RFC$^{(2)}$	
		Design Scenario (With Improvement)	
		AM Peak	PM Peak
C	Kam Sheung Road / Kam Tin Road	+23%	+18%

Items	Comments	Responses
		<table><tr><th rowspan="3">Ref. No.</th><th rowspan="3">Road</th><th rowspan="3">Allowable Queue Length (m)</th><th colspan="2">Queue Length (m)</th></tr><tr><th colspan="2">Design Scenario (With Improvement)</th></tr><tr><th>AM</th><th>PM</th></tr><tr><td>C</td><td>Kam Sheung Road NB</td><td>>300</td><td>48</td><td>42</td></tr></table>
1.2	Minimum 1.5m footpath shall be provided;	Noted. Minimum 1.5m footpath will be provided.
1.3	Please clarify whether the relocation of noise barrier will be carried out by applicant. Please also seek EPD's view since the noise barrier is set back from the HyD's proposed work;	Noted. The relocation of the noise barrier will be carried out by the Applicant. The Applicant will consult EPD's view prior to the relocation of the noise barrier.
1.4	Please assess whether the merging length from Kam Tin Road southbound is enough	The merging length is based on HyD's improvement design and we provided even longer merging length than that. The merging lane will only be used by limited no. of bus coming from the bus stops. A standard merging taper of a bus bay is 20m. The merging length is about 40m which is higher than the standard.
1.5	The flare length effect from Kam Tin Road northbound to Kam Sheung Road westbound shall be considered in the calculation.	Noted. Flare length effect is considered by imply site factors in the calculations. Please refer to the calculation sheets
	8 February 2024	
1.6	1 in 15 bicycle parking space shall be provided as internal transport facilities in the development.	Noted. 1 space for 15 flats with flat size ≤ 70m^2 (as per HKPSG, i.e. 51 bicycle parking spaces) will be provided. Please refer to **Table 2.2** of the revised TIA report (**Annex I** refers).
1.7	Figure 5.1: According to TPDM Vol 4 Chapter 2.2 Clause 2.2.3.5, "a distance of about 100m should be allowed for merging to take place". The merging arrangement for Kam Tin Road Southbound shall be reviewed.	It is revealed that our proposed improvement is not the same as merging arrangement at normal signalized junction. For normal signalized junction, similar volume of traffic flow will be merged and therefore sufficient merging length is required. However, the merging lane of our improvement scheme will only be used by the buses egress from the bus stops at Kam Tin Road. There are only 3 bus bays at the bus stops and

Items	Comments	Responses
		therefore will only be a maximum 3 nos. of buses using the merging lane per each cycle. The merging would not occur frequently and therefore the proposed merging length is sufficient for merging in this case. Also, there are temporary structures and a petrol filling station next to the receiving lane of Kam Tin Road South Bound, the merging lane cannot be extended due to this site constraints
1.8	The existing car parking space at Kam Sheung Road Northbound will block the flare length of the proposed left turn lane. Such arrangement shall be reviewed with regard to the queue length and the calculation of the junction. Relocation of the car parking space is necessary for further improvement of the junction.	Noted. It is proposed to relocate the car parking spaces so as to allow longer Kam Sheung Road left turn lane. Please refer to **Figure 5.1** of the TIA report (**Annex I** refers).
1.9	Please provide the calculation on queue length for all lanes of the junction.	Noted. Calculation on queue length for all lanes of the junction are provided and attached in **Appendix II** of the revised TIA report (**Annex I** refers).
1.10	Please provide the site factor of 0.2 and 0.35 for Kam Tin Road Northbound and justify the basis of using this site factor. Please also indicate the length of flare in the drawing.	<u>Kam Tin Road North Bound</u> No. of pcu could be stored on the flare length of for the left turn lane of Kam Tin Road NB = 8 pcu Cycle time = 130 sec No. of cycle = 3600/130 = 27.7 Estimated saturation flow = No. of pcu x No. of cycle x No. of stage = 8 x 27.7 x 3 = 664 pcu/hr Thus 0.35 site factor was applied to obtain similar saturation flow <u>Kam Sheung Road North Bound</u> No. of pcu could be stored on the flare length of for the left turn lane of Kam Tin Road NB = 7 pcu Cycle time = 130sec No. of cycle = 3600/130 = 27.7 Estimated saturation flow = No. of pcu x No. of cycle x No. of stage = 7 x 27.7 x 3 = 582 pcu/hr Thus 0.35 site factor was applied to obtain similar saturation flow.

Item s	Comments	Responses
		The length of flare is indicated on Figure 5.1 of the TIA
1.11	We reiterate that EPD's view on the relocation of noise barrier is crucial to the improvement scheme. The feasibility of the proposed delicate left turn lane and the whole junction calculation would rely on the comment from EPD.	The Applicant has reviewed the feasibility of the relocation of noise barrier and has conducted a Sensitivity Study for the Noise Barrier (**Annex II** refers). It is concluded that minor adjustment to the noise barrier would have no adverse noise implications for the nearby NSRs. The revised Noise Impact Assessment (NIA) is also attached in **Annex III**. The Applicant intends to solicit EPD's view via this FI submission.
1.12	RC of 25% shall be achieved for new 4ignalized junctions.	This is not a new junction. The "new junction" is referring to a completely new junction in new development area. This junction is an existing junction which is proposed to be converted from a priority junction to a signalized junction. The requirements for new junctions in new development area are higher than existing junctions because there will be more future developments in new development area than developed area. More spare capacities will be required to cater increase in future traffic flow. Moreover, new development areas have more spare space to be used, where existing junctions are usually limited by site constraints. Improvement works such as road widening would be limited. As this junction is an existing junction and limited by existing surrounding facilities/developments, the requirement of RC ≥15% for existing junction should be adopted in this case.
2	**Comments from Drainage Service Department**	
	18 December 2023	
	Drainage Impact Assessment (DIA)	
2.1	Appendix K.2 – The values of freeboard for Channels 2, 3, 4, 5.2 and 5.3 are larger than the height of the channel as shown in Appendix K.1 for some cases. Please check.	Since the ground level along the channel may be varied, to have a more conservative assessment, the channel height adopted for the calculation of the free flow capacity of the proposed channel is based on the minimum channel height. The actual heights of the channels are based on the ground level minus by the invert level of the channels. For clarity, actual channel height for upstream and downstream of channels are added in **Appendices K.1** and **K.2** of DIA (**Annex IV** refers). Thus, the actual size of the proposed

<table>
<tr><th>Items</th><th>Comments</th><th>Responses</th></tr>
<tr><td></td><td></td><td>channels is greater than the minimum channel size used in hydraulic calculation.

With reference to the actual channel height of the proposed channel, please be clarified that the freeboards for all the channels are less than actual channel heights of all the channels and at least 300mm freeboard can be achieved.</td></tr>
<tr><td>2.2</td><td>Appendix B5.2 – In view of insufficient freeboard provided for some proposed channels as mentioned in (a) above and the cross-sectional areas of Channels 1 , 2, 3, 4 and 5 are all smaller than that of the existing watercourse (~3.2m wide with ~0.8m deep). To enhance the robustness of the system, please review whether the Channels 1, 2, 3, 4 and 5 can be enlarged as far as practicable.</td><td>As mentioned above, it is noted that the freeboards for all the channels are less than actual channel heights of all the channels and minimum 300mm freeboard can be achieved under 1 in 10 years, 50 years and 200 years rainfall event, considering climate change effect as demonstrated in **Appendices K.1** and **K.2** of DIA (**Annex IV** refers).

Despite that both the hydraulic calculation and hydraulic model results indicating minimum 300mm freeboard can be achieved which is in line with the requirement of DSD Stormwater Drainage Manual and the proposed channels are considered adequate to mitigate the drainage impacts, it is understood that DSD still have a concern on the robustness of the proposed channel system and would like to have larger channels as far as practicable. To relieve the concern of DSD, the Applicant is willing to take the opportunity to further enlarge the proposed channels, even though the previous proposed size of channels with smaller size is adequate for mitigating the drainage impacts, as follow: -

<table>
<tr><th rowspan="2">Channel name</th><th colspan="2">Channel Size adopted in hydraulic model and calculation which demonstrated sufficient freeboard can be achieved</th><th colspan="2">**Enlarged channel size to relieve DSD’s concerns**</th><th rowspan="2">**Flow area of enlarged channel m^2**</th></tr>
<tr><th>Min. Channel Width m</th><th>Min. Channel Height m</th><th>**Design Channel Width m**</th><th>**Min. Actual Height m**</th></tr>
<tr><td>Channel 1</td><td>0.8</td><td>1.0</td><td>**1.3**</td><td>**1.00**</td><td>**1.3**</td></tr>
<tr><td>Channel 2</td><td>0.6</td><td>0.6</td><td>**1.2**</td><td>**1.09**</td><td>**1.3**</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Items</th><th>Comments</th><th>Responses</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Channel 3</td><td>0.6</td><td>1.5</td><td>**1**</td><td>**1.50**</td><td>**1.5**</td></tr>
<tr><td>Channel 4</td><td>0.6</td><td>0.6</td><td>**1.4**</td><td>**0.76**</td><td>**1.1**</td></tr>
<tr><td>Channel 5.1</td><td>0.8</td><td>0.6</td><td>**1.2**</td><td>**0.90**</td><td>**1.1**</td></tr>
<tr><td>Channel 5.2</td><td>1</td><td>0.5</td><td>**1.2**</td><td>**1.27**</td><td>**1.5**</td></tr>
<tr><td>Channel 5.3</td><td>1</td><td>0.5</td><td>**1.2**</td><td>**1.43**</td><td>**1.7**</td></tr>
</table>

Based on survey information, the total flow area of the existing watercourse is about 1.6m^2 as shown in **Appendix B5.2** of DIA (**Annex IV** refers). After enlargement of proposed channel as requested by DSD, the flow area of each enlarged channel is close to the original existing watercourse.

Appendices B5.1, **B5.2** and **B5.3** of DIA are updated for the enlarged channel sizes (**Annex IV** refers).</td></tr>
<tr><td>2.3</td><td>Appendix B5.2 – The revised connection angle between channel 3 and the alternative 1050mm dia. Pipe is still about 90 degree for discharge, which may induce vortex and affect the hydraulic performance of the alternative pipes (both 1050 dia. And 900 dia. Pipes). Please review again.</td><td>**Appendices B5.1** and **B5.3** of DIA are updated to allow a smoother angle between channel 3 and the alternative 1050mm dia. Pipe (**Annex IV** refers).</td></tr>
<tr><td></td><td>**<u>25 January 2024</u>**</td><td></td></tr>
<tr><td>2.4</td><td>Referring to R-to-C on item 2.2, it is noted that all proposed channels will be enlarged. However, as compared with Appendix B5.2, the minimum height of some proposed channels are not matched with the one in R-to-C (e.g. Channel 2: min. 1.09m height in R-to-C but min. 0.6m height in Appendix B5.2, etc.). Please check.</td><td>For clarity, **Appendices B5.1**, **B5.2** and **B5.3** of DIA are updated to show the proposed channel height of the enlarged size of proposed channels. The proposed heights of the channels are based on the ground level minus by the invert level of the channels (**Annex IV** refers).</td></tr>
<tr><td>2.5</td><td>Besides, all proposed channels should use its minimum height in hydraulic assessment for conservative case. Please review the hydraulic assessment in Appendix K.1 & K.2 accordingly.</td><td>The hydraulic calculation in **Appendices K.1** & **K.2** of DIA are reviewed with the minimum channel height of the proposed channels for the enlarged proposed channels which indicate the utilisation of proposed channels is much lower under the enlarged channel scheme. The enlarged proposed channels</td></tr>
</table>

Item s	Comments	Responses
		have been included in hydraulic model for the proposed conditions scenario in **Appendix I** of DIA (**Annex IV** refers). Also, as per DSD advised, it is noted that there are changes in the DSD proposed drainage works at downstream of northern channel. The latest design information for the DSD Lin Fa Tei Drainage Improvement Works at the downstream of the proposed development has been collected and incorporated into the hydraulic model scenarios with DSD improvement works. The hydraulic model updated is included in **Appendix I** of DIA (**Annex IV** refers).
2.6	Please be reminded that the whole proposed drainage system is subject to the provision of a 1.4-2.6m width channel with 1.7m flood wall (highlighted in pink in Appendix B5.1), which is located outside the application site. The applicant/developer shall demonstrate that the proposed drainage construction/improvement/modification works and the operation of the drainage can be practicably implemented on site.	According to the site inspection and aerial photos, it is understood that there is a blockage of the northern channel. Due to the blockage of the northern channel, there is no proper drainage system connecting the upstream portion of the northern channel to the downstream portion of the northern channel. The existing blocked drainage system would result in flooding back to existing private lots. The Applicant has taken this development opportunity to restore and enhance the connectivity of the northern channel by proposing the provision of a 3.0m(w) x 2.5m(H) box culvert within the Site and 1.4-2.6m width channel with 1.7m flood wall within the government land. The proposed measures will reconnect the upstream portion of the northern channel to the downstream portion of the northern channel at Lin Fa Tei, as well as replace the existing blocked portion of the northern channel outside of the Site, which would help to improve the drainage condition of the area. The proposed channel is a typical engineering channel laid on government lands in rural areas and its construction works mainly involve conventional civil engineering works such as excavation and reinforced concrete works that are commonly adopted in engineering projects in HK. Thus, the implementation of the proposed drainage construction/ improvement/ modification works and the operation of the drainage would be technically feasible and practicable. Please note that the Applicant has previously submitted several rounds of Further Information of which one of them included the drainage proposal to Town Planning Board (TPB); and Planning Department would have circulated the same to the District Offices (DOs) under the Home Affairs Department (HAD) to solicit the public comments. However, there are no comments received from DOs on this proposed channel on government land. Besides that, the public would be able to make their comments on the Further

Items	Comments	Responses
		Information (including drainage proposal) to TPB during the 3-weeks public consultation period under the prevailing Town Planning procedures. The public would also be given the opportunity to make representations/ comments on the proposed development or proposed amendments to the comments of the Site during the statutory plan-making procedures upon the approval of S12A Application. The Applicant will ensure that the proposed drainage construction/ improvement/ modification works and the operation of the drainage can be practicably implemented both on-site and off-site at the detailed design stage after the approval of the planning application and amendment of Statutory Plans.
3	**Comments from Highways Department received on 20 December 2023**	
3.1	In view that the applicant will only provide related information in later design stage, attached comments provided on 9.8.2023 remain valid.	Noted. However, please kindly note that the Applicant could only provide the detailed information including the design and location of the interception channel, gullies and engineering details on the run-in/out, when the detailed design of the proposed development is formulated. There is currently no information to be provided at this pre-development stage. The Applicant will closely liaise with your office when the detailed design is formulated.

Public Comments		
1	**Summary of Public Comments on Traffic Aspect**	
1.1	There are concerns on the growing demand of public transport. Minibuses Nos. 72 and 23 are very popular but excluded from the Traffic Impact Assessment. The lack of improvement plans to Kam Sheung Road is also concerning, given the influx of residents to the new development.	In response to the concerns on the growing demand of public transport, the TIA has covered assessment on Public Transport Demand; and the demand for Minibus Nos. 72 and 23 has also been included in the assessment of Public Transport Demand. Based on the assessment results, it is surveyed that the average occupancy rate of GMB 72, GMB 72M and RMB 23 is around 12% to 31% at weekday AM peak (07:30 – 08:30) and expected that there is a surplus in 2034 for both AM and PM peak with the proposal to increase 2 nos. of GMB trip/hr in PM peak. Please also note that there are proposed new pedestrian crossings across Kam Sheung Road near the Site to improve pedestrian access across both sides.
1.2	There are also growing concerns on the road networks of Pat Heung South, especially Kam Sheung Road. The road networks are insufficient to support the needs of the resident with the Proposed Development	The Applicant has conducted TIA taking into account reference case scenario (without proposed development) and Design Case Scenario (with proposed development) for critical junctions and link capacity on the relevant section of Kam Sheung Road. Based on the assessment results, it is indicated that all junctions and road links are predicted to perform with ample spare capacities

		during AM and PM peaks in the design year of 2034 except the junction of Kam Sheung Road / Kam Tin Road. For this junction, there is improvement proposal including junction widening and converting the priority junction to signalized junction. In addition, there is a government proposal of widening Kam Sheung Road to a single two-lane carriageway by Highways Department
1.3	The internal traffic of the application site has not been addressed in the Traffic Impact Assessment. The cars travelling to the loading and unloading area, carports, and open carparks are believed to have impact on the residents of Wah Yuen. Bicycle Parking is also not provided within the Site.	There would be fence wall with harmony design along the site boundary to block the direct line of sight to the internal open carpark and loading unloading areas. Nevertheless, please note that the detailed development proposal will be formulated in the later design stage. The internal traffic of the application site (including the internal road paving materials) will be formulated at the detailed design stage and shall be consulted with relevant government department(s) for approval.
2	**Summary of Public Comment on Lands Aspect**	
2.1	The vehicle paths of Lot Nos. 852, 854 S.A, 854 S.B, 855 and 858 in D.D.112 will be blocked as the application site would surround those lots. There are concerns that the future development of those lots are landlocked.	Please note that the Applicant has reviewed the master layout plan by incorporating 2.5m-wide footpath to the subject private lots which are located near the southeastern part of the Application Site.
3	Comment on Landscape and Visual Impact	
3.1	There are comments on the visual impact of the 6-storey high proposed development will obstruct the views of villagers of Pat Heung Sheung Tsuen. It is also noted that the application site is directly impact the development of Wah Yuen including the residents in D.D. 112. Wah Yuen has been left out of the VIA.	The VIA has been conducted, in accordance with TPB Planning Guidelines No. 41, to assess the visual impact of the Proposed Development to the public viewpoints in the surroundings. At least 2 points (VP2: Lai Uk Tsuen Bus Stop (Eastbound) to the northeast and VP3: Front Entrance of the Chik Kwai Study Hall) to the east of the Site have been selected, covering and assessing the likely potential impact of the Proposed Development. It is understood that the Proposed Development is close to Wah Yuen. There will be peripheral fencing planting and setback of building blocks to ease the potential impact to Wah Yuen residents and provide visual relief in the area.
4	**Summary of Public Comments on the Drainage System**	
4.1	Comments are mainly related to the flood risk to Wah Yuen posed by the proposed development. - The effectiveness of Water Storage Tank and Channels within the Proposed Development - The depth and width of the Proposed Channels is significantly narrower than the Original Channels	The Applicant has spent its maximum effort and shouldered his responsibility to minimise the flood risk to surrounding areas, especially Wah Yuen. In response to the public concerns on the flood risk and the blockage of the northern channel identified, the Applicant has proposed the following measures

	- There will be water runoff from Proposed Development to the watercourse near Wah Yuen, leading to the increase of water level	1) To construct a box culvert and a concrete channel of 1.7m high flood wall within the government lands, in order to re-connect the upstream of channel to the downstream of the northern channel at Lin Fa Tei, 2) To provide five sets of surface channel and associated pipe near Wah Yuen to replace the existing watercourse to convey runoffs from the catchments back to the downstream of the existing natural watercourse near to Wah Yuen, 3) To provide by-pass pipes to intercept the runoff collected from Channels to temporarily store in the proposed storage tank under extreme weather events. Please note that the proposed measures will not only address the drainage impact as a result of the runoff from the development, it will also be able to mitigate the high water level under extreme flood event with the effect of climate change in the end of century. The DIA has confirmed that with the above mitigation measures, there will be no adverse drainage impact.
5	**Summary of Public Comments on the Disposition of Building Blocks**	
5.1	There are no buffer between the Wah Yuen and the Application Site, especially three of the building blocks are just 4 metres away from the Wah Yuen boundaries.	The Applicant has carefully placed the disposition of the building blocks and has provided green buffer between the proposed building blocks to Wah Yuen, in order to provide visual relief to the proposed development. The master layout plan put forward at this stage will be fine-tuned taking into account the comments at the detailed design stage.
5.2	The is no information (i.e. BH) of the certain building blocks such as 3 storeys carport.	To clarify, the carport buildings would have 3 levels of covered carpark.
5.3	The average unit size of about 38.9 sq. m. is only around 50% of the GFA of one floor of a village house. It is believed that 400 sq. ft. is not large enough to raise a family, given the rural location has fewer community facilities and alternative spaces.	Please note that the design of the proposed development will be revised in the detailed design stage. The Applicant will review the unit size of the proposed development based on the latest market trends and demand.
6	**Summary of Public Comments on the S12A Planning Application**	
6.1	If this application is approved, it will set a precedent for similar applications, and the rural character of the area will be disrupted.	Please note that the Applicant has made reference to development quantum and the range of Plot Ratio proposed within the Kam Tin South and Pat Heung area. The Proposed Development is only about 700m away from the eastern peripheries of the boundary of Kam Tin South and Pat Heung area. The Proposed Development would therefore be in line with the Government's policy and planning strategy to increase land supply for housing and unleash

		the development potential of underutilised land in Shek Kong area with good accessibility.
7	**Summary of Public Comments on the Waste and Sewage System**	
7.1	No central sewage system is present in the area. Therefore, it is believed that the surrounding rivers and water bodies will be polluted if the domestic sewage is discharged directly into the nearby rivers.	Please note that a Sewage Treatment Plant is proposed within the Site to treat sewage generated from the proposed development until the public sewer and capacity of the downstream sewerage are available for discharge. The proposed STP would provide tertiary effluent treatment.
7.2	All the garbage collection points along Kam Sheung Road are overloaded. The increased population is expected to worsen the situation.	The Applicant will review the provision of garbage collection point to be provided within the proposed development in the later detailed design stage.

Enclosure:

Annex I:	**Revised Traffic Impact Assessment**
Annex II:	**Sensitivity Study for the Noise Barrier**
Annex III:	**Revised Noise Impact Assessment**
Annex IV:	**Revised Drainage Impact Assessment**

Complied by: KTA Planning Limited
Date: 22 March 2024
File Ref: 20240103_S3046_FI11_V01_Final

Application for Amendment to the Approved Shek Kong Outline Zoning Plan (OZP) No. S/YL-SK/9
From “Residential (Group D)” to “Residential (Group C)”
At Various Lots in D.D. 112 and Adjoining Government Land, Kam Sheung Road, Shek Kong, Yuen Long, New Territories
S12A Amendment of Plan Application No. Y/YL-SK/1

Items	Comments	Responses
1	**Comments from Drainage Service Department received on 7 May 2024**	
	On Drainage Impact Assessment (DIA) in FI No. 11	
1.1	(a) Please be reminded that the newly promulgated Stormwater Drainage Manual Corrigendum No. 1/2024 and 2/2024 should be considered in the design.	Stormwater Drainage Manual (SDM) Corrigendum No. 1/2024 and 2/2024 have been considered and the new storm constants are applied in the hydraulic assessment of the revised DIA report (**Annex 1a** of this Further Information (FI)). Due to the higher rainfall intensities generated from the new storm constants listed in SDM Corrigendum No. 1/2024, higher water levels are identified at downstream northern channel under the extreme rainfall events. In order to achieve the previously provided flood standard for proposed channels near Wah Yuen area, the previously proposed interception pipeline will be extended to Channel 1 via an additional 900mm diameter pipe. The proposed interception pipeline will collect excessive runoff from Channels 1, 2, 3 and 4 to proposed storage tank for temporary storage under the extreme rainfall event. The relevant parts of DIA report including **Appendix B5.3** and **Appendix L** have been updated to incorporate the above further drainage improvement works arising from change of rainfall standard under Corrigendum No. 1/2024.
1.2	(b) The 1.7m flood wall is not a typical engineering design for the proposed 1.4-2.6m width channel (highlighted in pink in Appendix B5.1). It may affect the public access of the villagers and/or public street furniture(s). You may wish to review the risk of objection from locals. Please provide a section drawing showing the details of the proposed channel with ground level for review. Please review whether the concerned government land has sufficient space for the provision of the above channel. Please also seek advice from TD and/or HAD whether the remaining spacing maintained for public use is sufficient or not. The applicant/developer shall demonstrate that the proposed drainage construction/improvement/modification works and the	As observed from the recent aerial photo (**Annex 1b** of this FI), filling works are identified within the government lands and the adjacent private lots. The ground levels along the proposed channel are reviewed and identified to be generally increased by about 1m according to the released more recent LiDAR data from CEDD. Thus, the height of associated flood walls of the proposed channel can generally be reduced to about 0.4m to 1m above ground except for a short section of flood wall connecting to the existing northern channel at the downstream which will be about 1.65m high due to the constraints of high-water level at the downstream existing northern channel and maintaining of 300mm freeboard under the 10 years flood event. Thus, it is considered the revised proposed flood wall is acceptable from engineering design point of view.

Items	Comments	Responses
	operation and maintenance (e.g. inspection, desilting, etc.) of the proposed channel can be practicably implemented on site.	As shown in **Annex A** of the revised DIA report, the alignment of the proposed channel mainly falls outside possible public access except for two small portions which are idled land and may possibly affect public access between south and north sides. To allow public access from/ to areas between south and north as well as between east and west across the proposed channel, the channel has been designed to have two sections of box culverts at the existing tracks so that public access across the proposed channel alignment can be maintained as shown in **Appendix B5.1**. With the provision of box culvert sections, public access of the villages will be maintained at all direction. The section of proposed channel with box culverts for public access with reviewed ground level using more recent LiDAR data from CEDD is prepared and provided in **Appendix L**. The approximate widths of the two proposed public access openings are about 15m and 7m for the eastern one and the western one respectively. Based on desktop information, the width along the government land for the proposed channel is generally about 3m or more except a few local spots where the minimum width still has at least 2.4m. The channel width has been designed to suit the public land spaces. Thus, it is considered the proposed channel can be provided within government lands. The construction of the proposed channels and associated box culverts along the government land strip is a typical engineering works similar to typical trench excavations and drainage works at rear lane/ building back alley. The construction of channel will be starting from west to east for maintaining construction access along the government land strip from the development site. Trench shoring will be installed at the trench for conventional civil engineering works such as excavation works and construction of concrete channel and associated box culvert. Thus, technically, the implementation of the proposed drainage construction/ improvement/ modification works is practicable. Since the applicant will take up the maintenance responsibility of the proposed channels and box culverts and access to the proposed channel will be provided within application site for their routine inspection and maintenance works. Thus, the operation and maintenance (e.g. inspection, desilting, etc.)

Items	Comments	Responses
		of the proposed channel can be practicably implemented on site via the access within the development site. Also, the Applicant will ensure that the proposed drainage construction/ improvement/ modification works and the operation and maintenance of the drainage can be practicably implemented both on-site and off-site at the detailed design stage after the approval of the planning application and amendment of Statutory Plans. This Further Information submission will be circulated to Transport Department (TD) and/or Home Affairs Department (HAD) as appropriate for comments via Planning Department (PlanD).
1.3	(c) Appendix B3 & B4 – Please be reminded that part of the flood walls will be constructed by HAD instead of DSD, please update the DIA report and relevant drawing for clarity. Please refer to the attached drawing for details.	**Appendices B3** and **B4** of the DIA are updated accordingly (**Annex Ia** refers),

Enclosure:

Annex Ia:	**Revised Drainage Impact Assessment**
Annex Ib:	**Alignment of Proposed Channel shown on Aerial Photo**

Complied by: KTA Planning Limited
Date: 21 May 2024
File Ref: 20240507_S3046_FI12_V01_Final

Application for Amendment to the Approved Shek Kong Outline Zoning Plan (OZP) No. S/YL-SK/9
From "Residential (Group D)" to "Residential (Group C)"
At Various Lots in D.D. 112 and Adjoining Government Land, Kam Sheung Road, Shek Kong, Yuen Long, New Territories
S12A Amendment of Plan Application No. Y/YL-SK/1

Items	Comments	Responses
1	**Comments from Transport Department (Contact Person: Mr. Phil CAI; Tel: 2399 2421)**	
1.1	Table 2.3 - bicycle parking space is missing.	Noted. Bicycle parking space is added in **Table 2.3** of the revised TIA report (**Annex I** refers).
1.2	Figure 5.1 -\	
	• The justification on the length of merging lane of Junction C is qualitative and is not sufficient. The current proposed merging lane is approx. 15m only and it is largelydeviated from the requirement in TPDM. A quantitative demonstration with regarding tocycle time, green time and traffic flow is required to justify the sufficiency	The merging lane has been increased as shown in **Figure 5.1** of the TIA to provide sufficient merging length (**Annex I** refers).
	• The bus stop proposed at Kam Sheung Road northbound will block the left turn lanewhich is an ineffective proposal. The applicant shall review such arrangement.	The arrangement of bus stop has been revised as shown in **Figure 5.1** of the TIA (**Annex I** refers).
	• Cycle time of 130s is not acceptable. The maximum cycle time shall be 120s.	Noted. Cycle time has been revised to 120s (**Annex I** refers).
1.3	Figure 7.1 - Please clarify whether the widening works are by CEDD or HyD.	Please note that the widening works are carried out by HyD. **Figure 7.1** of TIA has been updated (**Annex I** refers).
1.4	A separate sensitivity study shall be provided on PWP No. 6892TH not been implemented in the design year.	Noted. A sensitivity study on PWP No. 6892TB has been added in **Chapter 5** of the revised TIA (**Annex I** refers).
1.5	RtoC item 1.10 - it is uncleared how the site factor is developed in the last step. Please further elaborate.	Kam Tin Road NB No. of pcu could be stored on the flare length of the left turn lane of Kam Tin Road NB = 8 pcu

Items	Comments	Responses
		Cycle time = 120 sec No. of cycle = 3600/120 = 30 Estimated saturation flow = No. of pcu x No. of cycle x No. of stage = 8 x 30 x 3 = 720 pcu/hr Saturation flow without flare length effect = 1875 pcu/hr Site factor = 720/1875 = 0.384 Thus, 0.384 site factor was applied Kam Sheung Road NB As the storage length is elongated to standard length in the latest layout, no site factor was applied.
1.6	RtoC item 1.11- We reiterate that EPD's view on the relocation of noise barrier is crucial to the improvement scheme. The feasibility of the proposed delicate left turn lane and the whole junction calculation would rely on the comment from EPD.	Further to our meeting with the Highways Department on 8 July 2024, it is our understanding that the implementation programmes of both 6820TH Project and 6892TH Project are still under review and will be subject to change by the Highways Department. To ensure certainty of the Applicant's proposal, the Applicant would like to bring forward two implementation scenarios (i.e. BEFORE the implementation of the improvement works carried out by HyD and AFTER the implementation of the improvement works carried out by HyD) for your kind consideration: **Before the implementation of the improvement works carried out by HyD** The Applicant is willing to undertake necessary junction improvement works at Junction Kam Sheung Road/ Kam Tin Road (C) to avoid adverse traffic impact generated from the Proposed Development. From our understanding, the proposed improvement works carried out by the Applicant (before the implementation of improvement works carried out by HyD) (indicated in **Figure 5.2** of the TIA) would not fall under the purview of EPD. Thus, there will be no interface issues between the proposed improvement works with HyD's 6820TH Project and 6892TH Project. A sensitivity study for the noise barrier has been updated accordingly to reflect the latest implementation programme of HyD's projects (**Annex II** refers). **After the implementation of the improvement works carried out by HyD**

Items	Comments	Responses
		Under this scenario, the implementation programme of 6820TH Project and 6892TH Project would be able to match with the anticipated completion year of the project. The Applicant will implement the improvement works together with the relocation of the noise barrier at his own expense after the implementation of junction improvement works carried out by HyD. The Applicant will solicit EPD's view on the relocation of Noise Barrier. Nevertheless, a Sensitivity Study for the Noise Barrier has been conducted and submitted previously by the Applicant to demonstrate that the relocation of the noise barrier would not lead to any adverse impact. The Applicant intends to continuously liaise with the relevant government departments on the implementation of the above works upon the approval of this rezoning application.
2	**Comments from Highways Department (Contact Person: Johnny C Y Tham; Tel: 3903 6817)**	
2.1	The proposed works lay within the limit of works area of the Project PWP Item No.6820TH - Upgrading of Remaining Sections of Kam Tin Road and Lam Kam Road ("the6820TH Project") and Project PWP Item No. 6892TH - Improvement to Kam Sheung Road ("the 6892TH Project"). Below are comments from the perspective of both projects.	Noted.
2.2	Further details of the works under the 6820TH Project are available in the gazetted drawings through the link below: https://www.hyd.gov.hk/en/our_projects/road_projects/6820th/gazettal/scheme/index.htmland the project boundary under the 6892TH Project is attached below:*[See attachment "20240606_Y_YL-SK_1[FI11] (HyD reply plan).pdf"]*	Noted.
2.3	Referring to para. 3.3.2, the scope of the 6820TH Project covers Junctions C, D, H, please correct the typo in the project title as "Upgrading of Remaining Sections of KamTin Road and Lam Kam Road". The scope of the 6892TH Project covers Junctions A, B,E,G, F and the portion of Kam Sheung Road near Junction C. Please also correct the project title as "Improvement to Kam Sheung Road". Also, since the programme of both the 6820TH Project and 6892TH Project are under review, it is inappropriate to indicate the completion year in the report at the moment.	Noted. The project title has been updated. It is understood that the programme of both the 6820TH Project and 6892TH Project are under review. However, we need to consider the completion years of these PWP projects in our assessment. Thus, we will adopt "tentative completion year" in the TIA. We have also added "under government review" for both of the PWP projects in latest TIA (**Annex I** refers).

Items	Comments	Responses
2.4	Part of the works indicated in red, presumably intended to indicate the works to be "carried [out] by HyD under PWP Item No. 6820TH", in figures 3.12, 3.13, and 3.15 laid outside the limit of works area of the 6820TH Project, while part of the works falls within the limit of works area of the 6892TH Project. Please clearly delineate the scope of work of each project.	Noted. Figures 3.12, 3.13, and 3.15 have been revised accordingly. Moreover, Government's improvement works shown in Figures 3.11 to 3.15 were changed from red to blue/green. Our proposed improvement works are indicated in red and this is to tally with Figure 5.1 of the TIA (**Annex I** refers).
2.5	Moreover, it is inappropriate to show the details of the works, the road markings, traffic island and drop kerbs as the design of the 6820TH Project and 6892TH Project are still ongoing and are therefore subject to change. Please refrain from showing the works of the 6820TH Project and 6892TH Project in such detail.	We understand the two PWP projects are under review and the design of the two PWP projects may be subject to change. However, it is necessary for the Applicant to indicate the details of the works (i.e. junction layouts), in order to assess the junction performance and propose further improvement measures (e.g. Figure 5.1), if needed. We have indicated in the report and figures that these junction layouts are indicative only and will subject to change.
3	**Comments from Environmental Protection Department (Contact Person: Mr. Kelvin WONG; Tel: 2835 1117)**	
3.1	For the new Sensitivity Study for the Noise Barrier, we understand that the proposed junction improvement work would have interface issue with the works proposed under the approved Environmental Impact Assessment (EIA) Report for Upgrading of Remaining Sections of Kam Tin Road and Lam Kam Road (EIAO Register No. AEIAR-222/2020). The applicant /consultant may wish to resolve the interface issues with relevant government departments first, before we can review and provide our detailed comments on the new Sensitivity Study for the Noise Barrier.	Further to our meeting with the Highways Department on 8 July 2024, it is our understanding that the implementation programmes of both 6820TH Project and 6892TH Project are still under review and will be subject to change by the Highways Department. To ensure certainty of the Applicant's proposal, the Applicant would like to bring forward two implementation scenarios (i.e. BEFORE the implementation of the improvement works carried out by HyD and AFTER the implementation of the improvement works carried out by HyD) for your kind consideration. **Before the implementation of the improvement works carried out by HyD** The Applicant is willing to undertake necessary junction improvement works at Junction Kam Sheung Road/ Kam Tin Road (C) to avoid adverse traffic impact generated from the Proposed Development. From our understanding, the proposed improvement works carried out by the Applicant (before the implementation of improvement works carried out by HyD) (indicated in **Figure 5.2** of the TIA) would not fall under the purview of your office. Thus, there will be no interface issues between the proposed improvement works with HyD's 6820TH Project and 6892TH Project. A sensitivity study for the noise barrier

Item s	Comments	Responses
		has been updated accordingly to reflect the latest implementation programme of HyD's projects (**Annex II** refers). **<u>After the implementation of the improvement works carried out by HyD</u>** Under this scenario, the implementation programme of 6820TH Project and 6892TH Project would be able to match with the anticipated completion year of the project. The Applicant will implement the improvement works together with the relocation of the noise barrier at his own expense after the implementation of junction improvement works carried out by HyD. The Applicant will solicit your view on the relocation of Noise Barrier. Nevertheless, a Sensitivity Study for the Noise Barrier has been conducted and submitted previously by the Applicant to demonstrate that the relocation of the noise barrier would not lead to any adverse impact. The Applicant intends to continuous liaise with the relevant government departments on the implementation of the above works upon the approval of this rezoning application.
3.2	For the Revised Noise Impact Assessment (NIA), our comments are as follows:	Noted.
	Comments on the NIA	
3.3	S.2.3 - For the sake of a better presentation, the proposed development will not give rise to an adverse noise impact on existing or planned NSRs. Please refine the last sentence accordingly.	Section 2.3 of the NIA has been revised accordingly (**Annex III** refers).
3.4	S.3.2, S.8.1 and S.8.2 - Please provide full details to clarify if there are any noise issues with the plane/helicopter.	More details regarding the aircraft and helicopter noise impact assessment have been provided in Section 3.2, Section 3.3 and Section 8 (**Annex III** refers). It is concluded that the adverse aircraft and helicopter impacts are not anticipated.
3.5	S.3.4 – Please update the latest ProPECC, GN and PN accordingly.	Section 3.5 of the NIA has revised (**Annex III** refers).
3.6	S.4.1 – It has been two years since the last site survey. An updated site survey is required to identify the existing and planned fixed noise sources located within the 300m study area surrounding the proposed development.	Additional site surveys are conducted on 12 July 2024 and 18 July 2024 to identify the existing and planned fixed noise sources located within the 300m study area surrounding the proposed development.

Items	Comments	Responses
3.7	S.4.12 - Please provide photo records and details to confirm that all the workshops did not operate at night.	Photos and details of additional night time survey is provided in Appendix 5 (**Annex III** refers).
3.8	S.6.3 and Appendix 3 – Please document TD's agreement on the traffic forecast data in the report once available. In case TD has no comment on the methodology for traffic forecast only, the consultant should provide written confirmation from the respective competent party (e.g. traffic consultant) that TD's endorsed methodology has been strictly adopted in preparing the traffic forecast data, and hence the validity of traffic data can be confirmed.	Noted, TD's endorsement and written confirmation has been provided (**Annex III** refers). .
3.9	S.6.3 - According to ATC 2022, it is stated that there are more vehicles in the PM than in the AM. Please re-confirm with a traffic consultant to ensure the traffic forecast is representative.	The traffic consultant has confirmed that the traffic forecast is representative.
3.10	S.7.4 - Please double-check to see if any other corrections are needed for the fixed noise impact assessment.	The equation of Section 7.4 of NIA has been revised to include tonal correction and impulsiveness correction for a conservative approach (as mentioned in Section 7.10) (**Annex III** refers).
3.11	S.7.7 - Please provide a detailed site survey indicating that tonality correction, impulsiveness correction, and intermittency correction are not necessary for fixed noise sources.	Tonal noise was not identified by on-site measurements and fluctuation of noise was not observed during the site surveys, also there was no night-time operation for the identified fixed noise sources, hence, tonality correction, impulsiveness correction and intermittency correction are not required to be applied to the fixed noise sources based on site observation and measurements. The calculation of tonality is provided in Appendix 5 of NIA. (Section7.9) However, for conservative, 3dB(A) tonality correction and 3dB(A) impulsiveness correction are considered in the calculation. (Section 7.10)
3.12	S.7.10 -Please also provide the table and summary of the predicted fixed noise level for easy reference.	The summary of the predicted noise levels has been provided in Table 7.2 of NIA (**Annex III** refers).
3.13	S.7.13 - As a common practice and trade norm, full details of the prevailing background noise measurement, including personnel, equipment, weather, field observations, etc., shall be	The details of the prevailing background noise measurement have been provided in Table 3.2 of the NIA (**Annex III** refers).

Items	Comments	Responses
	documented and included in the report for easy future reference. Please supplement.	
3.14	S.7.14 - Please review and revise this statement as it appears to have problematic wording.	Section 7.16 of NIA has been rephrased (**Annex III** refers).
3.15	Appendix 4 - Please double-check the result table as it appears that a column is blank.	The column/row is left blank as intended in Appendix 4.
3.16	S.7.7 - Please provide a detailed site survey indicating that tonality correction, impulsiveness correction, and intermittency correction are not necessary for fixed noise sources.	ditto
3.17	S.7.10 -Please also provide the table and summary of the predicted fixed noise level for easy reference.	ditto
3.18	S.7.13 - As a common practice and trade norm, full details of the prevailing background noise measurement, including personnel, equipment, weather, field observations, etc., shall be documented and included in the report for easy future reference. Please supplement.	ditto
3.19	S.7.14 - Please review and revise this statement as it appears to have problematic wording.	ditto
3.20	Appendix 4 - Please double-check the result table as it appears that a column is blank.	ditto
3.21	Appendix 5 - Please provide the photo documentation for the measurement of the existing fixed noise sources.	Photos for the measurement of the existing fixed noise sources are provided in Appendix 5.
4	**Comments from Drainage Services Department (Contact Person: Mr. CHAN Yue Lap, Kenneth; Tel: 2300 1259)**	
4.1	It is stated in item 2 of the RtC that the revised proposed flood wall is acceptable. The alignment of the proposed channel mainly falls outside possible public access except for two small portions which are idled land and may possibly affect public access and two sections of box culverts at the existing tracks will be provided to maintain public access across the proposed	The illustrations (i.e. photomontages) of the proposed channel and box culvert are enclosed in **Annex IV**. The invert levels and ground levels of the proposed channel and box culvert are shown in **Appendix L** of the previously submitted DIA Report.

Items	Comments	Responses
	channel. Supporting information i.e. photographs/drawings covering the entire proposed channel/ box culvert to show its cross-section including the invert levels, ground levels and the sightline etc. should be included in the submission for our consideration.	
4.2	Since part of the proposed works for the channel/ box culvert will be implemented outside the application site, please seek local resident/VR's view on the proposed drainage works for our further consideration.	Please note that the proposal for the proposed works for the channel/box culvert implemented outside the application site has been included in Further Information No.12. There was departmental circulation of Further Information No.12 for comments. Nil departmental comments have been received on the proposed works. Besides, the Public could make comments on the proposed works during the 3-week public inspection period. Based on our review of the public comments received, there have been no public comments from the local residents/VR made on the proposed works.
4.3	Please note that size of proposed pipe at Kam Sheung Road under DSD PWP No. 4191CED is proposed to be changed from 1650mm to 1350mm diameter and is currently under review as well as may be subject to further changes. The submitted DIA report should update the proposed pipe size for checking and/or adopt a more conservative pipe size at Kam Sheung Road to cater for any potential further changes.	Please note that the previously submitted DIA Report included the worst-case scenario of hydraulic assessment, existing drainage system without the DSD and HAD planned drainage improvement works but with the proposed development and its proposed drainage, and the results of the worst-case scenario indicated that there will be about 8.7% reduction in peak flow at the upstream of existing channel (i.e. Control Point 2) in **Table 4.2**, as well as there will be a reduction in water levels of the assessed existing channel due to the reduced in upstream peak flow. In view of the worst-case scenario showed that there are reduced in peak flow to downstream drainage system from the proposed development with its proposed drainage system, in other words, the proposed development will bring along with an enhancement to the existing downstream drainage system. Thus, the downstream proposed DSD and HAD drainage improvement works which is some distance away from the proposed development is considered no longer relevant to the hydraulic assessment of this Application due to the reduction in peak flow to the drainage system after the proposed development. Nevertheless, the change of size for proposed pipes at Kam Sheung Road from 1650mm to 1350mm as confirmed by DSD has been reassessed for the sensitivity model scenario with DSD and HAD planned improvement works. **Section 4.4** of the revised DIA (amended pages enclosed in **Annex V**) has been updated accordingly. The hydraulic model results show that predicted water levels of the northern channel at Control points 1 to 5 under the proposed condition are all reduced in 10 years, 1 in 50 years and 1 in 200

Items	Comments	Responses
		years flood events with the presence of DSD and HAD planned improvement works. No adverse impact from the proposed development is anticipated.
4.4	This is a coordinated reply from Land Drainage Division, Project Management Division and Mainland North Division of Drainage Services Department.	Noted.

Enclosure:
Annex I: Revised Traffic Impact Assessment
Annex II: Revised Sensitivity Study for the Noise Barrier
Annex III: Revised Noise Impact Assessment
Annex IV: Photomontage of the Proposed Drainage Works
Annex V: Replacement Page(s) of Drainage Impact Assessment

Complied by: KTA Planning Limited
Date: 1 August 2024
File Ref: 20240729_S3046_FI13_V01

Application for Amendment to the Approved Shek Kong Outline Zoning Plan (OZP) No. S/YL-SK/9
From "Residential (Group D)" to "Residential (Group C)"
At Various Lots in D.D. 112 and Adjoining Government Land, Kam Sheung Road, Shek Kong, Yuen Long, New Territories
S12A Amendment of Plan Application No. Y/YL-SK/1

Items	Comments	Responses
1	**Comments from Highways Department (Contact Person: Mr. Johnny C Y Tham; Tel: 3903 6817)**	
1.1	The proposed works lay within the limit of works area of the Project PWP Item No. 6820TH - Upgrading of Remaining Sections of Kam Tin Road and Lam Kam Road ("the 6820TH Project") and Project PWP Item No. 6892TH - Improvement to Kam Sheung Road ("the 6892TH Project"). Below is a comment from the perspective of both projects. I refer to item number 2.3 of your response-to-comment table. While we recognise your need to assume the completion year for the 6820TH Project and the 6892TH Project for your assessments, we would like to reiterate the design of the 6820TH Project and the 6892TH Project are still ongoing and are subject to change. In this connection, we normally would avoid to comment your own assumptions. However, we feel the obligation to note that your assumption on completion year of the 6820TH Project and the 6892TH Project is overly optimistic.	The traffic consultant has tried to obtain the completion years for those works, including obtaining from the public domain or consulting Highways Department. And we understand at this moment the programmes of those works are still under review. To cater for the uncertain completion year of the PWP works, both Scenarios (WITH and WITHOUT PWP works) have been considered in the TIA report. The assessment and proposed improvement works are presented under both scenarios of with and without the PWP works. In any case, the Applicant is committed to the submission of the TIA during the land exchange application stage and could update the assumptions in the TIA upon receiving the exact completion year from your office.
2	**Comments from Environmental Protection Department (Contact Person: Mr. Kelvin Wong; Tel: 2835 1117)**	
2.1	Please be advised that we have no objection to the planning application from environmental planning perspective. Nevertheless, noting that the proposed development may subject to detailed design at a later stage, we are of the view that relevant land lease conditions, which would require the grantee to (i) submit a Noise Impact Assessment (NIA) and implement mitigation measure(s), if any, identified therein; and (ii) submit a Sewerage Impact Assessment (SIA) and implement mitigation measure(s), if any, identified	Noted that your office has no objection to the planning application from the environmental planning perspective. The Applicant will comply with the relevant land lease conditions incorporated into the land title document for the proposed development to ensure its environmental performance.

Items	Comments	Responses
	therein; and (iii) submit a detailed Land Contamination Assessment and implement remedial action, if any, prior to the commencement of construction of the contaminated areas of the proposed development. shall be incorporated into the land title document for the proposed development to ensure its environmental performance.	
2.2	Meanwhile, we have some advisory comments on revised NIA that shall be addressed in the NIA to submitted at a later stage.	Noted with Thanks.
	Advisory Comments on Revised NIA	
2.3	S.3.2, S.8.1 and S.8.2 – Please critically review and clarify the necessity for the plane/helicopter noise. If not, please remove these sections from future NIA reports.	Noted. The Applicant will review the plane/helicopter noise section in the future NIA report at a later stage.
2.4	S.4.14 and Fixed noise calculation spreadsheet – Please critically review and refine the predicted night time fixed noise level and proposed mitigation measures, if necessary, in the future NIA submission.	Noted. The Applicant will review and refine the predicted nighttime fixed noise level and proposed mitigation measures in the further NIA report at a later stage.
2.5	We note that the proposed off-site road works may have potential interface issue with two projects, namely *Improvement to Kam Sheung Road* and *Upgrading of Remaining Sections of Kam Tin Road and Lam Kam Road*, with project proponent being Highways Department (HyD). The latter project under HyD is governed by an Environmental Permit (EP) No. EP-576/2020 with Permit Holder of the EP being HyD. Therefore, the applicant may wish to liaise with HyD on the potential implications arising from the proposed road works under the captioned planning application and to resolve the potential interface issue(s) with relevant government department(s) with a view to complying the requirements in the EP, in particular the requirements related to the noise barriers. Meanwhile, we have no particular comment on the proposed off-site road works under the	Noted that your office has no particular comment on the proposed off-site road works under the planning application from environmental planning perspective. Meanwhile, the Applicant will continue to closely liaise with Highways Department on the potential interface issue with two projects, namely *Improvement to Kam Sheung Road* and *Upgrading of Remaining Sections of Kam Tin Road and Lam Kam Road*.

Items	Comments	Responses
	planning application from environmental planning perspective provided that the relevant statutory procedures and requirements set out in relevant environmental legislation, in particular the Environmental Impact Assessment Ordinance and its associated Technical Memorandum on Environmental Impact Assessment Process are met.	
2.6	Apart from the above, I would like to draw your attention that based on the information provided, a box culvert is proposed and it is noted that the proposed box culvert is located less than 300 meters from the boundary of a declared monument (Chik Kwai Study Hall) and a Conservation Area. As such, the proposed development may constitute a Designated Project (DP) under EIAO by virtue of Item I.1 in Schedule 2, Part 1 of the EIAO. An Environmental Permit (EP) may be required for the construction and operation of the proposed development. Nevertheless, understanding that the proposed development may subject to detailed design at a later stage, the applicant is asked to liaise with us to confirm the EIAO implications of the proposed development.	Noted. The Applicant will review the detailed design of the Proposed Development at a later stage. Meanwhile, the Applicant will closely liaise with your office to confirm the EIAO implications of the proposed development if necessary.
2.7	Lastly, the applicant is asked to note our advisory comments on the planning application. The applicant is advised to: (i) follow good engineering practice set out in "Recommended Pollution Control Clauses for Construction Contracts"; (ii) follow the relevant guidelines and requirements in Relevant Professional Persons Environmental Consultative Committee Practice Notes (ProPECCPNs); (iii) minimize the generation of construction and demolition (C&D) materials; reuse and recycle the C&D materials on-site as far as possible; (iv) obtain a valid license under the Cap. 358 Water Pollution Control Ordinance for discharge of treated sewage for the proposed on-site sewage treatment	The Applicant noted your advisory comments on the planning application.

Items	Comments	Responses
	plant if an on-site sewage treatment plant will be pursued for the proposed development; and (v) it is the obligation of the applicant to meet the statutory requirements under relevant environmental legislation.	
3	**Comments from Drainage Services Department (Contact Person: Mr. Kenneth CHAN; Tel: 2300 1259)**	
3.1	Please note that I have no further comment on the drainage proposal.	Noted that your office has no further comments on the drainage proposal of this planning application.
3.2	Please carry out the maintenance responsibility for the proposed channels and box culverts and access to the proposed channel as stated in the applicant's response to comment item 1.2 (Further Information No.12) submitted on 4 June 2024 with letter ref. S3046/DD112_LFT_YL/22/025Lg.	Noted. The Applicant will carry out the maintenance responsibility for the proposed channels and box culverts and access to the proposed channel.
4	**Comments from Transport Department (Contact Person: Mr. Phil CAI; Tel: 2399 2421)**	
4.1	Table 7.1 and 7.2 - it is shown that the width of existing footpath is 1.5m and the effective width is 1.0m. This is not tallied with the existing conditions that narrower footpath was observed on site. The applicant shall consider to provide standard width of footpath from the site to adjacent public transport.	Noted. **Table 7.1** and **7.2** is revised. The width of existing footpath is revised to 1.0m and the effective width is 0.5m. The LOSs still have A to B even without widening. It is noted that PWP Item No.6892TH - Improvement to Kam Sheung Road will also include widening of the footpath along Kam Sheung Road as shown in **Figure 7.1** of the TIA report. As the programmes of PWP works are still under review, the PWP works may be delayed. In case delay occurs, the Applicant will carry out our proposed improvement works in advance to PWP works. The layout generally follows the preliminary layout of PWP works and could match with PWP improvement layout. The improvement layout prior to the PWP works is shown in **Figure 7.2**. Details arrangement would be discussed with government departments at detailed design stage.

Items	Comments	Responses
4.2	Figure 5.1 - The proposed bus layby in between two traffic lanes will lead to potential road safety hazard because (1) there is no pedestrian crossing facilities.(2) it will cause confusion to road users on choice of traffic lane. Please review whether it is feasible to provide bus layby next to the proposed parking space.	As the standard bus stop requires 15-20m tappers plus 13/14m bus bay length, it is difficult to provide just next to the parking space as there is not sufficient length at the junction. Therefore, the proposed improvement layout is revised as shown in **Figures 5.1** and **5.2** of the TIA report. Similar to the existing car parking space, run-in/out is proposed such that continuous footpath could be provided without crossing. The alignment is revised to avoid confusion to road users on choice of traffic lane.
4.3	TD notes that EPD's comment on the noise barrier by PWP 6820TH. As requested in EPD's email, the applicant shall liaise with HyD to solve the interface issue meanwhile fulfilling EP conditions under the PWP.	Noted. HyD's comment would be sought.
5	**Comments from Highways Department (Contact Person: Mr. Stanley CHOI; Tel: 2762 4905)**	
5.1	It is noticed that the Applicant's FI are submitted mainly in response to comments of other departments, and are related to the revised Traffic Impact Assessment (TIA), revised Sensitivity Study for the Noise Barrier, revised Noise Impact Assessment (NIA), Photomontage of the proposed Drainage Works and revised Drainage Impact Assessment. Presumably, the relevant departments will provide comments to you.	Noted.
5.2	The Applicant should be attentive that some of our previous comments remain valid, and we reserve further comments on any further information to be submitted or when more relevant details are available at later stage of the Application.	Noted.
5.3	Any proposed road improvements in the TIA or proposed noise barriers as a result of the NIA are considered necessary by the relevant departments due to the subject development, they shall be implemented by the Applicant at Applicant's own costs.	Noted.

Items	Comments	Responses
5.4	To avoid repeated comments, the Applicant should advise and highlight in the future submission for our review and further comments if there be any latest findings / recommendations / revisions in the FI that may affect our inventories including slope features or require HyD's particular input.	Noted.

Enclosure:
Annex I: Revised Traffic Impact Assessment

Complied by: KTA Planning Limited
Date: 10 October 2024
File Ref: 20241010_S3046_FI14_V01

Application for Amendment to the Approved Shek Kong Outline Zoning Plan (OZP) No. S/YL-SK/9
From “Residential (Group D)” to “Residential (Group C)”
At Various Lots in D.D. 112 and Adjoining Government Land, Kam Sheung Road, Shek Kong, Yuen Long, New Territories
S12A Amendment of Plan Application No. Y/YL-SK/1

Items	Comments	Responses
1	**Comments from Transport Department (Contact Person: Mr. Phil CAI; Tel: 2399 2421)**	
1.1	Figure 5.1 - the relocated car park may affect the operation of bus operation. Please review.	Noted. The car park is further relocated to avoid affecting the operation of the bus. **Figures 5.1** and **5.2** have been updated in the revised TIA report (**Annex 1** refers).
1.2	Tables 5.2 and 5.4 - the v/c of road link L5 exceeds 1.0 without PWP 6820TH. The applicant shall advise whether any improvement work will be carried out.	Road link L5 (Kam Tin Road) is part of Junction C (Kam Sheung Road / Kam Tin Road) where the proposed junction improvement works will be carried out. Since the Applicant agrees to carry out junction improvement works (as shown in **Figure 5.2**) even if the programme of PWP 6820TH is delayed, the future V/C will be lower than 1.0.

Enclosure:
Annex 1: Revised Traffic Impact Assessment

Complied by: KTA Planning Limited
Date: 24 December 2024
File Ref: 20241224_S3046_FI15_V01

Application for Amendment to the Approved Shek Kong Outline Zoning Plan (OZP) No. S/YL-SK/9
From "Residential (Group D)" to "Residential (Group C)"
At Various Lots in D.D. 112 and Adjoining Government Land, Kam Sheung Road, Shek Kong, Yuen Long, New Territories
S12A Amendment of Plan Application No. Y/YL-SK/1

Items	Comments	Responses
1	**Comments from Antiquities and Monuments Office of Development Bureau (Contact Person: Mr. Michael Leung; Tel: 2655 0832)**	
	Built Heritage	
1.1	There is no graded historic building or declared monument located within the application site. However, **Lai Mansion** (a **Grade 2** historic building at No. 485 Lai Uk Tsuen) and **Chik Kwai Study Hall** (a **declared monument** in Lai Uk Tsuen) are located at about 65 metres and 90 metres respectively from the application site. Their photos, locations and relevant information can be assessed on the· websites of the Antiquities Advisory Board (https://www.aab.gov.hk/en/historic-buildings/search-for-information-on-individual-buildings/index.html) and AMO (https://www.amo.gov.hk/en/historic-buildings/monuments/newterritories/monuments_82/index.html). The Applicant should ensure that the proposed development would not cause any physical disturbance to Lai Mansion and Chik Kwai Study Hall.	Noted. The Applicant will ensure that the Proposed Development will not cause any physical disturbance to Lai Mansion and Chik Kwai Study Hall.
1.2	The proposed development is relatively large in scale compared to the adjacent village where the Lai Mansion and Chik Kwai Study Hall are located. The Applicant should minimise the visual impact on the said graded building and declared monument.	Please note that a visual impact assessment has been conducted and concluded that the resultant visual change due to the proposed development is considered acceptable to the identified visual sensitive receivers and not visually incompatible with the surrounding context. Urban Design Section of Planning Department has no comments on the visual impact assessment. Besides, the visual impact assessment has evaluated the visual impact on the Chik Kwai Study Hall. A viewpoint standing at the entrance of the Chik Kwai Study Hall has been identified in the visual impact assessment and it is noted that there is only a small top edge of a few building blocks of the Proposed Development seen behind Lai Mansion. The nearest block, T8, which is 6-storey high, is seen to be compatible with the adjoining village houses. It is concluded that the visual impact due to the proposed development will be negligible to slightly adverse.

Items	Comments	Responses
1.3	Following our comment in para. 3, we kindly request the Applicant to clarify. or revise the Visual Impact Assessment ("VIA") report as below:-:	Noted.
1.4	i) Re. VIA report section 4.1.1 - It is noted from the gist of application that the proposed development includes 19 residential blocks, each limited to 6 storeys and a maximum height of 44.15 mPD. Please provide the specific height of each residential block to facilitate our assessment of the visual impact on the historic building and declared monument.	Please note that all residential blocks would have 6 storeys and a maximum height of 44.15mPD.
1.5	ii) Re. IA report section 4.1.3 VP3 - Front Entrance of Chik Kwai Study Hall- The proposed building blocks / towers would obstruct the sky view from Chik Kwai Study Hall and result in other adverse visual impact. Our observations are marked on the VIA report "Figure 4.1 - Design and Disposition of Building Blocks" enclosed at Annex A for the Applicant's consideration and clarification.	Please note that the development scheme is indicative only. Your comments are well noted and will be taken into careful consideration at the detailed design stage. Suitable greenery and façade treatment on the side facing Chik Kwai Study Hall and Lai Mansion will be considered as appropriate.
1.6	iii) Re. VIA Section 4.1.1 and Table 4.1 - The Applicant should clarify if "residential blocks" and "residential towers" referred to the same structures.	Please note that residential blocks and residential towers referred to the same structures.
1.7	Re. VIA Section 6.4.1 - "Graded II listed Building" should be revised to "Graded 2 historic building".	Noted. The wording “Grade 2 historic building” has been revised accordingly in Section 6.4.1 of VIA (**Annex 1** refers).
	Archaeology	
1.8	It is noted that a small part of the application site touches the boundary of the Lin Fa Tei Site of Archaeological Interest. After reviewing the location and scope of the proposed development as well as the findings of previous archaeological work in the surrounding area, the Applicant is required to inform AMO (Ringo NG, tel: 2655 0822 and email: klng@amo.gov.qk) immediately when any antiquities or supposed antiquities under the Antiquities and Monuments Ordinance (Cap. 53) are discovered in the course of works.	Noted. The Applicant will inform your office should the Applicant discover any antiquities or supposed antiquities under the Ordinance.

Items	Comments	Responses
1.9	Please keep AMO posted on the application site's latest proposed development and its relevant studies for AMO's comments from the heritage conservation perspective. AMO stands ready to provide comments on the building plans submission at post-planning stage if the subject application is approved by Town Planning Board.	Noted. The Applicant will liaise with your office once the application is approved by the Town Planning Board.

Enclosure:
Annex 1: Replacement Page of Visual Impact Assessment

Complied by: KTA Planning Limited
Date: 28 January 2025
File Ref: 20250123_S3046_FI16_V01

KTA
PLANNING LIMITED
規劃顧問有限公司

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By Hand

Our Ref: S3046/DD112_LFT_YL/22/033Lg

6 March 2025

Secretary, Town Planning Board
15/F, North Point Government Offices
333 Java Road
North Point
Hong Kong

Dear Sir/ Madam,

Proposed Rezoning from "Residential (Group D)" to "Residential (Group C)" zone for Proposed Residential Development at Various Lots and Adjoining Government Land in D.D. 112, Kam Sheung Road, Shek Kong, Yuen Long, New Territories

- Section 12A Amendment of Plan Application No. Y/YL-SK/1 -

(Further Information No.16)

We refer to the recent queries from the Fanling, Sheung Shui & Yuen Long East District Planning Office of Planning Department on the captioned S12A Amendment of Plan Application, which was submitted to the Town Planning Board ("TPB") on 28 April 2022.

Please find below the Applicant's supplementary responses:

Pedestrian Access to the Unacquired Private Lots No. 854 S.A., 854 S.B., 855 and 860 in D.D. 112 within Site

The Applicant has revised the master layout plan to ensure the provision of an internal footpath that facilitates access to landlocked sites within the development. In case of emergency situations, the Applicant will discretionally permit/allow emergency vehicles to the landlocked sites. Kindly refer to **Annex A** for the revised MLP and a diagram illustrating how the landowners of the landlocked sites will be able to access their lots.

Improvement Proposals for Footpath, Crossing and Junction

The Applicant will implement the pedestrian improvement works for the footpath and crossing abutting the Application Site along Kam Sheung Road as illustrated in Figure 7.2 of Traffic Impact Assessment (TIA) attached with Further Information (FI) No.15. Upon completion, the footpath and crossing facilities will be handed over to the relevant government department(s) for maintenance and management.

Regarding the improvement works at Junction C (Kam Sheung Road/ Kam Tin Road), the Applicant will implement the junction improvement works either before or after the Highway Department's (HyD) public work projects (PWPs) on *"Upgrading of Remaining Section of Kam Tin Road and Lam Kam Road"* and *"Improvement to Kam Sheung Road"* or after the abovesaid PWPs.

Upon completion, the improved junction facilities will also be handed over to the relevant government department(s) for maintenance and management. The Applicant will closely liaise and coordinate with the respective government department(s) regarding the detailed design and implementation of the junction improvements upon approval of the rezoning application.

Please also refer to **Annex B** for the updated legends for Figures 7.1 and 7.2 of the TIA.

Self-sustained Drainage System

As detailed in the Drainage Impact Assessment (DIA) submitted under FI No. 13, the proposed drainage system for the development will have sufficient capacity even in the absence of drainage improvement works by the Drainage Service Department (DSD) and Home Affairs Department (HAD). Two scenarios were conducted in the DIA, including scenario 1- proposed development without DSD and HAD drainage improvement works and scenario 2- proposed development with DSD and HAD drainage improvement works. Both scenarios have demonstrated that there will be no adverse drainage impacts to the nearby drainage system arising from the proposed development with the proposed drainage system. Please refer to Table 4.3 of DIA for scenario 1 and Table 4.4 of DIA for scenario 2 for the assessment results.

Potential Acquisition of the Residual Lands

The Applicant has made substantial efforts to acquire and consolidate land for this rezoning application since 1998. At this stage, a considerable size/portion of land (with 41,290 sqm) has been assembled to facilitate development.

Upon approval of this rezoning application, the Applicant will continue to explore opportunities for acquiring additional land, particularly within the "Residential (Group D)" zone, where feasible. A further rezoning application will be submitted once the remaining lots have been successfully consolidated.

Building Height of Carpark Buildings and Clubhouse Buildings

The Applicant would like to clarify that the building height of the two car parking buildings will be 37.5mPD, and the building height of the two clubhouses will be 30.6mPD.

Enclosed please also find the responses to departmental comments on Antiquities and Monument Office of Development Bureau on 20 January 2025 and the replacement page of Visual Impact Assessment (**Annex C** refers).

Thank you for your kind attention.

Yours faithfully
For and on behalf of
KTA PLANNING LIMITED

Pauline Lam

cc. the Applicant & Team

PL/CL/EC/vy

Application for Amendment to the Approved Shek Kong Outline Zoning Plan (OZP) No. S/YL-SK/9
From "Residential (Group D)" to "Residential (Group C)"
At Various Lots in D.D. 112 and Adjoining Government Land, Kam Sheung Road, Shek Kong, Yuen Long, New Territories
S12A Amendment of Plan Application No. Y/YL-SK/1

Items	Comments	Responses
1	**Comments from Antiquities and Monuments Office of Development Bureau (Contact Person: Mr. Michael Leung; Tel: 2655 0832)**	
	Built Heritage	
1.1	There is no graded historic building or declared monument located within the application site. However, **Lai Mansion** (a **Grade 2** historic building at No. 485 Lai Uk Tsuen) and **Chik Kwai Study Hall** (a **declared monument** in Lai Uk Tsuen) are located at about 65 metres and 90 metres respectively from the application site. Their photos, locations and relevant information can be assessed on the· websites of the Antiquities Advisory Board (https://www.aab.gov.hk/en/historic-buildings/search-for-information-on-individual-buildings/index.html) and AMO (https://www.amo.gov.hk/en/historic-buildings/monuments/newterritories/monuments_82/index.html). The Applicant should ensure that the proposed development would not cause any physical disturbance to Lai Mansion and Chik Kwai Study Hall.	Noted. The Applicant will ensure that the Proposed Development will not cause any physical disturbance to Lai Mansion and Chik Kwai Study Hall.
1.2	The proposed development is relatively large in scale compared to the adjacent village where the Lai Mansion and Chik Kwai Study Hall are located. The Applicant should minimise the visual impact on the said graded building and declared monument.	Please note that a visual impact assessment has been conducted and concluded that the resultant visual change due to the proposed development is considered acceptable to the identified visual sensitive receivers and not visually incompatible with the surrounding context. Urban Design Section of Planning Department has no comments on the visual impact assessment. Besides, the visual impact assessment has evaluated the visual impact on the Chik Kwai Study Hall. A viewpoint standing at the entrance of the Chik Kwai Study Hall has been identified in the visual impact assessment and it is noted that there is only a small top edge of a few building blocks of the Proposed Development seen behind Lai Mansion. The nearest block, T8, which is 6-storey high, is seen to be compatible with the adjoining village houses. It is concluded that the visual impact due to the proposed development will be negligible to slightly adverse.

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