

寄件者: Camille Lam [REDACTED]
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收件者: tpbpd/PLAND
副本: Pauline Lam; Andrea Wing Yin YAN/PLAND
主旨: S12A Application No. Y/YL-KTN/6: Submission of Further Information No. 2
附件: S3045a_KTR_25_005Lg FI2.pdf

類別: Internet Email

Dear TPB Secretariat,

We refer to the captioned S12A Amendment of Plan Application.

In response to the departmental comments received, attached please find the cover letter of Further Information (FI) No. 2 for submission to the TPB and the full set of FI No. 2 uploaded to the path: [FI 2 \(formal submission\) 20260213](#)

Should you have queries related to the above, please don't hesitate to contact the undersigned. Thanks.

Rgds,

Camille Lam

Principal Town Planner

KTA Planning Limited
[REDACTED]

By Email

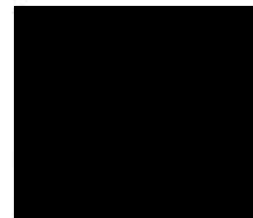
Our Ref: S3045a/KTR/25/005Lg

13 February 2026

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



PLANNING LIMITED
規劃顧問有限公司



Dear Sir / Madam,

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

and

**Rezoning from "Residential (Group C) 2" to "Open Space" zone
at Lot Nos. 121, 137, 138, 139 S.A and 139 RP (part) in D.D. 110
and adjoining Government land, Shek Kong, Yuen Long, N.T.**

(S12A Amendment of Plan Application No. Y/YL-KTN/6)

- Further Information No. 2 -

We refer to the captioned S12A Application received by the Town Planning Board ("TPB") on 11 November 2025 and the departmental comments received via the Fanling, Sheung Shui and Yuen Long East District Planning Office between 8 and 15 January 2026.

In response to the departmental comments received, we hereby submit a response-to-comment table with the relevant annexes:

Annex A – Revised Traffic Impact Assessment

Annex B – Email Confirmation from Planning Department on using 2021 TPEDM in the TIA

Annex C – Revised Drainage Impact Assessment

Annex D – Revised Air Quality Impact Assessment

Annex E – Replacement Page of Noise Impact Assessment

Should you have any queries in relation to the above or attached, please do not hesitate to contact the undersigned at [REDACTED]

Thank you for your kind attention.



Our Ref: S3045a/KTR/25/005Lg
Date: 13 February 2026



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Yours faithfully
For and on behalf of
KTA PLANNING LIMITED

A handwritten signature in black ink, appearing to be 'Camille LAM', with a large, stylized 'C' and 'L'.

Camille LAM

Encl.

cc. the Applicant & Team

PL/CL/vy

Proposed Rezoning of the Application Site from (i) “Residential (Group C) 2” and “Open Space “ Zones to “Residential (Group C) 4” Zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and adjoining Government land and (ii) from “Residential (Group C) 2” to “Open Space” Zones at Lot Nos. 121, 137, 138, 139 S.A and 139 RP (part) in D.D. 110 and adjoining Government land at Shek Kong, Yuen Long, N.T. (S12A Amendment of Plan Application No. Y/YL-KTN/6)

Comments Forwarded from Fanling, Sheung Shui and Yuen Long East District Planning Office (FSS&YLE DPO)

Comments	Responses
Comments from Transport Department (received on 8 January 2026) Contact person: Mr. Phil CAI; Tel. No.: 2399 2421	
Table 3.4 - it is noted that the traffic survey was conducted in Feb 2025, i.e. before Tai Lam Tunnel being taken over by the government and adjustment of toll. Using of the data in Table 3.3 to factor up the flow is not appropriate to considering the seasonal fluctuation and school holiday period.	Noted. A new survey was carried out on 19 December 2025 to obtain the latest survey results and updated in the revised Traffic Impact Assessment (TIA) in Annex A of this Further Information (FI) submission.
Table 3.4 - the pcu factor adopted shall be supported with data.	The pcu factor is found by Total Survey pcu / veh. Supporting data was added in Table 3.4 of the TIA report.
Table 4.1 - the report selected 6 ATC stations and five of which are with growth rate between 1% to 5%. The reason for taking average of these stations and concluded the growth rate of -2.03% shall be provided, especially Tai Lam Tunnel is affected by toll adjustment.	The reason to take the average growth rate of these ATC stations is to obtain an overall picture of this area rather than a particular road. To eliminate the effect of Tai Lam Tunnel toll, its ATC data was excluded from the assessment of growth rate. As 2024 ATC data was released, Table 4.1 of the TIA report was updated. The growth rates are ranged between -2.49% to 5.03% and an average of 1.60% is obtained, which is still below the adopted 2.18% found from TPDEM data.
Table 4.2 - confirmation from PlanD of using 2021 TPEDM shall be provided.	FSS&YLE DPO confirmed that they had no particular comments on using 2021 TPEDM in the Traffic Impact Assessment. Please refer to the attached email in Annex B of this FI.
Table 5.1 - The assessment for Junction C appears to be largely different with the previous submission under Y/YL-KTN/4. The applicant shall critically review all calculation.	As mentioned in the last response-to-comment, the calculations have been reviewed and the latest results are correct.

Comments	Responses
Table 5.2 and 5.4 - I note that L4 and L5 will be overloaded in design year 2034. Development traffic will further increase traffic on the overloaded road sections. The statements in other parts of the texts regarding the traffic impact to the existing network shall be carefully and critically reviewed.	As shown in Table 5.2 and 5.4 of the TIA report, there are only 0.00 to 0.01 changes in DFC, which are insignificant. The Proposed Development will only generate small amount of traffic, which will only induce insufficient impact to the road link. Besides, to minimize the traffic impact, the no. of units of the Proposed Development has been reduced from 916 in the previous planning application (S12A Application No. Y/YL-KTN/4) to only 240 in this application. Moreover, with reference to the TIA of "Sites 1, 4a and 6 for Public Housing Development and Government, Institution or Community Facilities" (see extracted pages in Appendix III of the revised TIA), Kam Tin Road will be overloaded even with the planned PWP works. There was no improvement scheme proposed for Kam Tin Road in that TIA. The development scale and traffic impact of the current Application No. Y/YL-KTN/6 are substantially smaller than those, which only have insignificant impact to Kam Tin Road and therefore should be acceptable.
Figure 2.1 - The swept path analyses showed that vehicles may experience difficulties in entering and exiting the development. The applicant should demonstrate how to provide sufficient space and ensure unobstructed manoeuvre of vehicles. The distance between the development run-in/out and the nearest junction shall be indicated.	Since the trip generation of the Proposed Development is low and there are only 6 HGV L/UL bays, the chance of large vehicles ingress/egress is not high. Moreover, in the previous TIA, to reduce the cross traffic conflict, it was already proposed to ban vehicles longer than 7m from turning left from the proposed development. This proposal was included in the TIA under the previous planning application (S12A Application No. Y/YL-KTN/4) without receiving adverse comments from TD.
Figure 5.1 - Please elaborate whether the proposed work will be in conflict with the public works project. The party being responsible for the works shall be indicated.	The proposed work is with reference to the planned PWP works but only involves local widening on Junction C. It will not be in conflict with PWP

Comments	Responses
	works. Further elaboration on the proposed works is added under Table 5.11 of the TIA. Junction C could operate with ample capacity after the PWP works of Kam Tin Road. However, as the programme of PWP works are still under review, the PWP works may be delayed. In case delay occurs, the Applicant will carry out the proposed improvement works in advance to PWP works before the implementation of the Proposed Development.
Comments from Drainage Services Department (received on 12 January 2026) Contact person: Ms. Jessica KWAN; Tel. No.: 3965 8924	
<u>Drainage Impact Assessment (DIA)</u>	
<u>(A) Specific Comments</u>	
1 The applicant should clarify if any works are proposed to be carried out at Site 2.	Please be clarified that there are no works proposed to be carried out at Site 2.
2 Appendix B2: The applicant should clarify discharge path at the downstream of the proposed 300 mm (W) and 600 mm (W) surface channels.	The flow directions of the proposed 300mm(W) and 600mm (W) surface channels are indicated in Appendix B2. Besides, Section 4.1.2 is revised to clarify the discharge path of the proposed channels. Please refer to the revised Drainage Impact Assessment report in Annex C of this FI submission.
3 The applicant should clarify gradient and invert levels of all proposed drainage facilities. Invert levels of the drainage facilities at the upstream shall be higher than that at the downstream.	Invert levels and gradients of all the proposed pipes and proposed channels are shown in Appendix B2. All the drainage facilities have higher invert levels at the upstream as compared to that at the downstream.
4 A sand trap/desilting type catchpit should be provided prior to connection to the proposed stormwater terminal manhole or to the downstream public stormwater drainage system. The sand trap/desilting type catchpit should be regularly desilted by the applicant to prevent sand, silt, cementitious materials or other objects from being washed down into the existing stormwater drainage system.	Sand trap/desilting type catchpits has been provided prior to the connection to the proposed stormwater terminal manhole as shown in enlarged plan in Appendix B2. Regular desilting will be carried out by the owner/ management office of the Proposed Development.

Comments	Responses
5 The proposed terminal manhole should be located within the application site as near to the site boundary as possible.	A terminal manhole (i.e. Model ID: TDM) has been added into the hydraulic model in Appendix H . The proposed terminal manhole has been located within the application site and as near to the site boundary as possible and its location and invert levels are included in the revised Appendix B2 .
6 The DTL of the proposed stormwater terminal manhole should be indicated on the drawing complying with the current Government standard and a 150mm difference between I.L. and D.T.I.L. should be maintained.	The proposed terminal manhole has a 150mm difference between I.L. and D.T.I.L. The information has been provided in Appendix B2 .
7 The terminal manhole should be of Type T1, T2, T3, T4 or T10 as appropriate and in accordance with current DSD standard drawings.	Noted. Appropriate type of terminal manhole in accordance with latest DSD standard drawings will be adopted in the later detailed design stage.
8 The applicant should submit the updated hydraulic models if there are differences from the pre-submission models.	Hydraulic model is updated for addressing DSD's comments dated 12 Jan 2026. Updated hydraulic model is enclosed in Appendix H .
9 The applicant should clarify management and maintenance responsibilities of the proposed drainage facilities. The applicant should be responsible for the maintenance of such discharge system.	The proposed drainage system shown in Appendix B2 , including the proposed stormwater storage tank, proposed pipes and manholes, peripheral channels and associated catchpits, will be maintained and managed by the owner/ management office of the Proposed Development. Section 4.1.3 is added to clarify management and maintenance responsibilities of the proposed drainage facilities.
10 The applicant should clarify connection details of the proposed and existing drainage facilities and utilization rate of the proposed drains in the detailed design stage	Noted. The connection details of the proposed and existing drainage facilities and utilization rate of the proposed drains will be clarified in the detailed design stage.
11 Catchpit should be provided at where a proposed surface channel changes direction / gradient.	Catchpits will be provided where a proposed surface channel changes direction / gradient. The proposed catchpits, as well as catchpits with sand trap for the proposed drainage system are also included in the enlarged plan in Appendix B2 .
(B) General Comments	
1 The applicant shall be required to place all the proposed works 3m away from the top of the bank of the existing watercourses. All the proposed works in the vicinity of the watercourses should	Noted. Apart from the proposed drainage outlet and the associated pipe, all the proposed works are at least 3m away from the top of the bank of

Comments	Responses
not create any adverse drainage impacts, both during and after construction. Adequate measures should be provided at the resources of the applicant to our satisfaction in order to avoid the subject site from being eroded and flooded and to ensure capacity of watercourses and flooding susceptibility of the adjoining areas would not be adversely affected by the proposed development.	existing watercourse. Adequate measures will be provided to maintain the watercourse during and after construction.
2 The applicant should be reminded to minimize the possible adverse environmental impacts on the existing watercourses in his design and during construction. DEP and DAFC should be consulted on possible environmental and/or ecological impacts of the proposed development.	Noted.
3 The standard sand trap in accordance with current DSD Standard Drawing no. DS1025 is designed for one incoming drain/u-channel with size of 900mm diameter or below. For the construction details of the proposed drainage facilities, reference should be made to the latest CEDD's standard drawings.	Noted. Relevant standard drawings will be referenced during the detailed design stage.
4 Precast concrete pipe should generally be used for stormwater connection. Reference should also be made to Stormwater Drainage Manual published by DSD.	Noted.
5 The applicant is required to ensure that no construction debris, silt and sediments, or cementitious materials will be discharged to or deposited inside the public drains from the site. Any blockage or damage of public drains arising from the construction works shall be made good at the cost of the applicant and to our satisfaction.	Noted. Adequate measures will be provided to ensure that no construction debris, silt and sediments, or cementitious materials will be discharged to or deposited inside the public drains from the site.
6 The applicant is required to liaise with relevant utility undertakers to obtain the latest records, plans and alignments of their utilities in order to ensure the feasibility of the proposed drainage works. The applicant is also required to excavate inspection	Noted. Liaison will be conducted with relevant utility undertakers during the detailed design stage.

Comments	Responses
pits and conduct utility detection to verify the alignments of utilities shown in such utility records if considered necessary.	
7 It is the applicant's responsibility to identify/locate the existing government sewers and stormwater drains to which drainage connections from his site are to be proposed. The applicant should verify the existence of any drains/sewers/utilities and also their exact locations, levels and alignments on site in order to ascertain the positions and levels of the proposed manholes and the associated connection works. The applicant should also verify that the existing government drains/sewer, to which connections are proposed, are in normal working conditions and capable of taking the discharge from the site. Besides, for any excavation works over or in close vicinity to existing government drains/sewers, the applicant should notify DSD in writing at least 14 working days before backfilling the excavation works and arrange joint site inspection with DSD prior to covering up.	Noted.
8 The applicant is also reminded that any person willfully, except with the permission in writing of the Authority, or negligently damages, alters, disconnects or otherwise interferes with any public sewer or drain or any connection therewith, shall be guilty of an offence under Section 6 of Public Health and Municipal Services Ordinance (Cap 132).	Noted.
9 Should any undue settlement or damage of the existing public drainage installations be detected, the piling/foundation/excavation works should be stopped immediately by the applicant who shall report the matter to PlanD and this Department as soon as possible. In the event of any damage caused to the existing public drainage installations by the above works, the applicant should be responsible for making good the damage at his own cost and to our satisfaction.	Noted.

Comments	Responses
10 Appropriate sedimentation tanks for proper treatment of site discharge should be provided, properly maintained and operated.	Noted.
11 The applicant should provide adequate drainage facilities to collect, convey and discharge surface runoff accrued on the subject site and the overland flow intercepted from the adjacent lands. Also, the applicant should ensure that the existing facilities to be discharged to have sufficient capacity to cater for any additional flow generated due to the proposed development.	Noted. Please be informed that adequate drainage facilities including internal drainage, stormwater storage tank and peripheral channels to collect, convey and discharge surface runoff accrued on the subject site and the overland flow intercepted from the adjacent lands are provided to avoid drainage impact to the existing drainage system. The hydraulic assessment results also indicated that the proposed drainage facilities are adequate to avoid drainage impact to existing drainage system.
12 The proposed development should neither obstruct overland flow nor adversely affect any existing natural streams, village drains, ditches and the adjacent areas, etc.	Noted. The proposed development has been designed to avoid adverse impact to any existing natural streams, village drains, ditches and the adjacent areas. Peripheral channels are provided along the boundaries of the proposed development, as spare drains for conveying runoff, if any, from the adjacent areas to the existing watercourse for discharge although it is not expected as the areas are currently served by their own drains or overland flow directly to existing watercourses.
13 The applicant is reminded that the design, operation and maintenance of the proposed Floodwater Storage Tank should comply with the requirements in the Stormwater Drainage Manual.	Noted. The requirements in the Stormwater Drainage Manual for Floodwater Storage Tank will be considered in later stages.
14 The applicant is required to rectify/modify the drainage system if it is found to be inadequate or ineffective during operation. The applicant shall also be liable for and shall indemnify Government against claims and demands arising out of damage or nuisance caused by failure of the system.	Noted.
15 The applicant should take all precautionary measures to prevent any disturbance, damage and pollution from the development to any parts of the existing drainage facilities in the vicinity of the lot. In the event of any damage to the existing drainage facilities, the applicant would be held responsible for the cost of all	Noted.

Comments	Responses
necessary repair works, compensation and any other consequences arising therefrom.	
16 The applicant should consult DLO/YL and seek consent from the relevant owners for any drainage works to be carried out outside his lot boundary before commencement of the drainage works.	Noted. Please be informed that all the proposed drainage works are in the Applicant-owned land lots or in government land. For works falling in government land, the applicant will consult DLO/YL for any works to be carried out outside his lot boundary before commencement of the drainage works.
17 For the construction details of the proposed drainage facilities, reference should be made to the latest CEDD's standard drawings.	Noted. The construction details of the proposed drainage facilities will be developed in detail design stage and reference will be made to the relevant standard drawings including latest CEDD's standard drawings if applicable.
18 Consideration should be given to provide grating for the surface channels.	Grating cover will be provided for the surface channels in detail design stage. The proposed 300mm(W) and 600mm(W) channels with grating cover also stated in Appendix B2 .
19 The proposed works should be carried out by the applicant at the cost of his project to our satisfaction.	Noted.
<u>Sewage Impact Assessment (SIA)</u>	
<u>(A) Specific Comments</u>	
1 The applicant should clarify if any works are proposed to be carried out at Site 2.	Please be clarified that there are no works proposed to be carried out at Site 2.
<u>(B) General Comments</u>	
1 There is no public sewer connection available in the vicinity of the proposed development. Views and comments from EPD should be sought regarding the sewage disposal arrangement of the proposed development.	Noted. The SIA has been circulated to EPD for their comments.
2 The applicant's attention is drawn to EPD's ProPECC PN 1/23 on discharge from the proposed swimming pool. Swimming pool main drain, footbath main drain and swimming pool make-up tank drain should be connected to storm water drains (except in the Water Gathering Grounds where the applicant is advised to	Noted. The sewage generated from backwashing of filters from the proposed swimming pool would be collected and discharged to the internal sewerage network and treated by the on-site STP.

Comments	Responses
consult WSD) while the filtration plant backwash should be discharged to foul sewers.	
3 The SIA needs to meet full satisfaction of Sewerage Infrastructure Group (SIG) of Environmental Protection Department (EPD), the planning authority of sewerage infrastructure. The comments of this department on the sewerage aspect are subject to the views and agreement of EPD.	Noted. The SIA has been circulated to EPD for their comments.
Comments from Environmental Protection Department (received on 15 January 2026) Contact person: Mr. Kelvin WONG; Tel. No.: 2835 1117	
Air Quality Impact Assessment 1. Please review if the 5-year mean for annual conc. of NO ₂ and RSP in terms of percentage of respective objectives should be 90% instead and update as appropriate.	Table 5.1 has been revised. Please refer to the revised Air Quality Impact Assessment report in Annex D of this FI.
2. S.7.2 i. Please revise the second sentence to read “Nevertheless, buffer distance of 5m has been adopted for the rural road.” and delete the third sentence. Accordingly, please revise the remarks for Table 7.1, figure 3, and the relevant part in the planning statement.	Section 7.2, the remarks for Table 7.1 and Figure 3 have been revised.
ii. Please check if Avenue De Versailles is a private road. If affirmative, please remove mentions of the road from the report. Otherwise, please provide TD’s endorsement to support the road type of the road.	With reference to the lease of Seasons Villas (Lot 815 RP & Ext Thereto in DD110), Avenue De Versailles is a non-exclusive right-of-way maintained by the owners of Seasons Villas (Lot 815 RP & Ext Thereto in DD110). On the side of caution, the proposed layout has allowed more than 5m setback from this access road to ensure adequate air buffer distance. The Consultant issued enquiry to TD for confirming the road type of this access road in June 2025, yet still pending reply.

Comments	Responses
3. S.9.8 and Table 9.1 i. S.9.8 – Please revised “committed STW” to “proposed STKSTW”	S.9.8 has been revised.
ii. Title of Table 9. 1 - Please revise “Committed STW” to “proposed STKSTW”	Title of Table 9.1 has been revised.
iii. Please revise the ADWF for STKSTW to read “5,000 m ³ / day <u>with allowance to facilitate a further increase to 10,000 m³/ day</u> ”. Accordingly, please add “at least” before “about 20 times smaller ...” in 2 nd last line of S.9.9	Table 9.1 and S.9.9 have been revised.
Noise Impact Assessment 1. RtC(1) – Please state clearly in an appropriate part of the current noise impact assessment report that an updated noise impact assessment would be submitted under the land administration mechanism.	Noted. It is now stated in S.1.5. Please refer to the replacement page of Noise Impact Assessment report in Annex E of this FI.

Encl.:**Annex A** – Revised Traffic Impact Assessment**Annex B** – Email Confirmation from Planning Department on using 2021 TPEDM in the TIA**Annex C** – Revised Drainage Impact Assessment**Annex D** – Revised Air Quality Impact Assessment**Annex E** – Replacement Page of Noise Impact Assessment

Compiled by: KTA

Date: 13 February 2026

File Ref.: 20260213_s3045a_RtC FI2 Full

Annex A

Revised Traffic Impact Assessment

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

Traffic Impact Assessment

Revised Final Report

February 2026



CTA Consultants Limited

志達顧問有限公司

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Appendix I – Kam Tin South Housing Development – Layout Plan

Appendix II – Junction Calculation Sheets



1. INTRODUCTION

1.1 Background

1.1.1 The Development Site is located at DD110, Shek Kong, Kam Tin Road, Yuen Long New Territories. The site location is shown in **Figure 1.1**.

1.1.2 The Applicant intends to rezone the Development Site from "Residential (Group C)2" and "Open Space" to "Residential (Group C)4" to enable the proposed residential development.

1.1.3 In support of the aforesaid application, a traffic impact assessment is required to review and appraise any possible traffic impact induced by the proposed development on the adjacent road network.

1.1.4 CTA Consultants Limited (CTA) was therefore commissioned as the traffic consultant to prepare the Traffic Impact Assessment (TIA) and provide technical justifications in supporting the application from traffic engineering point of view.

1.2 Study Objectives

1.2.1 Main objectives of this study are listed below:

- To assess the existing and proposed traffic arrangement & provision of internal transport facilities at the subject site;
- To assess the existing traffic condition in the vicinity of the proposed development;
- To estimate traffic trips related to the proposed development;
- To carry out forecasts about traffic demand of the adjacent road network in design year;
- To appraise any possible traffic impact induced by the proposed development on the adjacent road network;
- To recommend traffic improvement measures to alleviate any foreseeable traffic problem to the surrounding road network, if any.



2. THE PROPOSED DEVELOPMENT

2.1 Site Location

2.1.1 The Development Site is located in D.D. 110, Kam Tin, Yuen Long, New Territories. The site location is shown in **Figure 1.1**.

2.2 Development Proposal

2.2.1 Parameters of the proposed development are listed in **Table 2.1**.

Table 2.1 Parameters of the Proposed Development

	Development Parameters	
Proposed Use	Residential Use	
Development Site Area	8,580 m ²	
Domestic GFA	8,580 m ²	
No. of Tower	6	
No. of Units	≤ 40 m ²	120
	40 m ² < FS ≤ 70 m ²	120

2.2.2 It is anticipated that the proposed development will be completed in year 2031.

2.2.3 The Master layout plan of the proposed development is shown in **Figures 2.1** and **2.2**. The Ground floor plan is shown in **Figures 2.6** and **2.7**.

2.3 Provision of Internal Transport Facilities

2.3.1 According to the requirements stipulated in the latest Hong Kong Planning Standards and Guidelines (HKPSG), the internal transport facilities provision for the proposed development is summarized in **Table 2.2**.



Table 2.2 Internal Transport Facilities Provision required under the HKPSG

Proposed Development			Parking Requirement					Loading/Unloading Requirement	
			Private Car Parking Space				Motorcycle Parking Space	Bicycle Parking	Loading / Unloading Bay for Goods Vehicles
Private Housing	Resident						1 space per 100-150 flats	1 space for 15 flats with flat size $\leq 70\text{m}^2$	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
	Flat Size (GFA) (m ²)	No. of Flat	GPS: 1 space per 4-7 flats			GPS x R1 X R2 X R3			
			R1	R2	R3				
	FS ≤ 40	120	0.5	1	1.3	12 to 20			
	40 <FS ≤ 70	120	1.2	1	1.3	27 to 47			
	70 < FS ≤ 100	0	2.4	1	1.3	0			
	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	240	39 to 67						
Visitor						1 space per 100-150 flats	1 space for 15 flats with flat size $\leq 70\text{m}^2$	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	
No. of Block	Average No. of Unit per Block	> 75 units per block: 5 visitor spaces per block, $\leq$ 75 units per block: Determined by TD							
6	40	12 ⁽²⁾							
Total			51 to 79 ⁽¹⁾				2 to 3	16	6 HGV

Notes: (1) Including 2 accessible car parking spaces for total 51-150 number of parking spaces

(2) Average about 40 units per block. As discussed with TD in previous planning application

no. Y/YL-KTN/4, 2 visitor spaces per block is adopted.

2.3.2 The details of proposed internal transport facilities of the proposed development complying with the HKPSG requirements are summarized in **Table 2.3**.

Table 2.3 Proposed Internal Transport Facilities of Proposed Development

Type		Proposed Number of Spaces	
Private Housing			
Private Cars	Resident	67	79 ⁽¹⁾
	Visitor	12 ⁽²⁾	
Motorcycles		3	
Bicycle Parking		16	
L/UL for HGV		6	

(1) Including 2 accessible car parking spaces for total 51-150 number of parking spaces.

(2) Average about 40 units per block. As discussed with TD in previous planning application no. Y/YL-KTN/4, 2 visitor spaces per block is adopted.



2.4 Upgrade of Kam Tin Road

2.4.1 Kam Tin Road will be upgraded by Highway Department under PWP item No. 6820TH “Upgrading of Remaining Sections of Kam Tin Road and Lam Kam Road”. The works include:

- (i) upgrading of a section of Kam Tin Road of approximately 1.9 kilometres long between Tung Wui Road and Fan Kam Road to a 10.3 metres wide single two lane carriageway
- (ii) upgrading of a section of Kam Tin Road of approximately 2.1 kilometres long between Fan Kam Road and Lam Kam Road and a section of Lam Kam Road of approximately 1.3 kilometres long between Kam Tin Road and Kadoorie Farm and Botanic Garden to a 7.3 metres wide single two-lane carriageway;

2.4.2 The design of the proposed development and the assessment in this TIA considered this upgrading works.

2.5 Development Access

Without Kam Tin Road Widening

2.5.1 As shown in **Figure 2.1 (SP3)**, since existing Kam Tin Road is narrow, long vehicles would have difficulty turning left from the proposed development and will encroach into the opposite lane. To minimize the impact to the public road, it is proposed all egress vehicles longer than **7m** are only allowed to turn right to westbound. Traffic signs will be erected as shown in **Figures 2.3 and 2.3 (SP)** to restrict the turning movement.

With Kam Tin Road Widening

2.5.2 As shown in **Figure 2.2 (SP3)**, long vehicles would still have difficulty turning left from the proposed development and will encroach into the opposite lane even after Kam Tin Road widening. Therefore, all egress vehicles longer than **7m** are still only allowed to turn right to westbound. Traffic signs will be erected as shown in **Figures 2.4 and 2.4 (SP)** to restrict the turning movement.



- 2.5.3 The existing beam barrier and railings at proposed vehicular access will be removed as shown in **Figures 2.5**. Detailed modifications will be reviewed at the detail design stage.



3. EXISTING TRAFFIC CONDITION

3.1 Existing Road Network

3.1.1 The proposed development locates at Kam Tin Road. Kam Tin Road is a two-lane two-way road and connects to Kam Tin By-pass and Fan Kam Road.

3.2 Critical Junctions

3.2.1 Seven junctions are identified to be critical for the Traffic Impact Assessment due to the proposed development. Relevant details are listed in **Table 3.1** and shown in **Figure 3.1**. Existing junction layouts are tabulated in **Figures 3.2 to 3.8** respectively.

Table 3.1 Identified Critical Junctions

Ref.	Junction	Type	Figure No.
A	Kam Tin Bypass / Kam Tin Road / Tung Wui Road	Roundabout	3.2
B	Kam Tin Bypass / Kong Tai Road	Signalized	3.3
C	Kam Tin Road / Kam Tai Road	Priority	3.4
D	Kam Tin Road / Fan Kam Road	Roundabout	3.5
E	Kam Tin Road	Signalized	3.6
F	Kam Tin Road / Tsing Long Highway slip road	Signalized	3.7
G	Kam Tin Road / Kam Tin Bypass	Roundabout	3.8

3.2.2 As mentioned in Section 2.4, Kam Tin Road will be upgraded under HyD PWP item No. 6820TH. Therefore, junctions along Kam Tin Road (Junctions C, D and E) will also be improved. As there is no detail future layout of these junctions can be obtained from public domain, the conceptual future layouts of these junctions are drawn which are based on the existing layouts and gazette layout plans. Also, Junction improvement to Junctions F and G are constructing by CEDD under Contract No. YL/2017/01 (Original Target Completion Date: Mid 2022). The future layouts are shown in **Figures 3.10 to 3.14** respectively.



- 3.2.3 In order to study the existing traffic condition of the above critical junctions, traffic survey in the form of manual-classified count was carried out during the Weekday AM and PM peak periods on 26 February 2025 from 07:30AM to 09:30AM and 17:00PM to 19:00PM respectively. The survey provides most up-to-date details of the traffic condition within the study area under normal operation. Based on the observed traffic flows, it reveals that Weekday AM and PM peak hour occurred from 07:30AM to 08:30AM, 17:00PM to 18:00PM respectively.
- 3.2.4 Observed traffic data indicates that both morning peak hour, evening peak hour and the surveyed traffic flows are shown in **Figure 3.9**.
- 3.2.5 The operational performances of the critical junctions are listed in **Table 3.2** below.

Table 3.2 Operational Performances of Critical Junctions in 2025

Ref.	Junction	Method of Control	Year 2025 RC/DFC ⁽¹⁾	
			AM Peak	PM Peak
A	Kam Tin Bypass / Kam Tin Road / Tung Wui Road	Roundabout	0.36	0.34
B	Kam Tin Bypass / Kong Tai Road	Signalized	59%	90%
C	Kam Tin Road / Kam Tai Road	Priority	0.71	0.62
D	Kam Tin Road / Fan Kam Road	Roundabout	0.61	0.65
E	Kam Tin Road	Signalized	60%	70%
F ⁽²⁾	Kam Tin Road / Tsing Long Highway slip road	Signalized	23%	23%
G	Kam Tin Road / Kam Tin Bypass	Roundabout	0.57	0.52

Notes: (1) RC = Reserve Capacity for Signal Junction;

DFC = Design Ratio of Flow to Capacity for Priority Junction/Roundabout

(2) Effect of TTA was considered

- 3.2.6 As the Government took over the Tai Lam Tunnel on 31 May 2025 and implemented new tolls, a new survey was carried out on 19 December 2025 to obtain the latest survey results. As per the comment of TD, new survey on Junction E and F is also carried out on 19 December 2025



Table 3.3 Ratio of Tai Lam Tunnel before and after being Taken over by the Government and Adjustment of Toll

Tai Lam Tunnel	Month	Average Daily Vehicles		
		SB	NB	Total
Before being taken over by the government and adjustment of toll	Feb	20872	18679	39552
After being taken over by the government and adjustment of toll	Aug	28391	27499	55891
Factor		1.36	1.47	1.41

Table 3.4 V/C Ratio of Critical Road Link in Year 2025

Index	Direction	Cap.		Observed Scenario			
		(veh/hr) (C) ⁽¹⁾	(pcu/hr) (C) ⁽¹⁾	Flow (pcu/hr) (V)		V/C	
				AM Peak	PM Peak	AM Peak	PM Peak
L1	EB	2,800	3,415	2160	1935	0.63	0.57
	WB	2,800	3,415	2075	1930	0.61	0.56
L2	EB	2,800	3,415	675	620	0.20	0.18
	WB	2,800	3,415	685	700	0.20	0.21
L3	EB	850	1,035	320	265	0.31	0.25
	WB	850	1,035	260	295	0.25	0.28
L4	EB	850	1,035	870	830	0.84	0.80
	WB	850	1,035	915	860	0.88	0.83
L5	EB	850	1,035	920	820	0.89	0.79
	WB	850	1,035	950	970	0.92	0.94
Tai Lam Tunnel ⁽³⁾	NB	4,700	6535	1815	3430	0.28	0.52
	SB	4,700	6535	5270	2560	0.81	0.39

Note:

(1) Index please refer to Figure 3.1

(2) Pcu factor (Excluded Tai Lam Tunnel) = Total Survey pcu / veh = 47,020/38,427= 1.22 is adopted

(3) Pcu factor for Tai Lam Tunnel = 13079/9387 = 1.39 is adopted

3.2.7 The assessment results in **Table 3.2** and **3.4** indicate that all critical junctions and road links are at present operating with ample capacities during the peak hours except Link



L4 and L5 above 0.85 but still lower than 1.0, which means there is still spare capacity.

3.3 Public Transport Services in the Vicinity

3.3.1 Numerous road-based public transport services, for instance, franchised buses and GMB are also provided in vicinity of the proposed development. Details of the current services of franchised buses and GMB routes within the catchment area of 500 meters are listed in **Table 3.5** and shown in **Figure 3.15**.

Table 3.5 Public Transport Services in the Vicinity of the Proposed Development

Service	Route	Origin - Destination	Frequency (mins)
Franchised Bus	54	Yuen Long (West) - Sheung Tsuen (Circular)	20 - 30
	77K	Yuen Long (Fung Cheung Road) – Sheung Shui	15 - 30
		Sheung Shui – Yuen Long (Fung Cheung Road)	12 - 30
		Sheung Shui – Yuen Long (West)	06:55 ⁽¹⁾
		Sheung Shui – Kam Sheung Road Station	07:25 ⁽¹⁾
	251B	Pat Heung Road - Sheung Tsuen (Circular)	20 - 30
	251M	Sheung Tsuen - Tsuen Wan Station	07:00, 08:00, 09:00 ⁽¹⁾
GMB	608	Wang Toi Shan (Pat Heung) – Yuen Long (Fung Cheung Road) (Circular)	10-13
		Wang Toi Shan (Pat Heung) – Kam Sheung Road Station (Circular)	10-13
	608S	CONCORDIA Tsat Sing Kong Public Light Bus Terminus – Kam Sheung Road Station Public Transit Interchange (Circular)	15 – 30
RMB	18	Yuen Long - Sheung Shui	Non-regular
	Tai Po – Yuen Long	Tai Po – Yuen Long	Non-regular

Note:

(1) Peak Hour Services only



4. FUTURE TRAFFIC CONDITION & TRAFFIC IMPACT ASSESSMENT

4.1 Design Year

4.1.1 It is anticipated that the proposed development would be completed in 2031 tentatively with full intended operation. In order to assess the possible traffic impacts to the local road network due to the proposed development, year 2034 (i.e. 3 years after completion) has been adopted as the design year for this study.

4.2 Traffic Forecast

4.2.1 To estimate the reference traffic flow in year 2034 (without the proposed development) in the local road network, an appropriate growth factor has to be identified for the area in the first instance. The following approaches have been adopted to derive the growth factor for the Area of Influence.

Historical Trend

4.2.2 TD has traffic count stations in the vicinity of the proposed development. The past 6 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 Proposed Development from ATC

ATC Stn.	Road Name	Annual Average Daily Traffic (AADT)						Average Annual Growth Rate
		2019	2020	2021	2022	2023	2024	
5014	Route Twisk (From Chuen Lung to Cheung Pei Shan RA)	6,420	6,910	6,990	6,660	6,960	7,060	1.92%
5463	Lam Kam Rd (From Kam Sheung Rd to Kadoorie Farm and Botanic Garden)	19,580	19,660	20,420	20,220	20,900	25,020	5.03%
6207	Kam Tin Rd (Kam Sheung Rd western junction to Fan Kam Rd)	21,300	21,640	20,490	20,520	21,510	20,230	-1.03%
6212	Fan Kam Rd (From Kam Tin Rd to Fanling Highway)	11,660	12,250	12,450	12,400	13,890	13,920	3.61%
6208	Kam Sheung Rd (From Kam Tin Rd to Kam Tin Rd)	8,080	9,400	8,960	9,600	10,460	10,060	4.48%
5254	Kam Tin Rd (From Fan Kam Rd to kam Sheung Rd eastern junction)	18,510	18,330	19,040	18,850	15,740	16,320	-2.49%
Total		85,550	88,190	88,350	88,250	89,460	92,610	1.60%



- 4.2.3 The Average Annual Daily Traffic (AADT) flows in **Table 4.1** shows the average traffic growth on surrounding roads which **increased** at the rate of **1.60%** per annum.

Planning Data

- 4.2.4 Reference has also been made to the latest 2021-Based Territorial Population Employment Data Matrices (TPEDM) planning data published by the Planning Department for projection of population and employment within the study district. The average annual growth rates in terms of population and employment from 2021 to 2031 are tabulated in **Table 4.2**.

Table 4.2 2021-Based Planning Data from 2021 to 2031

Yuen Long Districts				
Data	Year			Average Annual Growth Rate
	2021	2026	2031	
Population	668,100	685,000	760,600	1.31%
Employment	152,850	238,500	258,200	5.38%
Total	820,950	923,500	1,018,800	2.18%

Adopted Growth Rate

- 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 **+1.60%** from year 2019 to year 2024.
- 4.2.6 Whilst, the planning data indicates that the population and employment of the study area are expected to grow with an average annual growth rate of +2.18%.
- 4.2.7 As a conservative approach, annual growth rate **+2.18%** p.a. has been adopted for projecting traffic forecasts from year 2025 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.



4.3 Reference Traffic Flow in Year 2034

4.3.1 The year 2034 reference traffic flow is estimated by applying the adopted growth rate to the year 2025 observed traffic flow.

Adjacent New Developments

4.3.2 Additional traffic generation and attraction of major committed/planned developments in the vicinity have been estimated and superimposed onto the road network to derive the year 2034 reference traffic flow. The committed/planned developments in the vicinity are summarized **Tables 4.3** and **4.4** and illustrated in **Figure 4.1** and **Appendix I**.

Table 4.3 Development Schedule of Proposed Residential Development at Vicinity

Ref.	Development Site / Planning Application No.	Use	Development Parameters
A	A/YL-KTN/604	Residential	Not more than 3,891 flats
B	A/YL-KTN/663 (Park Yoho Phase 2)	Residential	Not more than 1,154 flats
C	A/YL-KTN/761	Residential	12 houses
D	A/YL-KTN/791	Residential	243 flats 87 houses
E	A/YL-KTN/964	Residential	615 flats
F	Y/YL-SK/1	Residential	850 flats

Note: According to their TIA reports / Planning Statement

Table 4.4 Development Schedules of Developments of Kam Tin South

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	4,000m ²	2,900m ²	-
Kindergarten	1	-	1	1	1
School	-	2	-	-	-



Note: According to the TIA report of Sites 1, 4a and 6 in support of Proposed Amendments to the Approved Kam Tin South Outline Zoning Plan No. S/YL-KTS/13 (RNTPC Paper No. 8/17) and the approved Planning Briefs of Site 1, 4a and 6

4.3.3 The adopted estimated trips of the proposed developments in vicinity are listed in below **Table 4.5**.

Table 4.5 Estimated Traffic Generations of Planned Vicinity Development

Developments	AM Peak		PM Peak	
	Gen.	Att.	Gen.	Att.
	Pcu/hr			
A/YL-KTN/604	335	223	149	185
A/YL-KTN/663	83	50	34	43
A/YL-KTN/761	4	2	2	3
A/YL-KTN/791	56	25	17	38
A/YL-KTN/964	63	44	26	29
Y/YL-SK/1	87	60	35	39
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

4.3.4 The 2034 reference traffic flows are presented in **Figure 4.2**.

$$\begin{array}{l}
 \text{2034 Reference} \\
 \text{Flows (without} \\
 \text{proposed} \\
 \text{development)} \\
 \end{array}
 =
 \begin{array}{l}
 \text{2025} \\
 \text{Observed Flows}
 \end{array}
 \times
 \begin{array}{l}
 \text{Adopted Growth} \\
 \text{Factor} \\
 \text{i.e. +2.18 \% p.a. for} \\
 \text{9 years}
 \end{array}
 +
 \begin{array}{l}
 \text{Traffic Flows of} \\
 \text{Adjacent} \\
 \text{Developments}
 \end{array}$$



4.4 Traffic Trips of the Proposed Development

4.4.1 In order to estimate the traffic generation and attraction of the proposed development, reference has been made to the trip generation rates as stipulated in Volume 1 Chapter 3 Appendix D Table 1 of the latest T.P.D.M. published by Transport Department. The adopted trip rates are summarized in below **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 Trip Rates (pcu/flat/hr)			
		AM Peak		PM Peak	
		Gen	Att	Gen	Att
FS ≤ 40m ²	60 m ²	0.1021	0.0709	0.0415	0.0464
40m ² < FS ≤ 70 m ²	70 m ²	0.1117	0.0729	0.0454	0.0551

4.4.2 Based on the adopted trip rate listed in the above **Table 4.6** and the development parameters in **Table 2.1**, the trip generated and attracted by the proposed development are estimated and summarized in the following **Table 4.7**.

Table 4.7 Estimated Traffic Generations and Attractions of Proposed Development

Proposed Development	Average Flat Size (m ²)	Nos. of Flat / GFA	AM Peak Hour		PM Peak Hour	
			Gen.	Att.	Gen.	Att.
			pcu/hr			
Resident	FS ≤ 40m ²	120	12	9	5	6
	40m ² < FS ≤ 70 m ²	120	13	9	5	7
Total			25	18	10	13

4.5 Traffic Forecast for Design Year 2034

4.5.1 The net traffic trips of the proposed development is then superimposed onto the year 2034 reference traffic flow (without the proposed development) as shown in **Figure 4.2** to derive the year 2034 design traffic flow (with the proposed development).

$$\begin{array}{l}
 \text{Year 2034 Design Flow (with the Proposed Development)} \\
 \text{Year 2034 Reference Flow (without the Proposed Development)} \\
 \text{Traffic Trips of the Proposed Development}
 \end{array}
 =
 \begin{array}{l}
 \text{Year 2034 Reference Flow (without the Proposed Development)} \\
 \text{Traffic Trips of the Proposed Development}
 \end{array}
 +
 \begin{array}{l}
 \text{Traffic Trips of the Proposed Development}
 \end{array}$$



- 4.5.2 The traffic flow during AM and PM peak periods in the design year 2034 (with the proposed development) are shown in **Figure 4.3**. The development trips are shown in **Figure 4.4**.



5. TRAFFIC IMPACT ASSESSMENT

5.1 Operational Assessment

Reference Case in Year 2034

5.1.1 To assess traffic impacts due to the proposed development, operational assessment of the critical junctions identified in Chapter 3 are carried out for both reference (without the proposed development) and design (with the proposed development) scenarios in year 2034. The results are summarized in **Table 5.1**.

Table 5.1 Operational Performance of Critical Junctions for Reference Case in Year 2034

Ref.	Junction	Method of Control		Year 2034 RC/DFC ⁽¹⁾	
				Reference Scenario (Without the Proposed Development)	
				AM Peak	PM Peak
A	Kam Tin Bypass / Kam Tin Road / Tung Wui Road	Roundabout		0.49	0.46
B	Kam Tin Bypass / Kong Tai Road	Signalized		31%	55%
C	Kam Tin Road / Kam Tai Road	Priority	w/o PWP	<u>1.08</u>	<u>0.97</u>
			w PWP ⁽²⁾	0.25	0.30
D	Kam Tin Road / Fan Kam Road	Roundabout	w/o PWP	<u>0.90</u>	<u>0.90</u>
			w PWP ⁽²⁾	0.74	0.67
E	Kam Tin Road	Signalized	w/o PWP	20%	28%
			w PWP ⁽²⁾	28%	36%
F ⁽³⁾	Kam Tin Road / Tsing Long Highway slip road	Signalized		30%	24%
G ⁽³⁾	Kam Tin Road / Kam Tin Bypass	Roundabout		0.75	0.60

Notes: (1) RC = Reserve Capacity for Signal Junction;

DFC = Design Ratio of Flow to Capacity for Priority Junction/Roundabout

(2)Based on future PWP 6820's layouts shown in Figures 3.10 to 3.12

(3)Based on future CEDD's layouts shown in Figures 3.13 to 3.14



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

Index	Direction	Cap.		Reference Scenario (Without the Proposed Development)			
		(veh/hr) (C) ⁽¹⁾	(pcu/hr) (C) ⁽¹⁾	Flow (pcu/hr) (V)		V/C	
				AM Peak	PM Peak	AM Peak	PM Peak
L1 ⁽²⁾	EB	4,200	5,125	3030	2545	0.59	0.50
	WB	2,800	3,415	2895	2560	0.85	0.75
L2	EB	2,800	3,415	825	765	0.24	0.22
	WB	2,800	3,415	840	860	0.25	0.25
L3	EB	850	1,035	525	390	0.51	0.38
	WB	850	1,035	415	445	0.40	0.43
L4 (w/o PWP)	EB	850	1,035	1200	1090	1.16	1.05
	WB	850	1,035	1220	1145	1.18	1.11
L4 (w PWP)	EB	1,100	1,340	1200	1090	0.90	0.81
	WB	1,100	1,340	1220	1145	0.91	0.85
L5 (w/o PWP)	EB	850	1,035	1250	1070	1.21	1.03
	WB	850	1,035	1245	1265	1.20	1.22
L5 (w PWP)	EB	1,100	1,340	1250	1070	0.93	0.80
	WB	1,100	1,340	1245	1265	0.93	0.94
Tai Lam Tunnel	NB	4,700	6,535	2715	4645	0.42	0.71
	SB	4,700	6,535	7100	3470	1.09	0.53

Note: (1) Index please refer to Figure 3.1

(2) Capacity based on future widening schemes 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 was carried out and the results are summarized in **Table 5.3**.



Table 5.3 Operational Performance of Critical Junctions for Design Case in Year 2034

Ref.	Junction	Method of Control		Year 2034 RC/DFC ⁽¹⁾	
				Design Scenario (With the Proposed Development)	
				AM Peak	PM Peak
A	Kam Tin Bypass / Kam Tin Road / Tung Wui Road	Roundabout		0.50	0.46
B	Kam Tin Bypass / Kong Tai Road	Signalized		30%	55%
C	Kam Tin Road / Kam Tai Road	Priority	w/o PWP	1.09	0.98
			w PWP ⁽²⁾	0.25	0.30
D	Kam Tin Road / Fan Kam Road	Roundabout	w/o PWP	0.90	0.90
			w PWP ⁽²⁾	0.75	0.67
E	Kam Tin Road	Signalized	w/o PWP	18%	28%
			w PWP ⁽²⁾	26%	35%
F ⁽³⁾	Kam Tin Road / Tsing Long Highway slip road	Signalized		30%	24%
G ⁽³⁾	Kam Tin Road / Kam Tin Bypass	Roundabout		0.75	0.60

Notes: (1) RC = Reserve Capacity for Signal Junction;

DFC = Design Ratio of Flow to Capacity for Priority Junction/Roundabout

(2) Based on future PWP 6820's layouts shown in Figures 3.10 to 3.12

(3) Based on future CEDD's layouts shown in Figures 3.13 to 3.14

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

Index	Direction	Cap.		Design Scenario (With the Proposed Development)			
		(veh/hr) (C) ⁽¹⁾	(pcu/hr) (C) ⁽¹⁾	Flow (pcu/hr) (V)		V/C	
				AM Peak	PM Peak	AM Peak	PM Peak
L1 ⁽²⁾	EB	4,200	5,125	3035	2550	0.59	0.50
	WB	2,800	3,415	2905	2565	0.85	0.75
L2	EB	2,800	3,415	830	770	0.24	0.23
	WB	2,800	3,415	850	865	0.25	0.25
L3	EB	850	1,035	525	390	0.51	0.38
	WB	850	1,035	415	445	0.40	0.43
L4 (w/o PWP)	EB	850	1,035	1215	1100	1.17	1.06
	WB	850	1,035	1240	1150	1.19	1.11
L4 (w PWP)	EB	1,100	1,340	1215	1100	0.90	0.82
	WB	1,100	1,340	1240	1150	0.92	0.86
L5 (w/o PWP)	EB	850	1,035	1260	1070	1.22	1.03
	WB	850	1,035	1255	1265	1.21	1.22
L5 (w PWP)	EB	1,100	1,340	1260	1070	0.94	0.80
	WB	1,100	1,340	1255	1265	0.94	0.94
Tai Lam Tunnel	NB	4,700	6,535	2720	4650	0.42	0.71
	SB	4,700	6,535	7110	3475	1.09	0.53

Note: (1) Index please refer to Figure 3.1

(2) Capacity based on future widening schemes under government projects



- 5.1.3 The assessment result in **Tables 5.1 to 5.4** reveals that all Junctions and V/C will operate with ample capacities in both reference and design scenarios with planned PWP’s works in year 2034, except Link L4, L5 above 0.85 but still lower than 1.0, which means there is still spare capacity. **Tai Lam Tunnel southbound in AM peak will over 1.0 but still below 1.2, which is a manageable degree of congestion but still acceptable.**
- 5.1.4 It is revealed that these junction/links will already be overloaded even without our development trips. The additional traffic generated by our proposed development is minimal, resulting in only a marginal increase in the DFC or V/C ratio by just 0.01 or no change at all. As such, the proposed development would have an insignificant traffic impact on the road networks, and it could commence even if the planned PWP widening works were to be deferred.
- 5.1.5 It is noted that the traffic generated by the proposed development is very small and would induce insignificant impact on the surrounding road network. Therefore, the application is supported from the traffic points of view.
- 5.1.6 Moreover, with reference to the TIA of “Sites 1, 4a and 6 for Public Housing Development and Government, Institution or Community Facilities”, the V/C of Kam Tin Road and Tai Lam Road will be over 0.85 even with the planned PWP works. There was no improvement scheme proposed on these roads in their TIA. Our development scale and traffic impact are much smaller than them which only have insignificant impact to Kam Tin Road and Tai Lam Road and therefore should be acceptable. The extracted pages of their TIA are attached in **Appendix III.**
- 5.2 Sensitivity Test on Remaining Sites of Land Use Review for Kam Tin and Pat Heung (LUR)**
- 5.2.1 There are 9 remaining sites under LUR. They are still in the review stage and therefore have no target year of completion. It is believed that developments at these sites should only be completed after our design year.
- 5.2.2 This sensitivity test is carried out to see the effect if all the remaining sites are being considered.



Table 5.5 Development Parameters of Remaining Sites under LUR

Site No.	Use	Planned/ Target PR ⁽¹⁾	Expected Completion	No. of Units (about) ⁽¹⁾
2	Private Housing	2.1	N/A	452
3	Private Housing	2.1	N/A	1,106
4b	Public Housing	3.0	N/A	5,700
4c	Private Housing	2.1	N/A	626
5a	Public Housing	3.0	N/A	3,300
5b	Private Housing	0.8	N/A	289
7	Private Housing	1.5	N/A	3,018
8	Private Housing	1.5	N/A	882
9	Private Housing	0.8	N/A	1,676

Note: (1) TPB Paper No. 9590 refers.

Table 5.6 Estimated Traffic Generations of Remaining Sites under LUR

Development Site No.	AM Peak		PM Peak	
	Gen.	Att.	Gen.	Att.
	Pcu/hr			
2	41	24	17	22
3	99	57	40	54
4b	355	243	170	229
4c	56	33	23	31
5a	206	141	99	133
5b	26	15	11	14
7	268	156	108	145
8	79	46	32	43
9	149	87	60	81

Note: Assume average 50m² for Public Housing and average 70m² for Private Housing

5.2.3 The traffic generation of the remaining sites under LUR are superimposed to the network and the results are shown below.



Table 5.7 Operational Performance for Reference Case in Year 2034 (With Remaining Sites under LUR)

Ref.	Junction	Method of Control		Year 2034 RC/DFC ⁽¹⁾	
				Reference Scenario (Without the Proposed Development, With Remaining Sites under LUR)	
				AM Peak	PM Peak
A	Kam Tin Bypass / Kam Tin Road / Tung Wui Road	Roundabout		0.50	0.47
B	Kam Tin Bypass / Kong Tai Road	Signalized		31%	55%
C	Kam Tin Road / Kam Tai Road	Priority	w/o PWP	<u>1.68</u>	<u>1.01</u>
			w PWP ⁽²⁾	0.26	0.30
D	Kam Tin Road / Fan Kam Road	Roundabout	w/o PWP	<u>0.93</u>	<u>0.93</u>
			w PWP ⁽²⁾	0.76	0.69
E	Kam Tin Road	Signalized	w/o PWP	17%	25%
			w PWP ⁽²⁾	25%	32%
F ⁽³⁾	Kam Tin Road / Tsing Long Highway slip road	Signalized		16%	18%
G ⁽³⁾	Kam Tin Road / Kam Tin Bypass	Roundabout		0.85	0.67

Notes: (1) RC = Reserve Capacity for Signal Junction;

DFC = Design Ratio of Flow to Capacity for Priority Junction/Roundabout

(2)Based on future PWP 6820's layouts shown in Figures 3.10 to 3.12

(3)Based on future CEDD's layouts shown in Figures 3.13 to 3.14



Table 5.8 V/C Ratio of Critical Road Link for Reference Case in Year 2034 (With Remaining Sites under LUR)

Index	Direction	Cap.		Reference Scenario (Without the Proposed Development, With Remaining Sites under LUR)			
		(veh/hr) (C) ⁽¹⁾	(pcu/hr) (C) ⁽¹⁾	Flow (pcu/hr) (V)		V/C	
				AM Peak	PM Peak	AM Peak	PM Peak
L1 ⁽²⁾	EB	4,200	5,125	3295	2795	0.64	0.55
	WB	2,800	3,415	3325	2745	0.97	0.80
L2	EB	2,800	3,415	825	765	0.24	0.22
	WB	2,800	3,415	840	860	0.25	0.25
L3	EB	850	1,035	525	390	0.51	0.38
	WB	850	1,035	415	445	0.40	0.43
L4 (w/o PWP)	EB	850	1,035	1250	1115	1.21	1.08
	WB	850	1,035	1250	1175	1.21	1.14
L4 (w PWP)	EB	1,100	1,340	1250	1115	0.93	0.83
	WB	1,100	1,340	1250	1175	0.93	0.88
L5 (w/o PWP)	EB	850	1,035	1300	1095	1.25	1.06
	WB	850	1,035	1275	1295	1.23	1.25
L5 (w PWP)	EB	1,100	1,340	1300	1095	0.97	0.82
	WB	1,100	1,340	1275	1295	0.95	0.96
Tai Lam Tunnel	NB	4,700	6,535	3275	5170	0.50	0.79
	SB	4,700	6,535	7995	3860	1.22	0.59

Note: (1) Index please refer to Figure 3.1

(2) Capacity based on future widening schemes under government projects

Table 5.9 Operational Performance for Design Case in Year 2034 (With Remaining Sites under LUR)

Ref.	Junction	Method of Control		Year 2034 RC/DFC ⁽¹⁾	
				Design Scenario (With the Proposed Development, With Remaining Sites under LUR)	
				AM Peak	PM Peak
A	Kam Tin Bypass / Kam Tin Road / Tung Wui Road	Roundabout		0.51	0.47
B	Kam Tin Bypass / Kong Tai Road	Signalized		30%	55%
C	Kam Tin Road / Kam Tai Road	Priority	w/o PWP	2.32	1.02
			w PWP ⁽²⁾	0.26	0.30
D	Kam Tin Road / Fan Kam Road	Roundabout	w/o PWP	0.94	0.93
			w PWP ⁽²⁾	0.77	0.69
E	Kam Tin Road	Signalized	w/o PWP	15%	24%
			w PWP ⁽²⁾	23%	32%
F ⁽³⁾	Kam Tin Road / Tsing Long Highway slip road	Signalized		16%	18%
G ⁽³⁾	Kam Tin Road / Kam Tin Bypass	Roundabout		0.85	0.67



Notes: (1) RC = Reserve Capacity for Signal Junction;
DFC = Design Ratio of Flow to Capacity for Priority Junction/Roundabout
(2) Based on future PWP 6820's layouts shown in Figures 3.10 to 3.12
(3) Based on future CEDD's layouts shown in Figures 3.13 to 3.14

**Table 5.10 V/C Ratio of Critical Road Link for Design Case in Year 2034
(With Remaining Sites under LUR)**

Index	Direction	Cap.		Design Scenario (With the Proposed Development, With Remaining Sites under LUR)			
		(veh/hr) (C) ⁽¹⁾	(pcu/hr) (C) ⁽¹⁾	Flow (pcu/hr) (V)		V/C	
				AM Peak	PM Peak	AM Peak	PM Peak
L1 ⁽²⁾	EB	4,200	5,125	3300	2800	0.64	0.55
	WB	2,800	3,415	3335	2750	0.98	0.80
L2	EB	2,800	3,415	830	770	0.24	0.23
	WB	2,800	3,415	850	865	0.25	0.25
L3	EB	850	1,035	525	390	0.51	0.38
	WB	850	1,035	415	445	0.40	0.43
L4 (w/o PWP)	EB	850	1,035	1265	1125	1.22	1.08
	WB	850	1,035	1270	1180	1.22	1.14
L4 (w PWP)	EB	1,100	1,340	1265	1125	0.94	0.84
	WB	1,100	1,340	1270	1180	0.95	0.88
L5 (w/o PWP)	EB	850	1,035	1310	1095	1.26	1.06
	WB	850	1,035	1285	1295	1.24	1.25
L5 (w PWP)	EB	1,100	1,340	1310	1095	0.98	0.82
	WB	1,100	1,340	1285	1295	0.96	0.96
Tai Lam Tunnel	NB	4,700	6,535	3280	5175	0.50	0.79
	SB	4,700	6,535	8005	3865	1.22	0.59

Note: (1) Index please refer to Figure 3.1

(2) Capacity based on future widening schemes under government projects

5.2.4 The assessment result in **Tables 5.7 to 5.10** reveals that all Junctions and V/C will operate with ample capacities in both reference and design scenarios with planned PWP's works and with the Remaining Sites under LUR in year 2034, except Link L1, L4 and L5 above 0.85 but still lower than 1.0, which means there is still spare capacity. **Tai Lam Tunnel southbound in AM peak will be over 1.2. However, Tai Lam Tunnel will already be over 1.2 even without our proposed development and our impact to it is negligible.**



5.2.5 It is noted that the traffic generated by the proposed development is very small and would induce insignificant impact on the surrounding road network. Therefore, the application is supported from the traffic points of view.

5.2.6 Moreover, with reference to the TIA of “Sites 1, 4a and 6 for Public Housing Development and Government, Institution or Community Facilities”, the V/C of Kam Tin Road and Tai Lam Road will be over 0.85 even with the planned PWP works. There was no improvement scheme proposed on these roads in their TIA. Our development scale and traffic impact are much smaller than them which only have insignificant impact to Kam Tin Road and Tai Lam Road and therefore should be acceptable. The extracted pages of their TIA are attached in **Appendix III**.

5.3 Mitigation Measure

5.3.1 As the programme of PWP works are still under review, the PWP works maybe delayed and the programme may be mis-match between the development and the public works project.

5.3.2 Except for Junction C (the DFC changes from 1.08 (reference case) to 1.09 (design case)), the rest of the road junction/road links only changes by 0 to 0.01 (DFC or V/C)

5.3.3 For Junction C, an improvement scheme is proposed as shown in **Figure 5.1**. The Applicant considers carrying out the improvement works as per the improvement scheme, in case of programme mis-match between the development and the public works project.

Table 5.11 Operational Performance of Critical Junctions for Design Case in Year 2034

Ref.	Junction	Proposed Improvement	Year 2034 RC/DFC ⁽¹⁾			
			Design Scenario (Without Proposed Improvement)		Design Scenario (With Proposed Improvement)	
			AM Peak	PM Peak	AM Peak	PM Peak
C	Kam Tin Road / Kam Tai Road	- Local Widening on Kam Tin Road - A right-turn pocket is added to allow traffic wait and turn from Kam Tin Road westbound into Kam Tai Road	<u>1.09</u>	<u>0.98</u>	0.80	0.35

Notes: (1) RC = Reserve Capacity for Signal Junction;

DFC = Design Ratio of Flow to Capacity for Priority Junction/Roundabout



- 5.3.4 The assessment results in **Table 5.11** indicate that Junction would be operating with ample capacities with the proposed improvement scheme.
- 5.3.5 It is note that widening length of Kam Tin Road is very long and extensive, and may involve land resumption of private land. The scale of the works is beyond the capability of a private sector and it could not be carried out by a private sector. It is revealed that L4 and L5 will already be overloaded even without the development trips of the Proposed Development. The additional traffic generated by the Proposed Development is minimal (maximum 25 pcu/hr, one-way), resulting in only a marginal increase in the DFC or V/C ratio by 0 ~ 0.01. It is considered the impact caused by the Proposed Development is minimal and to be tolerable.



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 Tin Road as shown in **Figure 3.15**.

6.1.2 The survey was carried out on 26 February 2025 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 P1 – Eastbound (To Sheung Shui / Tsuen Wan)

P1						
Eastbound (To Sheung Shui / Tsuen Wan)						
		Routes	Observed Trips	Average Occupancy	Spare Capacity (passenger)	
AM Peak (0730-0830)	BUS	54	2	38%	89	329
		77K	3	43%	115	
		251B	2	23%	125	
	GMB	608	17	69%	84	202
		608S	3	38%	30	
	RMB	18	11	50%	88	
		-	7	100%	0	
PM Peak (1700-1800)	BUS	54	3	38%	133	438
		77K	4	49%	125	
		251B	3	25%	180	
	GMB	608	13	94%	12	32
		608S	2	63%	12	
	RMB	18	7	100%	0	
		Tai Po – Yuen Long	8	94%	8	

Notes: (a) Full capacity of 120 passengers with max. 75% for double-decked Franchised Bus is assumed.
(b) 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 – Eastbound (To Sheung Shui / Tsuen Wan)

P1			
Eastbound (To Sheung Shui / Tsuen Wan)			
Period	PT	Total Spare Capacity (passenger)	Expected Spare Capacity in 2034 (passenger) ^(a)
AM Peak (0730-0830)	Bus	329	270
	Minibus	202	166
PM Peak (1700-1800)	Bus	438	359
	Minibus	32	26

Notes: (a) 2.18% growth rate adopted in Section 4.2

Table 6.3 Public Transport Survey at Stop B – Westbound (To Yuen Long / Kam Sheung Road)

P2						
Westbound (To Yuen Long / Kam Sheung Road)						
		Routes	Observed Trips	Average Occupancy	Spare Capacity (passenger)	
AM Peak (0730-0830)	BUS	54	2	49%	62	363
		77K	5	53%	132	
		251B	2	27%	115	
		251M	1	30%	54	
	GMB	608	21	113%	-44	-1
		608S	1	119%	-3	
	RMB	18	14	81%	43	
		-	3	94%	3	
PM Peak (1700-1800)	BUS	54	2	19%	134	448
		77K	3	25%	180	
		251B	2	19%	134	
	GMB	608	11	100%	0	33
		608S	3	50%	24	
	RMB	18	9	94%	9	
		Tai Po – Yuen Long	5	100%	0	

Notes: (a) Full capacity of 120 passengers with max. 75% for double-decked Franchised Bus is assumed.
(b) 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 – Westbound (To Yuen Long / Kam Sheung Road)

P2			
Westbound (To Yuen Long / Kam Sheung Road)			
Period	PT	Total Spare Capacity (passenger)	Expected Spare Capacity in 2034 (passenger) ^(a)
AM Peak (0730-0830)	Bus	363	298
	Minibus	-1	-1
PM Peak (1700-1800)	Bus	448	367
	Minibus	33	27

Notes: (a) 2.18% growth rate adopted in Section 4.2

6.2 Assessment on Public Transport Demand

6.2.1 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.

6.2.2 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 **Table 6.5** below:

Table 6.5 Calculation of Total Passenger Trips from Proposed Development

Item	Proposed Development
Nos. of units	240
Average household size	2.7 ppl/unit*
Total population	= 240 x 2.7 = 648 ppl
Trip Rate per Person	1.83**
Daily trips generated from proposed development	= 648 ppl x 1.83 = 1,186 trips
Peak Hour Factor	12%**
Peak hour trips (Two-ways)	= 1,186 trips x 12% = 142 trips

Notes: * Latest average household size 2.7 in Hong Kong obtains from Census and Statistics Department

**Data extracted from TCS Report 2011



6.2.3 The distribution of trips by transport mode derived from 2021 Population Census is given in below **Table 6.6**. As the nearest MTR station is outside walking distance, no ferry services, and assumes there is no residential coach service 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 6.6**.

Table 6.6 Distribution of Transport Modal Split

Year 2021 Census (Yuen Long)													
Yuen Long 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	51%	27%	-	-	4%	-	-	-	-	-	82%	100%
	Non-PT	-	-	-	14%	-	-	-	1%	-	3%	18%	
Adjusted Modal Split for the Development Site (MTR services by feeder bus/GMB)	PT	-	71%	-	-	11%	-	-	-	-	-	82%	100%
	Non-PT	-	-	-	14%	-	-	-	1%	-	3%	18%	

Notes: Example for PT:

Example for Non-PT:

Adjusted Modal Split of MTR = 42% + 9% = 51%

%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%

Example for Further Adjust on PT:

Adjusted Modal Split of Bus = 51% x (27% / (27% + 4%)) + 27% = 71%

6.2.4 Taking into consideration that the majority of residents will go out to work at AM peak and back at PM peak and the critical bus stops would be westbound stop at AM peak and eastbound stop at PM peak.



6.2.5 For conservative approach, assume all residents will go out at AM peak and come back at PM peak and all the 82% public transport passengers will use westbound stop at AM peak and eastbound stop at PM peak in the assessment.

6.2.6 The distribution of proposed development trips are summarized in **Table 6.7**.

Table 6.7 Estimated Passenger Trips using Public Transports at Critical Stop

Period	Stop	Passenger trips
AM Peak	Stop P2 Westbound (To Kam Sheung Road MTR)	= 142 x 82% = 117 ppl
PM Peak	Stop P1 Eastbound (From Kam Sheung Road MTR)	= 142 x 82% = 117 ppl

Table 6.8 Estimated Passenger Trips using Bus and Mini-buses

PT Passenger trips					
Period	Stop P2 Westbound (To Yuen Long / Kam Sheung Road)				
	Total Trips	Bus		Minibus	
		Demand	Spare Capacity ^(b)	Demand	Spare Capacity ^(b)
AM Peak	117	142 x 71% = 101	< 298, OK	142 x 11% = 16	> -1, Not OK
Period	Stop P1 Eastbound (To Sheung Shui / Tsuen Wan)				
	Total Trips	Bus		Minibus	
		Demand	Spare Capacity ^(a)	Demand	Spare Capacity ^(a)
PM Peak	117	142 x 71% = 101	< 359, OK	142 x 11% = 16	< 26, OK

Note: (a) Refer to Table 6.2

(b) Refer to Table 6.4

6.2.7 Based on the assessment results shows in **Table 6.8**, part of the forecast spare capacity are not able to meet the expected public transport demand due to the proposed development in design year 2034. Therefore, it is proposed to increase the no. of PT trips as estimated in **Table 6.9** below.



Table 6.9 Additional Bus and Mini-buses Trips

Period	PT Passenger trips	
	Westbound (To Yuen Long / Kam Sheung Road)	
	Minibus	
	Spaces Required ^(a)	No. of Additional GMB Trips Required
AM Peak	16 – (-1) = 17	17 / 19 = 1

Note: (a) Refer to Table 6.8

(b) 19 seaters GMB are proposed to use

6.2.8 From **Table 6.9**, the demand could be solved by providing additional maximum 1 GMB trip.

6.3 Bus Stop Bay Assessment

6.3.1 At present, there is one bay at the eastbound and westbound bus stop respectively. Kam Tin Road will be widened by Highway Department and the bus stops will be upgraded to standard one bay bus layby.

6.3.2 The queuing situation can be assessed based on a single channel queuing system, thus Poisson distribution and multi-server queuing (M/M/N) theory is used.

6.3.3 The assessment is work out the probability that n bus are in the bus bay.

The formula in deriving the probability is given by:

$$P(n) = \frac{1}{\sum_{n=0}^{N-1} \frac{e^n}{n!} + \frac{e^N}{N! \left(1 - \frac{e}{N}\right)}} \quad \text{for } n = 0$$

$$P(n) = \frac{e^n}{n!} P(0) \quad \text{for } 0 < n \leq N$$

$$P(n) = \frac{e^n}{N^{n-N} N!} P(0) \quad \text{for } n > N$$

where: $P(n)$ = Probability of n buses in the system
 λ = Peak 15-minutes arrival rate



μ	= Servicing rate
n	= Number of bus in the system
N	= Number of bus bay
e	= λ / μ

Peak 15-minutes arrival Rate (λ)

6.3.4 Based on the survey result shown in **Tables 6.1** and **6.3**, the no of bus/GMB arrive/departure to the bus stop is shown in **Table 6.10** below.

Table 6.10 Trip Rates for Bus Stop

Bus Stop			Period	
			AM Peak	PM Peak
Stop P1 Eastbound (To Sheung Shui / Tsuen Wan)	Bus	No of trips (veh/hr)	7	10
	Minibus	No of trips (veh/hr)	38	30
	Total	No of trips (veh/hr)	45	40
Stop P2 Westbound (To Yuen Long / Kam Sheung Road)	Bus	No of trips (veh/hr)	10	7
	Minibus	No of trips (veh/hr)	39	28
	Total	No of trips (veh/hr)	49	35

6.3.5 Based on the data shown in **Table 6.10** above, the maximum peak 15-minutes arrival rate is 13 veh/15min/bay (= 49 x 15 minutes/60 minutes).



6.3.6 As mentioned in **Section 6.3**, 1 no. of GMB trip/hr is proposed to be added. Therefore, the Peak 15-minutes arrival Rate (λ) is 13 veh/15min/bay (= (49+ 1) x 15 minutes/60 minutes).

Servicing Rate (μ)

6.3.7 Based on site observation and internal survey, a bus/GMB will pick-up/drop-off for an average 20 sec = 0.33 min.

6.3.8 For conservative, assume a GMB would occupy a whole bus bay during pick-up/drop-off.

6.3.9 The average servicing rate (μ) is 60 / 0.33 = 180 veh/hr = 45 veh/15min

The probability that n vehicles are in the bus bay is given by:

$$P(n) = \frac{1}{\sum_{n=0}^{N-1} \frac{e^n}{n!} + \frac{e^N}{N! \left(1 - \frac{e}{N}\right)}} \quad \text{for } n = 0$$

$$P(n) = \frac{e^n}{n!} P(0) \quad \text{for } 0 < n \leq N$$

$$P(n) = \frac{e^n}{N^{n-N} N!} P(0) \quad \text{for } n > N$$

where:	$P(n)$	= Probability of n vehicles in the system	
	λ	= Peak 15-minutes arrival rate	= <u>13</u>
	μ	= Servicing rate	= <u>45 veh/15min</u>
	N	= Number of bus bay	= 1
	e	= λ / μ	= <u>0.289</u>
	n	= Number of bus in the system	



6.3.10 Probability of requiring more than 1 bus bay

Table 6.11 Probability of requiring more than 1 bus bay

n	λ	μ	e	N	P(n)
0	13	49	0.265	1	0.734693878
1	13	49	0.265	1	0.194918784
Total					0.929612661

6.3.11 As can be seen, it is anticipated that the probability for more than one bus coming to the bus stop and waiting outside the bus bay is 0.070387339 (= 1 - **0.929612661**), i.e. approximately 3 out of 49 expected vehicles in the peak hour.

6.3.12 Based on the assessment results and the above points of view, it is concluded that one bus bay for one bus stop is considered acceptable and no further lengthening is required.

6.4 Railway Assessment

6.4.1 Railway Assessment is carried out to assess the impact by the proposed development. The existing railway information was obtained from “Reply Serial No. TLB162 of Replies to initial written questions raised by Legislative Council Members in examining the Estimates of Expenditure 2024-2025”. The assessment of Tuen Ma Line is summarized in **Table 6.10** below:

Table 6.11 Railway Assessment

Item	Tuen Ma Line		
	2023	2034	2034
	Existing	Reference (without Proposed development)	Design (with Proposed development)
Carrying Capacity (6 ppsm)	58,800	58,800	58,800
Passenger Throughput	35,700	45,258 ^(b)	45,258+ (142 ^(c) *51% ^(d)) = 45,330
Loading (6 ppsm) [Passenger Throughput / Carrying Capacity]	61% (Tsuen Wan West to Mei Foo)	77.0%	77.1%
Loading (4 ppsm) [Loading (6 ppsm) / 71.2%]	85%	108.1%	108.3%

Notes:



(a) Source of the data: “Reply Serial No. TLB162 of Replies to initial written questions raised by Legislative Council Members in examining the Estimates of Expenditure 2024-2025”

(b) 2.18% growth rate adopted in Section 4.2

(c) Expected passenger trips from Table 6.5

(d) MTR modal Split from Table 6.6

6.4.2 From the result, it is revealed that the loading (6 ppsm) of Tuen Ma Line would be below 100% but loading (4 ppsm) would be over 100% even without the proposed development. However, the change of loading is very small (+0.1% to +0.2%) with the proposed development and thus the impact by the proposed development is insignificant.

6.5 Conclusion

6.5.1 Based on the surveyed results and the forecast spare capacity for the public transport in 2034, the forecast spare capacity is able to meet the expected public transport demand due to the proposed development by providing additional maximum 1 GMB trip/hr. The impact by the proposed development to Tuen Ma Line is very small and insignificant.



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 26 February 2025 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-services (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 2025 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	1.50	1.00	40	0.67	A	30	0.50	A
F2	1.50	1.00	30	0.50	A	35	0.58	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.

Pedestrian Crossing

7.1.4 The V/C Ratio of the pedestrian at the pedestrian crossing of the identified critical section are shown in **Tables 7.2**.



Table 7.2 V/C Ratio of Critical Crossing in Existing Scenario

Critical Sections	Lateral Width of Ped. Crossing [W] (m)	Year 2025 Observed 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	4.00	30	12	60	0.20	1520	0.02	15	12	60	0.20	1520	0.01

Note:

(1) $PC = K \times GTP \times W$

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)

7.1.5 The assessment results shown in **Tables 7.2** indicate that all critical sections are operating within acceptable criteria ($V/C < 0.85$), and therefore considered acceptable.

7.2 Pedestrian Traffic Forecast

Reference Scenario (Without the Proposed Development)

7.2.1 To assess the future impact due to the proposed development, based on the survey flow and the growth rate of +2.18% adopted in **Chapter 4**, future reference pedestrian flows (without the proposed development) at the critical sections are estimated.

Footpath Assessment

7.2.2 The LOS are assessed and summarized in **Table 7.3** below:



Table 7.3 Operational Performance of Critical Footpath in Reference Scenario (Without the Proposed Development)

Critical Section	Total Footpath Width (m)	Effective Width (m) ⁽¹⁾	Year 2034 Reference Scenario (Without the Proposed Development)					
			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 (without Widening)	1.5	1.0	50	0.83	A	35	0.58	A
F1 (with Widening)	2.0 ⁽⁴⁾	1.5	50	0.56	A	35	0.39	A
F2 (without Widening)	1.5	1.0	35	0.58	A	40	0.67	A
F2 (with Widening)	2.0 ⁽⁴⁾	1.5	35	0.39	A	40	0.44	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 Tin Road will be carried out by HyD and 2m footpaths will be provided along both sides of the road.

7.2.3 The assessment results shown in **Table 7.3** indicate that critical sections are operating within LOS A.

Pedestrian Crossing

7.2.4 The V/C Ratio of the pedestrian at the pedestrian crossing of the identified critical section are shown in **Tables 7.4**.

Table 7.4 V/C Ratio of Critical Crossing in Reference Scenario (Without the Proposed Development)

Critical Sections	Lateral Width of Ped. Crossing [W] (m)	Year 2034 Reference Scenario (Without the Proposed Development)											
		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 (without Widening)	4	35	12	60	0.20	1520	0.02	20	12	60	0.20	1520	0.01
C1 (with Widening)	4	35	11 ⁽²⁾	60	0.18	1395	0.03	20	11 ⁽²⁾	60	0.18	1395	0.01

Note:



$$(1) PC = K \times GTP \times W$$

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)

(2) Future crossing layout carried out by HyD is used for assessment.

7.2.5 The assessment results shown in **Tables 7.4** indicate that all critical sections are operating within acceptable criteria ($V/C < 0.85$), and therefore considered acceptable.

Design Scenario (With the Proposed Development)

7.2.6 The total trips generated from the proposed development are estimated in **Tables 6.5** of **Chapter 6** above.

Footpath Assessment

7.2.7 The estimated trips are superimposed to the network. The assessment of the design scenario is summarized in **Tables 7.5**.

Table 7.5 Operational Performance of Critical Footpath in Design Scenario (With the Proposed Development)

Critical Section	Total Footpath Width (m)	Effective Width (m) ⁽¹⁾	Year 2034 Design Scenario (With the Proposed Development)					
			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 (without Widening)	1.5	1.0	190	3.17	A	175	2.92	A
F1 (with Widening)	2.0 ⁽⁴⁾	1.5	190	2.11	A	175	1.94	A
F2 (without Widening)	1.5	1.0	175	2.92	A	180	3.00	A
F2 (with Widening)	2.0 ⁽⁴⁾	1.5	175	1.94	A	180	2.00	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 Tin Road will be carried out by HyD and 2m footpaths will be provided along both sides of the road.



7.2.8 The assessment results in **Table 7.5** shows that all critical footpaths would operate with LOS A and therefore considered acceptable.

Pedestrian Crossing

7.2.9 As a cautionary crossing was planned to be constructed near the proposed development under HyD’s PWP works as shown in **Figure 7.2**. Part of the pedestrians will be diverted to use this crossing. The V/C Ratio and LOS of the pedestrian at the pedestrian crossing of the identified critical section are shown in **Tables 7.6** and **7.7**.

Table 7.6 V/C Ratio of Critical Crossing in Design Scenario (With the Proposed Development)

Critical Sections	Lateral Width of Ped. Crossing [W] (m)	Year 2034 Design Scenario (With the Proposed Development)											
		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 (without Widening)	4	175	12	60	0.20	1520	0.12	160	11	60	0.18	1395	0.11
C1 (with Widening)	4	105	11 ⁽²⁾	60	0.18	1395	0.08	90	11 ⁽²⁾	60	0.18	1395	0.06

Note:

(1) $PC = K \times GTP \times W$

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)

(2) Future crossing layout carried out by HyD is used for assessment.



Table 7.7 Operational Performance of Cautionary Crossing in Design Scenario

Critical Sections	Input Parameters		Year 2034 Design Scenario (With HyD's PWP works)	
			AM Peak	PM Peak
C2	S _p	= average pedestrian walking speed (m/s)	1.2	1.2
	t _s	= pedestrian start-up time and end clearance time (s)	3	3
	L	= crosswalk length (m)	4.8	4.8
	v _p	= pedestrian flow rate (p/h)	70	70
		= pedestrian flow rate (p/s)	0.02	0.02
	v	= vehicular flow rate (veh/h)	1035	965
		= vehicular flow rate (veh/s)	0.29	0.27
	W _E	= effective crosswalk (m)	3	3
Step				
1	t _c	= single pedestrian critical gap	7	7
2	N _c	= total number of pedestrian in the crossing platoon (p)	1.3	1.3
3	N _p	= spatial distribution of pedestrian (p)	1	1
4	t _G	= group critical gap (s)	7	7
5	d _p	= average pedestrian delay (s)	15.8	13.8
6	LOS	= Level of Services	<u>C</u>	<u>C</u>

Note: Methodology from HCM Chapter 18

7.2.10 The assessment results shown in **Tables 7.6** and **7.7** indicate that all critical sections are operating within acceptable criteria ($V/C < 0.85$, $LOS \leq C$), and therefore considered acceptable.

7.2.11 As the programme of PWP works are still under review, the PWP works maybe delayed. In case delay occurs, to facilitate residents crossing, the Applicant will provide a pair of dropped kerbs at the same location of planned cautionary crossing at Kam Tin Road as shown in **Figure 7.3**. Details arrangement would be discussed with government departments at detailed design stage.

7.3 Conclusion

7.3.1 Based on the assessment results, the critical footpath and crossing facilities are able to meet the future pedestrian demand due to the proposed development. It is revealed that footpaths and the pedestrian crossing at Kam Tin Road will be upgraded by HyD and thus the future walking condition will be improved.



8. SUMMARY AND CONCLUSION

8.1 Summary

- 8.1.1 The Applicant intends to rezone the Development Site from "Residential (Group C)2" and "Open Space" to "Residential (Group C)4" to enable the proposed residential development.
- 8.1.2 CTA Consultants Limited (CTA), are therefore commissioned as the traffic consultant to prepare the Traffic Impact Assessment (TIA) and provide technical justifications in supporting the application from traffic engineering point of view.
- 8.1.3 To appraise the existing traffic condition, a vehicular survey in the form of manual-classified count was conducted at the surrounding road network of the proposed development. Current operational performance of the critical junctions has been assessed with the observed traffic flow. The results reveal that all critical junctions are at present operating within its capacities, except Link L4, L5 above 0.85 but still lower than 1.0, which means there is still spare capacity.
- 8.1.4 Assessment of operational performance of the critical junctions indicates that all critical junctions will still operate within their capacities in both reference and design scenarios with planned PWP's works in year 2034, except Link L4, L5, Tai Lam Tunnel above 0.85 but still lower than 1.0, which means there is still spare capacity. Tai Lam Tunnel southbound in AM peak will be over 1.0 but still below 1.2, which is a manageable degree of congestion but still acceptable.
- 8.1.5 It is revealed that these junction/links will already be overloaded even without our development trips. The additional traffic generated by our proposed development is minimal, resulting in only a marginal increase in the DFC or V/C ratio by just 0.01 or no change at all. As such, the proposed development would have an insignificant traffic impact on the road networks, and it could commence even if the planned PWP widening works were to be deferred.



- 8.1.6 Assessment of public transport indicates that the existing public transport could cater the future public transport demand by providing additional maximum 1 GMB trip/hr. The impact by the proposed development to the loading of railway is very small and insignificant.
- 8.1.7 Assessment of pedestrian indicates that all footpath and pedestrian crossing could cater the future pedestrian demand in both reference and design scenarios in year 2034.
- 8.1.8 The traffic generated by the proposed development is very small and would induce insignificant impact on the surrounding road network. Therefore, the application is supported from the traffic points of view.

8.2 Conclusion

- 8.2.1 In conclusion, this Traffic Impact Assessment (TIA) study demonstrated that the related traffic trips related to the proposed development can be absorbed by the nearby road network and no significant traffic impact will be induced.
- 8.2.2 Therefore, the proposed residential development is reckoned feasible from traffic engineering point of view.

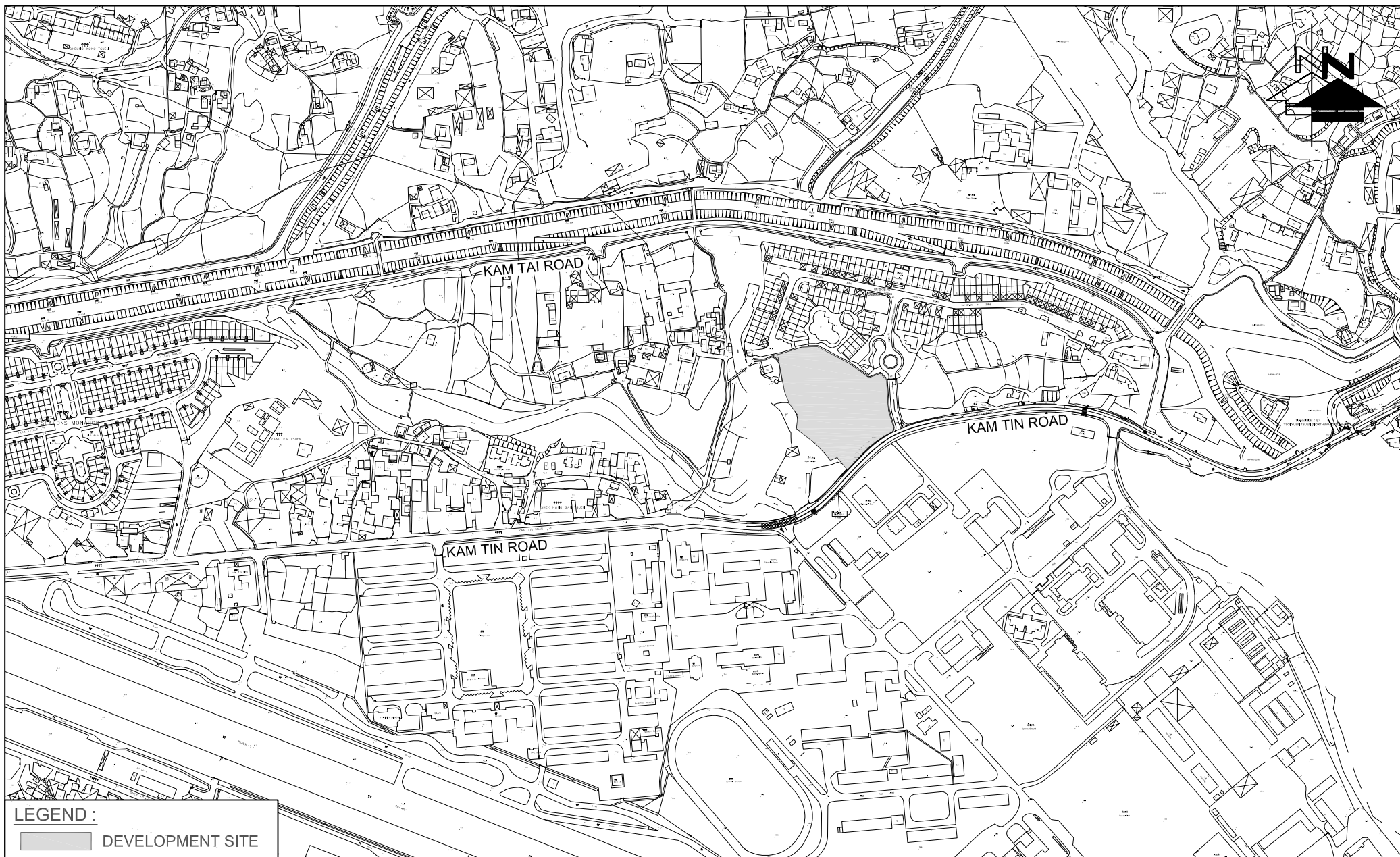
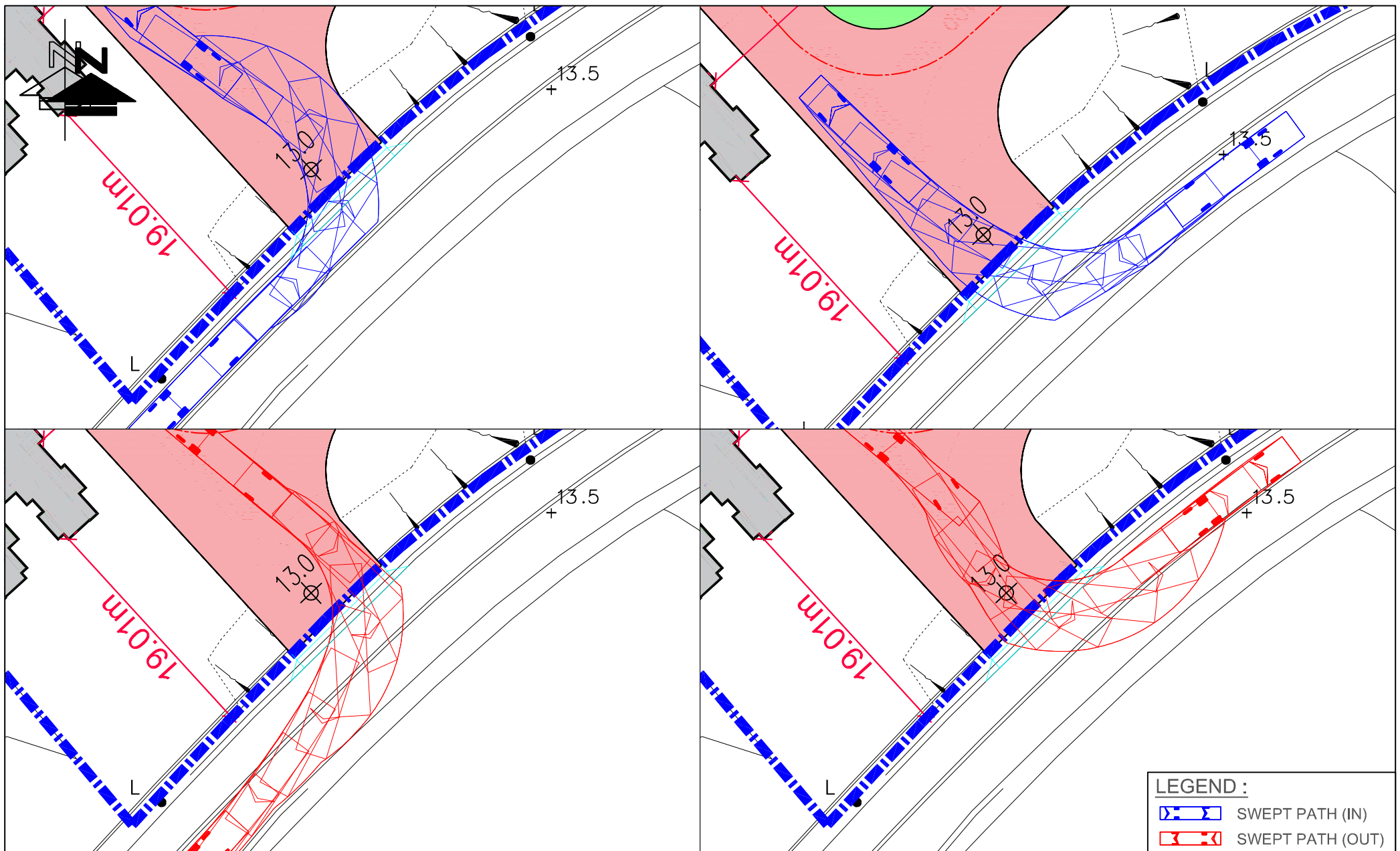


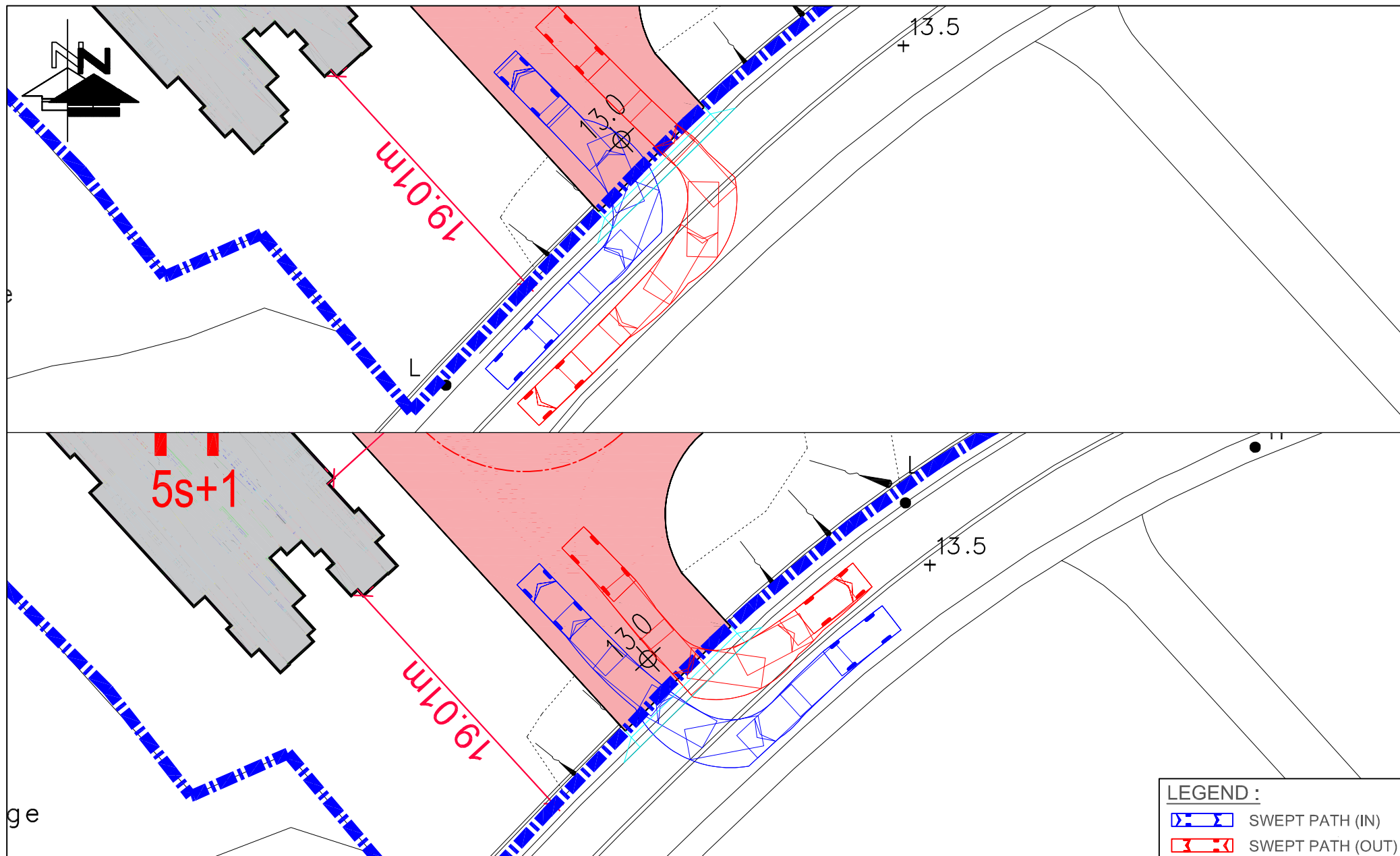
FIGURE NO.: 1.1		PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	
PROJECT NO.: 25009HK		DRAWING TITLE: SITE LOCATION PLAN	
SCALE: 1 : 500 @A4	DATE: 14 JUL 2025	 CTA Consultants Limited 志達顧問有限公司	



LEGEND :

- SWEEP PATH (IN)
- SWEEP PATH (OUT)

FIGURE NO.: 2.1(SP1)	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	 CTA Consultants Limited 志達顧問有限公司
PROJECT NO.: 25009HK	DRAWING TITLE: SWEPT PATH ANALYSIS OF 12M FIRE ENGINE OF MASTER LAYOUT PLAN (WITHOUT KAM TIN ROAD WIDENING)	
SCALE: 1 : 400 @A4	DATE: 05 FEB 2026	



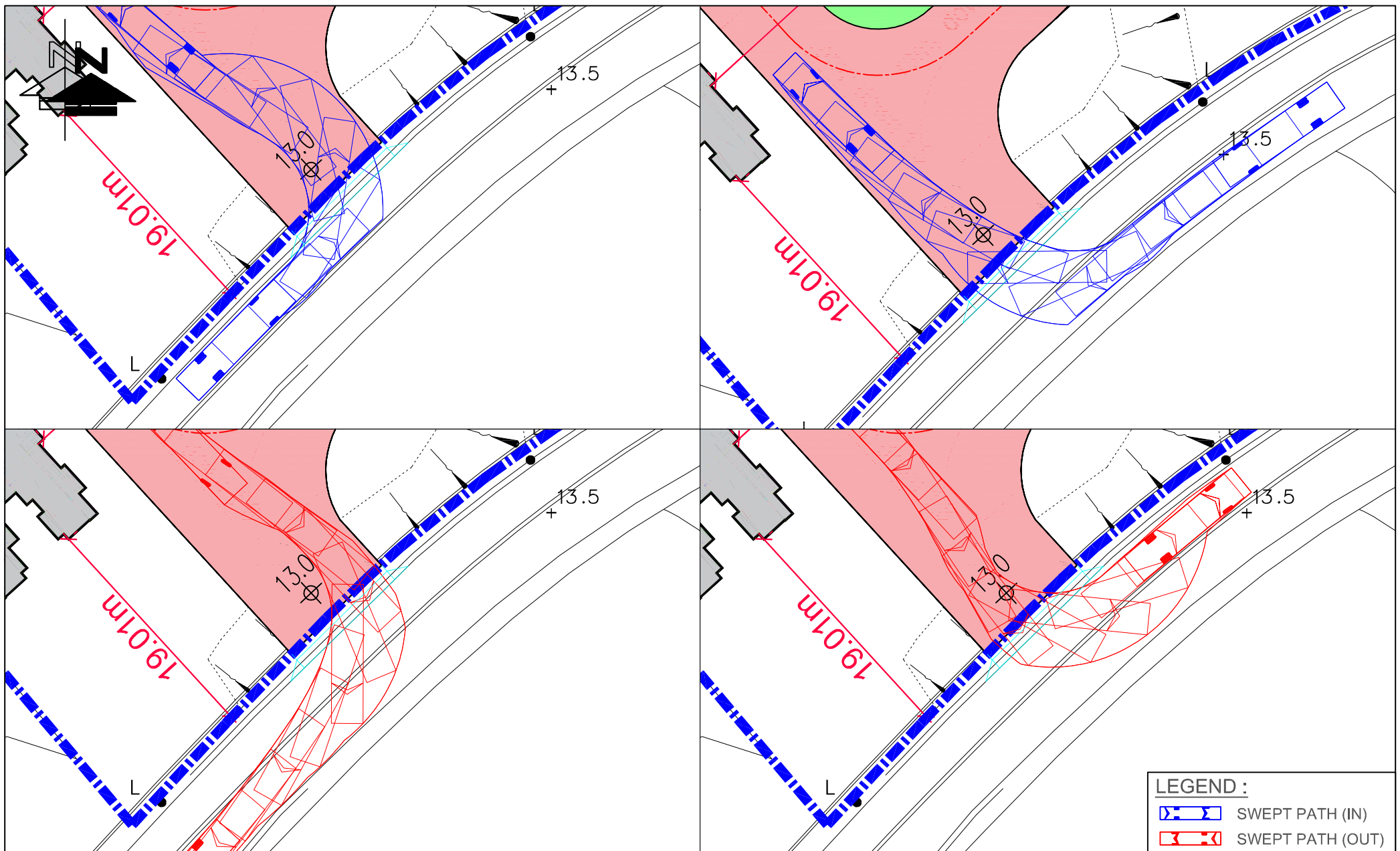
LEGEND :

- SWEPT PATH (IN)
- SWEPT PATH (OUT)

FIGURE NO.: 2.1(SP2)		PROJECT TITLE: Rezoning from “Residential (Group C)2” and “Open Space” zones to “Residential (Group C)4” zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	
PROJECT NO.: 25009HK		DRAWING TITLE: SWEPT PATH ANALYSIS OF 5M VEHICLE OF MASTER LAYOUT PLAN (WITHOUT KAM TIN ROAD WIDENING)	
SCALE: 1 : 350 @A4	DATE: 05 FEB 2026		



CTA Consultants Limited
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LEGEND :

- SWEPT PATH (IN)
- SWEPT PATH (OUT)

FIGURE NO.: 2.1(SP3)	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	 CTA Consultants Limited 志達顧問有限公司
PROJECT NO.: 25009HK	DRAWING TITLE: SWEPT PATH ANALYSIS OF 11M VEHICLE OF MASTER LAYOUT PLAN (WITHOUT KAM TIN ROAD WIDENING)	
SCALE: 1 : 400 @A4	DATE: 05 FEB 2026	

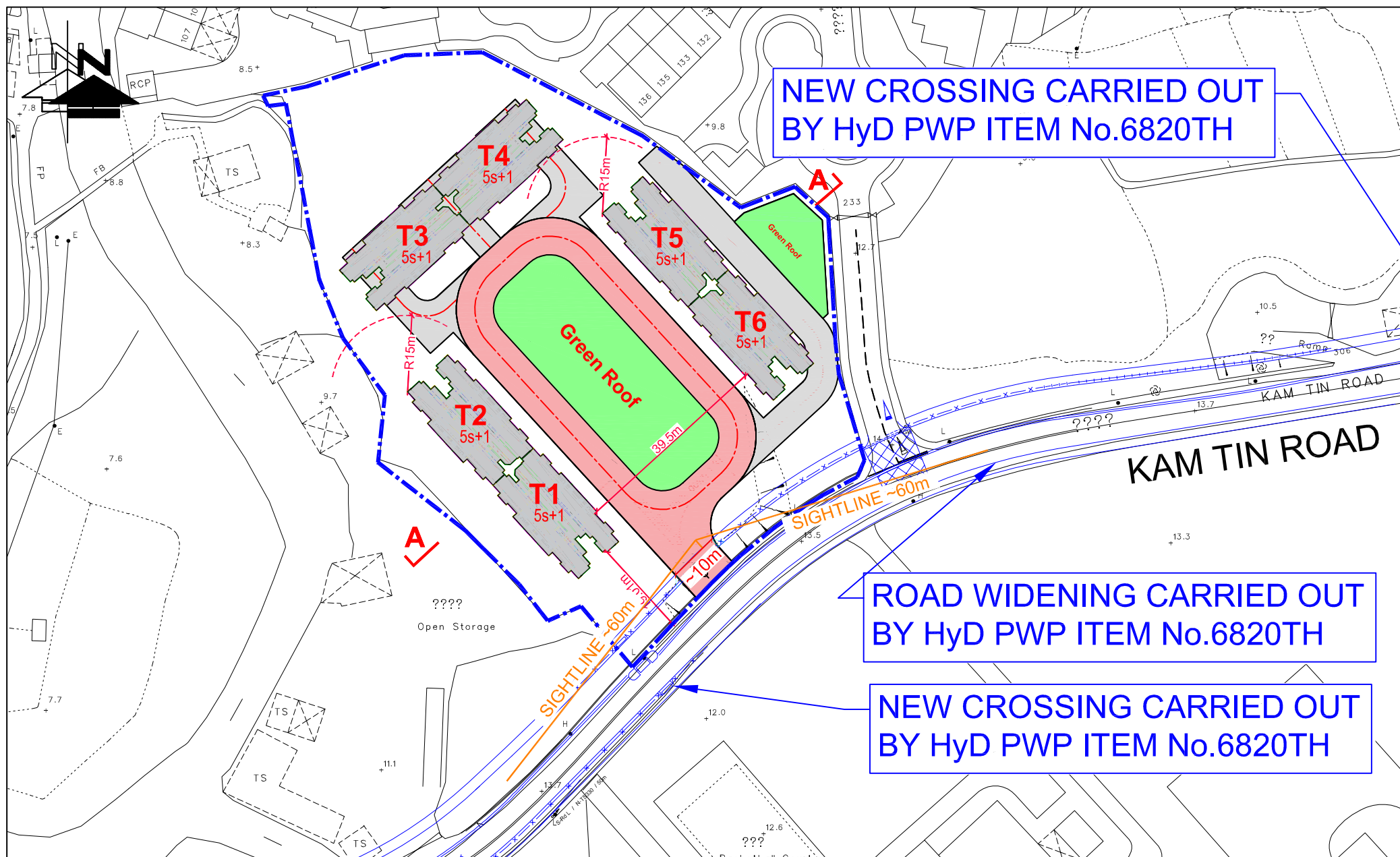


FIGURE NO.: 2.2	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	 CTA Consultants Limited 志達顧問有限公司
PROJECT NO.: 25009HK	DRAWING TITLE: MASTER LAYOUT PLAN (WITH KAM TIN ROAD WIDENING)	
SCALE: 1 : 1000 @A4	DATE: 05 FEB 2026	

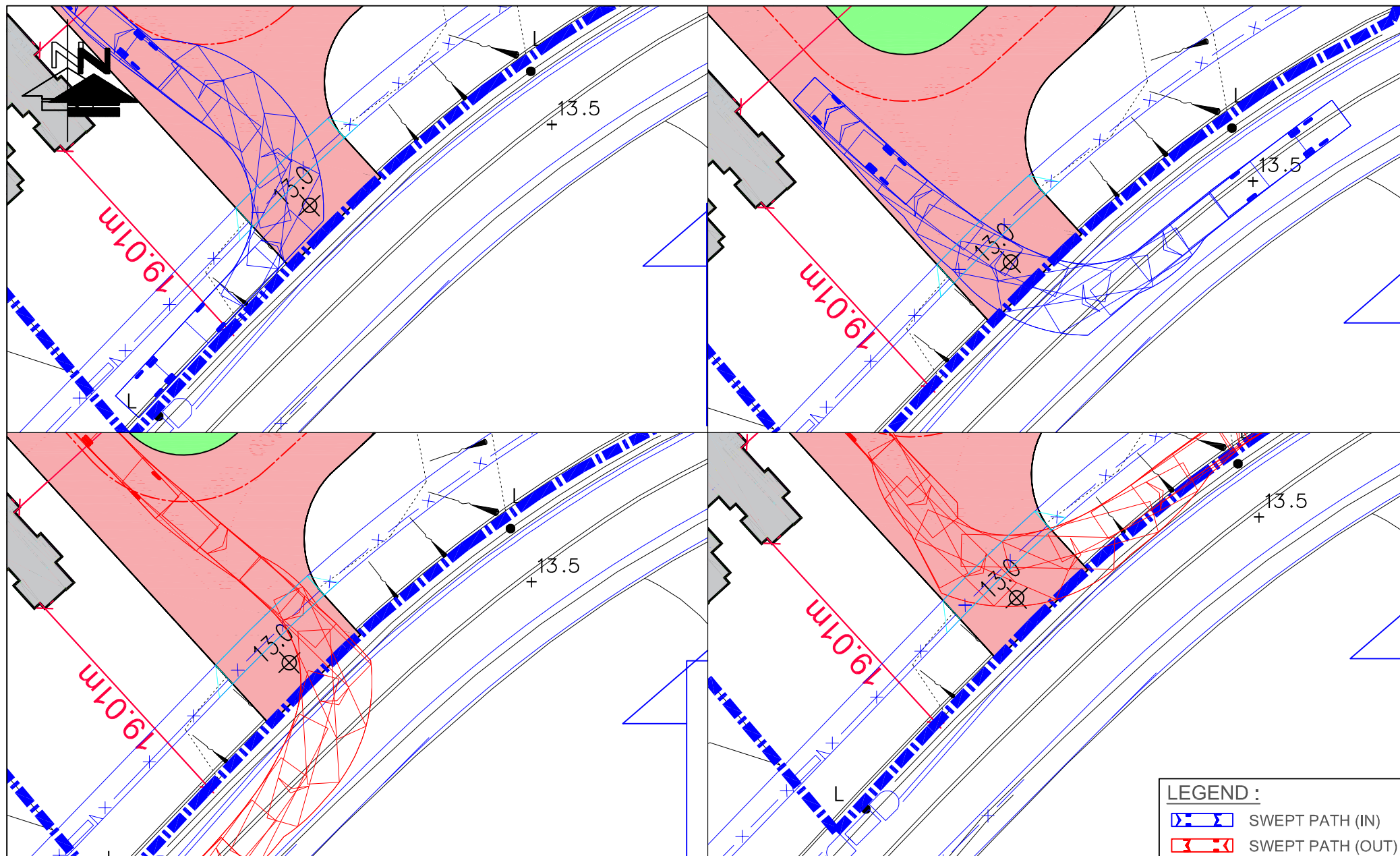


FIGURE NO.: 2.2(SP1)		PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	
PROJECT NO.: 25009HK		DRAWING TITLE: SWEPT PATH ANALYSIS OF 12M FIRE ENGINE OF MASTER LAYOUT PLAN (WITH KAM TIN ROAD WIDENING)	
SCALE: 1 : 400 @A4	DATE: 05 FEB 2026	 CTA Consultants Limited 志達顧問有限公司	

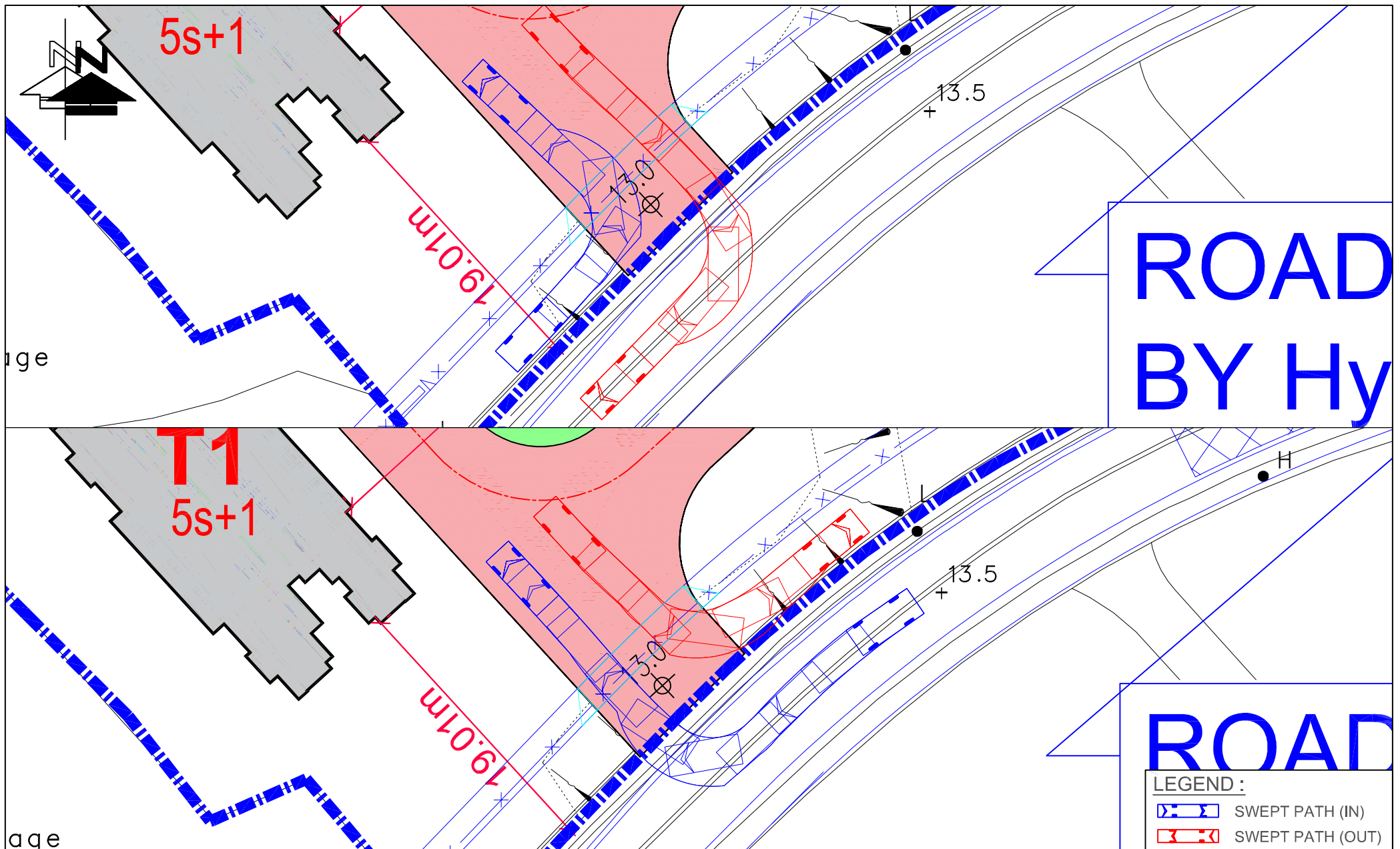
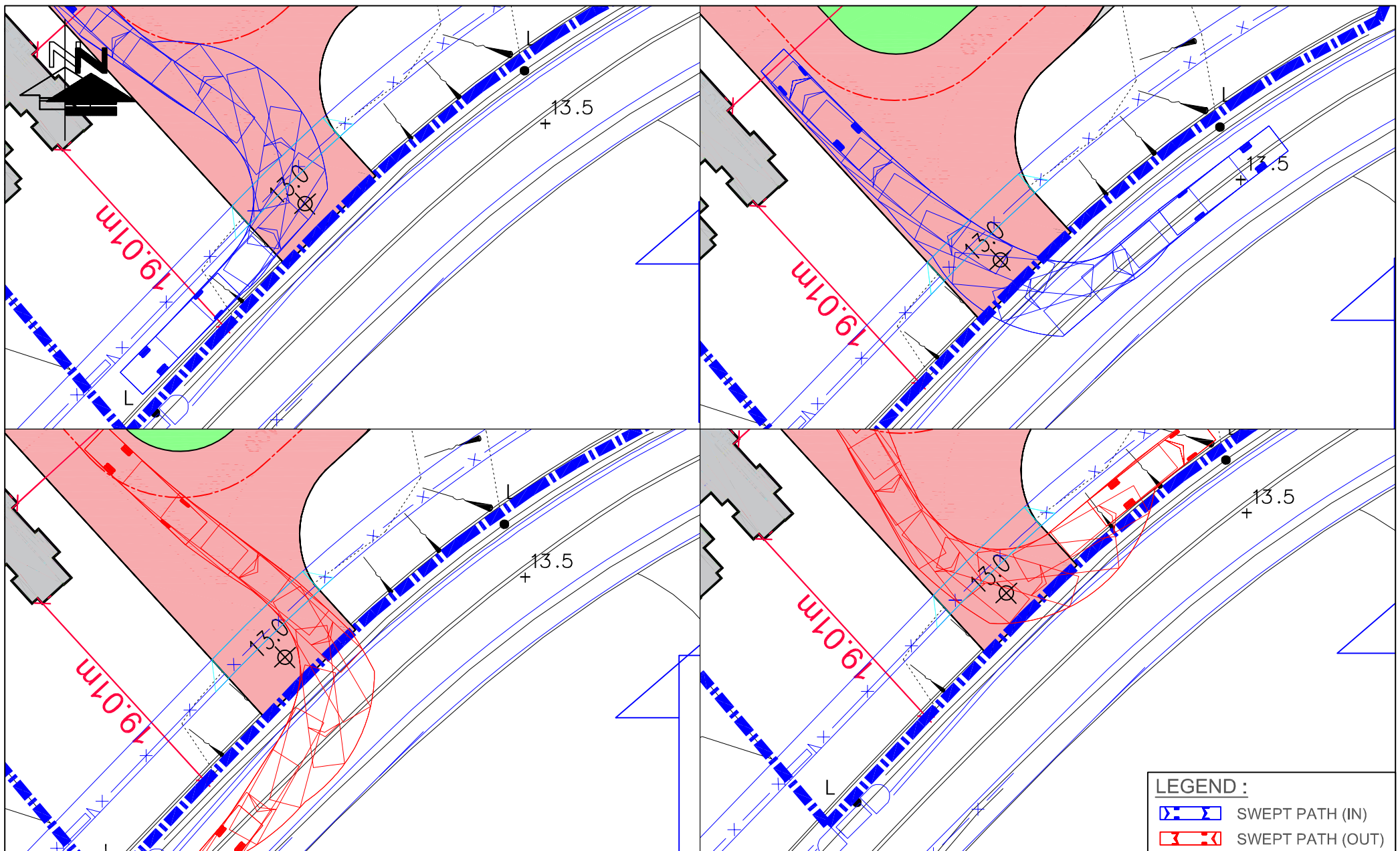


FIGURE NO.: 2.2(SP2)		PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	
PROJECT NO.: 25009HK		DRAWING TITLE: SWEPT PATH ANALYSIS OF 5M VEHICLE OF MASTER LAYOUT PLAN (WITH KAM TIN ROAD WIDENING)	
SCALE: 1 : 350 @A4	DATE: 05 FEB 2026	 CTA Consultants Limited 志達顧問有限公司	



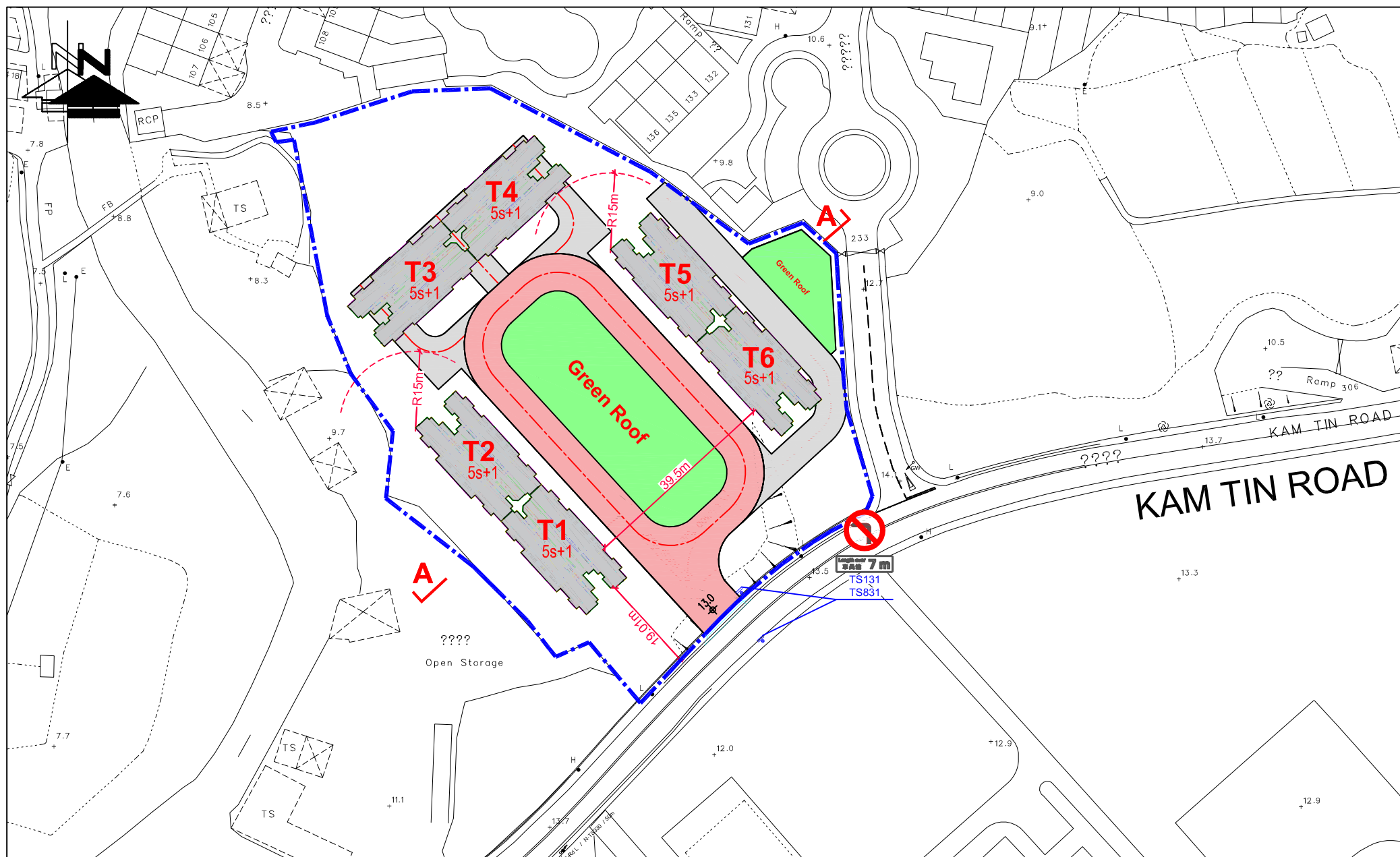


FIGURE NO.: 2.3		PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	 CTA Consultants Limited 志達顧問有限公司
PROJECT NO.: 25009HK		DRAWING TITLE: DEVELOPMENT ACCESS ARRANGEMENT (WITHOUT KAM TIN ROAD WIDENING)	
SCALE: 1 : 1000 @A4	DATE: 05 FEB 2026		

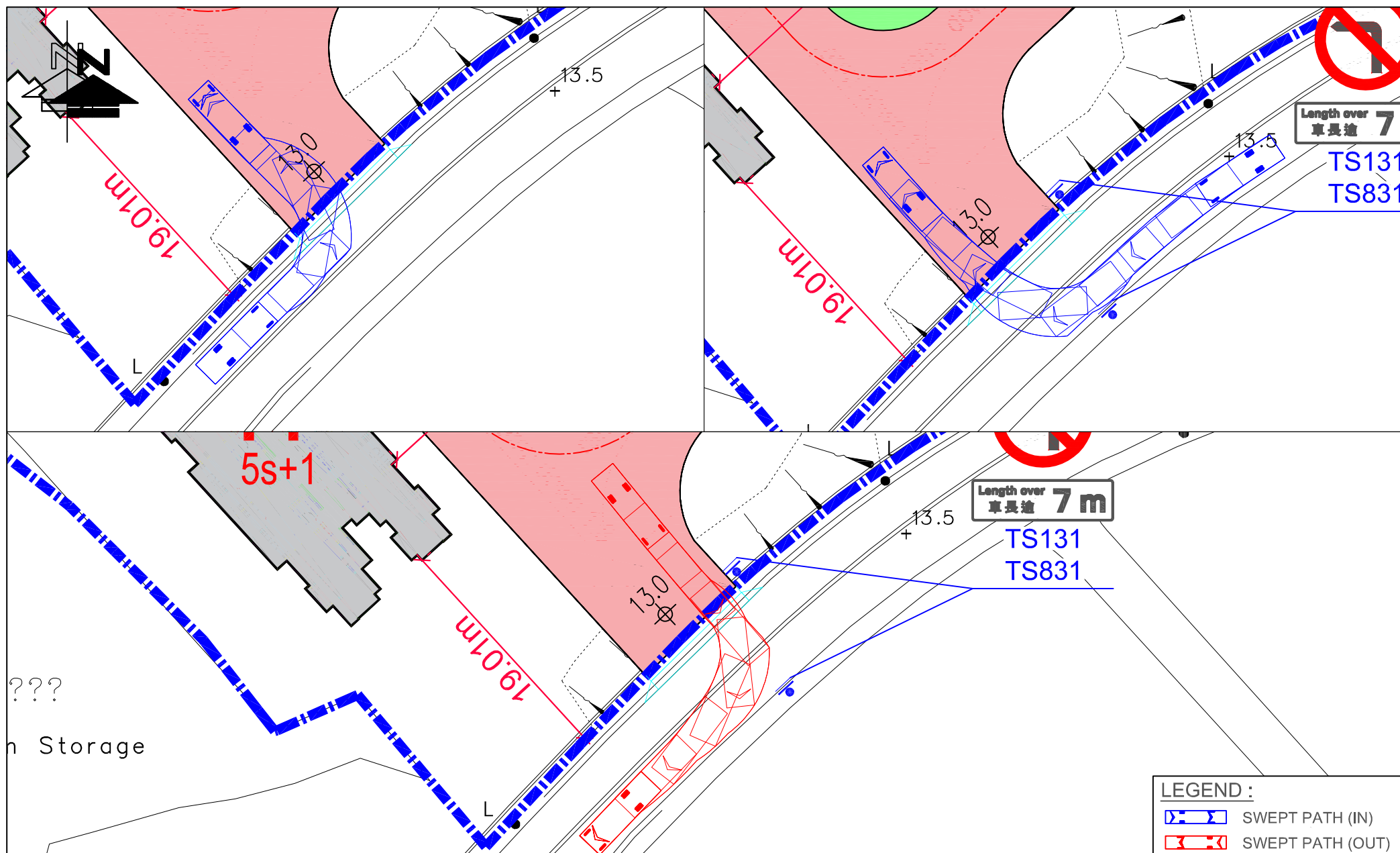


FIGURE NO.: 2.3(SP1)	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	 CTA Consultants Limited 志達顧問有限公司
PROJECT NO.: 25009HK	DRAWING TITLE: DEVELOPMENT ACCESS ARRANGEMENT (WITHOUT KAM TIN ROAD WIDENING) SWEPT PATH ANALYSIS OF 7M VEHICLES	
SCALE: 1 : 400 @A4	DATE: 05 FEB 2026	

LEGEND :

 SWEPT PATH (IN)

 SWEPT PATH (OUT)

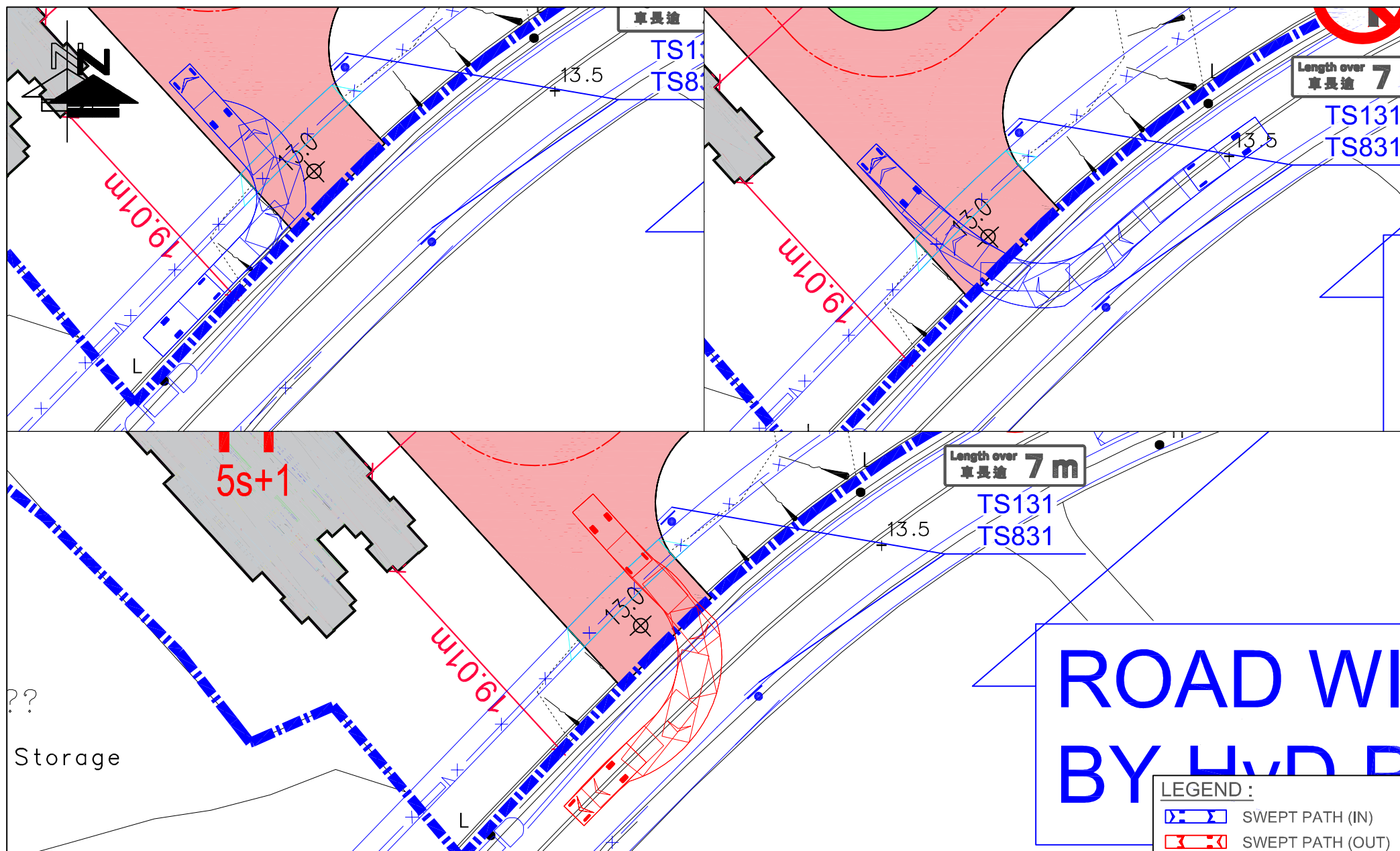


FIGURE NO.: 2.4(SP1)		PROJECT TITLE: Rezoning from “Residential (Group C)2” and “Open Space” zones to “Residential (Group C)4” zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	
PROJECT NO.: 25009HK		DRAWING TITLE: DEVELOPMENT ACCESS ARRANGEMENT (WITH KAM TIN ROAD WIDENING) SWEEP PATH ANALYSIS OF 7M VEHICLES	
SCALE: 1 : 400 @A4	DATE: 05 FEB 2026		



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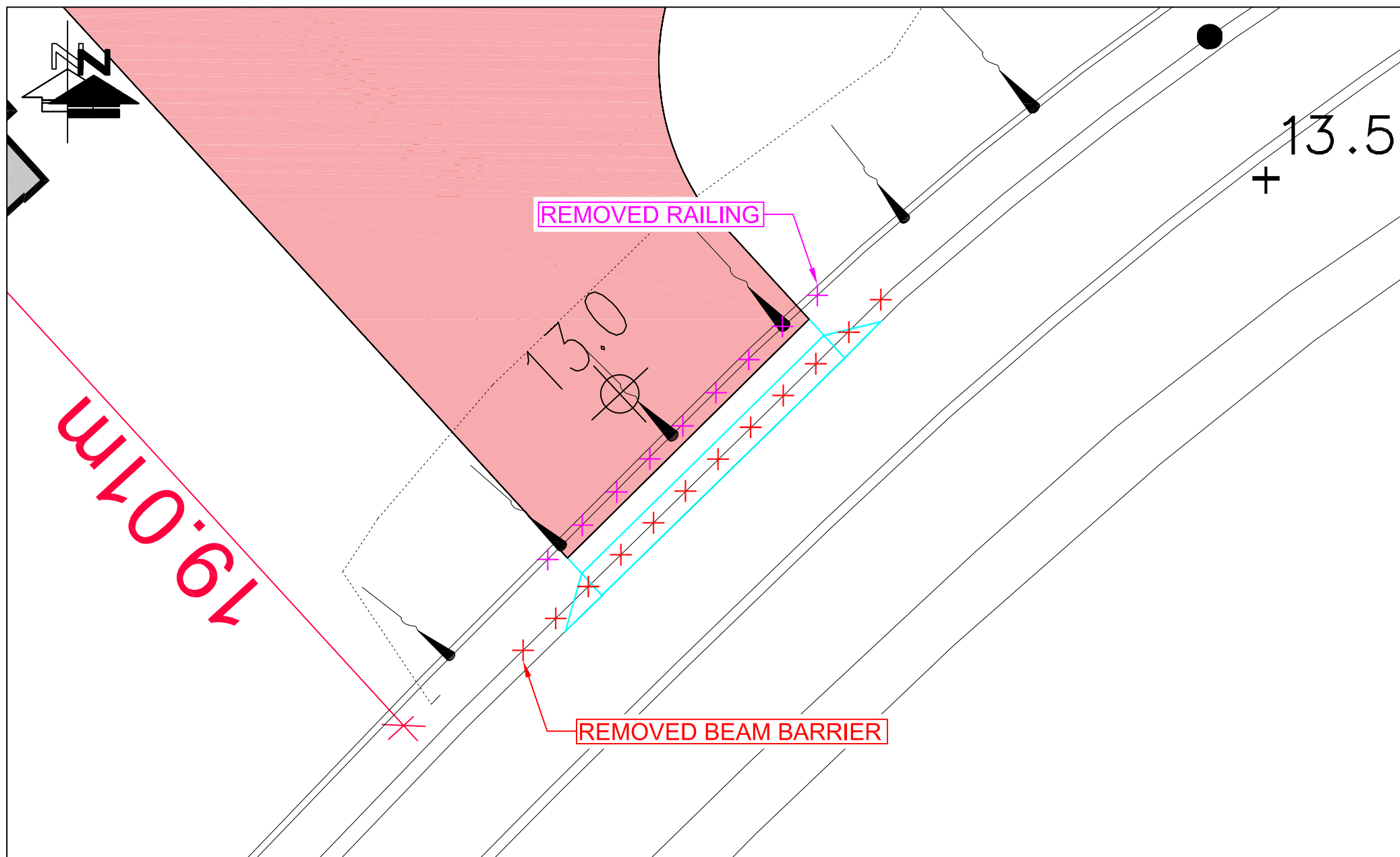


FIGURE NO.: 2.5	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	 CTA Consultants Limited 志達顧問有限公司
PROJECT NO.: 25009HK	DRAWING TITLE: PROPOSED MODIFICATION OF EXISTING STREET FURNITURE (WITHOUT KAM TIN ROAD WIDENING)	
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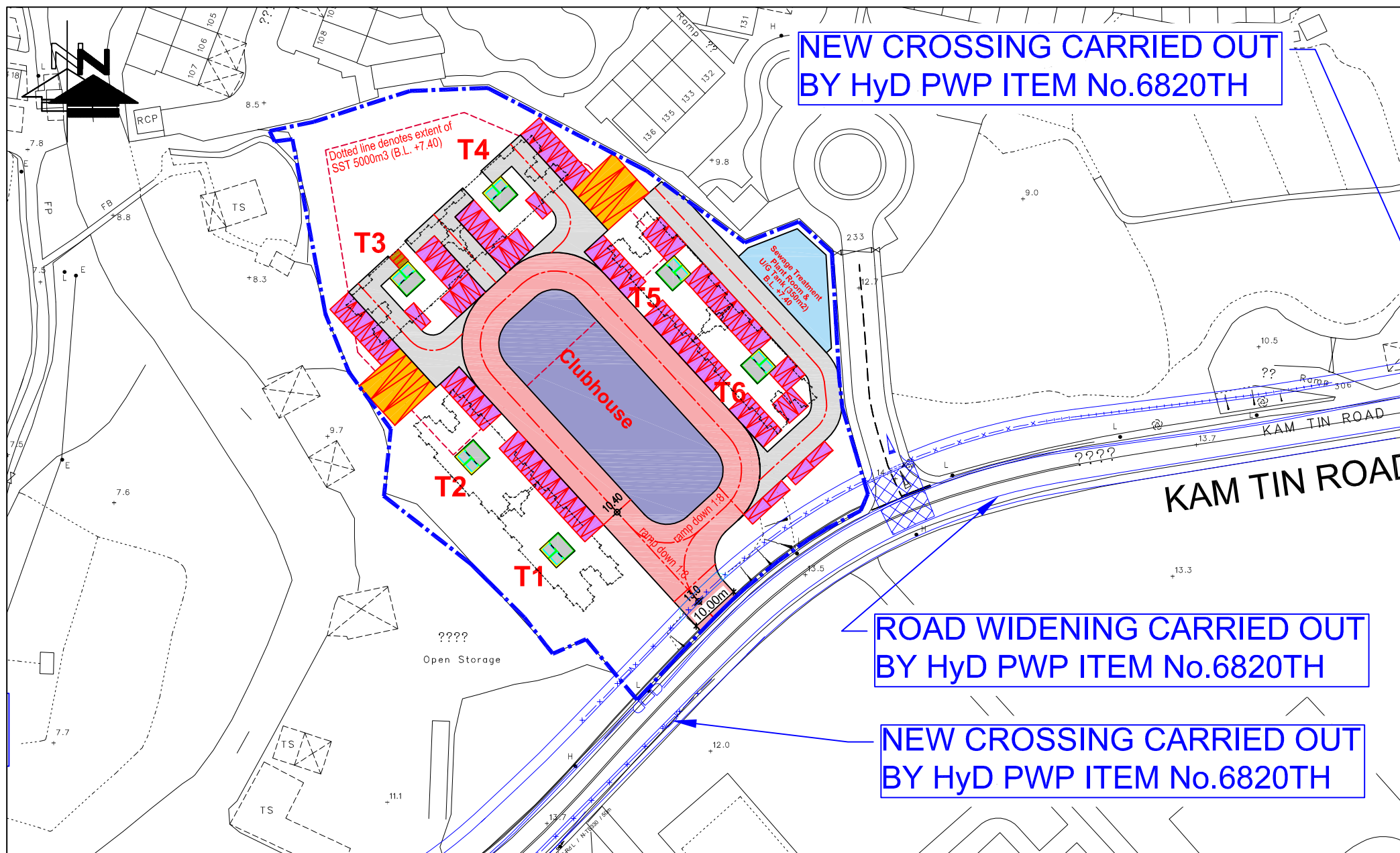
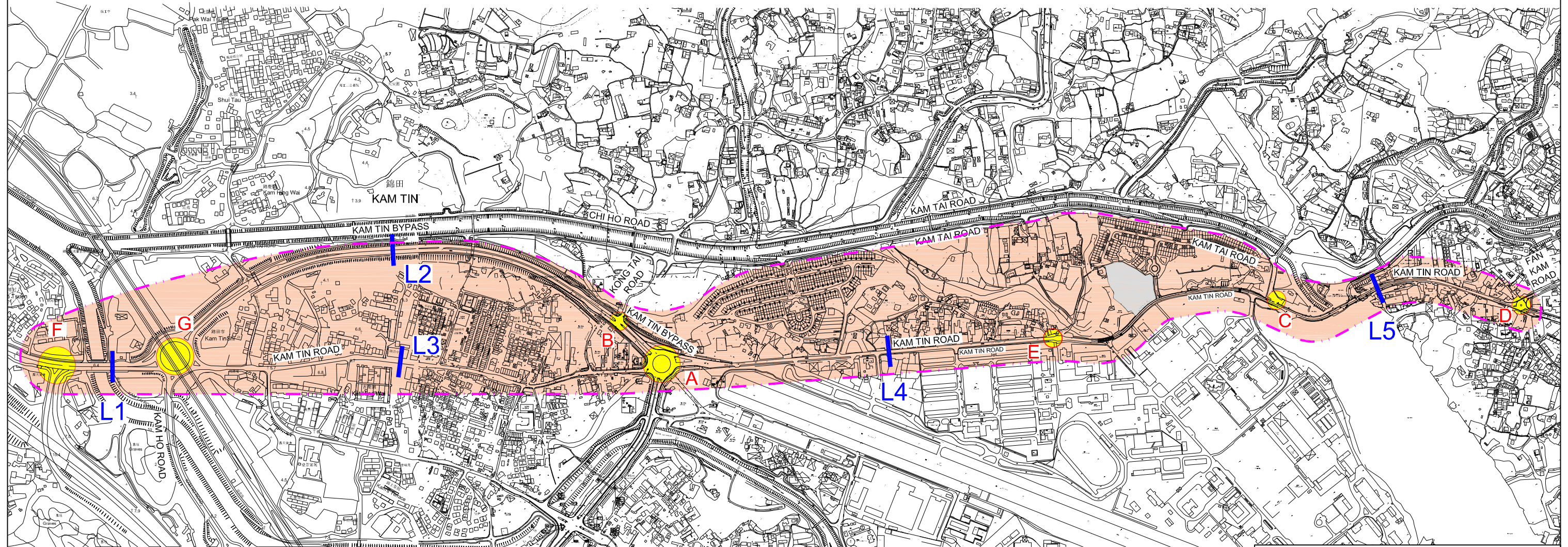
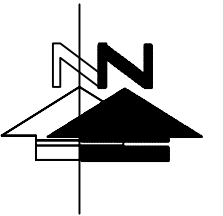


FIGURE NO.: 2.7	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	 CTA Consultants Limited 志達顧問有限公司
PROJECT NO.: 25009HK	DRAWING TITLE: GROUND FLOOR PLAN (WITH KAM TIN ROAD WIDENING)	
SCALE: 1 : 1000 @A4	DATE: 14 JUL 2025	



LEGEND :

- DEVELOPMENT SITE
- CRITICAL JUNCTION
- AREA OF INFLUENCE
- CRITICAL ROAD LINK

FIGURE NO.:

3.1

PROJECT TITLE:

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

PROJECT NO.:

25009HK

DRAWING TITLE:

IDENTIFIED CRITICAL JUNCTIONS

SCALE:

1 : 8700 @A3

DATE:

14 JUL 2025

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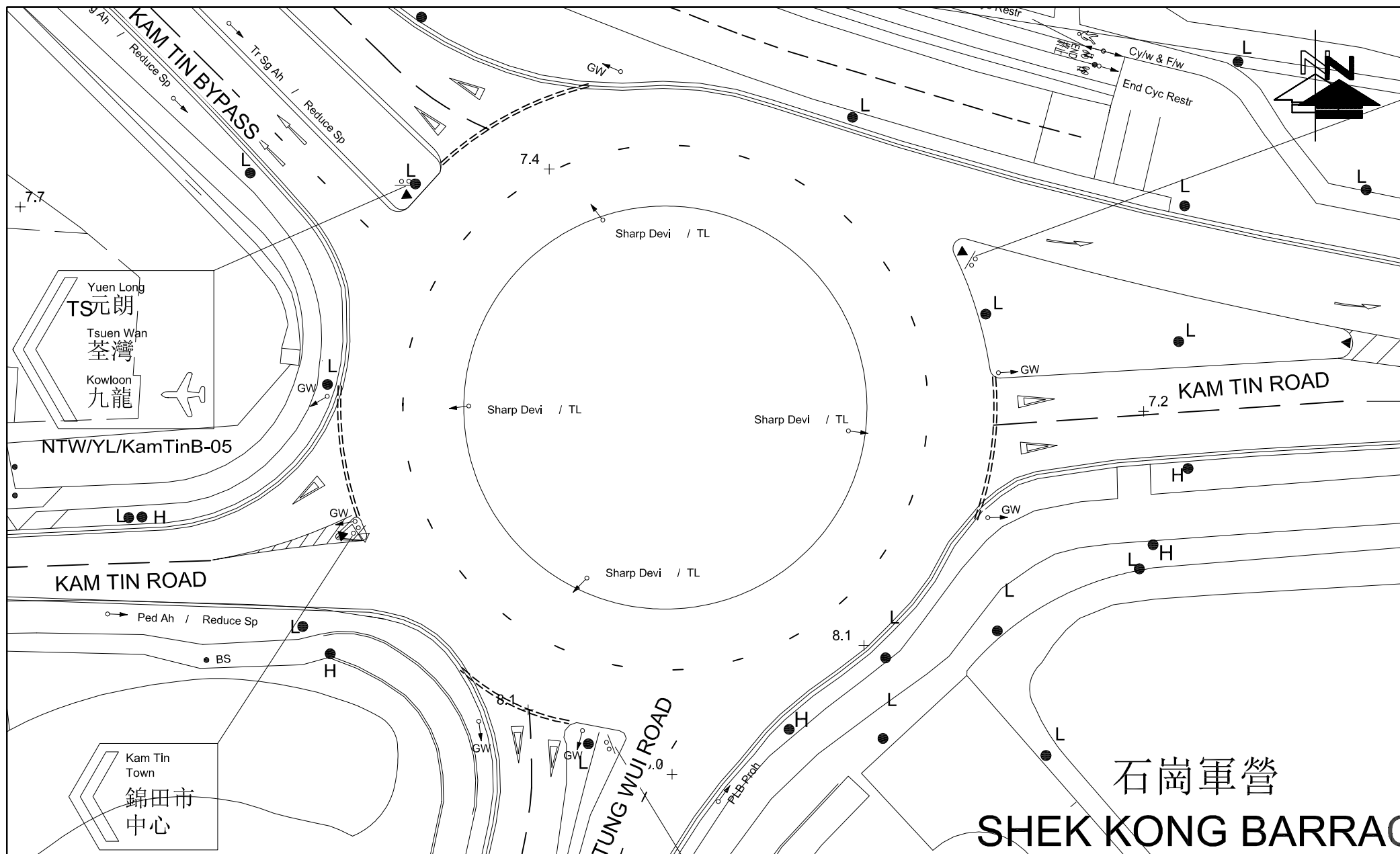


FIGURE NO.: 3.2		PROJECT TITLE: Rezoning from “Residential (Group C)2” and “Open Space” zones to “Residential (Group C)4” zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	 CTA Consultants Limited 志達顧問有限公司
PROJECT NO.: 25009HK		DRAWING TITLE: EXISTING JUNCTION LAYOUT OF KAM TIN BYPASS / KAM TIN ROAD / TUNG WUI ROAD (A)	
SCALE: 1 : 500 @A4	DATE: 01 APR 2025		

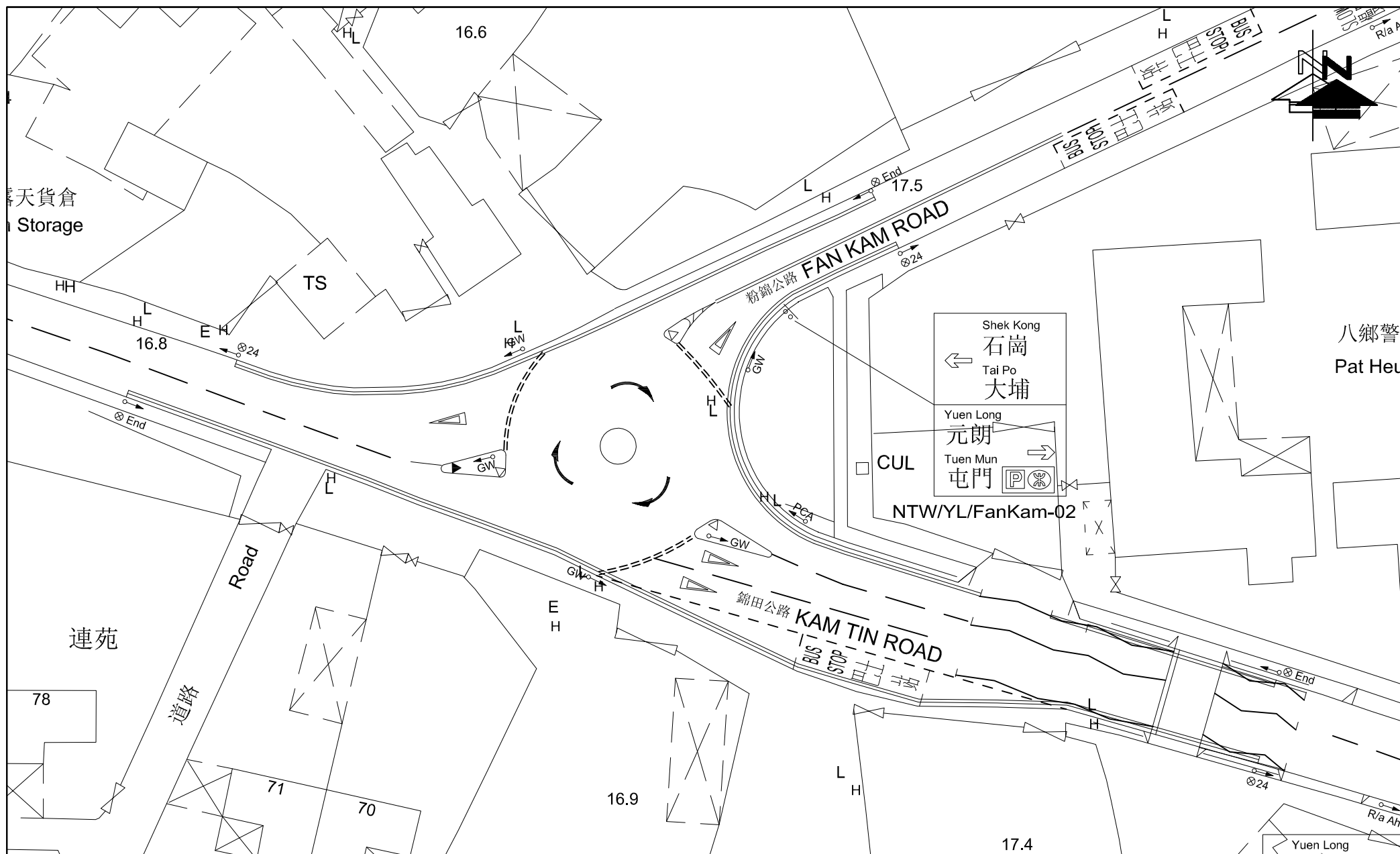
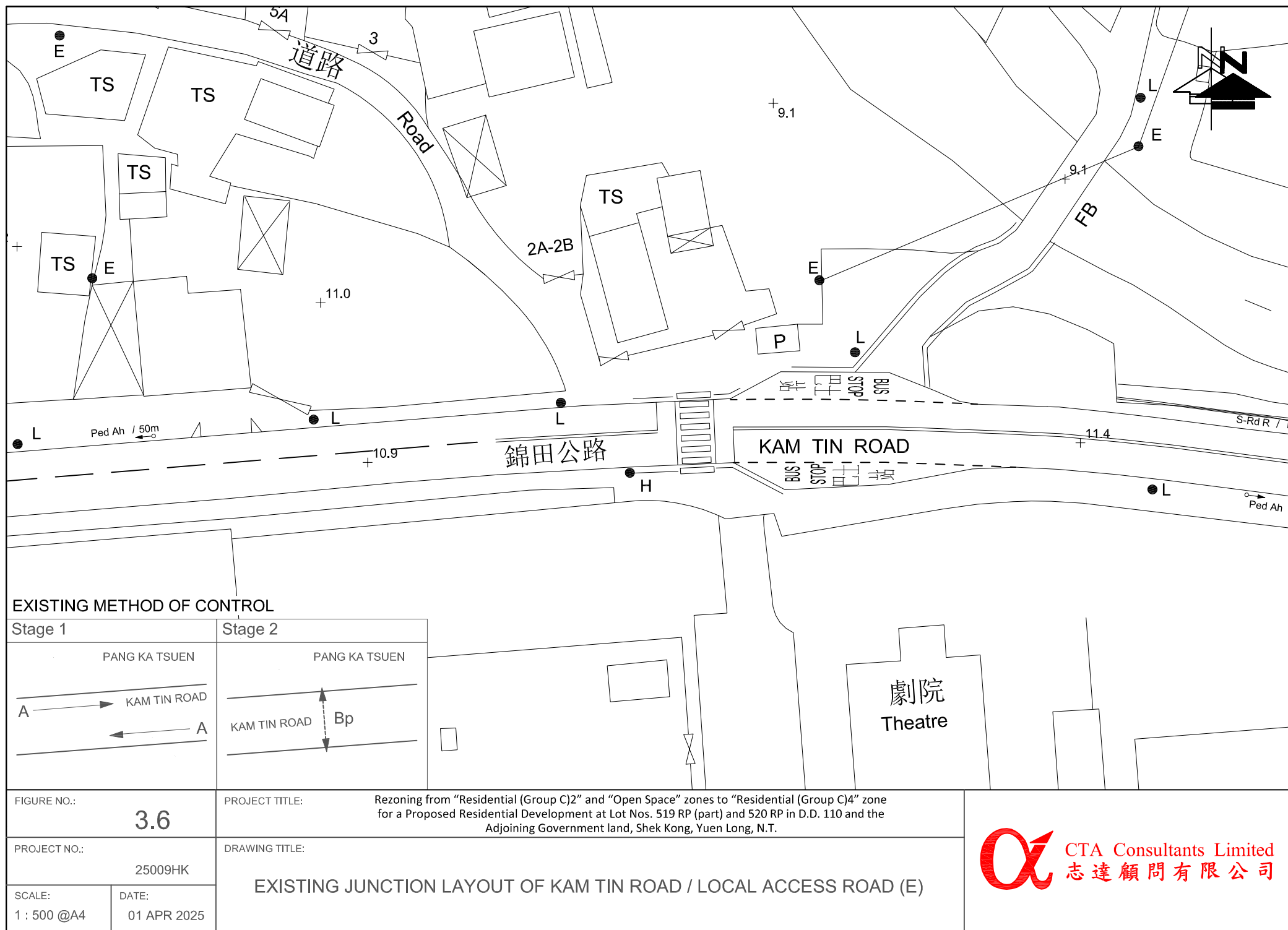


FIGURE NO.: 3.5	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	 CTA Consultants Limited 志達顧問有限公司
PROJECT NO.: 25009HK	DRAWING TITLE: EXISTING JUNCTION LAYOUT OF KAM TIN ROAD / FAN KAM ROAD (D)	
SCALE: 1 : 500 @A4	DATE: 01 APR 2025	



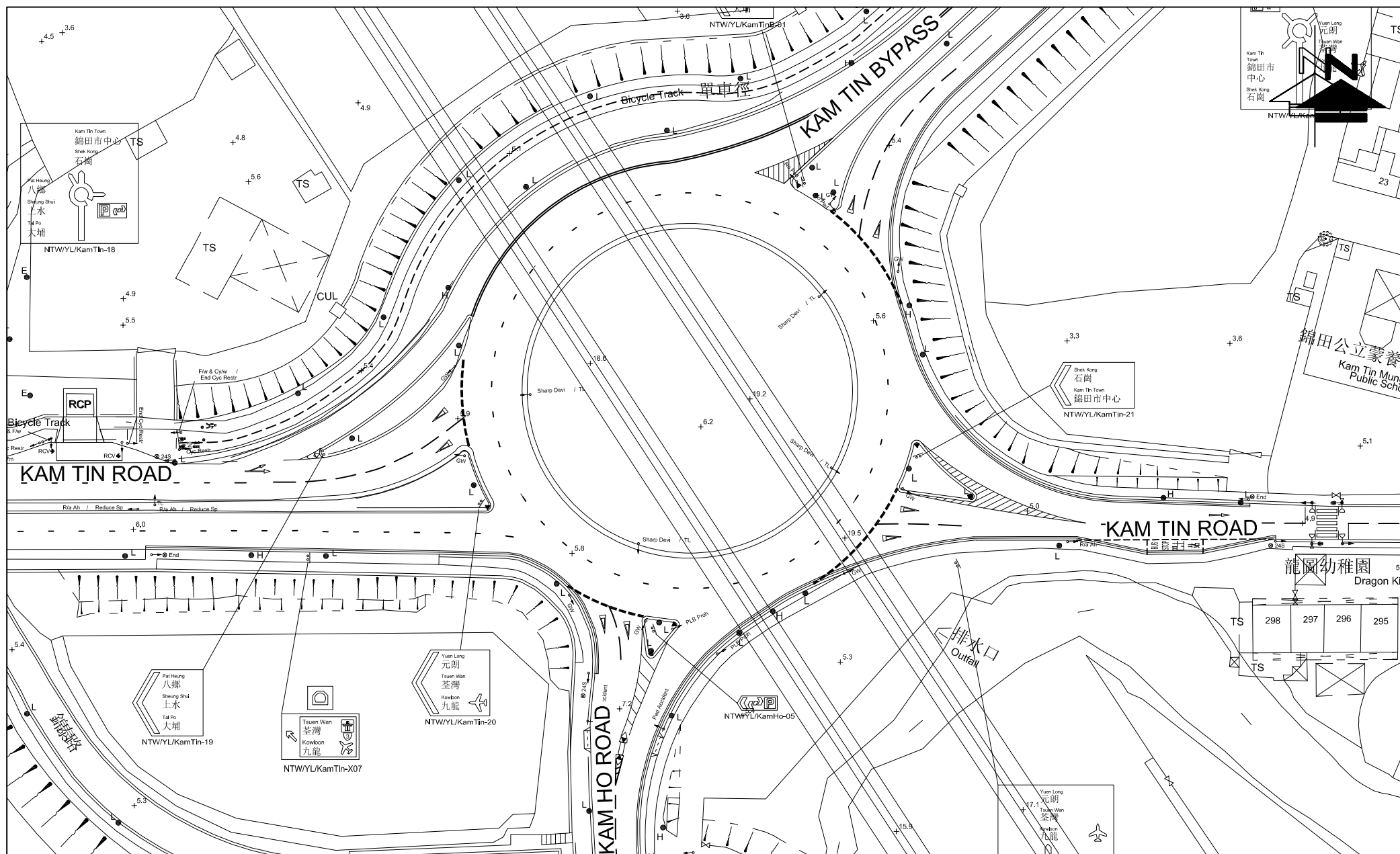
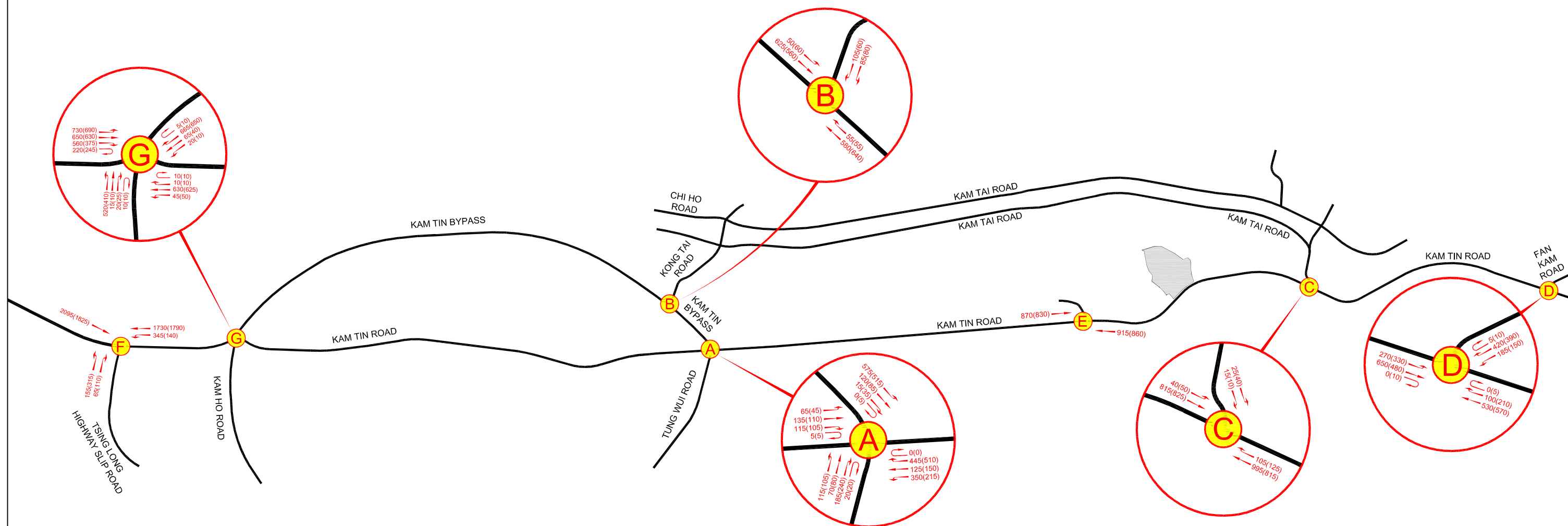
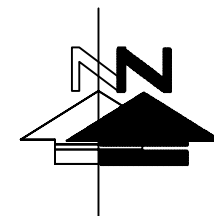


FIGURE NO.: 3.8	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	 CTA Consultants Limited 志達顧問有限公司
PROJECT NO.: 25009HK	DRAWING TITLE: EXISTING JUNCTION LAYOUT OF KAM TIN ROAD / KAM TIN BYPASS / KAM HO ROAD (G)	
SCALE: 1 : 1000 @A4	DATE: 01 APR 2025	



LEGEND :

-  DEVELOPMENT SITE
-  AM (PM) PEAK HOUR TRAFFIC FLOW (IN PCU / HR)

FIGURE NO.:

3.9

PROJECT TITLE:

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

PROJECT NO.:

25009HK

DRAWING TITLE:

2025 OBSERVED TRAFFIC FLOWS

SCALE:

N. T. S. @A3

DATE:

14 JUL 2025

 CTA Consultants Limited
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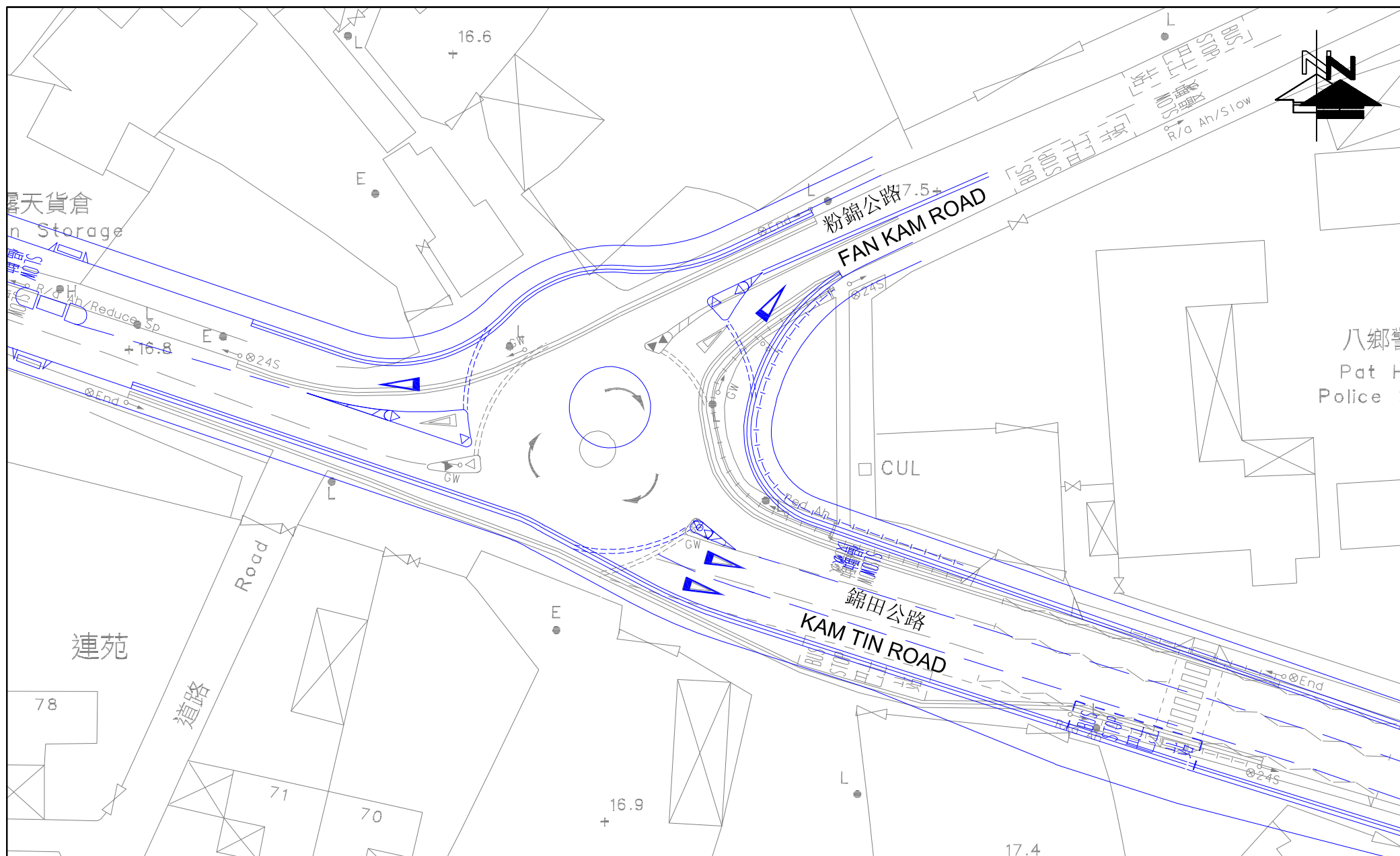


FIGURE NO.: 3.11		PROJECT TITLE: Rezoning from “Residential (Group C)2” and “Open Space” zones to “Residential (Group C)4” zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	 CTA Consultants Limited 志達顧問有限公司
PROJECT NO.: 25009HK		DRAWING TITLE: PROPOSED JUNCTION IMPROVEMENT OF KAM TIN ROAD / FAN KAM ROAD (D) (CARRIED OUT BY HyD UNDER PWP ITEM No.6820TH)	
SCALE: 1 : 500 @A4	DATE: 24 APR 2025		

DATE:
24 APR 2025

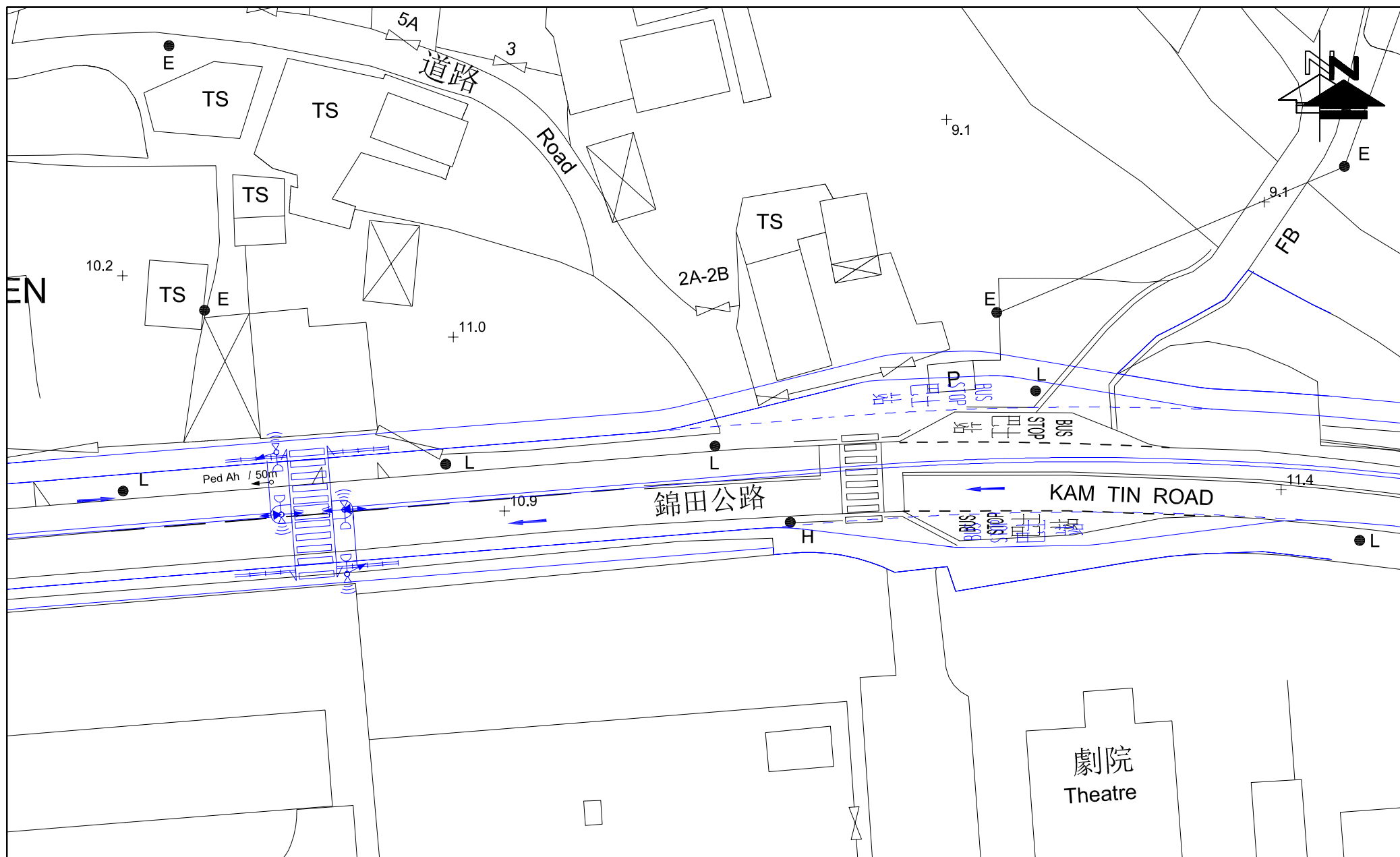


FIGURE NO.: 3.12		PROJECT TITLE: Rezoning from “Residential (Group C)2” and “Open Space” zones to “Residential (Group C)4” zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	 CTA Consultants Limited 志達顧問有限公司
PROJECT NO.: 25009HK		DRAWING TITLE: CONCEPTUAL JUNCTION IMPROVEMENT OF KAM TIN ROAD / LOCAL ACCESS ROAD (E) (CARRIED OUT BY HyD PWP ITEM No.6820TH)	
SCALE: 1 : 500 @A4	DATE: 24 APR 2025		

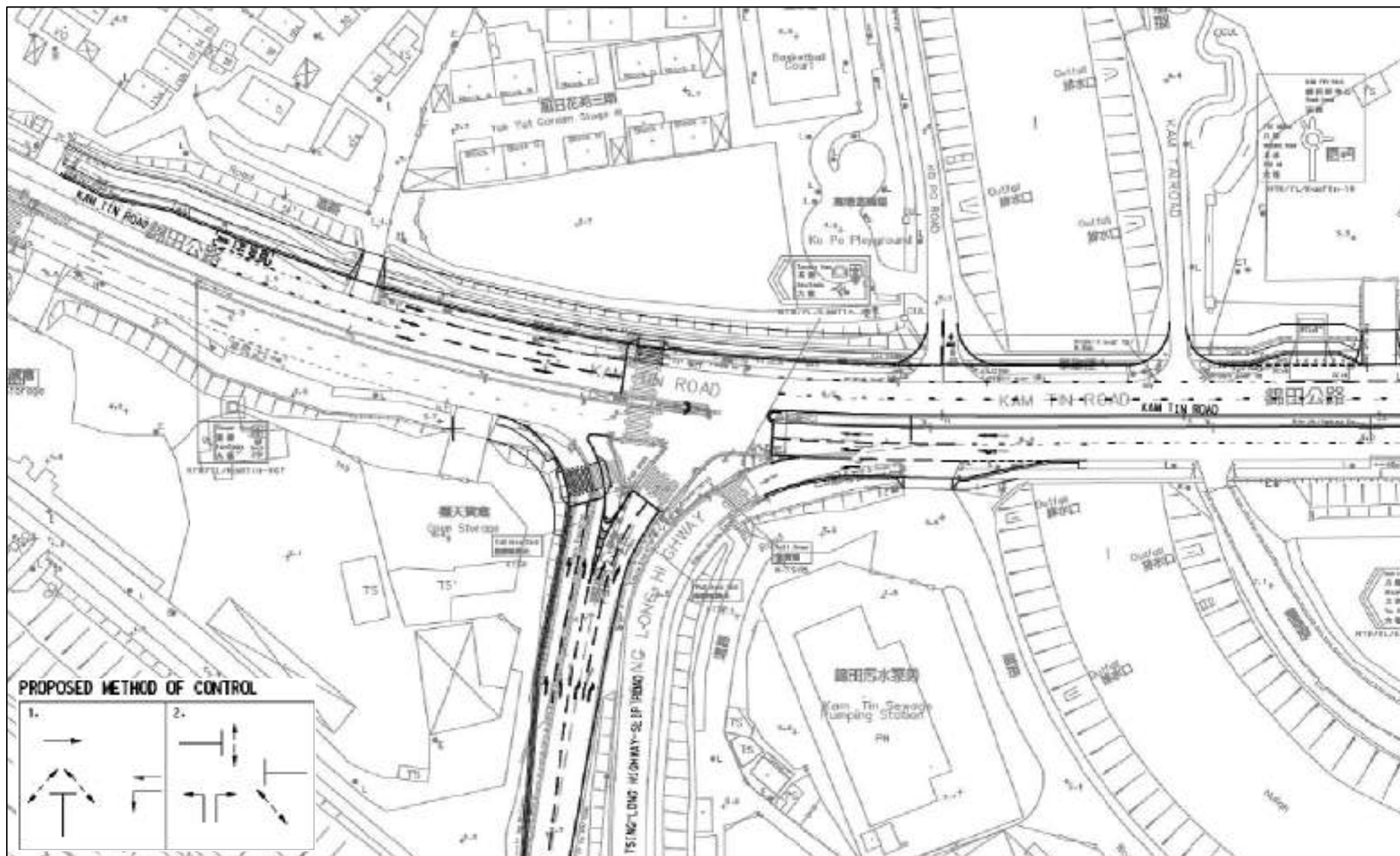
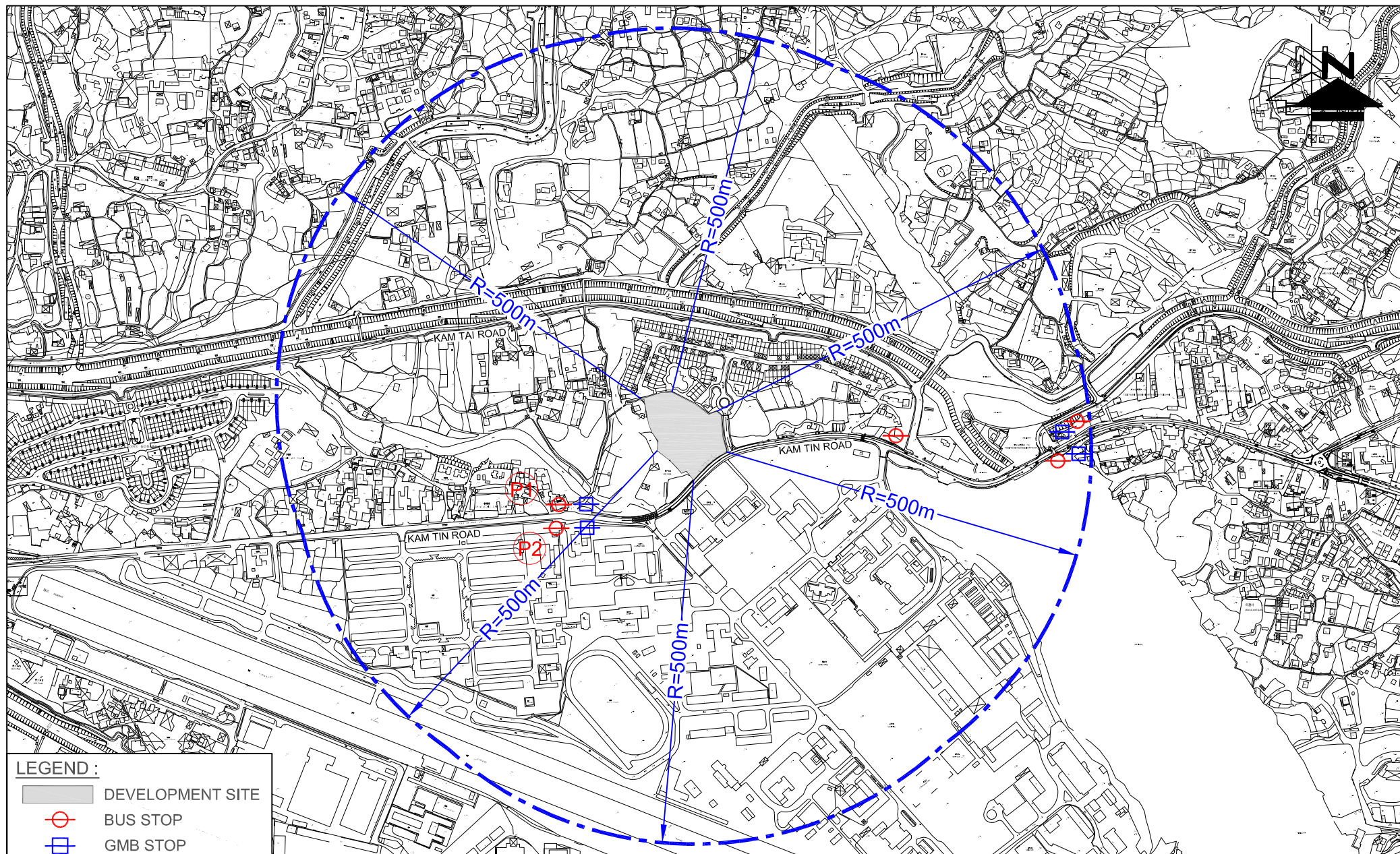


FIGURE NO.: 3.13	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	 CTA Consultants Limited 志達顧問有限公司
PROJECT NO.: 25009HK	DRAWING TITLE: FUTURE JUNCTION LAYOUT OF KAM TIN ROAD / TSING LONG HIGHWAY SLIP ROAD (F) (CARRIED OUT BY CEDD UNDER CONTRACT NO. YL/2017/01)	
SCALE: N.T.S. @A4	DATE: 01 APR 2025	

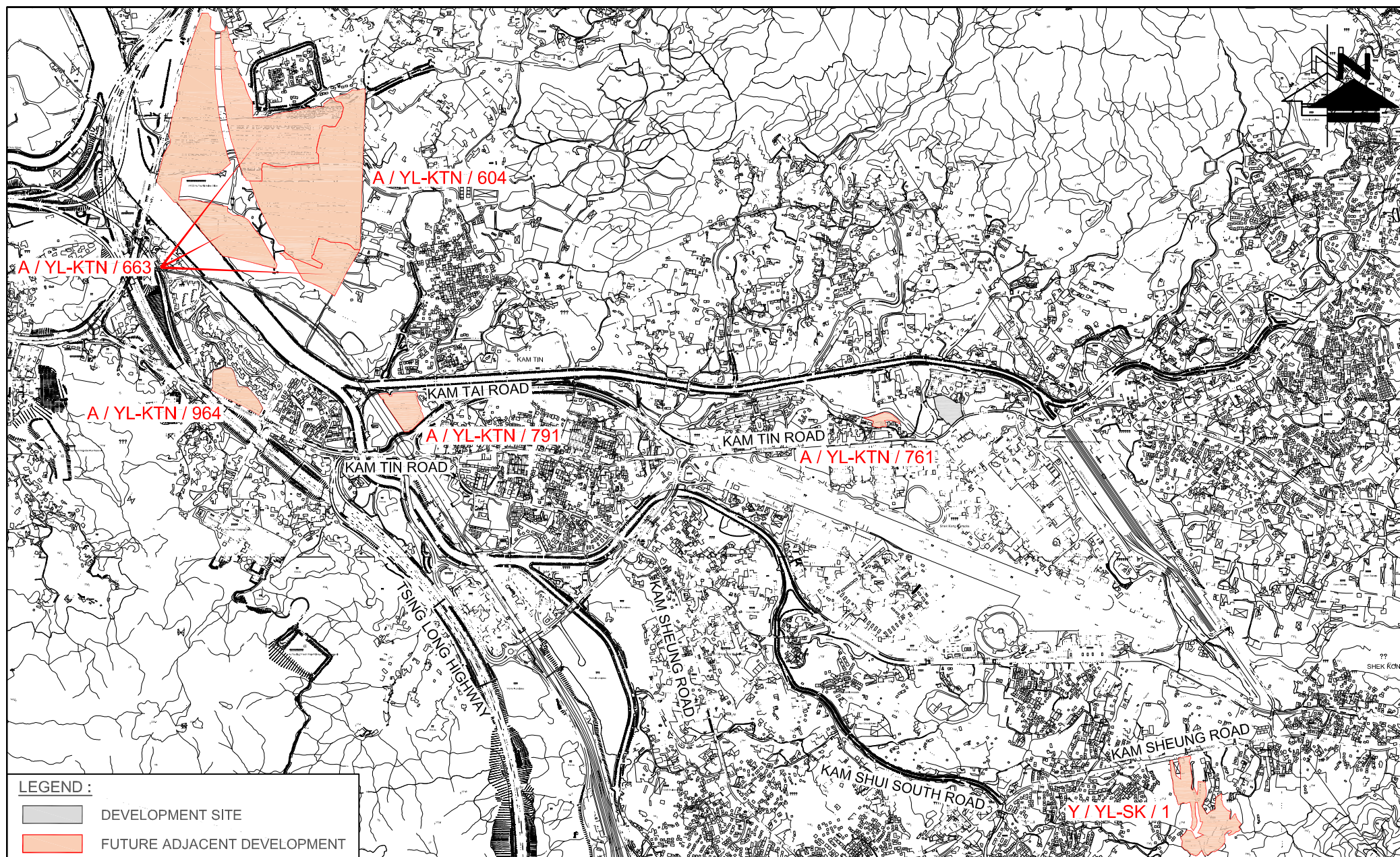


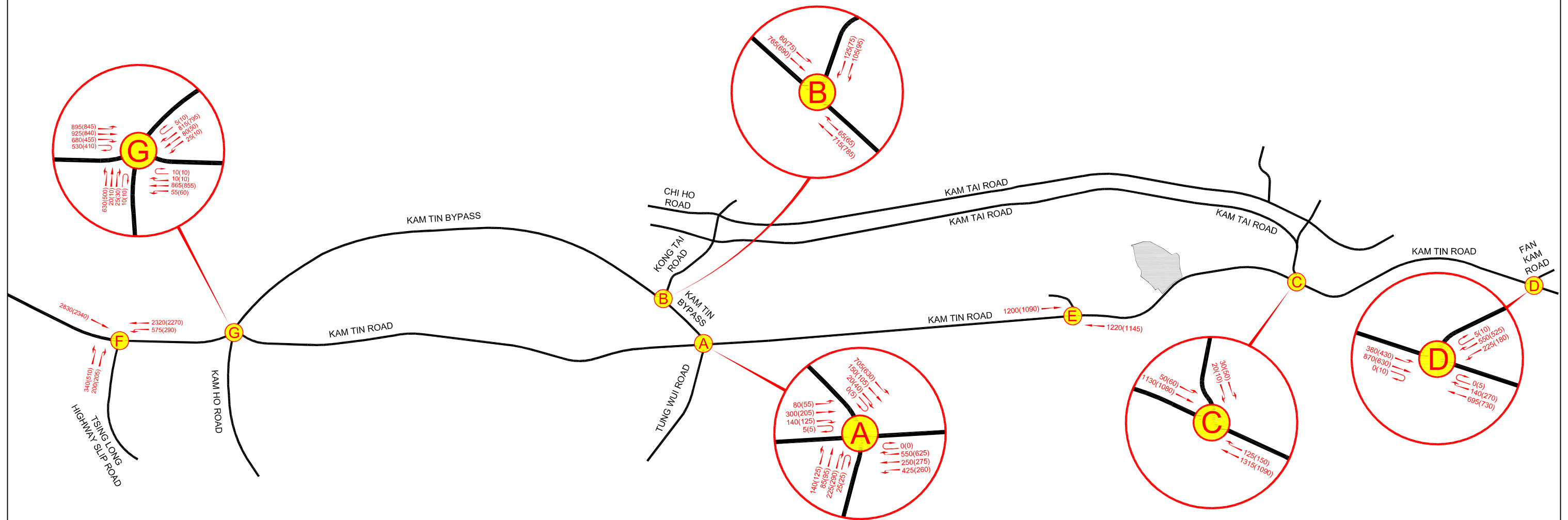
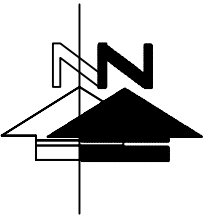
FIGURE NO.: 3.14	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	 CTA Consultants Limited 志達顧問有限公司
PROJECT NO.: 25009HK	DRAWING TITLE: FUTURE JUNCTION LAYOUT OF KAM TIN ROAD / KAM TIN BYPASS / KAM HO ROAD (G) (CARRIED OUT BY CEDD UNDER CONTRACT NO. YL/2017/01)	
SCALE: N.T.S. @A4 DATE: 01 APR 2025		



LEGEND :	
	DEVELOPMENT SITE
	BUS STOP
	GMB STOP

FIGURE NO.: 3.15		PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	
PROJECT NO.: 25009HK		DRAWING TITLE: PUBLIC TRANSPORT SERVICES IN THE VICINITY	
SCALE: 1 : 7000 @A4	DATE: 14 JUL 2025	 CTA Consultants Limited 志達顧問有限公司	





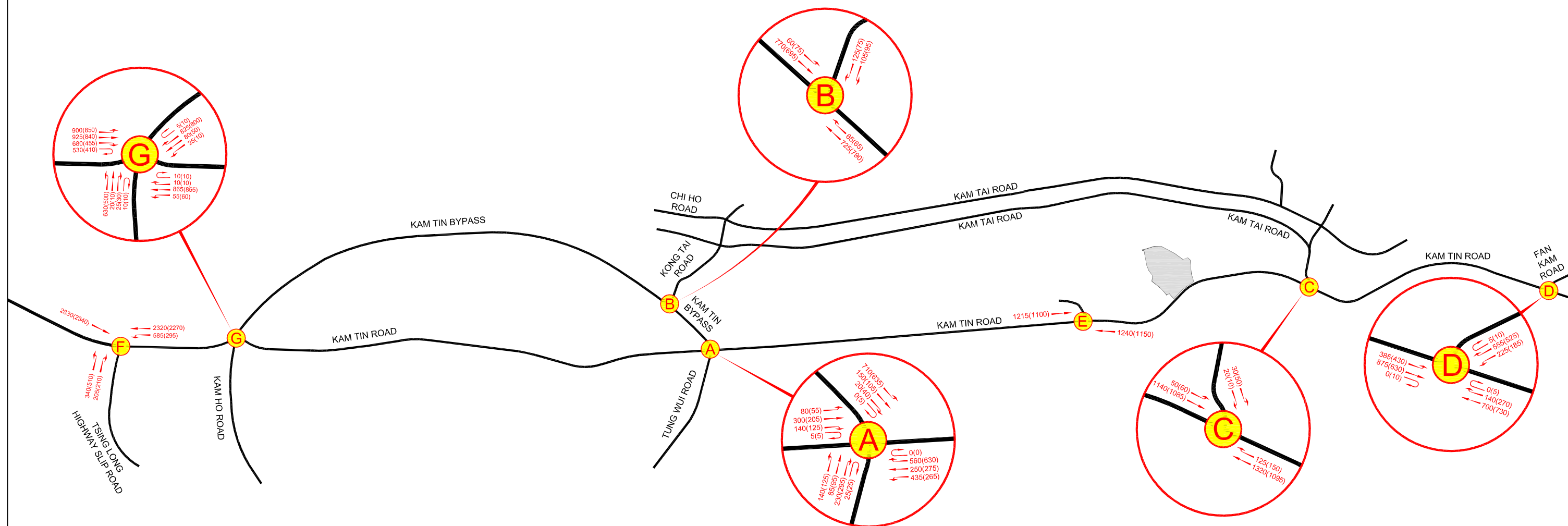
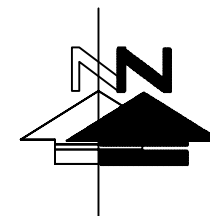
LEGEND :

 DEVELOPMENT SITE

595(540) AM (PM) PEAK HOUR
TRAFFIC FLOW (IN PCU / HR)

FIGURE NO.: 4.2		PROJECT TITLE: Rezoning from “Residential (Group C)2” and “Open Space” zones to “Residential (Group C)4” zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	
PROJECT NO.: 25009HK		DRAWING TITLE: 2034 REFERENCE TRAFFIC FLOWS	
SCALE: N. T. S. @A3	DATE: 14 JUL 2025		

 **CTA Consultants Limited**
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LEGEND :

-  DEVELOPMENT SITE
-  AM (PM) PEAK HOUR TRAFFIC FLOW (IN PCU / HR)

FIGURE NO.:

4.3

PROJECT TITLE:

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

PROJECT NO.:

25009HK

DRAWING TITLE:

2034 DESIGN TRAFFIC FLOWS

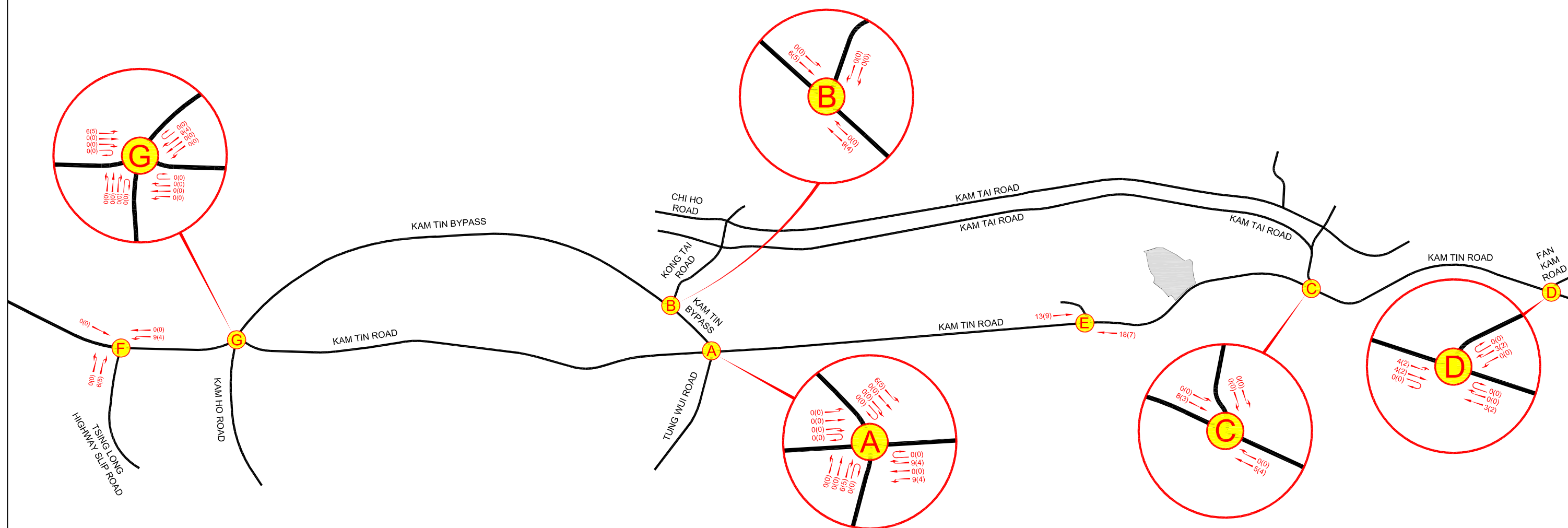
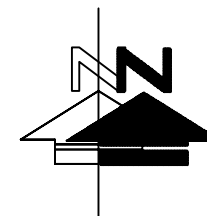
SCALE:

N. T. S. @A3

DATE:

15 JUL 2025

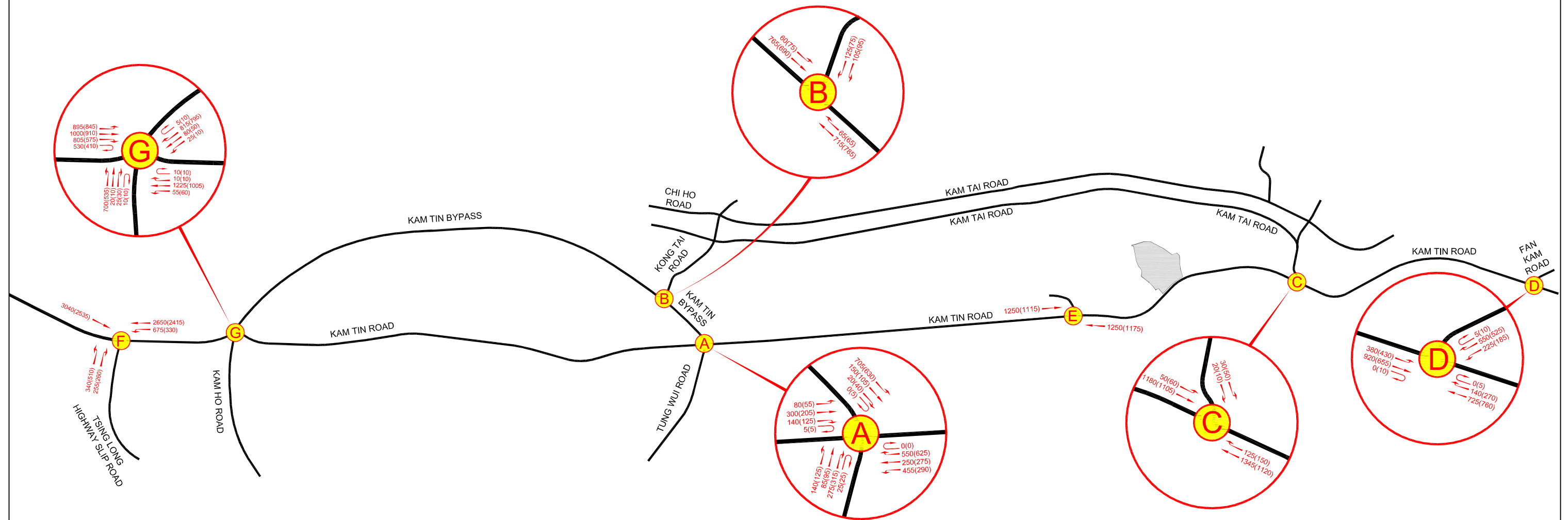
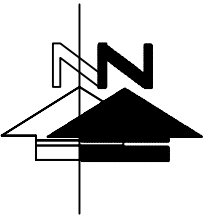
 CTA Consultants Limited
志達顧問有限公司



LEGEND :

	DEVELOPMENT SITE
595(540)	AM (PM) PEAK HOUR TRAFFIC FLOW (IN PCU / HR)

FIGURE NO.: 4.4		PROJECT TITLE: Rezoning from “Residential (Group C)2” and “Open Space” zones to “Residential (Group C)4” zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	
PROJECT NO.: 25009HK		DRAWING TITLE: 2034 DEVELOPMENT TRAFFIC FLOWS	
SCALE: N. T. S. @A3	DATE: 15 JUL 2025		



LEGEND :

-  DEVELOPMENT SITE
- 595(540)** AM (PM) PEAK HOUR TRAFFIC FLOW (IN PCU / HR)

FIGURE NO.:

4.5

PROJECT TITLE:

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

PROJECT NO.:

25009HK

DRAWING TITLE:

**2034 REFERENCE TRAFFIC FLOWS
(WITH REMAINING SITES OF LUR)**

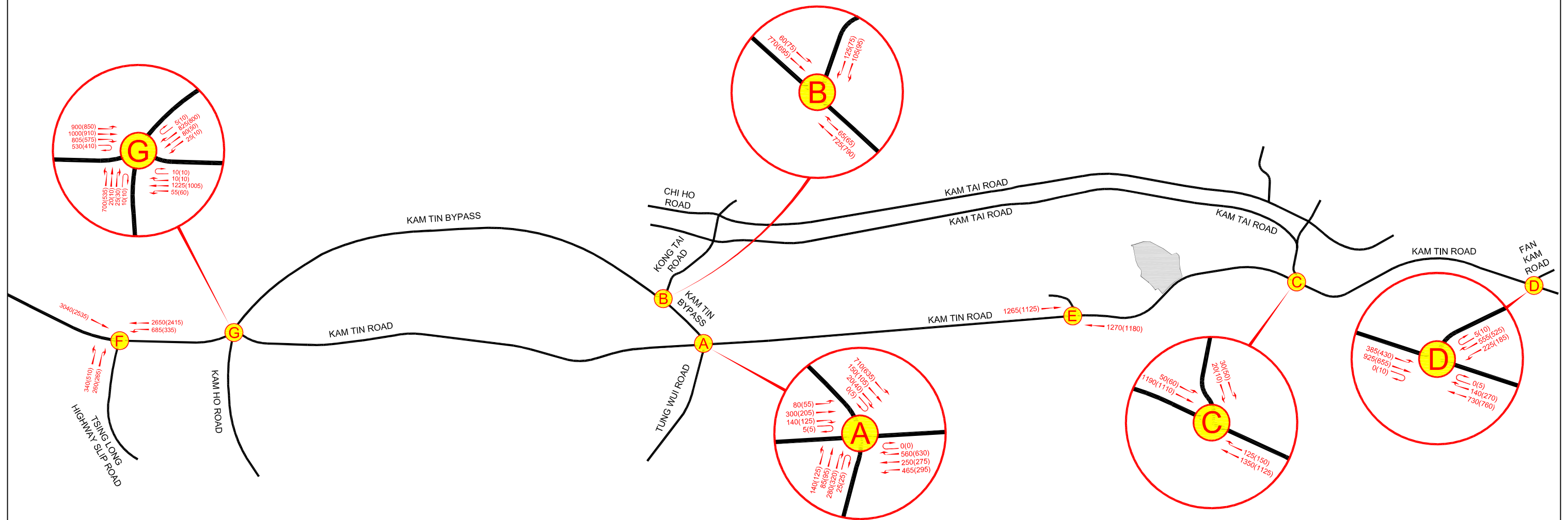
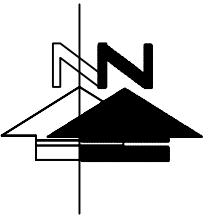
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DATE:

14 JUL 2025

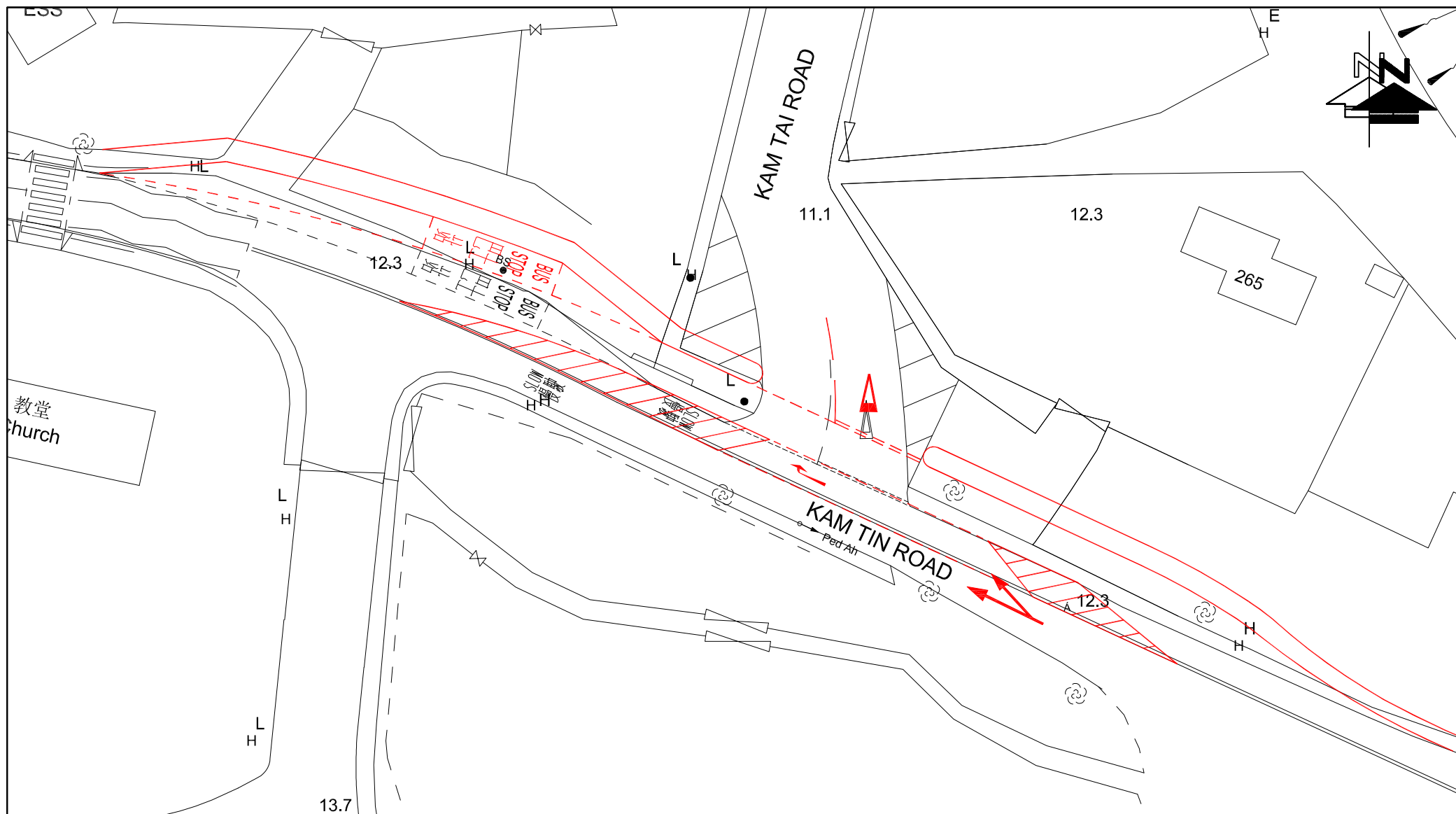
CTA Consultants Limited
志達顧問有限公司



LEGEND :

-  DEVELOPMENT SITE
- 595(540)** AM (PM) PEAK HOUR TRAFFIC FLOW (IN PCU / HR)

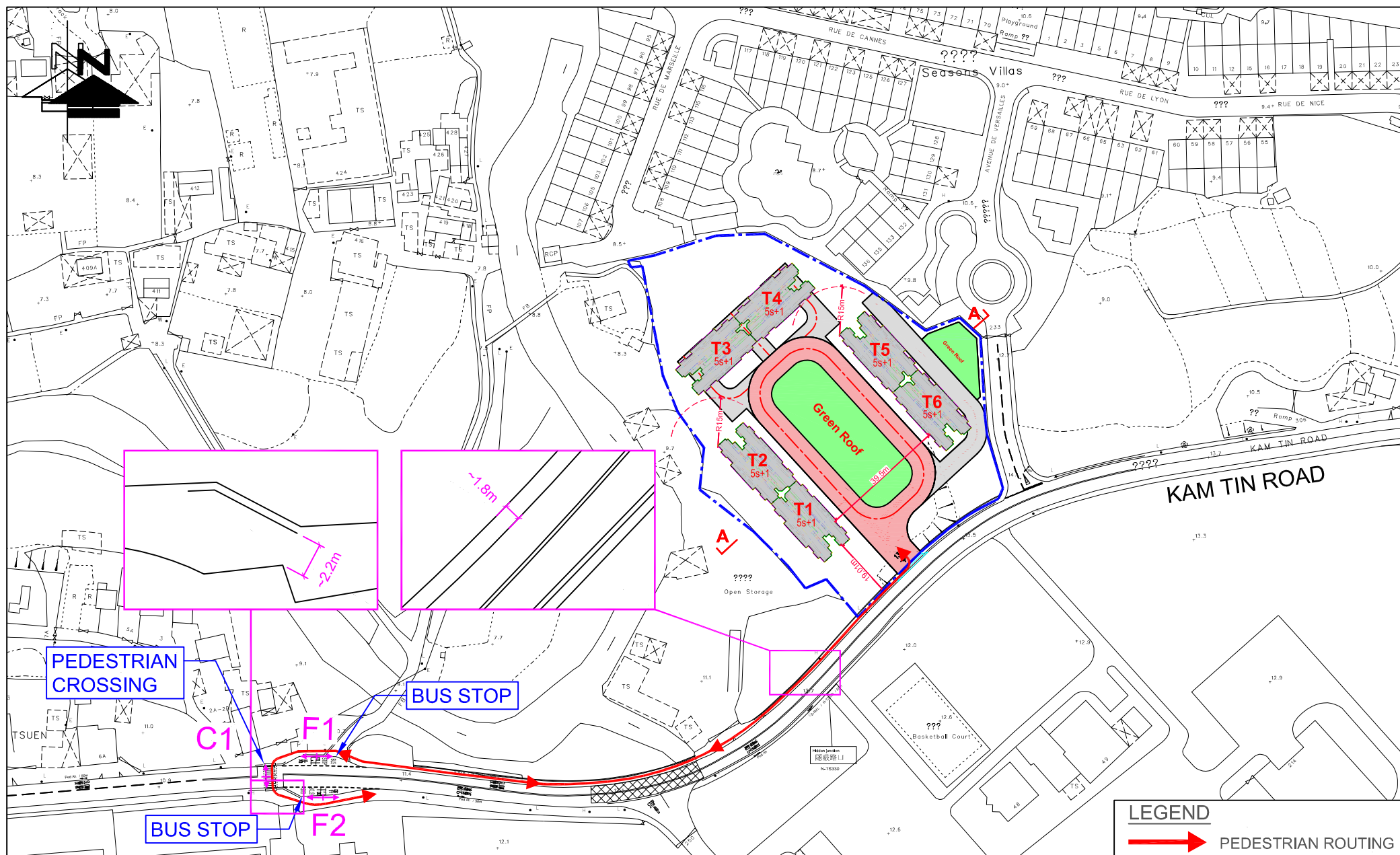
FIGURE NO.: 4.6		PROJECT TITLE: Rezoning from “Residential (Group C)2” and “Open Space” zones to “Residential (Group C)4” zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	
PROJECT NO.: 25009HK		DRAWING TITLE: 2034 DESIGN TRAFFIC FLOWS (WITH REMAINING SITES OF LUR)	
SCALE: N. T. S. @A3	DATE: 15 JUL 2025		



LEGEND :

— PROPOSED IMPROVEMENT BY THE APPLICANT

FIGURE NO.: 5.1	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	 CTA Consultants Limited 志達顧問有限公司
PROJECT NO.: 25009HK	DRAWING TITLE: PROPOSED IMPROVEMENT LAYOUT OF JUNCTION KAM TIN ROAD / KAM TAI ROAD (C)	
SCALE: 1 : 500 @A4	DATE: 04 FEB 2026	



LEGEND

→ PEDESTRIAN ROUTING

FIGURE NO.: 7.1	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	 CTA Consultants Limited 志達顧問有限公司
PROJECT NO.: 25009HK	DRAWING TITLE: CRITICAL FOOTPATH AND CROSSING (WITHOUT KAM TIN ROAD WIDENING)	
SCALE: 1 : 1600 @A4	DATE: 05 FEB 2026	

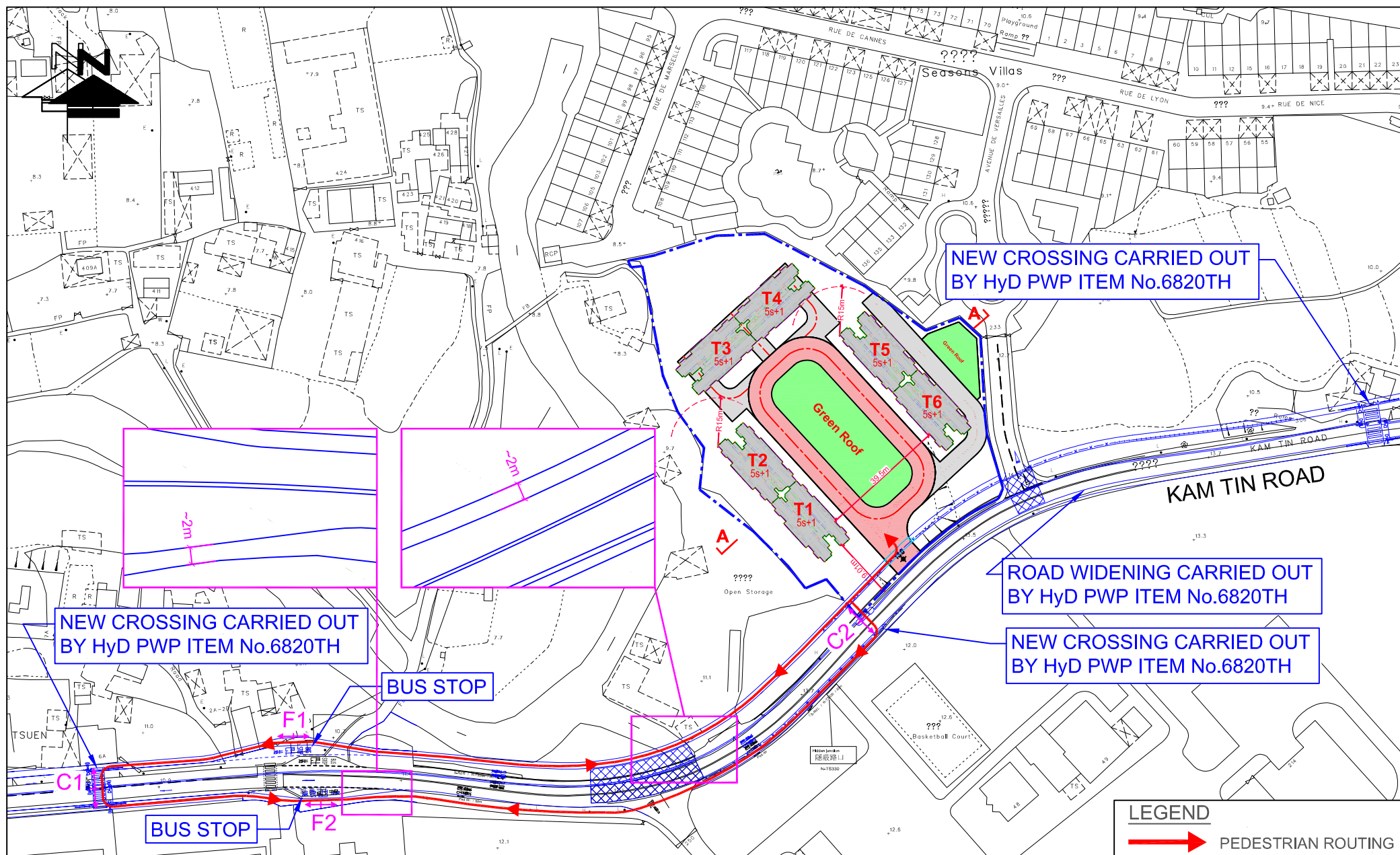


FIGURE NO.: 7.2	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	 CTA Consultants Limited 志達顧問有限公司
PROJECT NO.: 25009HK	DRAWING TITLE: CRITICAL FOOTPATH AND CROSSING (WITH KAM TIN ROAD WIDENING)	
SCALE: 1 : 1600 @A4	DATE: 05 FEB 2026	

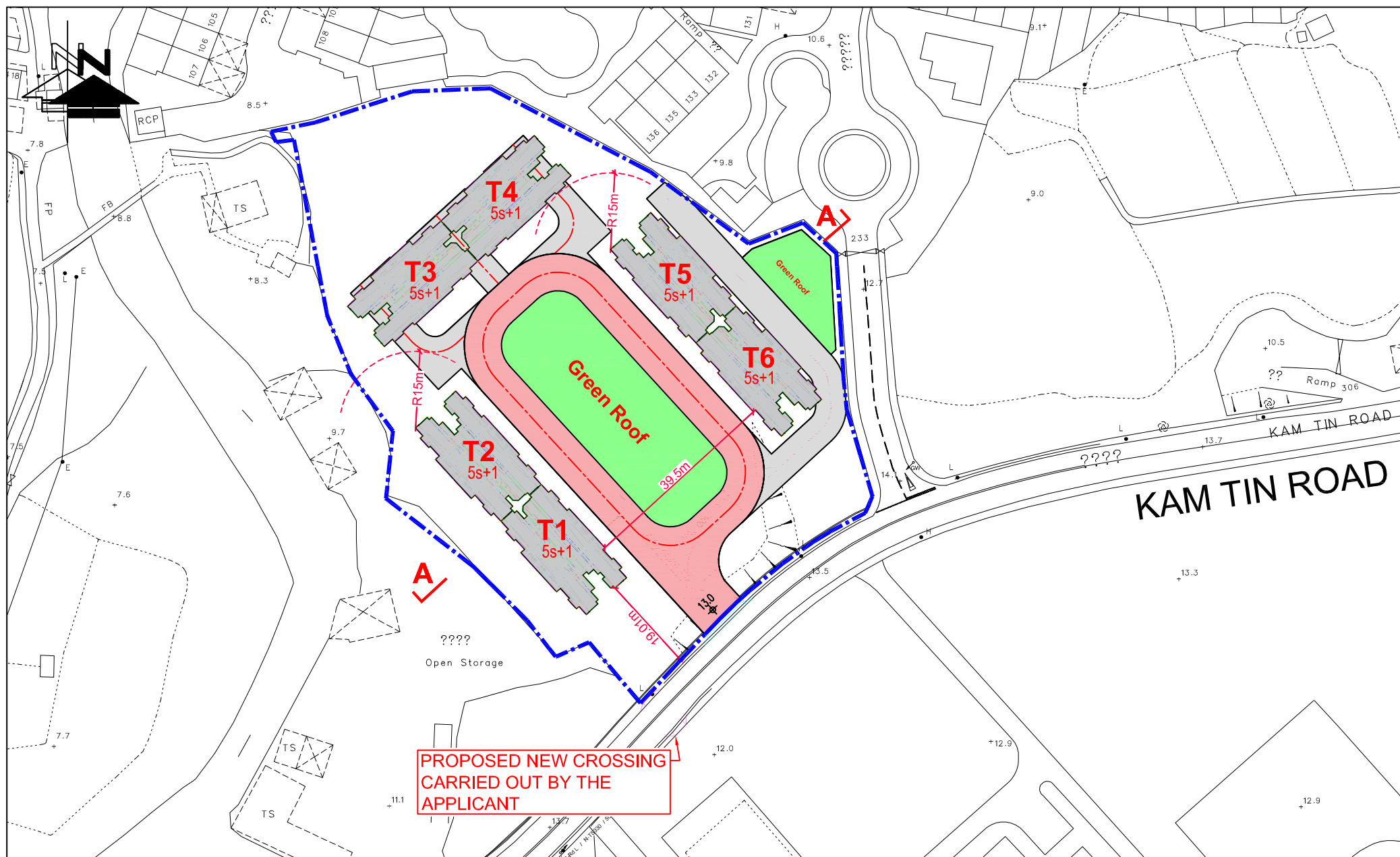
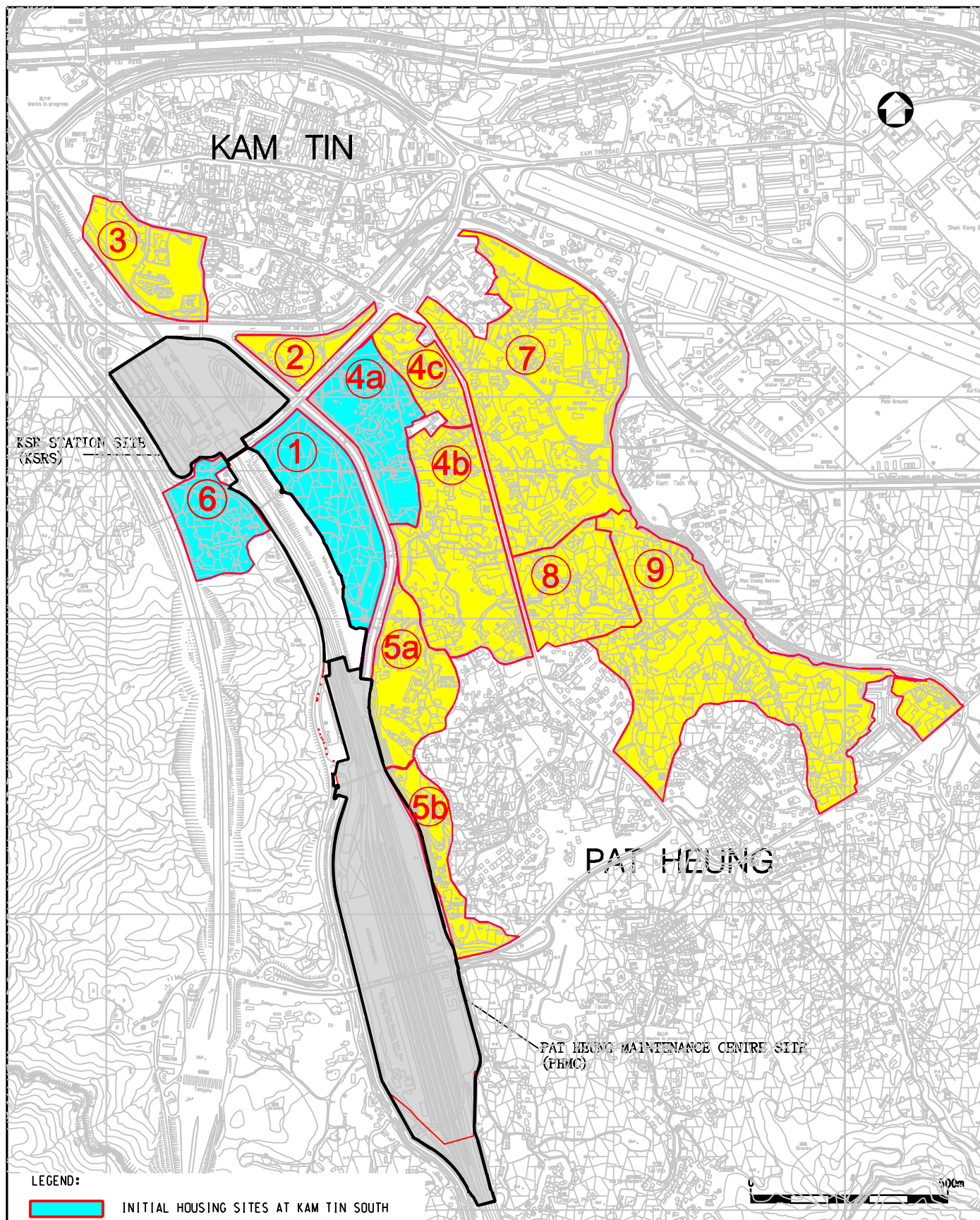


FIGURE NO.: 7.3		PROJECT TITLE: Rezoning from “Residential (Group C)2” and “Open Space” zones to “Residential (Group C)4” zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	 CTA Consultants Limited 志達顧問有限公司
PROJECT NO.: 25009HK		DRAWING TITLE: PROPOSED PEDESTRIAN CROSSING (PRIOR TO PWP'S WORKS)	
SCALE: 1 : 1000 @A4	DATE: 05 FEB 2026		



Appendix I

Kam Tin South Housing Development **– Layout Plan**



LEGEND:



INITIAL HOUSING SITES AT KAM TIN SOUTH



REMAINING HOUSING SITES AT KAM TIN SOUTH

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

修訂 REVISION

繪圖 drawn	簽署 initial	日期 date	項目編號 item no.	辦事處 office
S M CHU	SIGNED	18.10.13		新界西拓展處 NEW TERRITORIES WEST DEVELOPMENT OFFICE
核對 checked	簽署 initial	日期 date	比例 scale	
H S KO	SIGNED	18.10.13	AS SHOWN	
核准 approved	簽署 initial	日期 date	圖則編號 drawing no.	土木工程拓展署 CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
K L CHEUNG	SIGNED	18.10.13	NTNZ1855A	

圖則名稱 drawing title
KAM TIN SOUTH HOUSING DEVELOPMENT
-LAYOUT PLAN



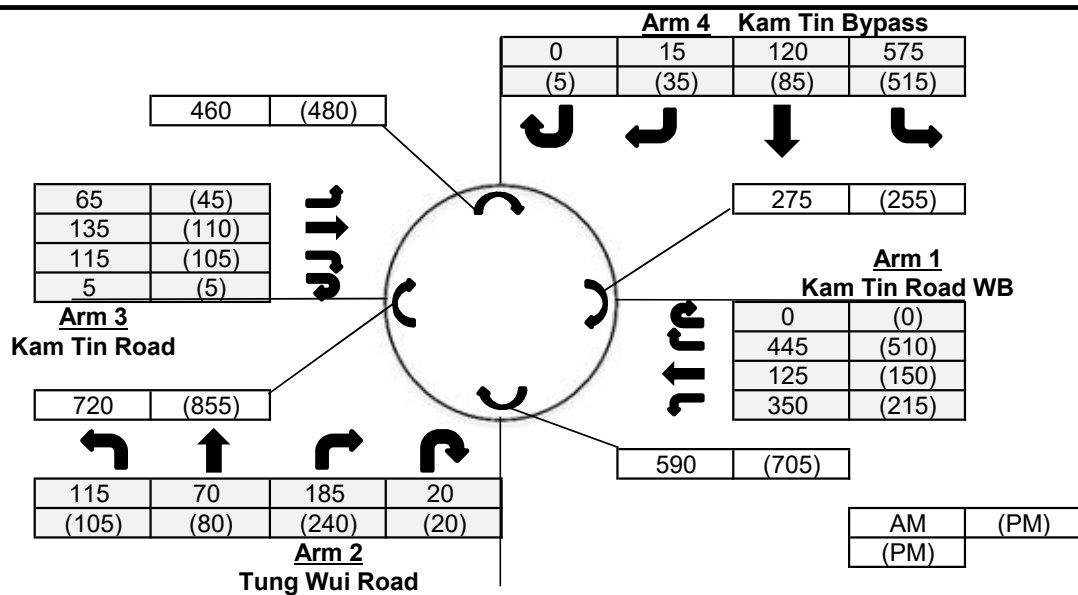
Appendix II

Junction Calculation Sheets

Roundabout Junction Calculation

Junction : (A) Kam Tin Bypass / Kam Tin Road / Tung Wui Road Job No.: 25009HK

Scenario : 2025 Observed Traffic Flows



Input Parameters

			Arm 1	Arm 2	Arm 3	Arm 4
V	=	Approach half width (m)	7.3	7.2	3.6	7.3
E	=	Entry width (m)	11.5	10.1	11.8	13.5
L	=	Effective length of flare (m)	12.6	9.4	14	12.5
R	=	Entry radius	26	20	18.4	36
D	=	Inscribed circle diameter (m)	64	64	64	64
A	=	Entry angle (degree)	42	27	45	23
Q	=	Entry flow (pcu/hr)	AM 920	390	320	710
			PM 875	445	265	640
Qc	=	Circulating flow across entry	AM 275	590	720	460
			PM 255	705	855	480

Output Parameters

			Arm 1	Arm 2	Arm 3	Arm 4
S	=	Sharpness of flare = $1.6 \cdot (E-V)/L$	0.53	0.49	0.94	0.79
K	=	$1 - 0.00347 \cdot (A-30) - 0.978 \cdot (1/R - 0.05)$	0.97	1.01	0.94	1.05
X ₂	=	$V + ((E-V)/(1+2 \cdot S))$	9.33	8.66	6.45	9.70
M	=	$\exp((D-60)/10)$	1.49	1.49	1.49	1.49
F	=	$303 \cdot X_2$	2828	2624	1955	2938
T _d	=	$1 + (0.5/(1+M))$	1.20	1.20	1.20	1.20
F _c	=	$0.21 \cdot T_d \cdot (1 + 0.2 \cdot X_2)$	0.72	0.69	0.58	0.74
Q _e	=	Capacity = $K \cdot (F - F_c \cdot Q_c)$	AM 2549	2240	1453	2717
			PM 2563	2160	1379	2701
DFC	=	Entry Flow/Capacity = Q/Q_e	AM 0.36	0.17	0.22	0.26
			PM 0.34	0.21	0.19	0.24

DFC of Critical Approach = AM 0.36
PM 0.34

TRAFFIC SIGNALS CALCULATION										Job No: 25009HK										CTA Consultants Ltd.																			
Junction: (B) Kam Tin Bypass / Kong Tai Road																																							
Description: 2025 Observed 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 Tin Bypass	W	↗	C	2	3.0	0	15	0	100%	100%	2055	2055	1870	1870	1870	1870	55	0.029		55	0.029																		
	W	↖	B	1,2	3.5	0	0	0	0%	0%	2105	0	2105	2105	0	0	315	0.149		347	0.165																		
	W	↖	B	1,2	3.0	0	0	1	0%	0%	1775	3880	1775	1775	3880	3880	265	0.149		293	0.165																		
Kam Tin Bypass	E	↘	A	1	3.0	13	0	1	15%	20%	1915	3970	1880	1870	3935	3925	323	0.172	0.172	295	0.158	0.158																	
	E	↘	A	1	3.0	0	0	0	0%	0%	2055	0	2055	2055	0	0	352	0.171		325	0.158																		
Kong To Road	S	⬇	D	3	3.5	10	12	1	45% / 55%	57% / 43%	1461	1461	1285	1280	1285	1280	190	0.148	0.148	140	0.109	0.109																	
Pedestrian crossing	↔	Ep	4	Min. Crossing Time = 12GM + 15FGM = 27s																																			
	↔	Fp	2,3,4	Min. Crossing Time = 7GM + 7FGM = 14s																																			
	↔	Gp	4	Min. Crossing Time = 7GM + 7FGM = 14s																																			
Notes:										Traffic Flow (pcu / hr)										A.M. Check Phase					P.M. Check Phase														
										105(60) 85(80) 50(60) 625(560) 55(55) 580(640)										Ey 0.319 L (sec) 47 C (sec) 108 y pract. 0.508 R.C. (%) 59%					Ey 0.267 L (sec) 47 C (sec) 108 y pract. 0.508 R.C. (%) 90%														
Stage/Phase Diagram:																																							
I/G=3s										I/G=6s + 5s										I/G=5s										I/G=4s (Min. Green Time for Ep=27s)									

Priority Junction Calculation

Junction :	(C) Kam Tin Road / Kam Tai Road	Job No.:	25009HK
Scenario :	2025 Observed Traffic Flows		

Arm B Kam Tai Road

15	25
(10)	(40)

Arm A Kam Tin Road EB **Arm C Kam Tin Road WB**

AM	(PM)
(PM)	

The predictive equations of capacity of movement are:

$$Q-BA = D(627 + 14W-CR - Y(0.364q-AC + 0.144q-AB + 0.229q-CA + 0.52q-CB))$$

$$Q-BC = E(745 - Y(0.364q-AC + 0.144q-AB))$$

$$Q-CB = F(745 - 0.364Y(q-AC + q-AB))$$

The geometric parameters represented by D, E, F are:

$$D = (1 + 0.094(w-BA - 3.65))(1 + 0.0009(V-rBA - 120))(1 + 0.0006(V-IBA - 150))$$

$$E = (1 + 0.094(w-BC - 3.65))(1 + 0.0009(V-rBC - 120))$$

$$F = (1 + 0.094(w-CB - 3.65))(1 + 0.0009(V-rCB - 120))$$

where

Y = 1 - 0.0345W

q-AB, etc = the design flow of movement AB, etc

W = major road width

W-CR = central reserve width

w-BA, etc = lane width to vehicle

v-rBA, etc = visibility to the right for waiting vehicles in stream BA, etc

v-IBA = visibility to the left for waiting vehicles in stream BA, etc

Geometry :	Input	Calculated
	W <u>7</u>	D <u>0.968</u>
	W-CR <u>0</u>	E <u>1.029</u>
C-B blocked C-A, residual width <2.5m? (Yes: 1, No: 0)	<u>1</u>	F <u>0.924</u>
Minor Road Share LT&RT? (Yes: 1, No: 0)	<u>1</u>	Y <u>0.759</u>

Analysis :	Traffic Flow pcu/hr	AM	PM	Capacity pcu/hr	AM	PM
q-CA	995	815	Q-BA	177	196	
q-CB	105	125	Q-BC	531	527	
q-AB	40	50	Q-CB	470	465	
q-AC	815	825	Q-CA	1398	1316	(If C-B blocked C-A)
q-BA	15	10	Q-BAC	304	394	(If Minor Road Share LT&RT)
q-BC	25	40				
f	0.625	0.800				

Results :	Ratio of Flow-to-Capacity	AM	PM
	B-A	N/A	N/A
	B-C	N/A	N/A
	C-B	0.22	0.27
	C-A	0.71	0.62
	B-AC	0.13	0.13

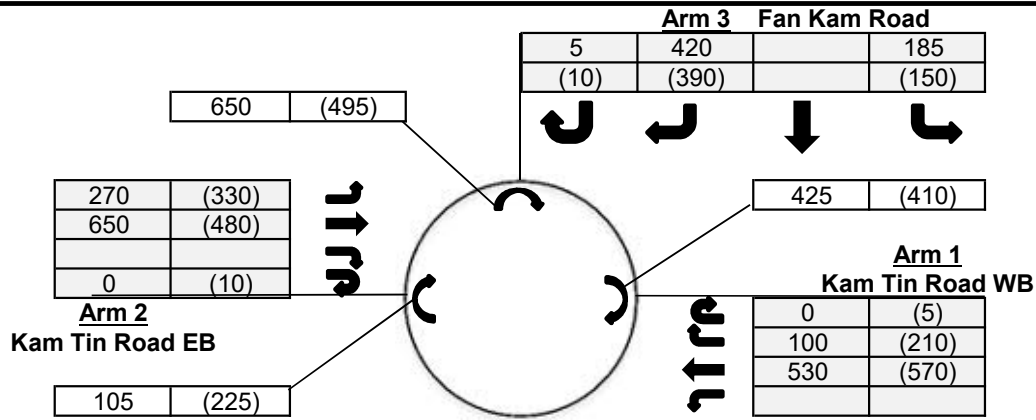
Critical DFC	0.71	0.62
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CTA Consultants Ltd.

Roundabout Junction Calculation

Junction : (D) Kam Tin Road / Fan Kam Road Job No.: 25009HK

Scenario : 2025 Observed Traffic Flows



AM	(PM)
(PM)	

Input Parameters

			Arm 1	Arm 2	Arm 3
V	=	Approach half width (m)	3	7	3
E	=	Entry width (m)	8	8	5.9
L	=	Effective length of flare (m)	7.8	12	10
R	=	Entry radius	100	33	13.4
D	=	Inscribed circle diameter (m)	20	20	20
A	=	Entry angle (degree)	30	10	15
Q	=	Entry flow (pcu/hr)			
		AM	630	920	610
		PM	785	820	550
Qc	=	Circulating flow across entry			
		AM	425	105	650
		PM	410	225	495

Output Parameters

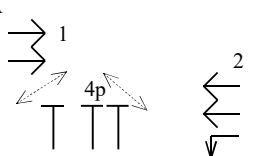
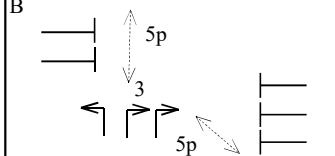
			Arm 1	Arm 2	Arm 3
S	=	Sharpness of flare = $1.6*(E-V)/L$	1.03	0.13	0.46
K	=	$1-0.00347*(A-30)-0.978*(1/R-0.05)$	1.04	1.09	1.03
X2	=	$V+((E-V)/(1+2*S))$	4.64	7.79	4.50
M	=	$\text{Exp}((D-60)/10)$	0.02	0.02	0.02
F	=	$303*X2$	1406	2360	1365
Td	=	$1+(0.5/(1+M))$	1.49	1.49	1.49
Fc	=	$0.21*Td*(1+0.2*X2)$	0.60	0.80	0.60
Qe	=	Capacity = $K*(F-Fc*Qc)$			
		AM	1194	2478	1005
		PM	1203	2373	1100
DFC	=	Entry Flow/Capacity = Q/Qe			
		AM	0.53	0.37	0.61
		PM	0.65	0.35	0.50

DFC of Critical Approach = AM 0.61
PM 0.65

CTA Consultants Ltd.

CTA Consultants Ltd.Description: **2025 Observed Traffic Flows**

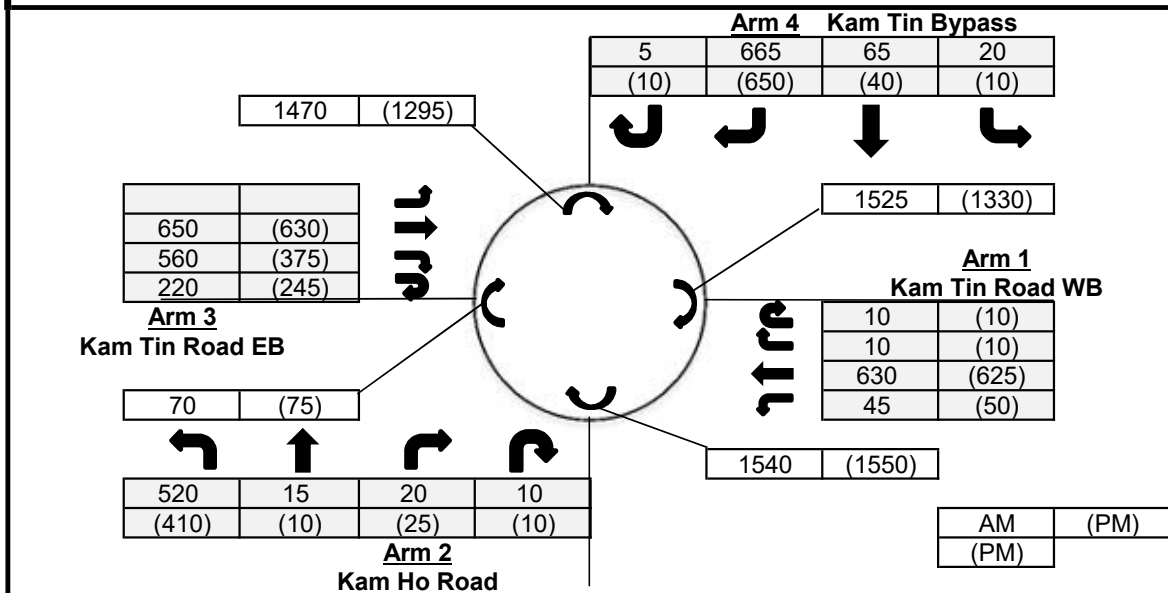
Approach	Direction	Movement notation	Phase	Stage	Width (m)	Radius (m)		Nearside 0/1	Pro. Turning (%)		Saturation Flow (pcu/hr)	Total Saturation Flow (pcu/hr)	Revised Saturation Flow (pcu/hr)		Total Revised Saturation Flow (pcu/hr)		A.M. Peak			P.M. Peak		
						Left	Right		A.M.	P.M.			A.M.	P.M.	A.M.	P.M.	Flow (pcu/hr)	y Value	Critical y	Flow (pcu/hr)	y Value	Critical y
Kam Tin Road	W	←	A	1	3.4	0	0	1	0%	0%	1955	1955	1955	1955	1955	1955	915	0.468	0.468	860	0.440	0.440
Kam Tin Road	E	→	A	1	3.4	0	0	1	0%	0%	1955	1955	1955	1955	1955	1955	870	0.445		830	0.425	
Pedestrian crossing ↔ Bp 2 Min. Crossing Time = 5GM + 7FGM = 12s																						
Notes:									Traffic Flow (pcu / hr)								A.M. Check Phase			P.M. Check Phase		
									870(830) →													

Junction: (F) Kam Tin Road / Tsing Long Highway Slip Road																			
Description: 2025 Observed Traffic Flows (With TTA)																			
Approach	Direction	Movement notation	Phase	Stage	Width (m)	Radius (m)		Nearside 0/1	Pro. Turning (%)		Revised Saturation Flow (pcu/hr)		A.M. Peak			P.M. Peak			
						Left	Right		A.M.	P.M.	A.M.	P.M.	Flow (pcu/hr)	y Value	Critical y	Flow (pcu/hr)	y Value	Critical y	
Kam Tin Road	E	→	1	A	3.65	0	0	1	0%	0%	1980	1980	1012	0.511	0.511	881	0.445		
	E	→	1	A	3.65	0	0	0	0%	0%	2120	2120	1083	0.511		944	0.445		
Kam Tin Road	W	←	2	A	3.80	0	0	0	0%	0%	2135	2135	865	0.405		895	0.419		
	W	←	2	A	3.80	0	0	0	0%	0%	2135	2135	865	0.405		895	0.419		
	W	↙	2	A	5.00	15	0	1	100%	100%	1925	1925	345	0.179		140	0.073		
Tsing Long Highway Slip Road	N	↖	3	B	5.60	25	0	1	100%	100%	2050	2050	155	0.076	0.108	315	0.154		
	N	→	3	B	3.60	0	30	0	100%	100%	525	525	57	0.108		96	0.183		
	N	→	3	B	3.50	0	28	0	100%	100%	75	75	8	0.108		14	0.183		
(*revised saturation flow)																			
*Pedestrian Crossing			4p	A	Min. Crossing Time				=	7 Gm + 7 Fm = 14s									
			5p	B	Min. Crossing Time				=	7 Gm + 7 Fm = 14s									
Notes:						Traffic Flow (pcu / hr)						[AM (PM)]		Check Phase			Check Phase		
						2095(1825)→ ↖ ↗ 155(315) 65(110) ↙ ↘ 1730(1790) 345(140)						εy	0.619	εy	0.628				
												L (sec)	15	L (sec)	15				
												C (sec)	96	C (sec)	106				
												y pract.	0.759	y pract.	0.773				
												R.C. (%)	23%	R.C. (%)	23%				
Stage / Phase Diagrams																			
A			B																
																			
I/G = 7			I/G = 10																

Roundabout Junction Calculation

Junction : (G) Kam Tin Road / Kam Tin Bypass Job No.: 25009HK

Scenario : 2025 Observed Traffic Flows



Input Parameters

Input Parameters			Arm 1	Arm 2	Arm 3	Arm 4	
V	=	Approach half width (m)	3.5	5	7.3	6.5	
E	=	Entry width (m)	12	10	11	11	
L	=	Effective length of flare (m)	13	9.5	13	15	
R	=	Entry radius	100	20	42.5	42.5	
D	=	Inscribed circle diameter (m)	88	88	88	88	
A	=	Entry angle (degree)	23	38	29	39	
Q	=	Entry flow (pcu/hr)	AM	695	565	1430	755
			PM	695	455	1250	710
Qc	=	Circulating flow across entry	AM	1525	1540	70	1470
			PM	1330	1550	75	1295

Output Parameters

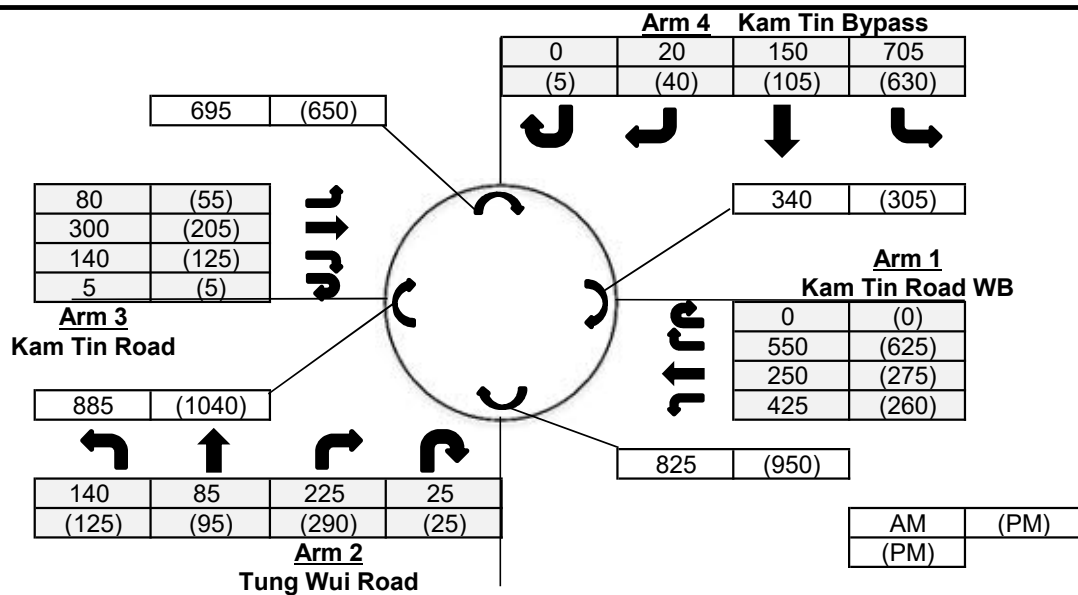
Output Parameters			Arm 1	Arm 2	Arm 3	Arm 4
S	=	Sharpness of flare = 1.6*(E-V)/L	1.05	0.84	0.46	0.48
K	=	1-0.00347*(A-30)-0.978*(1/R-0.05)	1.06	0.97	1.03	0.99
X2	=	V+((E-V)/(1+2*S))	6.25	6.86	9.24	8.80
M	=	Exp((D-60)/10)	16.44	16.44	16.44	16.44
F	=	303*X2	1893	2079	2799	2665
Td	=	1+(0.5/(1+M))	1.03	1.03	1.03	1.03
Fc	=	0.21*Td*(1+0.2*X2)	0.49	0.51	0.62	0.60
Qe	=	Capacity = K*(F-Fc*Qc)	AM	1225	1254	2836
			PM	1326	1249	2833
DFC	=	Entry Flow/Capacity = Q/Qe	AM	0.57	0.45	0.50
			PM	0.52	0.36	0.44

DFC of Critical Approach = AM 0.57
PM 0.52

Roundabout Junction Calculation

Junction : (A) Kam Tin Bypass / Kam Tin Road / Tung Wui Road Job No.: 25009HK

Scenario : 2034 Reference Traffic Flows



Input Parameters

			Arm 1	Arm 2	Arm 3	Arm 4
V	=	Approach half width (m)	7.3	7.2	3.6	7.3
E	=	Entry width (m)	11.5	10.1	11.8	13.5
L	=	Effective length of flare (m)	12.6	9.4	14	12.5
R	=	Entry radius	26	20	18.4	36
D	=	Inscribed circle diameter (m)	64	64	64	64
A	=	Entry angle (degree)	42	27	45	23
Q	=	Entry flow (pcu/hr)				
		AM	1225	475	525	875
		PM	1160	535	390	780
Qc	=	Circulating flow across entry				
		AM	340	825	885	695
		PM	305	950	1040	650

Output Parameters

			Arm 1	Arm 2	Arm 3	Arm 4
S	=	Sharpness of flare = $1.6 \cdot (E-V)/L$	0.53	0.49	0.94	0.79
K	=	$1 - 0.00347 \cdot (A-30) - 0.978 \cdot (1/R - 0.05)$	0.97	1.01	0.94	1.05
X ₂	=	$V + ((E-V)/(1+2 \cdot S))$	9.33	8.66	6.45	9.70
M	=	$\text{Exp}((D-60)/10)$	1.49	1.49	1.49	1.49
F	=	$303 \cdot X_2$	2828	2624	1955	2938
T _d	=	$1 + (0.5/(1+M))$	1.20	1.20	1.20	1.20
F _c	=	$0.21 \cdot T_d \cdot (1 + 0.2 \cdot X_2)$	0.72	0.69	0.58	0.74
Q _e	=	Capacity = $K \cdot (F - F_c \cdot Q_c)$				
		AM	2504	2077	1363	2534
		PM	2528	1990	1278	2569
DFC	=	Entry Flow/Capacity = Q/Q_e				
		AM	0.49	0.23	0.39	0.35
		PM	0.46	0.27	0.31	0.30

DFC of Critical Approach = AM 0.49
PM 0.46

Priority Junction Calculation

Junction :	(C) Kam Tin Road / Kam Tai Road	Job No.:	25009HK
Scenario :	2034 Reference Traffic Flows		

Arm B Kam Tai Road

20	30
(10)	(50)

Arm A Kam Tin Road EB **Arm C Kam Tin Road WB**

50	(60)	125	(150)
1130	(1080)	1315	(1090)

AM	(PM)
(PM)	

The predictive equations of capacity of movement are:

$$Q-BA = D(627 + 14W-CR - Y(0.364q-AC + 0.144q-AB + 0.229q-CA + 0.52q-CB))$$

$$Q-BC = E(745 - Y(0.364q-AC + 0.144q-AB))$$

$$Q-CB = F(745 - 0.364Y(q-AC + q-AB))$$

The geometric parameters represented by D, E, F are:

$$D = (1 + 0.094(w-BA - 3.65))(1 + 0.0009(V-rBA - 120))(1 + 0.0006(V-IBA - 150))$$

$$E = (1 + 0.094(w-BC - 3.65))(1 + 0.0009(V-rBC - 120))$$

$$F = (1 + 0.094(w-CB - 3.65))(1 + 0.0009(V-rCB - 120))$$

where

Y = 1 - 0.0345W

q-AB, etc = the design flow of movement AB, etc

W = major road width

W-CR = central reserve width

w-BA, etc = lane width to vehicle

v-rBA, etc = visibility to the right for waiting vehicles in stream BA, etc

v-IBA = visibility to the left for waiting vehicles in stream BA, etc

Geometry :	Input	Calculated
W	7	D 0.968
W-CR	0	E 1.029
C-B blocked C-A, residual width <2.5m? (Yes: 1, No: 0)	1	F 0.924
Minor Road Share LT&RT? (Yes: 1, No: 0)	1	Y 0.759
V-rBA	50	
V-IBA	50	
V-rBC	50	
V-rCB	50	
w-BA	4.7	
w-BC	4.7	
w-CB	3.5	

Analysis :	Traffic Flow pcu/hr	AM	PM	Capacity pcu/hr	AM	PM
q-CA	1315	1090	Q-BA	31	71	
q-CB	125	150	Q-BC	440	453	
q-AB	50	60	Q-CB	387	397	
q-AC	1130	1080	Q-CA	1219	1121	(If C-B blocked C-A)
q-BA	20	10	Q-BAC	70	240	(If Minor Road Share LT&RT)
q-BC	30	50				
f	0.600	0.833				

Results :	Ratio of Flow-to-Capacity	AM	PM
	B-A	N/A	N/A
	B-C	N/A	N/A
	C-B	0.32	0.38
	C-A	1.08	0.97
	B-AC	0.72	0.25
	Critical DFC	1.08	0.97

Priority Junction Calculation

Junction :	(C) Kam Tin Road / Kam Tai Road	Job No.:	25009HK
Scenario :	2034 Reference Traffic Flows (With Planned Improvement)		

Arm B Kam Tai Road

20	30
(10)	(50)

AM	(PM)
(PM)	

Arm A Kam Tin Road EB

50	(60)
1130	(1080)

Arm C Kam Tin Road WB

125	(150)
1315	(1090)

The predictive equations of capacity of movement are:

$$Q-BA = D(627 + 14W-CR - Y(0.364q-AC + 0.144q-AB + 0.229q-CA + 0.52q-CB))$$

$$Q-BC = E(745 - Y(0.364q-AC + 0.144q-AB))$$

$$Q-CB = F(745 - 0.364Y(q-AC + q-AB))$$

The geometric parameters represented by D, E, F are:

$$D = (1 + 0.094(w-BA - 3.65))(1 + 0.0009(V-rBA - 120))(1 + 0.0006(V-IBA - 150))$$

$$E = (1 + 0.094(w-BC - 3.65))(1 + 0.0009(V-rBC - 120))$$

$$F = (1 + 0.094(w-CB - 3.65))(1 + 0.0009(V-rCB - 120))$$

where

Y = 1 - 0.0345W

q-AB, etc = the design flow of movement AB, etc

W = major road width

W-CR = central reserve width

w-BA, etc = lane width to vehicle

v-rBA, etc = visibility to the right for waiting vehicles in stream BA, etc

v-IBA = visibility to the left for waiting vehicles in stream BA, etc

Geometry :	Input	Calculated
	W <u>11</u>	D <u>0.968</u>
	W-CR <u>0</u>	E <u>1.029</u>
C-B blocked C-A, residual width <2.5m? (Yes: 1, No: 0)	<u>0</u>	F <u>1.029</u>
Minor Road Share LT&RT? (Yes: 1, No: 0)	<u>1</u>	Y <u>0.621</u>

Analysis :	Traffic Flow pcu/hr	AM	PM	Capacity pcu/hr	AM	PM
q-CA	1315	1090	Q-BA	136	169	
q-CB	125	150	Q-BC	500	510	
q-AB	50	60	Q-CB	493	502	
q-AC	1130	1080	Q-CA	N/A	N/A	(If C-B blocked C-A)
q-BA	20	10	Q-BAC	241	382	(If Minor Road Share LT&RT)
q-BC	30	50				
f	0.600	0.833				

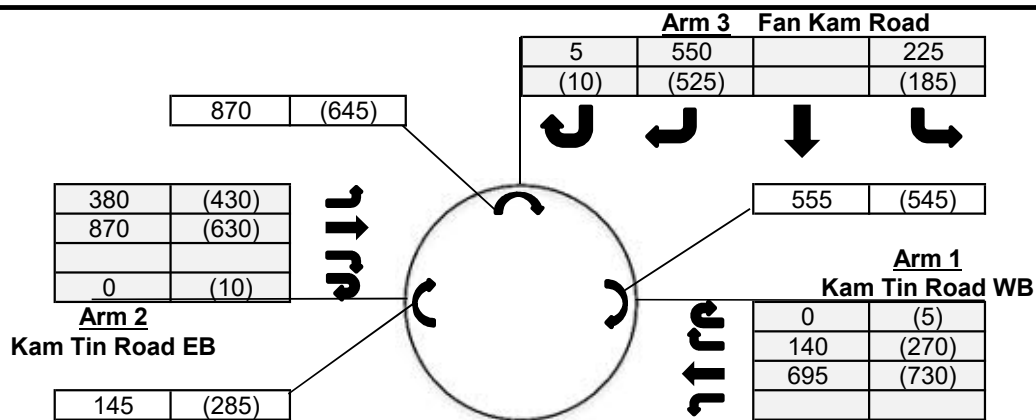
Results :	Ratio of Flow-to-Capacity	AM	PM
	B-A	N/A	N/A
	B-C	N/A	N/A
	C-B	0.25	0.30
	C-A	N/A	N/A
	B-AC	0.21	0.16

Critical DFC	0.25	0.30
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Roundabout Junction Calculation

Junction : (D) Kam Tin Road / Fan Kam Road Job No.: 25009HK

Scenario : 2034 Reference Traffic Flows



AM	(PM)
(PM)	

Input Parameters

			Arm 1	Arm 2	Arm 3
V	=	Approach half width (m)	3	7	3
E	=	Entry width (m)	8	8	5.9
L	=	Effective length of flare (m)	7.8	12	10
R	=	Entry radius	100	33	13.4
D	=	Inscribed circle diameter (m)	20	20	20
A	=	Entry angle (degree)	30	10	15
Q	=	Entry flow (pcu/hr)	AM 835	1250	780
			PM 1005	1070	720
Qc	=	Circulating flow across entry	AM 555	145	870
			PM 545	285	645

Output Parameters

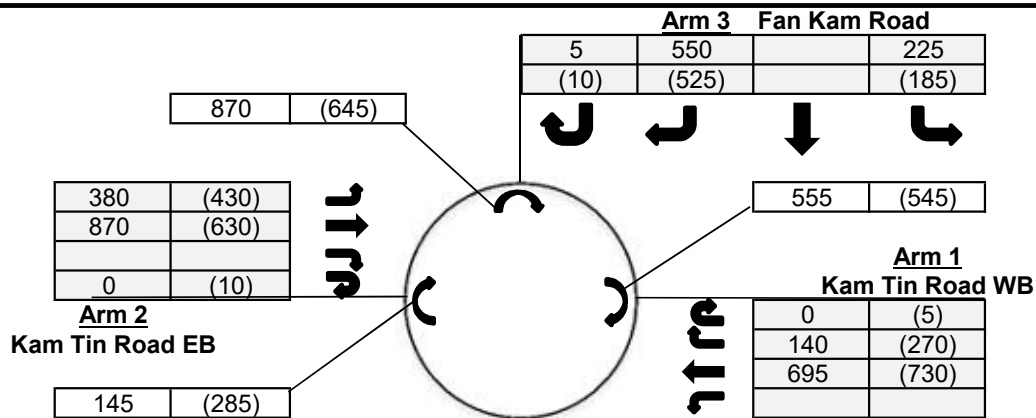
			Arm 1	Arm 2	Arm 3
S	=	Sharpness of flare = $1.6 \cdot (E-V)/L$	1.03	0.13	0.46
K	=	$1 - 0.00347 \cdot (A-30) - 0.978 \cdot (1/R - 0.05)$	1.04	1.09	1.03
X2	=	$V + ((E-V)/(1+2 \cdot S))$	4.64	7.79	4.50
M	=	$\exp((D-60)/10)$	0.02	0.02	0.02
F	=	$303 \cdot X2$	1406	2360	1365
Td	=	$1 + (0.5/(1+M))$	1.49	1.49	1.49
Fc	=	$0.21 \cdot Td \cdot (1 + 0.2 \cdot X2)$	0.60	0.80	0.60
Qe	=	Capacity = $K \cdot (F - Fc \cdot Qc)$	AM 1112	2443	871
			PM 1119	2321	1008
DFC	=	Entry Flow/Capacity = Q/Qe	AM 0.75	0.51	0.90
			PM 0.90	0.46	0.71

DFC of Critical Approach = AM 0.90
PM 0.90

Roundabout Junction Calculation

Junction : (D) Kam Tin Road / Fan Kam Road Job No.: 25009HK

Scenario : 2034 Reference Traffic Flows (With Planned Improvement)



AM	(PM)
(PM)	

Input Parameters

			Arm 1	Arm 2	Arm 3
V	=	Approach half width (m)	5	7	3.2
E	=	Entry width (m)	6.5	7.5	6.5
L	=	Effective length of flare (m)	12	3.6	15
R	=	Entry radius	100	15.8	25
D	=	Inscribed circle diameter (m)	28	28	28
A	=	Entry angle (degree)	33	10	20
Q	=	Entry flow (pcu/hr)	AM 835	1250	780
			PM 1005	1070	720
Qc	=	Circulating flow across entry	AM 555	145	870
			PM 545	285	645

Output Parameters

			Arm 1	Arm 2	Arm 3
S	=	Sharpness of flare = $1.6*(E-V)/L$	0.20	0.22	0.35
K	=	$1-0.00347*(A-30)-0.978*(1/R-0.05)$	1.03	1.06	1.04
X2	=	$V+((E-V)/(1+2*S))$	6.07	7.35	5.14
M	=	$\text{Exp}((D-60)/10)$	0.04	0.04	0.04
F	=	$303*X2$	1840	2226	1556
Td	=	$1+(0.5/(1+M))$	1.48	1.48	1.48
Fc	=	$0.21*Td*(1+0.2*X2)$	0.69	0.77	0.63
Qe	=	Capacity = $K*(F-Fc*Qc)$	AM 1499	2234	1053
			PM 1507	2120	1201
DFC	=	Entry Flow/Capacity = Q/Qe	AM 0.56	0.56	0.74
			PM 0.67	0.50	0.60

DFC of Critical Approach = AM 0.74
PM 0.67

Job No: 25009HK

Junction: (E) Kam Tin Road
Description: 2034 Reference 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 Tin Road	W	←	A	1	3.4	0	0	1	0%	0%	1955	1955	1955	1955	1955	1955	1220	0.624	0.624	1145	0.586	0.586
Kam Tin Road	E	→	A	1	3.4	0	0	1	0%	0%	1955	1955	1955	1955	1955	1955	1200	0.614		1090	0.558	
Pedestrian crossing																						
← → Bp 2 Min. Crossing Time = 5GM + 7FGM = 12s																						
Notes:									Traffic Flow (pcu / hr)								A.M. Check Phase			P.M. Check Phase		
									1200(1090) → ← 1220(1145)								εy 0.624 L (sec) 20 C (sec) 120 y pract. 0.750 R.C. (%) 20%			εy 0.586 L (sec) 20 C (sec) 120 y pract. 0.750 R.C. (%) 28%		
Stage/Phase Diagram:																						
1 → ←			2 — ↑ ↓ —																			
I/G = 5s			I/G = 4s + 12s																			

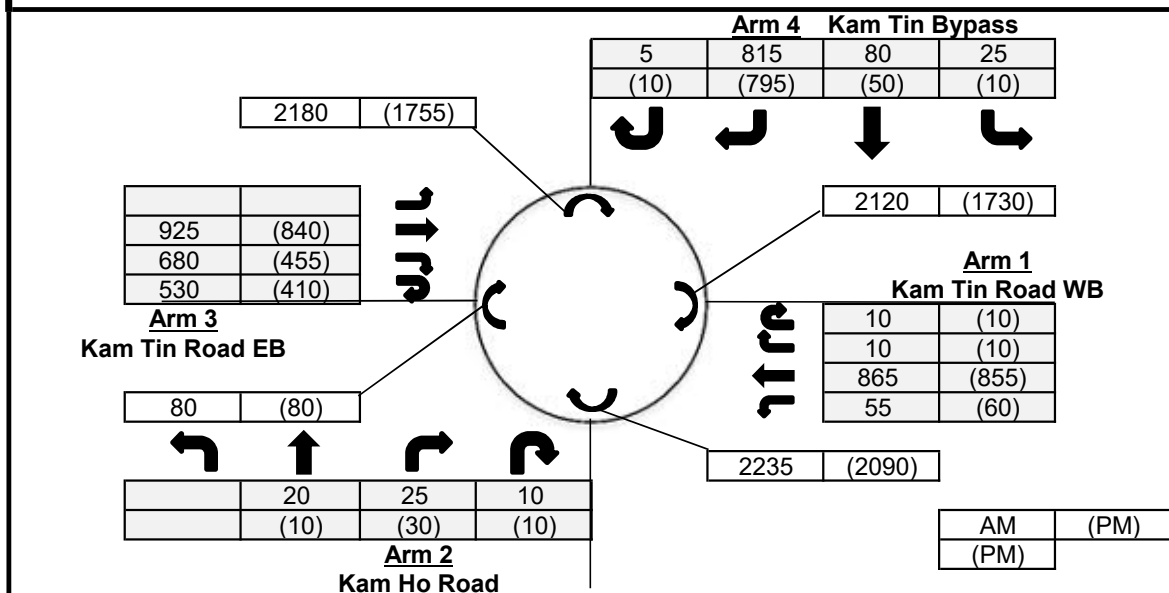
TRAFFIC SIGNALS CALCULATION										Job No: 25009HK										CTA Consultants Ltd.									
Junction: (E) Kam Tin Road																													
Description: 2034 Reference Traffic Flows (With Planned Improvement)																													
Approach	Direction	Movement notation	Phase	Stage	Width (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 Tin Road	W	←	A	1	4.4	0	0	1	0%	0%	2055	2055	2055	2055	2055	2055	1220	0.594	0.594	1145	0.557	0.557							
Kam Tin Road	E	→	A	1	4.4	0	0	1	0%	0%	2055	2055	2055	2055	2055	2055	1200	0.584		1090	0.530								
Pedestrian crossing ↔ Bp 2 Min. Crossing Time = 5GM + 6FGM = 11s																													
Notes:									Traffic Flow (pcu / hr)								A.M. Check Phase			P.M. Check Phase									
									1200(1090) → ← 1220(1145)								εy 0.594 L (sec) 19 C (sec) 120 y pract. 0.758 R.C. (%) 28%			εy 0.557 L (sec) 19 C (sec) 120 y pract. 0.758 R.C. (%) 36%									
Stage/Phase Diagram:																													
1 → ←		2 ┌──┐ └──┘																											
I/G = 5s		I/G = 4s + 11s																											

Junction: (F) Kam Tin Road / Tsing Long Highway Slip Road																			
Description: 2034 Reference Traffic Flows (With Planned Improvement)																			
Approach	Direction	Movement notation	Phase	Stage	Width (m)	Radius (m)		Nearside 0/1	Pro. Turning (%)		Revised Saturation Flow (pcu/hr)		A.M. Peak			P.M. Peak			
						Left	Right		A.M.	P.M.	A.M.	P.M.	Flow (pcu/hr)	y Value	Critical y	Flow (pcu/hr)	y Value	Critical y	
Kam Tin Road	E	→	1	A	3.65	0	0	1	0%	0%	1980	1980	901	0.455		745	0.376		
	E	→	1	A	3.65	0	0	0	0%	0%	2120	2120	965	0.455		798	0.376		
	E	→	1	A	3.65	0	0	0	0%	0%	2120	2120	965	0.455		798	0.376		
Kam Tin Road	W	←	2	A	3.80	0	0	0	0%	0%	2135	2135	1160	0.543	0.543	1135	0.532	0.532	
	W	←	2	A	3.80	0	0	0	0%	0%	2135	2135	1160	0.543		1135	0.532		
	W	↙	2	A	5.00	15	0	1	100%	100%	1925	1925	575	0.299		290	0.151		
Tsing Long Highway Slip Road	N	↖	3	B	3.50	20	0	1	100%	100%	1830	1830	163	0.089	0.089	245	0.134	0.134	
	N	↖	3	B	3.50	25	0	0	100%	100%	1985	1985	177	0.089		265	0.134		
	N	→	3	B	3.60	0	30	0	100%	100%	2015	2015	100	0.050		103	0.051		
	N	→	3	B	3.50	0	28	0	100%	100%	2000	2000	100	0.050		102	0.051		
*Pedestrian Crossing			4p	A	Min. Crossing Time = 7 Gm + 7 Fm = 14s														
			5p	B	Min. Crossing Time = 7 Gm + 7 Fm = 14s														
Notes:						Traffic Flow (pcu / hr) [AM (PM)]						Check Phase			Check Phase				
						2830(2340)→ ← 340(510) 200(205) → ← 2320(2270) ↓ 575(290)						E _y 0.632 L (sec) 10 C (sec) 120 y pract. 0.825 R.C. (%) 30%			E _y 0.665 L (sec) 10 C (sec) 120 y pract. 0.825 R.C. (%) 24%				
Stage / Phase Diagrams																			
A				B															
I/G = 5				I/G = 7															

Roundabout Junction Calculation

Junction : (G) Kam Tin Road / Kam Tin Bypass Job No.: 25009HK

Scenario : 2034 Reference Traffic Flows (With Planned Improvement)



Input Parameters

			Arm 1	Arm 2	Arm 3	Arm 4
V	=	Approach half width (m)	7.3	7.3	7.3	6.5
E	=	Entry width (m)	13	10	11	11
L	=	Effective length of flare (m)	12	9.5	13	15
R	=	Entry radius	70	20	42.5	42.5
D	=	Inscribed circle diameter (m)	88	88	88	88
A	=	Entry angle (degree)	30	38	29	39
Q	=	Entry flow (pcu/hr)	AM 940	55	2135	925
			PM 935	50	1705	865
Qc	=	Circulating flow across entry	AM 2120	2235	80	2180
			PM 1730	2090	80	1755

Output Parameters

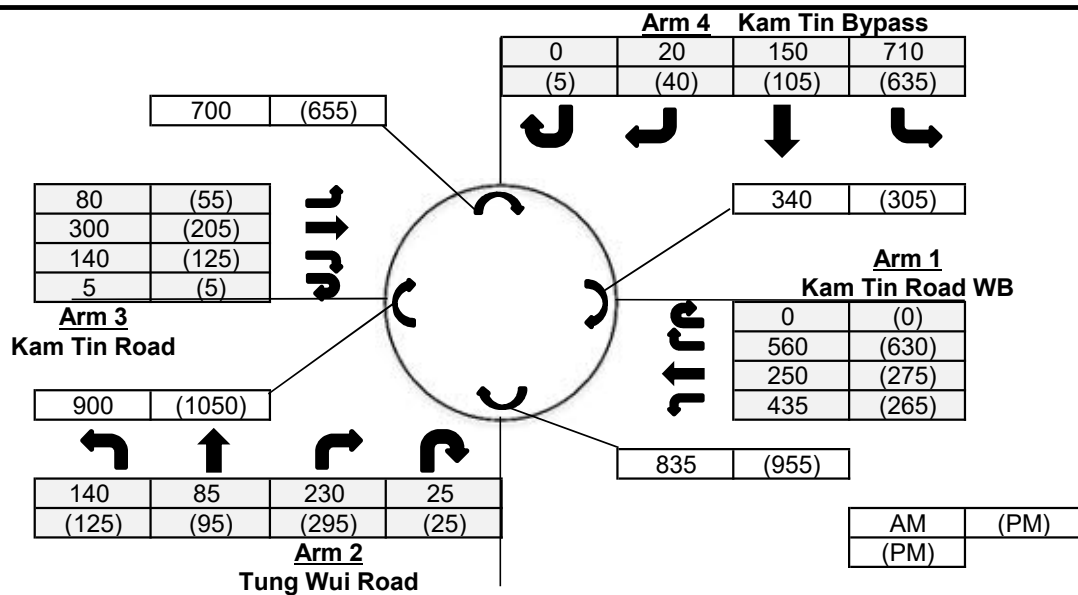
			Arm 1	Arm 2	Arm 3	Arm 4
S	=	Sharpness of flare = $1.6 \cdot (E - V) / L$	0.76	0.45	0.46	0.48
K	=	$1 - 0.00347 \cdot (A - 30) - 0.978 \cdot (1 / R - 0.05)$	1.03	0.97	1.03	0.99
X ₂	=	$V + ((E - V) / (1 + 2 \cdot S))$	9.56	8.71	9.24	8.80
M	=	$\text{Exp}((D - 60) / 10)$	16.44	16.44	16.44	16.44
F	=	$303 \cdot X_2$	2897	2640	2799	2665
T _d	=	$1 + (0.5 / (1 + M))$	1.03	1.03	1.03	1.03
F _c	=	$0.21 \cdot T_d \cdot (1 + 0.2 \cdot X_2)$	0.63	0.59	0.62	0.60
Q _e	=	Capacity = $K \cdot (F - F_c) \cdot Q_c$	AM 1618	1280	2830	1359
			PM 1872	1363	2830	1610
DFC	=	Entry Flow/Capacity = Q / Q_e	AM 0.58	0.04	0.75	0.68
			PM 0.50	0.04	0.60	0.54

DFC of Critical Approach = AM 0.75
PM 0.60

Roundabout Junction Calculation

Junction : (A) Kam Tin Bypass / Kam Tin Road / Tung Wui Road Job No.: 25009HK

Scenario : 2034 Design Traffic Flows



Input Parameters

			Arm 1	Arm 2	Arm 3	Arm 4
V	=	Approach half width (m)	7.3	7.2	3.6	7.3
E	=	Entry width (m)	11.5	10.1	11.8	13.5
L	=	Effective length of flare (m)	12.6	9.4	14	12.5
R	=	Entry radius	26	20	18.4	36
D	=	Inscribed circle diameter (m)	64	64	64	64
A	=	Entry angle (degree)	42	27	45	23
Q	=	Entry flow (pcu/hr)	AM 1245	480	525	880
			PM 1170	540	390	785
Qc	=	Circulating flow across entry	AM 340	835	900	700
			PM 305	955	1050	655

Output Parameters

			Arm 1	Arm 2	Arm 3	Arm 4
S	=	Sharpness of flare = $1.6 \cdot (E-V)/L$	0.53	0.49	0.94	0.79
K	=	$1 - 0.00347 \cdot (A-30) - 0.978 \cdot (1/R - 0.05)$	0.97	1.01	0.94	1.05
X2	=	$V + ((E-V)/(1+2 \cdot S))$	9.33	8.66	6.45	9.70
M	=	$\exp((D-60)/10)$	1.49	1.49	1.49	1.49
F	=	$303 \cdot X2$	2828	2624	1955	2938
Td	=	$1 + (0.5/(1+M))$	1.20	1.20	1.20	1.20
Fc	=	$0.21 \cdot Td \cdot (1 + 0.2 \cdot X2)$	0.72	0.69	0.58	0.74
Qe	=	Capacity = $K \cdot (F - Fc \cdot Qc)$	AM 2504	2070	1355	2531
			PM 2528	1986	1273	2565
DFC	=	Entry Flow/Capacity = Q/Qe	AM 0.50	0.23	0.39	0.35
			PM 0.46	0.27	0.31	0.31

DFC of Critical Approach = AM 0.50
PM 0.46

Priority Junction Calculation

Junction :	(C) Kam Tin Road / Kam Tai Road	Job No.:	25009HK
Scenario :	2034 Design Traffic Flows		

Arm B Kam Tai Road

20	30
(10)	(50)

Arm A Kam Tin Road EB Arm C Kam Tin Road WB

50	(60)	125	(150)
1140	(1085)	1320	(1095)

AM	(PM)
(PM)	

The predictive equations of capacity of movement are:

$$Q-BA = D(627 + 14W-CR - Y(0.364q-AC + 0.144q-AB + 0.229q-CA + 0.52q-CB))$$

$$Q-BC = E(745 - Y(0.364q-AC + 0.144q-AB))$$

$$Q-CB = F(745 - 0.364Y(q-AC + q-AB))$$

The geometric parameters represented by D, E, F are:

$$D = (1 + 0.094(w-BA - 3.65))(1 + 0.0009(V-rBA - 120))(1 + 0.0006(V-IBA - 150))$$

$$E = (1 + 0.094(w-BC - 3.65))(1 + 0.0009(V-rBC - 120))$$

$$F = (1 + 0.094(w-CB - 3.65))(1 + 0.0009(V-rCB - 120))$$

where

Y = 1 - 0.0345W

q-AB, etc = the design flow of movement AB, etc

W = major road width

W-CR = central reserve width

w-BA, etc = lane width to vehicle

v-rBA, etc = visibility to the right for waiting vehicles in stream BA, etc

v-IBA = visibility to the left for waiting vehicles in stream BA, etc

Geometry :	Input	Calculated
W	7	D 0.968
W-CR	0	E 1.029
C-B blocked C-A, residual width <2.5m? (Yes: 1, No: 0)	1	F 0.924
Minor Road Share LT&RT? (Yes: 1, No: 0)	1	Y 0.759

Analysis :	Traffic Flow pcu/hr	AM	PM	Capacity pcu/hr	AM	PM
q-CA	1320	1095	Q-BA	27	69	(If C-B blocked C-A) (If Minor Road Share LT&RT)
q-CB	125	150	Q-BC	437	452	
q-AB	50	60	Q-CB	385	396	
q-AC	1140	1085	Q-CA	1215	1119	
q-BA	20	10	Q-BAC	62	235	
q-BC	30	50				
f	0.600	0.833				

Results :	Ratio of Flow-to-Capacity	AM	PM
	B-A	N/A	N/A
	B-C	N/A	N/A
	C-B	0.32	0.38
	C-A	1.09	0.98
	B-AC	0.80	0.26
	Critical DFC	1.09	0.98

Priority Junction Calculation

Junction :	(C) Kam Tin Road / Kam Tai Road	Job No.:	25009HK
Scenario :	2034 Design Traffic Flows (With Planned Improvement)		

Arm B Kam Tai Road

20	30
(10)	(50)

Arm A Kam Tin Road EB Arm C Kam Tin Road WB

AM	(PM)
(PM)	

The predictive equations of capacity of movement are:

$$Q-BA = D(627 + 14W-CR - Y(0.364q-AC + 0.144q-AB + 0.229q-CA + 0.52q-CB))$$

$$Q-BC = E(745 - Y(0.364q-AC + 0.144q-AB))$$

$$Q-CB = F(745 - 0.364Y(q-AC + q-AB))$$

The geometric parameters represented by D, E, F are:

$$D = (1 + 0.094(w-BA - 3.65))(1 + 0.0009(V-rBA - 120))(1 + 0.0006(V-IBA - 150))$$

$$E = (1 + 0.094(w-BC - 3.65))(1 + 0.0009(V-rBC - 120))$$

$$F = (1 + 0.094(w-CB - 3.65))(1 + 0.0009(V-rCB - 120))$$

where

Y = 1 - 0.0345W

q-AB, etc = the design flow of movement AB, etc

W = major road width

W-CR = central reserve width

w-BA, etc = lane width to vehicle

v-rBA, etc = visibility to the right for waiting vehicles in stream BA, etc

v-IBA = visibility to the left for waiting vehicles in stream BA, etc

Geometry :	Input	Calculated
	W <u>11</u>	D <u>0.968</u>
	W-CR <u>0</u>	E <u>1.029</u>
C-B blocked C-A, residual width <2.5m? (Yes: 1, No: 0)	<u>0</u>	F <u>1.029</u>
Minor Road Share LT&RT? (Yes: 1, No: 0)	<u>1</u>	Y <u>0.621</u>
	V-rBA <u>50</u>	
	V-IBA <u>50</u>	
	V-rBC <u>50</u>	
	V-rCB <u>50</u>	
	w-BA <u>4.7</u>	
	w-BC <u>4.7</u>	
	w-CB <u>4.7</u>	

Analysis :	Traffic Flow pcu/hr	AM	PM	Capacity pcu/hr	AM	PM
q-CA	1320	1095	Q-BA	133	167	
q-CB	125	150	Q-BC	497	509	
q-AB	50	60	Q-CB	490	501	
q-AC	1140	1085	Q-CA	N/A	N/A	
q-BA	20	10	Q-BAC	237	380	
q-BC	30	50				
f	0.600	0.833				

(If C-B blocked C-A)
(If Minor Road Share LT&RT)

Results :	Ratio of Flow-to-Capacity	AM	PM
	B-A	N/A	N/A
	B-C	N/A	N/A
	C-B	0.25	0.30
	C-A	N/A	N/A
	B-AC	0.21	0.16

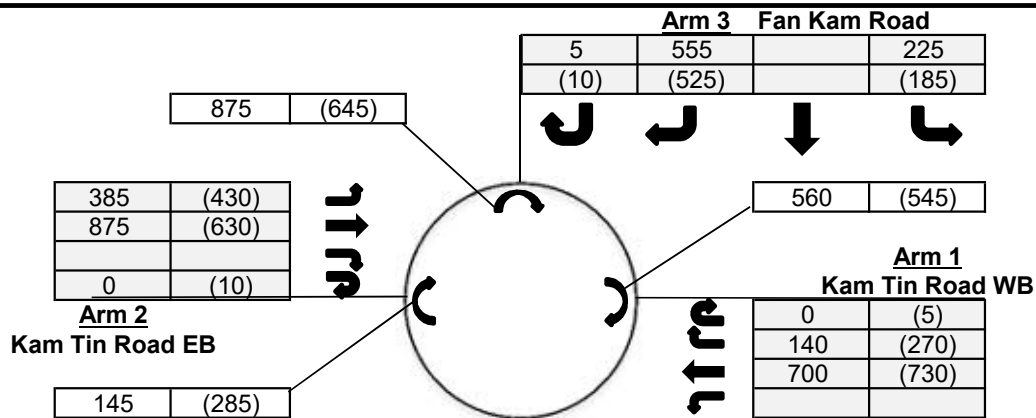
Critical DFC	0.25	0.30
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Roundabout Junction Calculation

Junction : (D) Kam Tin Road / Fan Kam Road Job No.: 25009HK

Scenario : 2034 Design Traffic Flows



AM	(PM)
(PM)	

Input Parameters

			Arm 1	Arm 2	Arm 3
V	=	Approach half width (m)	3	7	3
E	=	Entry width (m)	8	8	5.9
L	=	Effective length of flare (m)	7.8	12	10
R	=	Entry radius	100	33	13.4
D	=	Inscribed circle diameter (m)	20	20	20
A	=	Entry angle (degree)	30	10	15
Q	=	Entry flow (pcu/hr)	AM 840	1260	785
			PM 1005	1070	720
Qc	=	Circulating flow across entry	AM 560	145	875
			PM 545	285	645

Output Parameters

			Arm 1	Arm 2	Arm 3
S	=	Sharpness of flare = $1.6*(E-V)/L$	1.03	0.13	0.46
K	=	$1-0.00347*(A-30)-0.978*(1/R-0.05)$	1.04	1.09	1.03
X2	=	$V+((E-V)/(1+2*S))$	4.64	7.79	4.50
M	=	$\text{Exp}((D-60)/10)$	0.02	0.02	0.02
F	=	$303*X2$	1406	2360	1365
Td	=	$1+(0.5/(1+M))$	1.49	1.49	1.49
Fc	=	$0.21*Td*(1+0.2*X2)$	0.60	0.80	0.60
Qe	=	Capacity = $K*(F-Fc*Qc)$	AM 1109	2443	868
			PM 1119	2321	1008
DFC	=	Entry Flow/Capacity = Q/Qe	AM 0.76	0.52	0.90
			PM 0.90	0.46	0.71

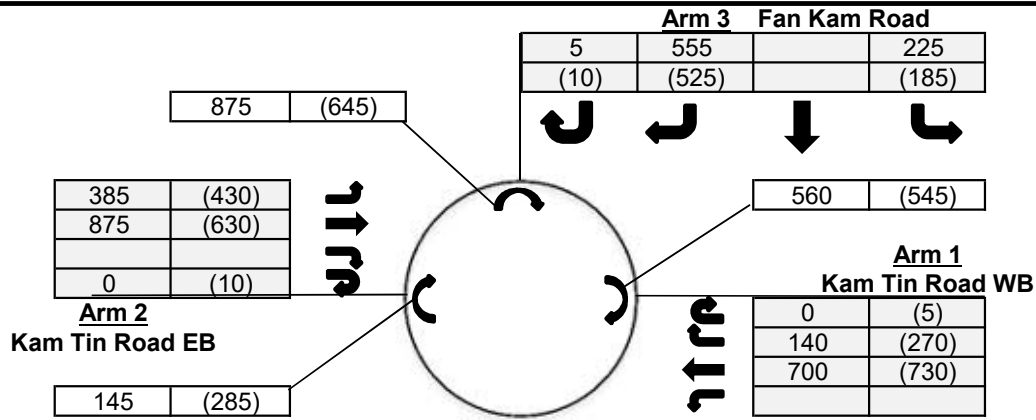
DFC of Critical Approach = AM 0.90
PM 0.90

CTA Consultants Ltd.

Roundabout Junction Calculation

Junction : (D) Kam Tin Road / Fan Kam Road Job No.: 25009HK

Scenario : 2034 Design Traffic Flows (With Planned Improvement)



AM	(PM)
(PM)	

Input Parameters

			Arm 1	Arm 2	Arm 3
V	=	Approach half width (m)	5	7	3.2
E	=	Entry width (m)	6.5	7.5	6.5
L	=	Effective length of flare (m)	12	3.6	15
R	=	Entry radius	100	15.8	25
D	=	Inscribed circle diameter (m)	28	28	28
A	=	Entry angle (degree)	33	10	20
Q	=	Entry flow (pcu/hr)	AM 840	1260	785
			PM 1005	1070	720
Qc	=	Circulating flow across entry	AM 560	145	875
			PM 545	285	645

Output Parameters

			Arm 1	Arm 2	Arm 3
S	=	Sharpness of flare = $1.6 \cdot (E-V)/L$	0.20	0.22	0.35
K	=	$1 - 0.00347 \cdot (A-30) - 0.978 \cdot (1/R - 0.05)$	1.03	1.06	1.04
X ₂	=	$V + ((E-V)/(1+2 \cdot S))$	6.07	7.35	5.14
M	=	$\exp((D-60)/10)$	0.04	0.04	0.04
F	=	$303 \cdot X_2$	1840	2226	1556
T _d	=	$1 + (0.5/(1+M))$	1.48	1.48	1.48
F _c	=	$0.21 \cdot T_d \cdot (1 + 0.2 \cdot X_2)$	0.69	0.77	0.63
Q _e	=	Capacity = $K \cdot (F - F_c \cdot Q_c)$	AM 1496	2234	1050
			PM 1507	2120	1201
DFC	=	Entry Flow/Capacity = Q/Q_e	AM 0.56	0.56	0.75
			PM 0.67	0.50	0.60

DFC of Critical Approach = AM 0.75
PM 0.67

Job No: 25009HK

CTA Consultants Ltd.

Junction: (E) Kam Tin Road

Description: **2034 Design Traffic Flows**

Approach	Direction	Movement notation	Phase	Stage	Width (m)	Radius (m)		Nearside O/I	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 Tin Road	W	←	A	1	3.4	0	0	1	0%	0%	1955	1955	1955	1955	1955	1955	1240	0.634	0.634	1150	0.588	0.588
Kam Tin Road	E	→	A	1	3.4	0	0	1	0%	0%	1955	1955	1955	1955	1955	1955	1215	0.621		1100	0.563	
Pedestrian crossing ↔ Bp 2 Min. Crossing Time = 5GM + 7FGM = 12s																						
Notes:									Traffic Flow (pcu / hr)								A.M. Check Phase			P.M. Check Phase		
									1215(1100) → ← 1240(1150)								εy 0.634 L (sec) 20 C (sec) 120 y pract. 0.750 R.C. (%) 18%			εy 0.588 L (sec) 20 C (sec) 120 y pract. 0.750 R.C. (%) 28%		
Stage/Phase Diagram: 1		2																				
I/G = 5s		I/G = 4s + 12s																				

Job No: 25009HK

Junction: (E) Kam Tin Road
Description: 2034 Design Traffic Flows (With Planned Improvement)

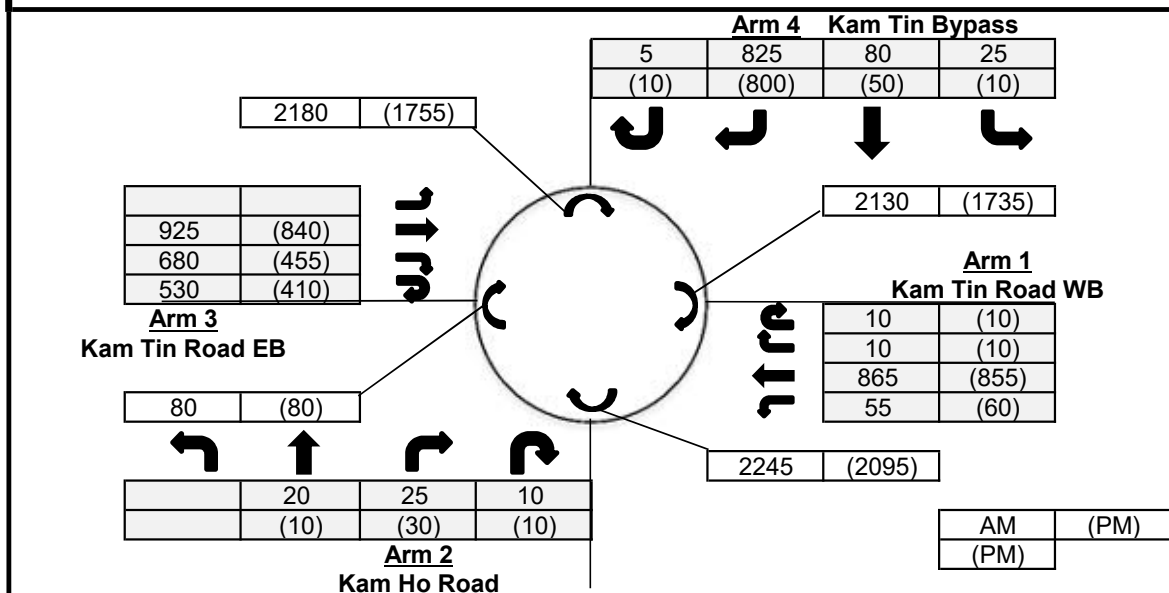
Approach	Direction	Movement notation	Phase	Stage	Width (m)	Radius (m)		Nearside Ø/1	Pro. Turning (%)		Saturation Flow (pcu/hr)	Total Saturation Flow (pcu/hr)	Revised Saturation Flow (pcu/hr)		Total Revised Saturation Flow (pcu/hr)		A.M. Peak			P.M. Peak		
						Left	Right		A.M.	P.M.			A.M.	P.M.	A.M.	P.M.	Flow (pcu/hr)	y Value	Critical y	Flow (pcu/hr)	y Value	Critical y
Kam Tin Road	W	←	A	1	4.4	0	0	1	0%	0%	2055	2055	2055	2055	2055	2055	1240	0.603	0.603	1150	0.560	0.560
Kam Tin Road	E	→	A	1	4.4	0	0	1	0%	0%	2055	2055	2055	2055	2055	2055	1215	0.591		1100	0.535	
Pedestrian crossing																						
		↔	Bp	2	Min. Crossing Time = 5GM + 6FGM = 11s																	
Notes:									Traffic Flow (pcu / hr)								A.M. Check Phase			P.M. Check Phase		
									1215(1100) → ← 1240(1150)								εy 0.603 L (sec) 19 C (sec) 120 y pract. 0.758 R.C. (%) 26%			εy 0.560 L (sec) 19 C (sec) 120 y pract. 0.758 R.C. (%) 35%		
Stage/Phase Diagram:																						
1 → ←			2 — — — — — ↑ ↓ — — — — —																			
I/G = 5s			I/G = 4s + 11s																			

Junction: (F) Kam Tin Road / Tsing Long Highway Slip Road																			
Description: 2034 Design Traffic Flows (With Planned Improvement)																			
Approach	Direction	Movement notation	Phase	Stage	Width (m)	Radius (m)		Nearside 0/1	Pro. Turning (%)		Revised Saturation Flow (pcu/hr)		A.M. Peak			P.M. Peak			
						Left	Right		A.M.	P.M.	A.M.	P.M.	Flow (pcu/hr)	y Value	Critical y	Flow (pcu/hr)	y Value	Critical y	
Kam Tin Road	E	→	1	A	3.65	0	0	1	0%	0%	1980	1980	901	0.455		745	0.376		
	E	→	1	A	3.65	0	0	0	0%	0%	2120	2120	965	0.455		798	0.376		
	E	→	1	A	3.65	0	0	0	0%	0%	2120	2120	965	0.455		798	0.376		
Kam Tin Road	W	←	2	A	3.80	0	0	0	0%	0%	2135	2135	1160	0.543	0.543	1135	0.532		
	W	←	2	A	3.80	0	0	0	0%	0%	2135	2135	1160	0.543		1135	0.532		
	W	↙	2	A	5.00	15	0	1	100%	100%	1925	1925	585	0.304		295	0.153		
Tsing Long Highway Slip Road	N	↖	3	B	3.50	20	0	1	100%	100%	1830	1830	163	0.089	0.089	245	0.134		
	N	↖	3	B	3.50	25	0	0	100%	100%	1985	1985	177	0.089		265	0.134		
	N	→	3	B	3.60	0	30	0	100%	100%	2015	2015	103	0.051		105	0.052		
	N	→	3	B	3.50	0	28	0	100%	100%	2000	2000	102	0.051		105	0.052		
*Pedestrian Crossing			4p	A	Min. Crossing Time = 7 Gm + 7 Fm = 14s														
			5p	B	Min. Crossing Time = 7 Gm + 7 Fm = 14s														
Notes:						Traffic Flow (pcu / hr) [AM (PM)]						Check Phase			Check Phase				
						2830(2340)→ ↖ ↗ 340(510) 205(210) ↖ 2320(2270) ↙ 585(295)						εy 0.632			εy 0.665				
												L (sec) 10			L (sec) 10				
												C (sec) 120			C (sec) 120				
												y pract. 0.825			y pract. 0.825				
												R.C. (%) 30%			R.C. (%) 24%				
Stage / Phase Diagrams																			
A				B															
I/G = 5				I/G = 7															

Roundabout Junction Calculation

Junction : (G) Kam Tin Road / Kam Tin Bypass Job No.: 25009HK

Scenario : 2034 Design Traffic Flows (With Planned Improvement)



Input Parameters

			Arm 1	Arm 2	Arm 3	Arm 4
V	=	Approach half width (m)	7.3	7.3	7.3	6.5
E	=	Entry width (m)	13	10	11	11
L	=	Effective length of flare (m)	12	9.5	13	15
R	=	Entry radius	70	20	42.5	42.5
D	=	Inscribed circle diameter (m)	88	88	88	88
A	=	Entry angle (degree)	30	38	29	39
Q	=	Entry flow (pcu/hr)	AM 940	55	2135	935
			PM 935	50	1705	870
Qc	=	Circulating flow across entry	AM 2130	2245	80	2180
			PM 1735	2095	80	1755

Output Parameters

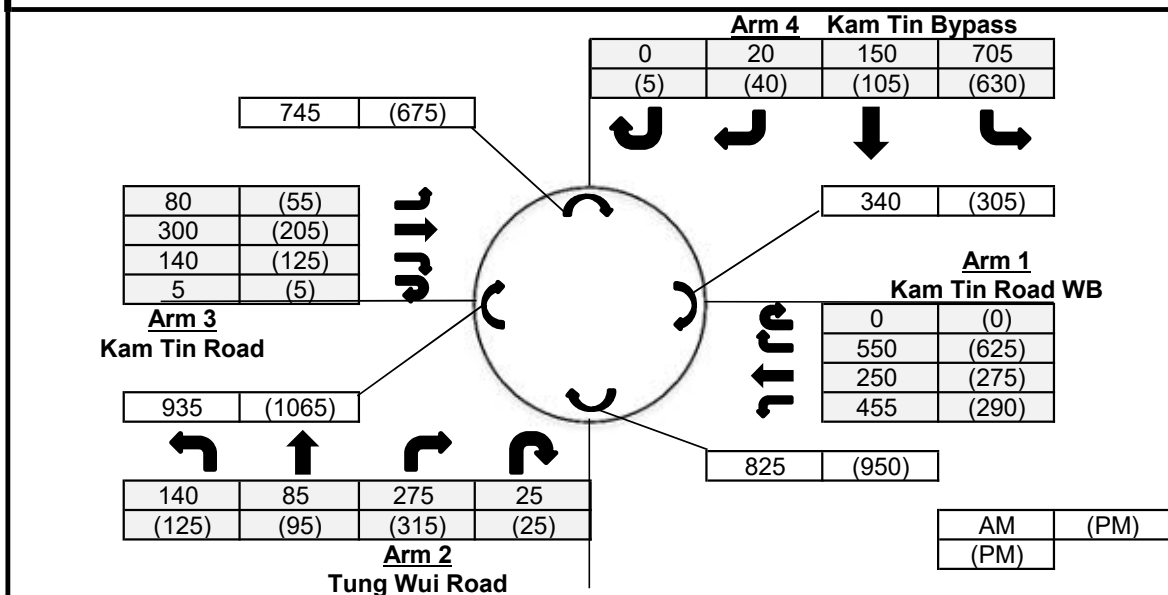
			Arm 1	Arm 2	Arm 3	Arm 4
S	=	Sharpness of flare = $1.6 \cdot (E - V) / L$	0.76	0.45	0.46	0.48
K	=	$1 - 0.00347 \cdot (A - 30) - 0.978 \cdot (1 / R - 0.05)$	1.03	0.97	1.03	0.99
X ₂	=	$V + ((E - V) / (1 + 2 \cdot S))$	9.56	8.71	9.24	8.80
M	=	$\text{Exp}((D - 60) / 10)$	16.44	16.44	16.44	16.44
F	=	$303 \cdot X_2$	2897	2640	2799	2665
T _d	=	$1 + (0.5 / (1 + M))$	1.03	1.03	1.03	1.03
F _c	=	$0.21 \cdot T_d \cdot (1 + 0.2 \cdot X_2)$	0.63	0.59	0.62	0.60
Q _e	=	Capacity = $K \cdot (F - F_c) \cdot Q_c$	AM 1612	1274	2830	1359
			PM 1869	1360	2830	1610
DFC	=	Entry Flow/Capacity = Q / Q_e	AM 0.58	0.04	0.75	0.69
			PM 0.50	0.04	0.60	0.54

DFC of Critical Approach = AM 0.75
PM 0.60

Roundabout Junction Calculation

Junction : (A) Kam Tin Bypass / Kam Tin Road / Tung Wui Road Job No.: 25009HK

Scenario : 2034 Reference Traffic Flows (With Remaining Site under LUR)



Input Parameters

			Arm 1	Arm 2	Arm 3	Arm 4
V	=	Approach half width (m)	7.3	7.2	3.6	7.3
E	=	Entry width (m)	11.5	10.1	11.8	13.5
L	=	Effective length of flare (m)	12.6	9.4	14	12.5
R	=	Entry radius	26	20	18.4	36
D	=	Inscribed circle diameter (m)	64	64	64	64
A	=	Entry angle (degree)	42	27	45	23
Q	=	Entry flow (pcu/hr)	AM 1255	525	525	875
			PM 1190	560	390	780
Qc	=	Circulating flow across entry	AM 340	825	935	745
			PM 305	950	1065	675

Output Parameters

			Arm 1	Arm 2	Arm 3	Arm 4
S	=	Sharpness of flare = $1.6 \cdot (E-V)/L$	0.53	0.49	0.94	0.79
K	=	$1 - 0.00347 \cdot (A-30) - 0.978 \cdot (1/R - 0.05)$	0.97	1.01	0.94	1.05
X2	=	$V + ((E-V)/(1+2 \cdot S))$	9.33	8.66	6.45	9.70
M	=	$\exp((D-60)/10)$	1.49	1.49	1.49	1.49
F	=	$303 \cdot X2$	2828	2624	1955	2938
Td	=	$1 + (0.5/(1+M))$	1.20	1.20	1.20	1.20
Fc	=	$0.21 \cdot Td \cdot (1 + 0.2 \cdot X2)$	0.72	0.69	0.58	0.74
Qe	=	Capacity = $K \cdot (F - Fc \cdot Qc)$	AM 2504	2077	1336	2496
			PM 2528	1990	1265	2550
DFC	=	Entry Flow/Capacity = Q/Qe	AM 0.50	0.25	0.39	0.35
			PM 0.47	0.28	0.31	0.31

DFC of Critical Approach = AM 0.50
PM 0.47

TRAFFIC SIGNALS CALCULATION										Job No: 25009HK										CTA Consultants Ltd.																			
Junction: (B) Kam Tin Bypass / Kong Tai Road																																							
Description: 2034 Reference Traffic Flows (With Remaining Site under LUR)																																							
Approach	Direction	Movement notation	Phase	Stage	Width (m)	Radius (m)		Nearside O/I	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 Tin Bypass	W	↗	C	2	3.0	0	15	0	100%	100%	2055	2055	1870	1870	1870	1870	65	0.035		65	0.035																		
	W	↖	B	1,2	3.5	0	0	0	0%	0%	2105	0	2105	2105	0	0	388	0.184		426	0.202																		
	W	↖	B	1,2	3.0	0	0	1	0%	0%	1775	3880	1775	1775	3880	3880	327	0.184		359	0.202																		
Kam Tin Bypass	E	↘	A	1	3.0	13	0	1	15%	21%	1915	3970	1880	1870	3935	3925	394	0.210	0.210	365	0.195	0.195																	
	E	↘	A	1	3.0	0	0	0	0%	0%	2055	0	2055	2055	0	0	431	0.210		400	0.195																		
Kong To Road	S	↓	D	3	3.5	10	12	1	46% / 54%	56% / 44%	1461	1461	1285	1285	1285	1285	230	0.179	0.179	170	0.132	0.132																	
Pedestrian crossing	↔	Ep	4			Min. Crossing Time = 12GM + 15FGM = 27s																																	
	↔	Fp	2,3,4			Min. Crossing Time = 7GM + 7FGM = 14s																																	
	↔	Gp	4			Min. Crossing Time = 7GM + 7FGM = 14s																																	
Notes:										Traffic Flow (pcu / hr)										A.M. Check Phase Ey 0.389 L (sec) 47 C (sec) 108 y pract. 0.508 R.C. (%) 31%					P.M. Check Phase Ey 0.327 L (sec) 47 C (sec) 108 y pract. 0.508 R.C. (%) 55%														
Stage/Phase Diagram:																																							
I/G=3s										I/G=6s + 5s										I/G=5s										I/G=4s (Min. Green Time for Ep=27s)									

Priority Junction Calculation

Junction :	(C) Kam Tin Road / Kam Tai Road	Job No.:	25009HK
Scenario :	2034 Reference Traffic Flows (With Remaining Site under LUR)		

Arm B Kam Tai Road

20	30
(10)	(50)

Arm A Kam Tin Road EB **Arm C Kam Tin Road WB**

50	(60)	125	(150)
1180	(1105)	1345	(1120)

AM	(PM)
(PM)	

The predictive equations of capacity of movement are:

$$Q-BA = D(627 + 14W-CR - Y(0.364q-AC + 0.144q-AB + 0.229q-CA + 0.52q-CB))$$

$$Q-BC = E(745 - Y(0.364q-AC + 0.144q-AB))$$

$$Q-CB = F(745 - 0.364Y(q-AC + q-AB))$$

The geometric parameters represented by D, E, F are:

$$D = (1 + 0.094(w-BA - 3.65))(1 + 0.0009(V-rBA - 120))(1 + 0.0006(V-IBA - 150))$$

$$E = (1 + 0.094(w-BC - 3.65))(1 + 0.0009(V-rBC - 120))$$

$$F = (1 + 0.094(w-CB - 3.65))(1 + 0.0009(V-rCB - 120))$$

where

Y = 1 - 0.0345W

q-AB, etc = the design flow of movement AB, etc

W = major road width

W-CR = central reserve width

w-BA, etc = lane width to vehicle

v-rBA, etc = visibility to the right for waiting vehicles in stream BA, etc

v-IBA = visibility to the left for waiting vehicles in stream BA, etc

Geometry :	Input	Calculated
	W <u>7</u>	D <u>0.968</u>
	W-CR <u>0</u>	E <u>1.029</u>
C-B blocked C-A, residual width <2.5m? (Yes: 1, No: 0)	<u>1</u>	F <u>0.924</u>
Minor Road Share LT&RT? (Yes: 1, No: 0)	<u>1</u>	Y <u>0.759</u>

Analysis :	Traffic Flow pcu/hr	AM	PM	Capacity pcu/hr	AM	PM
q-CA	1345	1120	Q-BA	12	60	
q-CB	125	150	Q-BC	426	446	
q-AB	50	60	Q-CB	375	391	
q-AC	1180	1105	Q-CA	1199	1110	(If C-B blocked C-A)
q-BA	20	10	Q-BAC	30	215	(If Minor Road Share LT&RT)
q-BC	30	50				
f	0.600	0.833				

Results :	Ratio of Flow-to-Capacity	AM	PM
	B-A	N/A	N/A
	B-C	N/A	N/A
	C-B	0.33	0.38
	C-A	1.12	1.01
	B-AC	1.68	0.28

Critical DFC	1.68	1.01
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CTA Consultants Ltd.

Priority Junction Calculation

Junction :	(C) Kam Tin Road / Kam Tai Road	Job No.:	25009HK
Scenario :	2034 Reference Traffic Flows (With Remaining Site under LUR) (With Planned Improvements)		

AM	(PM)
(PM)	

The predictive equations of capacity of movement are:

$$Q-BA = D(627 + 14W-CR - Y(0.364q-AC + 0.144q-AB + 0.229q-CA + 0.52q-CB))$$

$$Q-BC = E(745 - Y(0.364q-AC + 0.144q-AB))$$

$$Q-CB = F(745 - 0.364Y(q-AC + q-AB))$$

The geometric parameters represented by D, E, F are:

$$D = (1 + 0.094(w-BA - 3.65))(1 + 0.0009(V-rBA - 120))(1 + 0.0006(V-IBA - 150))$$

$$E = (1 + 0.094(w-BC - 3.65))(1 + 0.0009(V-rBC - 120))$$

$$F = (1 + 0.094(w-CB - 3.65))(1 + 0.0009(V-rCB - 120))$$

where

Y = 1 - 0.0345W

q-AB, etc = the design flow of movement AB, etc

W = major road width

W-CR = central reserve width

w-BA, etc = lane width to vehicle

v-rBA, etc = visibility to the right for waiting vehicles in stream BA, etc

v-IBA = visibility to the left for waiting vehicles in stream BA, etc

Geometry :	Input	Calculated
W	11	D 0.968
W-CR	0	E 1.029
C-B blocked C-A, residual width <2.5m? (Yes: 1, No: 0)	0	F 1.029
Minor Road Share LT&RT? (Yes: 1, No: 0)	1	Y 0.621

Analysis :	Traffic Flow pcu/hr	AM	PM	Capacity pcu/hr	AM	PM
q-CA	1345	1120	Q-BA	121	159	
q-CB	125	150	Q-BC	488	505	
q-AB	50	60	Q-CB	481	496	
q-AC	1180	1105	Q-CA	N/A	N/A	(If C-B blocked C-A)
q-BA	20	10	Q-BAC	220	371	(If Minor Road Share LT&RT)
q-BC	30	50				
f	0.600	0.833				

Results :	Ratio of Flow-to-Capacity	AM	PM
	B-A	N/A	N/A
	B-C	N/A	N/A
	C-B	0.26	0.30
	C-A	N/A	N/A
	B-AC	0.23	0.16

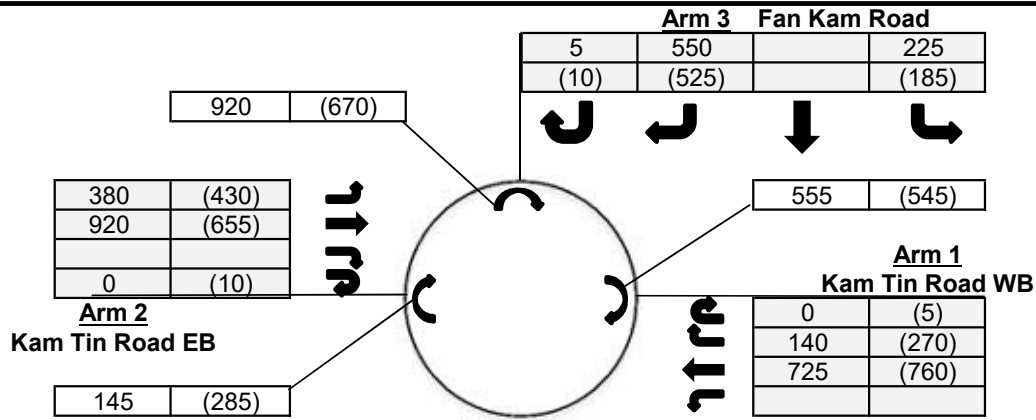
Critical DFC	0.26	0.30
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CTA Consultants Ltd.

Roundabout Junction Calculation

Junction : (D) Kam Tin Road / Fan Kam Road Job No.: 25009HK

Scenario : 2034 Reference Traffic Flows (With Remaining Site under LUR)



AM	(PM)
(PM)	

Input Parameters

			Arm 1	Arm 2	Arm 3
V	=	Approach half width (m)	3	7	3
E	=	Entry width (m)	8	8	5.9
L	=	Effective length of flare (m)	7.8	12	10
R	=	Entry radius	100	33	13.4
D	=	Inscribed circle diameter (m)	20	20	20
A	=	Entry angle (degree)	30	10	15
Q	=	Entry flow (pcu/hr)	AM	865	1300
			PM	1035	1095
Qc	=	Circulating flow across entry	AM	555	145
			PM	545	285
					920
					670

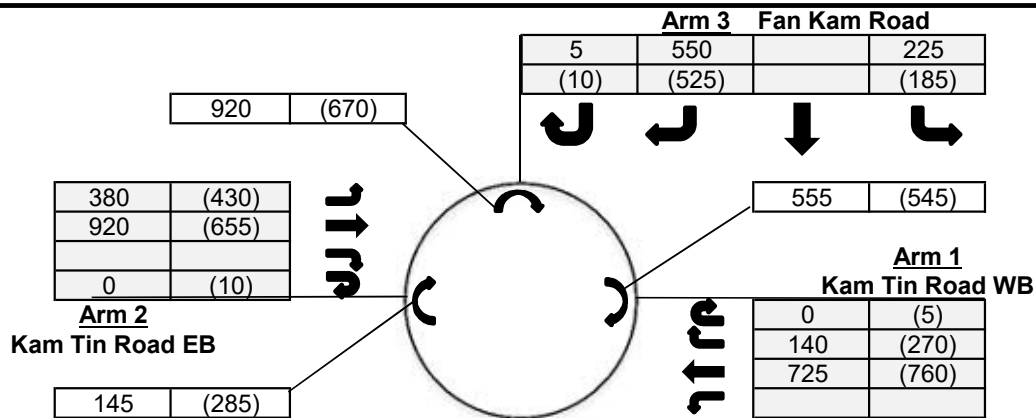
Output Parameters

			Arm 1	Arm 2	Arm 3
S	=	Sharpness of flare = $1.6*(E-V)/L$	1.03	0.13	0.46
K	=	$1-0.00347*(A-30)-0.978*(1/R-0.05)$	1.04	1.09	1.03
X2	=	$V+((E-V)/(1+2*S))$	4.64	7.79	4.50
M	=	$\text{Exp}((D-60)/10)$	0.02	0.02	0.02
F	=	$303*X2$	1406	2360	1365
Td	=	$1+(0.5/(1+M))$	1.49	1.49	1.49
Fc	=	$0.21*Td*(1+0.2*X2)$	0.60	0.80	0.60
Qe	=	Capacity = $K*(F-Fc*Qc)$	AM	1112	2443
			PM	1119	2321
DFC	=	Entry Flow/Capacity = Q/Qe	AM	0.78	0.53
			PM	0.93	0.47
					0.73

DFC of Critical Approach = AM 0.93
PM 0.93

Roundabout Junction Calculation

Junction : (D) Kam Tin Road / Fan Kam Road Job No.: 25009HK
 Scenario : 2034 Reference Traffic Flows (With Remaining Site under LUR) (With Planned Improvement)



AM	(PM)
(PM)	

Input Parameters

			Arm 1	Arm 2	Arm 3
V	=	Approach half width (m)	5	7	3.2
E	=	Entry width (m)	6.5	7.5	6.5
L	=	Effective length of flare (m)	12	3.6	15
R	=	Entry radius	100	15.8	25
D	=	Inscribed circle diameter (m)	28	28	28
A	=	Entry angle (degree)	33	10	20
Q	=	Entry flow (pcu/hr)	AM 865	1300	780
			PM 1035	1095	720
Qc	=	Circulating flow across entry	AM 555	145	920
			PM 545	285	670

Output Parameters

			Arm 1	Arm 2	Arm 3
S	=	Sharpness of flare = $1.6*(E-V)/L$	0.20	0.22	0.35
K	=	$1-0.00347*(A-30)-0.978*(1/R-0.05)$	1.03	1.06	1.04
X2	=	$V+((E-V)/(1+2*S))$	6.07	7.35	5.14
M	=	$\text{Exp}((D-60)/10)$	0.04	0.04	0.04
F	=	$303*X2$	1840	2226	1556
Td	=	$1+(0.5/(1+M))$	1.48	1.48	1.48
Fc	=	$0.21*Td*(1+0.2*X2)$	0.69	0.77	0.63
Qe	=	Capacity = $K*(F-Fc*Qc)$	AM 1499	2234	1020
			PM 1507	2120	1185
DFC	=	Entry Flow/Capacity = Q/Qe	AM 0.58	0.58	0.76
			PM 0.69	0.52	0.61

DFC of Critical Approach = AM 0.76
 PM 0.69

Job No: 25009HK

CTA Consultants Ltd.

Junction: (E) Kam Tin Road

Description: **2034 Reference Traffic Flows (With Remaining Site under LUR)**

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 Tin Road	W	←	A	1	3.4	0	0	1	0%	0%	1955	1955	1955	1955	1955	1955	1250	0.639	0.639	1175	0.601	0.601
Kam Tin Road	E	→	A	1	3.4	0	0	1	0%	0%	1955	1955	1955	1955	1955	1955	1250	0.639		1115	0.570	
Pedestrian crossing																						
↔ Bp 2 Min. Crossing Time = 5GM + 7FGM = 12s																						
Notes:									Traffic Flow (pcu / hr)								A.M. Check Phase			P.M. Check Phase		
									1250(1115) → ← 1250(1175)								εy 0.639 L (sec) 20 C (sec) 120 y pract. 0.750 R.C. (%) 17%			εy 0.601 L (sec) 20 C (sec) 120 y pract. 0.750 R.C. (%) 25%		
Stage/Phase Diagram:		1 →				2 — ↑ ↓ —																
I/G = 5s		I/G = 4s + 12s																				

Job No: 25009HK

CTA Consultants Ltd.

Junction: (E) Kam Tin Road

Description: **2034 Reference Traffic Flows (With Remaining Site under LUR) (With Planned Improvement)**

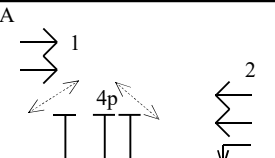
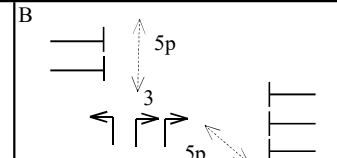
Approach	Direction	Movement notation	Phase	Stage	Width (m)	Radius (m)		Nearside O/I	Pro. Turning (%)		Saturation Flow (pcu/hr)	Total Saturation Flow (pcu/hr)	Revised Saturation Flow (pcu/hr)		Total Revised Saturation Flow (pcu/hr)		A.M. Peak			P.M. Peak		
						Left	Right		A.M.	P.M.			A.M.	P.M.	A.M.	P.M.	Flow (pcu/hr)	y Value	Critical y	Flow (pcu/hr)	y Value	Critical y
Kam Tin Road	W	←	A	1	4.4	0	0	1	0%	0%	2055	2055	2055	2055	2055	2055	1250	0.608	0.608	1175	0.572	0.572
Kam Tin Road	E	→	A	1	4.4	0	0	1	0%	0%	2055	2055	2055	2055	2055	2055	1250	0.608		1115	0.543	
Pedestrian crossing ↔ Bp 2 Min. Crossing Time = 5GM + 6FGM = 11s																						
Notes:									Traffic Flow (pcu / hr)								A.M. Check Phase εy 0.608 L (sec) 19 C (sec) 120 y pract. 0.758 R.C. (%) 25%			P.M. Check Phase εy 0.572 L (sec) 19 C (sec) 120 y pract. 0.758 R.C. (%) 32%		
Stage/Phase Diagram: 1 → ←		2 —┐ ↑ └─┘ ↓																				
I/G = 5s		I/G = 4s + 11s																				

TRAFFIC SIGNALS CALCULATION

Job No: 25009HK

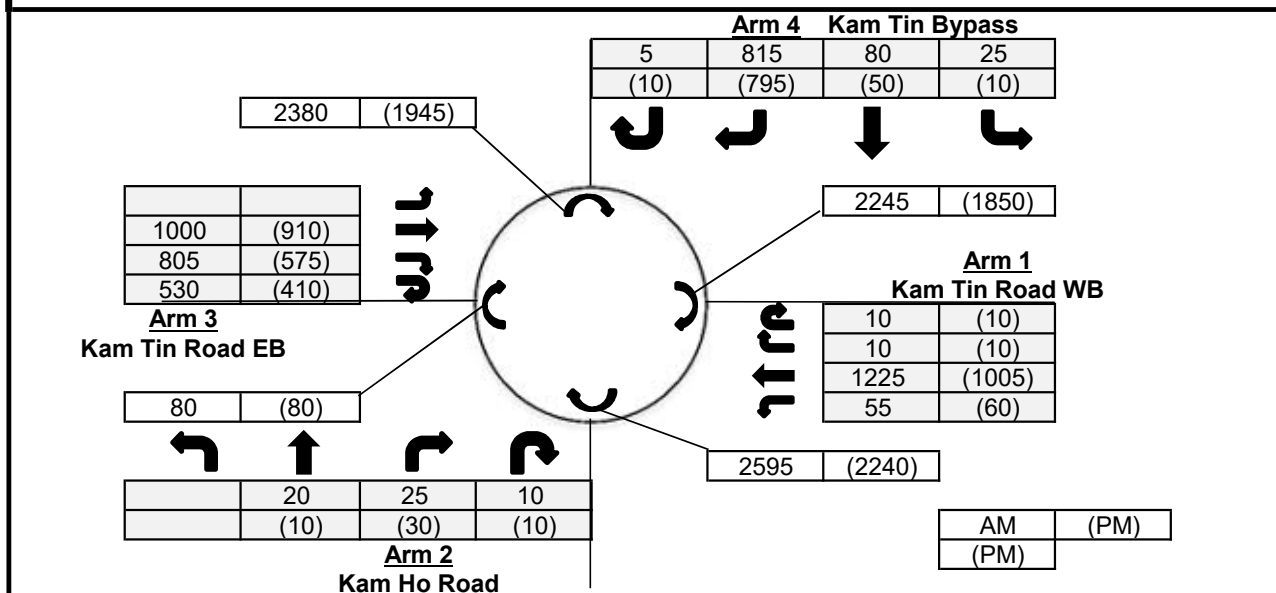
CTA Consultants Ltd.

Junction: **(F) Kam Tin Road / Tsing Long Highway Slip Road**Description: **2034 Reference Traffic Flows (With Remaining Site under LUR) (With Planned Improvement)**

Approach	Direction	Movement notation	Phase	Stage	Width (m)	Radius (m)		Nearside 0/1	Pro. Turning (%)		Revised Saturation Flow (pcu/hr)		A.M. Peak			P.M. Peak			
						Left	Right		A.M.	P.M.	A.M.	P.M.	Flow (pcu/hr)	y Value	Critical y	Flow (pcu/hr)	y Value	Critical y	
Kam Tin Road	E	→	1	A	3.65	0	0	1	0%	0%	1980	1980	968	0.489		807	0.408		
	E	→	1	A	3.65	0	0	0	0%	0%	2120	2120	1036	0.489		864	0.408		
	E	→	1	A	3.65	0	0	0	0%	0%	2120	2120	1036	0.489		864	0.408		
Kam Tin Road	W	←	2	A	3.80	0	0	0	0%	0%	2135	2135	1325	0.621	0.621	1208	0.566	0.566	
	W	←	2	A	3.80	0	0	0	0%	0%	2135	2135	1325	0.621		1208	0.566		
	W	↙	2	A	5.00	15	0	1	100%	100%	1925	1925	675	0.351		330	0.171		
Tsing Long Highway Slip Road	N	↖	3	B	3.50	20	0	1	100%	100%	1830	1830	163	0.089	0.089	245	0.134	0.134	
	N	↖	3	B	3.50	25	0	0	100%	100%	1985	1985	177	0.089		265	0.134		
	N	→	3	B	3.60	0	30	0	100%	100%	2015	2015	128	0.064		130	0.065		
	N	→	3	B	3.50	0	28	0	100%	100%	2000	2000	127	0.064		130	0.065		
*Pedestrian Crossing			4p	A		Min. Crossing Time			=	7 Gm + 7 Fm = 14s									
			5p	B		Min. Crossing Time			=	7 Gm + 7 Fm = 14s									
Notes:						Traffic Flow (pcu / hr) [AM (PM)]						Check Phase			Check Phase				
						3040(2535)→ ↙ ↘ 340(510) 255(260) ← 2650(2415) ↓ 675(330)						E _y 0.710 L (sec) 10 C (sec) 120 y pract. 0.825 R.C. (%) 16%			E _y 0.699 L (sec) 10 C (sec) 120 y pract. 0.825 R.C. (%) 18%				
Stage / Phase Diagrams																			
A				B															
																			
I/G = 5				I/G = 7															

Roundabout Junction Calculation

Junction : (G) Kam Tin Road / Kam Tin Bypass Job No.: 25009HK
 Scenario : 2034 Reference Traffic Flows (With Remaining Site under LUR) (With Planned Improvement)



Input Parameters			Arm 1	Arm 2	Arm 3	Arm 4
V	=	Approach half width (m)	7.3	7.3	7.3	6.5
E	=	Entry width (m)	13	10	11	11
L	=	Effective length of flare (m)	12	9.5	13	15
R	=	Entry radius	70	20	42.5	42.5
D	=	Inscribed circle diameter (m)	88	88	88	88
A	=	Entry angle (degree)	30	38	29	39
Q	=	Entry flow (pcu/hr)	AM 1300 PM 1085	55 50	2335 1895	925 865
Qc	=	Circulating flow across entry	AM 2245 PM 1850	2595 2240	80 80	2380 1945

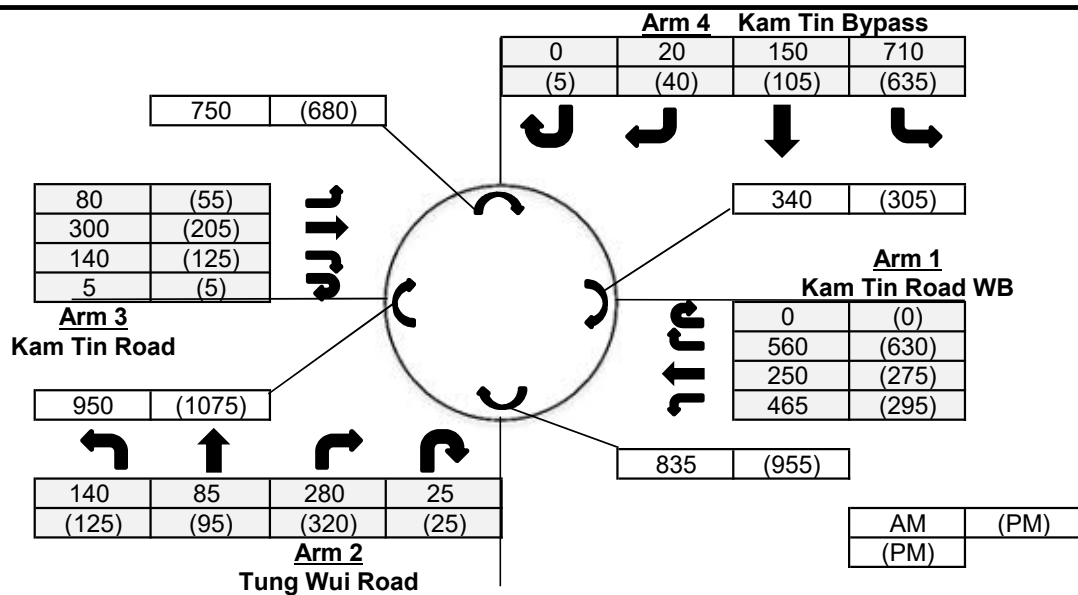
Output Parameters			Arm 1	Arm 2	Arm 3	Arm 4
S	=	Sharpness of flare = $1.6 \cdot (E - V) / L$	0.76	0.45	0.46	0.48
K	=	$1 - 0.00347 \cdot (A - 30) - 0.978 \cdot (1 / R - 0.05)$	1.03	0.97	1.03	0.99
X2	=	$V + ((E - V) / (1 + 2 \cdot S))$	9.56	8.71	9.24	8.80
M	=	$\text{Exp}((D - 60) / 10)$	16.44	16.44	16.44	16.44
F	=	$303 \cdot X2$	2897	2640	2799	2665
Td	=	$1 + (0.5 / (1 + M))$	1.03	1.03	1.03	1.03
Fc	=	$0.21 \cdot Td \cdot (1 + 0.2 \cdot X2)$	0.63	0.59	0.62	0.60
Qe	=	Capacity = $K \cdot (F - Fc \cdot Qc)$	AM 1537 PM 1794	1072 1277	2830 2830	1240 1498
DFC	=	Entry Flow/Capacity = Q / Qe	AM 0.85 PM 0.60	0.05 0.04	0.83 0.67	0.75 0.58

DFC of Critical Approach = AM 0.85
PM 0.67

Roundabout Junction Calculation

Junction : (A) Kam Tin Bypass / Kam Tin Road / Tung Wui Road Job No.: 25009HK

Scenario : 2034 Design Traffic Flows (With Remaining Site under LUR)



Input Parameters

			Arm 1	Arm 2	Arm 3	Arm 4
V	=	Approach half width (m)	7.3	7.2	3.6	7.3
E	=	Entry width (m)	11.5	10.1	11.8	13.5
L	=	Effective length of flare (m)	12.6	9.4	14	12.5
R	=	Entry radius	26	20	18.4	36
D	=	Inscribed circle diameter (m)	64	64	64	64
A	=	Entry angle (degree)	42	27	45	23
Q	=	Entry flow (pcu/hr)	AM 1275	530	525	880
			PM 1200	565	390	785
Qc	=	Circulating flow across entry	AM 340	835	950	750
			PM 305	955	1075	680

Output Parameters

			Arm 1	Arm 2	Arm 3	Arm 4
S	=	Sharpness of flare = $1.6 \cdot (E-V)/L$	0.53	0.49	0.94	0.79
K	=	$1 - 0.00347 \cdot (A-30) - 0.978 \cdot (1/R - 0.05)$	0.97	1.01	0.94	1.05
X ₂	=	$V + ((E-V)/(1+2 \cdot S))$	9.33	8.66	6.45	9.70
M	=	$\exp((D-60)/10)$	1.49	1.49	1.49	1.49
F	=	$303 \cdot X_2$	2828	2624	1955	2938
T _d	=	$1 + (0.5/(1+M))$	1.20	1.20	1.20	1.20
F _c	=	$0.21 \cdot T_d \cdot (1 + 0.2 \cdot X_2)$	0.72	0.69	0.58	0.74
Q _e	=	Capacity = $K \cdot (F - F_c \cdot Q_c)$	AM 2504	2070	1327	2492
			PM 2528	1986	1259	2546
DFC	=	Entry Flow/Capacity = Q/Q_e	AM 0.51	0.26	0.40	0.35
			PM 0.47	0.28	0.31	0.31

DFC of Critical Approach = AM 0.51
PM 0.47

TRAFFIC SIGNALS CALCULATION										Job No: 25009HK										CTA Consultants Ltd.																			
Junction: (B) Kam Tin Bypass / Kong Tai Road																																							
Description: 2034 Design Traffic Flows (With Remaining Site under LUR)																																							
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 Tin Bypass	W	↗	C	2	3.0	0	15	0	100%	100%	2055	2055	1870	1870	1870	1870	65	0.035		65	0.035																		
	W	↖	B	1,2	3.5	0	0	0	0%	0%	2105	0	2105	2105	0	0	393	0.187		429	0.204																		
	W	↖	B	1,2	3.0	0	0	1	0%	0%	1775	3880	1775	1775	3880	3880	332	0.187		361	0.204																		
Kam Tin Bypass	E	↘	A	1	3.0	13	0	1	15%	20%	1915	3970	1880	1870	3935	3925	397	0.211	0.211	367	0.196	0.196																	
	E	↘	A	1	3.0	0	0	0	0%	0%	2055	0	2055	2055	0	0	433	0.211		403	0.196																		
Kong To Road	S	⬇	D	3	3.5	10	12	1	46% / 54%	56% / 44%	1461	1461	1285	1285	1285	1285	230	0.179	0.179	170	0.132	0.132																	
Pedestrian crossing	↔	Ep	4	Min. Crossing Time = 12GM + 15FGM = 27s																																			
	↔	Fp	2,3,4	Min. Crossing Time = 7GM + 7FGM = 14s																																			
	↔	Gp	4	Min. Crossing Time = 7GM + 7FGM = 14s																																			
Notes:										Traffic Flow (pcu / hr)										A.M. Check Phase					P.M. Check Phase														
										125(75) 105(95) 60(75) 770(695) ↘ ↙ 65(65) 725(790) ↗ ↖										Ey 0.390 L (sec) 47 C (sec) 108 y pract. 0.508 R.C. (%) 30%					Ey 0.329 L (sec) 47 C (sec) 108 y pract. 0.508 R.C. (%) 55%														
Stage/Phase Diagram:																																							
I/G=3s										I/G=6s + 5s										I/G=5s										I/G=4s (Min. Green Time for Ep=27s)									

Priority Junction Calculation

Junction :	(C) Kam Tin Road / Kam Tai Road	Job No.:	25009HK
Scenario :	2034 Design Traffic Flows (With Remaining Site under LUR)		

AM	(PM)
(PM)	

The predictive equations of capacity of movement are:

$$Q-BA = D(627 + 14W-CR - Y(0.364q-AC + 0.144q-AB + 0.229q-CA + 0.52q-CB))$$

$$Q-BC = E(745 - Y(0.364q-AC + 0.144q-AB))$$

$$Q-CB = F(745 - 0.364Y(q-AC + q-AB))$$

The geometric parameters represented by D, E, F are:

$$D = (1 + 0.094(w-BA - 3.65))(1 + 0.0009(V-rBA - 120))(1 + 0.0006(V-IBA - 150))$$

$$E = (1 + 0.094(w-BC - 3.65))(1 + 0.0009(V-rBC - 120))$$

$$F = (1 + 0.094(w-CB - 3.65))(1 + 0.0009(V-rCB - 120))$$

where

Y = 1 - 0.0345W

q-AB, etc = the design flow of movement AB, etc

W = major road width

W-CR = central reserve width

w-BA, etc = lane width to vehicle

v-rBA, etc = visibility to the right for waiting vehicles in stream BA, etc

v-IBA = visibility to the left for waiting vehicles in stream BA, etc

Geometry :	Input	Calculated
W	7	D 0.968
W-CR	0	E 1.029
C-B blocked C-A, residual width <2.5m? (Yes: 1, No: 0)	1	F 0.924
Minor Road Share LT&RT? (Yes: 1, No: 0)	1	Y 0.759

Analysis :	Traffic Flow pcu/hr	AM	PM	Capacity pcu/hr	AM	PM
q-CA	1350	1125	Q-BA	9	57	(If C-B blocked C-A) (If Minor Road Share LT&RT)
q-CB	125	150	Q-BC	423	445	
q-AB	50	60	Q-CB	372	390	
q-AC	1190	1110	Q-CA	1195	1107	
q-BA	20	10	Q-BAC	22	210	
q-BC	30	50				
f	0.600	0.833				

Results :	Ratio of Flow-to-Capacity	AM	PM
	B-A	N/A	N/A
	B-C	N/A	N/A
	C-B	0.34	0.38
	C-A	1.13	1.02
	B-AC	2.32	0.29

Critical DFC	2.32	1.02
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Priority Junction Calculation

Junction :	(C) Kam Tin Road / Kam Tai Road	Job No.:	25009HK
Scenario :	2034 Design Traffic Flows (With Remaining Site under LUR) (With Planned Improvement)		

Arm B Kam Tai Road

20	30
(10)	(50)

Arm A Kam Tin Road EB

50	(60)
1190	(1110)

Arm C Kam Tin Road WB

125	(150)
1350	(1125)

AM	(PM)
(PM)	

The predictive equations of capacity of movement are:

$$Q-BA = D(627 + 14W-CR - Y(0.364q-AC + 0.144q-AB + 0.229q-CA + 0.52q-CB))$$

$$Q-BC = E(745 - Y(0.364q-AC + 0.144q-AB))$$

$$Q-CB = F(745 - 0.364Y(q-AC + q-AB))$$

The geometric parameters represented by D, E, F are:

$$D = (1 + 0.094(w-BA - 3.65))(1 + 0.0009(V-rBA - 120))(1 + 0.0006(V-IBA - 150))$$

$$E = (1 + 0.094(w-BC - 3.65))(1 + 0.0009(V-rBC - 120))$$

$$F = (1 + 0.094(w-CB - 3.65))(1 + 0.0009(V-rCB - 120))$$

where

Y = 1 - 0.0345W

q-AB, etc = the design flow of movement AB, etc

W = major road width

W-CR = central reserve width

w-BA, etc = lane width to vehicle

v-rBA, etc = visibility to the right for waiting vehicles in stream BA, etc

v-IBA = visibility to the left for waiting vehicles in stream BA, etc

Geometry :	Input	Calculated	
W	11	D	0.968
W-CR	0	E	1.029
C-B blocked C-A, residual width <2.5m? (Yes: 1, No: 0)	0	F	1.029
Minor Road Share LT&RT? (Yes: 1, No: 0)	1	Y	0.621

Analysis :	Traffic Flow pcu/hr	AM	PM	Capacity pcu/hr	AM	PM
q-CA	1350	1125	Q-BA	118	157	
q-CB	125	150	Q-BC	486	503	
q-AB	50	60	Q-CB	479	495	
q-AC	1190	1110	Q-CA	N/A	N/A	(If C-B blocked C-A)
q-BA	20	10	Q-BAC	216	368	(If Minor Road Share LT&RT)
q-BC	30	50				
f	0.600	0.833				

Results :	Ratio of Flow-to-Capacity	AM	PM
	B-A	N/A	N/A
	B-C	N/A	N/A
	C-B	0.26	0.30
	C-A	N/A	N/A
	B-AC	0.23	0.16

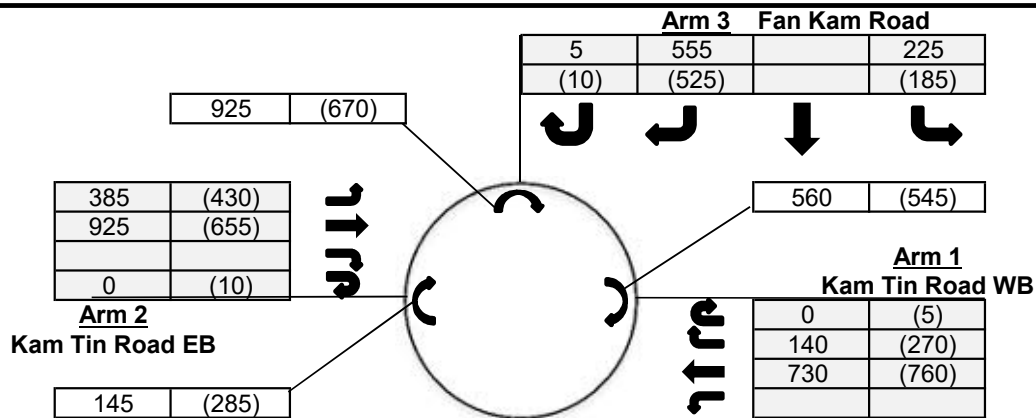
Critical DFC	0.26	0.30
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Roundabout Junction Calculation

Junction : (D) Kam Tin Road / Fan Kam Road Job No.: 25009HK

Scenario : 2034 Design Traffic Flows (With Remaining Site under LUR)



AM	(PM)
(PM)	

Input Parameters

			Arm 1	Arm 2	Arm 3
V	=	Approach half width (m)	3	7	3
E	=	Entry width (m)	8	8	5.9
L	=	Effective length of flare (m)	7.8	12	10
R	=	Entry radius	100	33	13.4
D	=	Inscribed circle diameter (m)	20	20	20
A	=	Entry angle (degree)	30	10	15
Q	=	Entry flow (pcu/hr)	AM 870	1310	785
			PM 1035	1095	720
Qc	=	Circulating flow across entry	AM 560	145	925
			PM 545	285	670

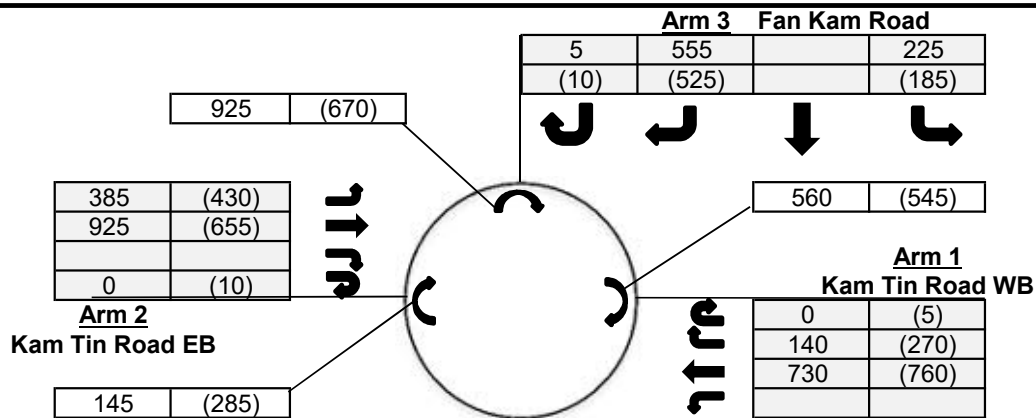
Output Parameters

			Arm 1	Arm 2	Arm 3
S	=	Sharpness of flare = $1.6 \cdot (E-V)/L$	1.03	0.13	0.46
K	=	$1 - 0.00347 \cdot (A-30) - 0.978 \cdot (1/R - 0.05)$	1.04	1.09	1.03
X2	=	$V + ((E-V)/(1+2 \cdot S))$	4.64	7.79	4.50
M	=	$\text{Exp}((D-60)/10)$	0.02	0.02	0.02
F	=	$303 \cdot X2$	1406	2360	1365
Td	=	$1 + (0.5/(1+M))$	1.49	1.49	1.49
Fc	=	$0.21 \cdot Td \cdot (1 + 0.2 \cdot X2)$	0.60	0.80	0.60
Qe	=	Capacity = $K \cdot (F - Fc \cdot Qc)$	AM 1109	2443	837
			PM 1119	2321	993
DFC	=	Entry Flow/Capacity = Q/Qe	AM 0.78	0.54	0.94
			PM 0.93	0.47	0.73

DFC of Critical Approach = AM 0.94
PM 0.93

Roundabout Junction Calculation

Junction : (D) Kam Tin Road / Fan Kam Road Job No.: 25009HK
 Scenario : 2034 Design Traffic Flows (With Remaining Site under LUR) (With Planned Improvement)



AM	(PM)
(PM)	

Input Parameters

			Arm 1	Arm 2	Arm 3
V	=	Approach half width (m)	5	7	3.2
E	=	Entry width (m)	6.5	7.5	6.5
L	=	Effective length of flare (m)	12	3.6	15
R	=	Entry radius	100	15.8	25
D	=	Inscribed circle diameter (m)	28	28	28
A	=	Entry angle (degree)	33	10	20
Q	=	Entry flow (pcu/hr)	AM 870	1310	785
			PM 1035	1095	720
Qc	=	Circulating flow across entry	AM 560	145	925
			PM 545	285	670

Output Parameters

			Arm 1	Arm 2	Arm 3
S	=	Sharpness of flare = $1.6 \cdot (E-V)/L$	0.20	0.22	0.35
K	=	$1 - 0.00347 \cdot (A-30) - 0.978 \cdot (1/R - 0.05)$	1.03	1.06	1.04
X2	=	$V + ((E-V)/(1+2 \cdot S))$	6.07	7.35	5.14
M	=	$\text{Exp}((D-60)/10)$	0.04	0.04	0.04
F	=	$303 \cdot X2$	1840	2226	1556
Td	=	$1 + (0.5/(1+M))$	1.48	1.48	1.48
Fc	=	$0.21 \cdot Td \cdot (1 + 0.2 \cdot X2)$	0.69	0.77	0.63
Qe	=	Capacity = $K \cdot (F - Fc \cdot Qc)$	AM 1496	2234	1017
			PM 1507	2120	1185
DFC	=	Entry Flow/Capacity = Q/Qe	AM 0.58	0.59	0.77
			PM 0.69	0.52	0.61

DFC of Critical Approach = AM 0.77
 PM 0.69

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Description: **2034 Design Traffic Flows (With Remaining Site under LUR)**

Approach	Direction	Movement notation	Phase	Stage	Width (m)	Radius (m)		Nearside O/I	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 Tin Road	W	←	A	1	3.4	0	0	1	0%	0%	1955	1955	1955	1955	1955	1955	1270	0.650	0.650	1180	0.604	0.604
Kam Tin Road	E	→	A	1	3.4	0	0	1	0%	0%	1955	1955	1955	1955	1955	1955	1265	0.647		1125	0.575	
Pedestrian crossing ↔ Bp 2 Min. Crossing Time = 5GM + 7FGM = 12s																						
Notes:									Traffic Flow (pcu / hr)								A.M. Check Phase			P.M. Check Phase		
									1265(1125) → ← 1270(1180)								εy 0.650 L (sec) 20 C (sec) 120 y pract. 0.750 R.C. (%) 15%			εy 0.604 L (sec) 20 C (sec) 120 y pract. 0.750 R.C. (%) 24%		
Stage/Phase Diagram: 1		2																				
→ ←		├─┤ ↑ └─┘ ↓ ┬─┴─┐																				
I/G = 5s		I/G = 4s + 12s																				

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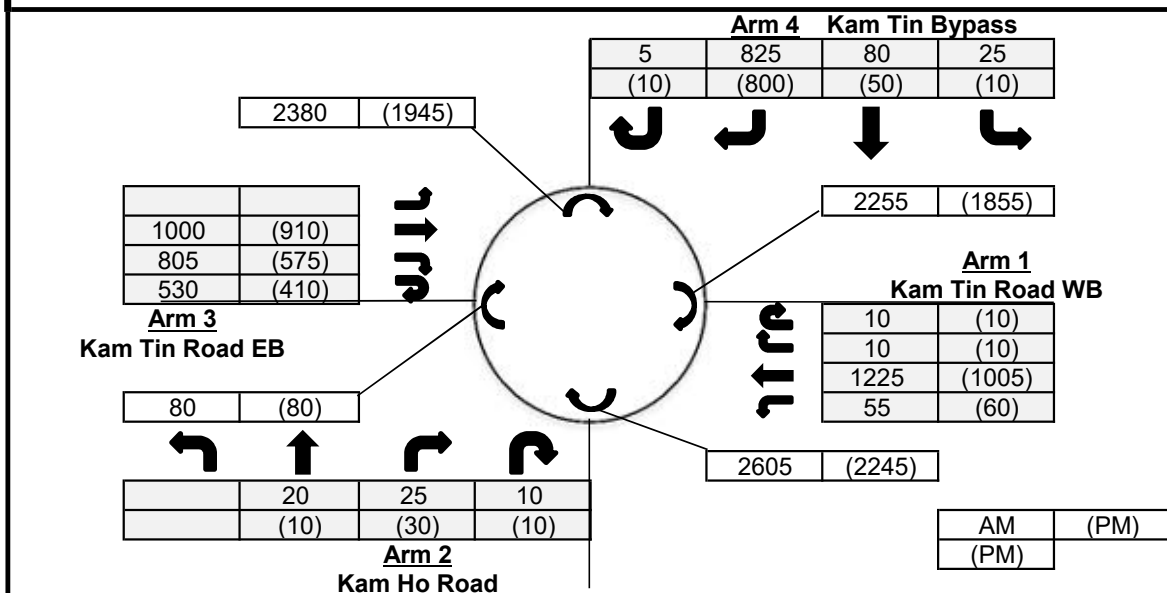
Description: **2034 Design Traffic Flows (With Remaining Site under LUR) (With Planned Improvement)**

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 Tin Road	W	←	A	1	4.4	0	0	1	0%	0%	2055	2055	2055	2055	2055	2055	1270	0.618	0.618	1180	0.574	0.574
Kam Tin Road	E	→	A	1	4.4	0	0	1	0%	0%	2055	2055	2055	2055	2055	2055	1265	0.616		1125	0.547	
Pedestrian crossing ↔ Bp 2 Min. Crossing Time = 5GM + 6FGM = 11s																						
Notes:									Traffic Flow (pcu / hr)								A.M. Check Phase			P.M. Check Phase		
									1265(1125) →													

Junction: (F) Kam Tin Road / Tsing Long Highway Slip Road																			
Description: 2034 Design Traffic Flows (With Remaining Site under LUR) (With Planned Improvement)																			
Approach	Direction	Movement notation	Phase	Stage	Width (m)	Radius (m)		Nearside 0/1	Pro. Turning (%)		Revised Saturation Flow (pcu/hr)		A.M. Peak			P.M. Peak			
						Left	Right		A.M.	P.M.	A.M.	P.M.	Flow (pcu/hr)	y Value	Critical y	Flow (pcu/hr)	y Value	Critical y	
Kam Tin Road	E	→	1	A	3.65	0	0	1	0%	0%	1980	1980	968	0.489		807	0.408		
	E	→	1	A	3.65	0	0	0	0%	0%	2120	2120	1036	0.489		864	0.408		
	E	→	1	A	3.65	0	0	0	0%	0%	2120	2120	1036	0.489		864	0.408		
Kam Tin Road	W	←	2	A	3.80	0	0	0	0%	0%	2135	2135	1325	0.621	0.621	1208	0.566	0.566	
	W	←	2	A	3.80	0	0	0	0%	0%	2135	2135	1325	0.621		1208	0.566		
	W	↓	2	A	5.00	15	0	1	100%	100%	1925	1925	685	0.356		335	0.174		
Tsing Long Highway Slip Road	N	↰	3	B	3.50	20	0	1	100%	100%	1830	1830	163	0.089	0.089	245	0.134	0.134	
	N	↱	3	B	3.50	25	0	0	100%	100%	1985	1985	177	0.089		265	0.134		
	N	→	3	B	3.60	0	30	0	100%	100%	2015	2015	130	0.065		133	0.066		
	N	↱	3	B	3.50	0	28	0	100%	100%	2000	2000	130	0.065		132	0.066		
*Pedestrian Crossing			4p	A	Min. Crossing Time = 7 Gm + 7 Fm = 14s														
			5p	B	Min. Crossing Time = 7 Gm + 7 Fm = 14s														
Notes:						Traffic Flow (pcu / hr) [AM (PM)]						Check Phase			Check Phase				
						3040(2535)→ ← → 340(510) 260(265) ← 2650(2415) ↓ 685(335)						E _y 0.710 L (sec) 10 C (sec) 120 y pract. 0.825 R.C. (%) 16%			E _y 0.699 L (sec) 10 C (sec) 120 y pract. 0.825 R.C. (%) 18%				
Stage / Phase Diagrams																			
A				B															
I/G = 5				I/G = 7															

Roundabout Junction Calculation

Junction : (G) Kam Tin Road / Kam Tin Bypass Job No.: 25009HK
 Scenario : 2034 Design Traffic Flows (With Remaining Site under LUR) (With Planned Improvement)



Input Parameters			Arm 1	Arm 2	Arm 3	Arm 4	
V	=	Approach half width (m)	7.3	7.3	7.3	6.5	
E	=	Entry width (m)	13	10	11	11	
L	=	Effective length of flare (m)	12	9.5	13	15	
R	=	Entry radius	70	20	42.5	42.5	
D	=	Inscribed circle diameter (m)	88	88	88	88	
A	=	Entry angle (degree)	30	38	29	39	
Q	=	Entry flow (pcu/hr)	AM	1300	55	2335	935
			PM	1085	50	1895	870
Qc	=	Circulating flow	AM	2255	2605	80	2380
		across entry	PM	1855	2245	80	1945

Output Parameters			Arm 1	Arm 2	Arm 3	Arm 4	
S	=	Sharpness of flare = 1.6*(E-V)/L	0.76	0.45	0.46	0.48	
K	=	1-0.00347*(A-30)-0.978*(1/R-0.05)	1.03	0.97	1.03	0.99	
X2	=	V+((E-V)/(1+2*S))	9.56	8.71	9.24	8.80	
M	=	Exp((D-60)/10)	16.44	16.44	16.44	16.44	
F	=	303*X2	2897	2640	2799	2665	
Td	=	1+(0.5/(1+M))	1.03	1.03	1.03	1.03	
Fc	=	0.21*Td*(1+0.2*X2)	0.63	0.59	0.62	0.60	
Qe	=	Capacity = K*(F-Fc*Qc)	AM	1530	1066	2830	1240
			PM	1791	1274	2830	1498
DFC	=	Entry Flow/Capacity = Q/Qe	AM	0.85	0.05	0.83	0.75
			PM	0.61	0.04	0.67	0.58

DFC of Critical Approach = AM 0.85
 PM 0.67

Priority Junction Calculation

Junction :	(C) Kam Tin Road / Kam Tai Road	Job No.:	25009HK
Scenario :	2034 Design Traffic Flows (With Proposed Improvement)		

Arm B Kam Tai Road

20	30
(10)	(50)

Arm A Kam Tin Road EB Arm C Kam Tin Road WB

50	(60)	125	(150)
1140	(1085)	1320	(1095)

AM	(PM)
(PM)	

The predictive equations of capacity of movement are:

$$Q-BA = D(627 + 14W-CR - Y(0.364q-AC + 0.144q-AB + 0.229q-CA + 0.52q-CB))$$

$$Q-BC = E(745 - Y(0.364q-AC + 0.144q-AB))$$

$$Q-CB = F(745 - 0.364Y(q-AC + q-AB))$$

The geometric parameters represented by D, E, F are:

$$D = (1 + 0.094(w-BA - 3.65))(1 + 0.0009(V-rBA - 120))(1 + 0.0006(V-IBA - 150))$$

$$E = (1 + 0.094(w-BC - 3.65))(1 + 0.0009(V-rBC - 120))$$

$$F = (1 + 0.094(w-CB - 3.65))(1 + 0.0009(V-rCB - 120))$$

where

Y = 1 - 0.0345W

q-AB, etc = the design flow of movement AB, etc

W = major road width

W-CR = central reserve width

w-BA, etc = lane width to vehicle

v-rBA, etc = visibility to the right for waiting vehicles in stream BA, etc

v-IBA = visibility to the left for waiting vehicles in stream BA, etc

Geometry :	Input	Calculated
W	7	D 0.968
W-CR	0	E 1.029
C-B blocked C-A, residual width <2.5m? (Yes: 1, No: 0)	0	F 0.924
Minor Road Share LT&RT? (Yes: 1, No: 0)	1	Y 0.759

Analysis :	Traffic Flow pcu/hr	AM	PM	Capacity pcu/hr	AM	PM
q-CA	1320	1095	Q-BA	27	69	
q-CB	125	150	Q-BC	437	452	
q-AB	50	60	Q-CB	385	396	
q-AC	1140	1085	Q-CA	N/A	N/A	(If C-B blocked C-A)
q-BA	20	10	Q-BAC	62	235	(If Minor Road Share LT&RT)
q-BC	30	50				
f	0.600	0.833				

Results :	Ratio of Flow-to-Capacity	AM	PM
	B-A	N/A	N/A
	B-C	N/A	N/A
	C-B	0.32	0.38
	C-A	N/A	N/A
	B-AC	0.80	0.26

Critical DFC	0.80	0.38
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Appendix III

Extracted pages of TIA Report of **“Sites 1, 4a and 6 for Public Housing** **Development and Government, Institution** **or Community”**

**PROPOSED AMENDMENTS TO THE
APPROVED KAM TIN SOUTH
OUTLINE ZONING PLAN NO. S/YL-KTS/13**

**Sites 1, 4a and 6 for Public Housing Development and
Government, Institution or Community Facilities**

Traffic Impact Assessment Report

AECOM ASIA COMPANY LIMITED

5 TRAFFIC IMPACT ASSESSMENT

5.1 Junction Capacity Analysis

5.1.1 The performances of the key junctions within the AOI were assessed based on the traffic forecasts for the three assessment scenarios in 2031, and are summarized in **Table 5.1**.

Table 5.1 2031 Junction Performance

No.	Junction	2031 RC/DFC ⁽¹⁾					
		Scenario 1		Scenario 2		Scenario 3	
		AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
J1	Au Tau Interchange	0.60	0.49	0.78	0.65	0.7	0.65
J2	Kam Tin Road/ Tsing Long Highway Slip Road	7%	<u>-4%</u>	<u>-12%</u>	<u>-17%</u>	40%	24%
J3	Kam Tin Road/ Kam Tin Bypass/ Kam Ho Road	0.54	0.56	<u>1.06</u>	0.88	0.75	0.66
J4	Kam Tin Road/ Kam Sheung Road (Western Junction)	0.57	0.61	<u>1.22</u>	<u>1.29</u>	45%	30%
J5	Kam Tin Road/ Kam Tin Bypass/ Tung Wui Road ⁽²⁾	0.45	0.52	0.48	0.56	0.48	0.56
	Kam Tin Road/ Kam Tin Bypass/ Tung Wui Road ⁽³⁾	0.45	0.52	0.48	0.56	0.48	0.56
J6	Kam Ho Road/ Access Road to KSRS	0.45	0.33	0.85	0.62	0.03	0.03
J7	Kam Ho Road/Tung Wui Road/Access Road to KSRS	0.29	0.33	0.84	0.62	0.79	0.55
J8	Tung Wui Road / Access Road to KSRS Eastern PTI	62%	61%	<u>-7%</u>	14%	44%	87%
J8A	Tung Wui Road / Access Road to Site 1	-	-	0.46	0.24	0.46	0.24
J9	Tung Wui Road/ Kam Po Road	0.09	0.07	<u>1.05</u>	0.49	45%	>100%
J10	Tung Wui Road / Kam Sheung Road	44%	48%	<u>-21%</u>	<u>-11%</u>	30%	46%
J11	Pat Heung Road/ Tsing Long Highway Slip Road	0.57	0.55	<u>1.31</u>	<u>1.20</u>	0.48	0.44
J12	Pat Heung Road/ Link Road to Kam Ho Road	0.53	0.32	<u>1.68</u>	0.82	0.56	0.37
J13	Pat Heung Road / Kam Ho Road	0.26	0.25	0.33	0.30	0.39	0.34
J14	Pat Heung Road/ Link Road to Kam Po Road	0.11	0.08	0.11	0.08	0.11	0.08
J15	Pat Heung Road/ Kam Sheung Road	0.42	0.53	0.54	0.60	95%	89%
J16	Castle Peak Road – Tam Mi / Sam Tam Road	31%	41%	19%	31%	19%	31%
J17	Kam Tin Road/ Fan Kam Road ⁽²⁾	0.71	0.70	0.79	0.75	0.79	0.75
	Kam Tin Road/ Fan Kam Road ⁽³⁾	0.63	0.70	0.71	0.75	0.71	0.75
J18	Kam Tin Road/ Kam Sheung Road (Eastern Junction) ⁽²⁾	0.64	0.61	0.71	0.70	0.71	0.70
	Kam Tin Road/ Kam Sheung Road (Eastern Junction) ⁽³⁾	0.62	0.59	0.59	0.67	0.69	0.67
J19	Kam Tin Road / Lam Kam Road / Route Twisk ⁽²⁾	0.59	0.60	0.65	0.63	0.65	0.63
	Kam Tin Road / Lam Kam Road / Route Twisk ⁽³⁾	0.58	0.59	0.64	0.62	0.64	0.62

No.	Junction	2031 RC/DFC ⁽¹⁾					
		Scenario 1		Scenario 2		Scenario 3	
		AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
J20	Pok Oi Interchange	0.69	0.81	0.84	0.88	0.84	0.88

Notes:

- (1) Explanatory notes for the terms “RC” and “DFC” are given in para. 3.3.2 and 3.3.3 respectively.
- (2) Existing layout without “Upgrading of Remaining Sections of Kam Tin Road and Lam Kam Road”.
- (3) With widening to a standard 7.3m wide single 2-lane carriageway under “Upgrading of Remaining Sections of Kam Tin Road and Lam Kam Road” by Highways Department.

- 5.1.2 With the proposed road improvement works, it is anticipated that all problematic junctions identified in the Assessment Scenario 2 could be alleviated without further capacity problem.

5.2 Link Capacity Analysis

- 5.2.1 The identified key road links within the AOI were assessed based on the traffic forecasts of the 3 assessment scenarios in 2031. The link performances are shown in **Tables 5.2 – 5.4**.

Scenario 1 (without KaTS Development and RIW)

- 5.2.2 Kam Tin Road east of Tung Wui Road (L15) would be overloaded ($V/C = 1.3$) in 2031. With the improvement works “Upgrading of Remaining Sections of Kam Tin Road and Lam Kam Road” implemented by Highway Department, the V/C ratio would be dropped to 1.06.
- 5.2.3 Tai Lam Tunnel (L19) would operate with spare capacity but close to its capacity limit in 2031 even without KaTS development ($V/C = 1.05$).

Scenario 2 (with KaTS Initial Sites but without RIW)

- 5.2.4 With the 2 MTRCL Sites and 3 Initial Sites, Kam Ho Road (L4) and Kam Po Road (L14 and L25) would be overloaded ($V/C > 1.2$), road improvement works is required in order to support KaTS Initial Sites Developments.
- 5.2.5 With the improvement works “Upgrading of Remaining Sections of Kam Tin Road and Lam Kam Road” implemented by Highway Department, Kam Tin Road (L3 and L15) would operate at capacity ($V/C < 1.2$). Otherwise, Kam Tin Road (L15) would be overloaded as same as Scenario 1.
- 5.2.6 With KaTS Initial Sites Developments, Tai Lam Tunnel (L19) would still operate at capacity ($V/C = 1.18$) which is still manageable.

Scenario 3 (with KaTS Initial Sites and RIW)

- 5.2.7 With the road improvement works implemented under the Project, all the road links would operate with ample capacity ($V/C < 1.0$) except Kam Tin Road (L15) and Tai Lam Tunnel (L19) which indicates a manageable degree of congestion ($V/C > 1.0$ but $V/C < 1.2$).

Table 5.2 Link Performance of 2031 Assessment Scenario 1

No.	Road	Config.	Dir.	Capacity (pcu/hr)	AM Peak		PM Peak	
					Flow	V/C	Flow	V/C
L1	Kam Tin Road	D2	EB	3,600	2,180	0.61	1,880	0.52
		D2	WB	3,600	1,750	0.49	2,080	0.58
L2	Tsing Long Highway Slip Road	S2	NB	3,600	410	0.11	660	0.18
		S2	SB	3,600	340	0.09	180	0.05
L3	Kam Tin Road	S2	EB	900	610	0.68	650	0.72
			WB	900	630	0.70	650	0.72
L4	Kam Ho Road	S2	NB	1,100	570	0.52	600	0.55
			SB	1,100	140	0.13	120	0.11
L5	Kam Sheung Road	S2	NB	900	300	0.33	350	0.39
			SB	900	240	0.27	270	0.30
L6	Kam Sheung Road	S2	NB	900	320	0.36	490	0.54
			SB	900	480	0.53	520	0.58
L7	Tung Wui Road	D2	EB	3,600	500	0.14	520	0.14
		D2	WB	3,600	560	0.16	560	0.16
L8	Kam Ho Road	S2	NB	1,100	420	0.38	460	0.42
			SB	1,100	450	0.41	300	0.27
L9	Pat Heung Road Link Road	S2	EB	1,100	390	0.35	390	0.35
			WB	1,100	390	0.35	320	0.29
L10	Pat Heung Road	S2	EB	1,100	270	0.25	340	0.31
			WB	1,100	400	0.36	300	0.27
L11	Kam Tin Road	S2	EB	900	350	0.39	310	0.34
			WB	900	340	0.38	360	0.40
L12	Kam Sheung Road	S2	EB	900	390	0.43	500	0.56
			WB	900	490	0.54	480	0.53
L13	Kam Tin Bypass	D2	EB	3,600	740	0.21	610	0.17
		D2	WB	3,600	500	0.14	780	0.22
L14	Kam Po Road	S1	2-way	130	80	0.62	70	0.54
L15	Kam Tin Road ⁽¹⁾	S2	EB	900	1,050	1.17	900	1.00
			WB	900	1,000	1.11	1,170	1.30
	Kam Tin Road ⁽²⁾	S2	EB	1,100	1,050	0.95	900	0.82
			WB	1,100	1,000	0.91	1,170	1.06
L16	Kam Tin Road	D2	EB	3,600	2,130	0.59	1,750	0.49
		D2	WB	3,600	1,770	0.49	2,430	0.68
L17	Tsing Long Highway	D3	NB	6,100	2,310	0.38	4,150	0.68
		D3	SB	6,100	4,960	0.81	3,330	0.55
L18	Tsing Long Highway	D3	NB	6,100	2,720	0.45	4,810	0.79
		D3	SB	6,100	5,300	0.87	3,510	0.58
L19	Tai Lam Tunnel	D3	NB	5,400	2,980	0.55	5,060	0.94
		D3	SB	5,400	5,690	1.05	3,690	0.68
L20	Tung Wui Road	D2	EB	3,600	500	0.14	520	0.14
		D2	WB	3,600	590	0.16	580	0.16
L21	Tung Wui Road	D2	EB	3,600	390	0.11	420	0.12
		D2	WB	3,600	680	0.19	580	0.16
L22	Kam Tin Road	S2	EB	1,000	810	0.74	690	0.63
		S2	WB	1,000	640	0.58	840	0.76
L23	Kam Tin Road	S2	EB	1,100	840	0.76	850	0.77
		S2	WB	1,100	700	0.64	910	0.83
L24	Kam Sheung Road	S2	EB	900	540	0.60	310	0.34
		S2	WB	900	310	0.34	350	0.39
L25	Kam Po Road	S1	2-way	130	80	0.62	70	0.54

Notes:

- (1) Existing layout without "Upgrading of Remaining Sections of Kam Tin Road and Lam Kam Road".
- (2) With widening to a standard 7.3m wide single 2-lane carriageway under "Upgrading of Remaining Sections of Kam Tin Road and Lam Kam Road" by Highways Department.

Table 5.3 Link Performance of 2031 Assessment Scenario 2

No.	Road	Config.	Dir.	Capacity (pcu/hr)	AM Peak		PM Peak	
					Flow	V/C	Flow	V/C
L1	Kam Tin Road	D2	EB	3,600	2,900	0.81	2,550	0.71
		D2	WB	3,600	2,720	0.76	2,590	0.72
L2	Tsing Long Highway Slip Road	S2	NB	3,600	610	0.17	850	0.24
		S2	SB	3,600	600	0.17	330	0.09
L3	Kam Tin Road	S2	EB	900	1,080	1.20	1,080	1.20
			WB	900	630	0.70	650	0.72
L4	Kam Ho Road	S2	NB	1,100	1,560	1.42	1,140	1.04
			SB	1,100	840	0.76	680	0.62
L5	Kam Sheung Road	S2	NB	900	300	0.33	350	0.39
			SB	900	720	0.80	700	0.78
L6	Kam Sheung Road	S2	NB	900	400	0.44	560	0.62
			SB	900	480	0.53	520	0.58
L7	Tung Wui Road	D2	EB	3,600	610	0.17	580	0.16
		D2	WB	3,600	1,200	0.33	1,150	0.32
L8	Kam Ho Road	S2	NB	1,100	550	0.50	550	0.50
			SB	1,100	700	0.64	440	0.40
L9	Pat Heung Road Link Road	S2	EB	1,100	650	0.59	600	0.55
			WB	1,100	870	0.79	550	0.50
L10	Pat Heung Road	S2	EB	1,100	400	0.36	450	0.41
			WB	1,100	440	0.40	320	0.29
L11	Kam Tin Road	S2	EB	900	350	0.39	310	0.34
			WB	900	340	0.38	360	0.40
L12	Kam Sheung Road	S2	EB	900	440	0.49	530	0.59
			WB	900	530	0.59	500	0.56
L13	Kam Tin Bypass	D2	EB	3,600	740	0.21	610	0.17
		D2	WB	3,600	500	0.14	780	0.22
L14	Kam Po Road	S1	2-way	130	920	7.08	590	4.54
L15	Kam Tin Road ⁽¹⁾	S2	EB	900	1,160	1.29	960	1.07
			WB	900	1,080	1.20	1,250	1.39
	Kam Tin Road ⁽²⁾	S2	EB	1,100	1,160	1.05	960	0.87
			WB	1,100	1,080	0.98	1,250	1.14
L16	Kam Tin Road	D2	EB	3,600	2,650	0.74	2,230	0.62
		D2	WB	3,600	2,480	0.69	2,790	0.78
L17	Tsing Long Highway	D3	NB	6,100	2,300	0.38	4,160	0.68
		D3	SB	6,100	4,960	0.81	3,330	0.55
L18	Tsing Long Highway	D3	NB	6,100	2,910	0.48	5,010	0.82
		D3	SB	6,100	5,560	0.91	3,660	0.60
L19	Tai Lam Tunnel	D3	NB	5,400	3,490	0.65	5,540	1.03
		D3	SB	5,400	6,390	1.18	4,050	0.75
L20	Tung Wui Road	D2	EB	3,600	610	0.17	580	0.16
		D2	WB	3,600	1,390	0.39	1,090	0.30
L21	Tung Wui Road	D2	EB	3,600	500	0.14	480	0.13
		D2	WB	3,600	770	0.21	660	0.18
L22	Kam Tin Road	S2	EB	1,100	860	0.78	720	0.65
		S2	WB	1,100	680	0.62	870	0.79
L23	Kam Tin Road	S2	EB	1,100	940	0.85	900	0.82
		S2	WB	1,100	760	0.69	970	0.88
L24	Kam Sheung Road	S2	EB	900	590	0.66	330	0.37
		S2	WB	900	340	0.38	380	0.42
L25	Kam Po Road	S1	2-way	130	500	3.85	350	2.69
L26	New Public Road to Site 1	S2	NB	1,100	320	0.29	180	0.16
		S2	SB	1,100	270	0.25	250	0.23

Notes:

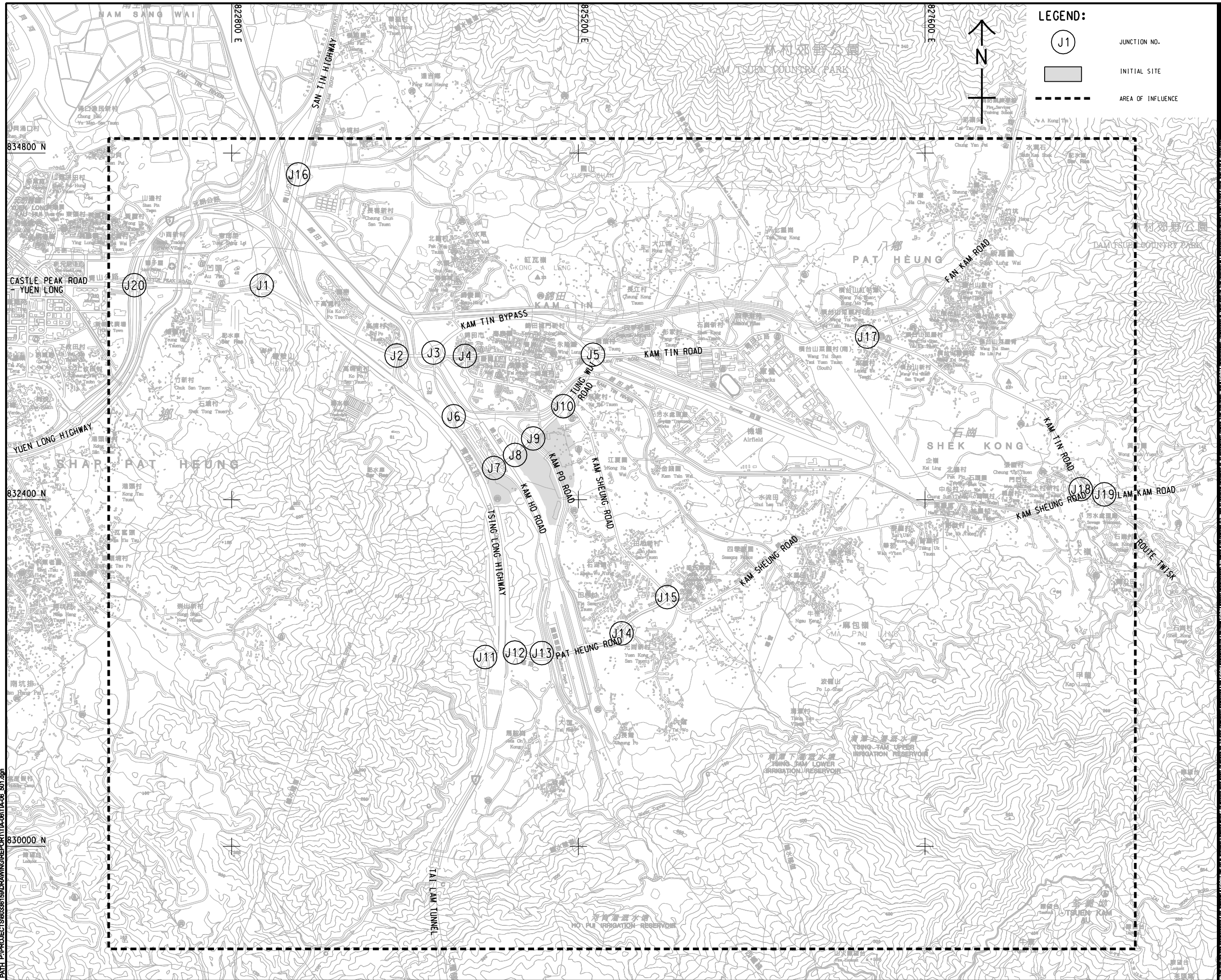
- (1) Existing layout without "Upgrading of Remaining Sections of Kam Tin Road and Lam Kam Road".
- (2) With widening to a standard 7.3m wide single 2-lane carriageway under "Upgrading of Remaining Sections of Kam Tin Road and Lam Kam Road" by Highways Department.

Table 5.4 Link Performance of 2031 Assessment Scenario 3

No.	Road	Config.	Dir.	Capacity (pcu/hr)	AM Peak		PM Peak	
					Flow	V/C	Flow	V/C
L1	Kam Tin Road ⁽¹⁾	D3	EB	5,400	2,900	0.54	2,550	0.47
		D2	WB	3,600	2,720	0.76	2,590	0.72
L2	Tsing Long Highway Slip Road	S2	NB	3,600	610	0.17	850	0.24
		S2	SB	3,600	600	0.17	330	0.09
L3	Kam Tin Road ⁽²⁾	S2	EB	1,100	800	0.73	830	0.75
			WB	1,100	630	0.57	650	0.59
L4	Kam Ho Road ⁽³⁾	D2	NB	3,600	1,560	0.43	1,150	0.32
		D2	SB	3,600	1,140	0.32	930	0.26
L5	Kam Sheung Road	S2	NB	900	300	0.33	350	0.39
			SB	900	440	0.49	450	0.50
L6	Kam Sheung Road	S2	NB	900	370	0.41	530	0.59
			SB	900	480	0.53	520	0.58
L7	Tung Wui Road	D2	EB	3,600	610	0.17	580	0.16
		D2	WB	3,600	900	0.25	880	0.24
L8	Kam Ho Road	S2	NB	1,100	670	0.61	610	0.55
			SB	1,100	760	0.69	500	0.45
L9	Pat Heung Road Link Road ⁽⁸⁾	S2	EB	1,100	830	0.75	710	0.65
			WB	2,200	1,020	0.46	630	0.29
L10	Pat Heung Road	S2	EB	1,100	370	0.34	420	0.38
			WB	1,100	440	0.40	320	0.29
L11	Kam Tin Road	S2	EB	900	350	0.39	310	0.34
			WB	900	340	0.38	360	0.40
L12	Kam Sheung Road	S2	EB	900	440	0.49	530	0.59
			WB	900	530	0.59	500	0.56
L13	Kam Tin Bypass	D2	EB	3,600	740	0.21	610	0.17
		D2	WB	3,600	500	0.14	780	0.22
L14	Kam Po Road ⁽⁴⁾	S2	NB	1,100	450	0.41	220	0.20
			SB	1,100	300	0.27	270	0.25
L15	Kam Tin Road ⁽⁵⁾	S2	EB	900	1,160	1.29	960	1.07
			WB	900	1,080	1.20	1,250	1.39
	Kam Tin Road ⁽⁶⁾	S2	EB	1,100	1,160	1.05	960	0.87
			WB	1,100	1,080	0.98	1,250	1.14
L16	Kam Tin Road	D2	EB	3,600	2,650	0.74	2,230	0.62
		D2	WB	3,600	2,480	0.69	2,790	0.78
L17	Tsing Long Highway	D3	NB	6,100	2,300	0.38	4,160	0.68
		D3	SB	6,100	4,960	0.81	3,330	0.55
L18	Tsing Long Highway	D3	NB	6,100	2,910	0.48	5,010	0.82
		D3	SB	6,100	5,560	0.91	3,660	0.60
L19	Tai Lam Tunnel	D3	NB	5,400	3,490	0.65	5,540	1.03
		D3	SB	5,400	6,390	1.18	4,050	0.75
L20	Tung Wui Road	D2	EB	3,600	890	0.25	830	0.23
		D2	WB	3,600	1,340	0.37	1,090	0.30
L21	Tung Wui Road	D2	EB	3,600	500	0.14	480	0.13
		D2	WB	3,600	770	0.21	660	0.18
L22	Kam Tin Road	S2	EB	1,100	860	0.78	720	0.65
		S2	WB	1,100	680	0.62	870	0.79
L23	Kam Tin Road	S2	EB	1,100	940	0.85	900	0.82
		S2	WB	1,100	760	0.69	970	0.88
L24	Kam Sheung Road	S2	EB	900	590	0.66	330	0.37
		S2	WB	900	340	0.38	380	0.42
L25	Kam Po Road ⁽⁷⁾	S2	NB	1,100	270	0.25	150	0.14
			SB	1,100	180	0.16	170	0.15
L26	New Public Road to Site 1	S2	NB	1,100	320	0.29	180	0.16
		S2	SB	1,100	270	0.25	250	0.23

Notes:

- (1) With widening of Kam Tin Road eastbound between Tsing Long Highway and Kam Ho Road to 3 traffic lanes due to junction improvement of Kam Tin Road / Tsing Long Highway (J2).
- (2) With widening to a standard 7.3m wide single 2-lane carriageway.
- (3) With widening to a standard 7.3m wide dual 2-lane carriageway.
- (4) With widening to a standard 7.3m wide single 2-lane carriageway.
- (5) Existing layout without “Upgrading of Remaining Sections of Kam Tin Road and Lam Kam Road”.
- (6) With widening to a standard 7.3m wide single 2-lane carriageway under “Upgrading of Remaining Sections of Kam Tin Road and Lam Kam Road” by Highways Department.
- (7) With widening of the remaining section of Kam Po Road between Site 4a and Pat Heung Road under separate project.
- (8) With widening of westbound Pat Heung Road Link Road between the future western site access of PHMC site and Pat Heung Road to 2 traffic lanes.



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60336159/TIA-06/FIGURE 3.1

Annex B

**Email Confirmation from Planning Department
on using 2021 TPEDM in the TIA**

Camille Lam

From: Andrea Wing Yin YAN/PLAND <awyyan@pland.gov.hk>
Sent: 2026年1月9日星期五 16:50
To: Camille Lam
Cc: Pauline Lam; Yen PY LEUNG/PLAND; Ivan Sze Yuet FUNG/PLAND
Subject: Re: S.12A Application No. Y/YL-KTN/6 - Departmental Comments

Dear Camille,

Please be advised that our Office has no particular comment on using 2021 TPEDM in the Traffic Impact Assessment. Thank you.

Regards,
 Andrea YAN
 TP/YLE3, PlanD
 Tel: 3168 4049



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From: Camille Lam [REDACTED]
Sent: Friday, January 9, 2026 10:48 AM
To: Andrea Wing Yin YAN/PLAND <awyyan@pland.gov.hk>
Cc: Pauline Lam [REDACTED]; Yen PY LEUNG/PLAND <pyleung@pland.gov.hk>; Ivan Sze Yuet FUNG/PLAND <isyfung@pland.gov.hk>
Subject: RE: S.12A Application No. Y/YL-KTN/6 - Departmental Comments

[Resent]

Dear Andrea,

Referring to Comment No. 4 from TD below, please provide confirmation on using 2021 TPEDM in the Traffic Impact Assessment. Thank you.

Rgds,

Camille Lam

Principal Town Planner

KTA Planning Limited



From: Andrea Wing Yin YAN/PLAND <awyyan@pland.gov.hk>
Sent: Thursday, January 8, 2026 7:19 PM
To: Camille Lam [REDACTED]
Cc: Pauline Lam [REDACTED]; Yen PY LEUNG/PLAND <pyleung@pland.gov.hk>; Ivan Sze Yuet

Dear Camille,

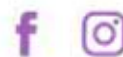
I refer to the captioned application. Below please find the comments of the **Transport Department** **(Contact: Mr Phil CAI at 2399 2421)**

- Table 3.4 - it is noted that the traffic survey was conducted in Feb 2025, i.e. before Tai Lam Tunnel being taken over by the government and adjustment of toll. Using of the data in Table 3.3 to factor up the flow is not appropriate to considering the seasonal fluctuation and school holiday period.
- Table 3.4 - the pcu factor adopted shall be supported with data.
- Table 4.1 - the report selected 6 ATC stations and five of which are with growth rate between 1% to 5%. The reason for taking average of these station and concluded the growth rate of -2.03% shall be provided, especially Tai Lam Tunnel is affected by toll adjustment.
- Table 4.2 - confirmation from PlanD of using 2021 TPEDM shall be provided.
- Table 5.1 - The assessment for Junction C appears to largely different with the previous submission under Y/YL-KTN/4. The applicant shall critically review all calculation.
- Table 5.2 and 5.4 - I note that L4 and L5 will be overloaded in design year 2034. Development traffic will further increase traffic on the overloaded road sections. The statements in other parts of the texts regarding the traffic impact to the existing network shall be carefully and critically reviewed.
- Figure 2.1 - The swept path analyses showed that vehicles may experience difficulties in entering and exiting the development. The applicant should demonstrate how to provide sufficient space and ensure unobstructed manoeuvre of vehicles. The distance between the development run-in/out and the nearest junction shall be indicated.
- Figure 5.1 - Please elaborate whether the proposed work will be in conflict with the public works project. The party being responsible for the works shall be indicated.

Regards,
Andrea YAN
TP/YLE3, PlanD
Tel: 3168 4049



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Annex C

Revised Drainage Impact Assessment

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

Drainage Impact Assessment

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

Mott MacDonald Hong Kong Limited
registered in Hong Kong no. 236497.
Registered Office: 3806 Central Plaza, 18
Harbour Road, Wanchai, Hong Kong.

Drainage Impact Assessment

Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
A	Apr 2025	Edith Chow	May Tse	May Tse	For submission
A1	Aug 2025	Edith Chow	May Tse	May Tse	For submission
A2	Oct 2025	Edith Chow	May Tse	May Tse	For submission
B	Jan 2026	Edith Chow	May Tse	May Tse	For submission

Document reference: 426076 | 11 | B

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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 Shek Kong, 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 to rezone the Site from "Residential (Group C)2" and "Open Space" to "Residential (Group C)4" zone to enable the proposed residential development at the Site.
- 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 water levels.

2.2 Assessment Methodology

Assessment Method

- 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 C1** 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 included drainage record plans and boundary information from Drainage Services Department (DSD), topographical information from basemap and Topographic Survey received from the Applicant in **Appendix G**;
 - 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 **Appendix E**) 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 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, Corrigendum No.1/2022 and Corrigendum No.1/2024 issued by DSD. 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. This DIA has also taken the Corrigendum No. 2/2024 of SDM into account for the formulation of proposed drainage mitigation measures.
- 2.3.2
- The following 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 provided by DSD, topographical information from basemap and Topographic Survey received from the Applicant. The extent of baseline model is showed in **Appendix E**. Design rainfall in

accordance with SDM and its corrigenda, 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 incorporated 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 C1**; and
- Detailed survey along the existing stream course near the Site has been carried out and incorporated into model. Details can be referred to **Appendix G**.

2.3.6 SCS-Curve Number method has been used to calculate the runoff from the assessed upland, urban and rural catchments respectively. In order to assess any drainage impact caused by the Development for streams in the vicinity of the Site, a one-dimensional (1D) hydraulic model covering the concerned area has been used. Drainage system including the conduits, river reaches and channels 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:

- a change of CN for the Site due to the Proposed Development;
- a stormwater storage tank with capacity of about 5,000m³ is built within the Development to store additional runoff from the Site; and
- the Development area is set to its formation level of about 10.4mPD.

2.3.8 The extent of the proposed model will be same as the baseline model and can be referred to **Appendix E**. A set of hydraulic models including baseline and proposed models used in this assessment is included in **Appendix H**.

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) are given in Table 3a of SDM corrigendum No. 1/2024 and repeated in **Table 2.2**.

$$F(t) = \begin{cases} \frac{a[b + 2(1-c)t]}{(2t + b)^{c+1}} & , \quad 0 \leq t \leq \frac{t_d}{2} \\ F(-t) & , \quad -\frac{t_d}{2} < t < 0 \end{cases}$$

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 of SDM corrigendum No. 1/2024 and repeated in the following table.

Table 2.2: Storm constants for different return periods

Return Period T (years)	10	50	200
a	485.0	505.5	508.8
b	3.11	3.29	3.46
c	0.397	0.355	0.322

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 increases percentage and mean 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 and design allowance as recommended in SDM Corrigendum No.1/2022 presented in **Table 2.4** and **Table 2.5** are also 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 of 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 of 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 Inflow from upstream

2.3.12 In order to assess the hydraulic performance of the existing drainage system, the upstream inflow boundary conditions obtained from DSD (**Appendix F**) has been adopted. To take account of the rainfall increase, the upstream inflow boundary has been increased by 28.1% in End of 21st Century. The upstream inflow 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 E**.

Table 2.6: Inflow boundary adopted in the localised model with climate change in End of 21st Century

Return Period T (years)	Flood Return Event Case	End of 21 st Century	
		Inflow Boundary received from DSD (m ³ /s)	Inflow with Climate Change (m ³ /s), see model ID: KT001
10	A	231.827	296.970
	B	138.460	177.367
50	A	306.148	392.175
	B	231.843	296.991
200	A	363.374	465.482
	B	231.839	296.986

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 F**) 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 2.7**. The location of the boundary is presented in the model extent in **Appendix E**.

Table 2.7: Design water levels for different return periods

Return Period T (years)	Flood Return Event Case	End of 21 st Century	
		Water Level Boundary received from DSD (mPD)	Water Level with Climate Change (mPD) for Model, see model ID: KT012
10	A	5.456	6.216
	B	4.760	5.610
50	A	5.958	6.808
	B	5.565	6.485
200	A	6.215	7.065
	B	5.817	6.817

- 2.3.14 As shown in **Table 2.6** and **Table 2.7**, the upstream inflow boundary and downstream 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 and upstream flow 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 CN values for the corresponding land uses adopted in this DIA have been presented in **Table 2.8**.

Table 2.8: Curve numbers adopted for each land use

Land use	CN
Agriculture	70
Upland	65
Grassed	70
Barracks	75
Village	90
Open Storage	90
Residential	95
Commercial	95
Rail	100
Roads / Footpath	100
River	100

- 2.3.16 For the Proposed Development, 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.

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 3mm has been adopted for pipelines and box culverts; and Manning's n value of 0.04 has been adopted for existing watercourse and 0.016 has been adopted for existing engineering channel.
- 2.3.19 For proposed drainage system, concrete pipes have been provided for the proposed new pipes, Colebrook-White ks value of 3mm has been adopted for concrete pipes.

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 Development Site covers a total site area of about 8,580 square meters and is located in Kam Tin North. The Site abuts Kam Tin Road to its immediate south. A low-rise, low-density residential developments, namely Seasons Villa, are located to the immediate north-east. In general, the existing ground level of the Site is ranging from approximately 9 to 10 mPD and the nearby road levels of about 13.5 mPD. The Site is found to be composed mostly trees and grass based on desktop study and site inspections. The location of the Site is shown in **Appendix A1**. An existing watercourse connecting to Kam Tin River is identified at the west of the Site. Three existing watercourse crossing structures connecting the north and south side of the steam have been identified from site inspections and survey, and the details are given in **Appendix G**.

3.2 Existing Drainage System and Catchment

- 3.2.1 The surface runoff generated from the existing Development Site is currently discharged to the watercourse at the west of the Site. The watercourse is then discharged to an engineering channel (Kam Tin River) via a 2-cell box culvert.
- 3.2.2 Based on site inspections and collected information, the existing watercourse originated at the northwest side of the Site and conveys runoff from nearby villages, vegetative areas, part of barrack and the existing Development Site to Kam Tin River via the watercourse and a 2-cell box culvert. Location of the existing watercourse and Kam Tin River refers to **Appendix B1**.

3.3 Existing Land Use Surface Characteristics

- 3.3.1 The existing watercourse and Kam Tin River currently conveys runoff to downstream drainage system from several catchments. Based on the topographic data in basemap, the delineation of local catchments 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 C1**.
- 3.3.2 The CN values for the corresponding land uses are summarised in **Table 2.8** and are used to calculate the weighted CN for the following sub-catchments.

Table 3.1: Catchment properties of existing catchment

Model ID	Area (ha)	Weighted CN
Cat_001	8.190	84.26
Cat_002	0.321	78.03
Cat_003	10.626	85.74
Cat_004	20.189	75.35
Cat_005	8.501	87.40
Cat_006	2.792	80.88

Model ID	Area (ha)	Weighted CN
Cat_007A	0.081	83.79
Cat_007B	0.462	90.00
Cat_007C	0.433	77.22
Cat_008	0.897	78.65
Cat_009A	1.289	81.65
Cat_009B	0.734	75.40
Cat_010A	1.187	75.00
Cat_010B	0.393	83.83
Cat_011A	0.176	77.91
Cat_011B	0.288	75.51
Cat_012A	0.092	70.00
Cat_012B	0.048	83.57
Cat_012C	0.858	70.00
Cat_013A	0.182	82.30
Cat_013B	0.318	82.2
Cat_014	0.222	70.94
Cat_015	0.025	71.12
Cat_017	56.851	65.00
Cat_018	16.467	65.00
Cat_019	39.24	74.61
Cat_020	55.316	75.33
Cat_021	31.806	75.28
Cat_022	74.009	65.21
Cat_023	1.527	76.86
Cat_024	2.189	75.00
Cat_025	6.569	87.93
Cat_026	27.003	75.09

3.3.3 The existing catchments of the Development Site (as indicated with Model ID: Cat_012C) have weighted CNs of 70 based on existing topography and land use. The runoff of all the existing catchments of the Development Site is discharged to the existing watercourse.

3.3.4 For other sub-catchments, weighted average CN values are ranging from about 65 to 90.

3.4 Hydraulic Performance of Existing Drainage System

3.4.1 The hydraulic performance of the existing channels has been assessed by the model with the network containing the existing watercourse and Kam Tin River. The results indicated that the predicted 200 years flood event water levels for the assessed section of Kam Tin River will generally be within riverbank with a freeboard of about 300mm,

except for the few cross sections near to the upstream and midstream of the modelled Kam Tin River. For the existing watercourse, due to the climate change effect at end of Century, downstream of the watercourse will be flooded under the 10 years flood event. Details of hydraulic model results can be referred to **Table 4.3** and the hydraulic model included in **Appendix H**.

4 Drainage Impact Assessment and Proposed Drainage System

4.1 The Development

- 4.1.1 The Development Site will be developed as a residential area with paved condition and some landscaping area. In view of the increase of paved area in the Development Site, additional runoff from the Site is anticipated. Runoff from the Development Site will be collected by 750mm diameter pipes. To cope with the increase of paved area in the Site, a storage tank with a size of about 5,000m³ will be provided to temporarily store the additional runoff and the stored runoff will be discharged to a new pipeline of size from 750 to 900mm connecting to the existing watercourse via a 450mm pipe after the peak of storm. Based on the design arrangement, the proposed stormwater storage tank, with a storage depth of 2m, will have an inflow level of 8.3mPD and an outflow level of 7.4mPD. The design will be further refined and developed, if needed, in subsequent design and construction phases of the project. The typical drainage outlet details connecting the proposed discharge pipe to existing watercourse is shown in **Appendix B2**. The design of the drainage outlet will be subject to be confirmed at the later design and construction stage.
- 4.1.2 For the surrounding areas, according to the topography, the runoff arising from the areas at the west and south of the proposed development are currently directly discharged to the existing watercourse through overland flow. As a conservative approach, a 600mm peripheral channel, as spare drain, will be provided to collect the runoff generated from the area between the east bank of the existing watercourse and the proposed Development Site boundary. The capacity check calculation for the set of 600mm channel is provided in **Appendix I**. For the existing development at the north and east of the proposed Development Site, the existing development has their own boundary channels and internal drainages which collect and convey the runoff from the development to Kam Tin River. In this connection, peripheral channels of 300mm at the boundaries of the proposed Development Site, as spare drains, are provided since the runoff generated from the adjacent lands is expected to be directly discharged into existing drainage system. Both the 600mm and 300mm peripheral channels are connected to the proposed stormwater terminal manhole via the associated pipes (i.e. 600mm pipe for 600mm peripheral channel and 300mm pipe for 300mm peripheral channel), then to the existing watercourse via the proposed 900mm diameter pipe. The proposed drainage arrangement is also shown in **Appendix B2**. The layout of the Proposed Development is shown in **Appendix A1**.
- 4.1.3 The proposed drainage system shown in **Appendix B2**, including the proposed stormwater storage tank, proposed pipes and manholes, peripheral channels and associated catchpits, will be maintained and managed by the owner/ management office of the Proposed Development.

4.2 Changes in Catchment and Existing Drainage Network due to the Proposed Development

- 4.2.1 As discussed in **Section 3**, the runoff generated from the Site under the existing condition is discharged to the existing watercourse. The runoff from the Development

Site will be discharged to the existing watercourse via 750mm and 900mm diameter pipes. With the stormwater stage tank in place, no additional runoff is anticipated from the proposed development.

- 4.2.2 Under the proposed condition, a CN value of 90 has been assigned for the Development Site (Model ID: Cat_012C) due to the paved condition of the Proposed Development and details given in **Table 4.1**.

Table 4.1: Catchment properties of proposed condition

Model ID	Area (ha)	Weighted CN
Cat_012C	0.858	90.00
Cat_011A-1	0.141	77.91
Cat_011A-2	0.035	77.91
Cat_012A-1	0.083	70.00
Cat_012A-2	0.009	70.00
Cat_013B-1	0.035	82.20
Cat_013B-2	0.283	82.20
Cat_023A	0.060	76.86
Cat_023B	1.466	76.86

- 4.2.3 Despite that the runoff arising from the areas at the west and south of the proposed development are currently directly discharged to the existing watercourse through overland flow, it is assumed that the proposed 600mm peripheral channel would act as a spare drain and has the capacity to collect those runoffs. Several existing catchments (i.e. Cat_011A, Cat_012A, Cat_013B and Cat_023) are further delineated to suit with the proposed 600mm peripheral channel. Some catchments, including Cat_011A-1, Cat_012A-1, Cat_012B, Cat_013A, Cat_013B-1 and Cat_023A, would be served by the proposed 600mm peripheral channel, whilst Cat_011B, Cat_013B-2, Cat_012A-2 and Cat_023B would be discharged to the existing watercourse. As there is no change to other catchments served by the assessed drainage system, apart from those catchments discussed above, the catchment properties for other catchments in **Table 3.1** are also applicable to the proposed condition.

- 4.2.4 The localised model under the proposed condition has incorporated the change in CN value arising from additional paved condition.

4.3 Drainage Impact Assessment

- 4.3.1 To mitigate the increase of runoff from the proposed development due to the increase of paved area in the Development Site, a storage tank with a size of about 5,000m³ will be provided to temporarily store the additional runoff and the stored runoff will be discharged after the peak of storm. Thus, the Proposed Development would lead to no increase to the hydraulic at the discharge point (i.e. Control point 5) under the 10 years, 50 years and 200 years flood return period as shown in **Table 4.2**. With the storage tank to mitigate the additional runoff, the peak runoff discharged from the Proposed

Development will be reduced as compared with the baseline condition under 1 in 10 years, 1 in 50 years and 1 in 200 years flood event.

Table 4.2: Change in peak flow at the existing streamcourse with mitigation measure (control point 5)

Return period (Years)	Flow (Existing) (m ³ /s)	Flow (Proposed) (m ³ /s)	Change (m ³ /s)	Change (%)
10	1.2	0.9	0.3	-27%
50	1.5	1.1	0.4	-25%
200	1.7	1.1	0.5	-33%

- 4.3.2 The stormwater inside the Development Site will be collected by internal drainage and is proposed to be discharged to existing watercourse at the west of the Development Site via the proposed 750 mm and 900mm diameter pipes.
- 4.3.3 To assess the effectiveness of the proposed drainage mitigation works, a hydraulic model has been developed under the proposed condition to incorporate the aforesaid proposed drainage system including the stormwater storage tank, the 450mm, 750mm and 900mm pipes using InfoWorks ICM. The predicated water levels under the 10 years, 50 years and 200 years flood return period under the proposed Mitigation Measures are presented in **Table 4.3**.

Table 4.3: Predicted peak water levels and freeboard of stream near the Site under 10-, 50- and 200-years flood events with climate change in End of 21st century

Case	Control Points	Cross Section line ID	Existing Condition			Proposed Condition with mitigation			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)
200A	1	KT-10	8.590	8.176	0.414	8.590	8.176	0.414	0.000
	2	KT-12	8.494	7.840	0.654	8.494	7.839	0.655	-0.001
	3	KT-17	7.557	7.243	0.314	7.557	7.242	0.315	-0.001
	4	S13-2	8.810	7.862	0.948	8.810	7.859	0.951	-0.003
	5	S13-2-S12	8.607	7.862	0.745	8.607	7.859	0.748	-0.003
	6	S4	6.480	7.858	-1.378	6.480	7.856	-1.376	-0.002
50A	1	KT-10	8.590	7.820	0.770	8.590	7.820	0.770	0.000
	2	KT-12	8.494	7.519	0.975	8.494	7.519	0.975	0.000
	3	KT-17	7.557	6.964	0.593	7.557	6.964	0.593	0.000
	4	S13-2	8.810	7.537	1.273	8.810	7.536	1.274	-0.001
	5	S13-2-S12	8.607	7.537	1.070	8.607	7.536	1.071	-0.001
	6	S4	6.480	7.533	-1.053	6.480	7.532	-1.052	-0.001
10A	1	KT-10	8.590	7.252	1.338	8.590	7.252	1.338	0.000
	2	KT-12	8.494	6.942	1.552	8.494	6.942	1.552	0.000
	3	KT-17	7.557	6.375	1.182	7.557	6.375	1.182	0.000
	4	S13-2	8.810	6.957	1.853	8.810	6.957	1.853	0.000
	5	S13-2-S12	8.607	6.957	1.650	8.607	6.956	1.651	-0.001
	6	S4	6.480	6.951	-0.471	6.480	6.950	-0.470	-0.001
Remarks:- 1. Location of control points refers to Appendix D. 2. The bank levels refer to the low 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.									

- 4.3.4 With reference to results in **Table 4.3**, the predicted peak water levels of the Kam Tin River generally remain unchanged under 1 in 10 years, 1 in 50 years and 1 in 200 years rainfall event compared with the Existing Condition after adopting the proposed Mitigation Measure. For all the control points of Kam Tin River (i.e. Control Points 1 to 3), there are at least 300mm freeboard under 1 in 10 years, 1 in 50 years and 1 in 200 years rainfall event. For the control points along the existing watercourse (i.e. Control Points 4 to 6), the predicted peak water levels remain unchanged or slightly decrease under 1 in 10 years, 1 in 50 years and 1 in 200 years rainfall event compared with the Existing Condition after adopting the proposed Mitigation Measure.
- 4.3.5 All the proposed pipeline of the proposed development, including the proposed 750mm pipes connected to the storage tank, the proposed 450mm pipe from storage tank, the proposed 750mm to 900mm outlet pipes, will have more than 300mm freeboard under 1 in 10 years, 1 in 50 years and 1 in 200 years flood event. Also, based on the results of the hydraulic model under the proposed condition, with the presence of the stormwater storage tank, the peak flow discharging from the proposed development will be reduced from 0.59m³/s to 0.29m³/s under the assessed scenario of 1 in 200 years rainfall event. With the flow collected by the proposed peripheral channels (as a conservation approach, it has assumed the 600mm channel will collect all runoff generated from the area between the east bank of the existing watercourse and the proposed Development Site boundary, about 0.478m³/s as shown in **Appendix I**), the proposed 900mm discharge pipe which collect a total flow of 0.768m³/s connecting the existing watercourse will have a full-bore capacity of about 1.03m³/s and the utilization of pipe is about 76%.
- 4.3.6 Based on the assessment, there are no changes or slightly improvement in the predicted peak 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 significant adverse impact from the Proposed Development with proposed drainage system and storage tank.

5 Conclusion

- 5.1.1 The surface runoff generated from the existing Development Site is currently discharged to the watercourse at the west of the Site. The watercourse is then discharged to an engineering channel (Kam Tin River) via a 2-cell box culvert.
- 5.1.2 The Development Site will be developed as a residential area with paved condition and some landscaping area. In view of the increase of paved area in the Development Site, additional runoff from the Site is anticipated. Runoff from the Development Site will be collected by 750mm diameter pipes. To cope with the increase of paved area in the Site, a storage tank with a size of about 5,000m³ will be provided to temporarily store the additional runoff and the stored runoff will be discharged to a new pipeline of size from 750mm to 900mm connecting to the existing watercourse via a 450mm pipe after the peak of storm. Based on the design arrangement, the proposed stormwater storage tank, with a storage depth of 2m, will have an inflow level of 8.3mPD and an outflow level of 7.4mPD. The design will be further refined and developed, if needed, in subsequent design and construction phases of the project.
- 5.1.3 With the storage tank to mitigate the additional runoff, the peak runoff discharged from the Proposed Development will be reduced as compared with the baseline condition under 1 in 10 years, 1 in 50 years and 1 in 200 years flood event.
- 5.1.4 With reference to results of the hydraulic assessment, the predicted peak water levels of the Kam Tin River generally remain unchanged under 1 in 10 years, 1 in 50 years and 1 in 200 years rainfall event compared with the Existing Condition after adopting the proposed Mitigation Measure. For all the control points of Kam Tin River (i.e. Control Points 1 to 3), there are at least 300mm freeboard under 1 in 10 years, 1 in 50 years and 1 in 200 years rainfall event. For the control points along the existing watercourse (i.e. Control Points 4 to 6), the predicted peak water levels remain unchanged or slightly decrease under 1 in 10 years, 1 in 50 years and 1 in 200 years rainfall event compared with the Existing Condition after adopting the proposed Mitigation Measure.
- 5.1.5 All the proposed pipeline of the proposed development, including the proposed 750mm pipes connected to the storage tank, the proposed 450mm pipe from the storage tank, the proposed 750mm and 900mm pipes, will have more than 300mm freeboard under 1 in 10 years, 1 in 50 years and 1 in 200 years flood event. Also, based on the results of the hydraulic model under the proposed condition, with the presence of the stormwater storage tank, the peak flow discharging from the proposed development will be reduced from 0.59m³/s to 0.29m³/s under the assessed scenario of 1 in 200 years rainfall event. With the flow collected by the proposed peripheral channels (as a conservation approach, it has assumed the 600mm channel will collect all runoff generated from the area between the east bank of the existing watercourse and the proposed Development Site boundary, about 0.478m³/s), the proposed 900mm discharge pipe connecting the existing watercourse will have a full-bore capacity of about 1.03m³/s and the utilization of pipe is about 76%.
- 5.1.6 Based on the assessment, there are no changes or slightly improvement in the predicted peak water levels for the 10 years, 50 years and 200 years flood event for all the control

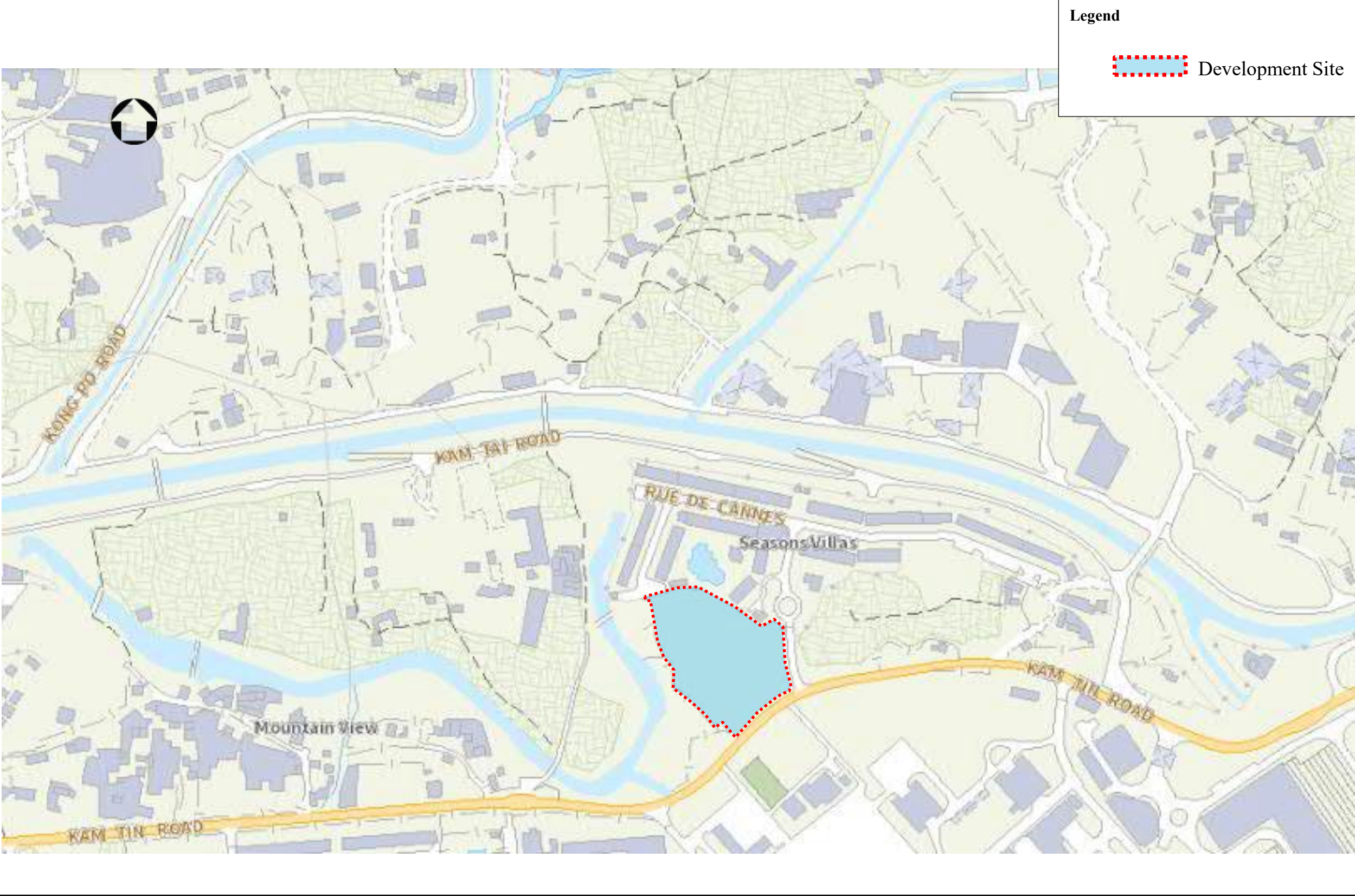
points. Therefore, it is concluded that there is no significant adverse impact from the Proposed Development with proposed drainage system and storage tank.

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
Appendix B2	Proposed Drainage System
Appendix C1	Existing Catchment Plan
Appendix C2	Proposed Catchment Plan
Appendix D	Location of Control Points in the Model
Appendix E	Existing Model Extent
Appendix F	Downstream Boundary Conditions Obtained from DSD
Appendix G	Topographic Survey received from the Applicant
Appendix H	InfoWorks ICM Hydraulic Model
Appendix I	Capacity Check for Peripheral Channels

Appendix A1

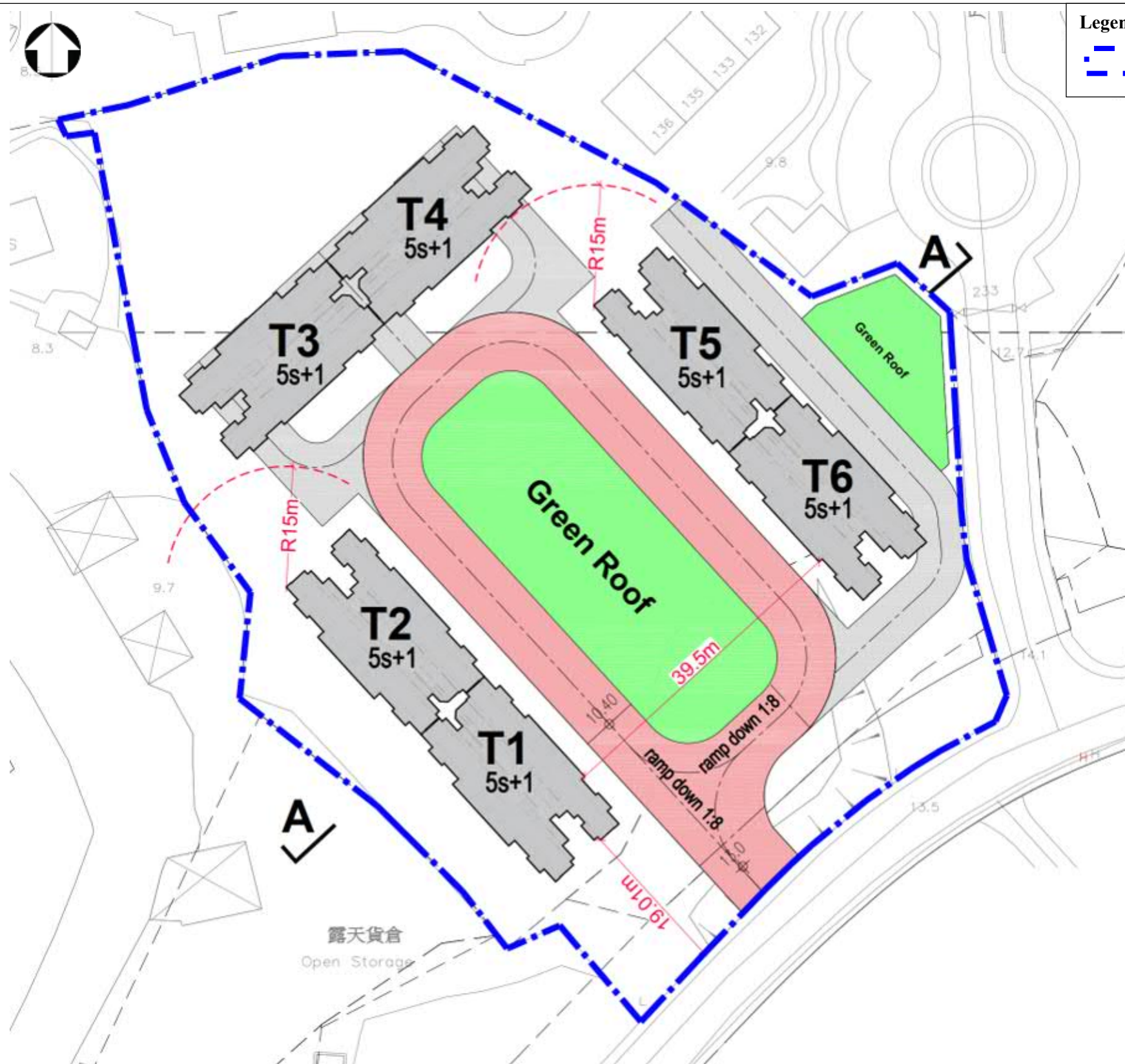
Location Plan of the Proposed Residential Development



Project Rezoning from “Residential (Group C)2” and “Open Space” zones to “Residential (Group C)4” zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.			M M MOTT MACDONALD	
Title Location Plan of the Proposed Residential Development			Appendix A1	
Date	Aug 2025	Scale	N.T.S.	File

Appendix A2

Master Layout Plan of the Proposed Residential Development



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

Title Master Layout Plan of the Proposed Residential Development

Date Aug 2025

Scale N.T.S.

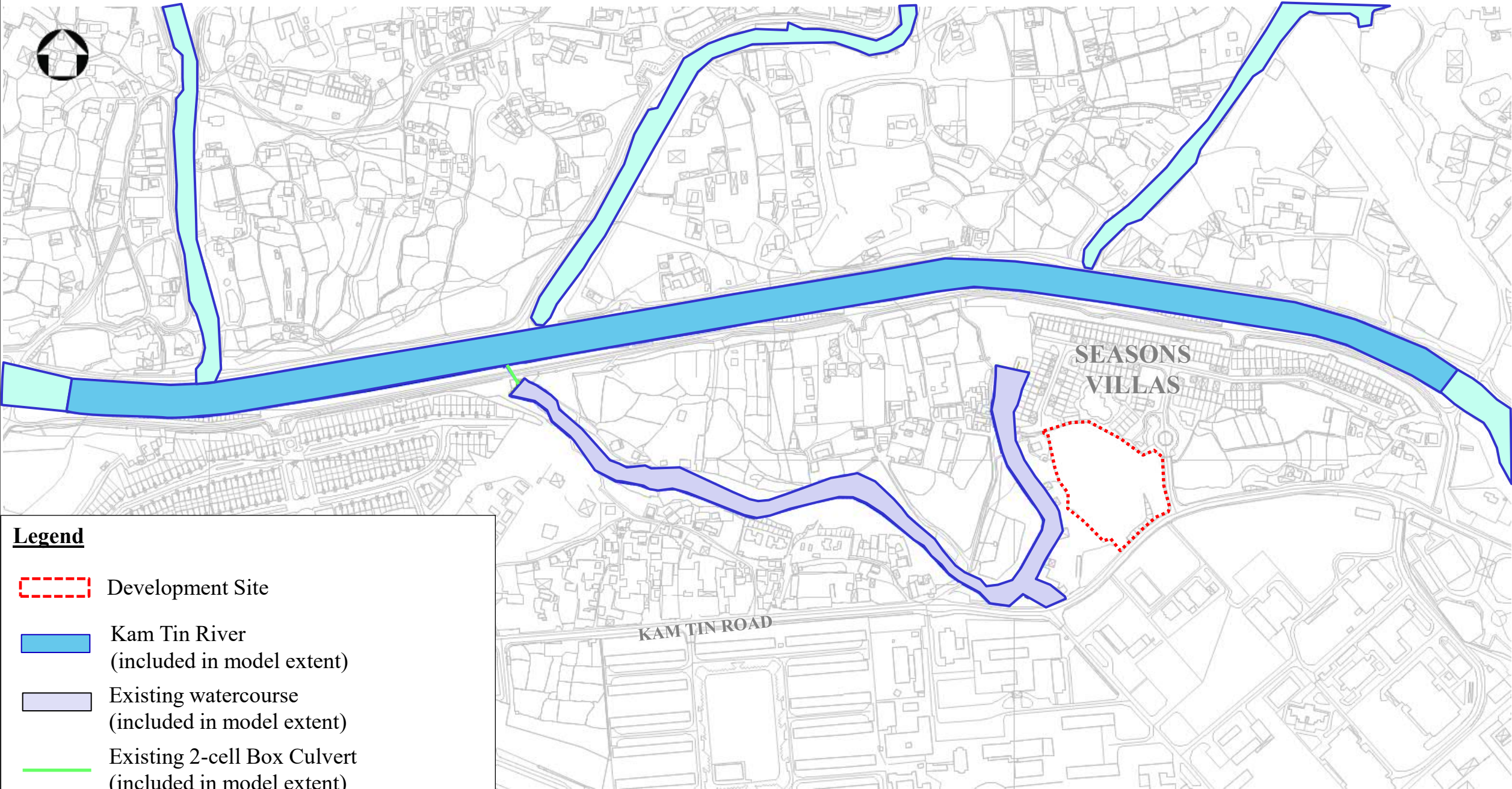
File

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Appendix A2

Appendix B1

Existing Drainage System



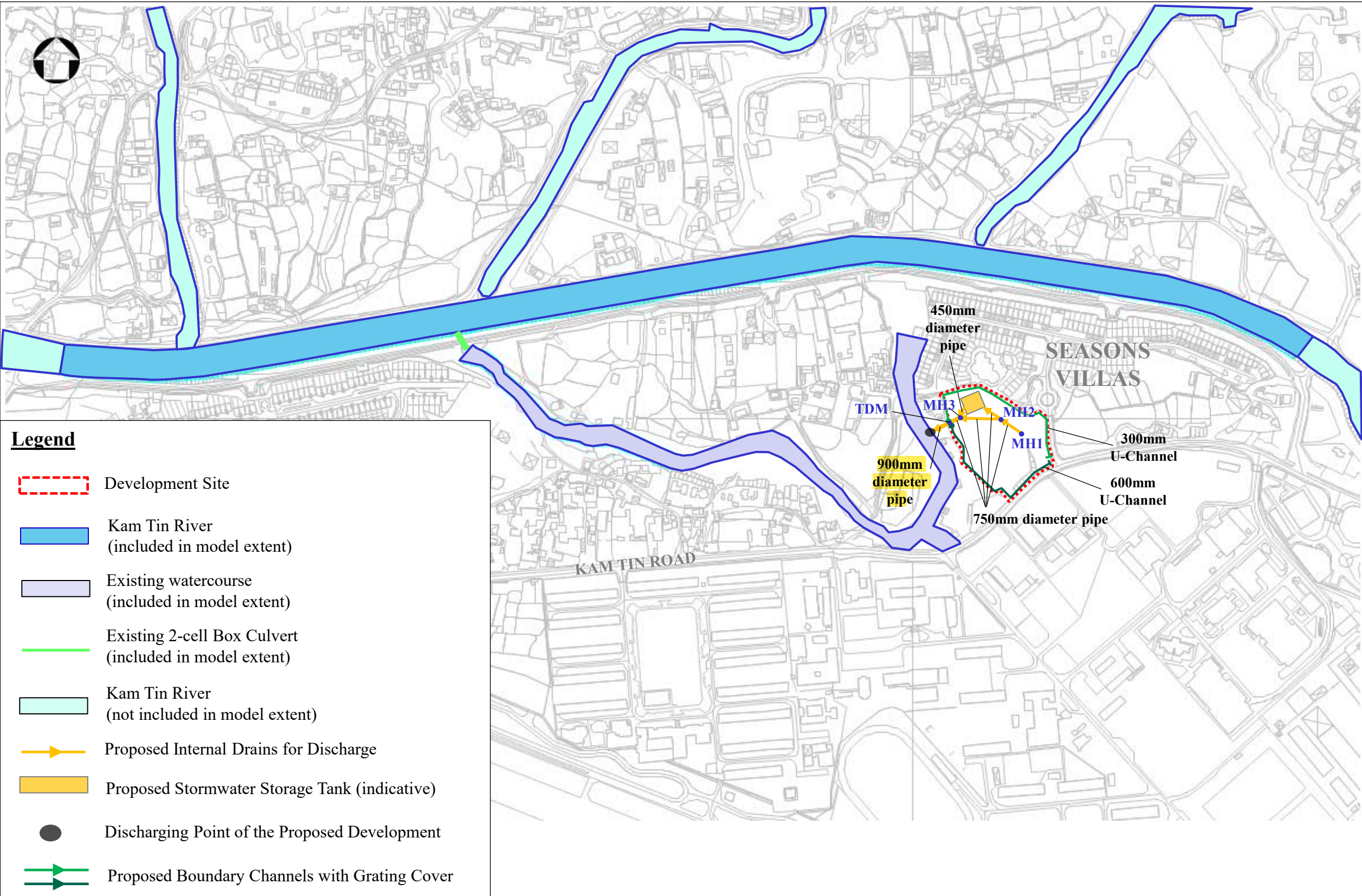
Legend

-  Development Site
-  Kam Tin River
(included in model extent)
-  Existing watercourse
(included in model extent)
-  Existing 2-cell Box Culvert
(included in model extent)
-  Kam Tin River
(not included in model extent)

Project	Rezoning from “Residential (Group C)2” and “Open Space” zones to “Residential (Group C)4” zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	 Appendix B1
Title	Existing Drainage System	
Date Aug 2025	Scale N.T.S.	
File		

Appendix B2

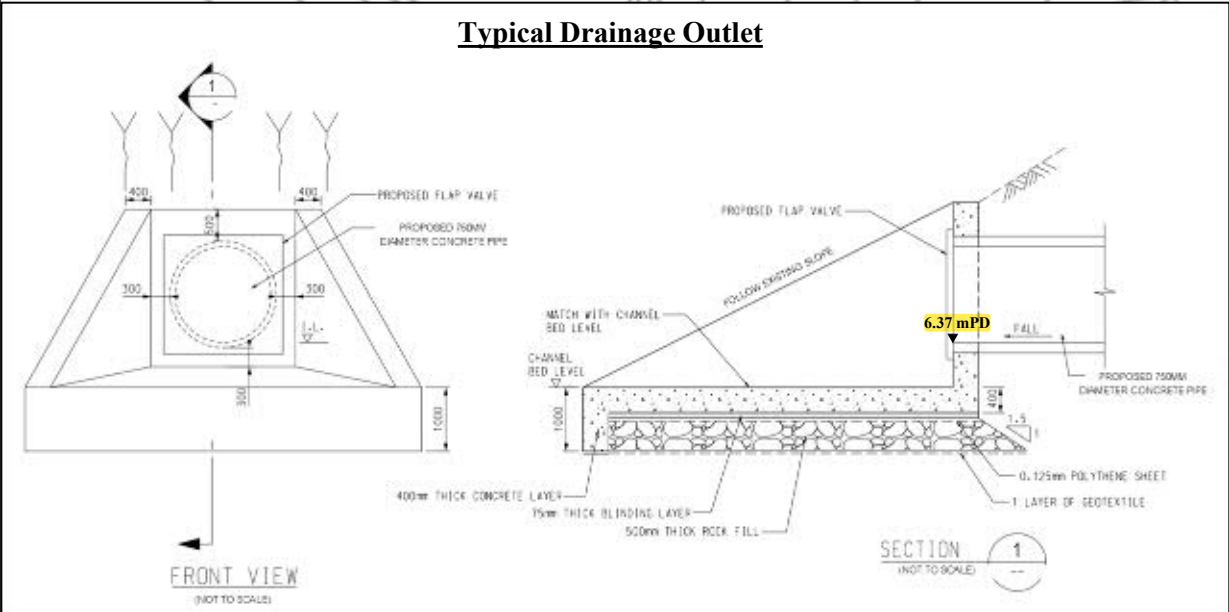
Proposed Drainage System



Project	Rezoning from “Residential (Group C)2” and “Open Space” zones to “Residential (Group C)4” zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	MOTT MACDONALD Appendix B2
Title	Proposed Drainage System	
Date	Jan 2026	
Scale	N.T.S.	
File		

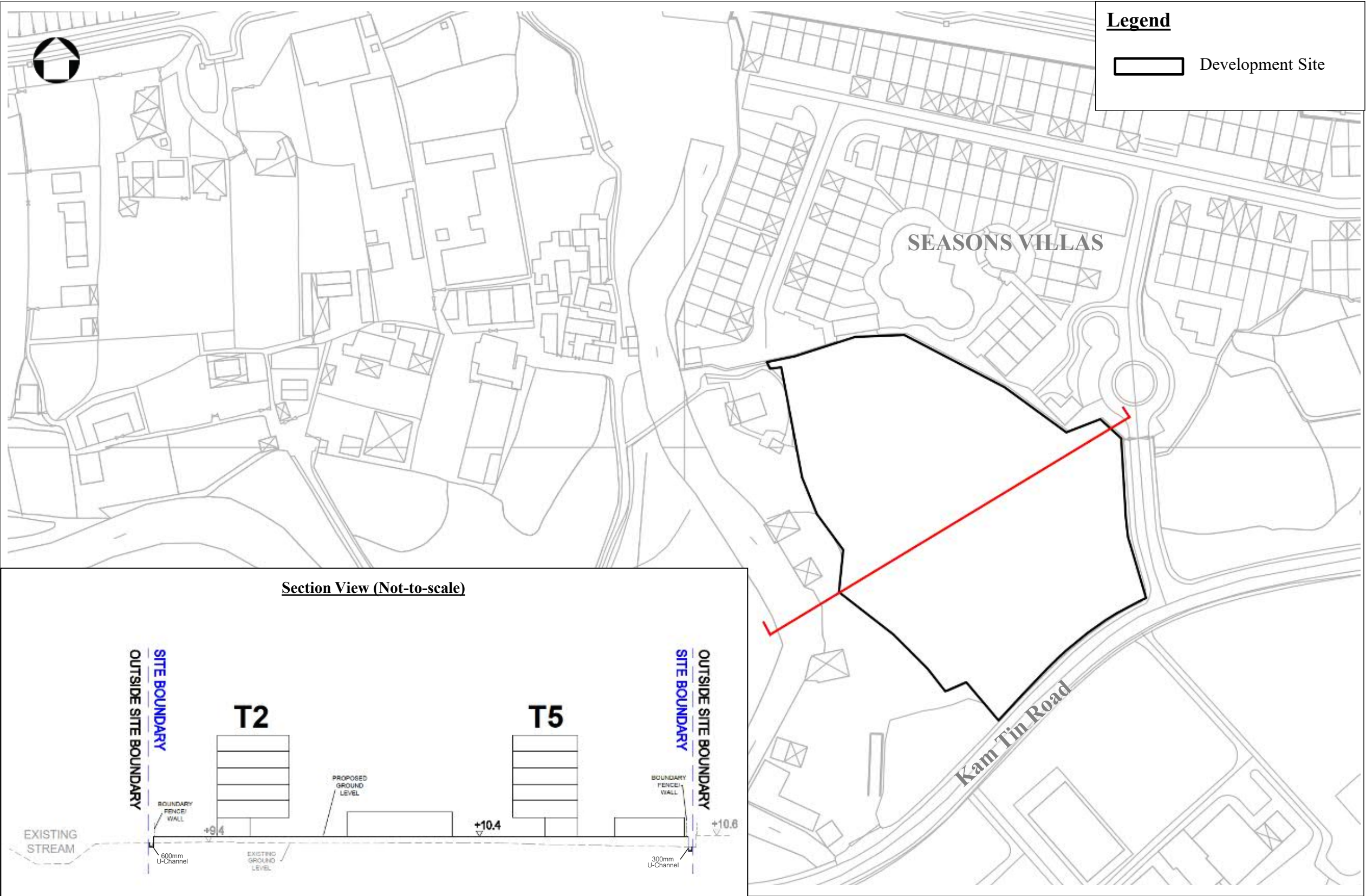
From	To	Size (mm)	US I.L. (mPD)	DS I.L. (mPD)	Gradient 1 in
MH1	MH2	750	8.870	8.800	212
MH2	SST	750	8.400	8.300	194
SST	MH3	450	7.400	7.320	193
MH2	MH3	750	8.800	8.660	195
MH3	TDM	750	6.720	6.675	193
TDM	watercourse	900	6.525*	6.370	182
C1	TDM	600	6.750	6.730	100
C2	TDM	300	7.080	7.070	200

- Note:
- US I.L. = Upstream Invert Level
 - DS I.L. = Downstream Invert Level
 - * means D.T.I.L. of terminal manhole
 - TDM = Terminal manhole. The type of terminal manhole will be made reference to DSD latest standard drawings in detailed design stage
 - C1 & C2 details will be made reference to DSD Standard Drawing No. DS1025.



- * The design of the drainage outlet will be subject to be confirmed at later design and construction stage.
- ** The invert level of the existing watercourse at the location of drainage outlet is about 5.2mPD.

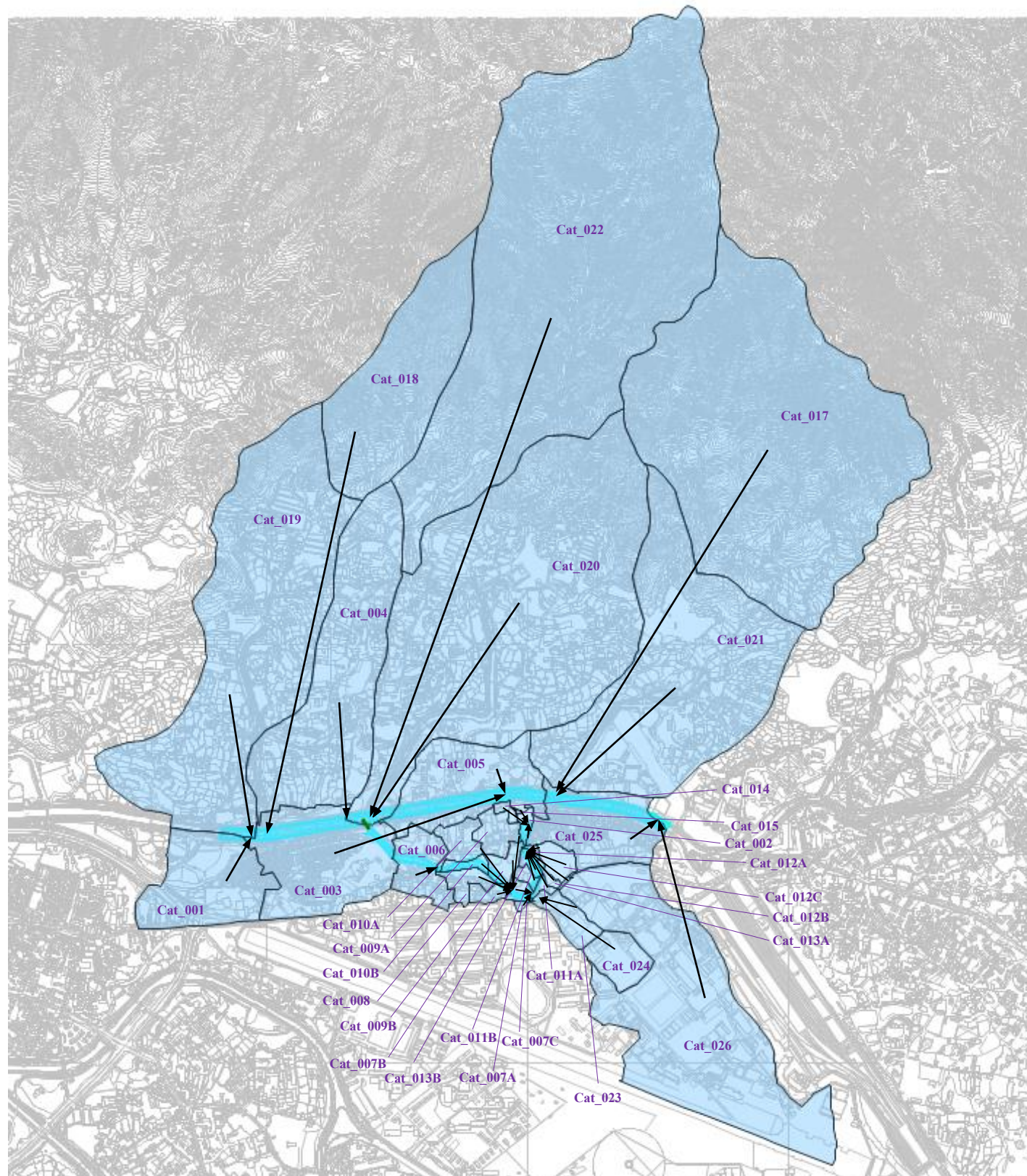
Project	Rezoning from “Residential (Group C)2” and “Open Space” zones to “Residential (Group C)4” zone for a Proposed Residential Develop ment at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	M M MOTT MACDONALD Appendix B2
Title	Proposed Drainage System (Enlarged)	
Date	Jan 2026	
Scale	N.T.S.	
File		



ProjectRezoning from “Residential (Group C)2” and “Open Space” zones to “Residential (Group C)4” zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.				
TitleProposed Drainage System			Appendix B2	
DateOct 2025	ScaleN.T.S.	File		

Appendix C1

Existing Catchment Plan



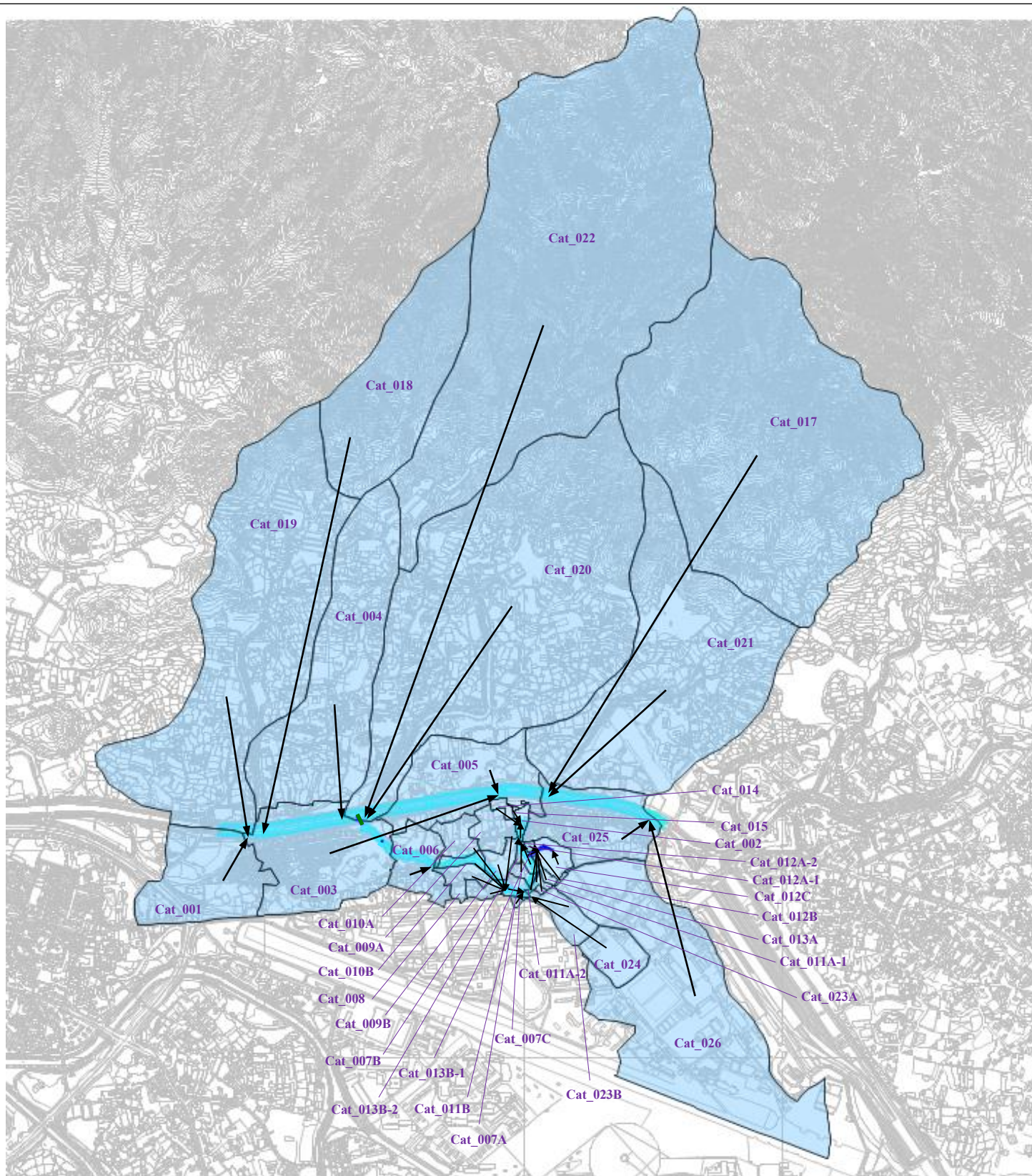
Legend

- Existing Channel Modelled
- Existing Box Culvert Modelled
- Sub-catchments
- Catchment Distribution

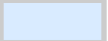
Project	Rezoning from “Residential (Group C)2” and “Open Space” zones to “Residential (Group C)4” zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.			M M MOTT MACDONALD Appendix C1
Title	Existing Catchment Plan			
Date	Jan 2026	Scale	N.T.S.	

Appendix C2

Proposed Catchment Plan



Legend

-  Existing Channel Modelled
-  Existing Box Culvert Modelled
-  Sub-catchments
-  Catchment Distribution
-  Proposed Drainage

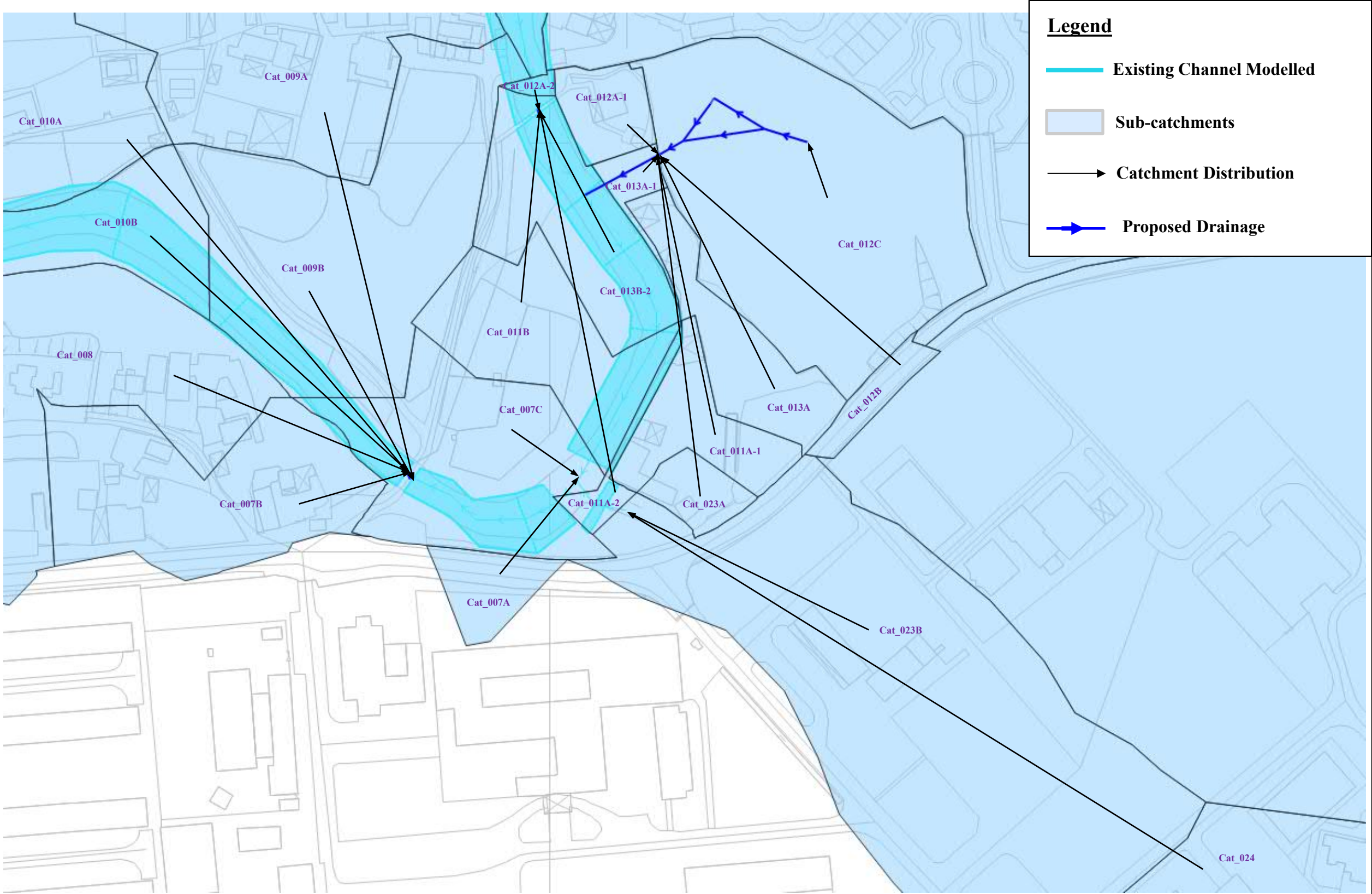
Project Rezoning from “Residential (Group C)2” and “Open Space” zones to “Residential (Group C)4” zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.

Title Proposed Catchment Plan

Date Jan 2026 **Scale** N.T.S. **File**



Appendix C2



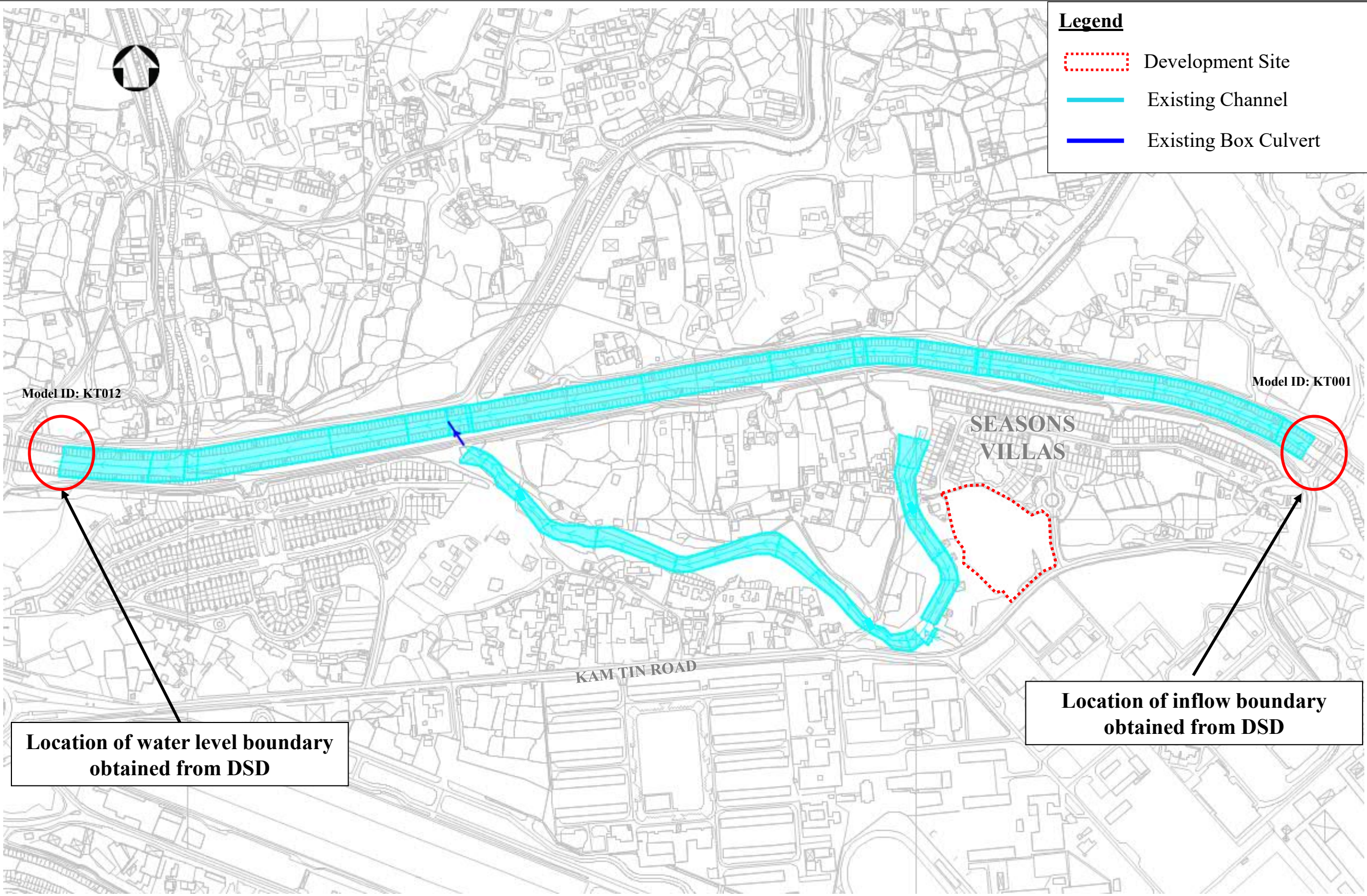
Project			Rezoning from “Residential (Group C)2” and “Open Space” zones to “Residential (Group C)4” zone for a Proposed Residential Develop ment at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.			M MOTT MACDONALD	
Title			Proposed Catchment Plan (Enlarged)			Appendix C2	
Date	Jan 2026	Scale	N.T.S.	File			

Appendix D

Location of Control Points in the Model

Appendix E

Existing Model Extent



Project	Rezoning from “Residential (Group C)2” and “Open Space” zones to “Residential (Group C)4” zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	MOTT MACDONALD Appendix E
Title	Existing Model Extent	
Date	Aug 2025	
Scale	N.T.S.	
File		

Appendix F

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 : (00RPNA) in MN 10/YL/DD110

來函檔號 Your Ref : EC/MT/426076/L-0004

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	Inform	Copy	Sign	Date
1						
2						
Rec'd		19 NOV 2021				
3						
4						
File No. 426076						MOTT MACDONALD M M

Dear Sir/Madam,

**S12A Planning Application for Proposed Residential Development at
Various Lots in DD110 Shek Kong, Kam Tin, Yuen Long, New Territories
Request for Information**

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

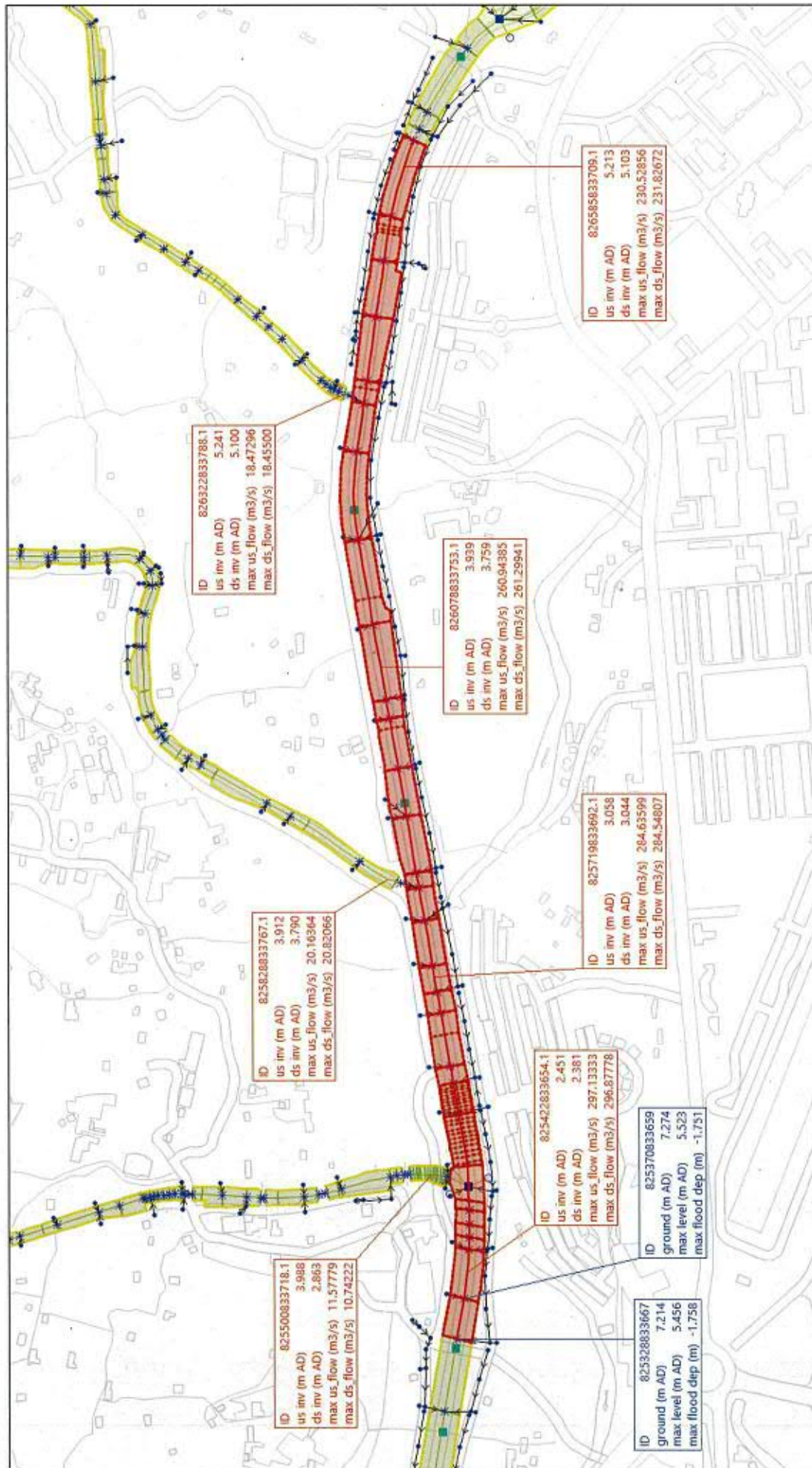
The map shows a residential area with a river. A dashed line outlines the 'Concerned Drainage System'. Blue arrows indicate the 'Flow Boundary' and flow direction. A red dot marks the 'Water level boundary'. Other labels include 'Flow Boundary', 'Water level boundary', 'Other flow boundary for this section of drainage system', and 'Remark: Request of information including any other flow/discharge boundary along the concerned drainage system'.

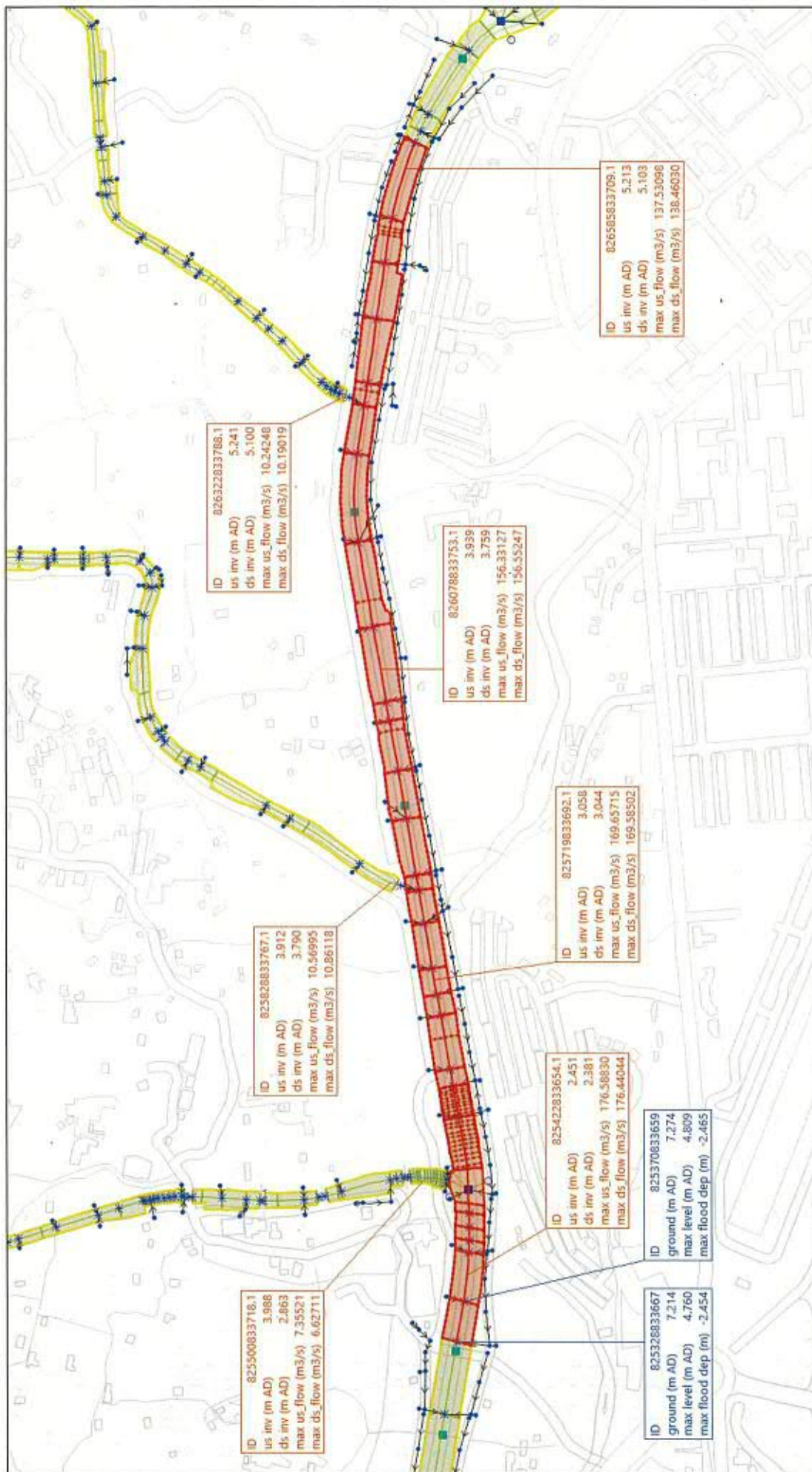
Sketch 1 - Request for Information

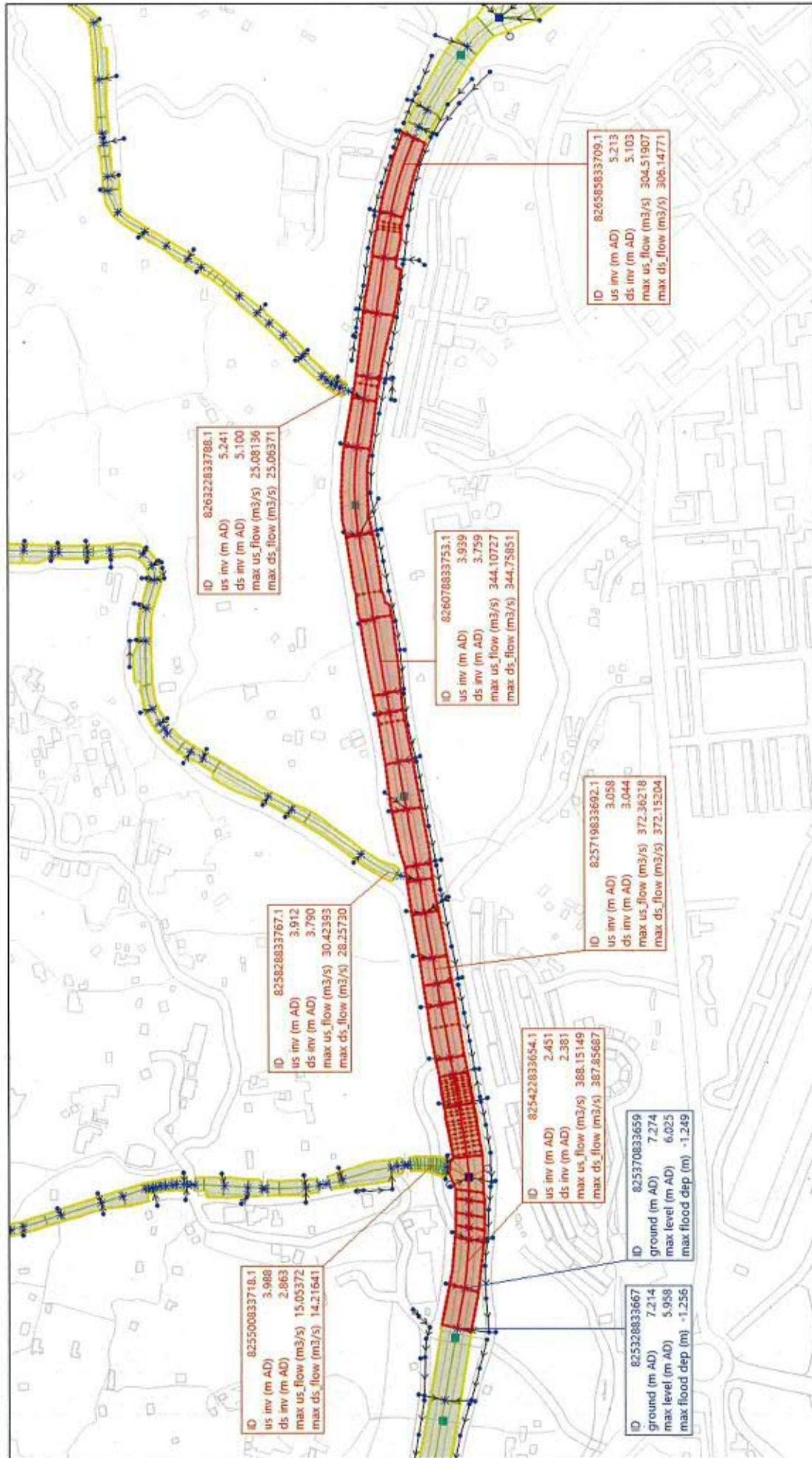
The map shows a residential area with a river. A dashed line outlines the 'Concerned Drainage System'. Blue arrows indicate the 'Flow Boundary' and flow direction. A red dot marks the 'Water level boundary'. Other labels include 'Flow Boundary', 'Water level boundary', 'Other flow boundary for this section of drainage system', and 'Remark: Request of information including any other flow/discharge boundary along the concerned drainage system'.

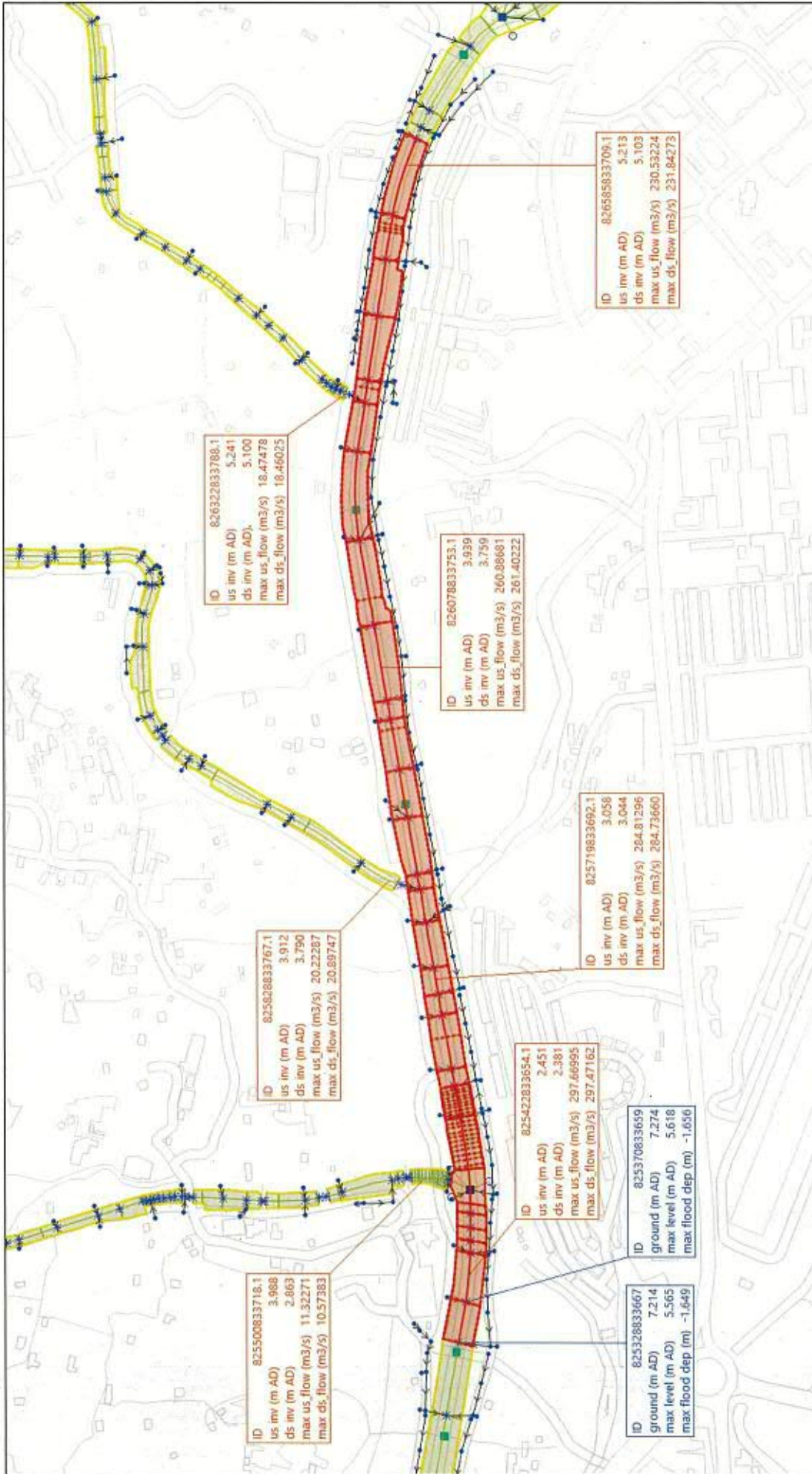
Sketch 1 - Request for Information

The map shows a drainage system with a central waterway. A dashed line outlines the 'Concerned Drainage System'. Blue arrows indicate the 'Flow Boundary'. A red dot marks the 'Water level boundary'. Other labels include 'Flow Boundary', 'Water level boundary', 'Other flow boundary for this section of drainage system', and 'Remark: Request of information including any other flow/discharge boundary along the concerned drainage system'.

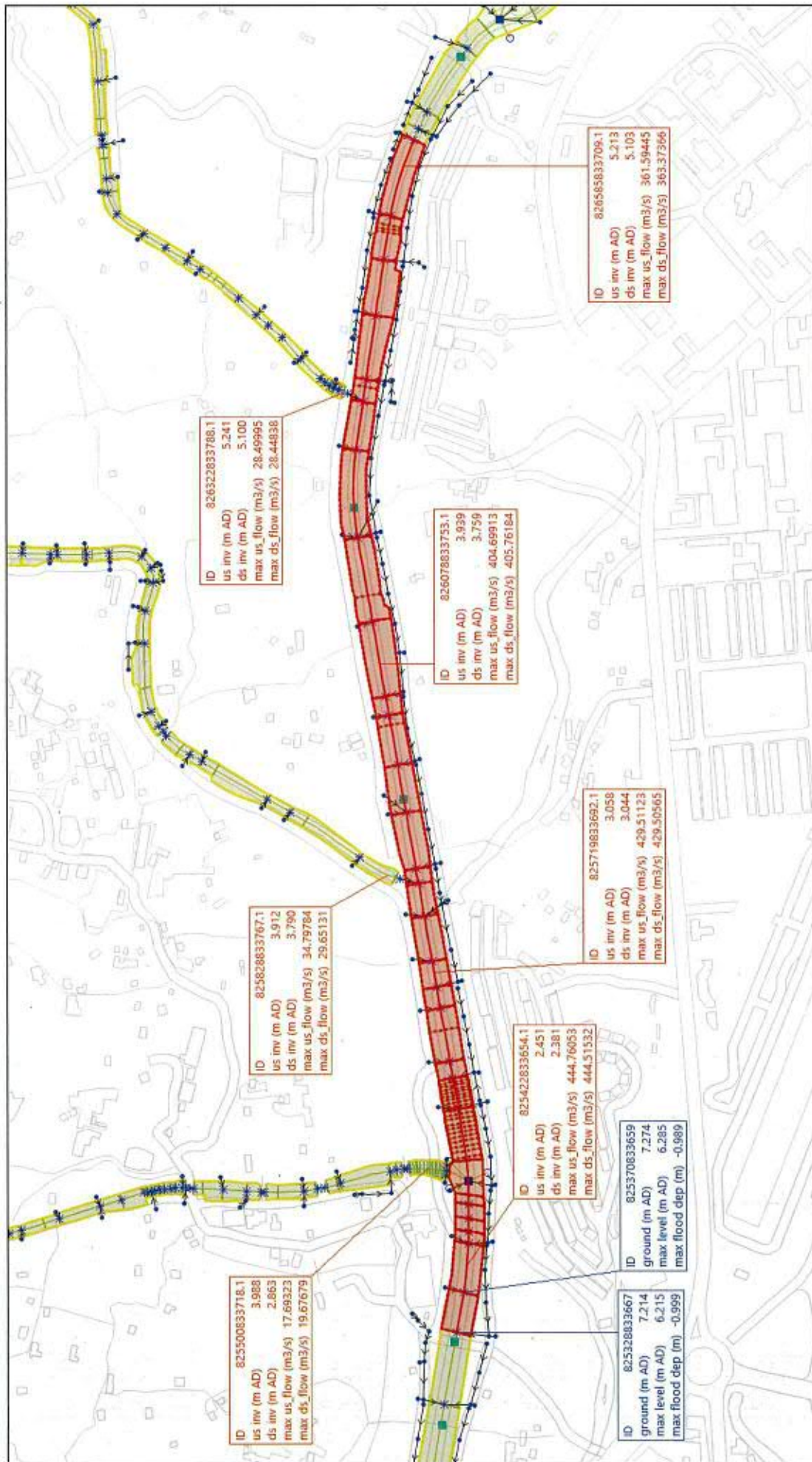




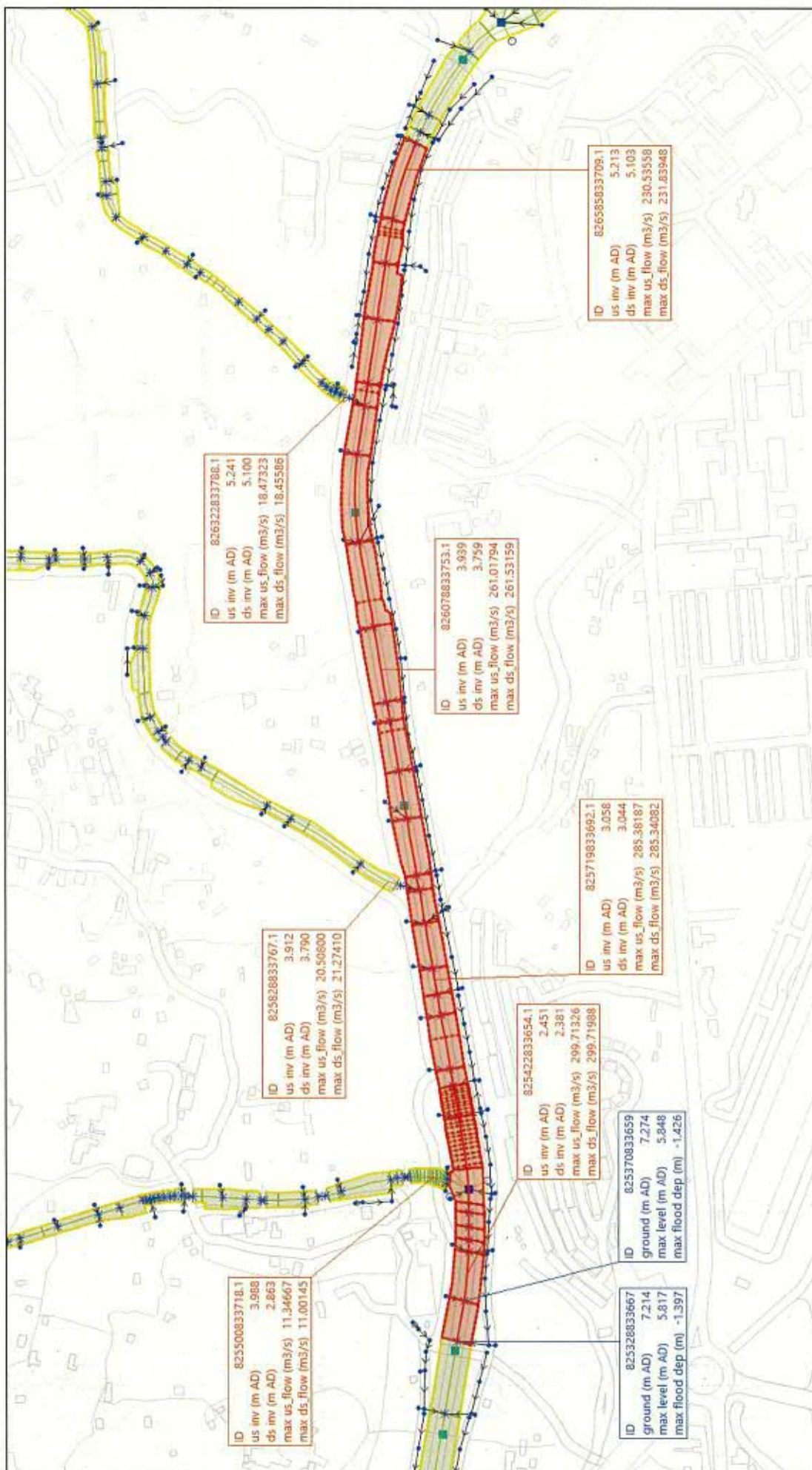




50B



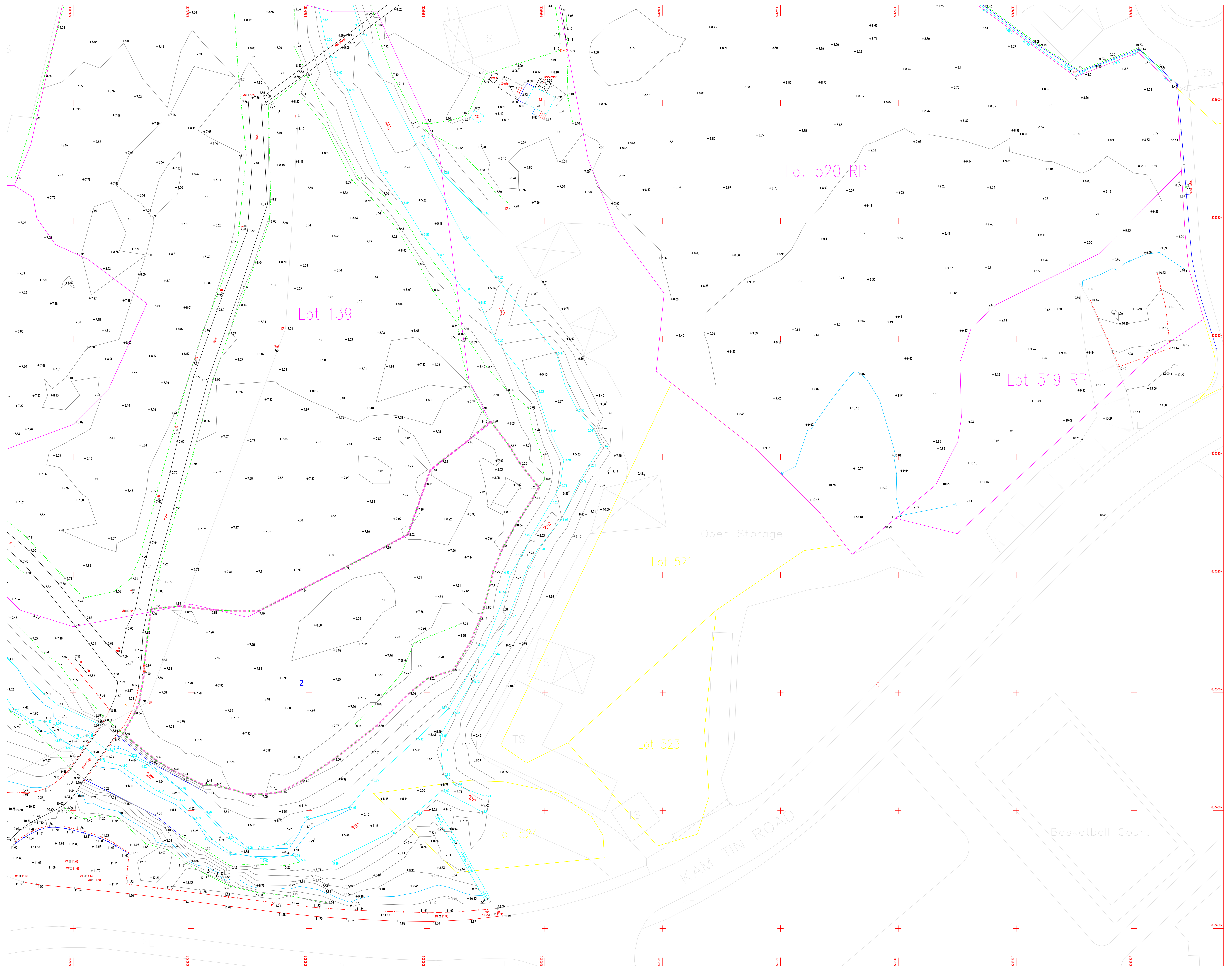
200A



200B

Appendix G

Topographic Survey received from the Applicant



Appendix H

InfoWorks ICM Hydraulic Model

Appendix I

Capacity Check for Peripheral Channels

Appendix I - Capacity Check for Peripheral Channels

Ref.

SDM
Table 12

Calculation

Objective

Determine the runoff of the adjacent areas that will be collected by the proposed peripheral channels.

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. The capacity of proposed boundary channels has been checked for 200-year rainfall event.

1. Runoff from Nearby Catchments Extracted from the Hydraulic Model

-Refer to Appendix C2 for the catchment plan.

-Runoff is extracted from hydraulic model as attached in Appendix H of this DIA Report.

-According to the topography, the runoff arising from the areas at the west and south of the proposed development are currently directly discharged to the existing watercourse through overland flow. As a conservative approach, the peripheral channel, namely Channel A, is sized to cater for the runoff generated from the area between the east bank of the existing watercourse and the proposed Development Site boundary.

-For the existing development at the north and east of the proposed Development Site, the existing development has their own boundary channels and internal drainages which collect and convey the runoff from the development to Kam Tin River. A set of 300mm peripheral channels, Channel B, and associated 300mm pipe will be provided along the site boundaries at the north and east side of the proposed Development Site boundary.

Sub Catchment ID	Total Catchment Areas(m ²)	200-year rainfall event	Collected By Proposed Drainage System
Cat_012A-1	829	0.0724	According to topography, the runoff from Cat_012A-1 is directly discharged to the existing watercourse. As conservative approach for sizing the peripheral channel, it is assumed that the peripheral channel have sufficient capacity to collect the runoff from Cat_012A-1. The peripheral channel is connected to Pipe PC-1 then to the proposed stormwater terminal manhole.
Cat_013B-1	351	0.0335	According to topography, the runoff from Cat_013B-1 is directly discharged to the existing watercourse. As conservative approach for sizing the peripheral channel, it is assumed that the peripheral channel have sufficient capacity to collect the runoff from Cat_013B-1. The peripheral channel is connected to Pipe PC-1 then to the proposed stormwater terminal manhole.
Cat_013A	1,820	0.1616	According to topography, the runoff from Cat_013A is directly discharged to the existing watercourse. As conservative approach for sizing the peripheral channel, it is assumed that the peripheral channel have sufficient capacity to collect the runoff from Cat_013A. The peripheral channel is connected to Pipe PC-1 then to the proposed stormwater terminal manhole.
Cat_011A-1	1,410	0.1249	According to topography, the runoff from Cat_011A-1 is directly discharged to the existing watercourse. As conservative approach for sizing the peripheral channel, it is assumed that the peripheral channel have sufficient capacity to collect the runoff from Cat_011A-1. The peripheral channel is connected to Pipe PC-1 then to the proposed stormwater terminal manhole.
Cat_023A	605	0.0461	According to topography, the runoff from Cat_023A is directly discharged to the existing watercourse. As conservative approach for sizing the peripheral channel, it is assumed that the peripheral channel have sufficient capacity to collect the runoff from Cat_023A. The peripheral channel is connected to Pipe PC-1 then to the proposed stormwater terminal manhole.
Cat_012B	483	0.0390	According to topography, the runoff from Cat_023A is directly discharged to the existing watercourse. As conservative approach for sizing the peripheral channel, it is assumed that the peripheral channel have sufficient capacity to collect the runoff from Cat_023A. The peripheral channel is connected to Pipe PC-1 then to the proposed stormwater terminal manhole.

2. Determine the size of proposed peripheral channels

Using Manning equation for calculate the channel Free Flow Full Bore Capacity

$$V = \frac{R^{1/6}}{n} \sqrt{RS_f}$$

where

V

=

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

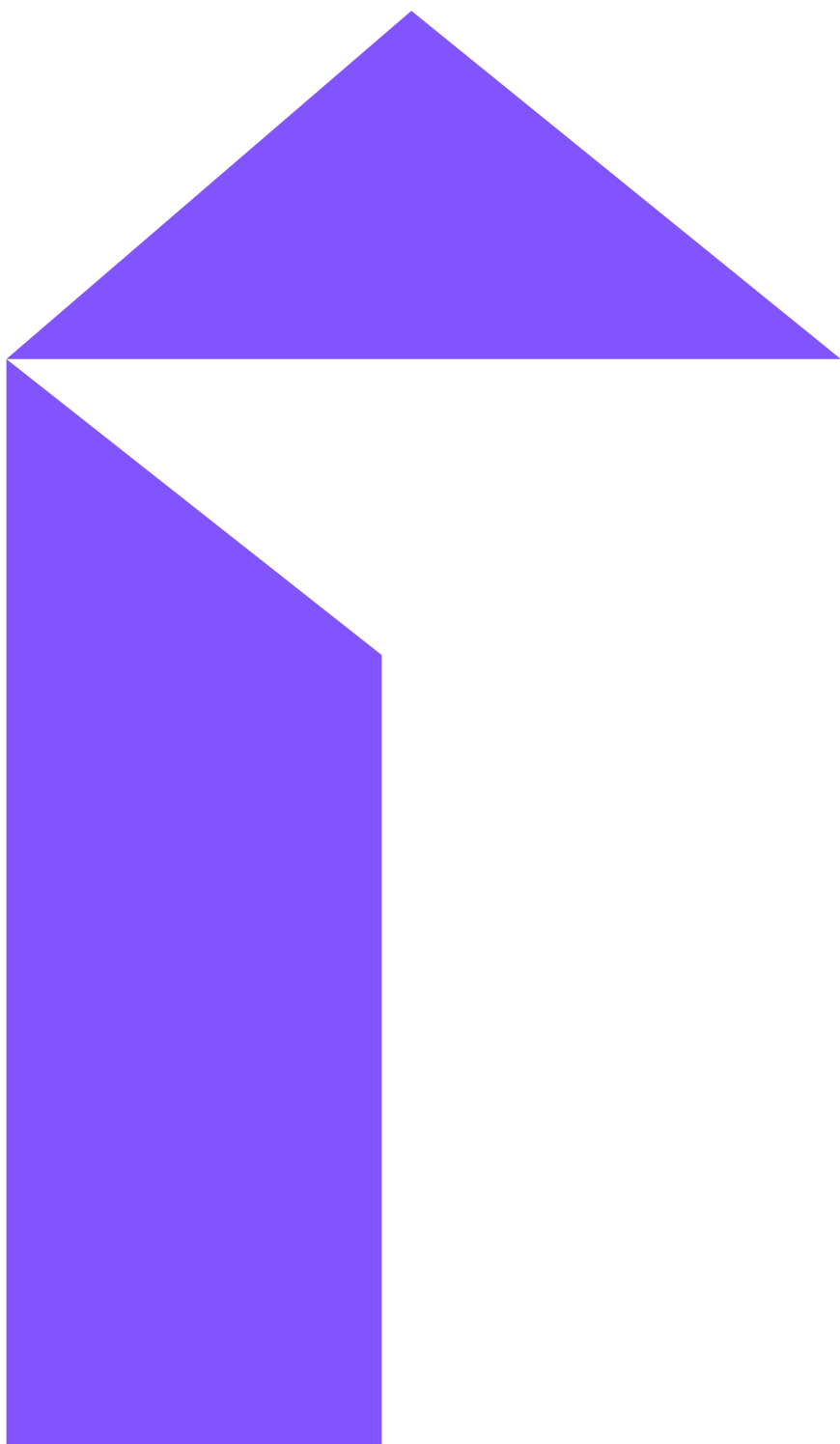
(refer to Concrete-lined Channel under Fair condition in Stormwater Drainage Manual Part 1 - Table 13)

Proposed open channels

For Rainfall Return Period 200 years

Channel Name	U-Channel / Rectangular Channel Size 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)	Flow from Catchment m ³ /s	Free Flow Full-bore Capacity m ³ /s	Full-bore Velocity m/s	Utilization %	Flow Capacity Check
Channel A.1	0.6	0.32	1.54	60	0.21	12.7	11.6	10.90	9.80	55	0.478	0.956	2.97	50.0	OK
Channel A.2	0.6	0.32	1.54	16	0.21	11.7	9.7	9.20	8.96	65	0.478	0.876	2.72	54.5	OK
Channel A.3	0.6	0.32	1.54	8	0.21	9.7	10.5	8.96	8.91	160	0.478	0.558	1.74	85.6	OK
Channel A.4	0.6	0.32	1.54	46	0.21	10.5	10.1	8.91	8.63	160	0.478	0.558	1.74	85.6	OK
Channel A.5	0.6	0.32	1.54	14	0.21	10.1	8.8	8.23	8.14	160	0.478	0.558	1.74	85.6	OK
Channel A.6	0.6	0.32	1.54	30	0.21	8.8	8.1	7.69	7.50	160	0.478	0.558	1.74	85.6	OK

Ref.	Calculation																																																																																																													
	3. Determine the Size of the Proposed Pipes																																																																																																													
	New proposed pipes will be proposed to divert the surface runoff collected from the development to the existing drainage network.																																																																																																													
	$V = -\sqrt{32gRSf} \log\left[\frac{ks}{14.8R} + \frac{1.255\nu}{R\sqrt{32gRSf}}\right]$					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 m2/s.																																																																																																													
	Full-bore capacity for Proposed Pipe PC-1:																																																																																																													
	<table><tr><td>Pipe Diameter</td><td>600</td><td>mm</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Pipe Roughness</td><td>3</td><td>mm</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Thickness of Pipe</td><td>0.2</td><td>m</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Cover</td><td>1.2</td><td>m</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Length of Pipe</td><td>2</td><td>m</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Upstream Invert</td><td>6.75</td><td>mPD</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Downstream Invert</td><td>6.73</td><td>mPD</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Hydraulic Gradient, Sf</td><td>0.010</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Gradient 1 in</td><td>100</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Full-bore capacity</td><td>0.56</td><td>m³/s</td><td>and velocity of</td><td>1.97</td><td>m/s</td><td></td><td></td><td></td><td></td></tr></table>										Pipe Diameter	600	mm								Pipe Roughness	3	mm								Thickness of Pipe	0.2	m								Cover	1.2	m								Length of Pipe	2	m								Upstream Invert	6.75	mPD								Downstream Invert	6.73	mPD								Hydraulic Gradient, Sf	0.010									Gradient 1 in	100									Full-bore capacity	0.56	m³/s	and velocity of	1.97	m/s				
	Pipe Diameter	600	mm																																																																																																											
Pipe Roughness	3	mm																																																																																																												
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Hydraulic Gradient, Sf	0.010																																																																																																													
Gradient 1 in	100																																																																																																													
Full-bore capacity	0.56	m³/s	and velocity of	1.97	m/s																																																																																																									
The future flow of 0.48 m³/s is 85.9% of the full-bore capacity of 0.56 m³/s																																																																																																														
The proposed Pipe PC-1 is capable of conveying the future flow while maintaining 10% flow capacity allowance for siltation under 1 in 200 years storm event.																																																																																																														
OK!																																																																																																														
3. Conclusion																																																																																																														
(1) The proposed peripheral channels and associated pipe have sufficient capacity to collect the peak flow from catchments.																																																																																																														



Annex D

Revised Air Quality Impact Assessment

Rezoning From “Residential (Group C)2” and “Open Space” Zones to “Residential (Group C)4” Zone for a Proposed Residential Development at Lot Nos. 519 RP (Part) and 520 RP in D.D. 110 and the Adjoining Government Land, Shek Kong, Yuen Long, New Territories

Environmental Air Quality Impact Assessment

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AIMS

To assess the air quality impact due to the surrounding industrial, vehicular and odour emissions on the proposed residential development at DD110 on Kam Tin Road in 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, other industrial emissions and potential odour sources were identified within 500m of the site. Site inspections revealed that 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. Therefore, no adverse air quality impacts on the proposed Development are anticipated.

Air quality control requirements in the Air Pollution Control (Construction Dust) Regulation will be complied with. Relevant mitigation measures for dust and gaseous 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 including industrial, vehicular and odour emissions in the vicinity of the proposed residential development at Lot Nos. 519 RP (Part) and 520 RP in DD110 and the adjoining government land 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 emission impact on the proposed Development;
 - Vehicular emission impact on the proposed Development;
 - Odour emission impact on the proposed Development; and
 - Air Quality impact control during construction.

2. SITE LOCATION

Site Location

- 2.1 The development site adjoins Shek Kong Barracks to the south and is located north of Kam Tin Road. The residential development Seasons Villas is located to the north-east. The location of the development site is shown in Figure 1. The development parameters are summarised in Table 2.1.

Building Layout

- 2.2 The proposed Development comprises 6 low-rise residential blocks with 5 storeys ontop of carport and clubhouse. The carport and clubhouse are located at G/F. The building layouts are shown in Appendix 1.

Table 2.1 Development Parameters of the Proposed Development

	Parameters
Zoning	“Residential (Group C)2” and “Open Space” zones on Approved Kam Tin North Outline Zoning Plan No. S/YL-KTN/11
Site Area	8,580m ²
Number of Residential Units	240
Number of Residential Storeys	5 storeys
Height of Building	28.9mPD
Use	6 residential blocks with a clubhouse and carport at Ground Floor
Completion Year	2031

3. SITE INSPECTIONS

Site Surveys

- 3.1 Site surveys were conducted on 18 March 2025, 10 October 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 development site. The results of site inspections have revealed that no industrial chimney and potential odour sources were identified within 500m of the development site.
- 3.3 The site inspections revealed that the nearby industrial uses are mainly vehicle repairing workshops, car trading centres and open storages, no air and odour emission sources from these industrial uses 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.
- 3.4 According to the Outline Zoning Plans, there are some areas in the vicinity of the development site zoned as I(D). Site inspections revealed that these I(D) zones are currently used as open storages and substation, which no industrial emissions are observed in these zones. Hence, adverse air quality impacts and I/R interface problem are not anticipated from these I(D) zones. Locations and photos of these I(D) zones are illustrated and provided in Figure 5.

4. HONG KONG AIR QUALITY OBJECTIVES

4.1 The Hong Kong Air Quality Objectives (HKAQO) are shown in Table 4.1.

Table 4.1 Hong Kong Air Quality Objectives

Pollutant	Averaging Time	AQO concentration ($\mu\text{g}/\text{m}^3$)	Number of exceedances allowed
Sulphur Dioxide	10 minute	500	3
	24 hour	40	3
Respirable Suspended Particulate (PM10) (ii)	24 hour	75	9
	Annual	30	NA
Fine Suspended Particulates (PM2.5) (iii)	24 hour	37.5	18
	Annual	15	NA
Nitrogen Dioxide	1 hour	200	18
	24 hour	120	9
	Annual	40	NA
Carbon Monoxide	1 hour	30,000	0
	8 hour	10,000	0
	24 hour	4000	0
Ozone	8 hour	160	9
	Peak season	100	NA
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.
 - (iv) 24 hour level for NO₂, peak season level for O₃ and 24 hour level for CO are new parameters in World Health Organization (WHO) Air Quality Guidelines (AQGs) as well as HKAQOs.

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 2020 to Year 2024) are tabulated in Table 5.1 below.

Table 5.1 Summary of AQMS Data from Year 2020 to Year 2024

Pollutant	Year	Highest 1-hour Conc. beyond the allowed exceedance ($\mu\text{g}/\text{m}^3$)	Annual Conc. ($\mu\text{g}/\text{m}^3$)	Highest 10-minutes Conc. beyond the allowed exceedance ($\mu\text{g}/\text{m}^3$)	Highest 24-hour Conc. beyond the allowed exceedance ($\mu\text{g}/\text{m}^3$)
NO₂	2020	135	32	-	64
	2021	148	40	-	78
	2022	122	37	-	68
	2023	130	37	-	67
	2024	125	35	-	66
	5-year Mean	132 [66%]	36 [90%]	-	69 [57%]
	AQOs	200 (18)	40	N/A	120 (9)
SO₂	2020	-	-	26	10
	2021	-	-	24	14
	2022	-	-	21	7
	2023	-	-	20	10
	2024	-	-	14	5
	5-year Mean	-	-	21 [4%]	9 [23%]
	AQOs	N/A	N/A	500 (3)	40 (3)
RSP (PM₁₀)	2020	-	30	-	<u>77</u>
	2021	-	30	-	73
	2022	-	25	-	56
	2023	-	26	-	59
	2024	-	25	-	61
	5-year Mean	-	27 [90%]	-	65 [87%]
	AQOs	N/A	30	N/A	75 (9)

Pollutant	Year	Highest 1-hour Conc. beyond the allowed exceedance ($\mu\text{g}/\text{m}^3$)	Annual Conc. ($\mu\text{g}/\text{m}^3$)	Highest 10-minutes Conc. beyond the allowed exceedance ($\mu\text{g}/\text{m}^3$)	Highest 24-hour Conc. beyond the allowed exceedance ($\mu\text{g}/\text{m}^3$)
FSP (PM_{2.5})	2020	-	<u>16</u>	-	33
	2021	-	<u>17</u>	-	36
	2022	-	<u>16</u>	-	<u>38</u>
	2023	-	<u>16</u>	-	34
	2024	-	<u>17</u>	-	<u>38</u>
	5-year Mean	-	<u>16 [109%]</u>	-	36 [95%]
	AQOs	N/A	15	N/A	37.5 (18)

- 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.
(iv) In consideration of the numbers of exceedances allowance in the AQOs, the 4th highest 10-minute and 24-hr SO₂, 19th highest 1-hr NO₂, 10th highest 24-hour NO₂, 10th highest 24-hour RSP and 19th highest 24-hour FSP concentrations are presented in above table.
(v) N/A – Not applicable since there are no AQOs for these parameters.

5.2 The expected commencement year would be 2031, the nearest available future background concentration data predicted by PATH v3.0 in Year 2030 at Grids (30_46), (30_47), (31_46) and (31_47) are summarised in Table 5.2 below.

Table 5.2 Summary of PATH v3.0 Background in Year 2030

Pollutant	PATH Grid	Highest 1-hour Conc. beyond the allowed exceedance ($\mu\text{g}/\text{m}^3$) ^[1]	Annual Conc. ($\mu\text{g}/\text{m}^3$)	Highest 10-minutes Conc. beyond the allowed exceedance ($\mu\text{g}/\text{m}^3$) ^{[2][3]}	Highest 24-hour Conc. beyond the allowed exceedance ($\mu\text{g}/\text{m}^3$) ^[4]
NO₂	(30_46)	56	11.44	-	22.31
	(30_47)	56.97	11.29	-	21.99
	(31_46)	48.98	10.36	-	19.43
	(31_47)	51.52	10.75	-	20.21
	AQOs	200 (18)^[5]	40	N/A	120 (9)

Pollutant	PATH Grid	Highest 1-hour Conc. beyond the allowed exceedance ($\mu\text{g}/\text{m}^3$) ^[1]	Annual Conc. ($\mu\text{g}/\text{m}^3$)	Highest 10-minutes Conc. beyond the allowed exceedance ($\mu\text{g}/\text{m}^3$) ^{[2] [3]}	Highest 24-hour Conc. beyond the allowed exceedance ($\mu\text{g}/\text{m}^3$) ^[4]
SO₂	(30_46)	-	-	23.71	6.55
	(30_47)	-	-	24.57	6.43
	(31_46)	-	-	23.98	6.47
	(31_47)	-	-	24.32	6.43
	AQOs	N/A	N/A	500 (3)	40 (3)
RSP	(30_46)	-	19.35	-	50.33
	(30_47)	-	20.38	-	53.32
	(31_46)	-	19.11	-	49.98
	(31_47)	-	20.05	-	52.34
	AQOs	N/A	30	N/A	75 (9)
FSP	(30_46)	-	11.87	-	29.6
	(30_47)	-	12.71	-	31.83
	(31_46)	-	11.67	-	29.3
	(31_47)	-	12.45	-	31.54
	AQOs	N/A	15	N/A	37.5 (18)

Note:

[1] 19th highest 1-hour concentration of NO₂

[2] 4th highest 10-minute SO₂ concentration

[3] According to EPD's "Guidelines on the Estimation of 10-minute Average SO₂ Concentration for Air Quality Assessment in Hong Kong".

[4] 10th highest 24-hour NO₂; 4th highest 24-hour concentration of SO₂; 10th highest 24-hour concentration of RSP; 19th highest 24-hour concentration of FSP.

[5] Values in () mean the number of exceedances allowed.

5.3 It can be seen from the above Table 5.1 that, the trends of NO₂, RSP, FSP and SO₂ concentrations in the area have been decreasing in general. According to the PATH data, 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 18 March 2025, 10 October 2022 and 17 November 2021, no industrial chimney and dusty use are being identified within a 500m radius of the development 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 and dusty use are not anticipated for the proposed Development.

7. VEHICULAR EMISSION ASSESSMENT

- 7.1 According to The Annual Traffic Census 2024 by Transport Department (TD), the Kam Tin Road is classified as “Rural Road”. For the Avenue De Versailles, where located to the easternmost of the proposed Development, is an access road leading to Kam Tin Road from Season Villas. With reference to the lease of Seasons Villas (Lot 815 RP & Ext Thereto in DD110), this road is a non-exclusive right-of-way maintained by the owners of Seasons Villas. Additionally, as advised by the Traffic Consultant (CTA Consultants Ltd.), the peak traffic flows of Season Villas are only 35 veh/hr and 30 veh/hr for AM and PM peak respectively. Hence, the Avenue De Versailles is considered as Rural Road in the assessment.
- 7.2 There is no recommended buffer distance for rural road in HKPSG. Nevertheless, buffer distance of 5m has been adopted for the rural road.
- 7.3 No air-sensitive uses including openable window, fresh air intake and recreational uses in open space is allowed within the buffer zones. Table 7.1 summarises the shortest distance between ASRs and the roads, with considering the road widening of Kam Tin Road (widening of Kam Tin Road is not covered in the subject project). The locations of the buffer zones are demonstrated in Figure 3. Therefore, adverse air quality impact due to vehicle emission is not anticipated for the proposed development.
- 7.4 The access road located to the north of T3 of the proposed Development is the private access road of the adjoining residential development (i.e. Season Villas). According to desktop review, the access road is not solely for EVA purpose, but also for access to the G/F carparking spaces. As advised by the Traffic Consultant, the access road only serves for the Season Villas without any by-pass traffic. The peak traffic flow of

Season Villas is about 30 to 35 veh/hr and will further split into the eastern part and western part of Season Villas (about 15 to 20 veh/hr each side). Therefore, the traffic flow of the access road is limited. Hence, adverse air quality impact on the proposed Development is not anticipated.

Table 7.1 Separation between ASRs/site Boundaries and the Roads

Road Name	Road Type	Shortest Distance between ASRs and the Roads ^[2]	Remark
Kam Tin Road	Rural Road ^[1]	12m	All ASRs comply with the HKPSG requirement
Avenue De Versailles (i.e. access road leading to Kam Tin Road from Season Villas)	Rural Road ^[3]	7m	All ASRs comply with the HKPSG requirement

Remark:-

- [1] According to The Annual Traffic Census 2024, Kam Tin Road is classified as Rural Road, **buffer distance of 5m is adopted.**
- [2] The road widening of Kam Tin Road is considered.
- [3] As a conservative approach, the access road is considered as Rural Road, **buffer distance of 5m is adopted.**

- 7.5 For the internal roads of the proposed Development, they are not solely for EVA purpose, but also for access to the G/F carparking spaces and HGV loading/unloading bays. As advised by the Traffic Consultant, the maximum traffic generation/attraction of the proposed Development in peak hour is only 35 veh/hr, anticipating the traffic flow of each section of the internal road is even lower. Considering the traffic flow of the proposed internal road is relatively limited, adverse air quality impact is not anticipated.

8. AIR QUALITY IMPACT DUE TO CARPARK OF THE PROPOSED DEVELOPMENT

- 8.1 The proposed carparking spaces are accommodating at the open area of G/F, which allows natural ventilation. According to the Traffic Impact Assessment (TIA) under the Application, the proposed Development will have 79 no. of carparking space (67 for resident and 12 for visitor). There is no PTI or public transport lay-by proposed in the proposed Development. Considering the carparking spaces are mainly for private car and light good vehicles only, and the numbers of carparking spaces are relatively small for small scale proposed residential development, adverse air quality impact due to the proposed carparking spaces is not anticipated.

9. ODOUR IMPACT ASSESSMENT

Odour Sources within the Assessment Area

- 9.1 The results of site inspections have revealed that no odour sources were identified within 500m of the development site. It is confirmed that adverse air quality impact due to odour sources in the vicinity are not anticipated for the proposed Development.

Odour Impact from On-site Sewage Treatment Plant

- 9.2 The proposed Sewage Treatment Plant (STP) is located at the eastern part of the proposed Development on ground level and within an enclosed building structure, with its tank located at the underground level.
- 9.3 The design of the STP will be reviewed during detailed design stage, the Environmental Consideration specified in “Guidelines for the Design of Small Sewage Treatment Plants” for minimization of the odour impact from the proposed STP will be observed and followed.
- 9.4 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. Also, the exhaust air of the stack will be discharged in the horizontal direction, which is away from any air-sensitive uses of Tower 6 and locate away from all other existing ASRs. The potential location of the exhaust outlet and its discharge direction are illustrated in Figure 4, which the separation distances from the potential exhaust outlet to the nearest existing ASR (i.e. houses of Season Villas) and the nearest air-sensitive use of the proposed Development (i.e. Tower 6) are 45m and 14m respectively.
- 9.5 The proposed Development would accommodate a total population of about 648. According to the Sewerage Impact Assessment, the design average dry weather flow (ADWF) of the proposed STP will be 247.5m³/day.
- 9.6 The proposed STP will be housed indoors with full enclosure maintained at negative pressure. The STP will be design with an inlet chamber and wet well which will be enclosed by airtight and watertight cover. A high-efficiency deodorizer (with at least 99.5% odour removal efficiency for H₂S) with a forced ventilation system will also be installed at the STP building to remove odour before discharge into open air.

- 9.7 According to the Sewerage Impact Assessment Report of the proposed Development, the STP will be designed to treat sewage generated from the proposed Development and discharge to the nearby stormwater drainage system. Membrane Bioreactor (MBR) technology with ultra-filtration will be used for the proposed STP for meeting EPD’s effluent discharge standard. The sludge from the STP as a by-product from the MBR treatment process will be temporarily stored in the STP and removed off-site by licensed sludge collection vehicles, which the temporary storage and collection of the sludge will be performed within a fully enclosed area inside the STP. With proper discharge of sewage and sludge generated from the STP, adverse odour impact related to disposal is not anticipated.
- 9.8 A desktop review has been conducted by making reference to an approved EIA report of Expansion of Sha Tau Kok Sewage Treatment Works (STKSTW) (EIA Register No.: AEIAR – 207/2017), to compare the proposed STP against **the proposed STKSTW** which have similar design and odour removal efficiency. The comparison is summarised in Table 9.1.

Table 9.1 Summary Table of **Proposed STKSTW and Proposed STP**

Feature	STKSTW	Proposed STP
ADWF	5,000m ³ /day, with allowance to facilitate a further increase to 10,000 m ³ /day	247.5m ³ /day
Shortest Separation distance with closest ASR	20m	20m
Enclosure of odourous facilities	Yes	Yes
Odour removal efficiency of deodourising units	99.5%	99.5%

- 9.9 According to the approved EIA report of STKSTW, the shortest separation distance between the nearest ASR (i.e. A8) and site boundary of the proposed STKSTW is 20m. The predicted 5-second odour concentrations at the ASR A8 would be in the range of 0.03OU to 0.13OU at the heights of 1.5m to 10.5m above ground (Table 3.7 of the approved EIA report for STKSTW), which are well below the odour criterion of 5OU. Given that the proposed STP is of similar design and separation distance with closest ASR to the STKSTW, while the proposed STP is having much smaller ADWF (i.e. **at least** about 20 times smaller than the ADWF of STKSTW). Hence, adverse air quality impact due to the proposed STP is not anticipated.

- 9.10 With STP design according to EPD’s guidelines, high efficiency deodorizer installed at the exhaust outlet, locating the exhaust and discharge angle away from the ASRs as far as possible and proper disposal, 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 along Kam Tai Road	Residential	450m	1-3
A02	Village Houses along local road	Residential	200m	1-2
A03	Village Houses along Kam Tai Road	Residential	340m	1-2
A04	Village Houses along Kong Po Road	Residential	490m	1-3
A05	Village Houses along Kam Tai Road	Residential	215m	2-3
A06	Seasons Villas	Residential	5m	2
A07	Village Houses along Kam Tai Road	Residential	180m	2-3
A08	Village Houses in Shek Kong Tsuen	Residential	165m	1-3
A09	Village Houses in Pang Ka Tsuen	Residential	310m	1-3
A10	Seasons Monarch	Residential	490m	3
A11	Shek Kong Barracks	Barrack	10m	1-3
A12	Village Houses adjoining the northwestern site boundary	Residential	45m	2-3

11. MITIGATION MEASURES 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 storm water storage tank, with volume of about 5000m³ and the underground tank of the proposed STP, 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.
- 11.2 During the construction phase, dust and gaseous emission would be generated from construction activities such as vehicles movement on haul roads, excavation, loading or unloading stockpile material, stockpiling of material, wind erosion of exposed areas and the use of construction machineries and construction vehicles.
- 11.3 The proposed Development comprises 6 low-rise residential blocks with 5 storeys above 1-storey ground floor carport and a clubhouse. 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. Detailed information such as the estimated size of site formation and excavated areas, the amount of excavated materials, size of active workfront and number of dump trucks to be used on site at a time, etc. are not available at this stage and the details of construction programme will be provided once available, which such information will be taken into account when planning the construction of the proposed Development for better controlling of the potential air quality impact during construction. For conservative, a dust monitoring and audit programme will be implemented during the construction stage to ensure that the nearby ASRs will not be subject to adverse constructional air quality impact. In addition, exempted NRMMs shall be avoided.
- 11.4 Appropriate air quality control measures stipulated in the Air Pollution Control (Construction Dust) Regulation would be implemented during construction stage to control the dust and gaseous 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 an 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;
- Regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather;
- Erect higher hoarding (e.g. 3.5m or above) at the locations with ASRs in immediate proximity (e.g. ASR A06, etc.) to the development site boundary;
- 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; and
- Exempted non-road mobile machinery (NRMM) shall be avoided.

Emission from Fuel Combustion Equipment

- 11.5 Apart from the dust and gaseous emission 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 0.001% by weight) will be complied with to control the exhaust emissions from non-road mobile machineries and construction vehicles.

Concurrent Project

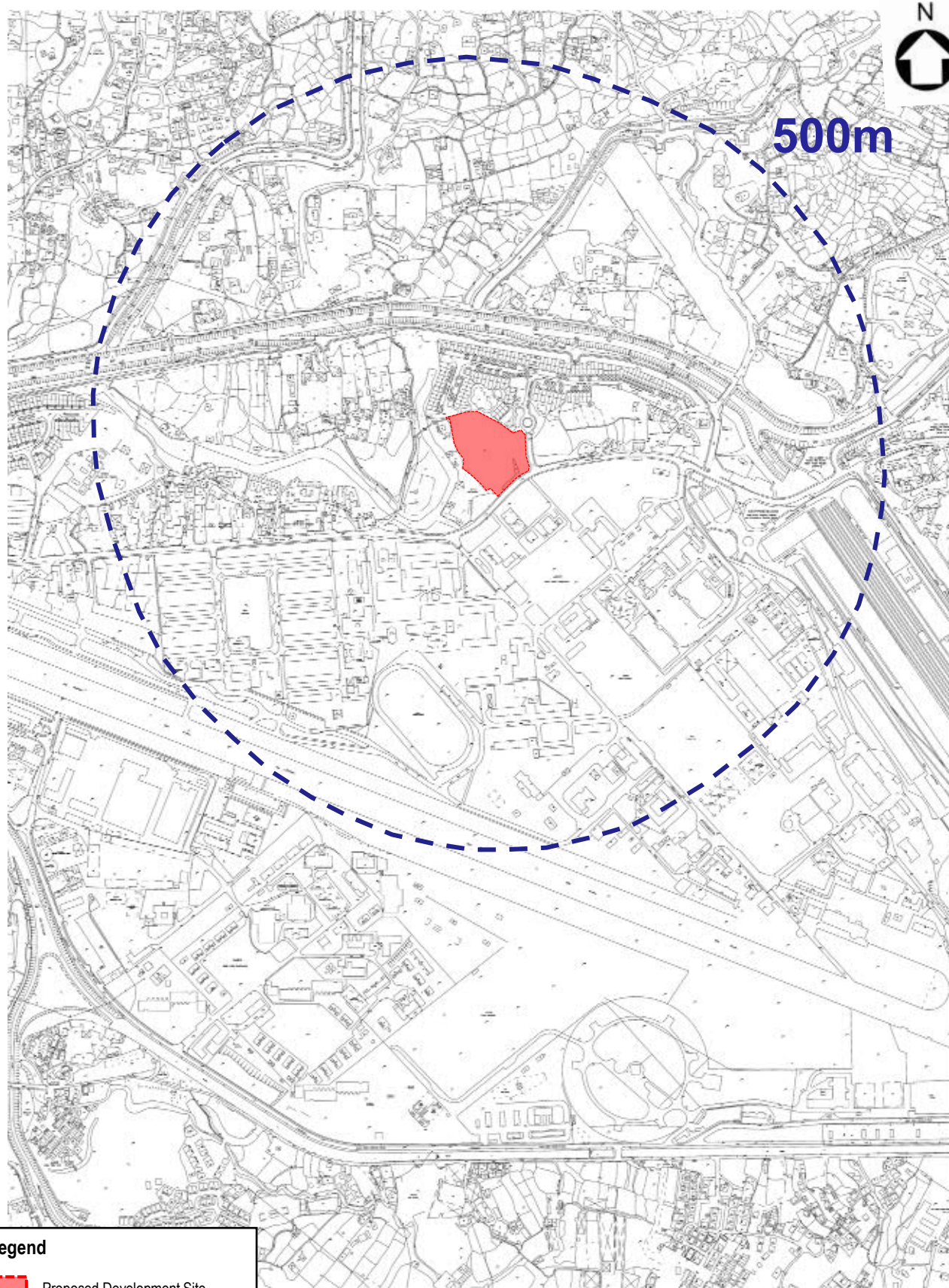
- 11.6 According to the site surveys and desktop reviews, there is no concurrent project within 500m of the proposed Development. With the implementation of air quality control measures stipulated in the Air Pollution Control (Construction Dust) Regulation and requirements stipulated in the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation, in addition the relatively small scale construction works of the proposed Development, adverse cumulative construction air quality impact is not anticipated.
- 11.7 Therefore, the potential dust and exhaust emission from the construction works to the ASRs in the vicinity would be controlled.

12. CONCLUSION

- 12.1 The proposed Development satisfies the buffer distance requirements for vehicular and industrial emissions stipulated under the Hong Kong Planning Standards and Guidelines (re. Table 3.1, Chapter 9, HKPSG). Site inspections revealed that 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. 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 Air quality control requirements in the Air Pollution Control (Construction Dust) Regulation will be followed. Relevant mitigation measures for dust and gaseous 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



Legend

 Proposed Development Site

Westwood Hong & Associates Ltd

PROJECT: 22605

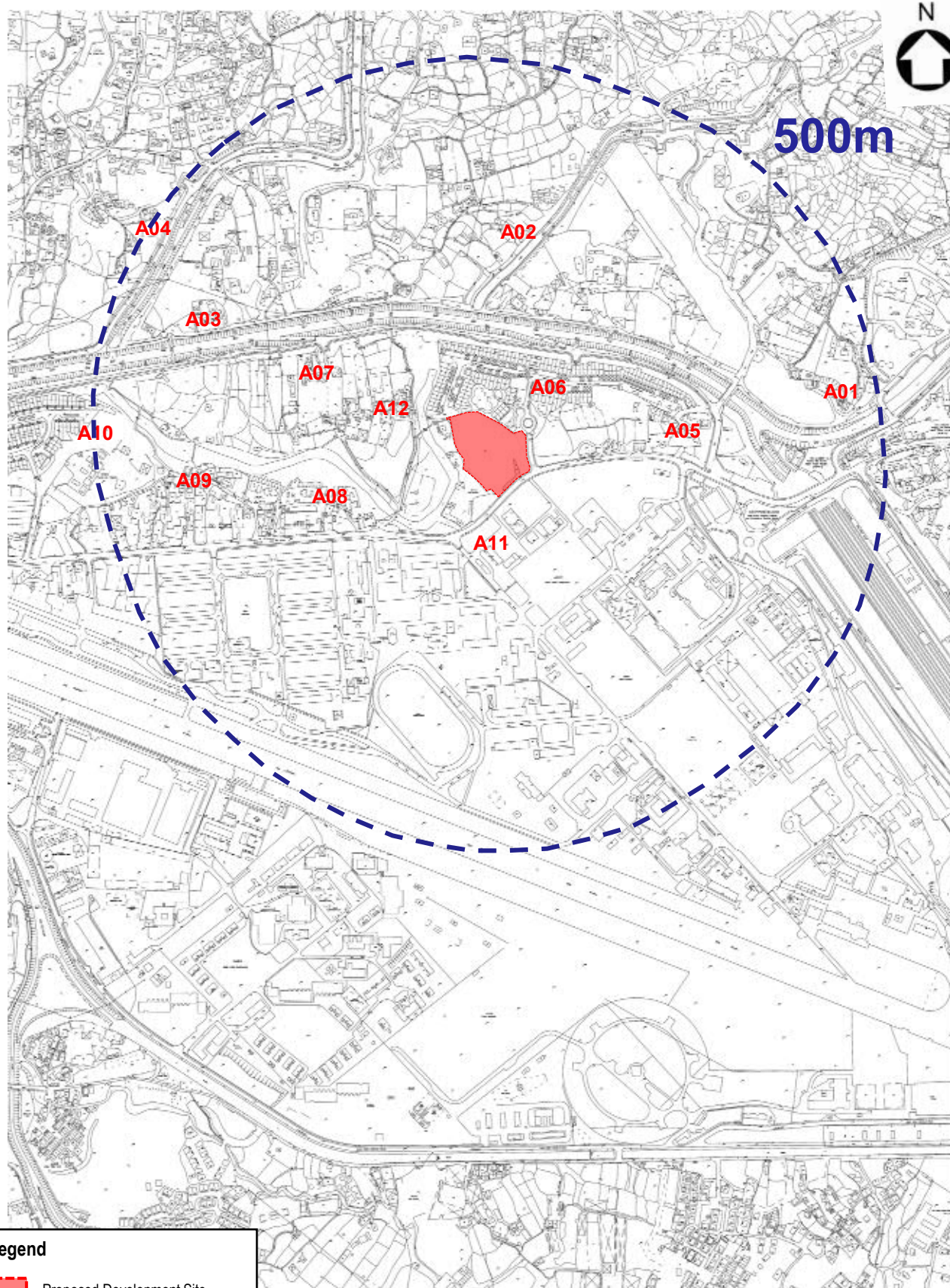
Proposed Residential Development at Lot Nos. 519 RP (Part) and 520 RP in D.D. 110 and the Adjoining Government Land, Shek Kong, Yuen Long, New Territories

TITLE:

Site Location

FIGURE

1



Legend

Proposed Development Site

Westwood Hong & Associates Ltd

TITLE:

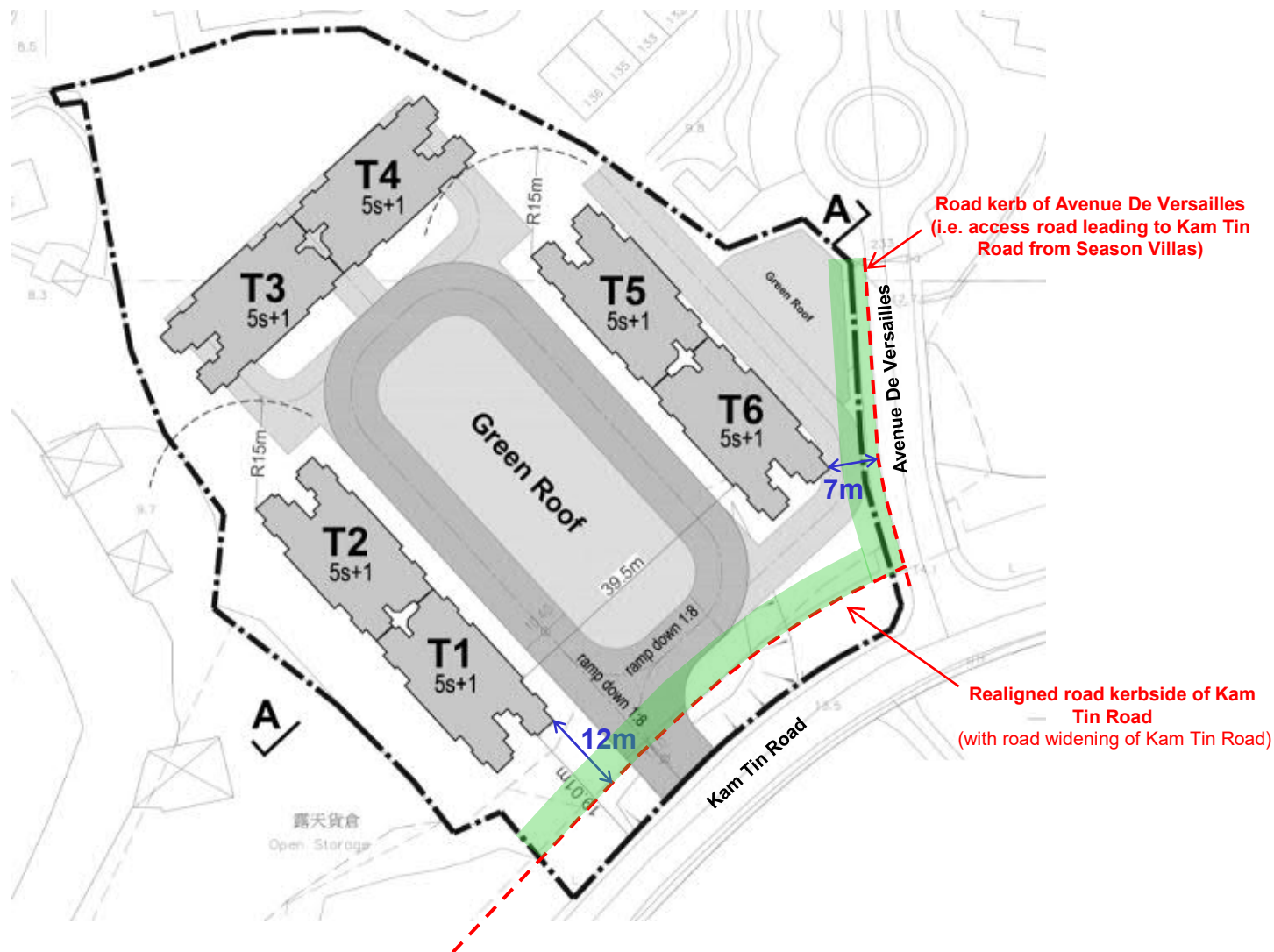
FIGURE

PROJECT: 22605

**Locations of Identified ASRs within 500m
from the Proposed Development**

Proposed Residential Development at Lot Nos. 519 RP (Part) and 520 RP in D.D. 110 and the Adjoining Government Land, Shek Kong, Yuen Long, New Territories

2



Legend

5m Buffer Distance from Road

*Remark: no air-sensitive use including openable window, fresh air intake and recreational use in open space shall be located within the buffer zones.

Westwood Hong & Associates Ltd

PROJECT: 22605

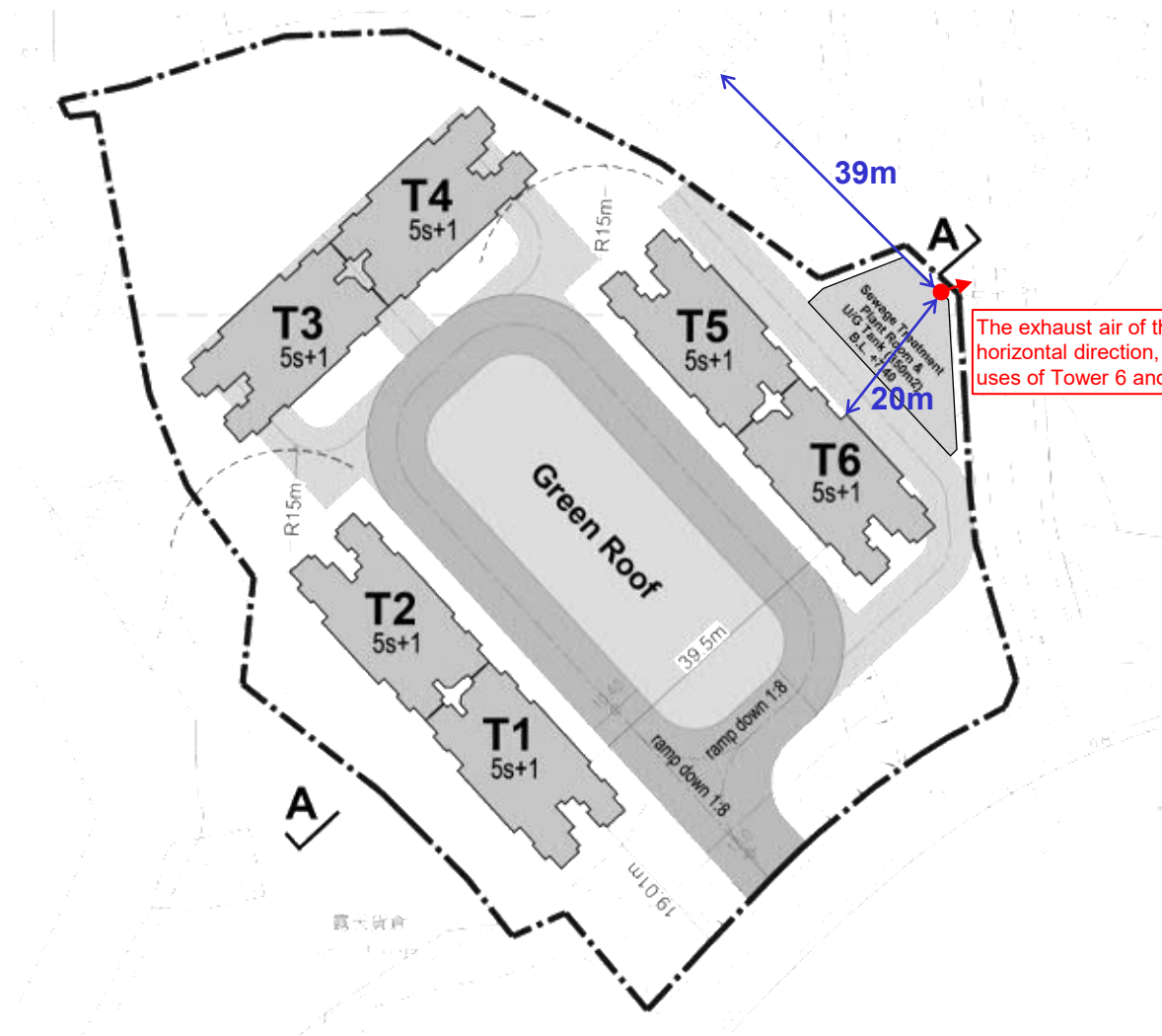
Proposed Residential Development at Lot Nos. 519 RP (Part) and 520 RP in D.D. 110 and the Adjoining Government Land, Shek Kong, Yuen Long, New Territories

TITLE:

Shortest Distance between ASRs within the Proposed Development and the Road

FIGURE

3



Legend



Potential location of exhaust outlet and discharge direction

Westwood Hong & Associates Ltd

PROJECT: 22605

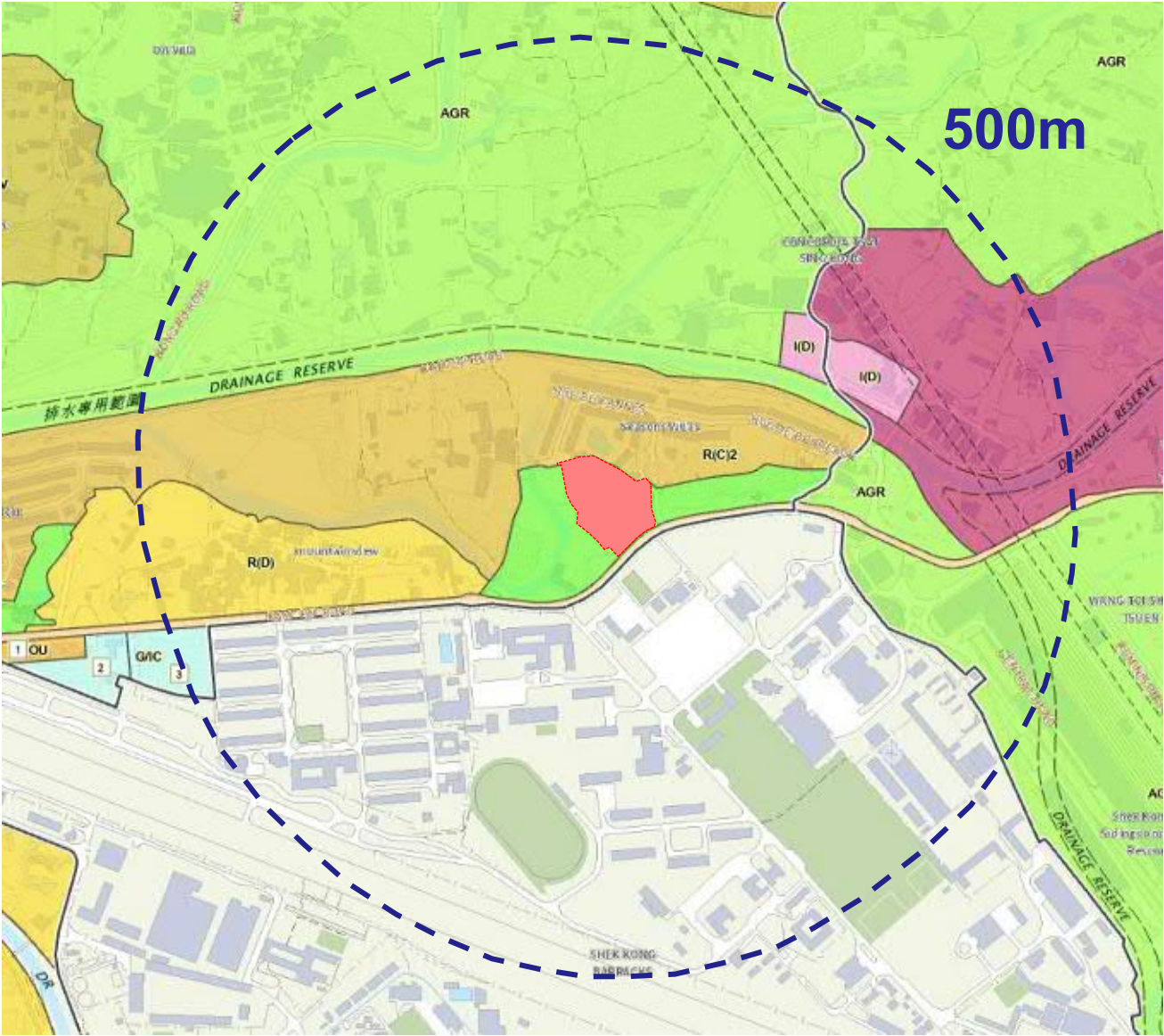
Proposed Residential Development at Lot Nos. 519 RP (Part) and 520 RP in D.D. 110 and the Adjoining Government Land, Shek Kong, Yuen Long, New Territories

TITLE:

Potential Location of Exhaust Outlet and Discharge Direction

FIGURE

4



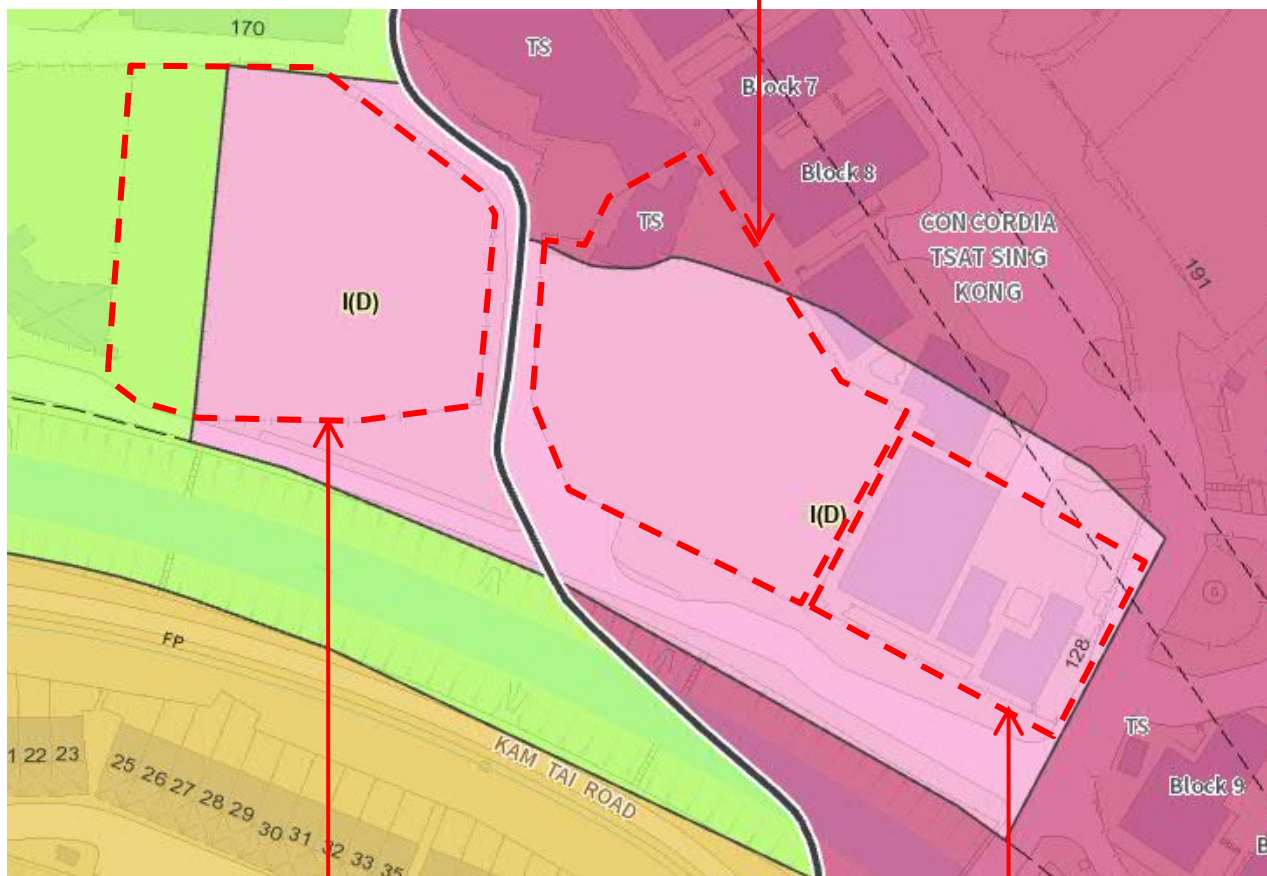
Legend

 Proposed Development Site

Westwood Hong & Associates Ltd PROJECT: 22605 Proposed Residential Development at Lot Nos. 519 RP (Part) and 520 RP in D.D. 110 and the Adjoining Government Land, Shek Kong, Yuen Long, New Territories	TITLE: I(D) Zones within 500 Assessment Area	FIGURE 5a
--	---	--



Observation: Used as open storage,
no active/heavy industrial operation



Observation: Used as open storage,
no active/heavy industrial operation



Observation: Used as substation,
no active/heavy industrial operation

Westwood Hong & Associates Ltd

TITLE:

FIGURE

PROJECT: 22605

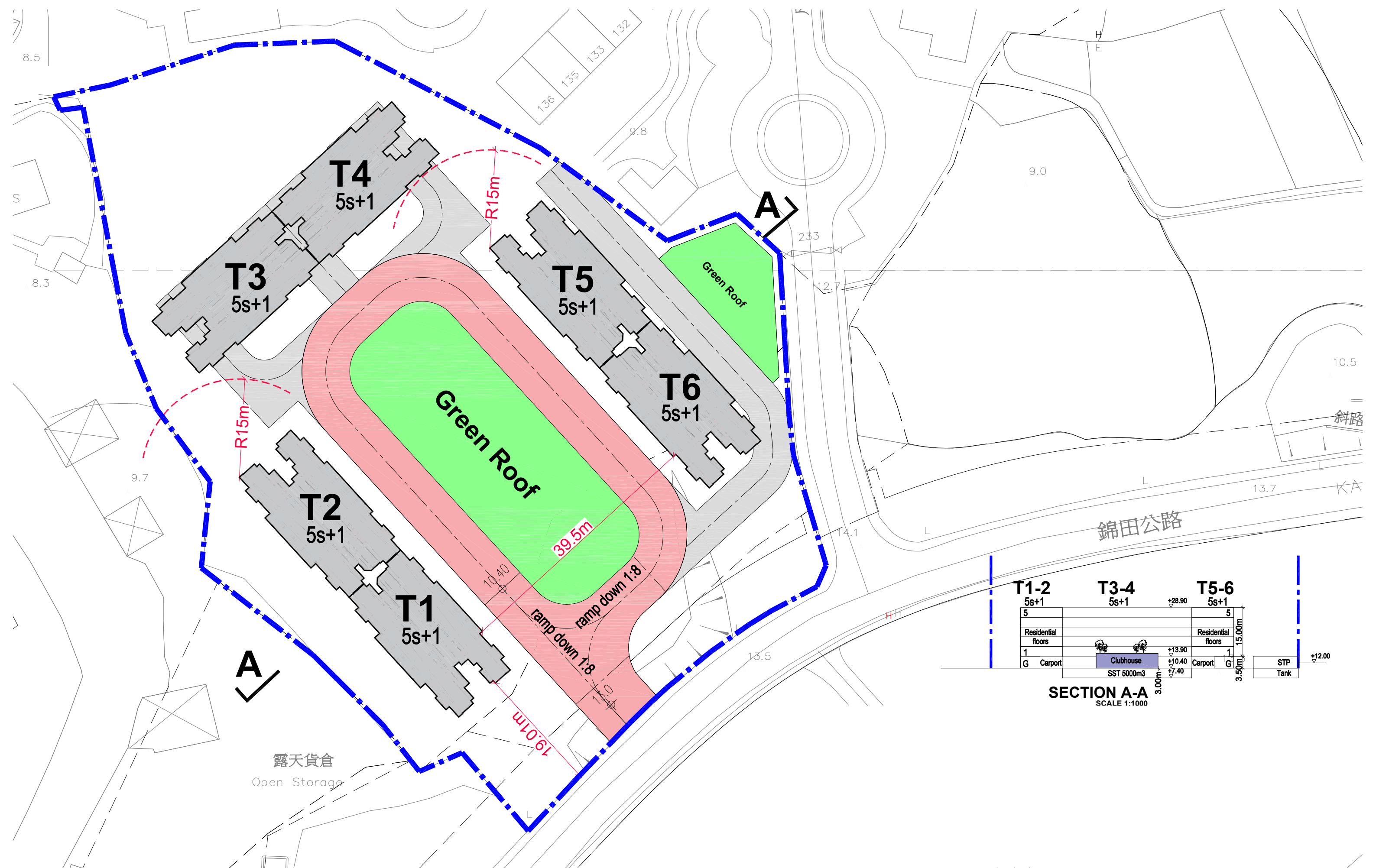
I(D) Zones within 500 Assessment Area

5b

Proposed Residential Development at Lot Nos. 519 RP (Part) and 520 RP in D.D. 110 and the Adjoining Government Land, Shek Kong, Yuen Long, New Territories

APPENDIX 1

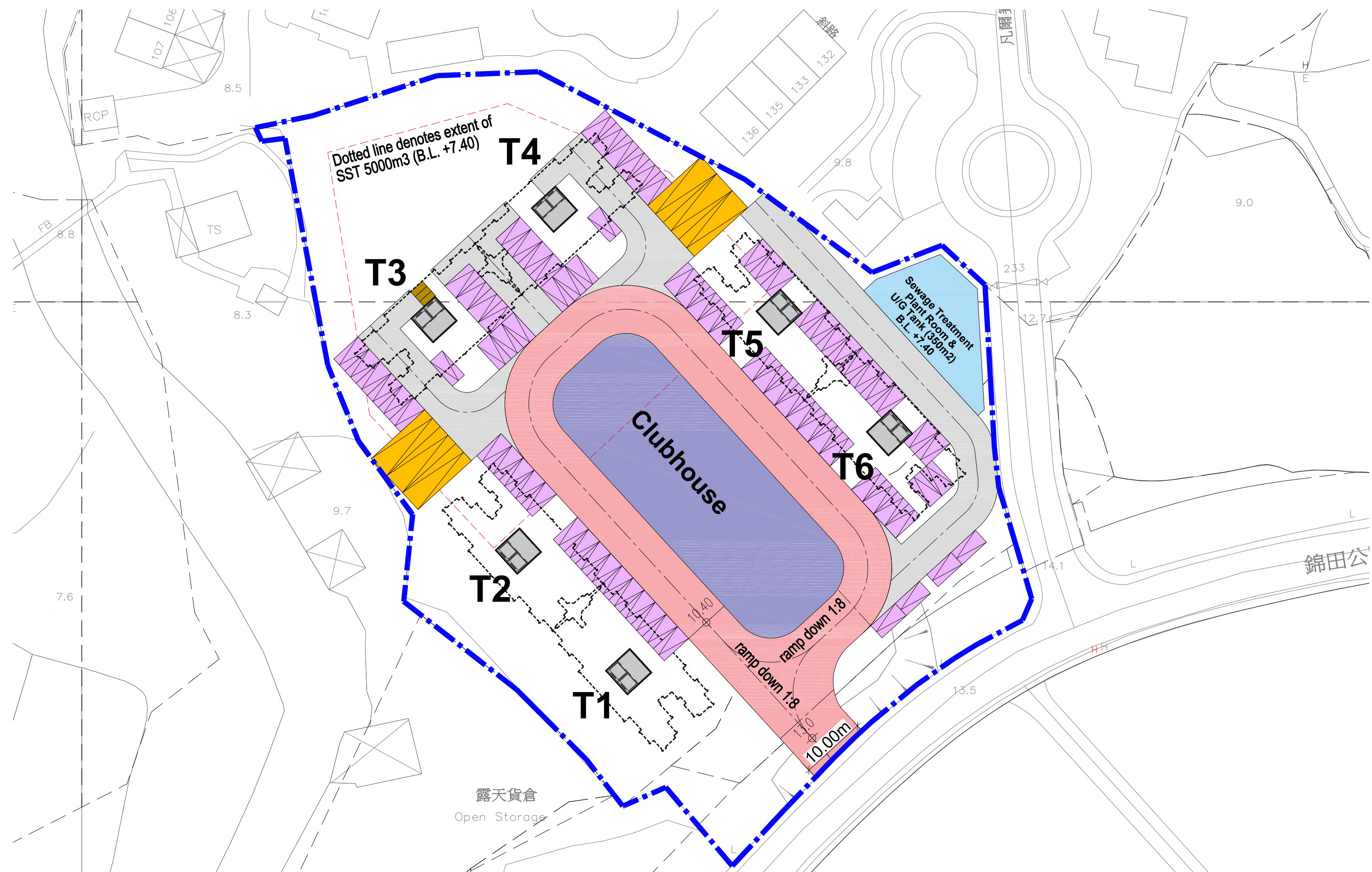
ARCHITECTURAL DRAWINGS



REZONING APPLICATION
AT DD110, SHEK KONG, KAM TIN ROAD,

MASTER LAYOUT PLAN

Dwg No: 20250309 - shek kong.dwg
Scale: 1 : 500(A3)
Date: 24/04/2025
File Path: p:\dd110, shek kong, kam tin road, yuen long\g. scheme\2025_shek kong new alternative s12a



REZONING APPLICATION
AT DD110, SHEK KONG, KAM TIN ROAD,

GROUND FLOOR PLAN

Dwg No: 20250309 - shek kong.dwg
Scale: 1 : 500(A3)
Date: 24/04/2025
File Path: p:\dd110, shek kong, kam tin road, yuen long\g. scheme\2025_shek kong new alternative s12a

APPENDIX 2

PHOTOGRAPHS TAKEN ON SITE



Plate 1:
Development Site



Plate 2:
Seasons Villa

Westwood Hong & Associates Ltd

PROJECT: 22605
 Proposed Residential Development at Lot Nos. 519 RP (Part) and 520 RP in D.D. 110 and the Adjoining Government Land, Shek Kong, Yuen Long, New Territories

TITLE:

Photographs taken on Site

FIGURE

A2-1

Annex E

Replacement Pages of Noise Impact Assessment

1. INTRODUCTION

- 1.1 Westwood Hong & Associates Ltd (WHA) was commissioned to conduct an environmental noise impact assessment for the proposed residential development at Shek Kong, 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 and helicopter noise affecting the proposed Development
- 1.5 The development layout for the proposed development is for indicative purpose only and the Applicant has committed to submit an updated Noise Impact Assessment under the land administration mechanism to cater for any possible changes in the development layout at a later stage.

2. SITE LOCATION & BUILDING LAYOUT

Site Location

- 2.1 The development site is located to the north of Kam Tin Road. Shek Kong Barracks is located to the south across Kam Tin Road. The residential developments Seasons Villas and Seasons Monarch are located to the north-east and west respectively. The location of the development site is shown in Figure 1.

Development Layout

- 2.2 The proposed Development comprises 6 low-rise residential blocks with 5 storeys on top of carport and clubhouse. The carport and clubhouse are located at G/F. The building layouts are shown in Appendix 1. The development parameters are summarised in Table 2.1 below.

- 2.3 The clubhouse 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.

Table 2.1 Development Parameters of the Proposed Development

	Parameters
Zoning	“Residential (Group C)2” and “Open Space” zones on Approved Kam Tin North Outline Zoning Plan No. S/YL-KTN/11
Site Area	8,580m ²
Number of Residential Units	240
Number of Residential Storeys	5 storeys
Height of Building	28.9mPD
Use	6 residential blocks with a clubhouse and carport at Ground Floor
Completion Year	2031

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.