寄件者: Camille Lam[redacted]
寄件日期: 2026年03月20日星期五 12:02
收件者: tpbpd/PLAND
副本: Andrea Wing Yin YAN/PLAND; Ivan Sze Yuet FUNG/PLAND; Pauline Lam
主旨: S12A Application No. Y/YL-KTN/6: Submission of Further Information No. 3
附件: S3045a_KTR_25_005Lg FI3.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. 3 for submission to the TPB and the full set of FI No. 3 uploaded to the path:
https://fespld.pland.gov.hk/FsShare?key=Y_YL_KTN_6

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

Rgds,

Camille Lam

Principal Town Planner

[redacted]

PLANNING LIMITED
規劃顧問有限公司

[redacted]

By Email

Our Ref: S3045a/KTR/25/006Lg

20 March 2026

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

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. 3 -

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 16 February and 3 March 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 – Replacement Pages of Air Quality Impact Assessment
Annex C – Revised Drainage 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.

Yours faithfully
For and on behalf of
KTA PLANNING LIMITED

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 16 February 2026) **Contact person: Mr. Phil CAI; Tel. No.: 2399 2421**	
General 1. The applicant shall note that this department provided comments on Planning Application No. Y/YL-KTN/4 in January 2025 and did not receive a response. TD understood that the planning application was subsequently withdrew, and resubmitted as Planning Application No. Y/YL-KTN/6. The applicant's quote on TD has no comment on a withdrawn planning application is incorrect.	Noted.
2. The applicant should note that the scenario to separate with or without PWP 6820TH is a sensitivity test on whether the existing road network could be maintained efficient taking into account the traffic flow at design year. The background and development traffic flow are both a main factor for a TIA.	Noted.
Specific 1. Para 2.5, Figure 2.1 - the design of the development access shall NOT affect the traffic in public road. Even though traffic management measures such as banning turns was proposed, it is observed that the vehicles would need to occupy the opposite lane within the site. I reiterate that the applicant should demonstrate how to provide sufficient space within the site and ensure unobstructed manoeuvre of vehicles. The applicant claimed that the frequency of long vehicles entering the site is low but failed to demonstrate how to prevent vehicles queuing back to public road.	To avoid vehicles obstructed by the opposite lane within the site and queuing back to public road, in addition to banning turns, the vehicular access was further revised to access road arrangement rather than run-in/out as shown in **Figures 2.1** and **2.2** of the TIA report (***Annex A*** of this Further Information (FI) refers). As shown in the swept path of **Figures 2.1 (SP1), 2.1 (SP2), 2.2 (SP1)** and **2.2 (SP2)**, ingress vehicles will not be blocked by vehicles waiting to egress from the site. Therefore, the traffic will not queue back to the public road.

Comments	Responses
2. Para 3.2.6 - it was stated that new survey was carried out for junction E and F but the performance of these junctions were not updated. Please clarify.	It is a typo, there is no new survey for junction E and F. **Para 3.2.6** is amended accordingly.
3. Tables 3.4, 5.2, 5.4, 5.8, 5.10 - the width of L3 appears to be various, resulting that the current proposed road capacity appears to be on optimistic side. This shall be reviewed. In addition, the road capacity in pcu/hr shall not be dependent on the surveyed data. The applicant is required to review the methodology on such derivation.	For conservative, capacity of L3 is reduced to 700 veh/hr (One-way). The assessments are updated accordingly. The V/Cs still have spare capacities. This is a general practice to obtain the road capacity in pcu/hr dependent on the surveyed data. The V/C ratio is derived from survey flow (veh/hr) divided by road capacity (veh/hr). In TIA assessments, the survey flows were converted to pcu/hr by multiplying the pcu factor obtained from the surveyed data. If the road capacities are presented in pcu/hr, same pcu factor should be applied to the road capacity for consistency. $$\text{V/C Ratio} = \frac{\text{Survey Flow (veh/hr)}}{\text{Road Capacity (veh/hr)}} = \frac{\text{Survey Flow (veh/hr) x pcu factor}}{\text{Road Capacity (veh/hr) x pcu factor}} = \frac{\text{Survey Flow (pcu/hr)}}{\text{Road Capacity (pcu/hr)}}$$
4. Para 5.1.3 - the current methodology by growth rate does not reflect the traffic flow redistribution in strategic roads. The constraints by this methodology shall be further elaborated in conjunction with the strategic road planning such as Route 11 etc. The statement on "manageable degree of congestion" shall be reviewed.	According to Tuen Mun DC TTC Paper 04/2021, the traffic flow would be redistributed by the strategic road planning Route 11 and associated major roads. The V/C ratio of Tai Lam Tunnel will drop from 1.2 to 0.7 after the Route 11 and associated major roads are completed. Therefore, the congestion of Tai Lam Tunnel would be relieved and become acceptable after the completion of Route 11 and associated major roads. This statement is added to **Para 5.1.4** and **5.2.5** of the TIA report.

Comments	Responses
5. Section 4.1 - please confirm the completion year 2031.	It is confirmed that the target completion year of the proposed residential development at Site 1 is 2031.
6. Para 5.3.5 - if the works described in this section is not proposed to be carried out by applicant, please elaborate how this paragraph assists to assess / minimise the traffic impact.	Local widening (i.e. Junction C) rather than full length of Kam Tin Road will be carried out by the Applicant to minimize the impact to traffic, in case of programme mis-match between the development and the public works project. **Para 5.3.5** is revised accordingly.
7. Section 8 - taking into account the above comments, the conclusion shall be adjusted accordingly. The proposed work by the applicant shall be incorporated in this section.	Noted. **Para 8.1.7** is added in this section to mention the proposed local widening works by the Applicant.
8. Figure 2.1 - the distance between the development run-in/out and the nearest junction shall be indicated. The applicant should also advise whether this could fulfill the requirement in TPDM.	The distance between the development run-in/out and the nearest junction (Kam Tin Road/ Avenue De Versailles) are shown in **Figure 2.1** of the TIA report. The distance is min. 30m, which fulfills the requirement in TPDM.
9. Figure 5.1 - in general the proposed improvement works ties in with the development, e.g. population intake, BC date etc, but not a public works. Please demonstrate when the improvement work would be carried out.	The improvement works will be carried out and completed before the population intake of the proposed development, in case of programme mis-match between the development and the public works project.
Comments from Environmental Protection Department (received on 25 February 2026) **Contact person: Mr. Kelvin WONG; Tel. No.: 2835 1117**	
It is understood from the RtC table that the consultant is waiting information from TD to address his previous comment (i.e. comment 2(ii) for the Air Quality Impact Assessment). As such, please update the report accordingly once information from TD has been received. Also, please delete the newly added sentence "*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*." from S.7.1 of the report. Other than the above, we have no further comment.	As per verbal conversation and written reply by TD, Avenue de Versailles is not under TD's management and thus TD consider not in position to comment on its road type. Since Avenue de Versailles connects to Season Villas only, according to Volume 2 Chapter 3.2 of Transport Planning and Design Manual (TPDM) published by TD, it is regarded as a feeder road. Based on the Annual Traffic Census 2024 (ATC) published by TD, Kam Tin Road (ATC Station no.6207) is Rural Road. TD has no comment on the road type of Kam Tin Road.

Comments	Responses
	S.7.1, S.7.2 and Table 7.1 in AQIA (***Annex B*** of this FI) have been revised accordingly.
Comments from Drainage Services Department (received on 3 March 2026) **Contact person: Ms Jessica KWAN; Tel. No.: 3965 8924**	
<u>Revised DIA</u> (A) Specific Comments 1. The applicant should clarify gradient of the proposed 300 mm (W) surface channels.	**Appendix B2** of the revised DIA (***Annex C*** of this FI) is revised to show the updated invert levels and gradients of the proposed channels. It is understood that there are existing boundary channels and internal drainage system at the existing development at the north and east of the proposed Development Site. Besides, the runoff arising from the areas at the west of the proposed development are currently directly discharged to the existing watercourse according to the topography. Thus, the proposed 300mm channels are acting as a spare drain. For conservative, the hydraulic calculation in **Appendix I** is updated to include the proposed 300mm channels and proposed 300mm pipe by assuming they will collect runoff from nearby catchment (i.e. Cat_012A-1).
2. The applicant should clarify discrepancy of invert levels of the proposed 300 mm and 600 mm dia. stormwater drainage pipes shown on the submitted drainage plan and pipe schedule. The applicant should update the submitted hydraulic calculation in Appendix I.	The invert levels of the proposed 300 mm and 600 mm dia. stormwater drainage pipes are revised in **Appendix B2**. **Appendix I** is updated to include the hydraulic calculation of the proposed 300mm pipe.
3. The applicant should clarify size of the proposed stormwater pipe shown in the proposed connection details of existing watercourse and the proposed stormwater terminal manhole TDM	The proposed stormwater pipe connecting the proposed stormwater terminal manhole is 900mm diameter. The pipe sizes shown in the typical drainage outlet in **Appendix B2** are updated.
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	Sand traps (i.e. C1 and C2 indicated in **Appendix B2**) are proposed at the connection from proposed channels to proposed pipes prior to the proposed stormwater terminal manhole. **Appendix B2** has also been

Comments	Responses
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.	updated to include another sand trap/ desilting type catchpit proposed for internal 750mm pipeline at MH3 before connection to the proposed stormwater terminal manhole. Subject to the future drainage plan approval at construction stage the sand trap/desilting type catchpit or alternative design for facilitating desilting will be provided prior to connection to the proposed stormwater terminal manhole. Regular desilting will be carried out by the owner/ management office of the Proposed Development.
5. 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 stormwater terminal manhole will comply with the current Government standard and have a 150mm difference between I.L and D.T.I.L of the proposed stormwater terminal manhole (i.e. TDM in **Appendix B2**). The invert levels of the incoming pipes of TDM are 6.75mPD for proposed 300mm pipe, 6.73mPD for proposed 600mm pipe and 6.675mPD for proposed 750mm. The D.T.I.L of the outgoing pipe of TDM has been set at 6.525mPD, providing the required 150 mm difference between the lowest I.L. (6.675mPD) and the D.T.I.L. (6.525mPD). The information has been provided in **Appendix B2**.
6. The terminal manhole should be of Type T1, T2, T3, T4 or T10 as appropriate and in accordance with current DSD standard drawings.	As the diameters of the incoming and outgoing pipes are greater than 450mm, subject to detailed design, Type T2 terminal manhole will be adopted. DSD standard drawings will be referenced in later detailed design stage. The note in **Appendix B2** has been updated to state Type T2 terminal manhole will be adopted.
<u>(B) General Comments</u> 1. The existing watercourse to be discharged is a designated watercourse under the Land Drainage Ordinance (LDO) and is under the purview of Drainage Authority (DA). An application to the DA for consent and approval under Sections 26(2) of the LDO is necessary	Noted and thank you for your kind reminder. The Applicant fully understood that the existing watercourse at the west of the proposed Development Site is a designated watercourse under Land Drainage Ordinance. The Applicant will apply for the Drainage Authority's consent

Comments	Responses
before execution of the relevant works. The contents of the application are stipulated in Chapter 446A titled "Land Drainage (Consent and Approval) Regulation".	and approval before execution of the relevant works in next stage of the project.
2. Peripheral surface channels shall be provided along the site boundary to collect the surface runoff accrued on the application site and to intercept the overland flow from the adjacent lands. It is noted that there is proposed land filling works for the development. Proper surface channels should be provided at the lower level and wall toe to collect the overland flow to/ from adjacent areas.	Noted. Peripheral surface channels will be provided along the site boundary and at the lower level/wall toe. Some existing and proposed ground levels are spotted in **Appendix B2**.
3. Flow velocity of the proposed drainage facilities is suggested to be within a range, i.e. 0.75 m/s to 3.0 m/s.	Please note that the full-bore velocities of all the proposed channels and pipes are within a range of 0.75m/s to 3.0m/s.
4. The general comments dated 12.1.2026 remain valid.	Noted.
Revised SIA 1. The general comments dated 12.1.2026 remain valid.	Noted.
The applicant is required to demonstrate in the DIA report that the proposed works will not obstruct the overland flow nor cause any adverse drainage impact to the adjacent areas. The applicant shall be liable for any adverse drainage and sewerage impact due to his/her proposed development.	Noted.

Encl.:
Annex A – Revised Traffic Impact Assessment
Annex B – Replacement Pages of Air Quality Impact Assessment
Annex C – Revised Drainage Impact Assessment

Compiled by: KTA
Date: 18 March 2026
File Ref.: 20260318_s3045a_RtC FI3

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

March 2026

CTA Consultants Limited
志達顧問有限公司

LIST OF CONTENTS

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 2.3** and **2.4**.

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 ≤ 70m²	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								
	No. of Block	Average No. of Unit per Block	> 75 units per block: 5 visitor spaces per block, ≤ 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 To minimize the impact to the public road, it is proposed that all egress vehicles longer than **7m** are only allowed to turn right to westbound. Moreover, to avoid ingress traffic from being blocked by vehicles waiting to egress from the Site and to avoid vehicles from occupying the opposite lane within the Site, access road arrangement rather than run-in/out is proposed. The access road arrangement and the traffic signs are shown in **Figure 2.1.**

2.5.2 As shown in **Figure 2.1 (SP1)** and **2.2 (SP2),** as larger turning radius is provided, the ingress vehicles have more space for turning and will not be blocked by vehicles waiting to egress. Also, no ingress vehicles would occupy the opposite lane within the Site. Therefore, the traffic will not queue back to the public road.

With Kam Tin Road Widening

2.5.3 Under the "with Kam Tin Road Widening" scenario, the same arrangements are proposed (i.e. all egress vehicles longer than 7m are only allowed to turn right to westbound, with access road arrangement rather than run-in/out design proposed). The access road arrangement and the traffic signs are shown in **Figure 2.2**.

2.5.4 As shown in **Figure 2.2 (SP1)** and **2.2 (SP2),** as larger turning radius is provided, the ingress vehicles have more space for turning and will not be blocked by vehicles waiting to egress. Therefore, the traffic will not queue back to the public road.

2.5.5 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 on Tai Lam Tunnel was carried out on 19 December 2025 to obtain the latest survey results.

Table 3.3 V/C Ratio of Critical Road Link in Year 2025

Index	Direction	Cap.		Observed Scenario			
				Flow (pcu/hr) (V)		V/C	
		(veh/hr) (C)[1]	(pcu/hr) (C)[1]	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	700	855	320	265	0.37	0.31
	WB	700	855	260	295	0.30	0.35
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 **3.3** 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 3.4** and shown in **Figure 3.15**.

Table 3.4 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 junctino)	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**.

2034 Reference Flows (without proposed development) = **2025 Observed Flows** x **Adopted Growth Factor i.e. +2.18 % p.a. for 9 years** + **Traffic Flows of Adjacent Developments**

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).

Year 2034 Design Flow (with the Proposed Development) = **Year 2034 Reference Flow (without the Proposed Development)** + **Traffic Trips of the Proposed Development**

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	**1.08**	**0.97**
			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)	0.74	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	700	855	525	390	0.61	0.46
	WB	700	855	415	445	0.49	0.52
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	700	855	525	390	0.61	0.46
	WB	700	855	415	445	0.49	0.52
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 According to Tuen Mun DC TTC paper 04/2021, the traffic flow would be redistributed by the strategic road planning Route 11 and associated major roads. The V/C ratio of Tai Lam Tunnel will drop from 1.2 to 0.7 after the Route 11 and associated major roads are completed. Therefore, the congestion of Tai Lam Tunnel would be relieved and become acceptable after the completion of Route 11 and associated major roads.

5.1.5 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.

5.1.6 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 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 50m^2 for Public Housing and average 70m^2 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	**1.68**	**1.01**
			w PWP[2]	0.26	0.30
D	Kam Tin Road / Fan Kam Road	Roundabout	w/o PWP	**0.93**	**0.93**
			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	700	855	525	390	0.61	0.46
	WB	700	855	415	445	0.49	0.52
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	700	855	525	390	0.61	0.46
	WB	700	855	415	445	0.49	0.52
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 According to Tuen Mun DC TTC paper 04/2021, the traffic flow would be redistributed by the strategic road planning Route 11 and associated major roads. The V/C ratio of Tai Lam Tunnel will drop from 1.2 to 0.7 after the Route 11 and associated major roads are completed. Therefore, the congestion of Tai Lam Tunnel would be relieved and become acceptable after the completion of Route 11 and associated major roads.

5.2.6 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.

5.3 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	**1.09**	**0.98**	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. Thus, local widening (i.e. **Figure 5.1** Junction C) rather than full length of Kam Tin Road will be carried out by the Applicant to minimize the impact to traffic, in case of programme mis-match between the development and the public works project.

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

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:

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

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

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

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:

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

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

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

where:

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

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

7.1.5 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 x GTP x W

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

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

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 <= 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 According to Tuen Mun DC TTC paper 04/2021, the traffic flow would be redistributed by the strategic road planning Route 11 and associated major roads. The V/C ratio of Tai Lam Tunnel will drop from 1.2 to 0.7 after the Route 11 and associated major roads are completed. Therefore, the congestion of Tai Lam Tunnel would be relieved and become acceptable after the completion of Route 11 and associated major roads.

8.1.6 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.

8.1.7 Concerning the scale of the whole PWP works of widening of Kam Tin Road is substantial, it cannot be carried out solely by the private sector. Thus, local widening (i.e. **Figure 5.1** Junction C) rather than full length of Kam Tin Road will be carried out by the Applicant to minimize the impact to traffic, in case of programme mis-match between the development and the public works project.

8.1.8 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.

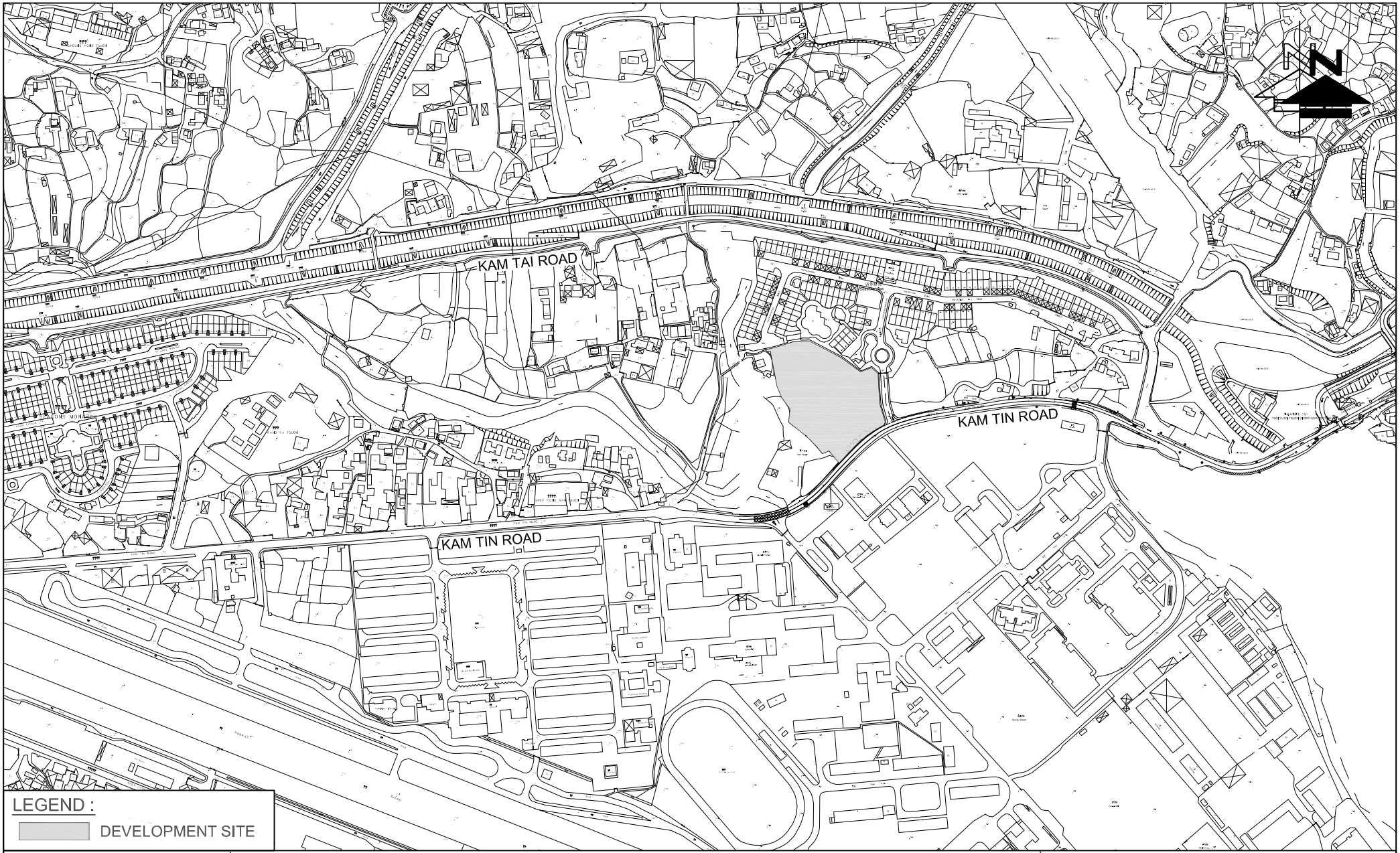
8.1.9 Assessment of pedestrian indicates that all footpath and pedestrian crossing could cater the future pedestrian demand in both reference and design scenarios in year 2034.

8.1.10 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.



LEGEND :

DEVELOPMENT SITE

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.	CTA Consultants Limited 志達顧問有限公司
PROJECT NO.: 25009HK	DRAWING TITLE: SITE LOCATION PLAN	
SCALE: 1 : 500 @A4 / DATE: 14 JUL 2025		

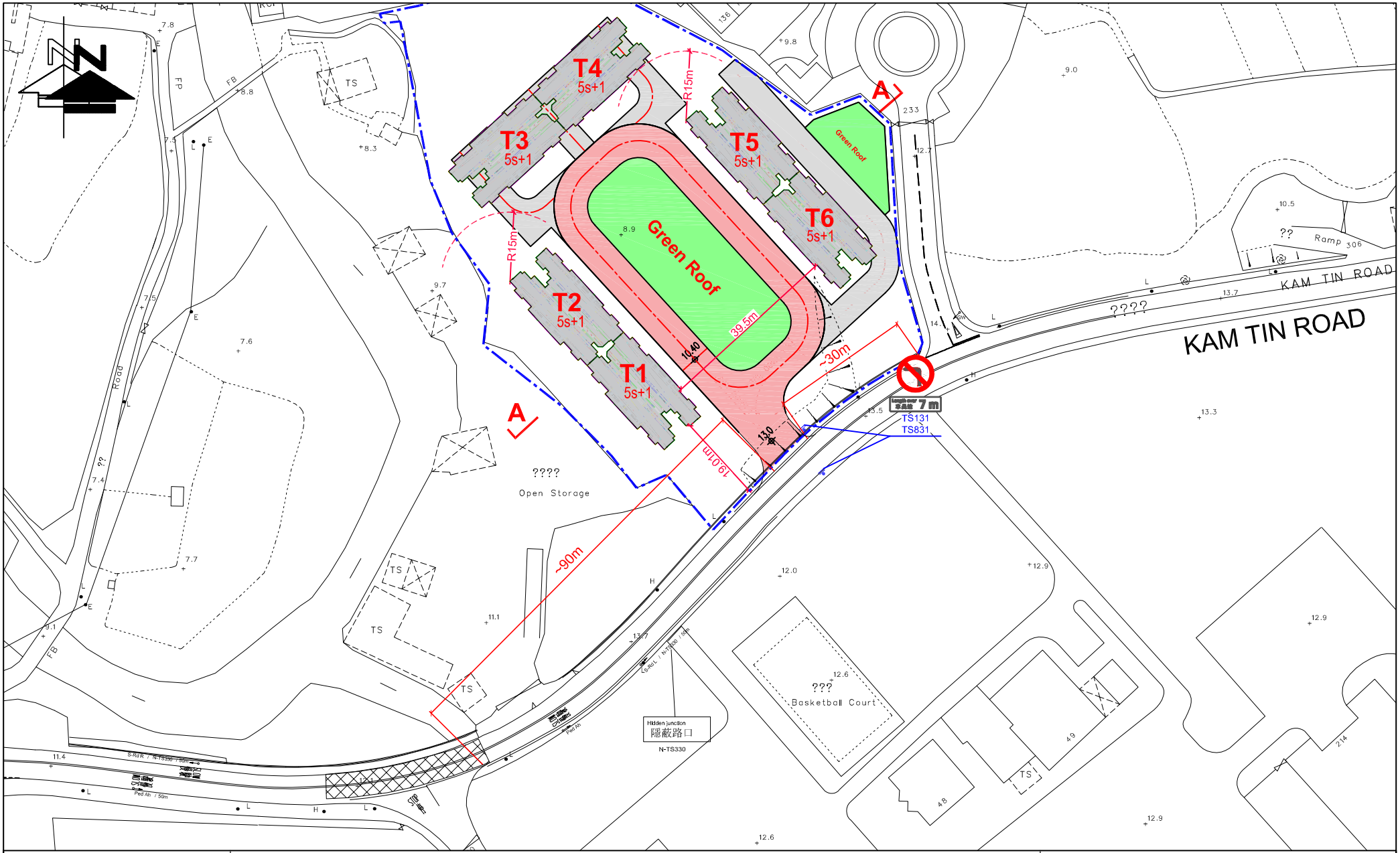


FIGURE NO.: 2.1	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	CTA Consultants Limited 志達顧問有限公司
PROJECT NO.: 25009HK	DRAWING TITLE: MASTER LAYOUT PLAN AND DEVELOPMENT ACCESS ARRANGEMENT (WITHOUT KAM TIN ROAD WIDENING)	
SCALE: 1 : 1100 @A4 / DATE: 10 MAR 2026		

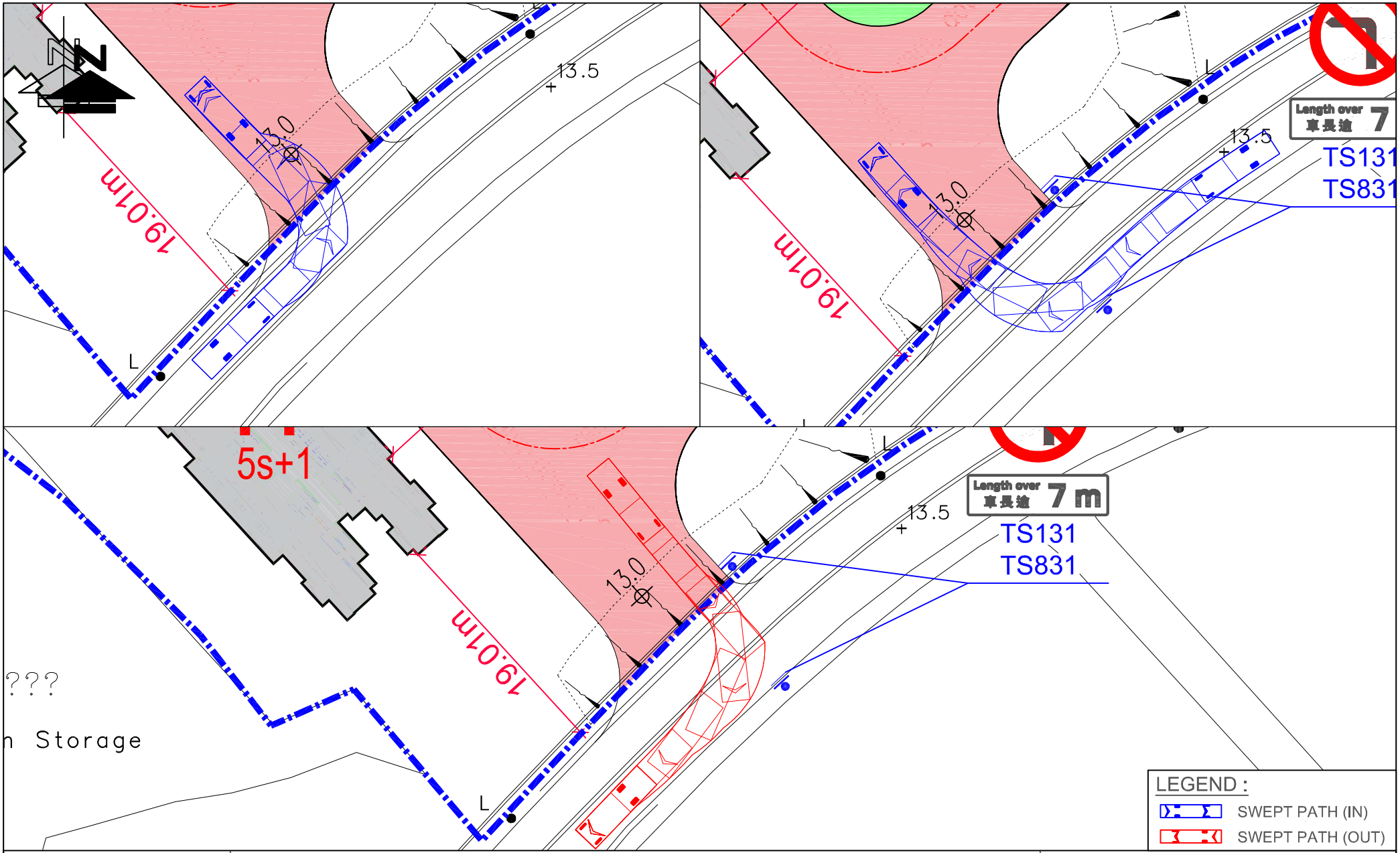


FIGURE NO.: 2.1(SP1)	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	CTA Consultants Limited 志達顧問有限公司
PROJECT NO.: 25009HK	DRAWING TITLE: SWEPT PATH ANALYSIS OF 7M VEHICLE OF MASTER LAYOUT PLAN AND DEVELOPMENT ACCESS ARRANGEMENT (WITHOUT KAM TIN ROAD WIDENING)	
SCALE: 1 : 400 @A4 / DATE: 10 MAR 2026		

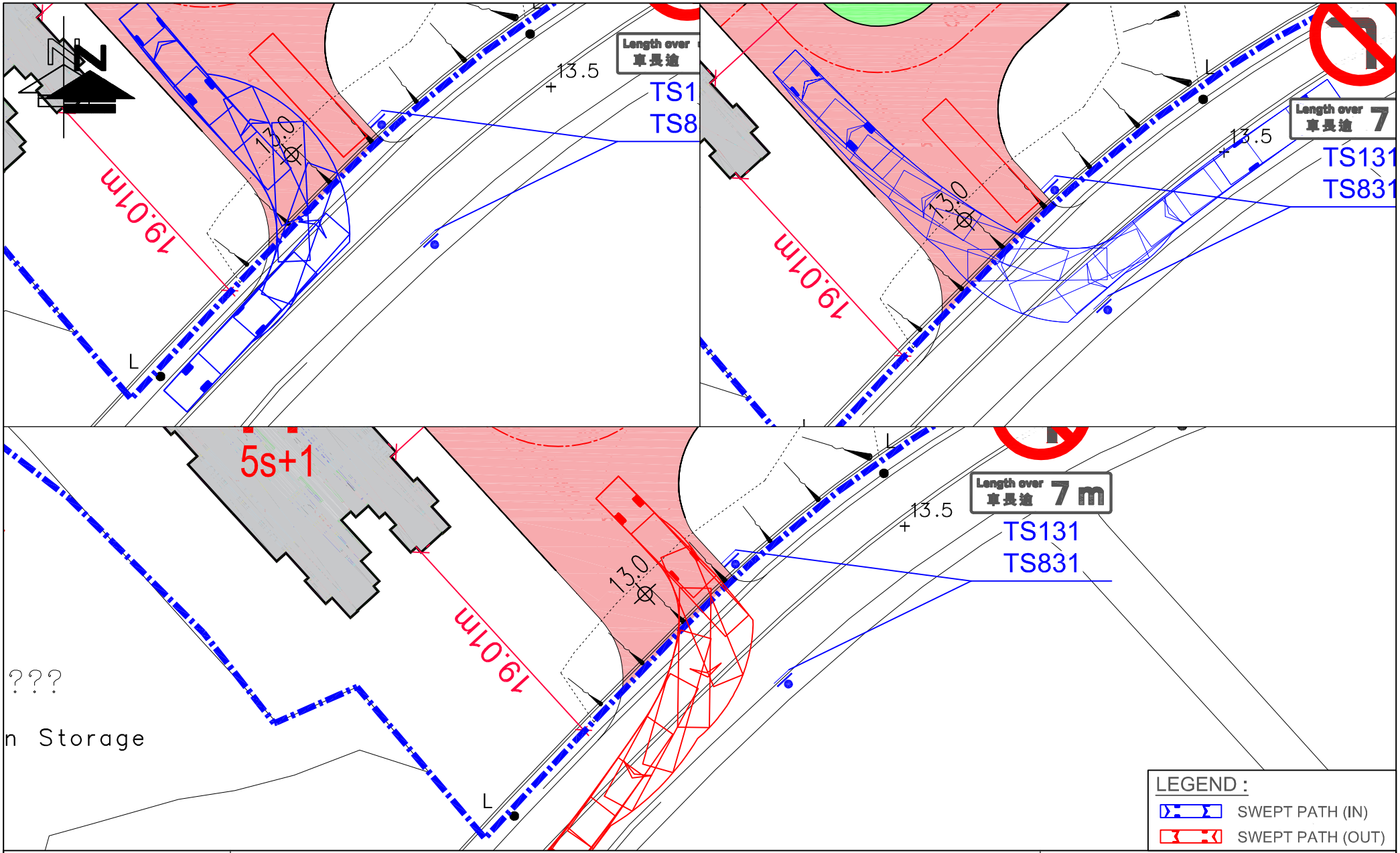


FIGURE NO.: 2.1(SP2)	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	CTA Consultants Limited 志達顧問有限公司
PROJECT NO.: 25009HK	DRAWING TITLE: SWEPT PATH ANALYSIS OF 11M VEHICLE OF MASTER LAYOUT PLAN AND DEVELOPMENT ACCESS ARRANGEMENT (WITHOUT KAM TIN ROAD WIDENING)	
SCALE: 1 : 400 @A4 / DATE: 10 MAR 2026		

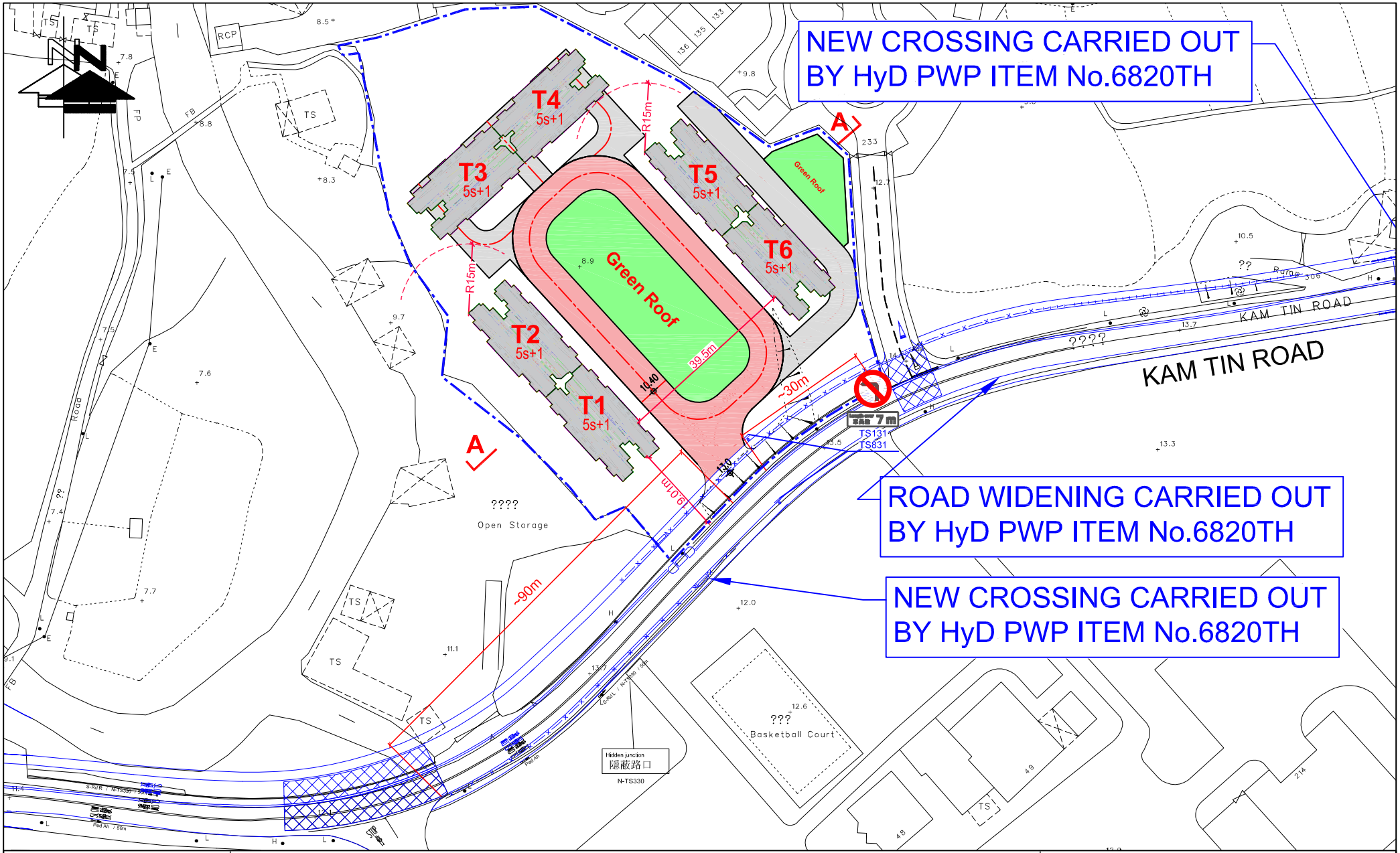


FIGURE NO.: 2.2	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	CTA Consultants Limited 志達顧問有限公司
PROJECT NO.: 25009HK	DRAWING TITLE: MASTER LAYOUT PLAN AND DEVELOPMENT ACCESS ARRANGEMENT (WITH KAM TIN ROAD WIDENING)	
SCALE: 1 : 1000 @A4 / DATE: 10 MAR 2026		

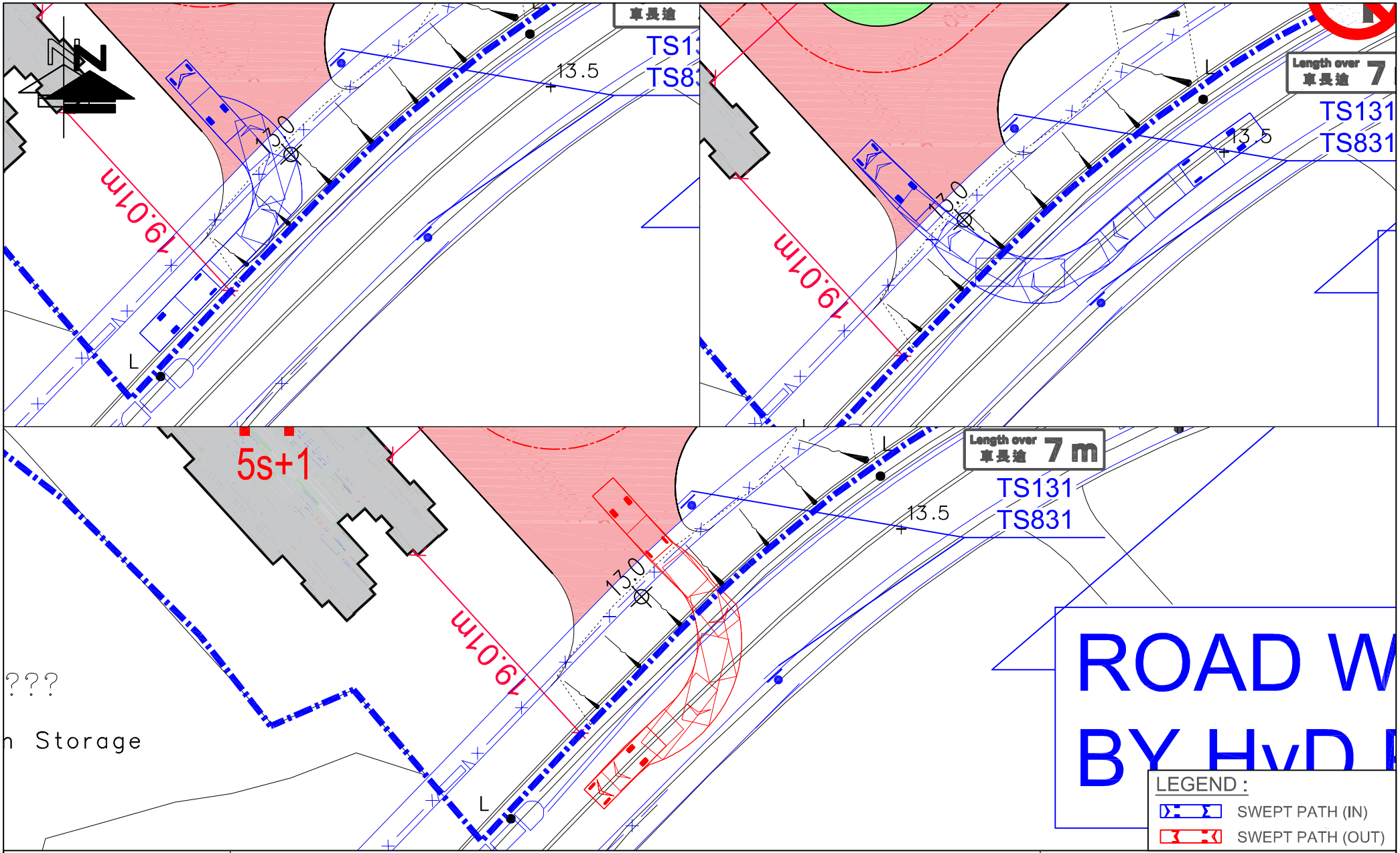


FIGURE NO.: 2.2(SP1)	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.
PROJECT NO.: 25009HK	DRAWING TITLE: SWEPT PATH ANALYSIS OF 7M VEHICLE OF MASTER LAYOUT PLAN AND DEVELOPMENT ACCESS ARRANGEMENT (WITH KAM TIN ROAD WIDENING)
SCALE: 1 : 400 @A4 / DATE: 10 MAR 2026	CTA Consultants Limited 志達顧問有限公司

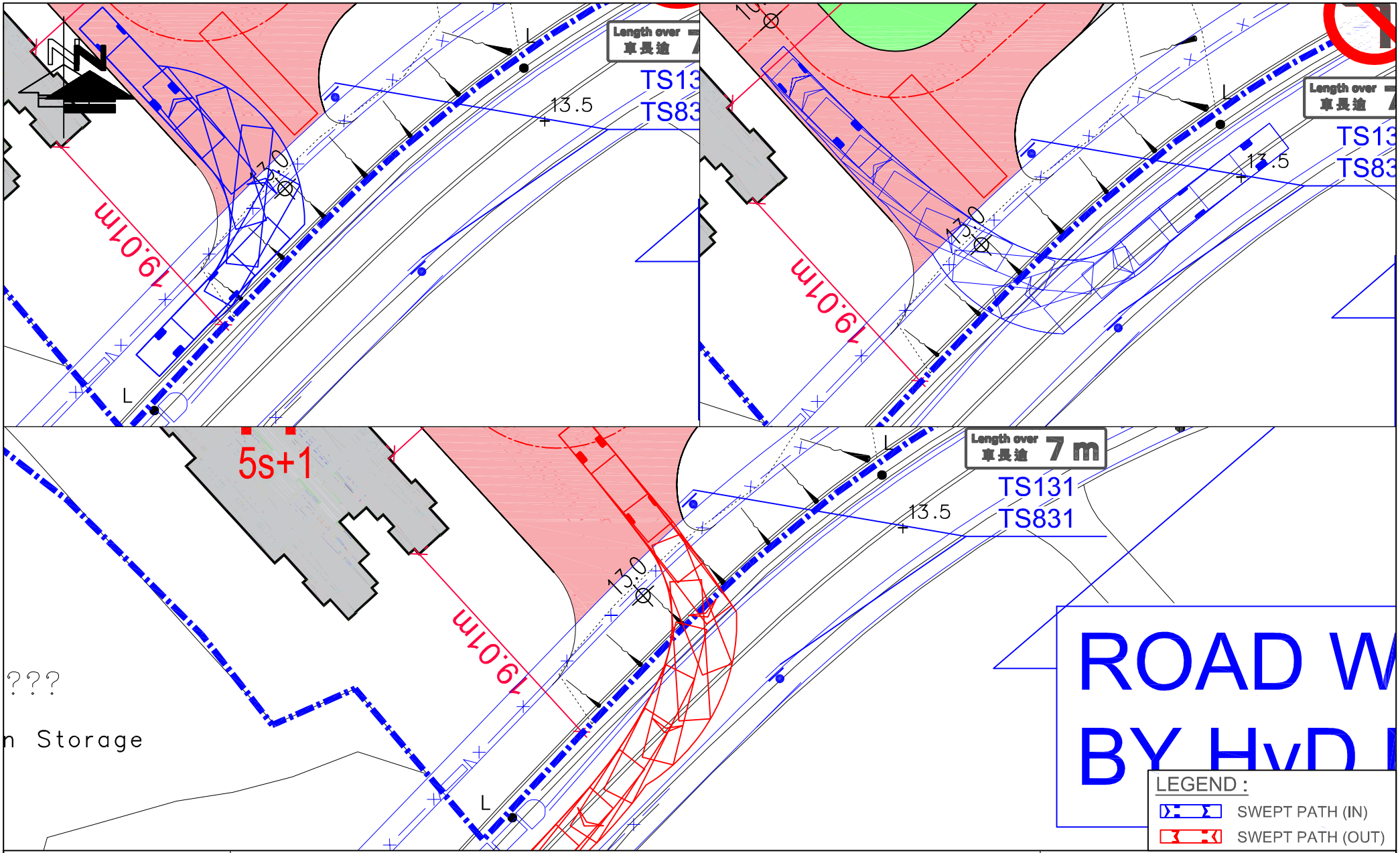


FIGURE NO.: 2.2(SP2)	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.
PROJECT NO.: 25009HK	DRAWING TITLE: SWEPT PATH ANALYSIS OF 11M VEHICLE OF MASTER LAYOUT PLAN AND DEVELOPMENT ACCESS ARRANGEMENT (WITH KAM TIN ROAD WIDENING)
SCALE: 1 : 400 @A4	DATE: 10 MAR 2026

CTA Consultants Limited
志達顧問有限公司

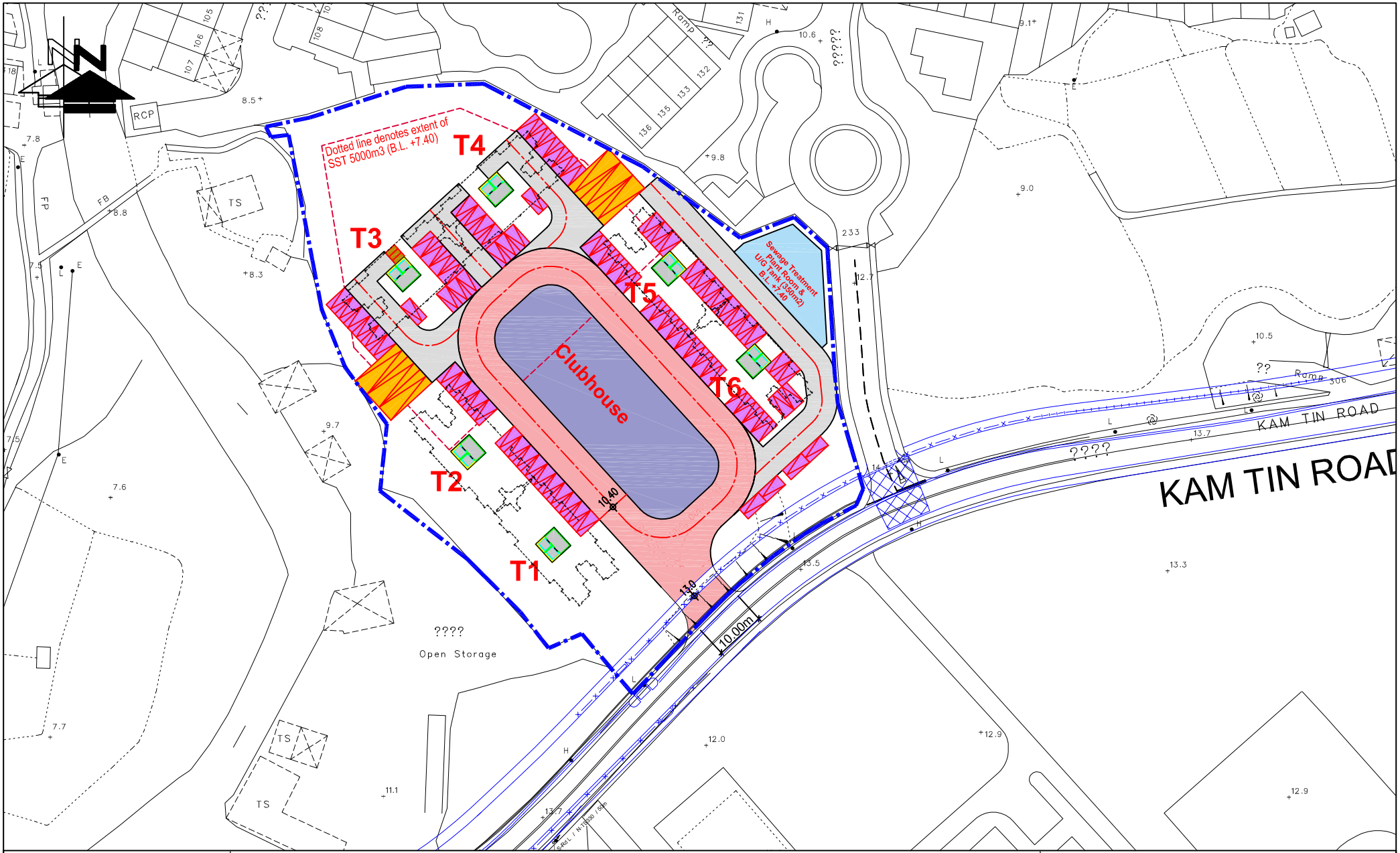


FIGURE NO.: 2.3	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	CTA Consultants Limited 志達顧問有限公司
PROJECT NO.: 25009HK	DRAWING TITLE: GROUND FLOOR PLAN (WITHOUT KAM TIN ROAD WIDENING)	
SCALE: 1 : 1000 @A4 / DATE: 10 MAR 2026		

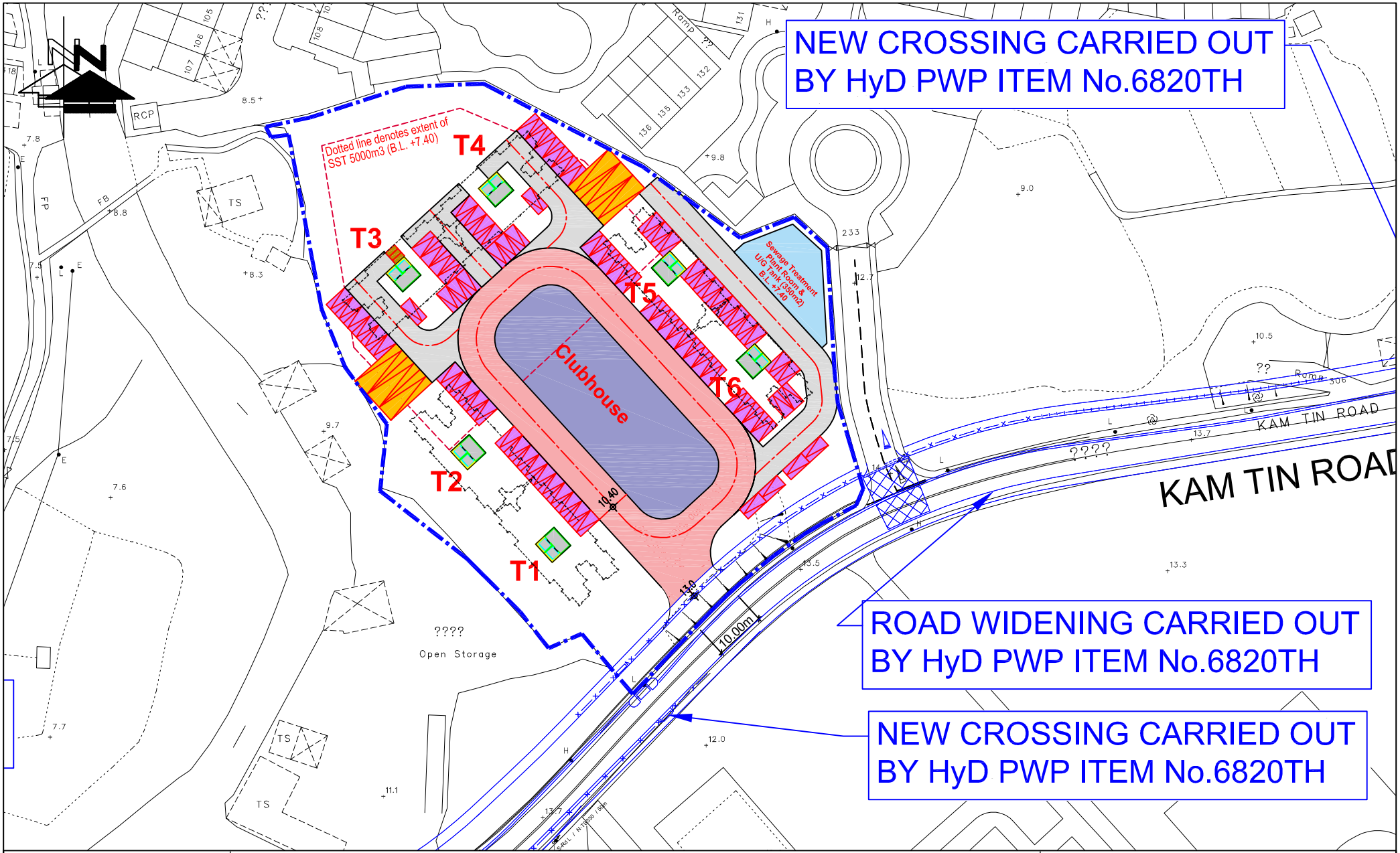


FIGURE NO.: 2.4	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	CTA Consultants Limited 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: 10 MAR 2026		

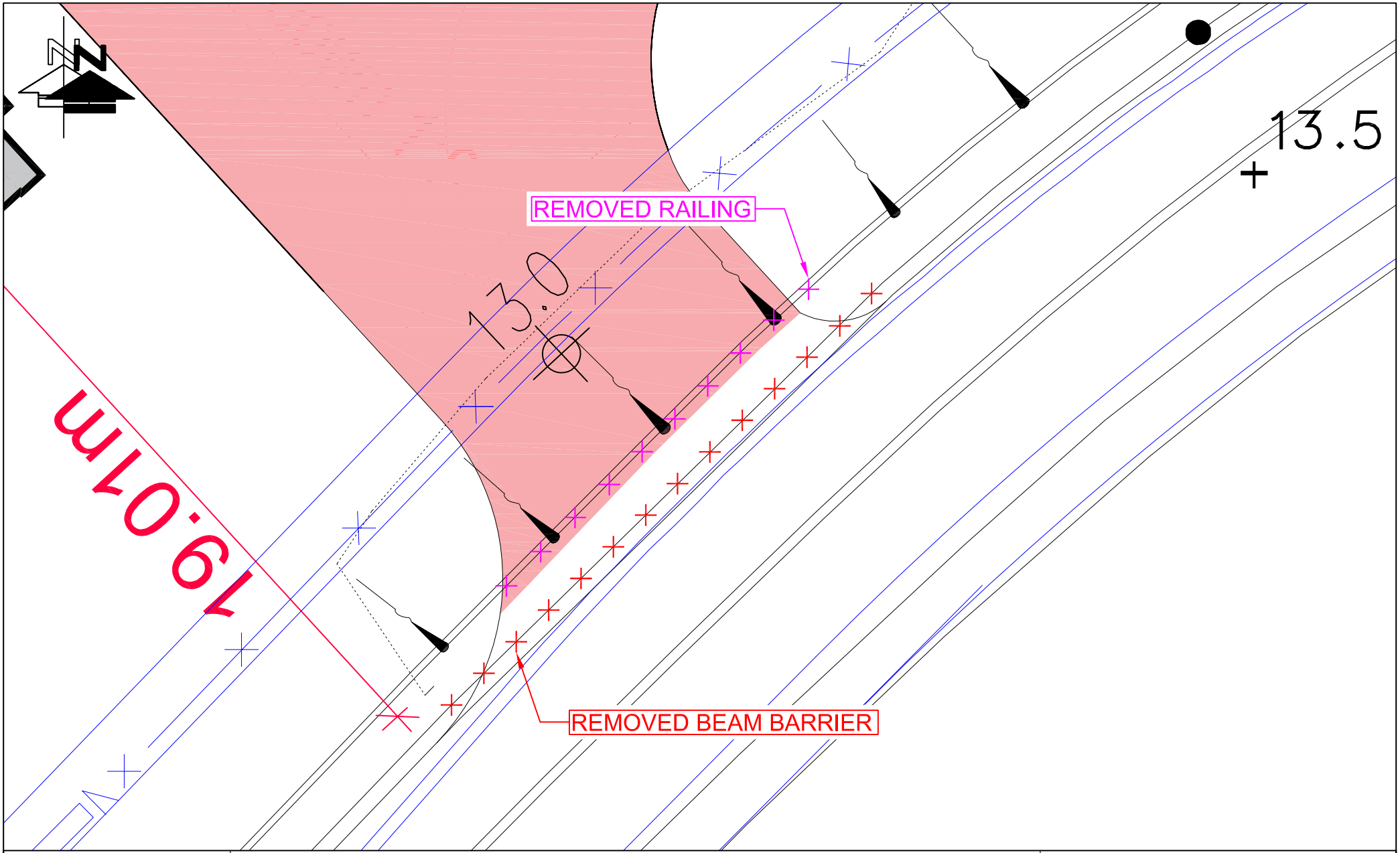
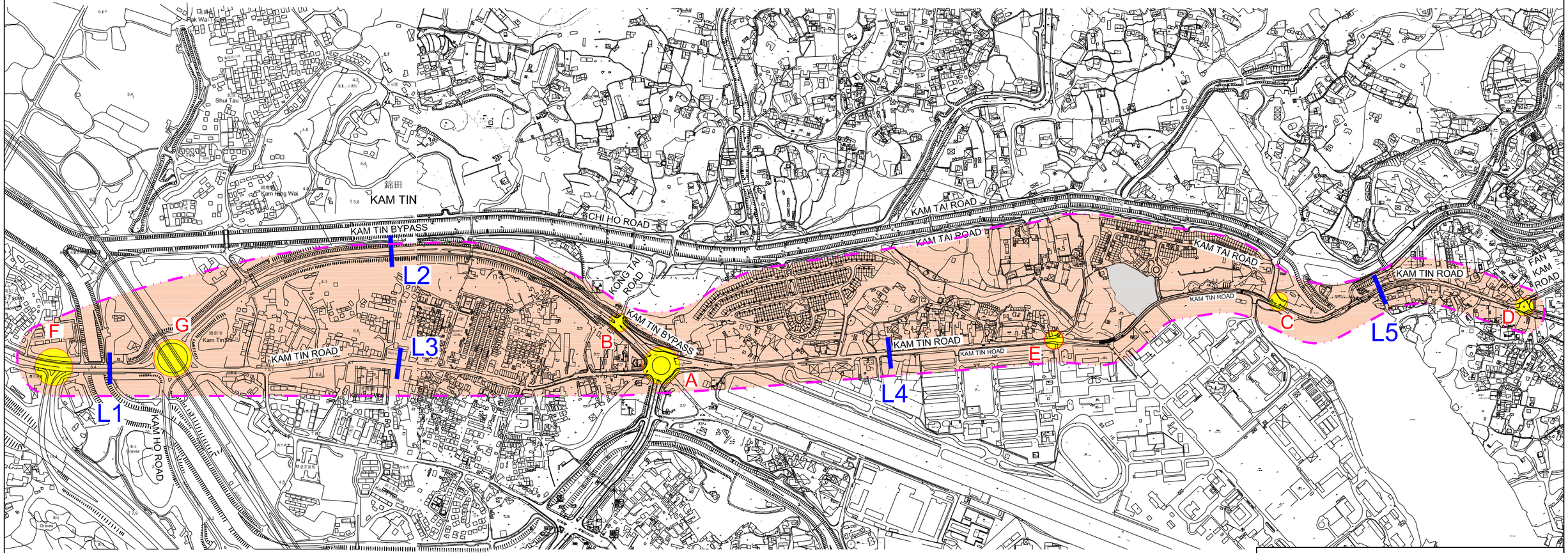


FIGURE NO.: 2.5	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	CTA Consultants Limited 志達顧問有限公司
PROJECT NO.: 25009HK	DRAWING TITLE: PROPOSED MODIFICATION OF EXISTING STREET FURNITURE (WITHOUT KAM TIN ROAD WIDENING)	
SCALE: 1 : 150 @A4 / DATE: 10 MAR 2026		



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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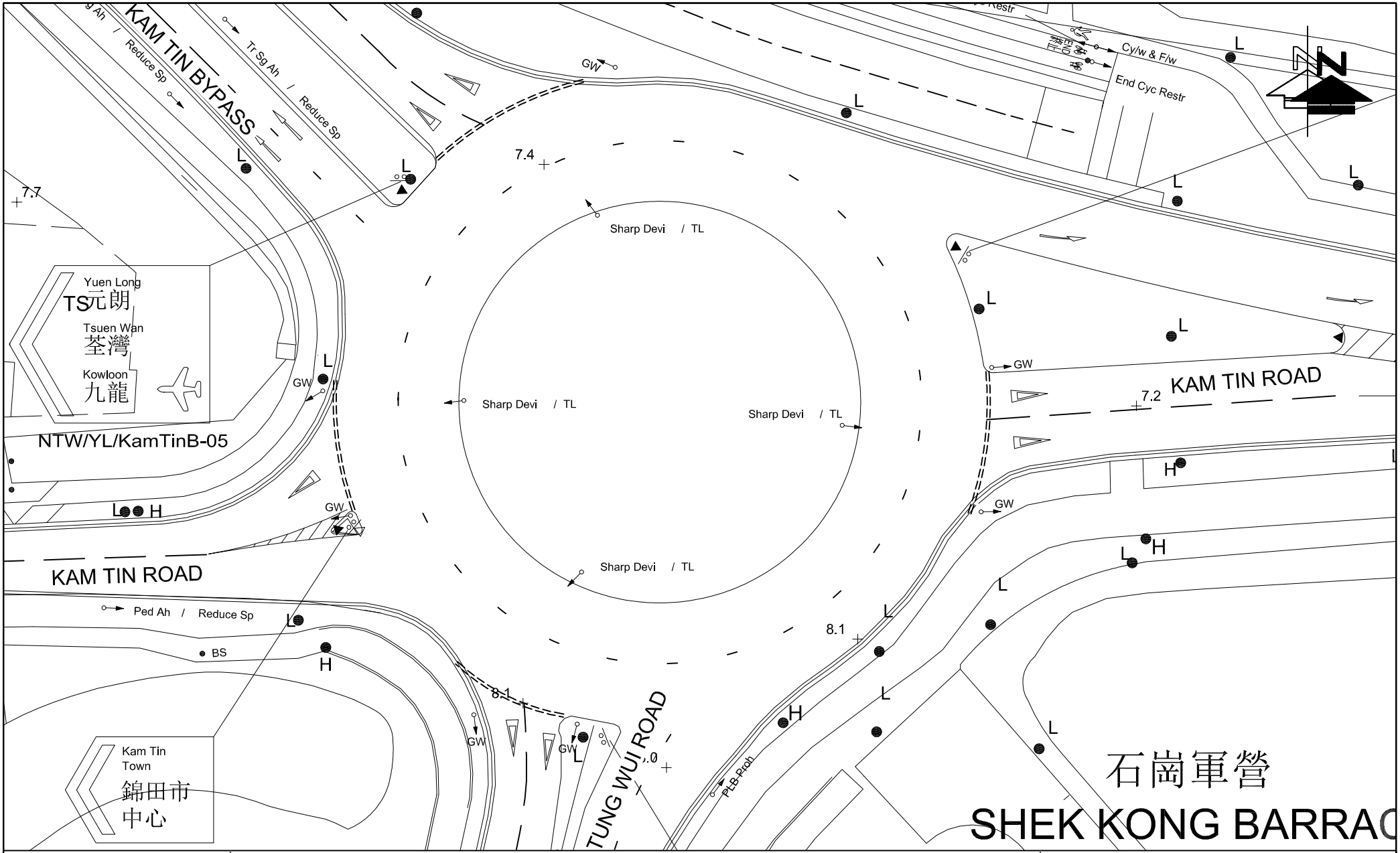


FIGURE NO.: 3.2	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	CTA Consultants Limited 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		

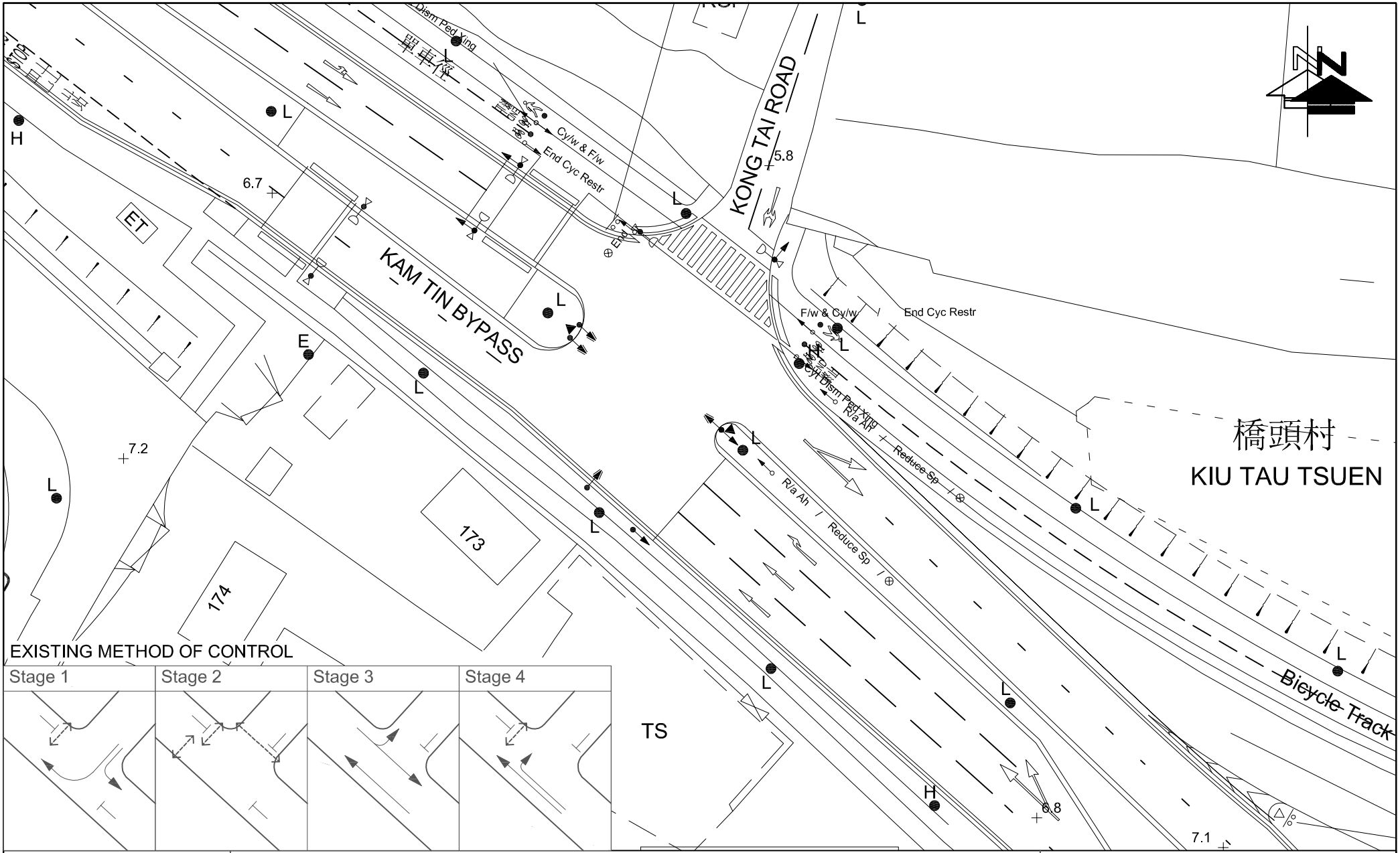


FIGURE NO.: 3.3	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.
PROJECT NO.: 25009HK	DRAWING TITLE: EXISTING JUNCTION LAYOUT OF KAM TIN BYPASS / KONG TAI ROAD (B)
SCALE: 1 : 500 @A4 / DATE: 01 APR 2025	

CTA Consultants Limited
志達顧問有限公司

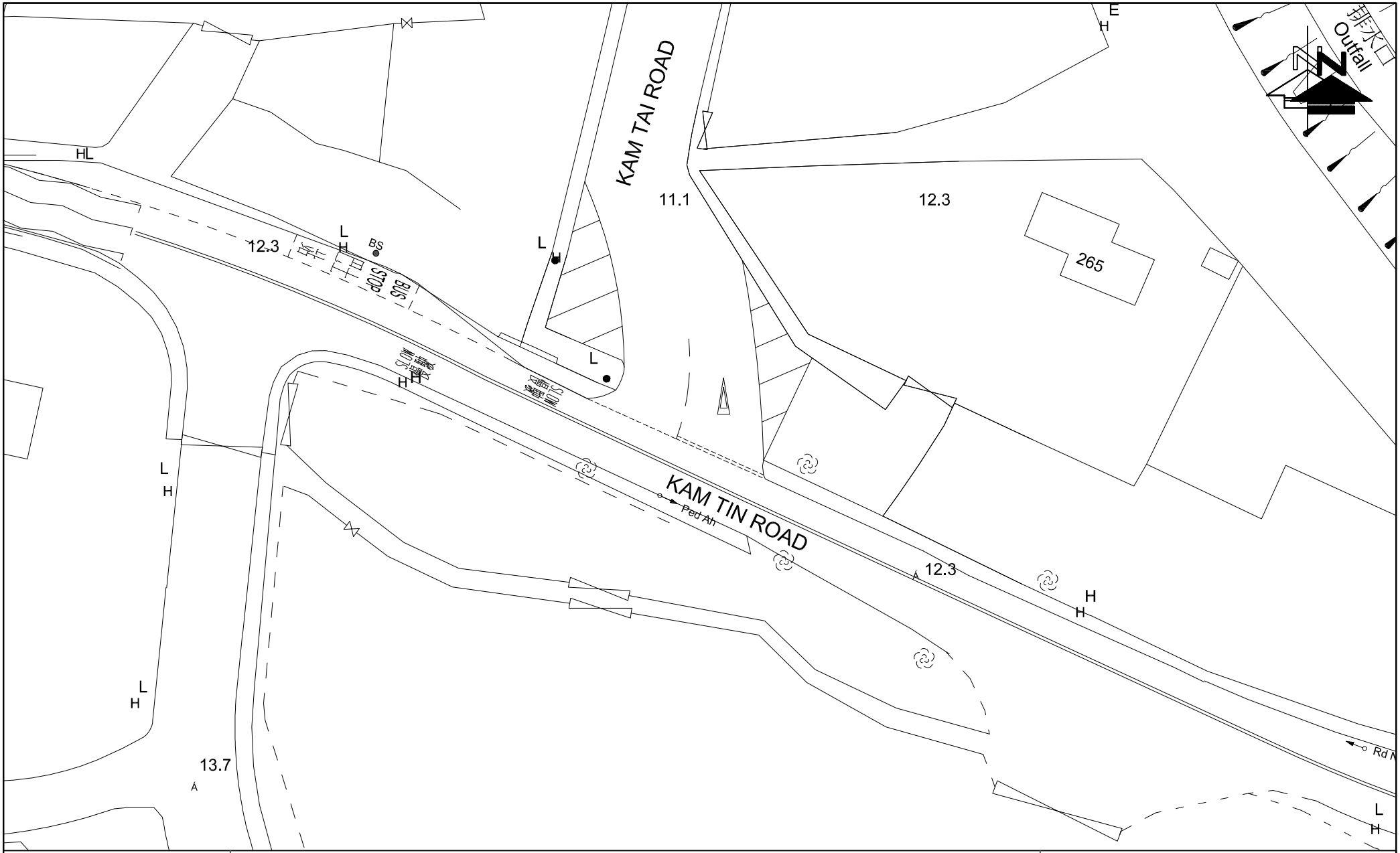


FIGURE NO.: 3.4	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	CTA Consultants Limited 志達顧問有限公司
PROJECT NO.: 25009HK	DRAWING TITLE: EXISTING JUNCTION LAYOUT OF KAM TIN ROAD / KAM TAI ROAD (C)	
SCALE: 1 : 500 @A4 / DATE: 05 NOV 2025		

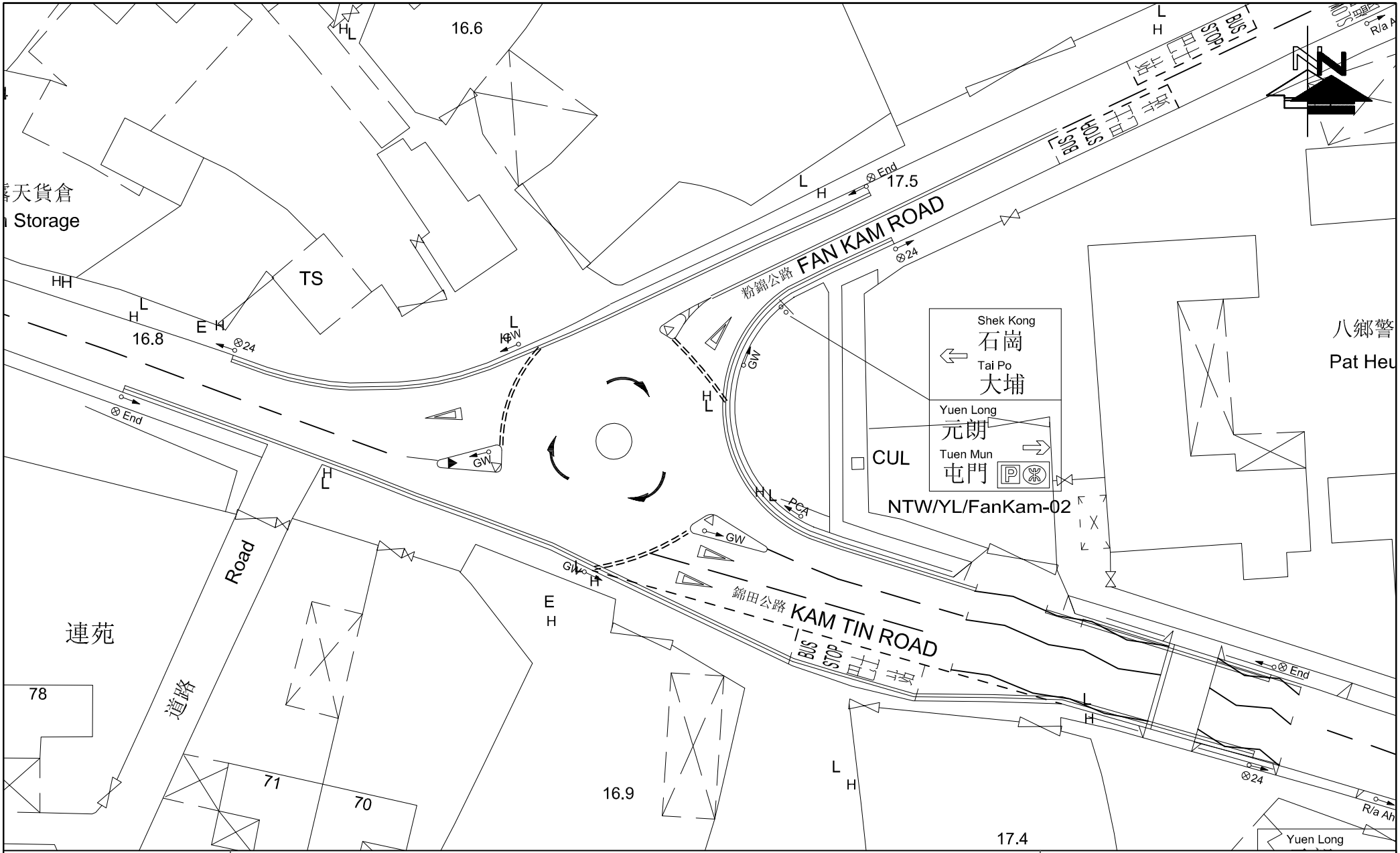
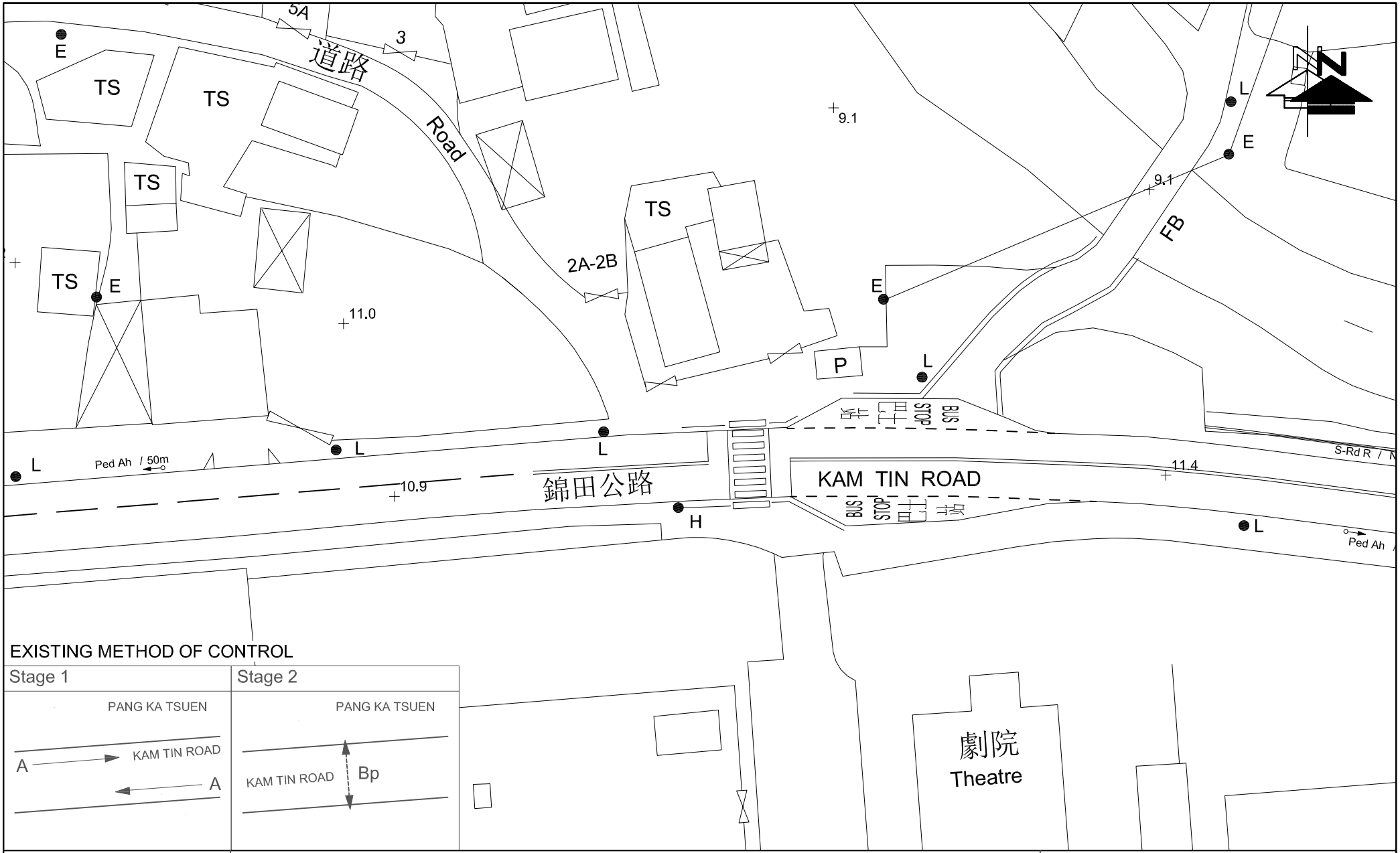


FIGURE NO.: 3.5	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	CTA Consultants Limited 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		



EXISTING METHOD OF CONTROL

FIGURE NO.: 3.6	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.	CTA Consultants Limited 志達顧問有限公司
PROJECT NO.: 25009HK	DRAWING TITLE: EXISTING JUNCTION LAYOUT OF KAM TIN ROAD / LOCAL ACCESS ROAD (E)	
SCALE: 1 : 500 @A4 / DATE: 01 APR 2025		

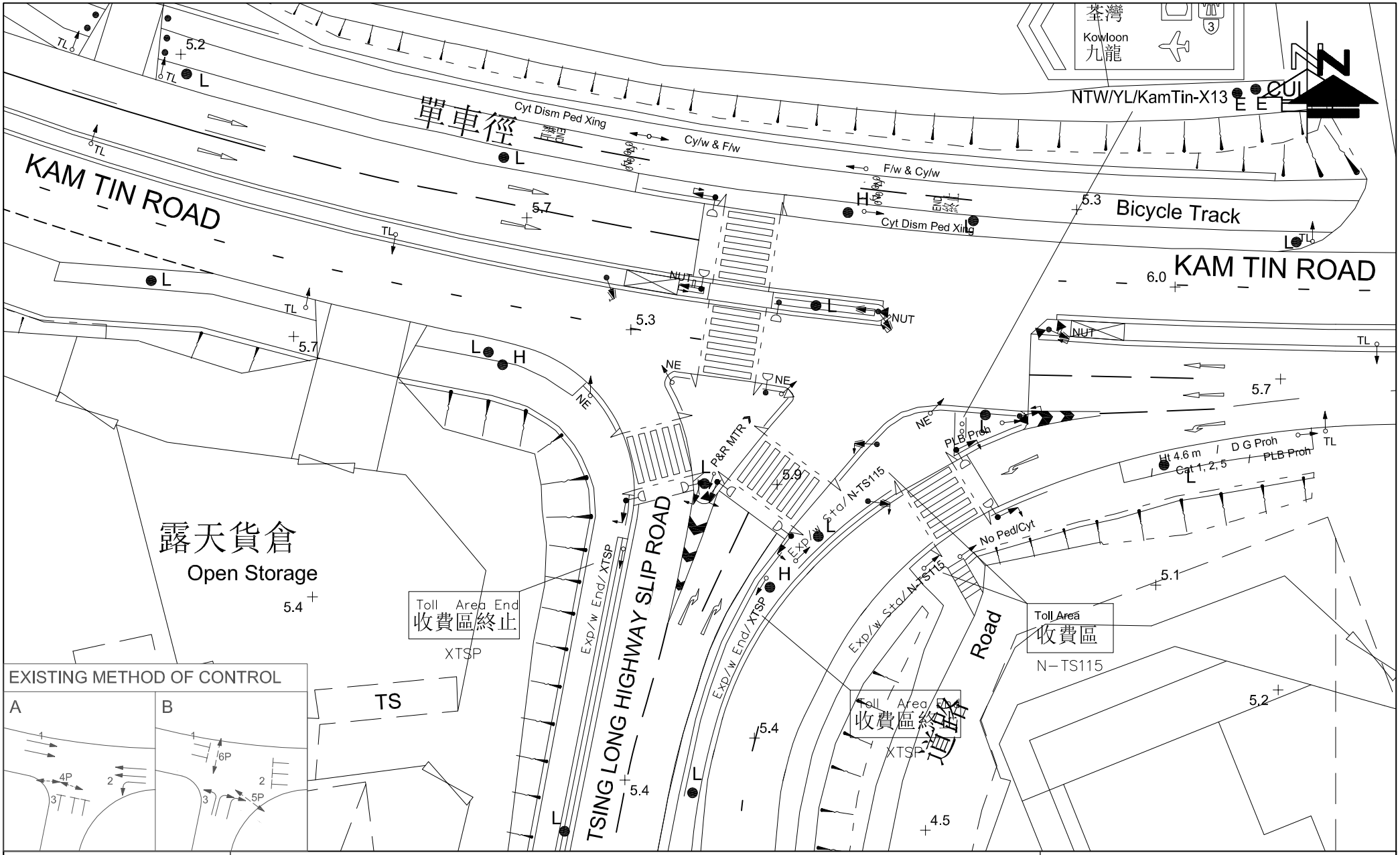


FIGURE NO.: 3.7	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.
PROJECT NO.: 25009HK	DRAWING TITLE: EXISTING JUNCTION LAYOUT OF KAM TIN ROAD / TSING LONG HIGHWAY SLIP ROAD (F)
SCALE: 1 : 500 @A4	DATE: 01 APR 2025

CTA Consultants Limited
志達顧問有限公司

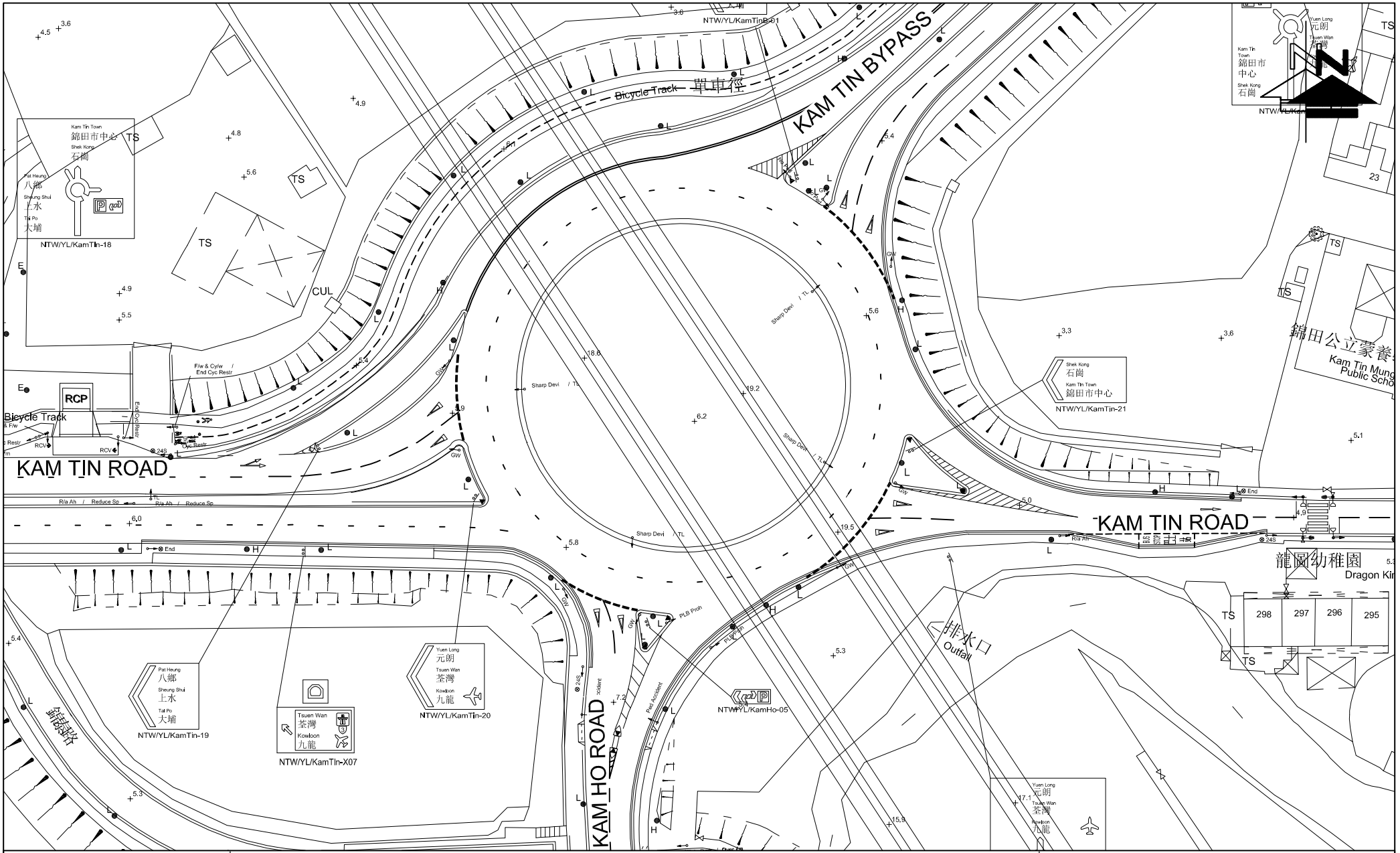
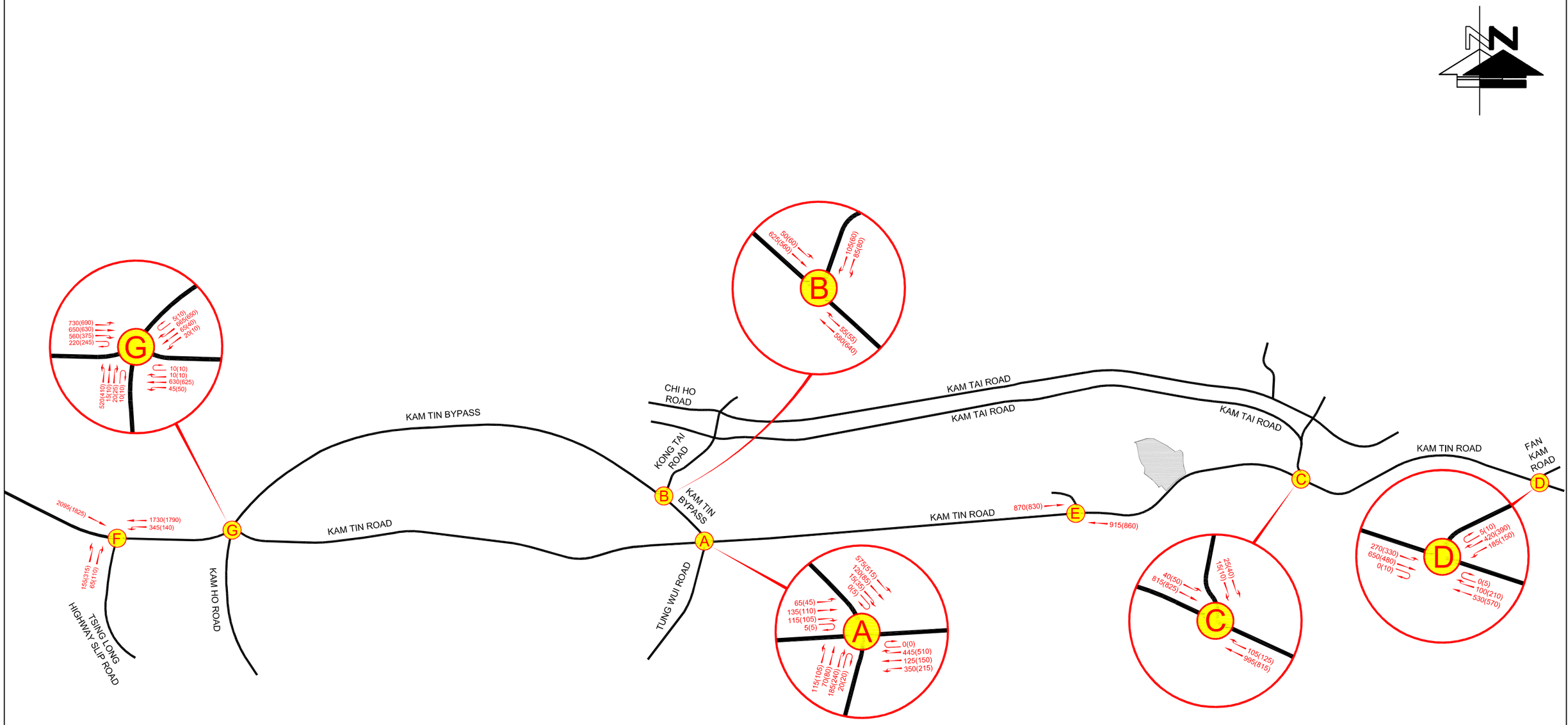


FIGURE NO.: 3.8	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	CTA Consultants Limited 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

595(540) 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
志達顧問有限公司

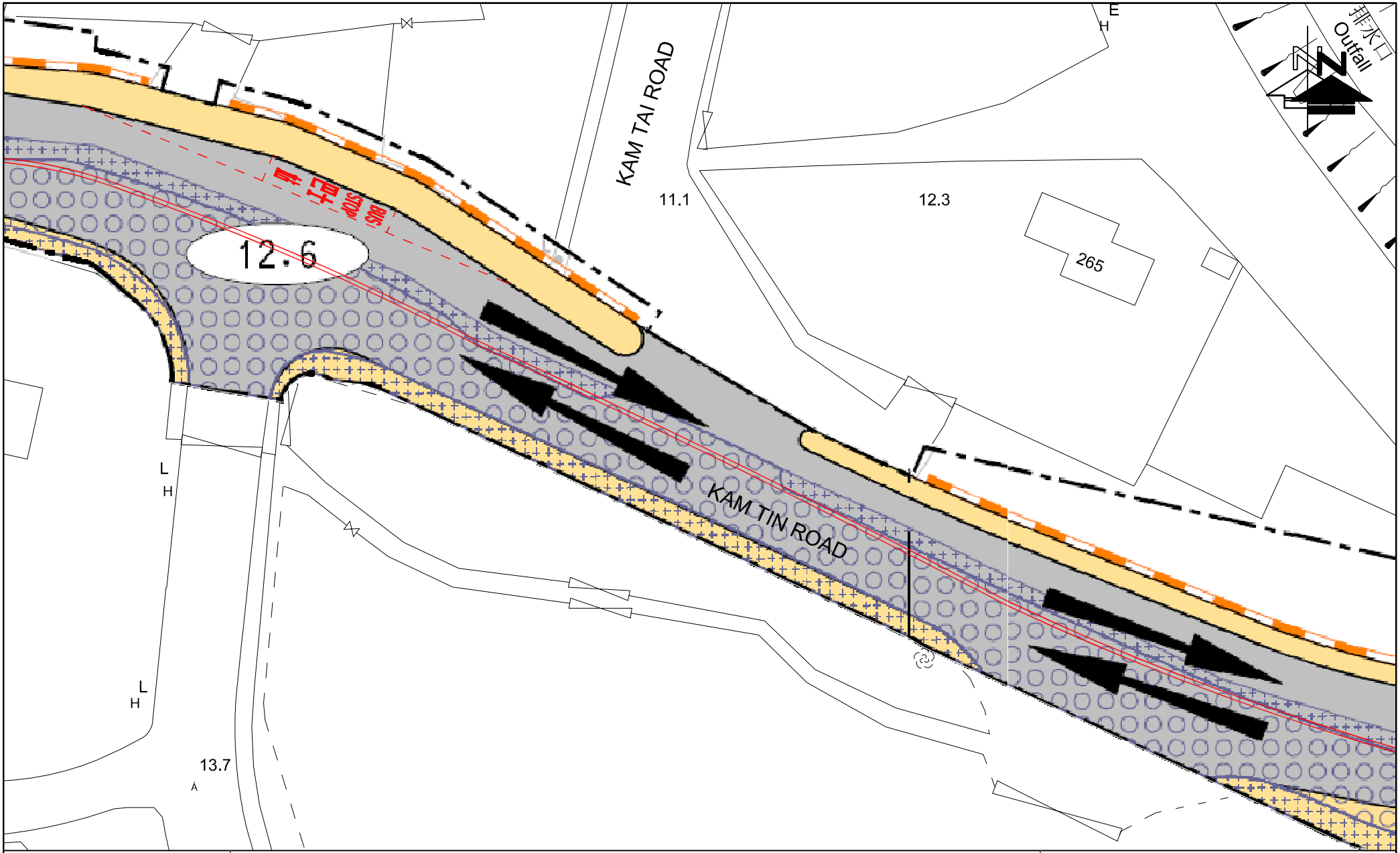


FIGURE NO.: 3.10	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	CTA Consultants Limited 志達顧問有限公司
PROJECT NO.: 25009HK	DRAWING TITLE: CONCEPTUAL JUNCTION IMPROVEMENT LAYOUT OF KAM TIN ROAD / KAM TAI ROAD (C) (CARRIED OUT BY HyD PWP ITEM No.6820TH)	
SCALE: 1 : 500 @A4 / DATE: 01 APR 2025		

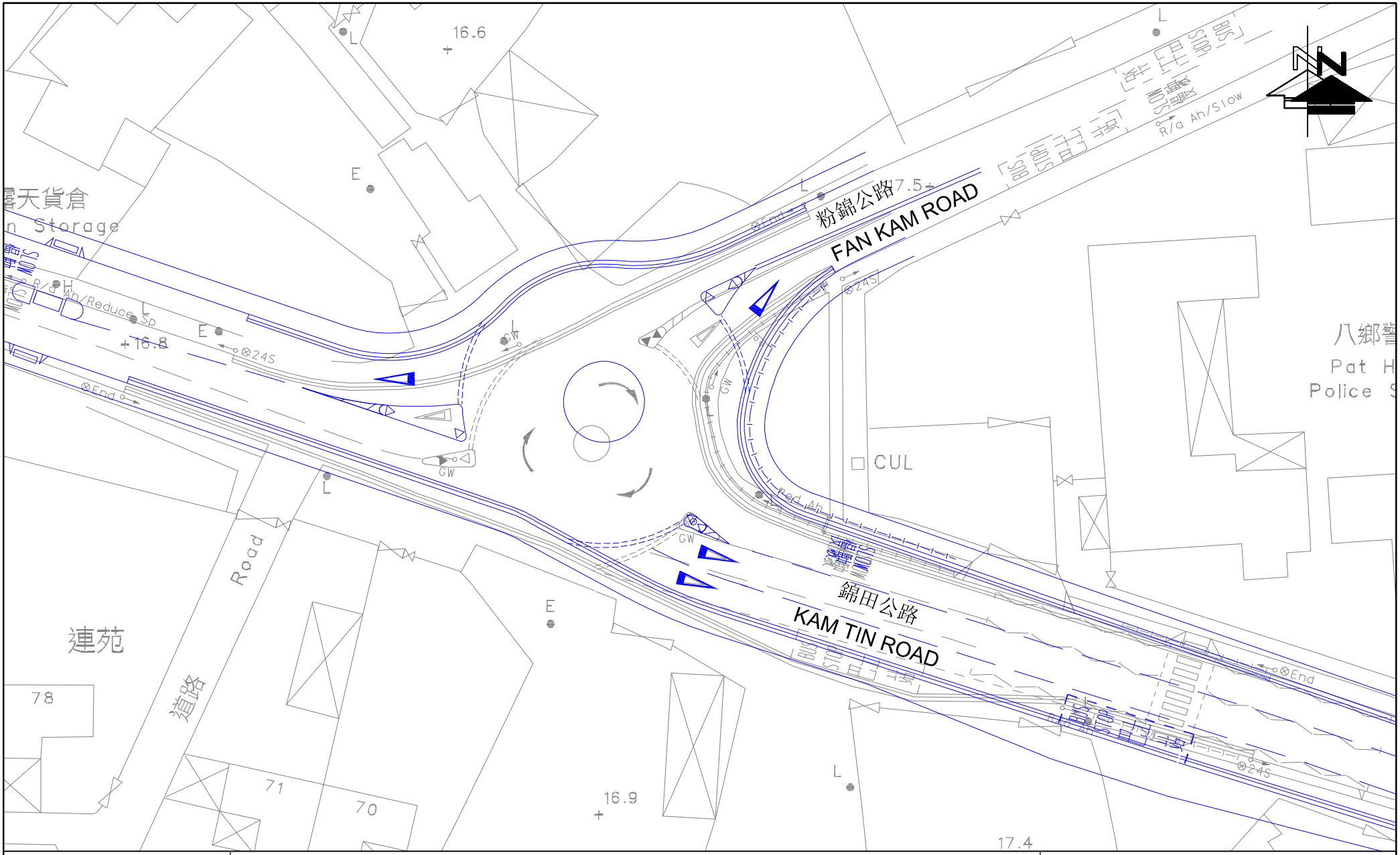


FIGURE NO.: 3.11	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	CTA Consultants Limited 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)	
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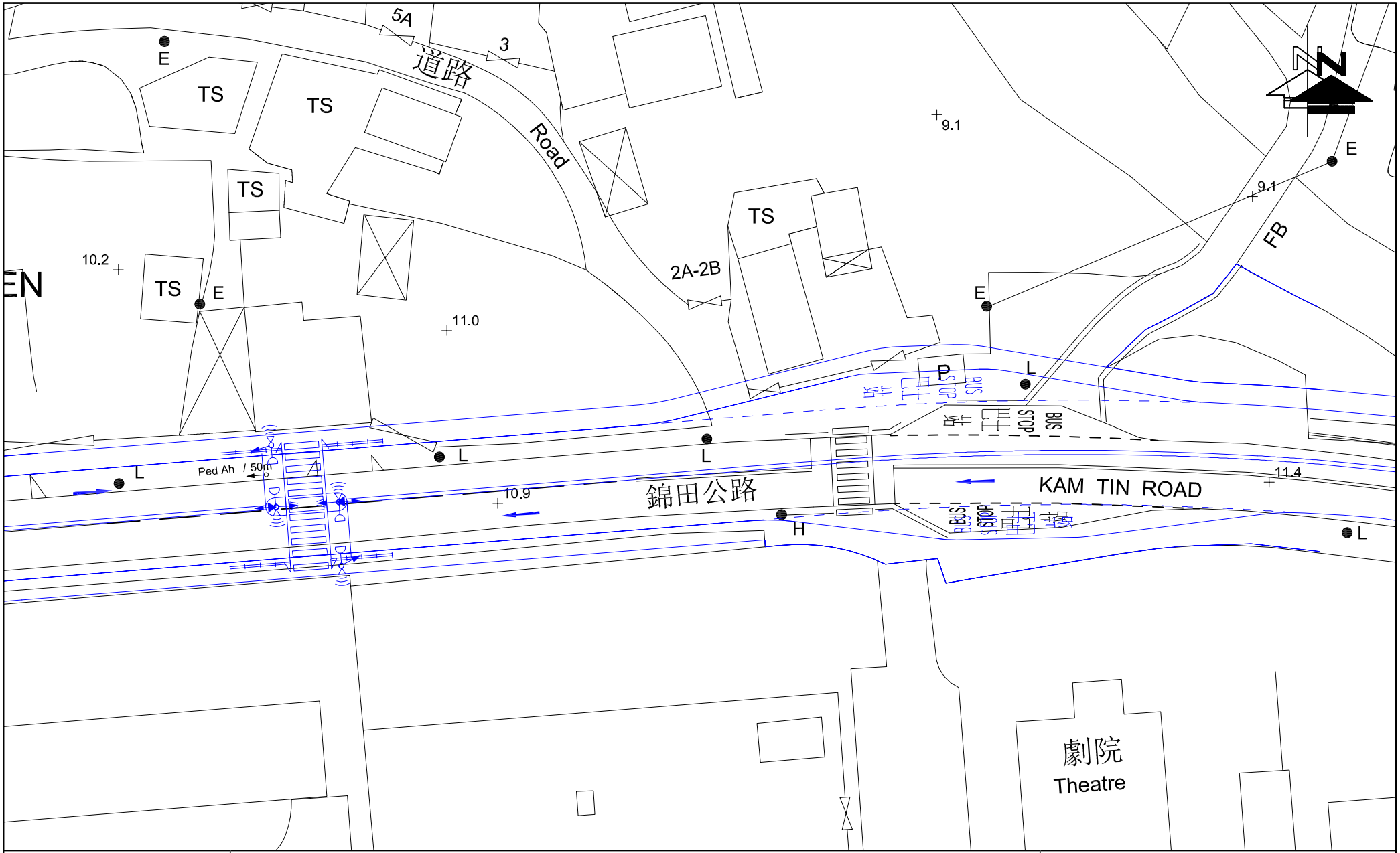

FIGURE NO.: 3.12	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	CTA Consultants Limited 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		

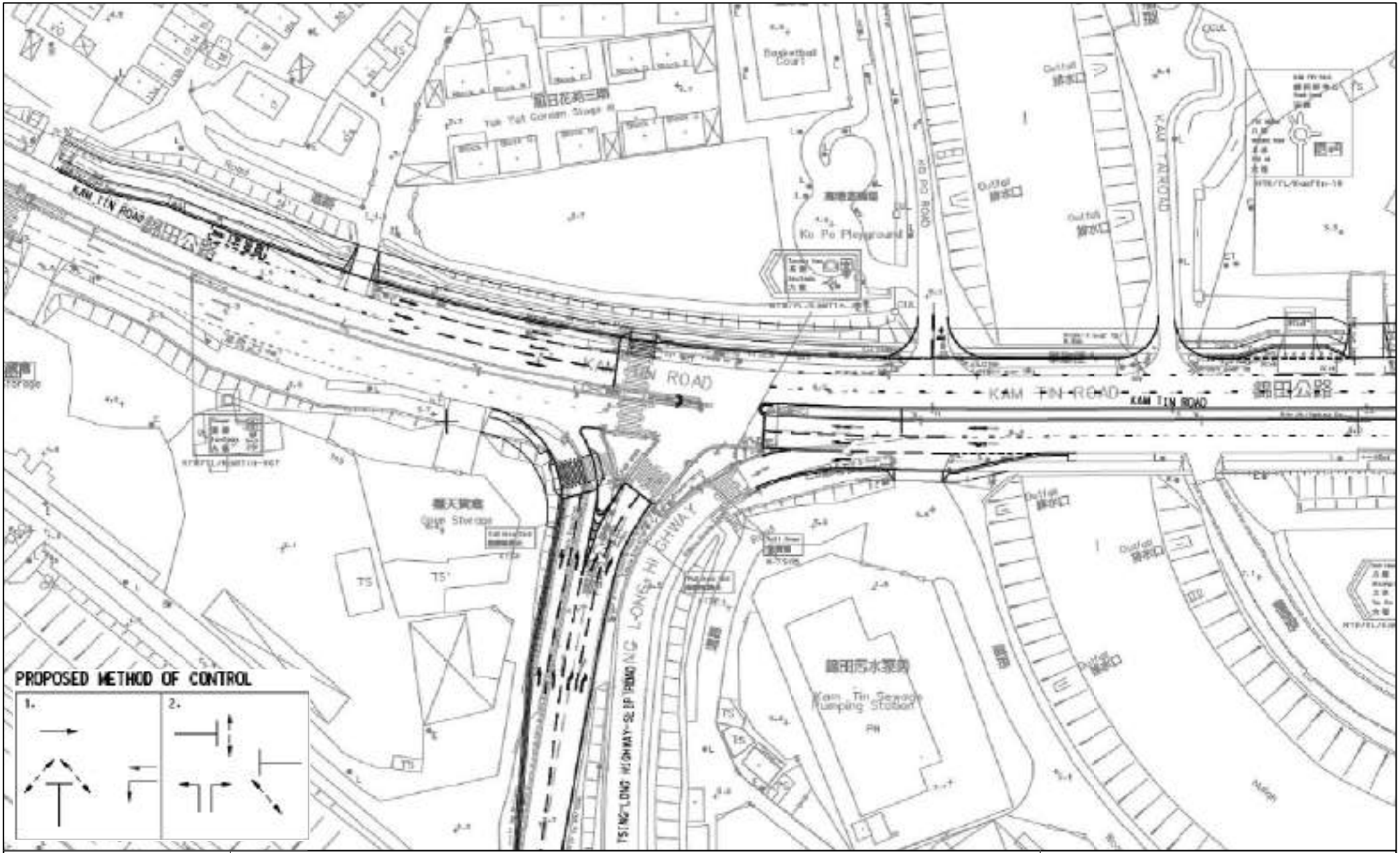

FIGURE NO.: 3.13	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	CTA Consultants Limited 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		

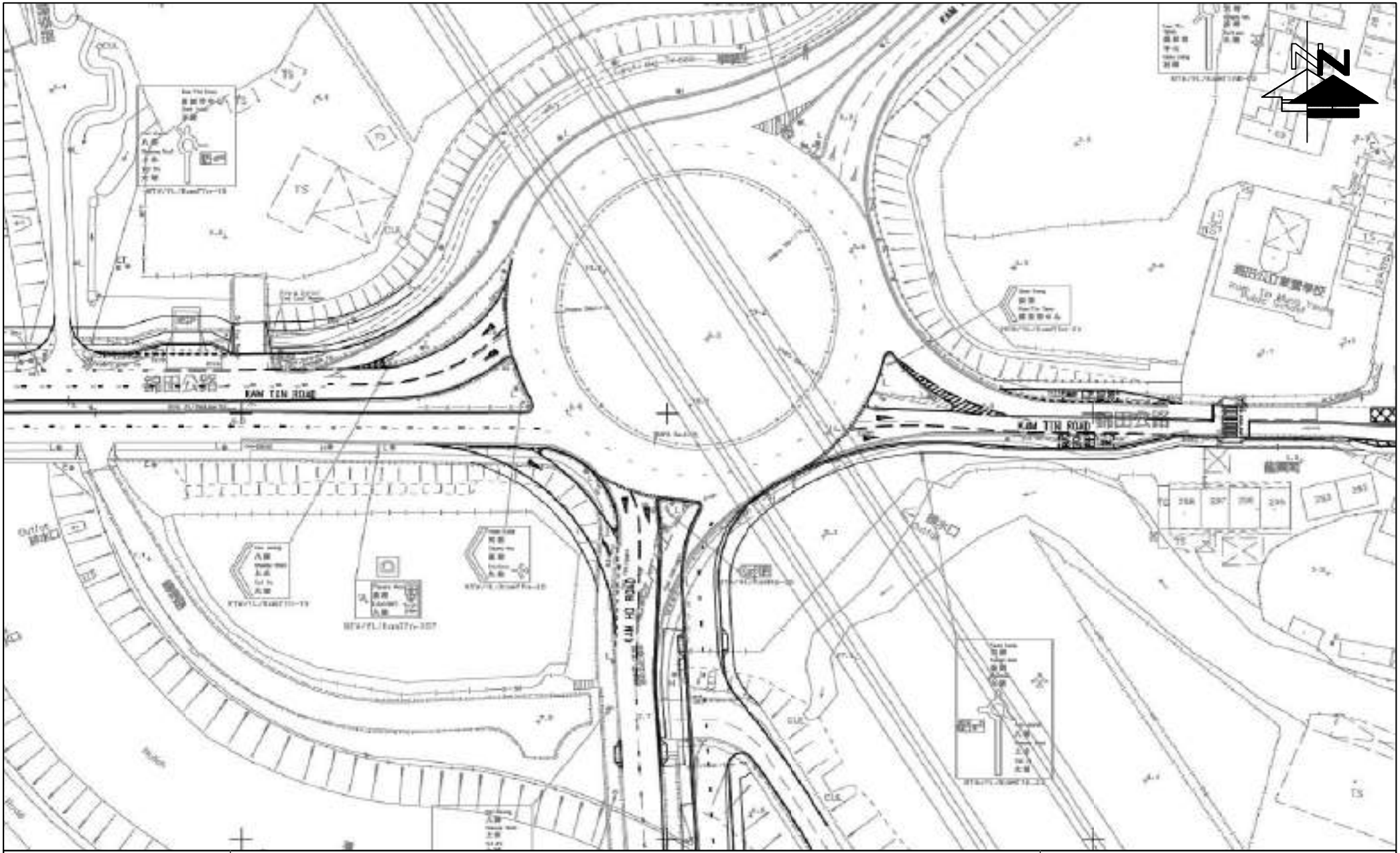

FIGURE NO.: 3.14	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	CTA Consultants Limited 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		

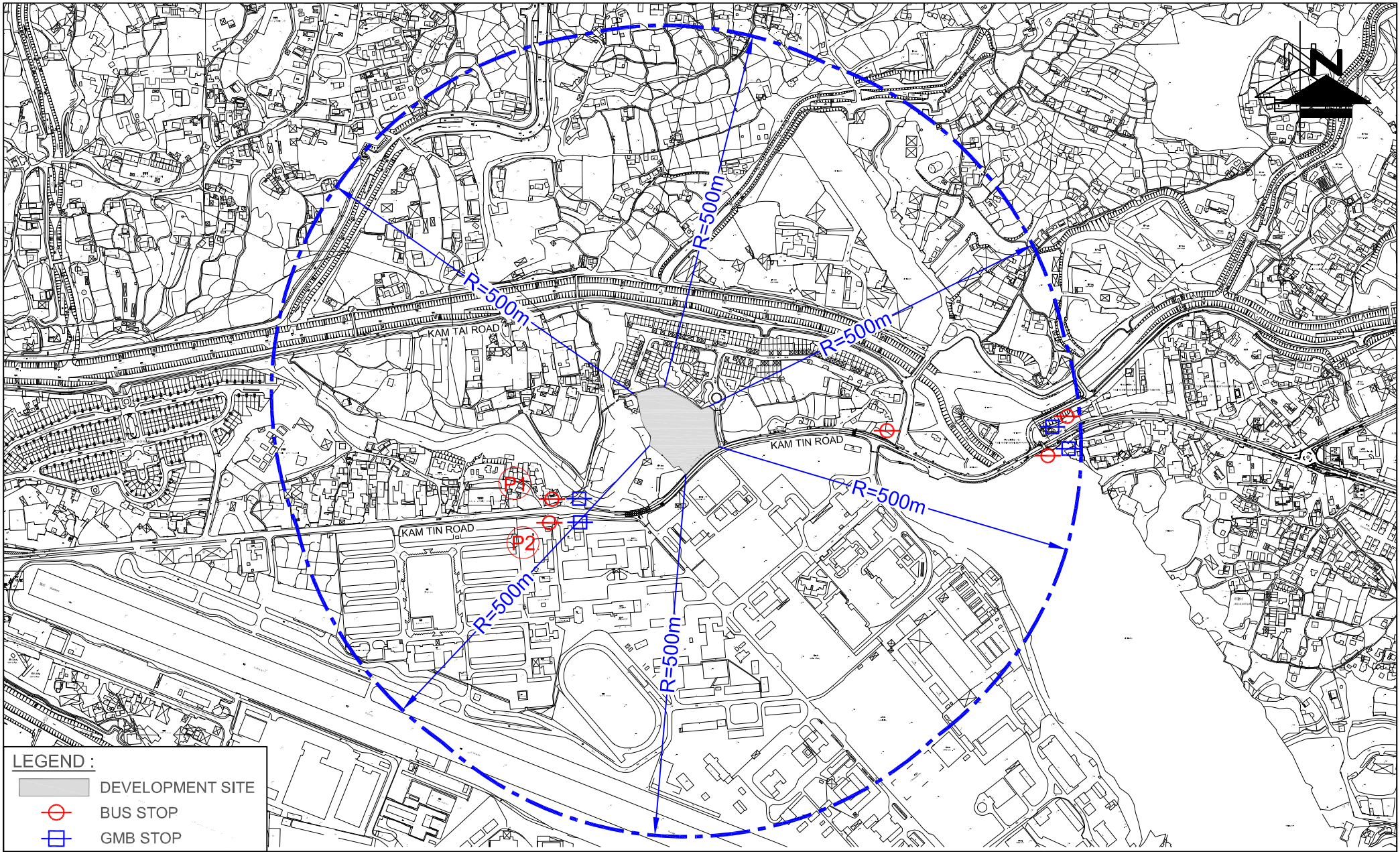

FIGURE NO.: 3.15	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	CTA Consultants Limited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

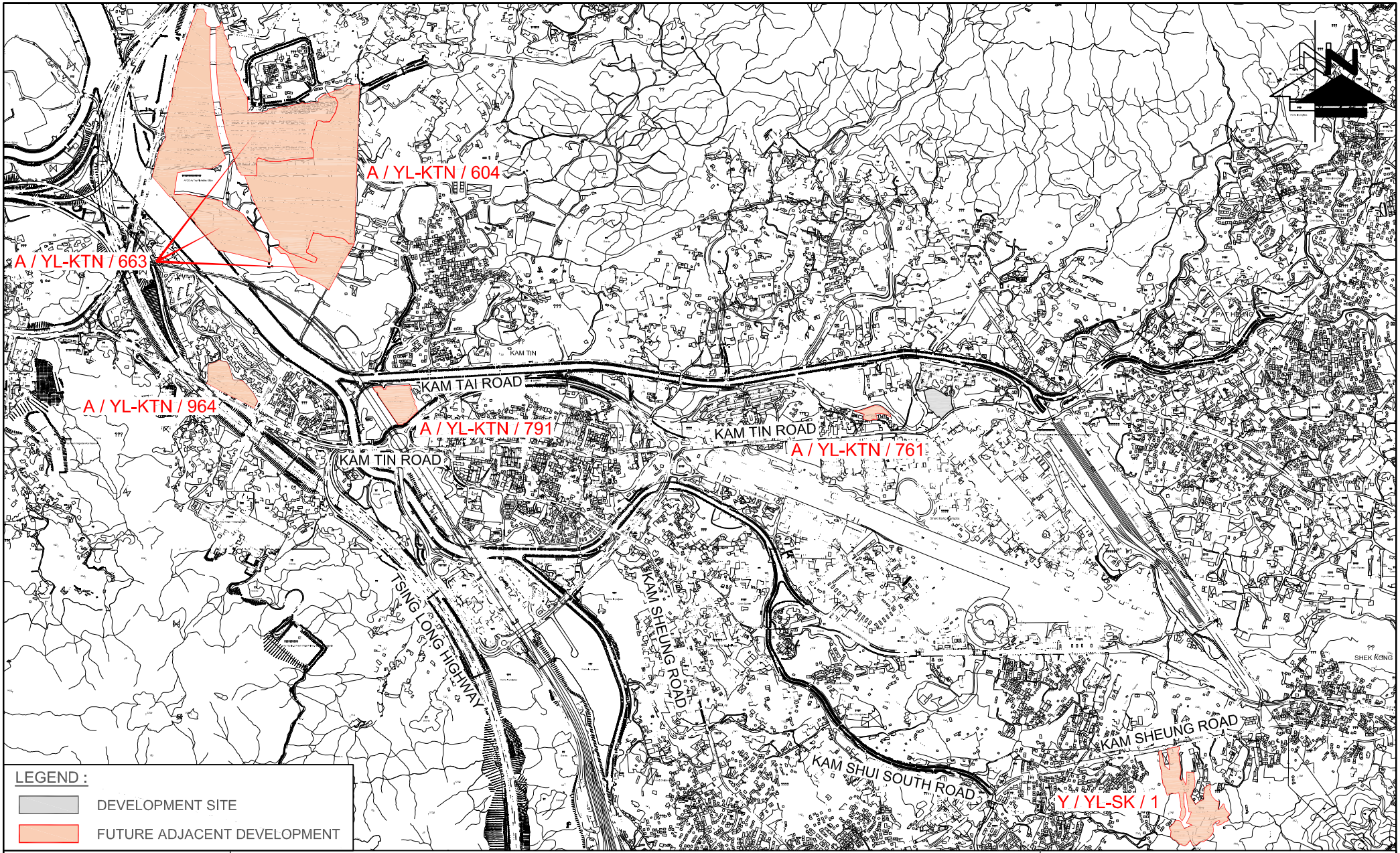

FIGURE NO.: 4.1	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.
PROJECT NO.: 25009HK	DRAWING TITLE: PLANNED / COMMITTED FUTURE DEVELOPMENT IN THE VICINITY
SCALE: 1 : 20000 @A4	DATE: 14 JUL 2025

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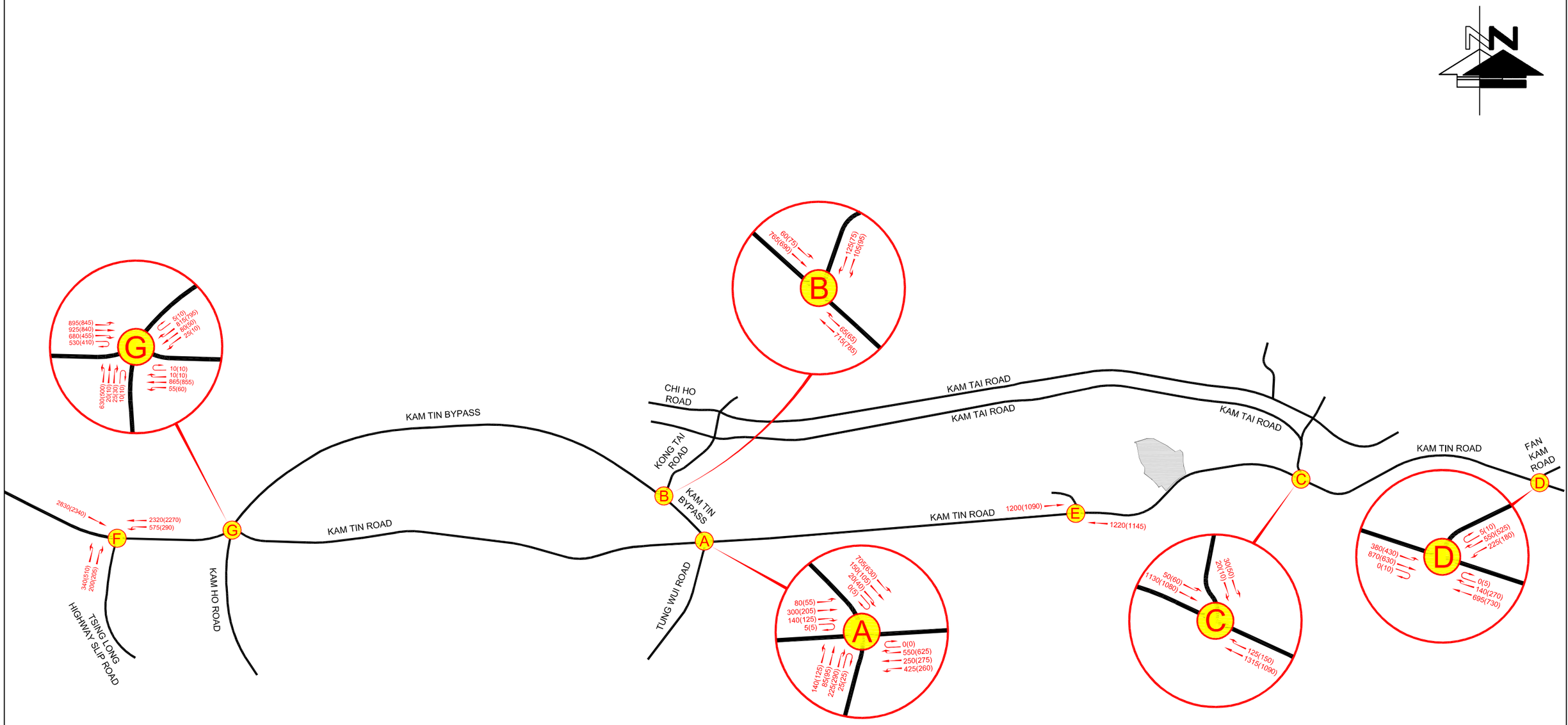

LEGEND :

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		

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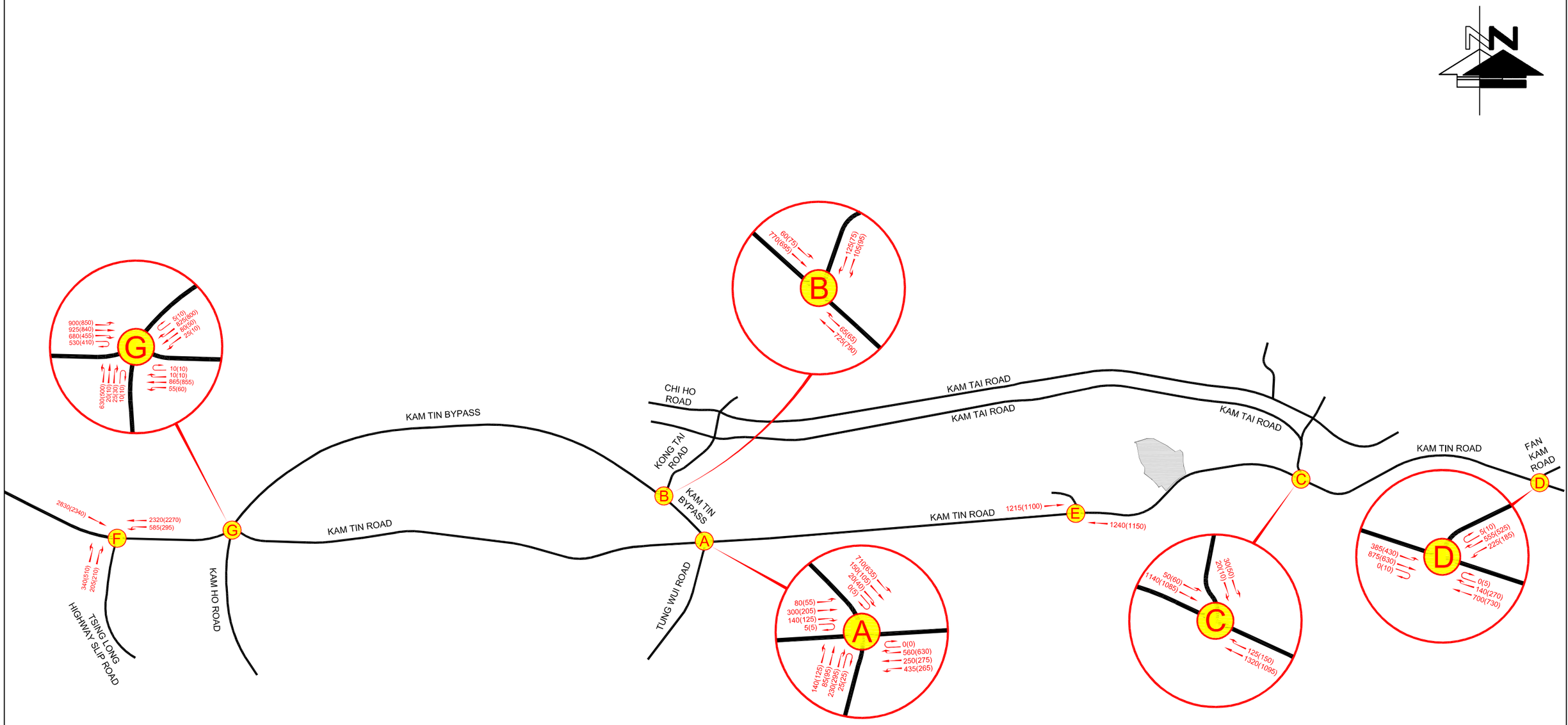
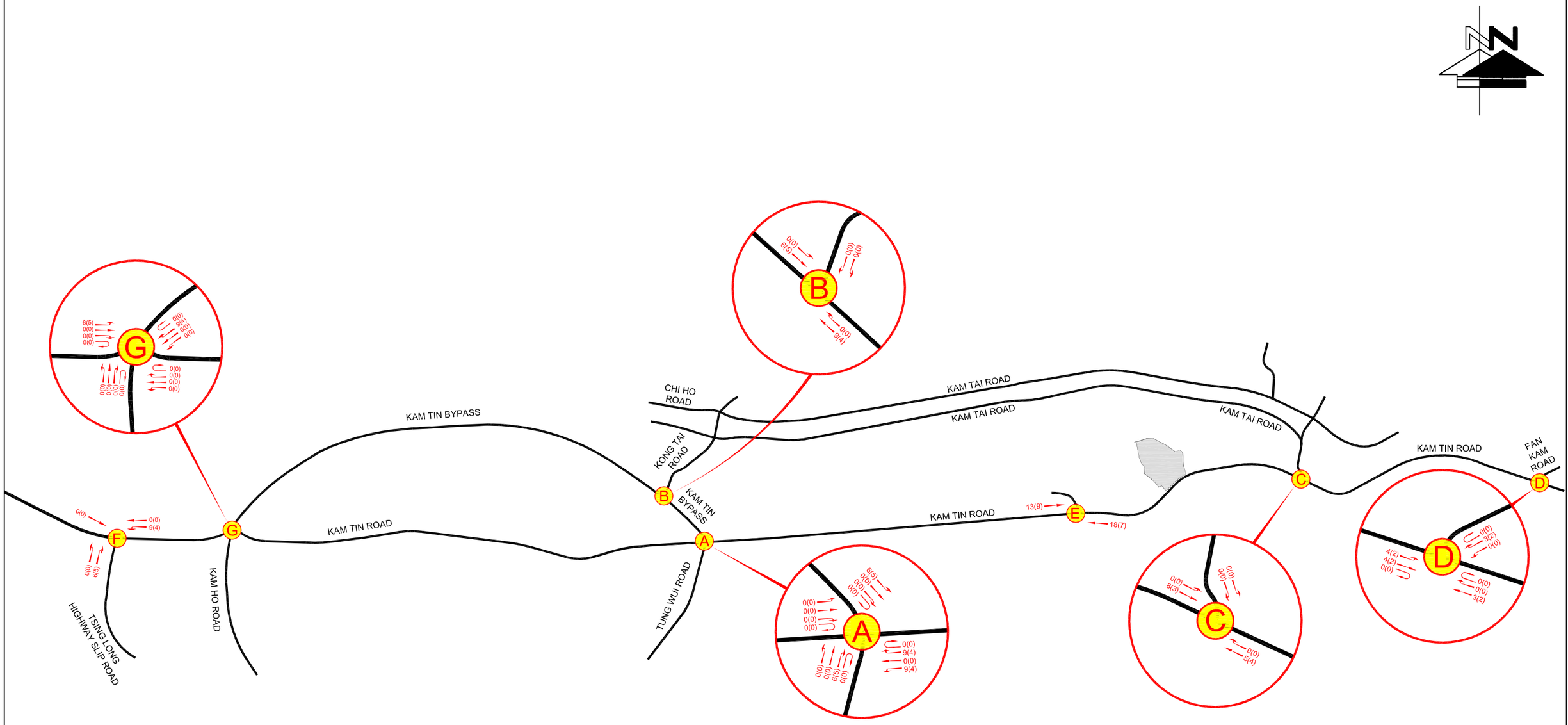


LEGEND :

DEVELOPMENT SITE

595(540) 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.	CTA Consultants Limited 志達顧問有限公司
PROJECT NO.: 25009HK	DRAWING TITLE: 2034 DESIGN TRAFFIC FLOWS	
SCALE: N. T. S. @A3 / DATE: 15 JUL 2025		

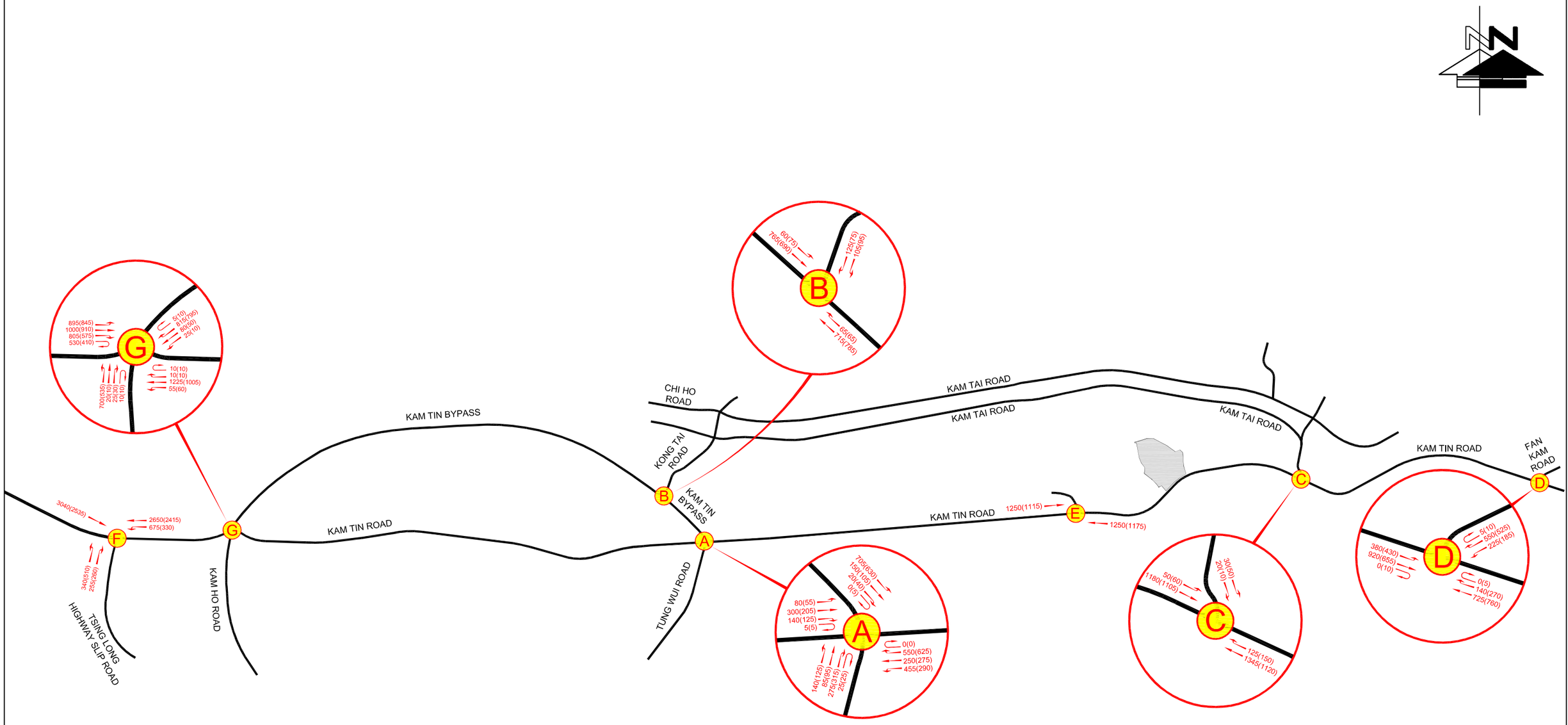


LEGEND :

DEVELOPMENT SITE

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

FIGURE NO.: 4.4	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	CTA Consultants Limited 志達顧問有限公司

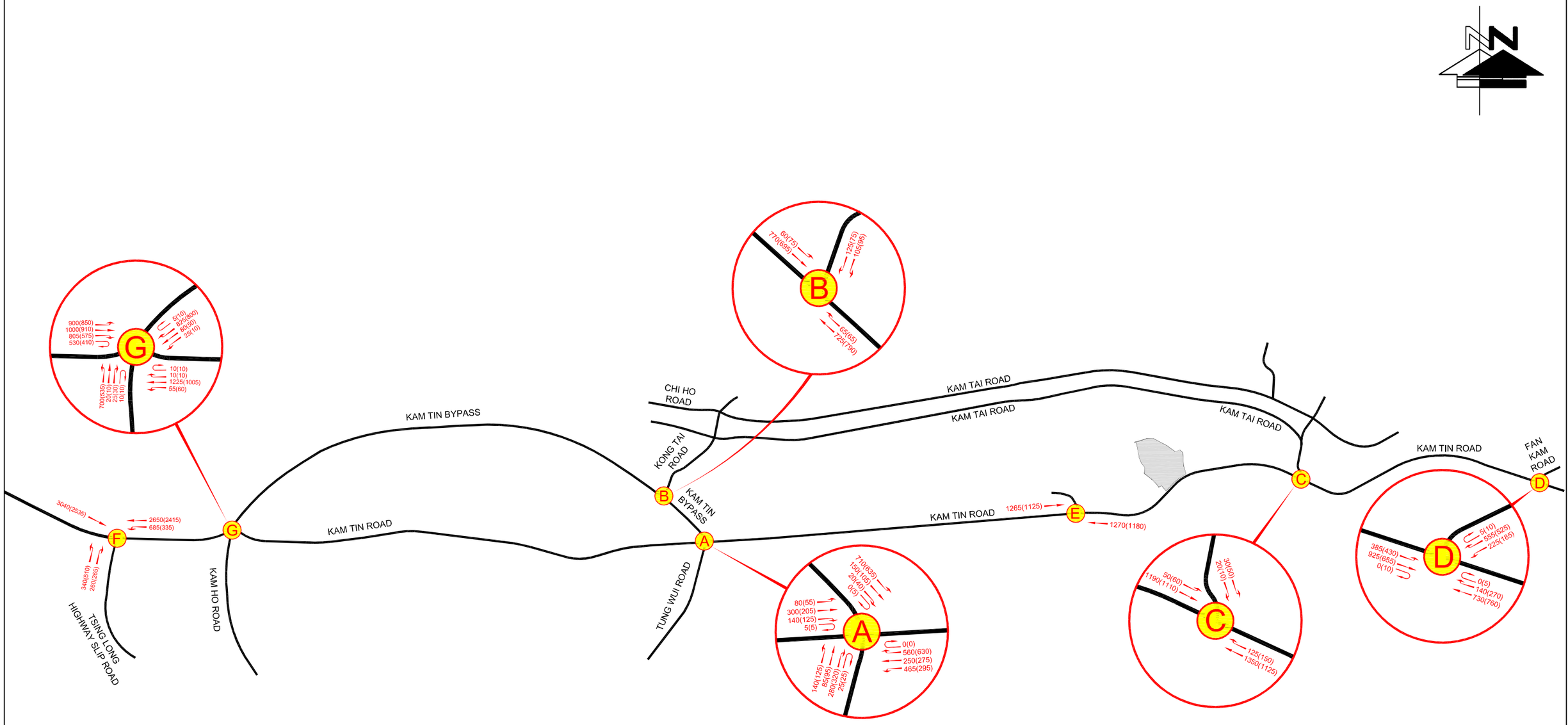


LEGEND :

DEVELOPMENT SITE

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

FIGURE NO.: 4.5	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: 2034 REFERENCE TRAFFIC FLOWS (WITH REMAINING SITES OF LUR)	
SCALE: N. T. S. @A3 / DATE: 14 JUL 2025		



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.	CTA Consultants Limited 志達顧問有限公司
PROJECT NO.: 25009HK	DRAWING TITLE: 2034 DESIGN TRAFFIC FLOWS (WITH REMAINING SITES OF LUR)	
SCALE: N. T. S. @A3 / DATE: 15 JUL 2025		

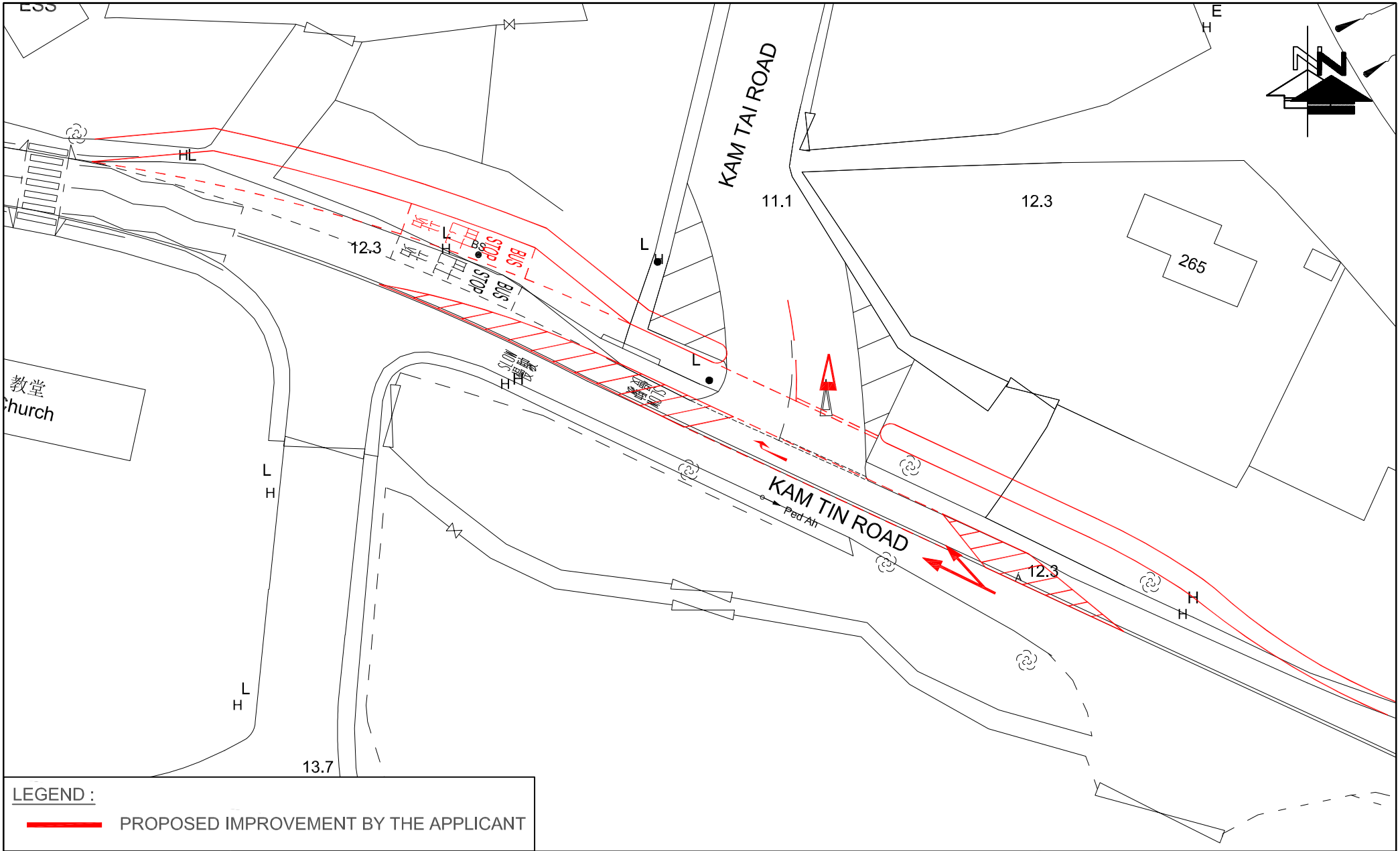


FIGURE NO.: 5.1	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	CTA Consultants Limited 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		

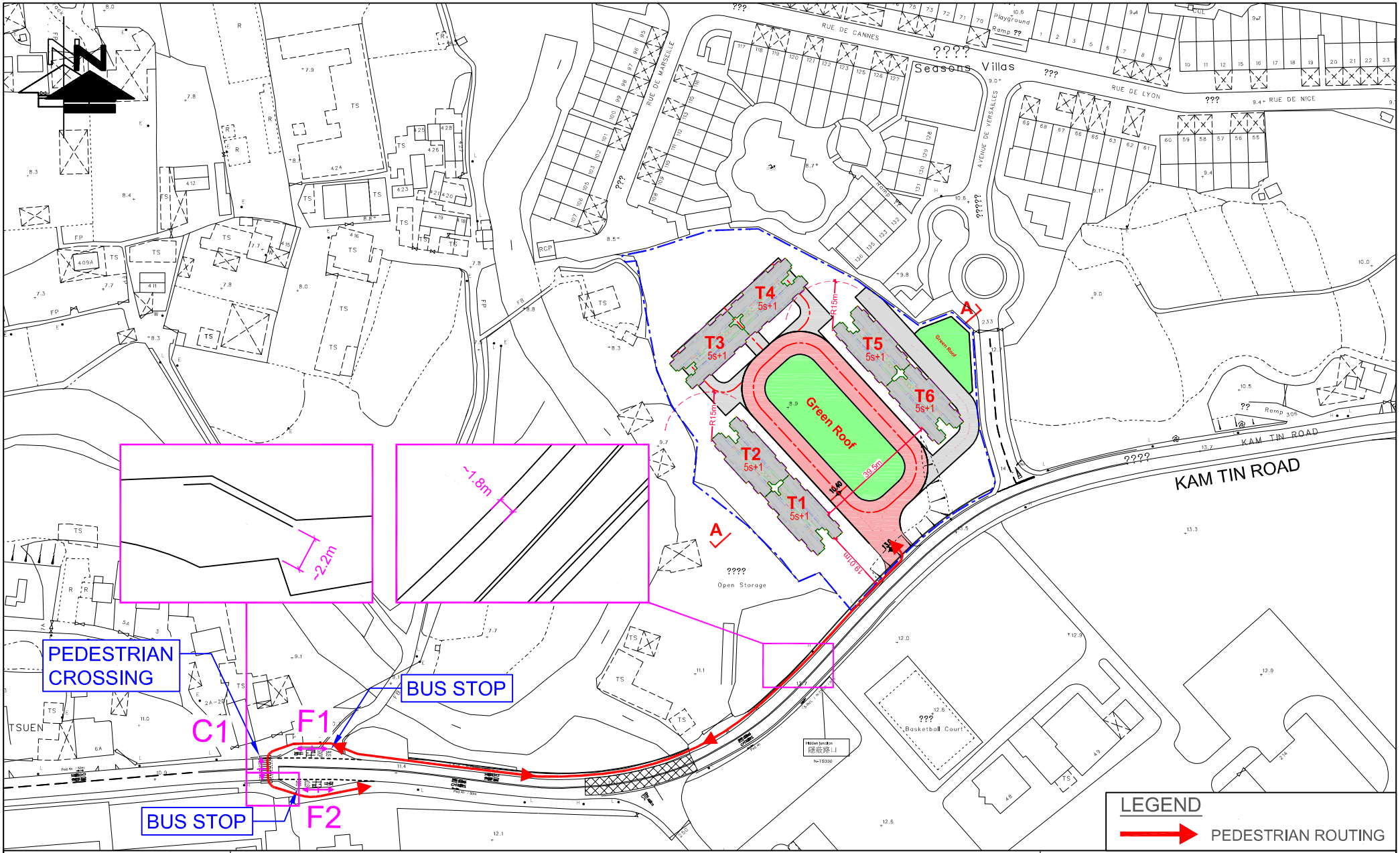


FIGURE NO.: 7.1	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	CTA Consultants Limited 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: 10 MAR 2026		

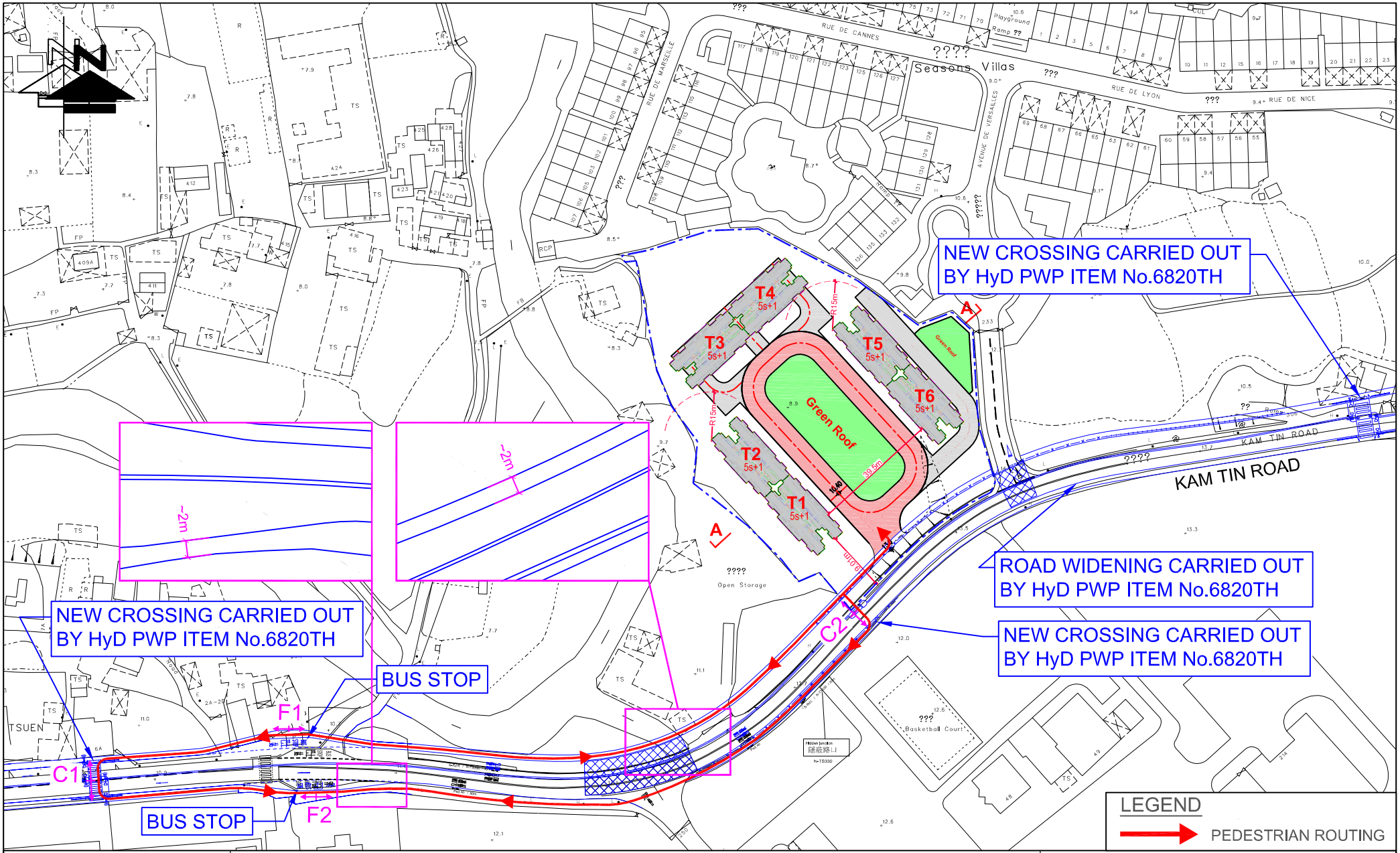


FIGURE NO.: 7.2	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	CTA Consultants Limited 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: 10 MAR 2026		

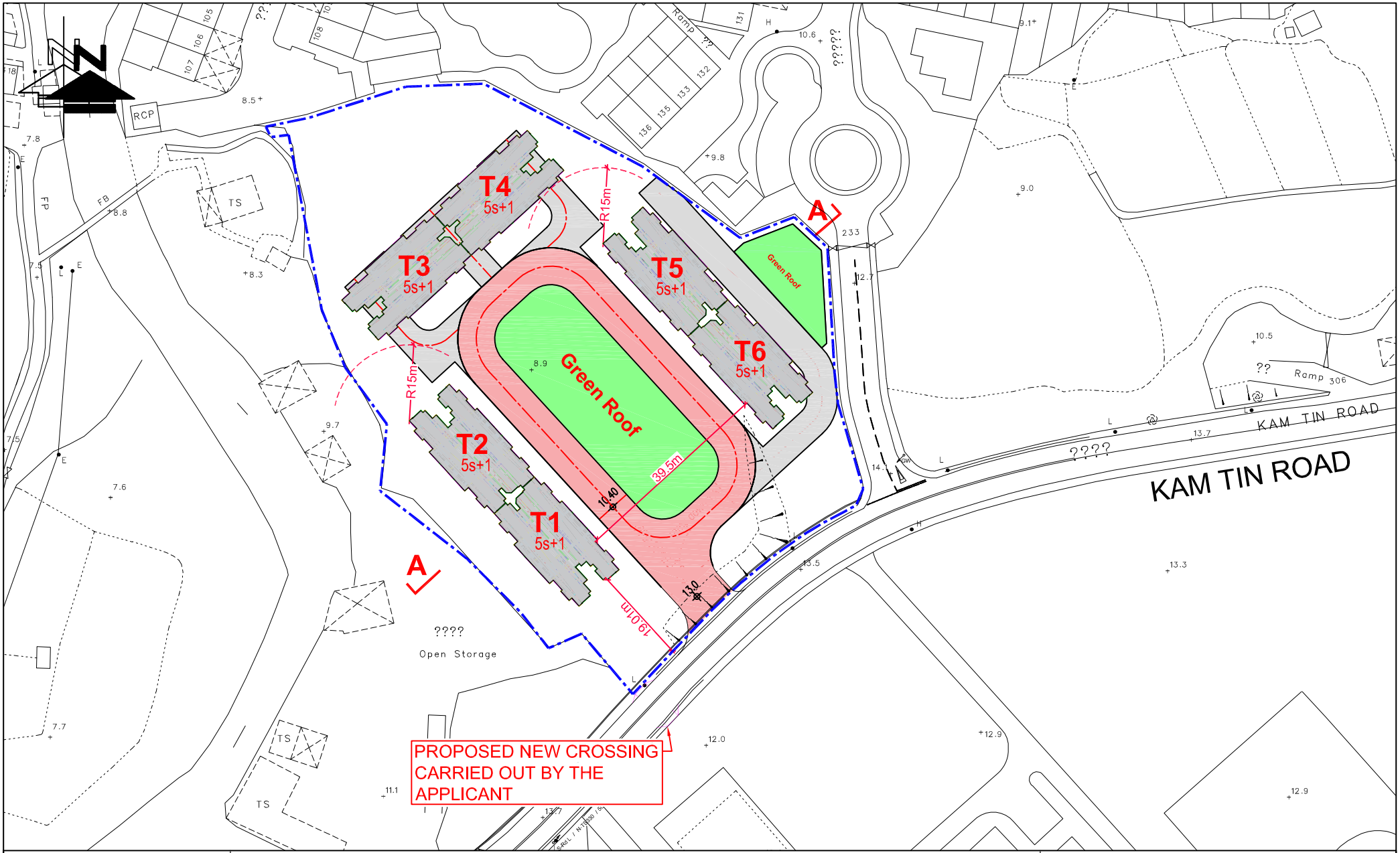
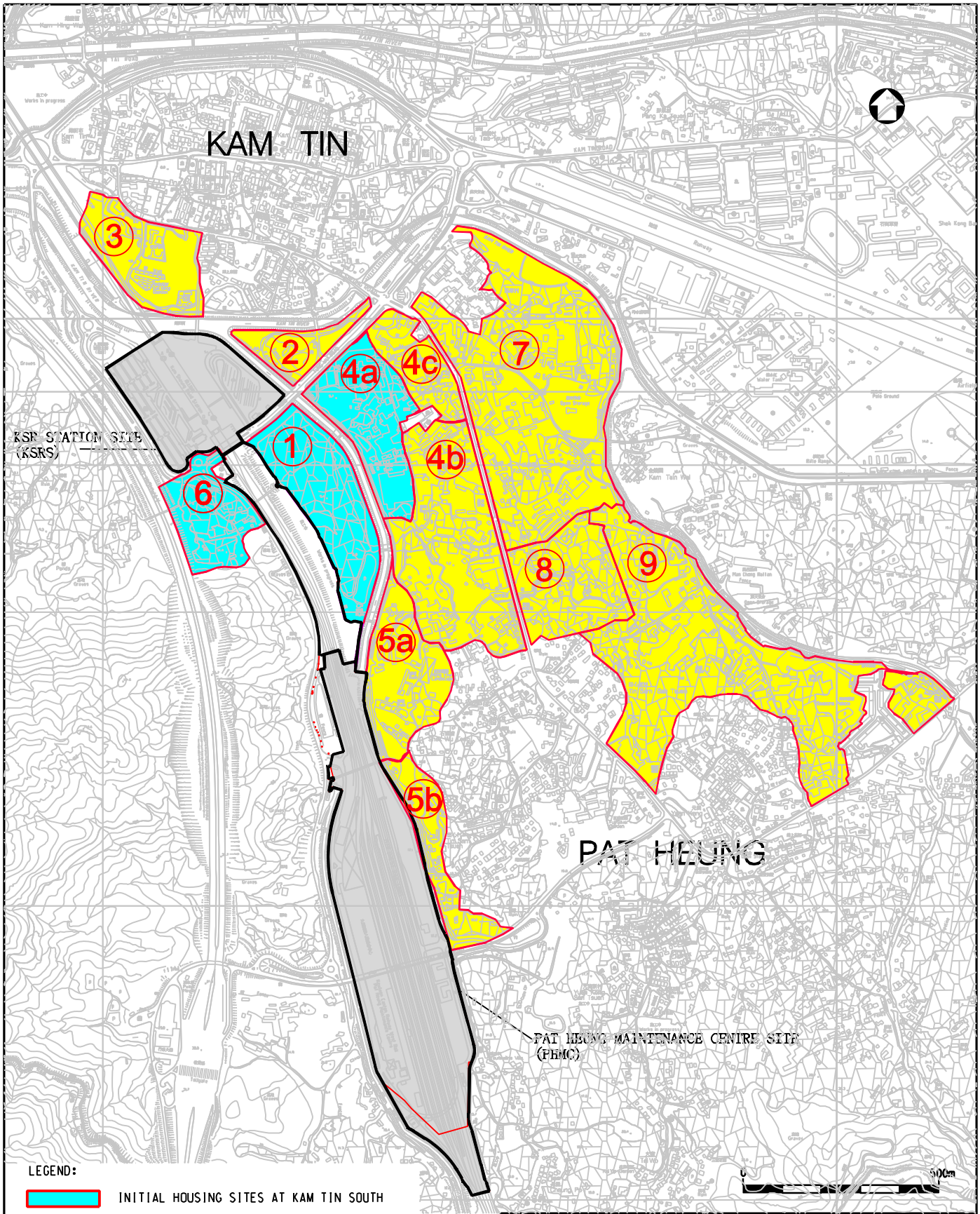


FIGURE NO.: 7.3	PROJECT TITLE: Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.	CTA Consultants Limited 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: 10 MAR 2026		

Appendix I

Kam Tin South Housing Development – Layout Plan



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

圖則名稱 drawing title

KAM TIN SOUTH HOUSING DEVELOPMENT -LAYOUT PLAN

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.	CEDD 土木工程拓展署 CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
K L CHEUNG	SIGNED	18.10.13	NTNZ1855A	

*ate filename (Updated as at 30 JUL 2014) L:\Drawing-MS\NTnz1855-1856\NTnz1855A.dgn A3 297MM X 420MM

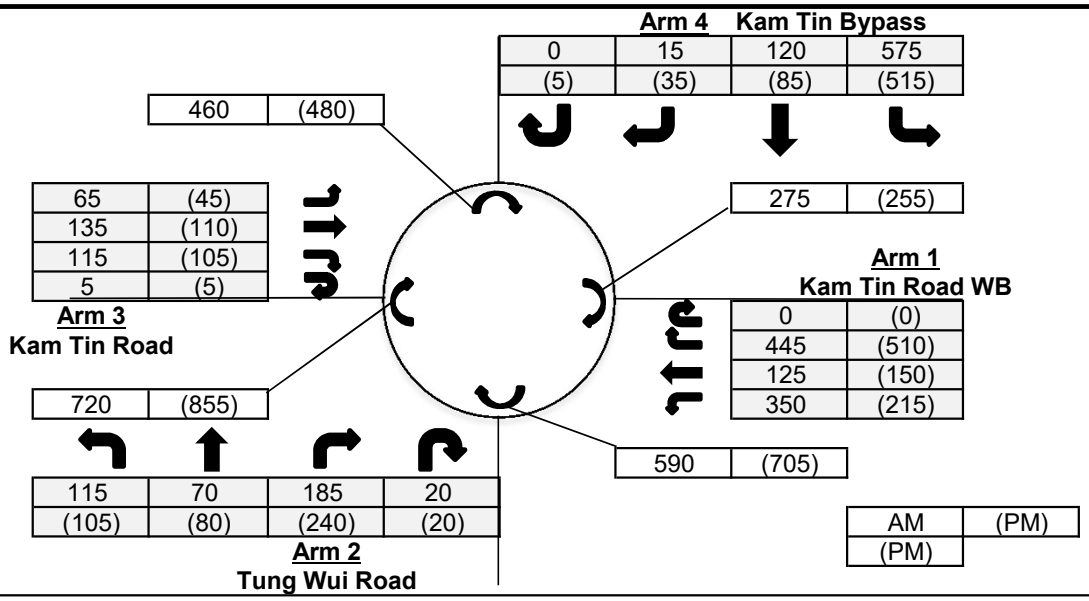
Appendix II

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	AM	275	590	720	460
		across entry	PM	255	705	855	480

Output Parameters				Arm 1	Arm 2	Arm 3	Arm 4
S	=	Sharpness of flare = 1.6*(E-V)/L		0.53	0.49	0.94	0.79
K	=	1-0.00347*(A-30)-0.978*(1/R-0.05)		0.97	1.01	0.94	1.05
X_2	=	V+((E-V)/(1+2*S))		9.33	8.66	6.45	9.70
M	=	Exp((D-60)/10)		1.49	1.49	1.49	1.49
F	=	303*X_2		2828	2624	1955	2938
Td	=	1+(0.5/(1+M))		1.20	1.20	1.20	1.20
Fc	=	0.21*Td*(1+0.2*X_2)		0.72	0.69	0.58	0.74
Qe	=	Capacity = K*(F-Fc*Qc)	AM	2549	2240	1453	2717
			PM	2563	2160	1379	2701
DFC	=	Entry Flow/Capacity = Q/Qe	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

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TRAFFIC SIGNALS CALCULATION Job No: 25009HK **CTA Consultants Ltd.**

Junction: **(B) Kam Tin Bypass / Kong Tai Road**

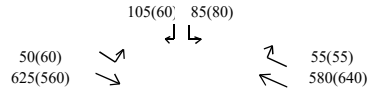
Description: **2025 Observed Traffic Flows**

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:

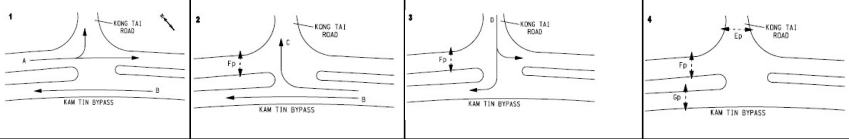
Traffic Flow (pcu / hr)



A.M. Check Phase	
εy	0.319
L (sec)	47
C (sec)	108
y pract.	0.508
R.C. (%)	59%

P.M. Check Phase	
εy	0.267
L (sec)	47
C (sec)	108
y pract.	0.508
R.C. (%)	90%

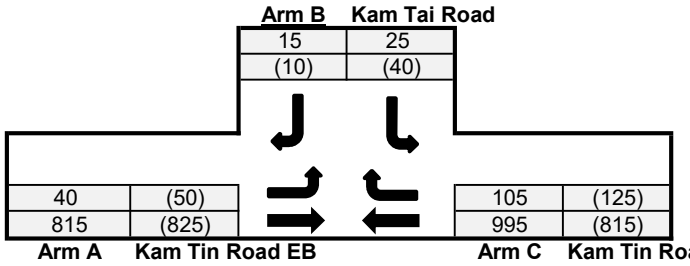
Stage/Phase Diagram:



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		



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

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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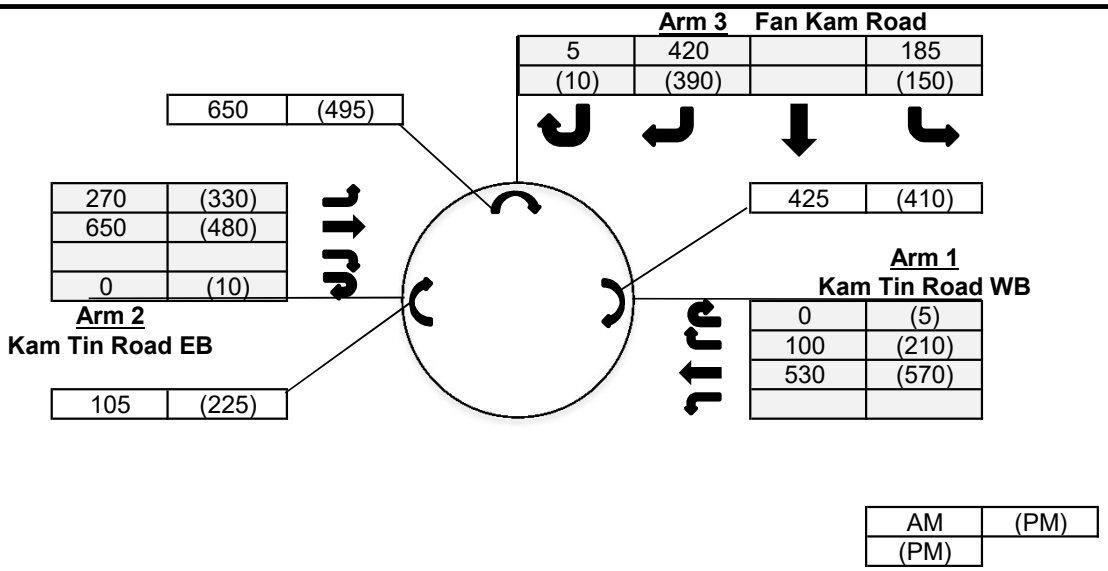
Roundabout Junction Calculation

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

Scenario : 2025 Observed Traffic Flows



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	AM	425	105	650
		across entry	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
X_2	=	V+((E-V)/(1+2*S))		4.64	7.79	4.50
M	=	Exp((D-60)/10)		0.02	0.02	0.02
F	=	303*X_2		1406	2360	1365
Td	=	1+(0.5/(1+M))		1.49	1.49	1.49
Fc	=	0.21*Td*(1+0.2*X_2)		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.

TRAFFIC SIGNALS CALCULATION Job No. 25009HK **CTA Consultants Ltd.**

Junction: **(E) Kam Tin 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 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)

870(830) → ← 915(860)

A.M. Check Phase	
εy	0.468
L (sec)	20
C (sec)	120
y pract.	0.750
R.C. (%)	60%

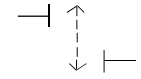
P.M. Check Phase	
εy	0.440
L (sec)	20
C (sec)	120
y pract.	0.750
R.C. (%)	70%

Stage/Phase Diagram:

1 →

←

2



I/G = 5s

I/G = 4s + 12s

TRAFFIC SIGNALS CALCULATION Job No: 25009HK **CTA Consultants Ltd.**

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) Left	Radius (m) Right	Nearside 0/1	Pro. Turning (%) A.M.	Pro. Turning (%) P.M.	Revised Saturation Flow (pcu/hr) A.M.	Revised Saturation Flow (pcu/hr) P.M.	A.M. Peak Flow (pcu/hr)	A.M. Peak y Value	A.M. Peak Critical y	P.M. Peak Flow (pcu/hr)	P.M. Peak y Value	P.M. Peak Critical y
Kam 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	0.445
	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	0.183
	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) →	εy	0.619	εy	0.628
	↰ 155(315) ↱ 65(110)	L (sec)	15	L (sec)	15
	← 1730(1790)	C (sec)	96	C (sec)	106
	↓ 345(140)	y pract.	0.759	y pract.	0.773
		R.C. (%)	23%	R.C. (%)	23%

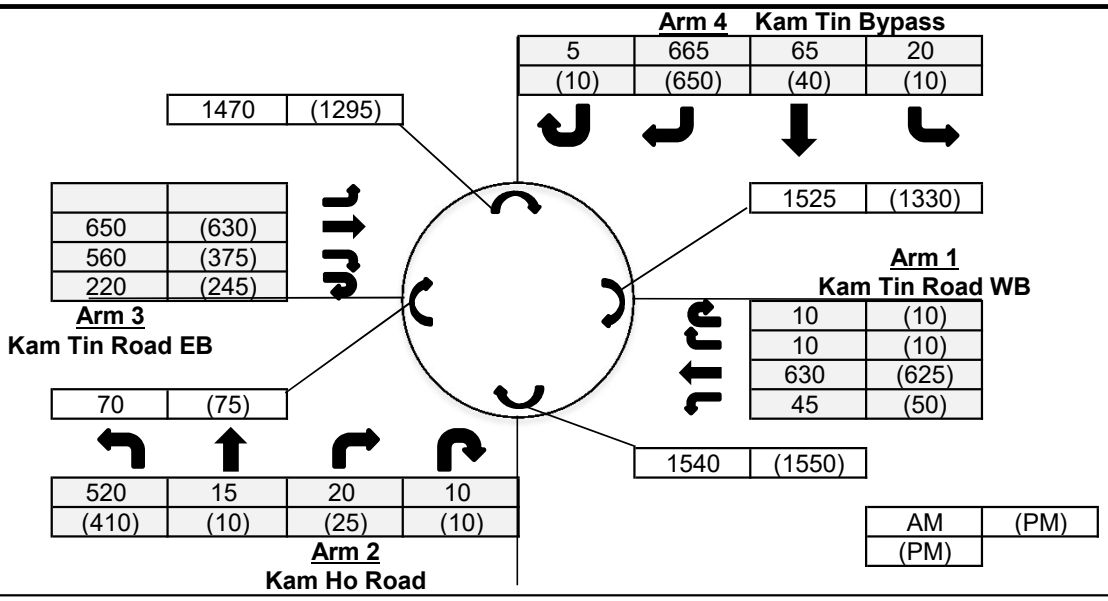
Stage / Phase Diagrams

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				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	AM	1525	1540	70	1470
		across entry	PM	1330	1550	75	1295

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
X_2	=	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*X_2		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*X_2)		0.49	0.51	0.62	0.60
Qe	=	Capacity = K*(F-Fc*Qc)	AM	1225	1254	2836	1779
			PM	1326	1249	2833	1883
DFC	=	Entry Flow/Capacity = Q/Qe	AM	0.57	0.45	0.50	0.42
			PM	0.52	0.36	0.44	0.38

DFC of Critical Approach = AM 0.57
PM 0.52

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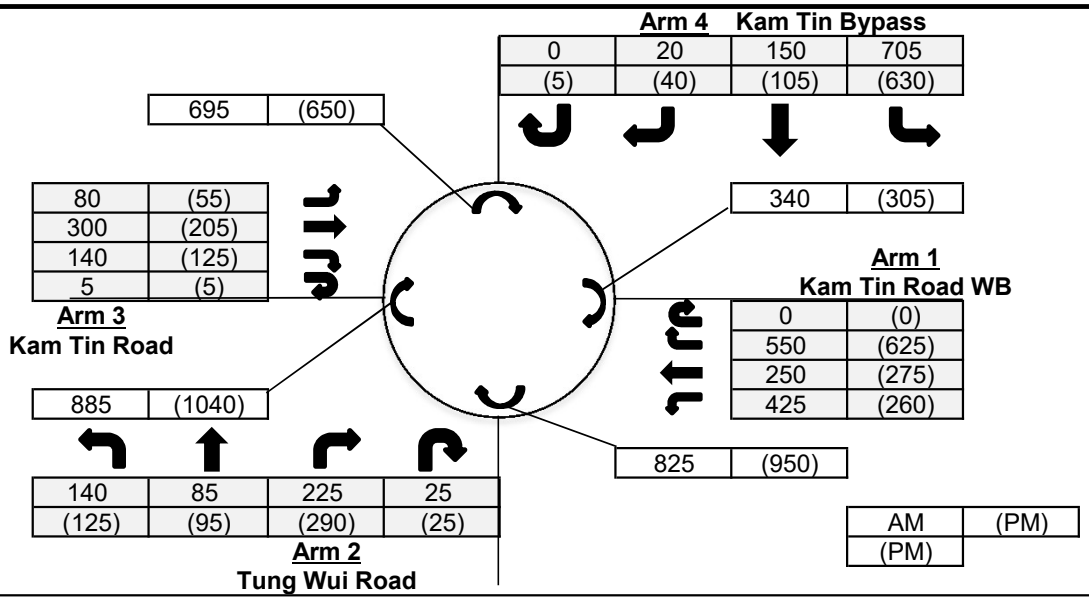
Roundabout Junction Calculation

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	AM	340	825	885	695
		across entry	PM	305	950	1040	650

Output Parameters				Arm 1	Arm 2	Arm 3	Arm 4
S	=	Sharpness of flare = 1.6*(E-V)/L		0.53	0.49	0.94	0.79
K	=	1-0.00347*(A-30)-0.978*(1/R-0.05)		0.97	1.01	0.94	1.05
X_2	=	V+((E-V)/(1+2*S))		9.33	8.66	6.45	9.70
M	=	Exp((D-60)/10)		1.49	1.49	1.49	1.49
F	=	303*X_2		2828	2624	1955	2938
Td	=	1+(0.5/(1+M))		1.20	1.20	1.20	1.20
Fc	=	0.21*Td*(1+0.2*X_2)		0.72	0.69	0.58	0.74
Qe	=	Capacity = K*(F-Fc*Qc)	AM	2504	2077	1363	2534
			PM	2528	1990	1278	2569
DFC	=	Entry Flow/Capacity = Q/Qe	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

CTA Consultants Ltd.

TRAFFIC SIGNALS CALCULATION Job No: 25009HK **CTA Consultants Ltd.**

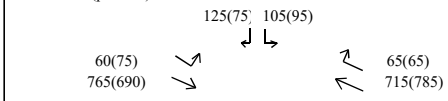
Junction: **(B) Kam Tin Bypass / Kong Tai Road**

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 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:

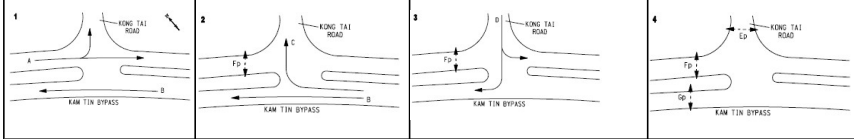
Traffic Flow (pcu / hr)



A.M. Check Phase	
εy	0.389
L (sec)	47
C (sec)	108
y pract.	0.508
R.C. (%)	31%

P.M. Check Phase	
εy	0.327
L (sec)	47
C (sec)	108
y pract.	0.508
R.C. (%)	55%

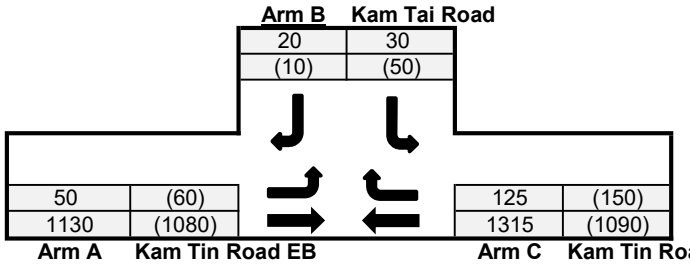
Stage/Phase Diagram:



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		



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

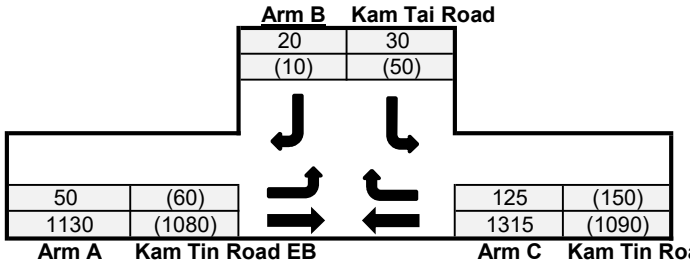
Analysis :	**Traffic Flow pcu/hr**	**AM**	**PM**	**Capacity pcu/hr**	**AM**	**PM**	
	q-CA	1315	1090	Q-BA	31	71	
	q-CB	125	150	Q-BC	440	453	
	q-AB	50	60	Q-CB	387	397	
	q-AC	1130	1080	Q-CA	1219	1121	(If C-B blocked C-A)
	q-BA	20	10	Q-BAC	70	240	(If Minor Road Share LT&RT)
	q-BC	30	50				
	f	0.600	0.833				

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**

CTA Consultants Ltd.

Priority Junction Calculation

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



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

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				

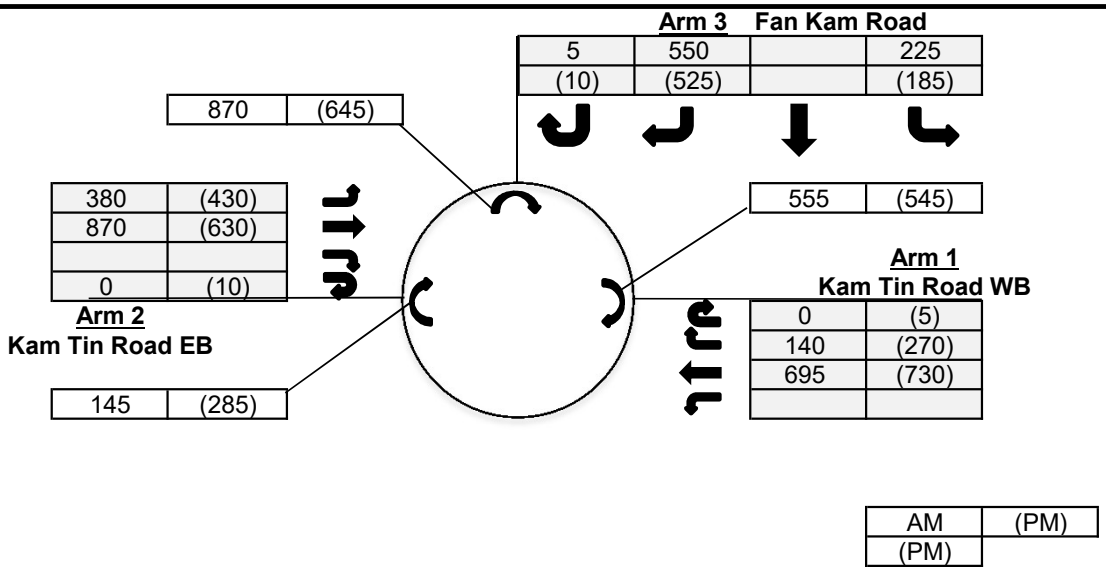
Results :	**Ratio of Flow-to-Capacity**	**AM**	**PM**
	B-A	N/A	N/A
	B-C	N/A	N/A
	C-B	0.25	0.30
	C-A	N/A	N/A
	B-AC	0.21	0.16
	Critical DFC	**0.25**	**0.30**

CTA Consultants Ltd.

Roundabout Junction Calculation

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

Scenario : 2034 Reference Traffic Flows



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	AM	555	145	870
		across entry	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
X_2	=	V+((E-V)/(1+2*S))		4.64	7.79	4.50
M	=	Exp((D-60)/10)		0.02	0.02	0.02
F	=	303*X_2		1406	2360	1365
Td	=	1+(0.5/(1+M))		1.49	1.49	1.49
Fc	=	0.21*Td*(1+0.2*X_2)		0.60	0.80	0.60
Qe	=	Capacity = K*(F-Fc*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

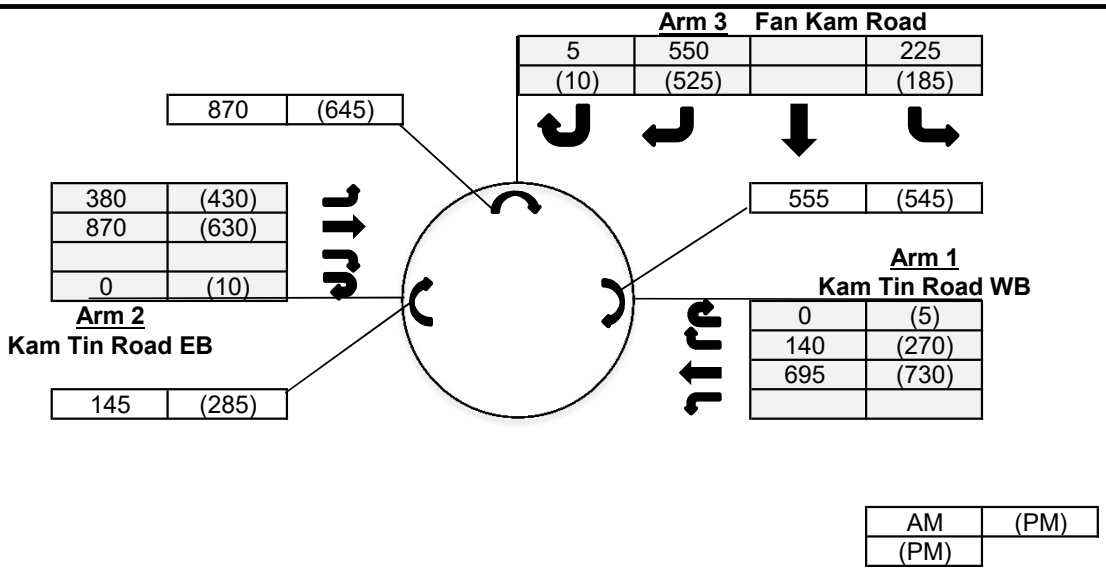
DFC of Critical Approach = AM 0.90
PM 0.90

CTA Consultants Ltd.

Roundabout Junction Calculation

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

Scenario : 2034 Reference Traffic Flows (With Planned Improvement)



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	AM	555	145	870
		across entry	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
X_2	=	V+((E-V)/(1+2*S))		6.07	7.35	5.14
M	=	Exp((D-60)/10)		0.04	0.04	0.04
F	=	303*X_2		1840	2226	1556
Td	=	1+(0.5/(1+M))		1.48	1.48	1.48
Fc	=	0.21*Td*(1+0.2*X_2)		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

CTA Consultants Ltd.

TRAFFIC SIGNALS CALCULATION Job No. 25009HK **CTA Consultants Ltd.**

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)

1200(1090) → ← 1220(1145)

A.M. Check Phase	
εy	0.624
L (sec)	20
C (sec)	120
y pract.	0.750
R.C. (%)	20%

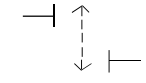
P.M. Check Phase	
εy	0.586
L (sec)	20
C (sec)	120
y pract.	0.750
R.C. (%)	28%

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:

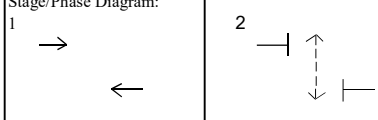
Traffic Flow (pcu / hr)

1200(1090) → ← 1220(1145)

A.M. Check Phase	
εy	0.594
L (sec)	19
C (sec)	120
y pract.	0.758
R.C. (%)	28%

P.M. Check Phase	
εy	0.557
L (sec)	19
C (sec)	120
y pract.	0.758
R.C. (%)	36%

Stage/Phase Diagram:



I/G = 5s I/G = 4s + 11s

TRAFFIC SIGNALS CALCULATION Job No: 25009HK **CTA Consultants Ltd.**

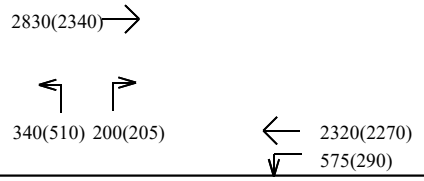
Junction: **(F) Kam Tin Road / Tsing Long Highway Slip Road**
Description: **2034 Reference Traffic Flows (With Planned Improvement)**

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:

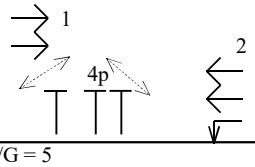
Traffic Flow (pcu / hr) [AM (PM)]



Check Phase		Check Phase	
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%

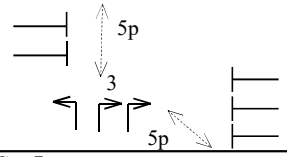
Stage / Phase Diagrams

A



I/G = 5

B

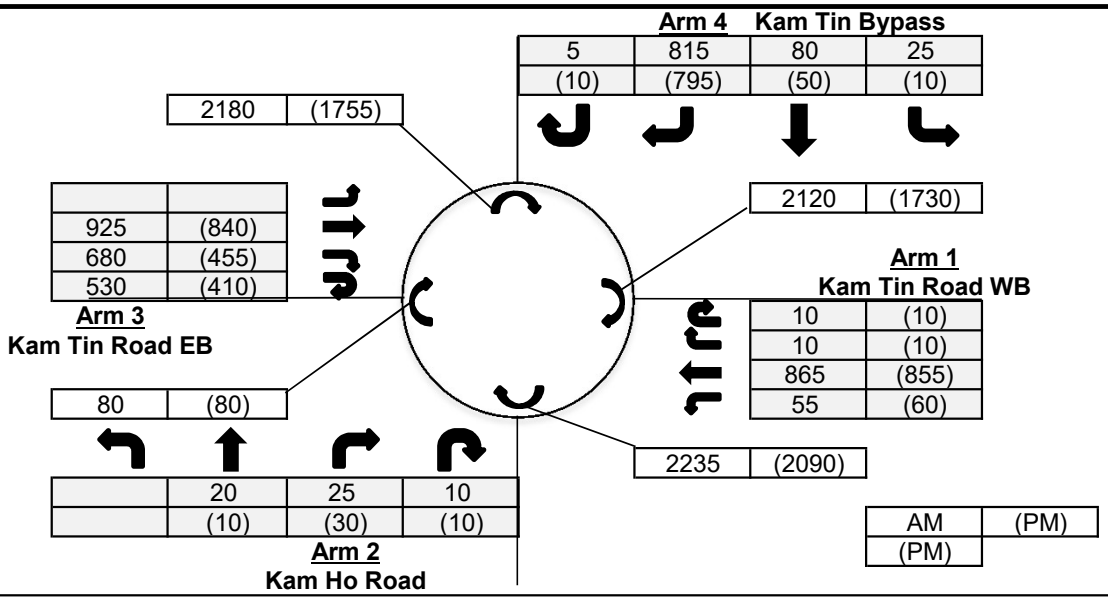


I/G = 7

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	AM	2120	2235	80	2180
		across entry	PM	1730	2090	80	1755

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
X_2	=	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*X_2		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*X_2)		0.63	0.59	0.62	0.60
Qe	=	Capacity = K*(F-Fc*Qc)	AM	1618	1280	2830	1359
			PM	1872	1363	2830	1610
DFC	=	Entry Flow/Capacity = Q/Qe	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

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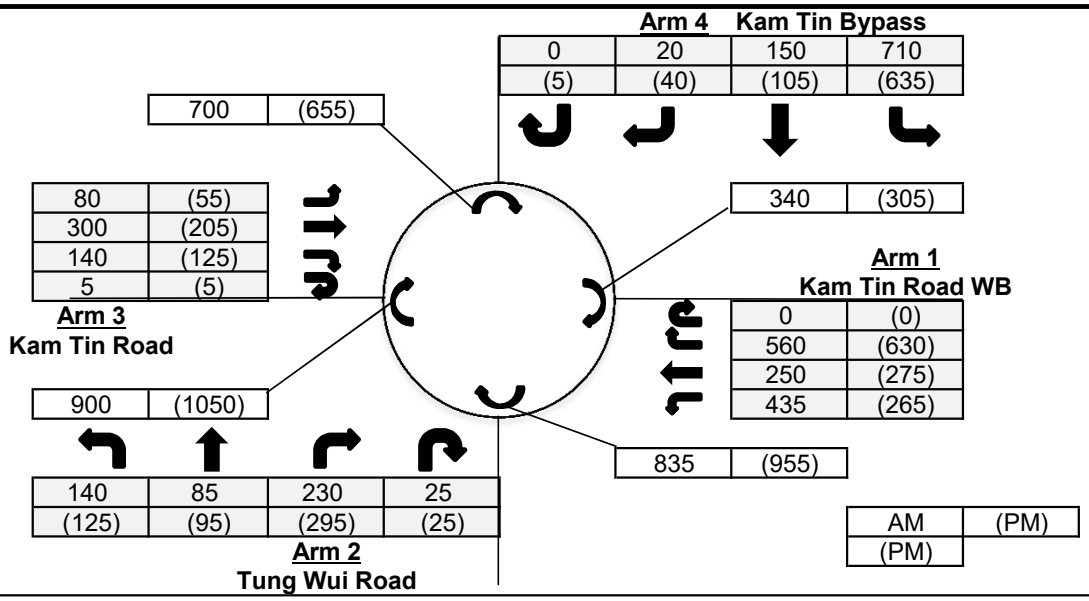
Roundabout Junction Calculation

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	AM	340	835	900	700
		across entry	PM	305	955	1050	655

Output Parameters				Arm 1	Arm 2	Arm 3	Arm 4
S	=	Sharpness of flare = 1.6*(E-V)/L		0.53	0.49	0.94	0.79
K	=	1-0.00347*(A-30)-0.978*(1/R-0.05)		0.97	1.01	0.94	1.05
X_2	=	V+((E-V)/(1+2*S))		9.33	8.66	6.45	9.70
M	=	Exp((D-60)/10)		1.49	1.49	1.49	1.49
F	=	303*X_2		2828	2624	1955	2938
Td	=	1+(0.5/(1+M))		1.20	1.20	1.20	1.20
Fc	=	0.21*Td*(1+0.2*X_2)		0.72	0.69	0.58	0.74
Qe	=	Capacity = K*(F-Fc*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

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TRAFFIC SIGNALS CALCULATION Job No: 25009HK **CTA Consultants Ltd.**

Junction: **(B) Kam Tin Bypass / Kong Tai Road**

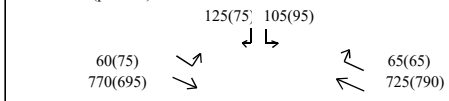
Description: **2034 Design Traffic Flows**

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	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:

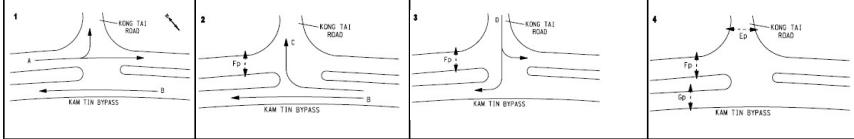
Traffic Flow (pcu / hr)



A.M. Check Phase	
εy	0.390
L (sec)	47
C (sec)	108
y pract.	0.508
R.C. (%)	30%

P.M. Check Phase	
εy	0.329
L (sec)	47
C (sec)	108
y pract.	0.508
R.C. (%)	55%

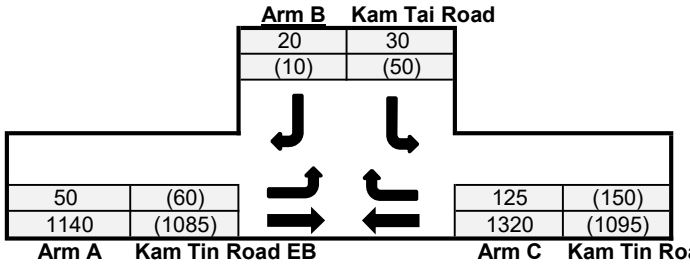
Stage/Phase Diagram:



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		



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	V-rBA	50	w-BA	4.7	D	0.968
W-CR	0	V-IBA	50	w-BC	4.7	E	1.029
C-B blocked C-A, residual width <2.5m? (Yes: 1, No: 0)	1	V-rBC	50	w-CB	3.5	F	0.924
Minor Road Share LT&RT? (Yes: 1, No: 0)	1	V-rCB	50			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	1215	1119	(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	1.09	0.98
	B-AC	0.80	0.26
	Critical DFC	**1.09**	**0.98**

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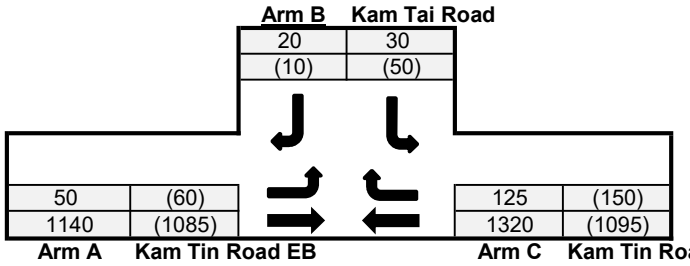
Priority Junction Calculation

Junction : (C) Kam Tin Road / Kam Tai Road Job No.: 25009HK

Scenario : 2034 Design Traffic Flows (With Planned Improvement)



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

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	(If C-B blocked C-A)
	q-BA	20	10	Q-BAC	237	380	(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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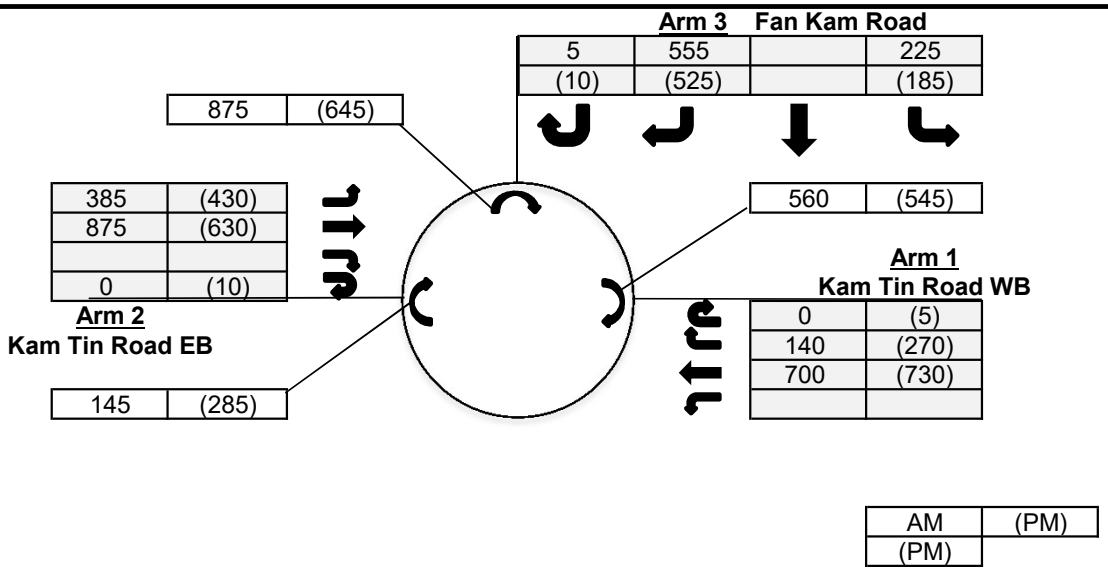
Roundabout Junction Calculation

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

Scenario : 2034 Design Traffic Flows



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	AM	560	145	875
		across entry	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
X_2	=	V+((E-V)/(1+2*S))		4.64	7.79	4.50
M	=	Exp((D-60)/10)		0.02	0.02	0.02
F	=	303*X_2		1406	2360	1365
Td	=	1+(0.5/(1+M))		1.49	1.49	1.49
Fc	=	0.21*Td*(1+0.2*X_2)		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

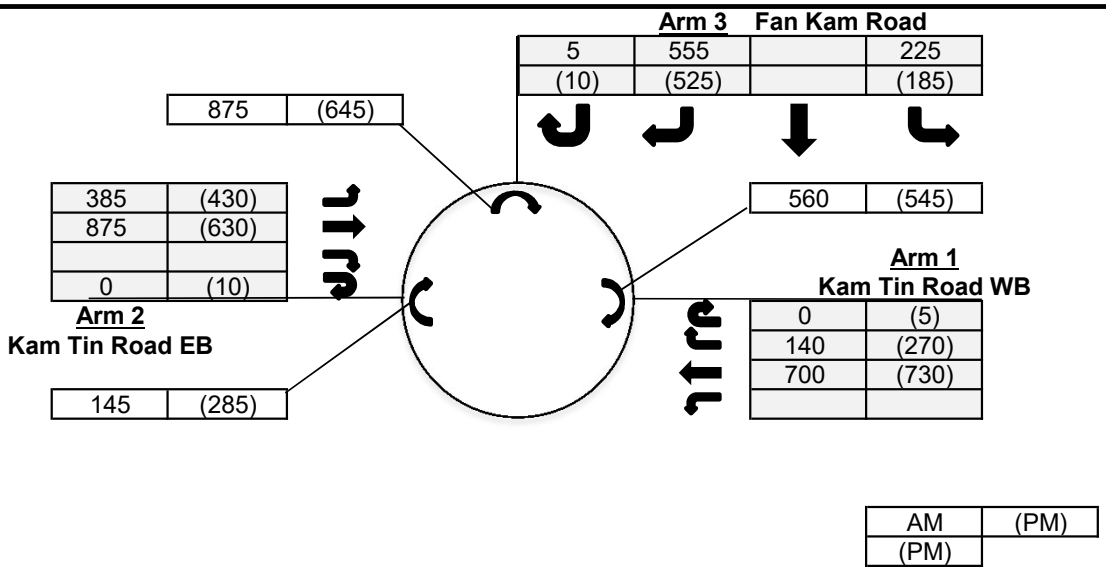
DFC of Critical Approach = AM 0.90
PM 0.90

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)



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	AM	560	145	875
		across entry	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
X_2	=	V+((E-V)/(1+2*S))		6.07	7.35	5.14
M	=	Exp((D-60)/10)		0.04	0.04	0.04
F	=	303*X_2		1840	2226	1556
Td	=	1+(0.5/(1+M))		1.48	1.48	1.48
Fc	=	0.21*Td*(1+0.2*X_2)		0.69	0.77	0.63
Qe	=	Capacity = K*(F-Fc*Qc)	AM	1496	2234	1050
			PM	1507	2120	1201
DFC	=	Entry Flow/Capacity = Q/Qe	AM	0.56	0.56	0.75
			PM	0.67	0.50	0.60

DFC of Critical Approach = AM 0.75
PM 0.67

CTA Consultants Ltd.

TRAFFIC SIGNALS CALCULATION 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 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	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)

1215(1100) → ← 1240(1150)

A.M. Check Phase	
εy	0.634
L (sec)	20
C (sec)	120
y pract.	0.750
R.C. (%)	18%

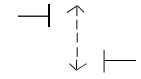
P.M. Check Phase	
εy	0.588
L (sec)	20
C (sec)	120
y pract.	0.750
R.C. (%)	28%

Stage/Phase Diagram:

1 →

←

2



I/G = 5s

I/G = 4s + 12s

TRAFFIC SIGNALS CALCULATION Job No. 25009HK **CTA Consultants Ltd.**

Junction: **(E) Kam Tin Road**

Description: **2034 Design 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	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:

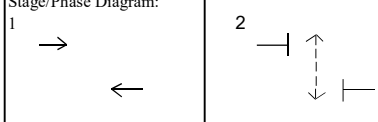
Traffic Flow (pcu / hr)

1215(1100) → ← 1240(1150)

A.M. Check Phase	
εy	0.603
L (sec)	19
C (sec)	120
y pract.	0.758
R.C. (%)	26%

P.M. Check Phase	
εy	0.560
L (sec)	19
C (sec)	120
y pract.	0.758
R.C. (%)	35%

Stage/Phase Diagram:



I/G = 5s

I/G = 4s + 11s

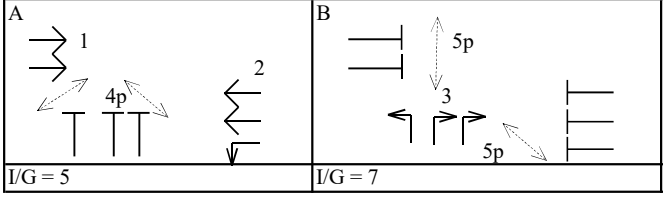
TRAFFIC SIGNALS CALCULATION Job No: 25009HK **CTA Consultants Ltd.**

Junction: **(F) Kam Tin Road / Tsing Long Highway Slip Road**
Description: **2034 Design Traffic Flows (With Planned Improvement)**

Approach	Direction	Movement notation	Phase	Stage	Width (m)	Radius (m) Left	Radius (m) Right	Nearside 0/1	Pro. Turning (%) A.M.	Pro. Turning (%) P.M.	Revised Saturation Flow (pcu/hr) A.M.	Revised Saturation Flow (pcu/hr) P.M.	A.M. Peak Flow (pcu/hr)	A.M. Peak y Value	A.M. Peak Critical y	P.M. Peak Flow (pcu/hr)	P.M. Peak y Value	P.M. Peak Critical y
Kam 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	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	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) →	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
	340(510) 205(210) ← 2320(2270)	R.C. (%)	30%	R.C. (%)	24%
	↓ 585(295)				

Stage / Phase Diagrams

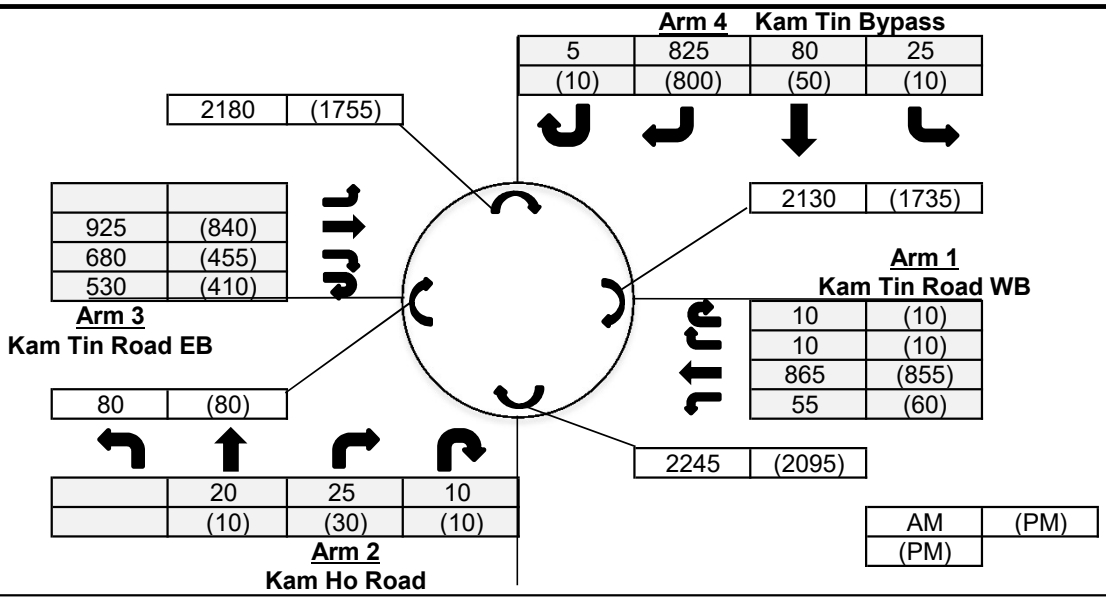


I/G = 5 I/G = 7

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	AM	2130	2245	80	2180
		across entry	PM	1735	2095	80	1755

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
X_2	=	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*X_2		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*X_2)		0.63	0.59	0.62	0.60
Qe	=	Capacity = K*(F-Fc*Qc)	AM	1612	1274	2830	1359
			PM	1869	1360	2830	1610
DFC	=	Entry Flow/Capacity = Q/Qe	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

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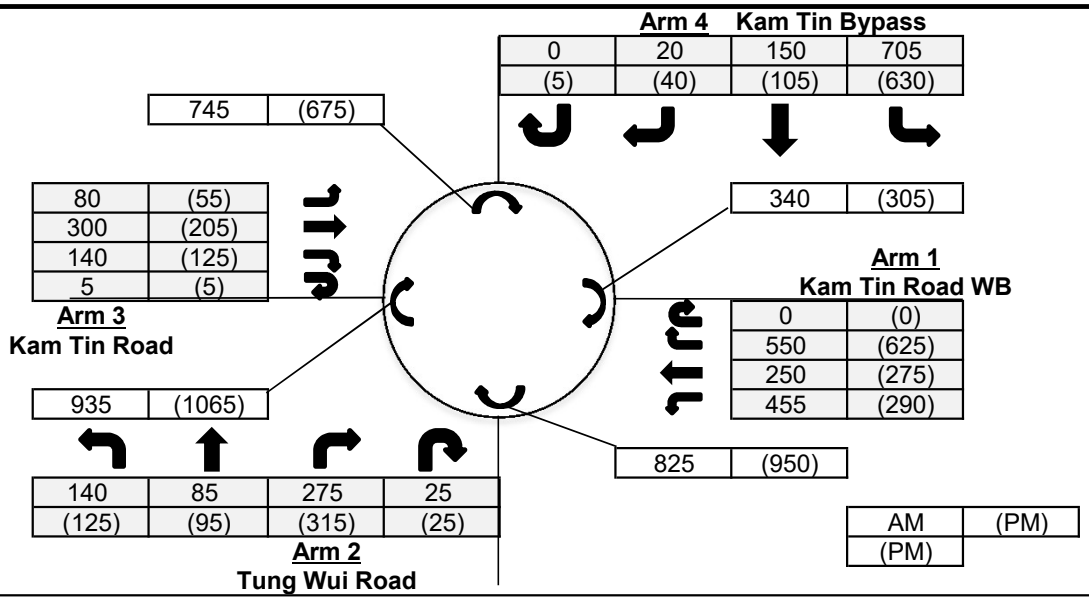
Roundabout Junction Calculation

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	AM	340	825	935	745
		across entry	PM	305	950	1065	675

Output Parameters				Arm 1	Arm 2	Arm 3	Arm 4
S	=	Sharpness of flare = 1.6*(E-V)/L		0.53	0.49	0.94	0.79
K	=	1-0.00347*(A-30)-0.978*(1/R-0.05)		0.97	1.01	0.94	1.05
X_2	=	V+((E-V)/(1+2*S))		9.33	8.66	6.45	9.70
M	=	Exp((D-60)/10)		1.49	1.49	1.49	1.49
F	=	303*X_2		2828	2624	1955	2938
Td	=	1+(0.5/(1+M))		1.20	1.20	1.20	1.20
Fc	=	0.21*Td*(1+0.2*X_2)		0.72	0.69	0.58	0.74
Qe	=	Capacity = K*(F-Fc*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

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TRAFFIC SIGNALS CALCULATION Job No: 25009HK **CTA Consultants Ltd.**

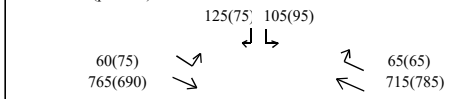
Junction: **(B) Kam Tin Bypass / Kong Tai Road**

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

Approach	Direction	Movement notation	Phase	Stage	Width (m)	Radius (m)		Nearside 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	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:

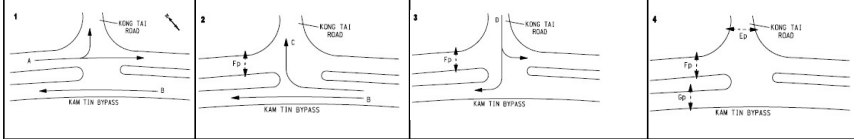
Traffic Flow (pcu / hr)



A.M. Check Phase	
εy	0.389
L (sec)	47
C (sec)	108
y pract.	0.508
R.C. (%)	31%

P.M. Check Phase	
εy	0.327
L (sec)	47
C (sec)	108
y pract.	0.508
R.C. (%)	55%

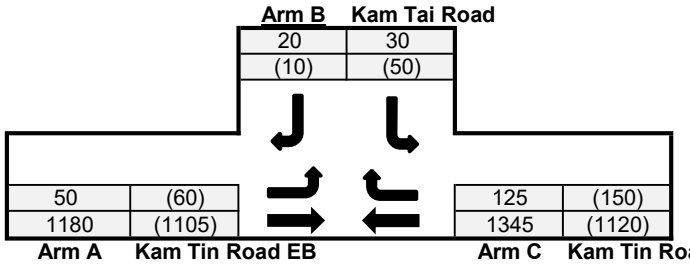
Stage/Phase Diagram:



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)		



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

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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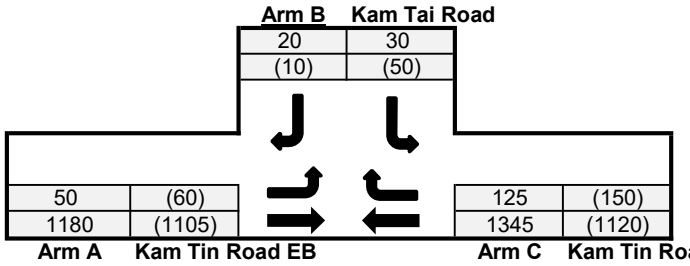
Priority Junction Calculation

Junction : (C) Kam Tin Road / Kam Tai Road Job No.: 25009HK

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



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	V-rBA	50	w-BA	4.7	D	0.968
W-CR	0	V-IBA	50	w-BC	4.7	E	1.029
C-B blocked C-A, residual width <2.5m? (Yes: 1, No: 0)	0	V-rBC	50	w-CB	4.7	F	1.029
Minor Road Share LT&RT? (Yes: 1, No: 0)	1	V-rCB	50			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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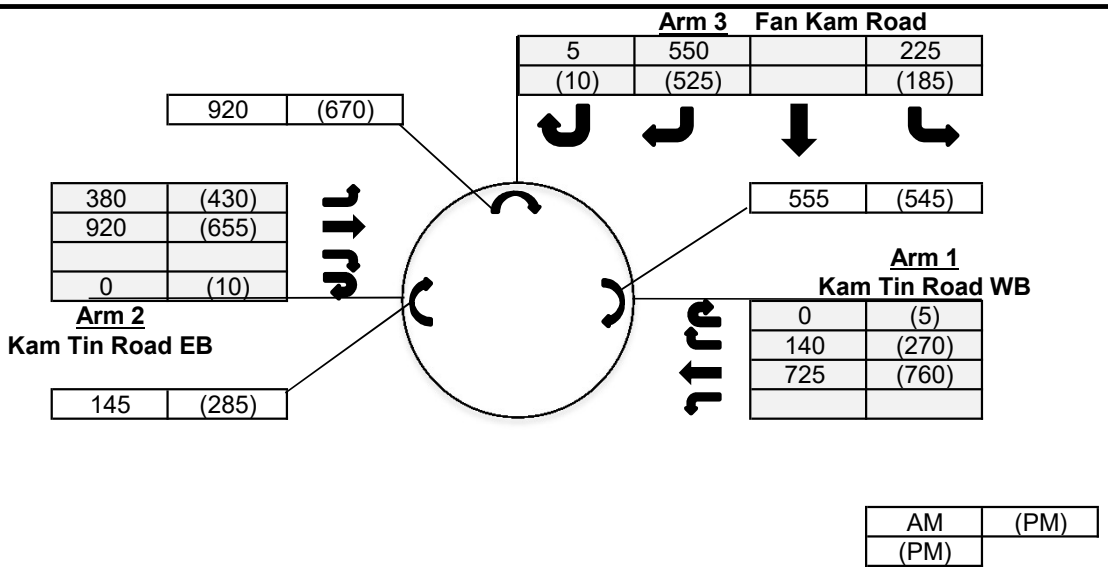
Roundabout Junction Calculation

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

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



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	780
			PM	1035	1095	720
Qc	=	Circulating flow	AM	555	145	920
		across entry	PM	545	285	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
X_2	=	V+((E-V)/(1+2*S))		4.64	7.79	4.50
M	=	Exp((D-60)/10)		0.02	0.02	0.02
F	=	303*X_2		1406	2360	1365
Td	=	1+(0.5/(1+M))		1.49	1.49	1.49
Fc	=	0.21*Td*(1+0.2*X_2)		0.60	0.80	0.60
Qe	=	Capacity = K*(F-Fc*Qc)	AM	1112	2443	840
			PM	1119	2321	993
DFC	=	Entry Flow/Capacity = Q/Qe	AM	0.78	0.53	0.93
			PM	0.93	0.47	0.73

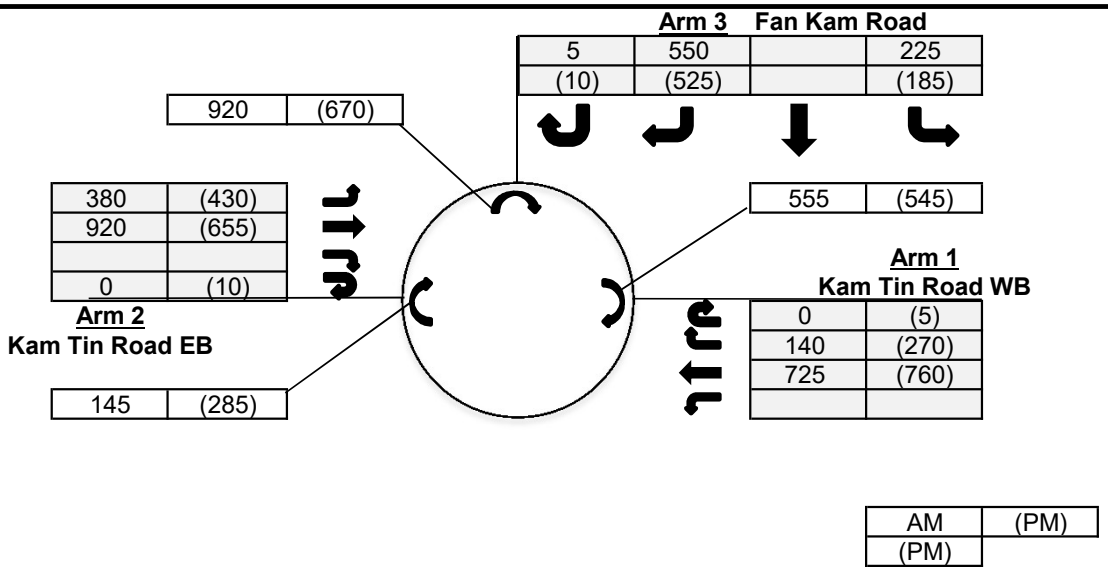
DFC of Critical Approach = AM 0.93
PM 0.93

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) (With Planned Improvement)



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	AM	555	145	920
		across entry	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
X_2	=	V+((E-V)/(1+2*S))		6.07	7.35	5.14
M	=	Exp((D-60)/10)		0.04	0.04	0.04
F	=	303*X_2		1840	2226	1556
Td	=	1+(0.5/(1+M))		1.48	1.48	1.48
Fc	=	0.21*Td*(1+0.2*X_2)		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

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TRAFFIC SIGNALS CALCULATION 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)

1250(1115) → ← 1250(1175)

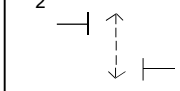
A.M. Check Phase	
εy	0.639
L (sec)	20
C (sec)	120
y pract.	0.750
R.C. (%)	17%

P.M. Check Phase	
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

TRAFFIC SIGNALS CALCULATION 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 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	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:

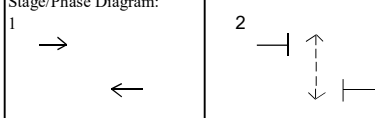
Traffic Flow (pcu / hr)

1250(1115) → ← 1250(1175)

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:



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) Left	Radius (m) Right	Nearside 0/1	Pro. Turning (%) A.M.	Pro. Turning (%) P.M.	Revised Saturation Flow (pcu/hr) A.M.	Revised Saturation Flow (pcu/hr) P.M.	A.M. Peak Flow (pcu/hr)	A.M. Peak y Value	A.M. Peak Critical y	P.M. Peak Flow (pcu/hr)	P.M. Peak y Value	P.M. Peak Critical y
Kam 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	

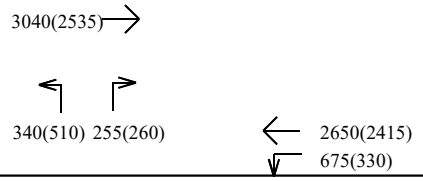
*Pedestrian Crossing

4p A Min. Crossing Time = 7 Gm + 7 Fm = 14s

5p B Min. Crossing Time = 7 Gm + 7 Fm = 14s

Notes:

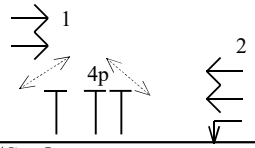
Traffic Flow (pcu / hr) [AM (PM)]



Check Phase		Check Phase	
εy	0.710	εy	0.699
L (sec)	10	L (sec)	10
C (sec)	120	C (sec)	120
y pract.	0.825	y pract.	0.825
R.C. (%)	16%	R.C. (%)	18%

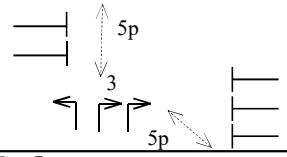
Stage / Phase Diagrams

A



I/G = 5

B

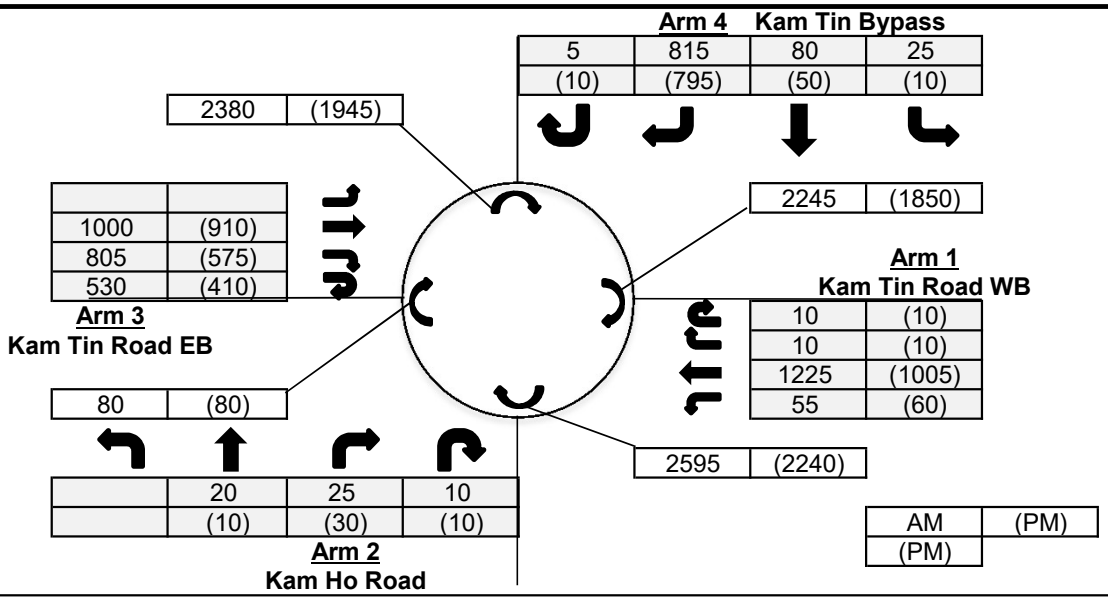


I/G = 7

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	55	2335	925
			PM	1085	50	1895	865
Qc	=	Circulating flow	AM	2245	2595	80	2380
		across entry	PM	1850	2240	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
X_2	=	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*X_2		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*X_2)		0.63	0.59	0.62	0.60
Qe	=	Capacity = K*(F-Fc*Qc)	AM	1537	1072	2830	1240
			PM	1794	1277	2830	1498
DFC	=	Entry Flow/Capacity = Q/Qe	AM	0.85	0.05	0.83	0.75
			PM	0.60	0.04	0.67	0.58

DFC of Critical Approach = AM 0.85
PM 0.67

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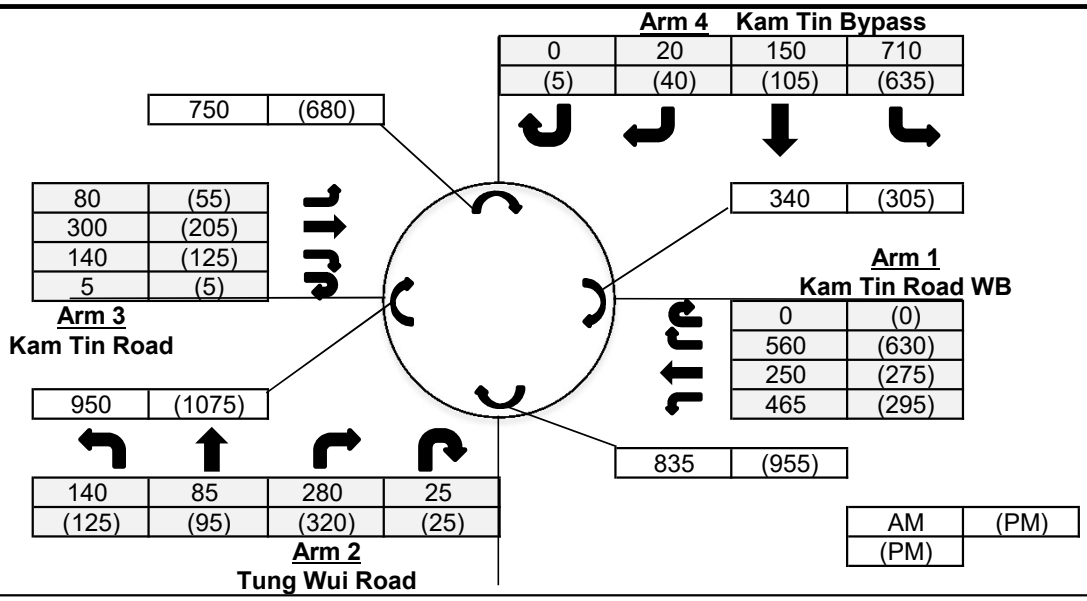
Roundabout Junction Calculation

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	AM	340	835	950	750
		across entry	PM	305	955	1075	680

Output Parameters				Arm 1	Arm 2	Arm 3	Arm 4
S	=	Sharpness of flare = 1.6*(E-V)/L		0.53	0.49	0.94	0.79
K	=	1-0.00347*(A-30)-0.978*(1/R-0.05)		0.97	1.01	0.94	1.05
X_2	=	V+((E-V)/(1+2*S))		9.33	8.66	6.45	9.70
M	=	Exp((D-60)/10)		1.49	1.49	1.49	1.49
F	=	303*X_2		2828	2624	1955	2938
Td	=	1+(0.5/(1+M))		1.20	1.20	1.20	1.20
Fc	=	0.21*Td*(1+0.2*X_2)		0.72	0.69	0.58	0.74
Qe	=	Capacity = K*(F-Fc*Qc)	AM	2504	2070	1327	2492
			PM	2528	1986	1259	2546
DFC	=	Entry Flow/Capacity = Q/Qe	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

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TRAFFIC SIGNALS CALCULATION Job No: 25009HK **CTA Consultants Ltd.**

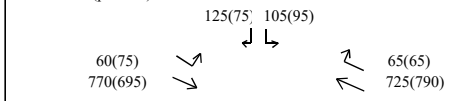
Junction: **(B) Kam Tin Bypass / Kong Tai Road**

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:

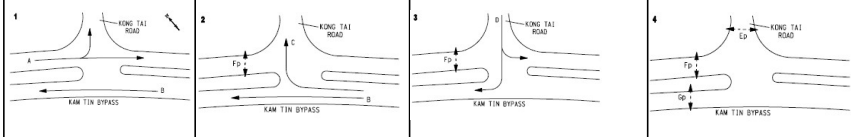
Traffic Flow (pcu / hr)



A.M. Check Phase	
εy	0.390
L (sec)	47
C (sec)	108
y pract.	0.508
R.C. (%)	30%

P.M. Check Phase	
εy	0.329
L (sec)	47
C (sec)	108
y pract.	0.508
R.C. (%)	55%

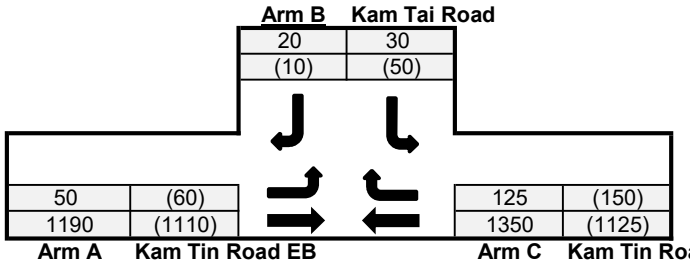
Stage/Phase Diagram:



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

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

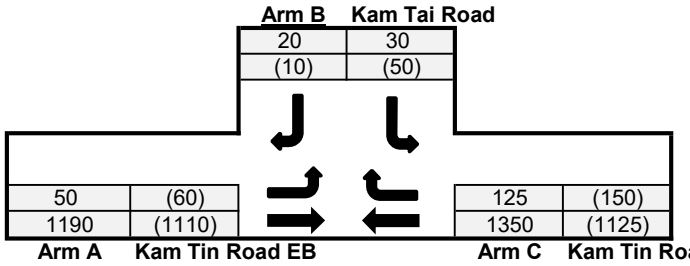
Results :	**Ratio of Flow-to-Capacity**	**AM**	**PM**
	B-A	N/A	N/A
	B-C	N/A	N/A
	C-B	0.34	0.38
	C-A	1.13	1.02
	B-AC	2.32	0.29
	Critical DFC	**2.32**	**1.02**

CTA Consultants Ltd.

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)



	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	V-rBA	50	w-BA	4.7	D	0.968
W-CR	0	V-IBA	50	w-BC	4.7	E	1.029
C-B blocked C-A, residual width <2.5m? (Yes: 1, No: 0)	0	V-rBC	50	w-CB	4.7	F	1.029
Minor Road Share LT&RT? (Yes: 1, No: 0)	1	V-rCB	50			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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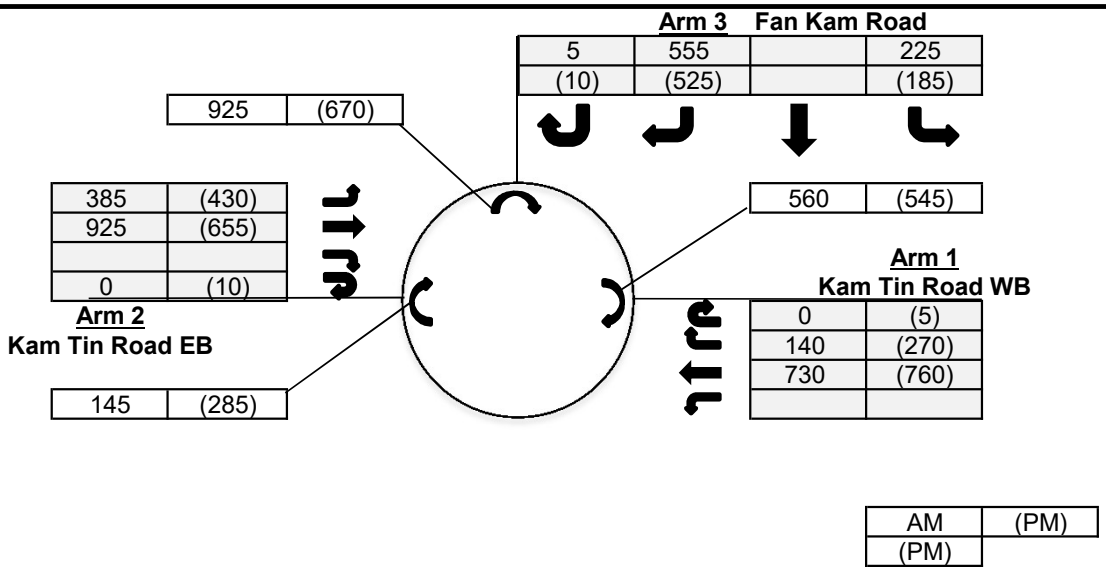
Roundabout Junction Calculation

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

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



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	AM	560	145	925
		across entry	PM	545	285	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
X_2	=	V+((E-V)/(1+2*S))		4.64	7.79	4.50
M	=	Exp((D-60)/10)		0.02	0.02	0.02
F	=	303*X_2		1406	2360	1365
Td	=	1+(0.5/(1+M))		1.49	1.49	1.49
Fc	=	0.21*Td*(1+0.2*X_2)		0.60	0.80	0.60
Qe	=	Capacity = K*(F-Fc*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

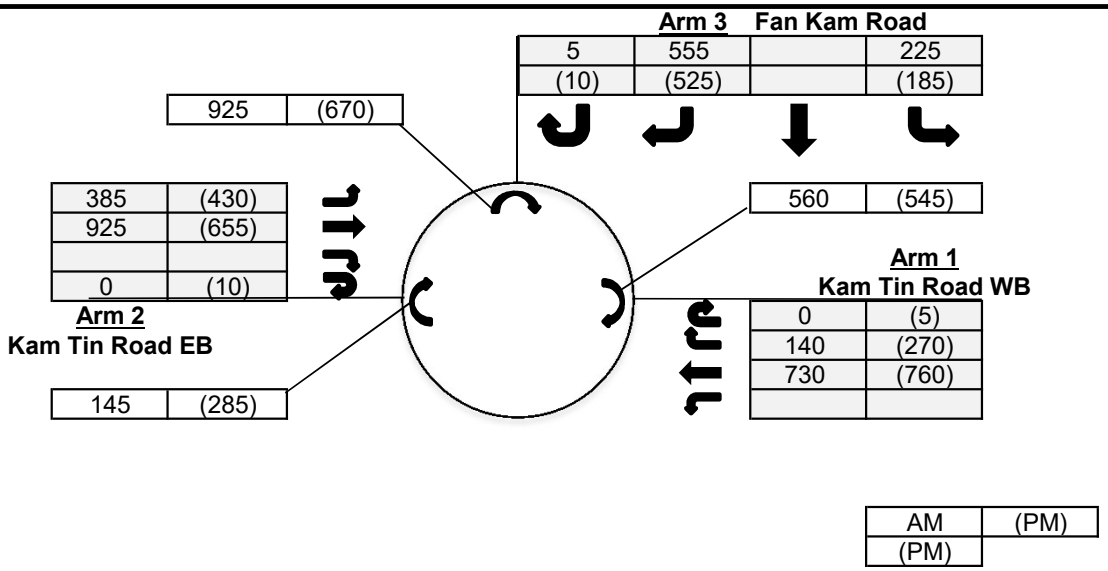
DFC of Critical Approach = AM 0.94
PM 0.93

CTA Consultants Ltd.

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)



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	AM	560	145	925
		across entry	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
X_2	=	V+((E-V)/(1+2*S))		6.07	7.35	5.14
M	=	Exp((D-60)/10)		0.04	0.04	0.04
F	=	303*X_2		1840	2226	1556
Td	=	1+(0.5/(1+M))		1.48	1.48	1.48
Fc	=	0.21*Td*(1+0.2*X_2)		0.69	0.77	0.63
Qe	=	Capacity = K*(F-Fc*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

CTA Consultants Ltd.

TRAFFIC SIGNALS CALCULATION Job No. 25009HK **CTA Consultants Ltd.**

Junction: **(E) Kam Tin 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 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:

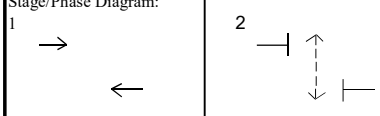
Traffic Flow (pcu / hr)

1265(1125) → ← 1270(1180)

A.M. Check Phase	
εy	0.650
L (sec)	20
C (sec)	120
y pract.	0.750
R.C. (%)	15%

P.M. Check Phase	
εy	0.604
L (sec)	20
C (sec)	120
y pract.	0.750
R.C. (%)	24%

Stage/Phase Diagram:



I/G = 5s I/G = 4s + 12s

TRAFFIC SIGNALS CALCULATION Job No. 25009HK **CTA Consultants Ltd.**

Junction: **(E) Kam Tin 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 (%)		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:

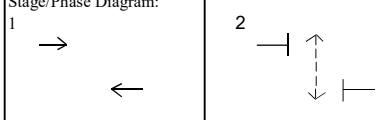
Traffic Flow (pcu / hr)

1265(1125) → ← 1270(1180)

A.M. Check Phase	
εy	0.618
L (sec)	19
C (sec)	120
y pract.	0.758
R.C. (%)	23%

P.M. Check Phase	
εy	0.574
L (sec)	19
C (sec)	120
y pract.	0.758
R.C. (%)	32%

Stage/Phase Diagram:



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**

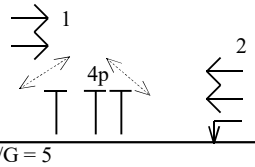
Description: **2034 Design Traffic Flows (With Remaining Site under LUR) (With Planned Improvement)**

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) →	εy	0.710	εy	0.699
	↰ 340(510) ↱ 260(265)	L (sec)	10	L (sec)	10
	← 2650(2415)	C (sec)	120	C (sec)	120
	↓ 685(335)	y pract.	0.825	y pract.	0.825
		R.C. (%)	16%	R.C. (%)	18%

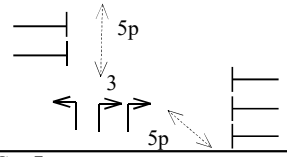
Stage / Phase Diagrams

A



I/G = 5

B

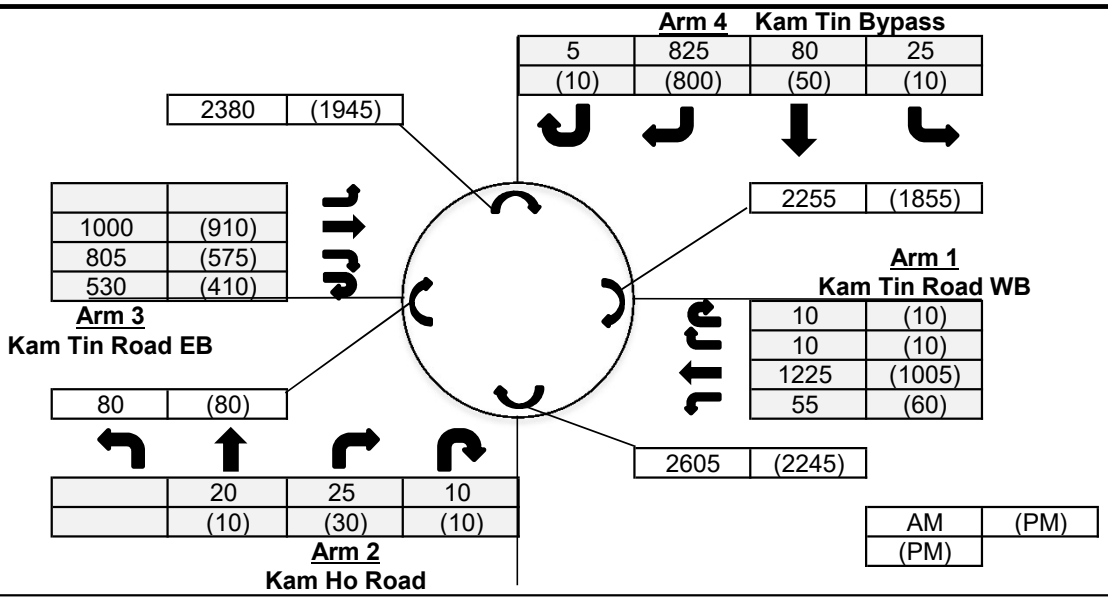


I/G = 7

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

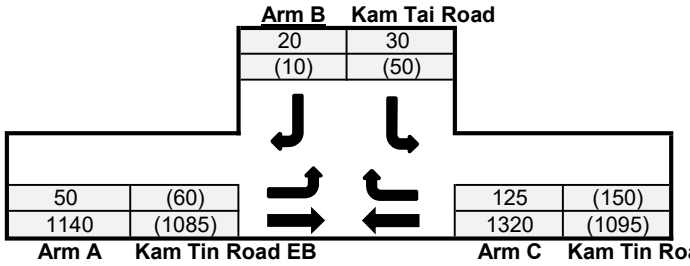
Output Parameters				Arm 1	Arm 2	Arm 3	Arm 4
S	=	Sharpness of flare = 1.6*(E-V)/L		0.76	0.45	0.46	0.48
K	=	1-0.00347*(A-30)-0.978*(1/R-0.05)		1.03	0.97	1.03	0.99
X_2	=	V+((E-V)/(1+2*S))		9.56	8.71	9.24	8.80
M	=	Exp((D-60)/10)		16.44	16.44	16.44	16.44
F	=	303*X_2		2897	2640	2799	2665
Td	=	1+(0.5/(1+M))		1.03	1.03	1.03	1.03
Fc	=	0.21*Td*(1+0.2*X_2)		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

CTA Consultants Ltd.

Priority Junction Calculation

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



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

CTA Consultants Ltd.

Annex B
Replacement Pages of
Air Quality Impact Assessment

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. As advised by the Traffic Consultant (CTA Consultants Ltd.), the Avenue De Versailles connects to Season Villas only, according to Volume 2 Chapter 3.2 of Transport Planning and Design Manual (TPDM) published by TD, it is regarded as a feeder road. Additionally, the peak traffic flows of Season Villas are only 35 veh/hr and 30 veh/hr for AM and PM peak respectively.

7.2 There is no recommended buffer distance for rural road and feeder road in HKPSG. Nevertheless, buffer distance of 5m has been adopted for the rural road and feeder 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)	Feeder 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 advised by the Traffic Consultant, the Avenue De Versailles connects to Season Villas only, according to Volume 2 Chapter 3.2 of TPDM published by TD, it is regarded as a feeder 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.

Annex C
Revised Drainage Impact Assessment

MOTT MACDONALD

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

Drainage Impact Assessment

March 2026

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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.

Drainage Impact Assessment

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

March 2020

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
C	Mar 2026	Edith Chow	May Tse	May Tse	For submission

Document reference: 426076 | 11 | C

Contents

1 Introduction

1.1 General

1.1.1 Mott MacDonald Hong Kong Limited (hereinafter as “MMHK) was commissioned by the Applicant to prepare a Drainage Impact Assessment (DIA) for supporting the proposed residential development at 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 5,000m^3 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**.

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

where

F(t) = rate of rainfall or instantaneous intensity in mm/hr at time t (in minutes)

t_d = rainstorm duration (in minutes) (td <= 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	Inflow Boundary received from DSD (m^3/s)	End of 21st Century: 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	Water Level Boundary received from DSD (mPD)	End of 21st Century: 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

Model ID	Area (ha)	Weighted CN
Cat_006	2.792	80.88
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 5,000m^3 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. 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. Besides, the runoff generated from the adjacent lands between the east bank of the existing watercourse and the proposed Development Site boundary is expected to be directly discharged into existing drainage system. In this connection, as a conservative approach, peripheral channels of 300mm at the boundaries of the proposed Development Site, as spare drains, are provided to collect the runoff generated from the local area (i.e. Cat_012A-1) between the east bank of the existing watercourse and the proposed Development Site boundary. The capacity check calculations for the set of 300mm and 600mm channel are provided in **Appendix I**. 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 sand traps and catchpit, 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 300mm and 600mm peripheral channels would act as spare drains 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 300mm and 600mm peripheral channels. Some catchments, including Cat_011A-1, Cat_012B, Cat_013A, Cat_013B-1 and Cat_023A, would be served by the proposed 600mm peripheral channel and catchment Cat_012A-1 would be served by the proposed 300mm peripheral channel. The remaining catchments (i.e. 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 5,000m^3 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 0.59m^3/s to 0.29m^3/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 300mm and 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 0.478m^3/s as shown in **Appendix I**), the proposed 900mm discharge pipe which collect a total flow of 0.768m^3/s connecting the existing watercourse will have a full-bore capacity of about 1.03m^3/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 5,000m^3 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 0.59m^3/s to 0.29m^3/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 300mm and 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 0.478m^3/s), the proposed 900mm discharge pipe connecting the existing watercourse will have a full-bore capacity of about 1.03m^3/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

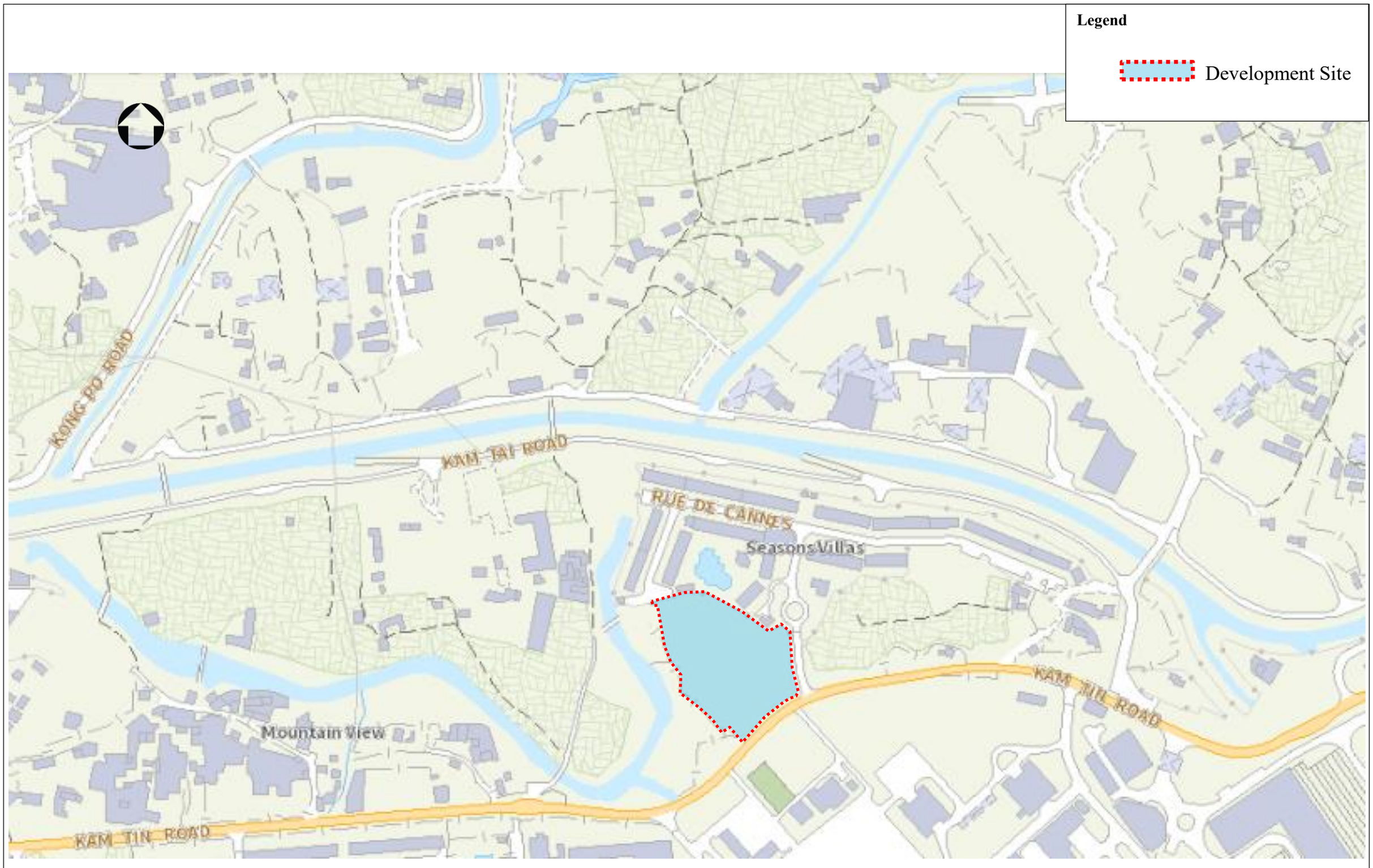
Appendix G Topographic Survey received from the Applicant

Appendix H InfoWorks ICM Hydraulic Model

Appendix I Capacity Check for Peripheral Channels

Appendix A1

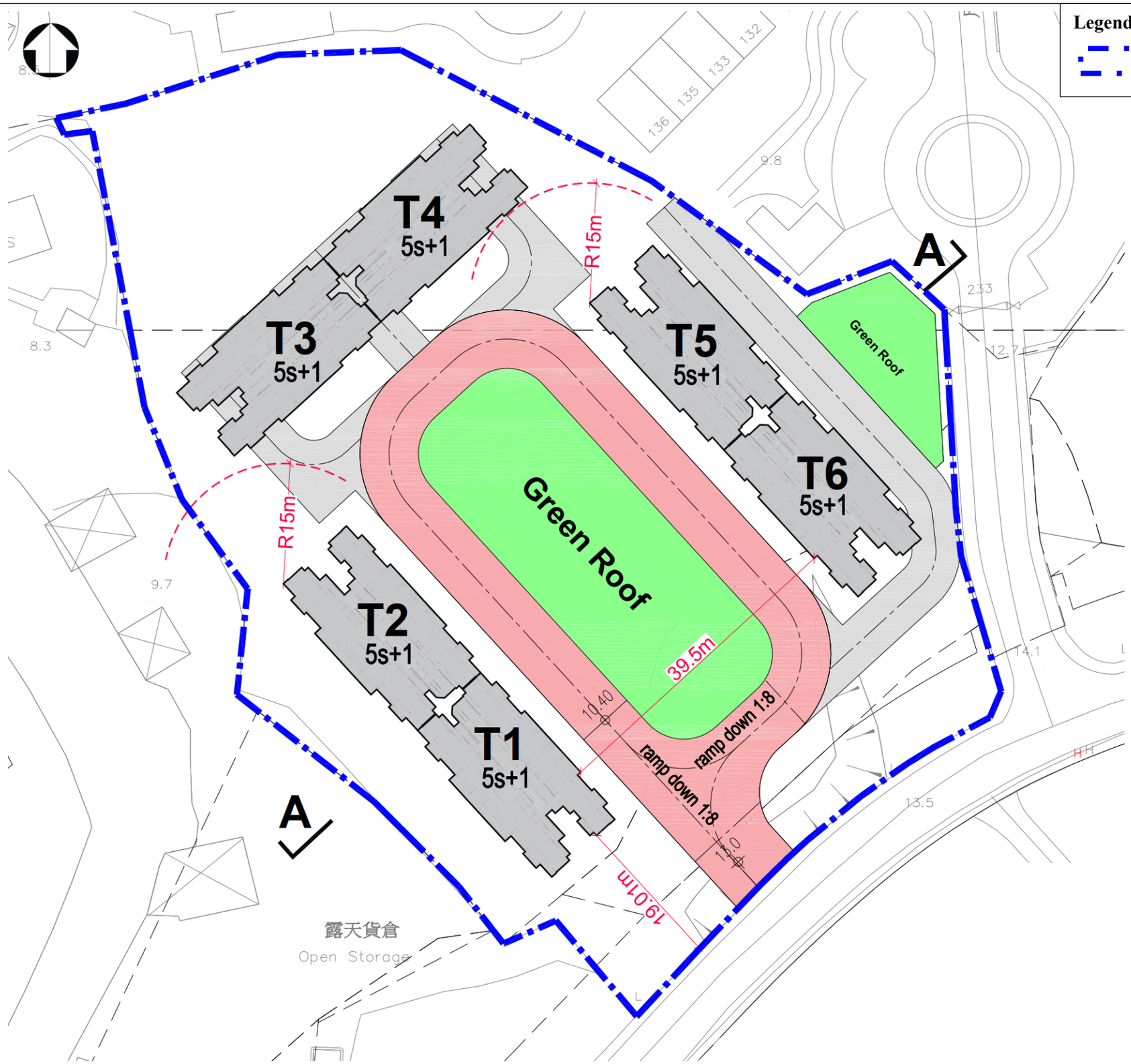
Location Plan of the Proposed Residential Development



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.**	MOTT MACDONALD
Title	**Location Plan of the Proposed Residential Development**	**Appendix A1**
Date Aug 2025	**Scale** N.T.S.	**File**

Appendix A2

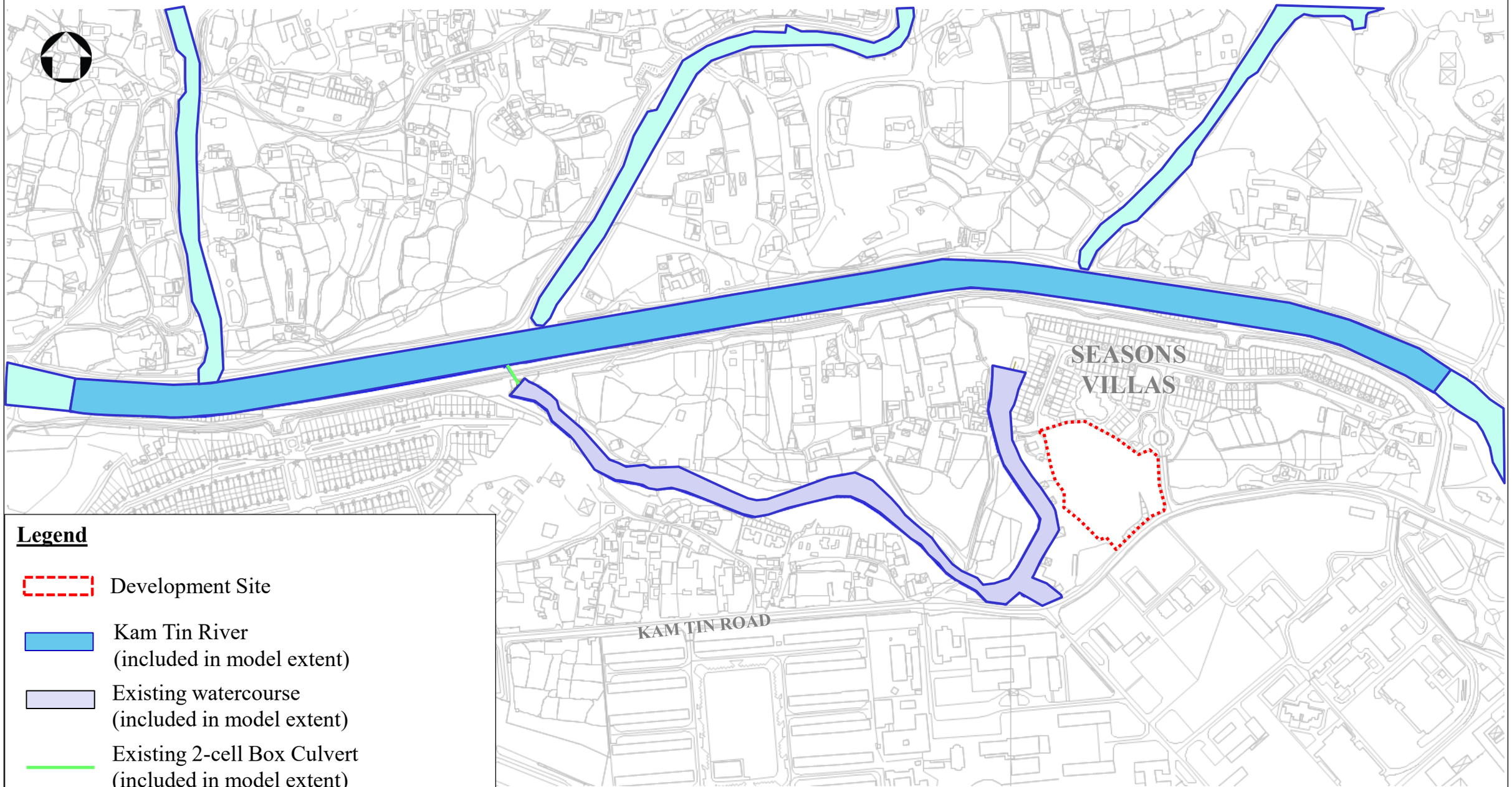
Master Layout Plan of the Proposed Residential Development



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.**	MOTT MACDONALD
Title	**Master Layout Plan of the Proposed Residential Development**	**Appendix A2**
Date Aug 2025	**Scale** N.T.S.	**File**

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.**
Title	**Existing Drainage System**

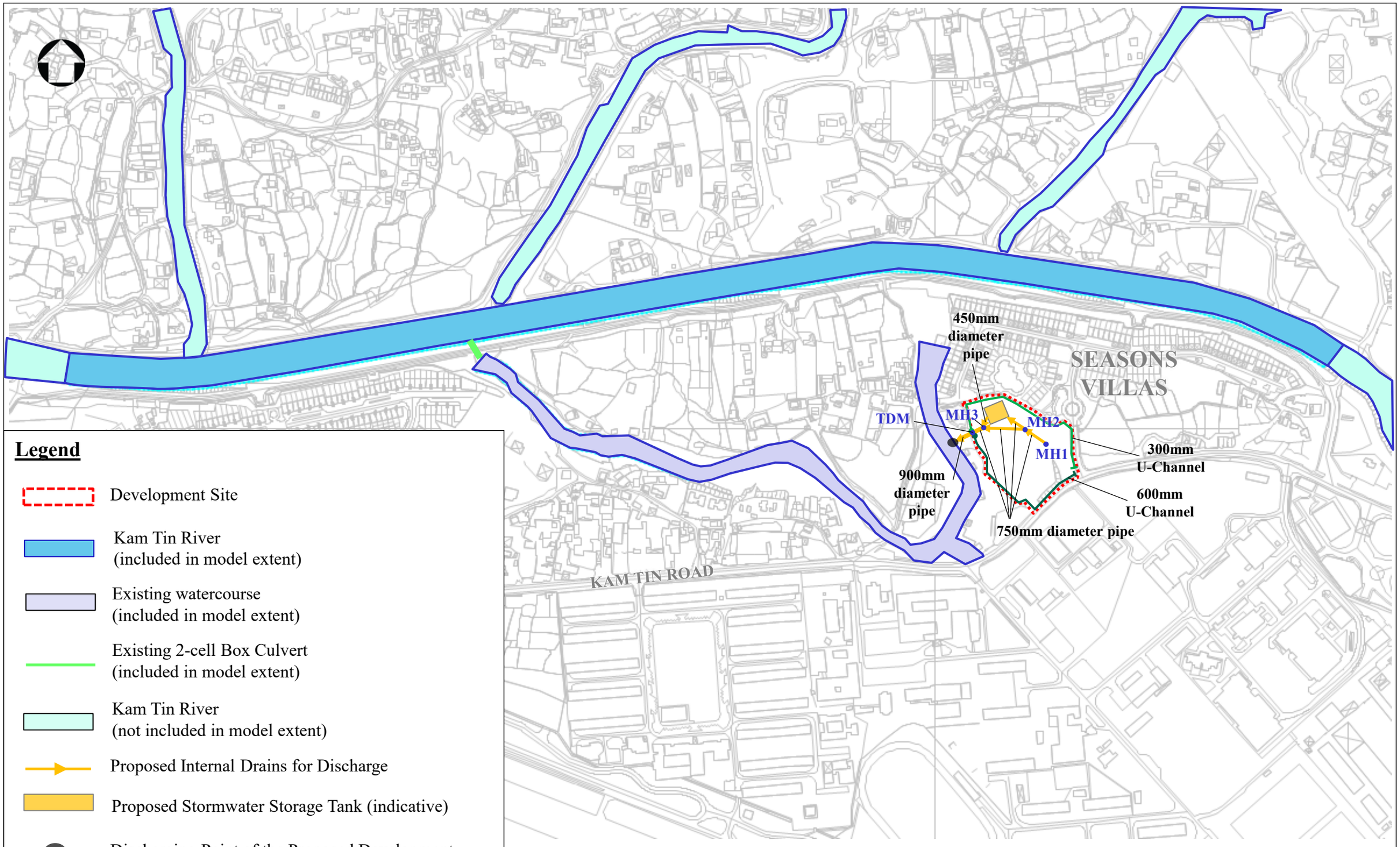
Date Aug 2025	**Scale** N.T.S.	**File**

MOTT MACDONALD

Appendix B1

Appendix B2

Proposed 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)
- Proposed Internal Drains for Discharge
- Proposed Stormwater Storage Tank (indicative)
- Discharging Point of the Proposed Development
- Proposed Boundary Channels with Grading Cover

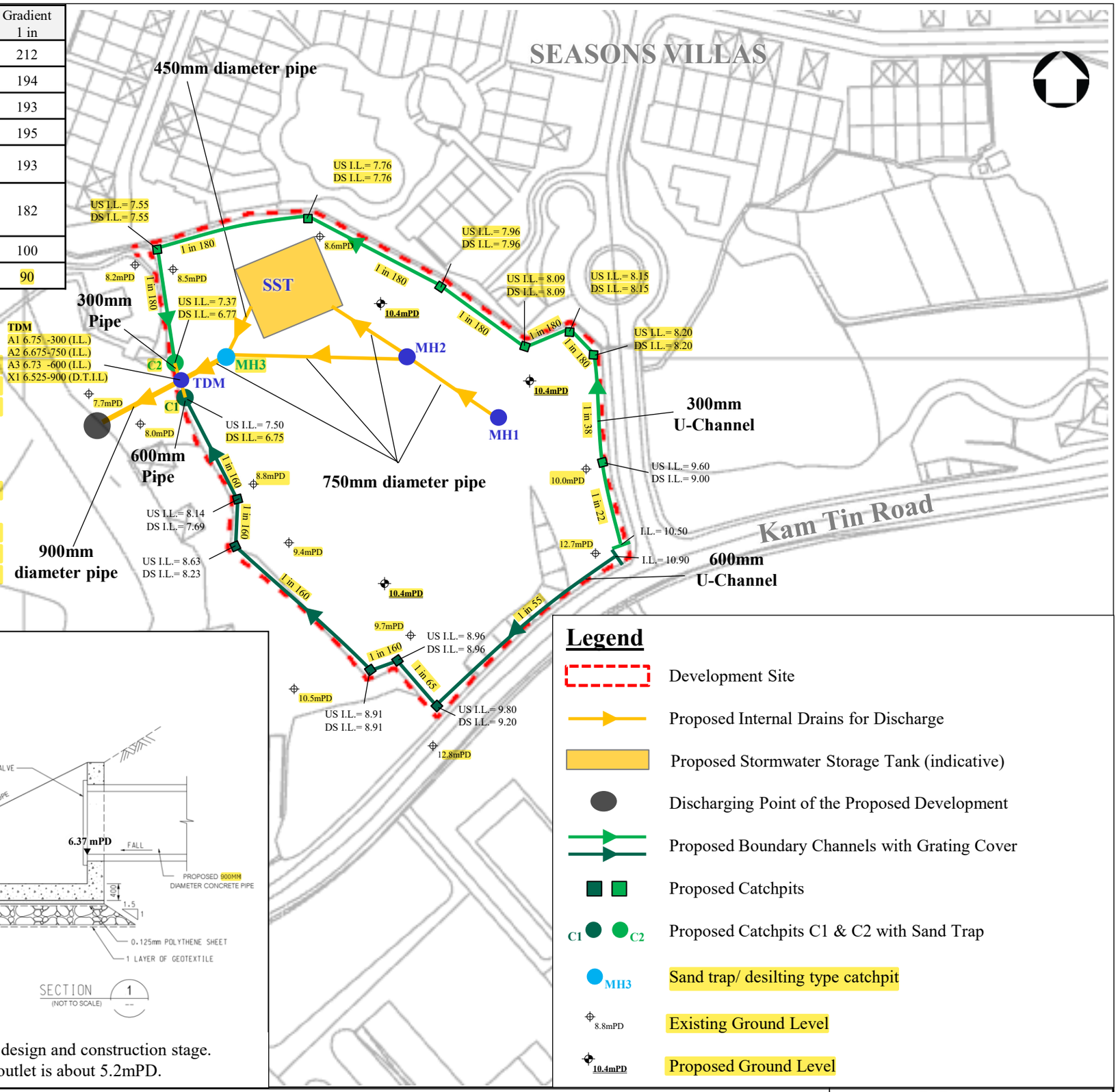
Project	**Rezoning from "Residential (Group C)2" and "Open Space" zones to "Residential (Group C)4" zone for a Proposed Residential Development at Lot Nos. 519 RP (part) and 520 RP in D.D. 110 and the Adjoining Government land, Shek Kong, Yuen Long, N.T.**
Title	**Proposed Drainage System**

Date	Scale	File	
Jan 2026	N.T.S.		**Appendix B2**

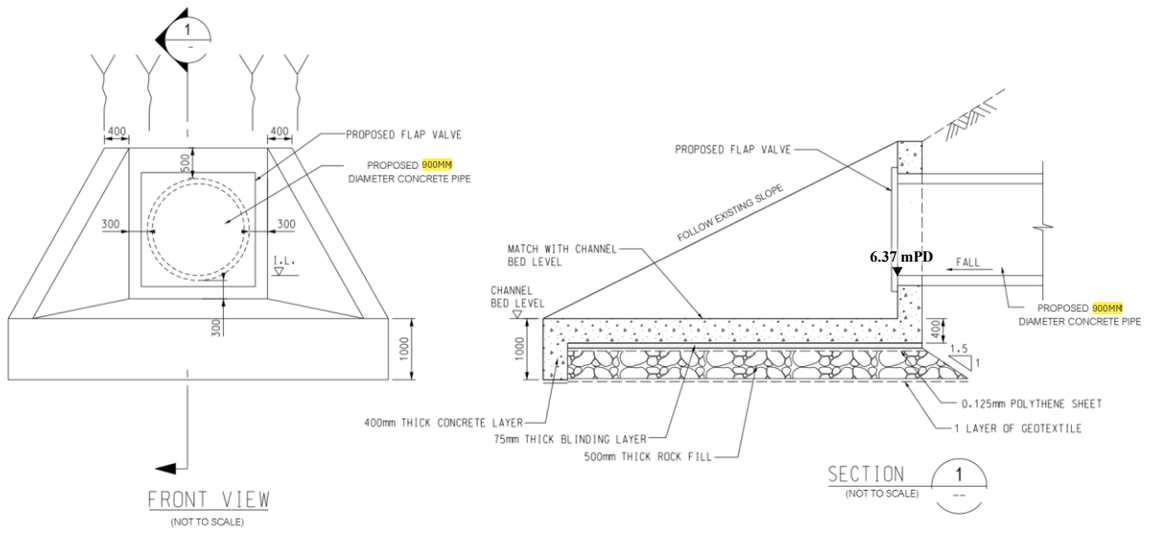
From	To	Size (mm)	US I.L. (mPD)	DS I.L. (mPD)	Gradient 1 in
MH1	MH2	750	8.870	8.800	212
MH2	SST	750	8.400	8.300	194
SST	MH3	450	7.400	7.320	193
MH2	MH3	750	8.800	8.660	195
MH3	TDM	750	6.720	6.675 (I.L. of TDM)	193
TDM	watercourse	900	6.525 (D.T.I.L. of TDM)	6.370	182
C1	TDM	600	6.750	6.730	100
C2	TDM	300	6.770	6.750	90

Note:

- US I.L. = Upstream Invert Level
  DS I.L. = Downstream Invert Level
- TDM = Terminal manhole. The proposed stormwater terminal manhole will comply with the current Government standard. The Type T2 terminal manhole will be adopted, subject to detailed design, and DSD standard drawings will be referenced in later detailed design stage.
- C1 & C2 details will be made reference to DSD Standard Drawing No. DS1025.
- MH3 details will be made reference to CEDD standard drawing No. C2406/1.
- Subject to the future drainage plan approval at construction stage, sand trap/desilting type catchpit or alternative design will be provided for drainage prior to connection to the proposed stormwater terminal manhole.



Typical Drainage Outlet



* 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.

Legend

- Development Site
- Proposed Internal Drains for Discharge
- Proposed Stormwater Storage Tank (indicative)
- Discharging Point of the Proposed Development
- Proposed Boundary Channels with Grating Cover
- Proposed Catchpits
- C1 C2 — Proposed Catchpits C1 & C2 with Sand Trap
- MH3 — Sand trap/ desilting type catchpit
- 8.8mPD — Existing Ground Level
- 10.4mPD — Proposed Ground Level

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 Drainage System (Enlarged)**
Date Mar 2026	**Scale** N.T.S. **File**

MOTT MACDONALD

Appendix B2

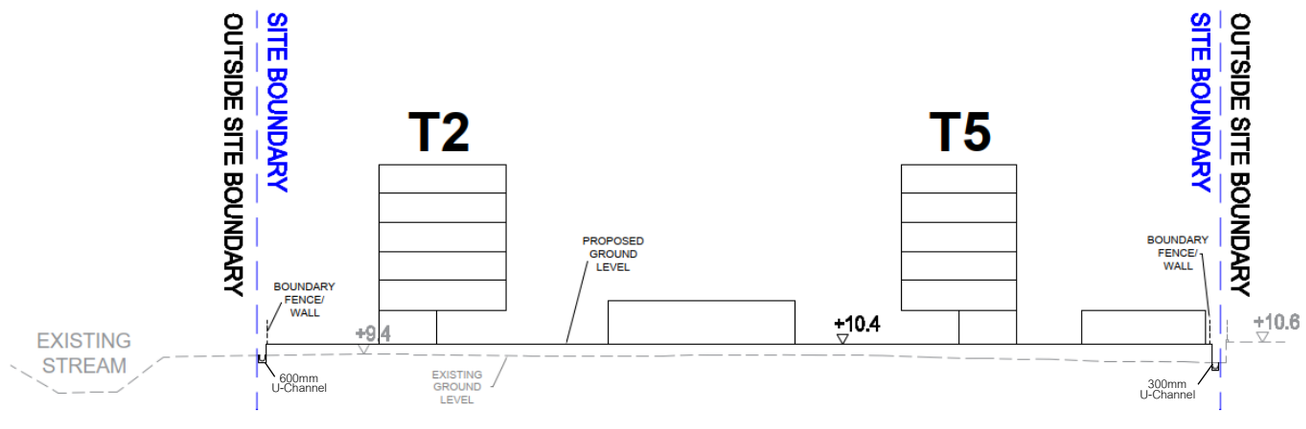
Legend

Development Site

SEASONS VILLAS

Kam Tin Road

Section View (Not-to-scale)



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 Drainage System**

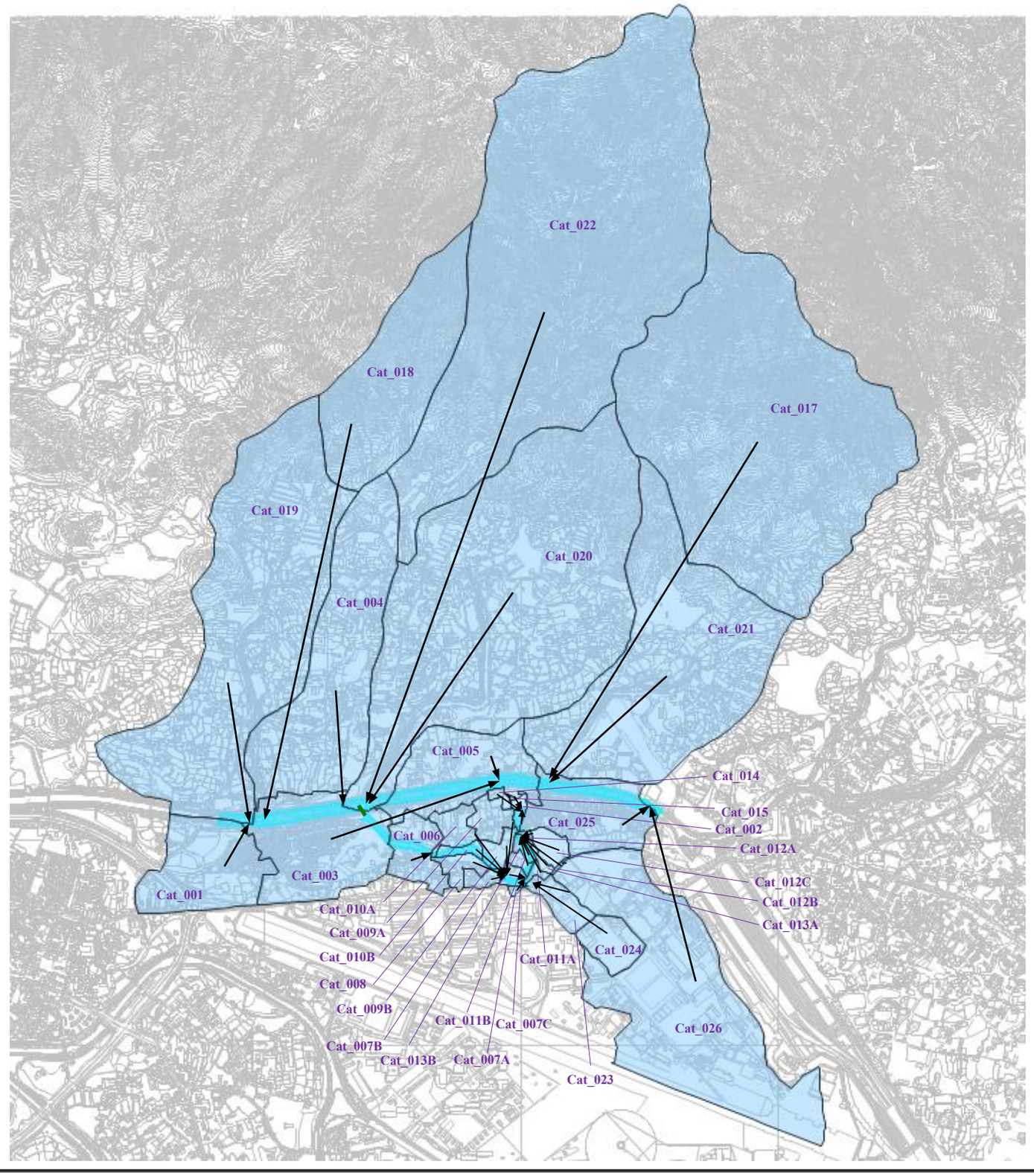
Date Oct 2025	**Scale** N.T.S.	**File**

MOTT MACDONALD

Appendix B2

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.**
Title	**Existing Catchment Plan**

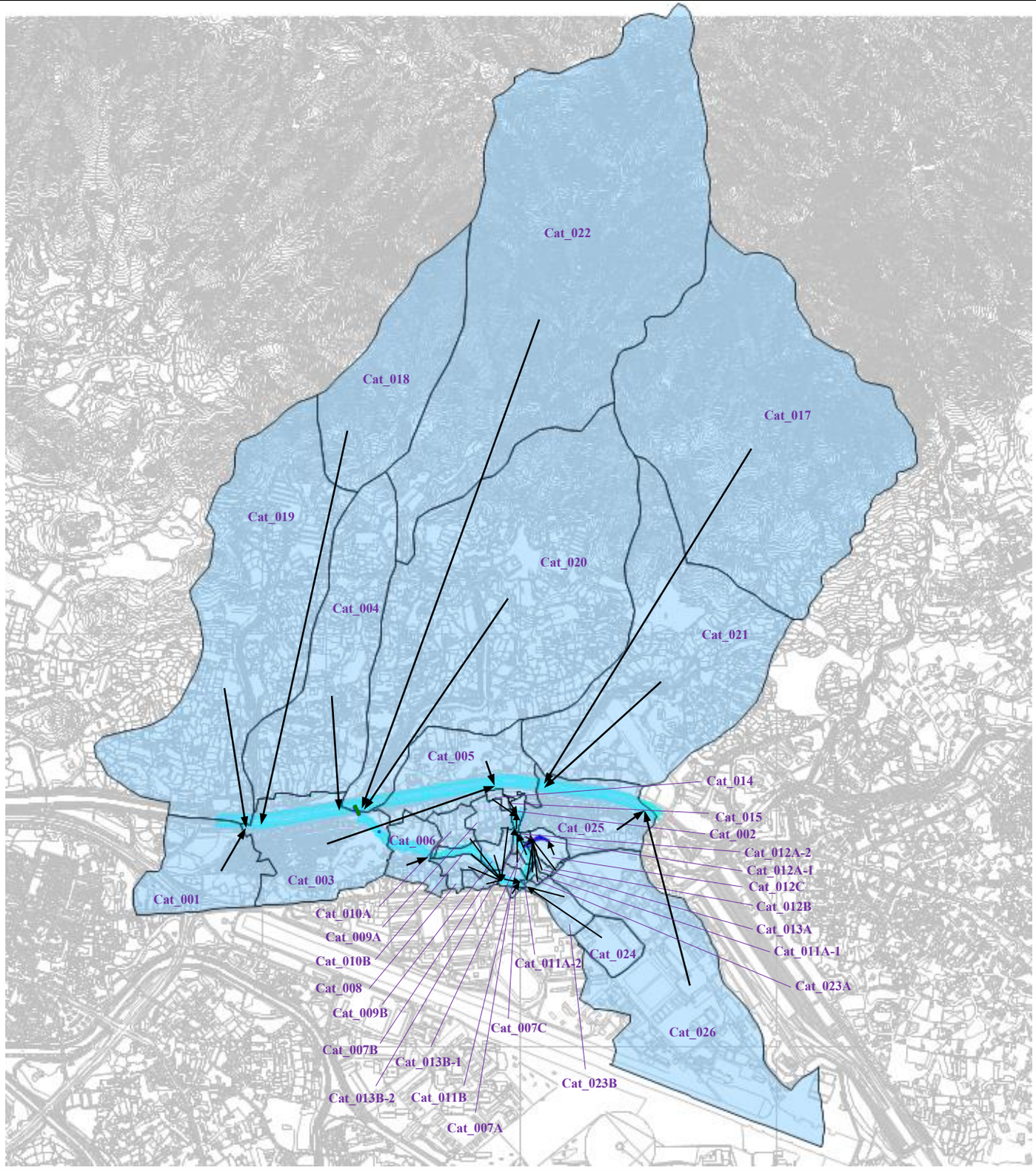
Date	Scale	File
Jan 2026	N.T.S.	

MOTT MACDONALD

Appendix C1

Appendix C2

Proposed Catchment Plan



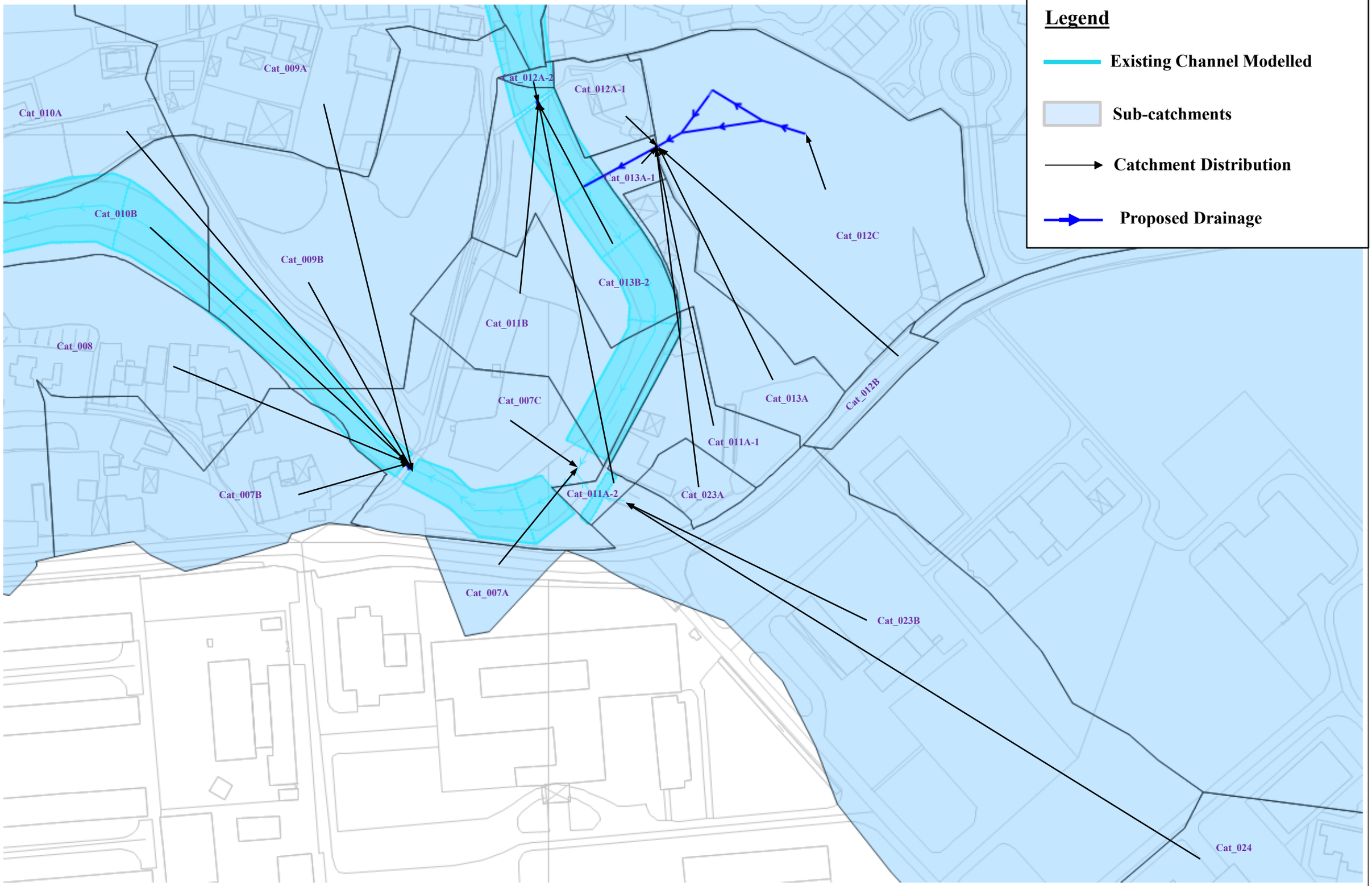
Legend

- 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**

MOTT MACDONALD

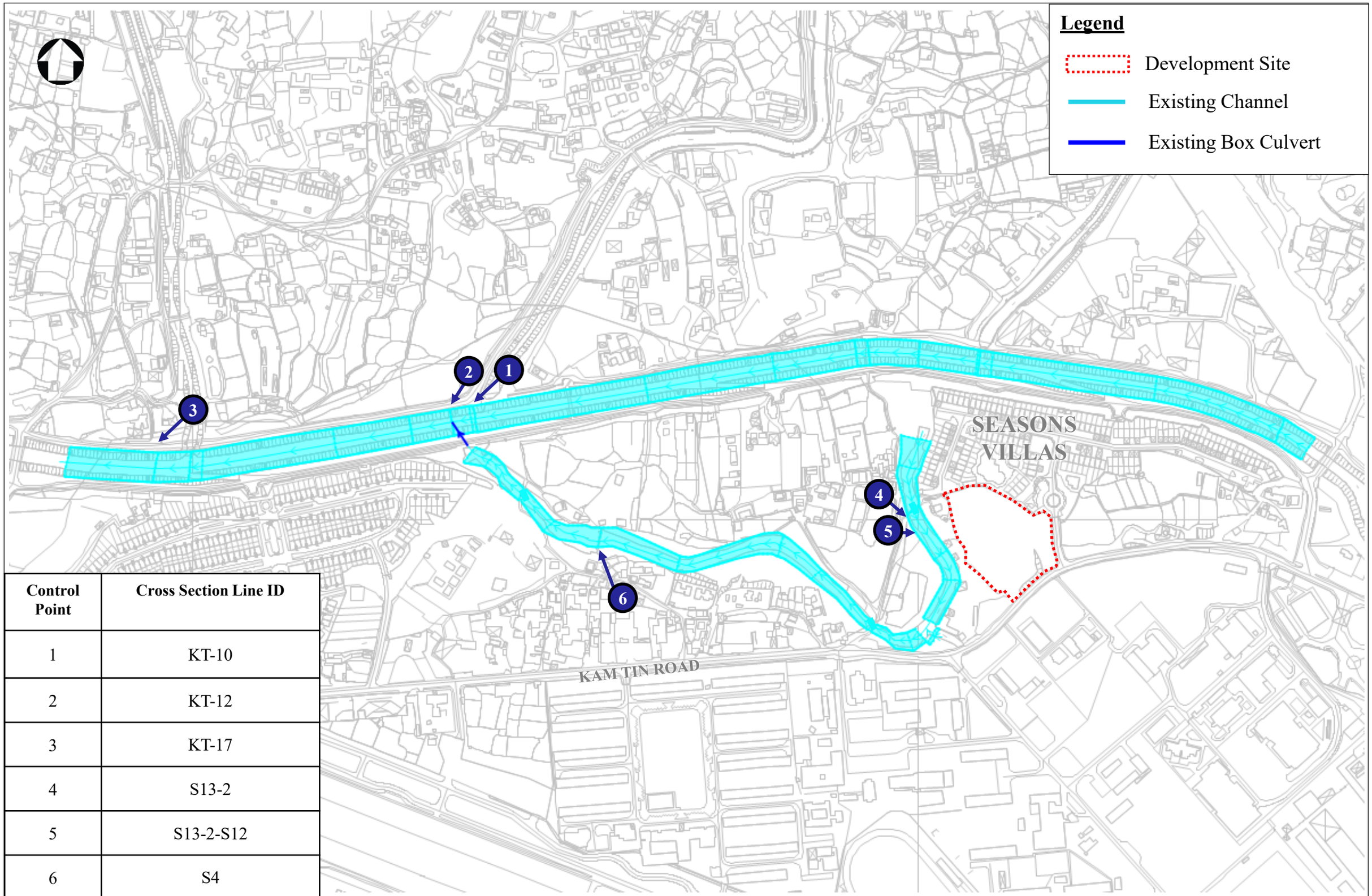
Appendix C2



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

Appendix D

Location of Control Points in the Model

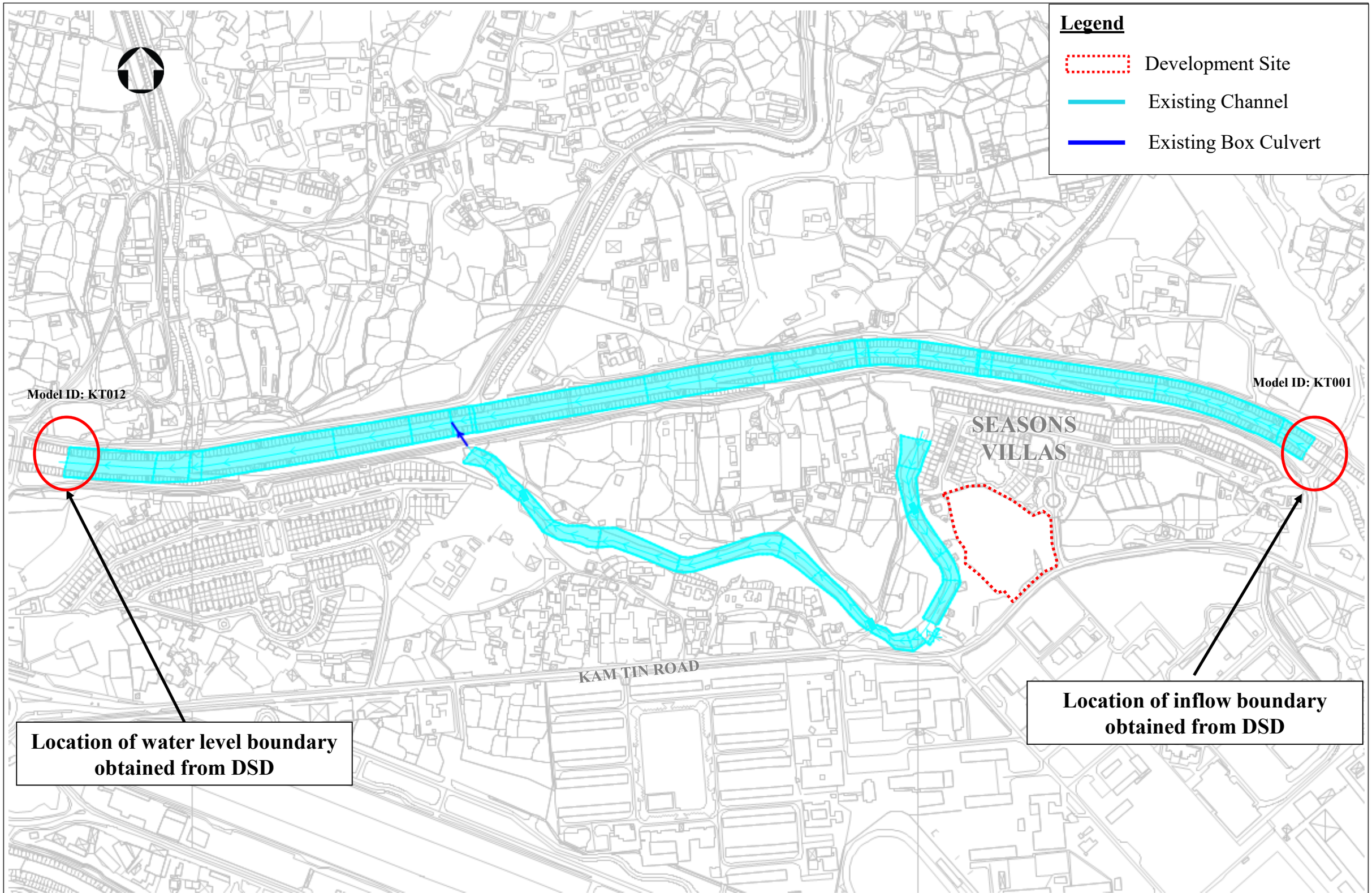


Control Point	Cross Section Line ID
1	KT-10
2	KT-12
3	KT-17
4	S13-2
5	S13-2-S12
6	S4

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

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
Title	**Existing Model Extent**	**Appendix E**
Date Aug 2025	**Scale** N.T.S.	**File**

Appendix F

Downstream Boundary Conditions Obtained from DSD

IC0014

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	Informan	Copy	Sign	Date
1						
2						
Rec'd	19 NOV 2021					
3						
4						
File No. 426076						

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

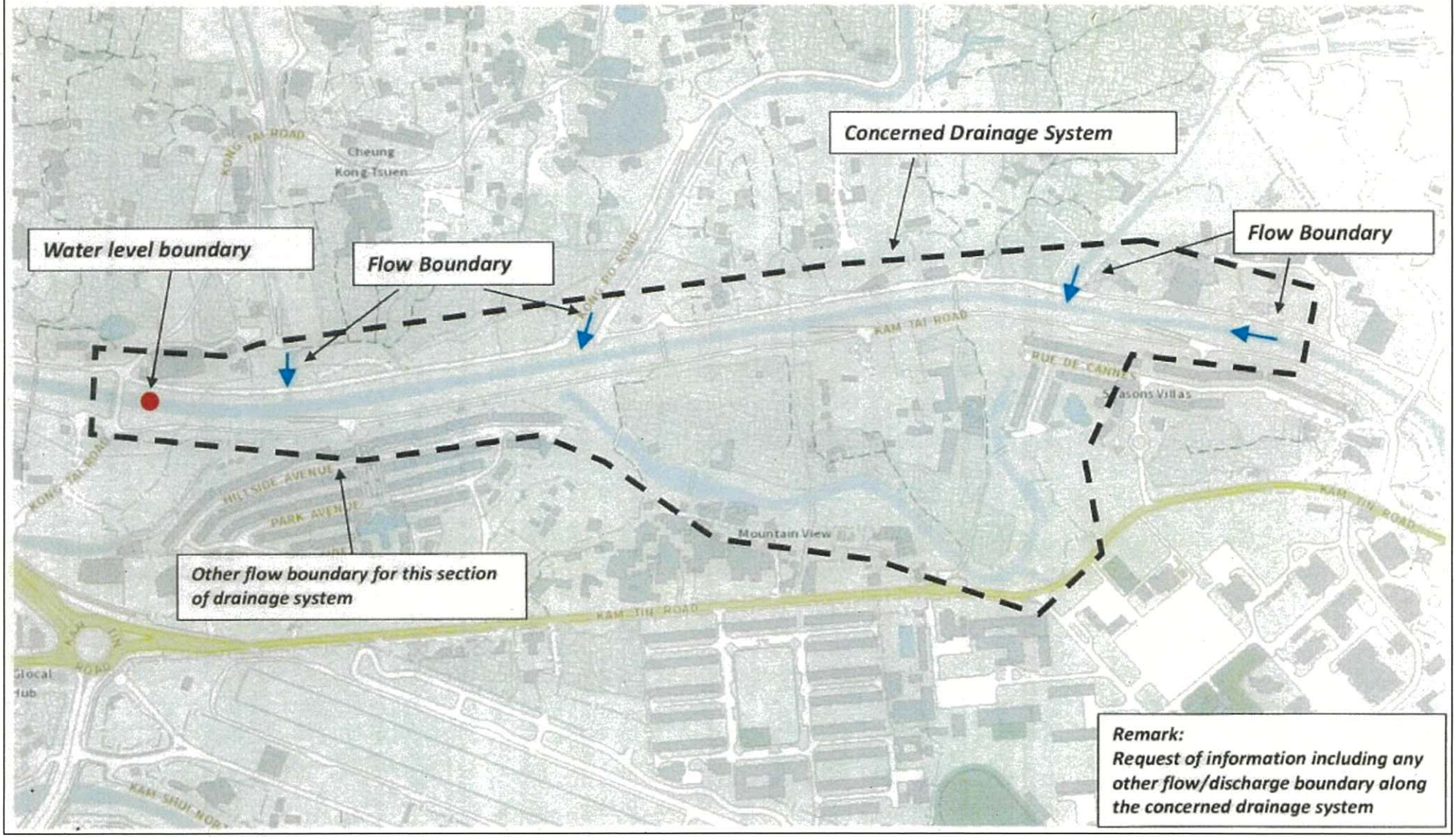
I refer to your letter dated 28 October 2021 requesting for drainage information.

The requested information is enclosed for your reference.

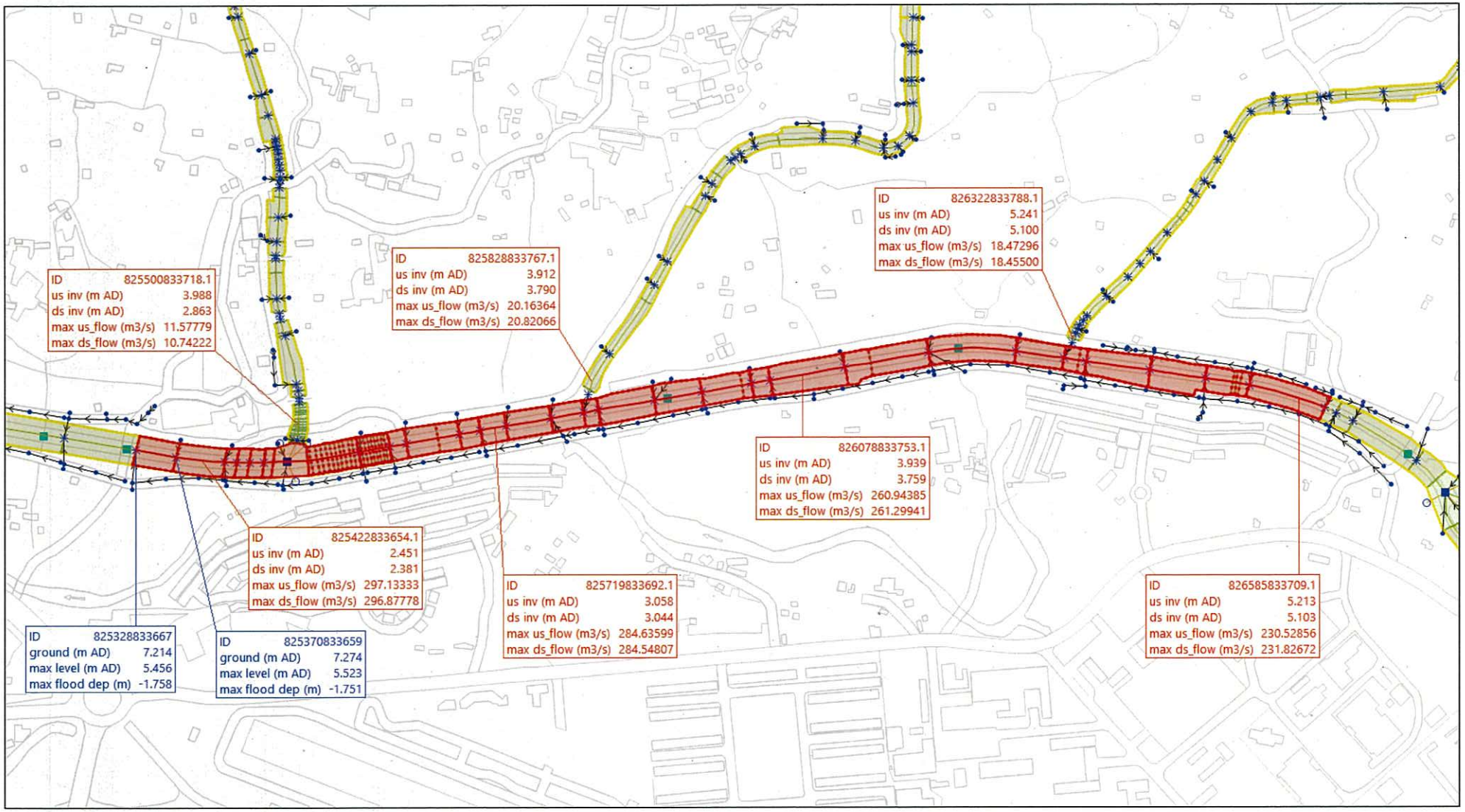
Yours faithfully,

(Bill C H CHAN)
for Chief Engineer / Mainland North
Drainage Services Department

Sketch 1 - Request for Information



Location of Request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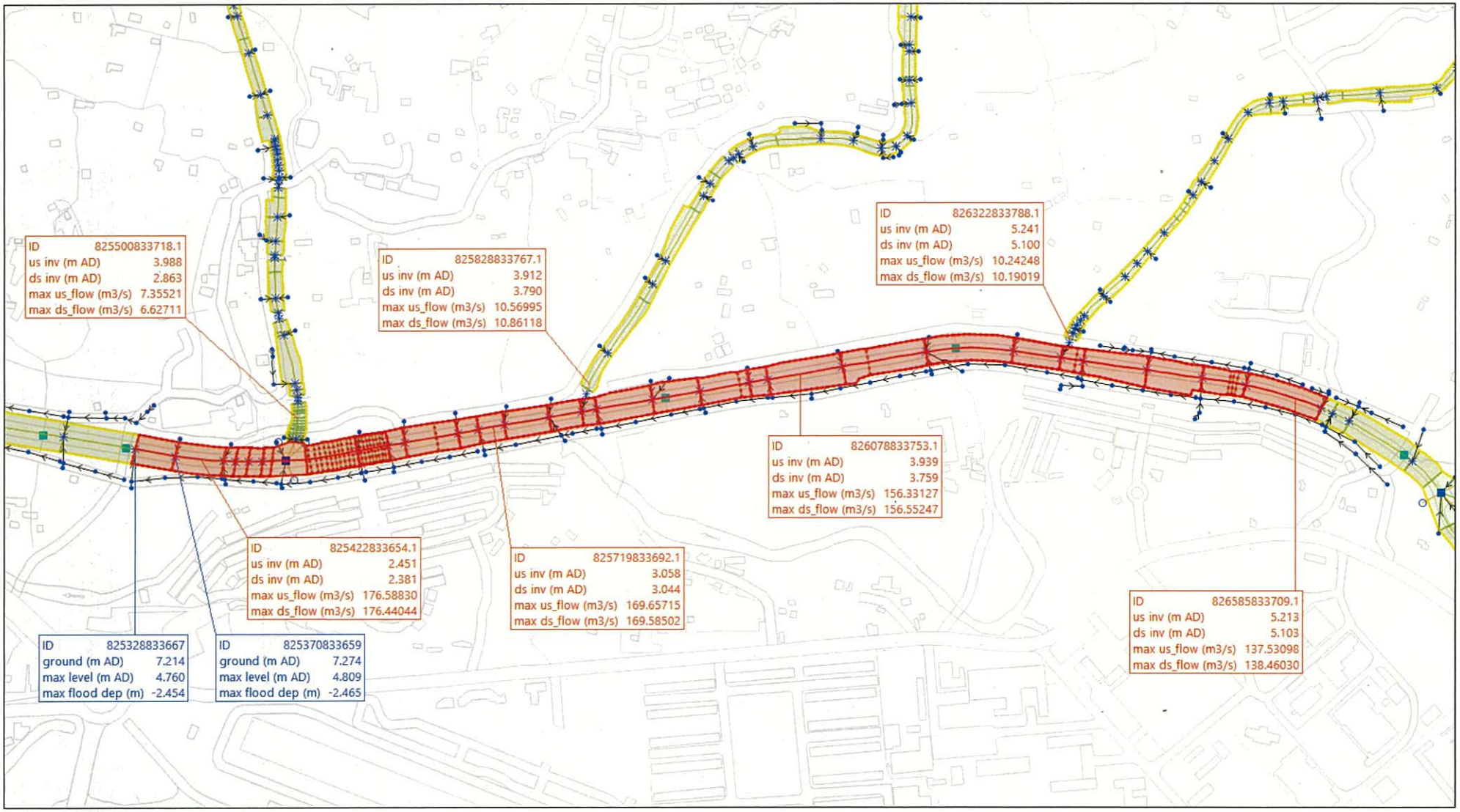
10A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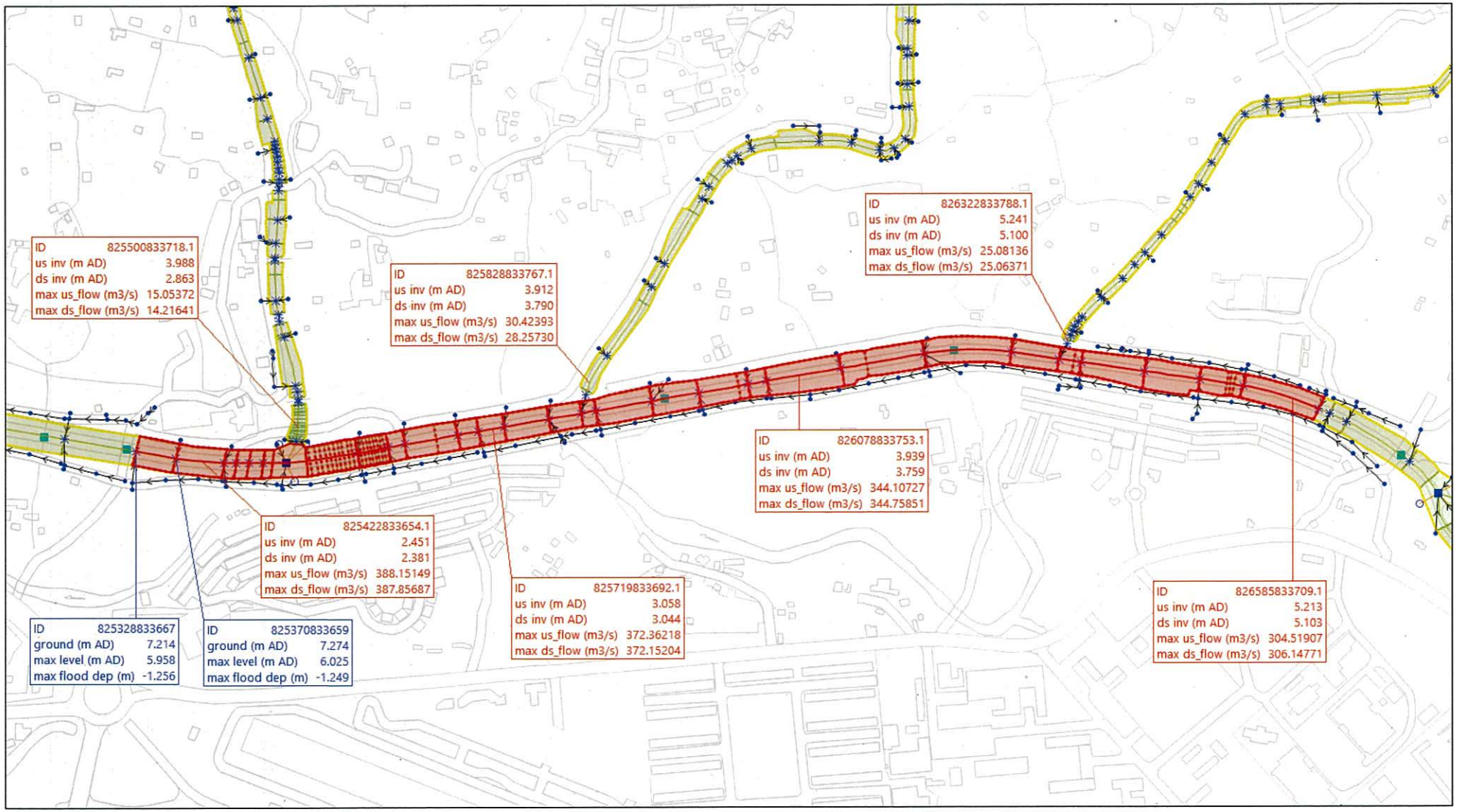
10B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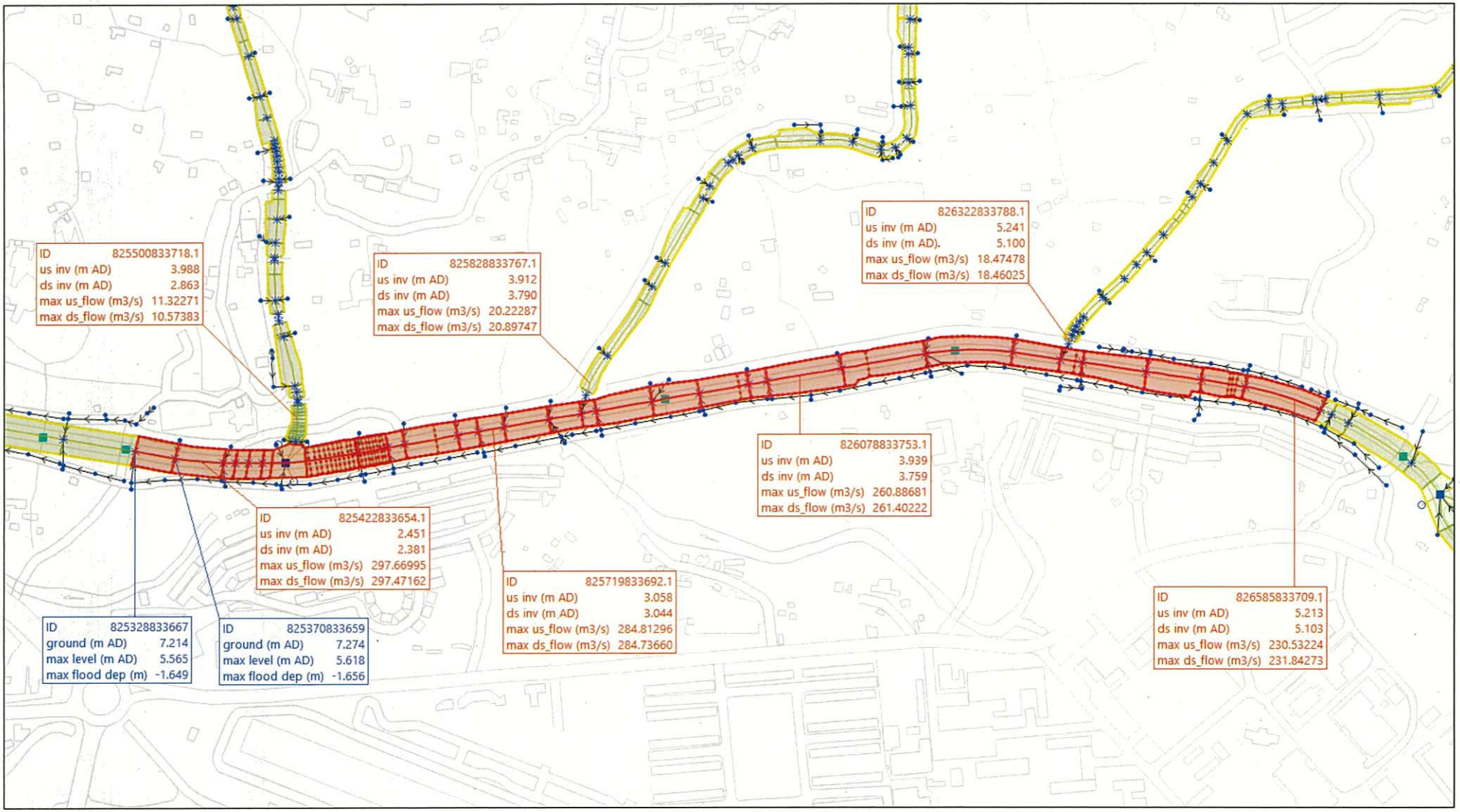
50A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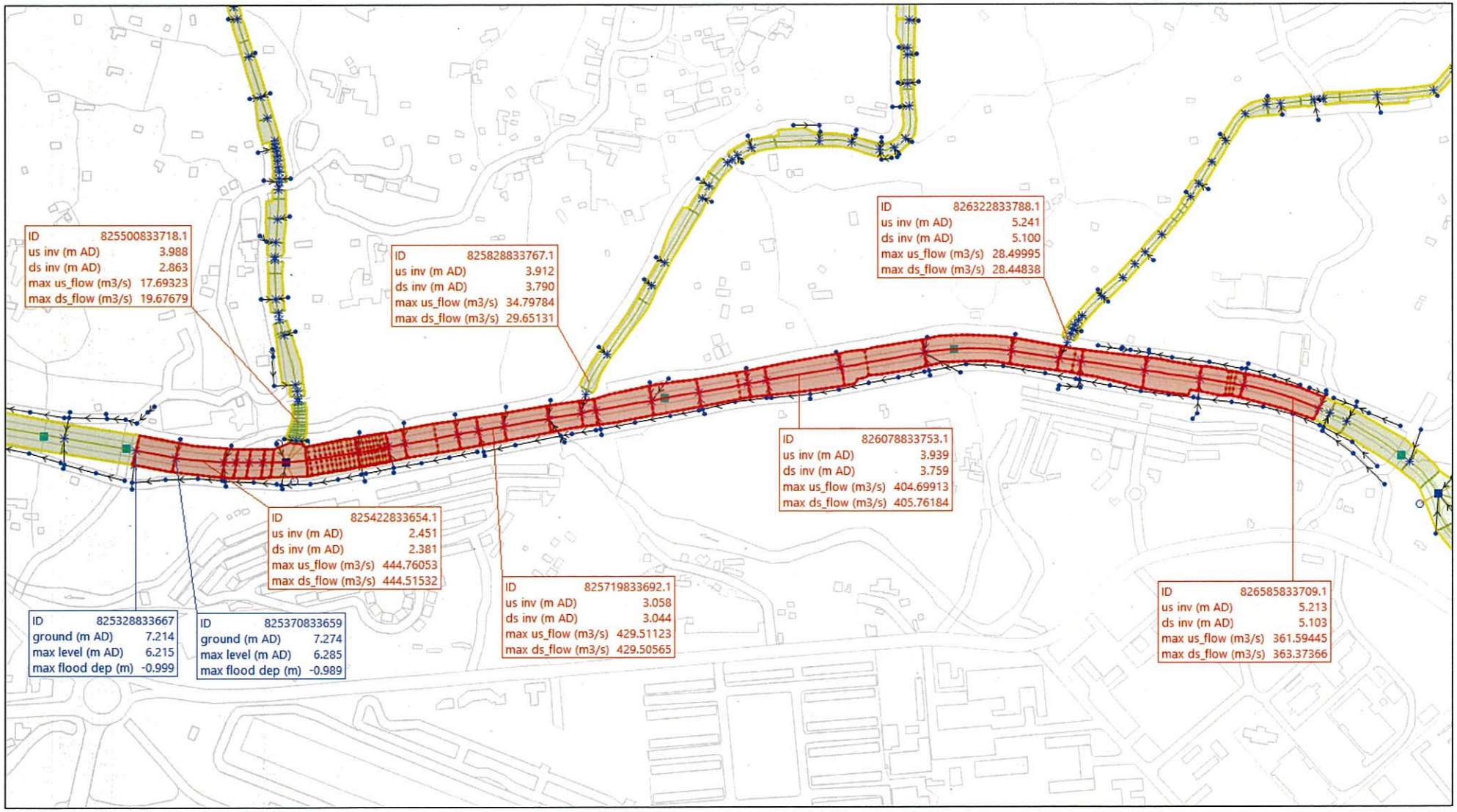
50B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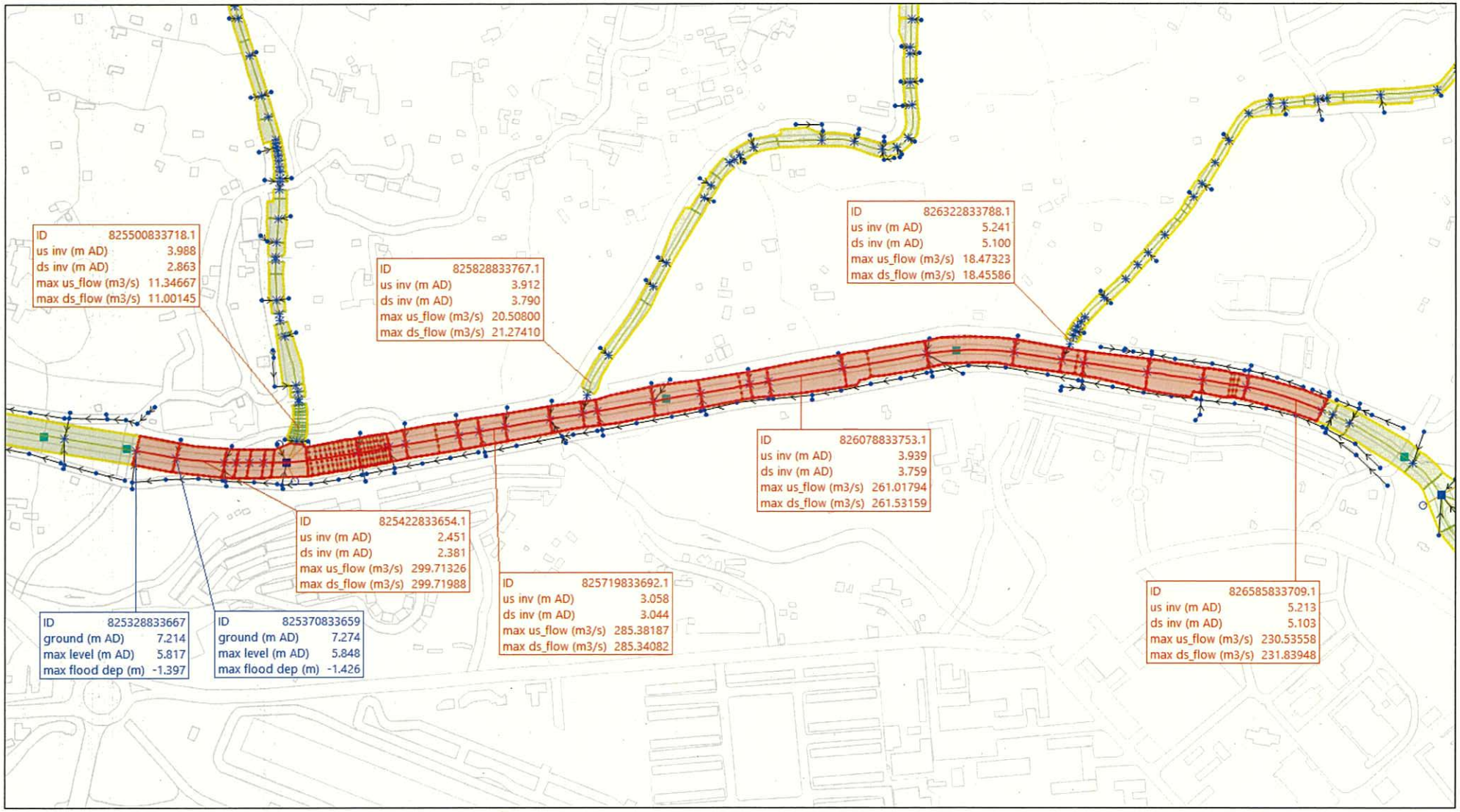
200A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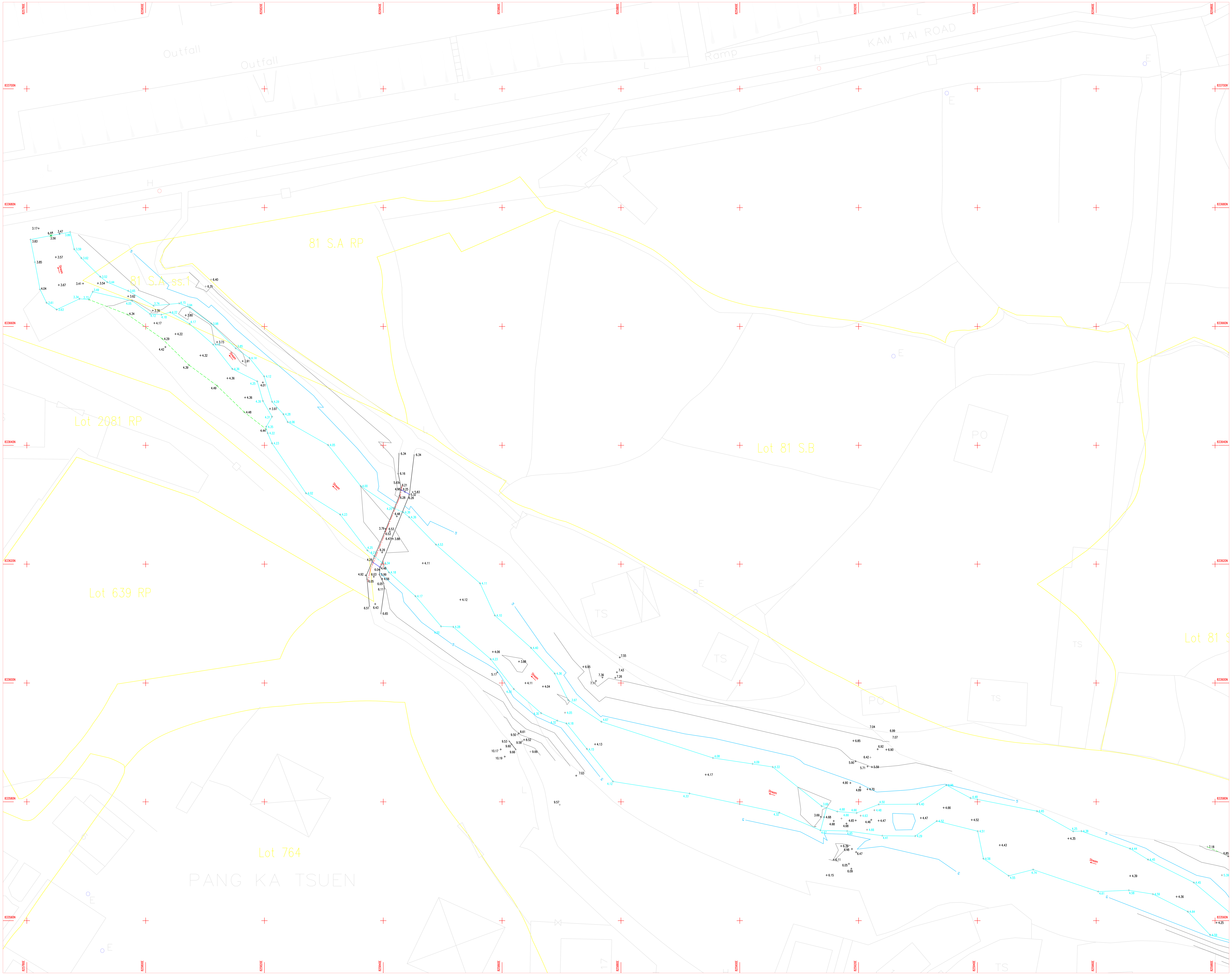
us inv (m AD) 3.939
ds inv (m AD) 3.759
max us_flow (m3/s) 261.01794
max ds_flow (m3/s) 261.53159
ID 825422833654.1
us inv (m AD) 2.451
ds inv (m AD) 2.381
max us_flow (m3/s) 299.71326
max ds_flow (m3/s) 299.71988
ID 825719833692.1
us inv (m AD) 3.058
ds inv (m AD) 3.044
max us_flow (m3/s) 285.38187
max ds_flow (m3/s) 285.34082
ID 826585833709.1
us inv (m AD) 5.213
ds inv (m AD) 5.103
max us_flow (m3/s) 230.53558
max ds_flow (m3/s) 231.83948
ID 825328833667
ground (m AD) 7.214
max level (m AD) 5.817
max flood dep (m) -1.397
ID 825370833659
ground (m AD) 7.274
max level (m AD) 5.848
max flood dep (m) -1.426

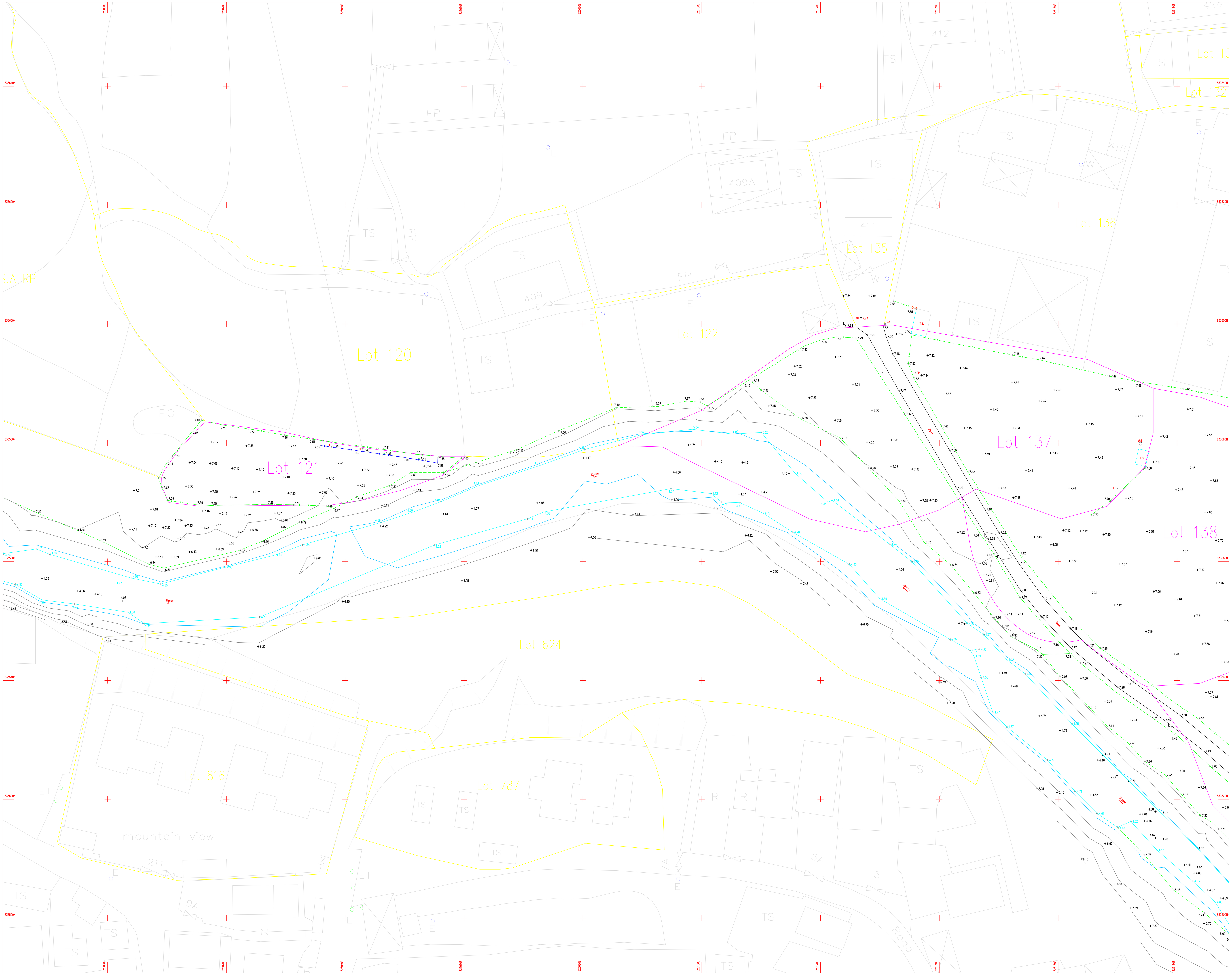
200B

Appendix G

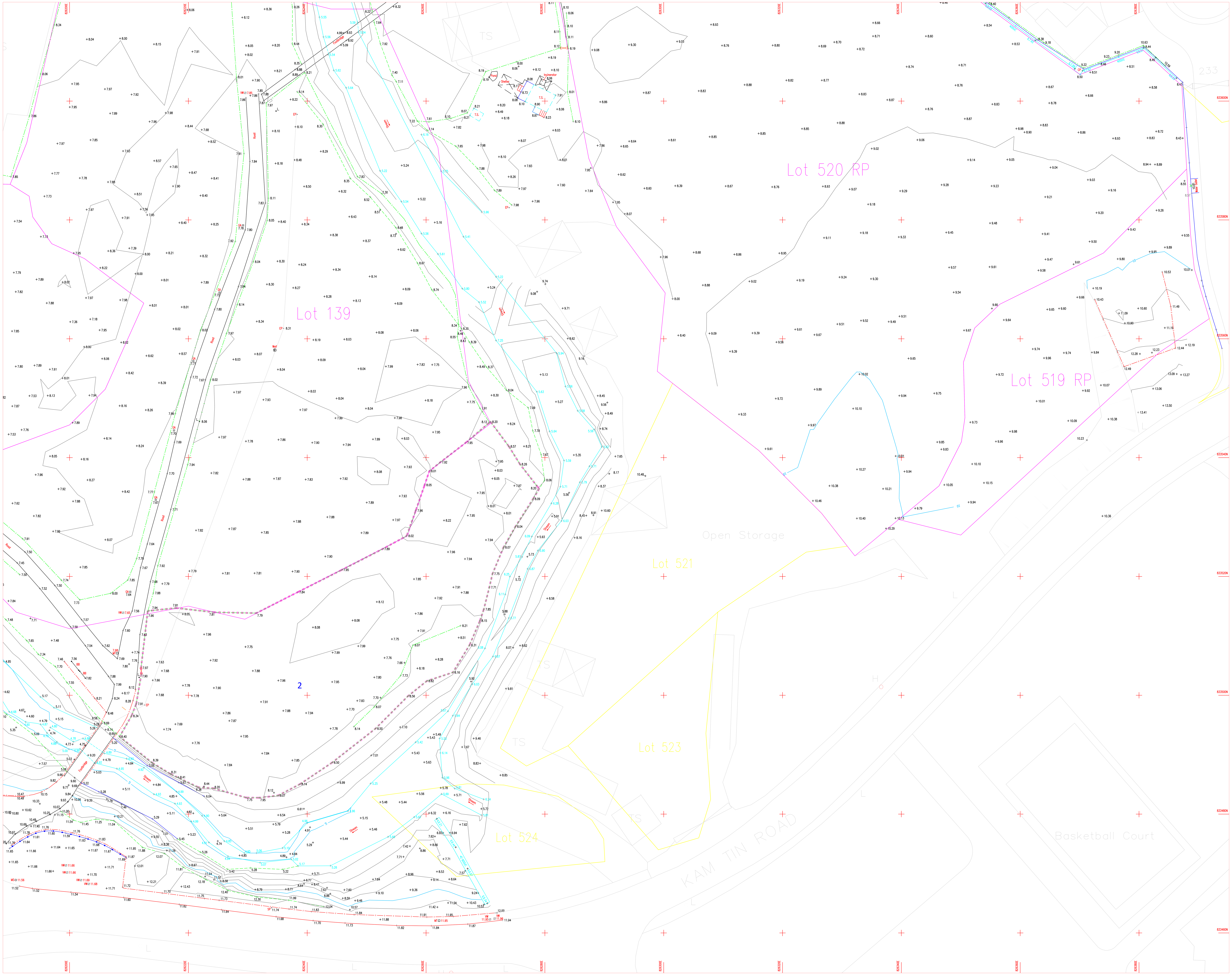
Topographic Survey received from the Applicant



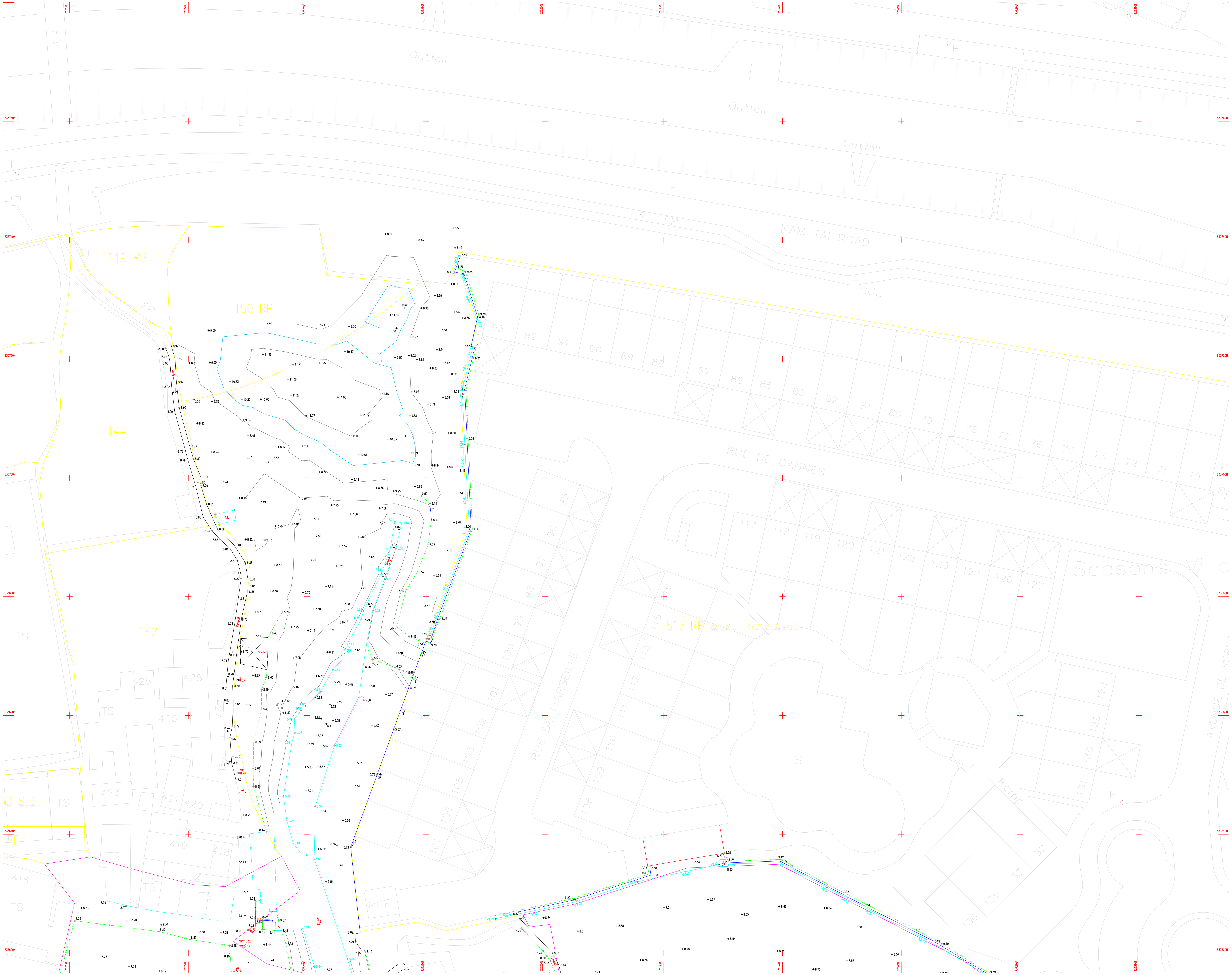
KAM TAI ROAD
Outfall
Outfall
Ramp
81 S.A RP
81 S.A ss.1
Lot 2081 RP
Lot 639 RP
Lot 81 S.B
Lot 764
PANG KA TSUEN
PO
TS



Lot 120
Lot 121
Lot 122
Lot 135
Lot 136
Lot 137
Lot 138
Lot 624
Lot 816
Lot 787
409
409A
411
412
415
PO
211
9A
7A
5A
3
mountain view
Road
Stream
TS
FP
ET



Lot 139
Lot 520 RP
Lot 519 RP
Lot 521
Lot 523
Lot 524
Open Storage
KAM TIN ROAD
Basketball Court
2


Outfall
Outfall
Outfall
KAM TAI ROAD
CUL
149 RP
150 RP
144
142
RUE DE CANNES
RUE DE MARSEILLE
815 RP &Ext ThereToLet
Shelter
Ramp
RCP

Appendix H

InfoWorks ICM Hydraulic Model

Appendix I

Capacity Check for Peripheral Channels

Appendix I - Capacity Check for Peripheral Channels

Ref.	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. As a conservative approach, the peripheral channel, namely Channel B, 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.

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 (Channel B), 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-2 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 (Channel A), 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 (Channel A), 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 (Channel A), 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 (Channel A), 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_012B is directly discharged to the existing watercourse. As conservative approach for sizing the peripheral channel (Channel A), it is assumed that the peripheral channel have sufficient capacity to collect the runoff from Cat_012B. 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

SDM Table 12

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

where

$\bar{V}$ = 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) 1 in	Flow from Catchment m^3/s	Free Flow Full-bore Capacity m^3/s	Full-bore Velocity m/s	Utilization %	Flow Capacity Check
Channel A.1	0.6	0.32	1.54	60	0.21	12.7	11.6	10.90	9.80	55	0.405	0.956	2.97	42.4	OK
Channel A.2	0.6	0.32	1.54	16	0.21	11.7	9.7	9.20	8.96	65	0.405	0.876	2.72	46.3	OK
Channel A.3	0.6	0.32	1.54	8	0.21	9.7	10.5	8.96	8.91	160	0.405	0.558	1.74	72.6	OK
Channel A.4	0.6	0.32	1.54	46	0.21	10.5	9.5	8.91	8.63	160	0.405	0.558	1.74	72.6	OK
Channel A.5	0.6	0.32	1.54	14	0.21	9.5	8.8	8.23	8.14	160	0.405	0.558	1.74	72.6	OK
Channel A.6	0.6	0.32	1.54	30	0.21	8.8	8.1	7.69	7.50	160	0.405	0.558	1.74	72.6	OK
Channel B.1	0.3	0.08	0.77	19	0.10	12.7	10.0	10.50	9.60	22	0.072	0.239	2.98	30.2	OK
Channel B.2	0.3	0.08	0.77	30	0.10	10.0	8.6	9.00	8.20	38	0.072	0.182	2.26	39.9	OK
Channel B.3	0.3	0.08	0.77	9	0.10	8.6	8.5	8.20	8.15	180	0.072	0.083	1.03	87.3	OK
Channel B.4	0.3	0.08	0.77	11	0.10	8.5	8.5	8.15	8.09	180	0.072	0.083	1.03	87.3	OK
Channel B.5	0.3	0.08	0.77	24	0.10	8.5	8.4	8.09	7.96	180	0.072	0.083	1.03	87.3	OK
Channel B.6	0.3	0.08	0.77	36	0.10	8.4	8.6	7.96	7.76	180	0.072	0.083	1.03	87.3	OK
Channel B.7	0.3	0.08	0.77	39	0.10	8.6	8.2	7.76	7.55	180	0.072	0.083	1.03	87.3	OK
Channel B.8	0.3	0.08	0.77	32	0.10	8.2	8.1	7.55	7.37	180	0.072	0.083	1.03	87.3	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.

$$V = -\sqrt{32gRSf}\log\left[\frac{ks}{14.8R} + \frac{1.255v}{R\sqrt{32gRSf}}\right]$$

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:

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	m^3/s	and velocity of 1.97 m/s

The future flow of	0.41	m^3/s	is	72.9%	of the full-bore capacity of	0.56	m^3/s	**OK!**

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.

Full-bore capacity for Proposed Pipe PC-2:

Pipe Diameter	300	mm	
Pipe Roughness	3	mm	
Thickness of Pipe	0.2	m	
Cover	1.2	m	
Length of Pipe	2	m	
Upstream Invert	6.77	mPD	
Downstream Invert	6.75	mPD	
Hydraulic Gradient, Sf	0.011		
Gradient 1 in	90		
Full-bore capacity	0.09	m^3/s	and velocity of 1.31 m/s

The future flow of	0.07	m^3/s	is	78.1%	of the full-bore capacity of	0.09	m^3/s	**OK!**

The proposed Pipe PC-2 is capable of conveying the future flow while maintaining 10% flow capacity allowance for siltation under 1 in 200 years storm event.

3. Conclusion

(1) The proposed peripheral channels and associated pipe have sufficient capacity to collect the peak flow from catchments.