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Revised Traffic Impact Assessment

**Proposed Development at
Various Lots in D.D.83
and Adjoining Government Land
Lung Yeuk Tau, Fanling, N.T.**

**Revised Traffic Impact Assessment
Final Report**

21st June, 2023

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1.0 INTRODUCTION

Background

- 1.1 The Subject Site is located at Various Lots, i.e. Lot Nos. 755, 756, 782 S.A, 789 S.A, 789 RP, 790 S.A ss.1, 790 S.A RP, 791 S.A ss.1, 791 S.A ss.2, 791 S.A ss.3, 791 S.A RP, 791 RP, 792 S.A RP, 792 RP, 793, 794 S.A, 794 RP, 800 S.A RP, 801 S.A, 803 RP, 835 S.B ss.1 S.A, 835 S.B ss.1 RP, 836 S.A, 836 RP, 837, 838 S.A, 838 RP, 839, 840, 841 S.A, 841 S.B, 841 RP, 842 S.A, 842 S.B, 842 RP, 843, 844 S.A, 844 RP and 854, in D.D. 83 and Adjoining Government Land, in Lung Yeuk Tau, Fanling, New Territories. **Figure 1.1** shows the location of the Subject Site.
- 1.2 At present, the Subject Site is occupied by several open storages, which are accessed from either Sha Tau Kok Road – Lung Yeuk Tau or Hai Wing Road / Dao Yang Road.
- 1.3 The Owner intends to develop the Subject Site into a development with 5 residential blocks comprising of 3,305 flats with average flat size of 44m² GFA, and 5,570 m² retail GFA (hereinafter “the Proposed Development”).
- 1.4 Against this background, CKM Asia Limited, a traffic and transportation planning consultancy firm, was commissioned to conduct a Traffic Impact Assessment (“TIA”) for the Proposed Development for the Section 12A Rezoning Application from “Residential (Group C)” zone and “Agriculture” zone to “Residential (Group A)2”. This revised TIA report has incorporated the comments provided by Transport Department in May 2023 on the earlier submitted TIA report.

Structure of Report

- 1.5 The report is structured as follows:

- Chapter 1 - Gives the background of the project;
- Chapter 2 - Describes the existing situation;
- Chapter 3 - Provides details on the Proposed Development, and presents the internal transport facilities provided;
- Chapter 4 - Describes the traffic impact analysis; and
- Chapter 5 - Gives the overall conclusion.

2.0 EXISTING SITUATION

The Subject Site

- 2.1 The Subject Site is located in Ma Liu Shui San Tsuen, Lung Yeuk Tau in Fanling, New Territories. Its site area is approximately 22,500m², and is now being occupied by several open storage areas. Access to the Subject Site is from either Sha Tau Kok Road – Lung Yeuk Tau, or Dao Yang Road / Hai Wing Road.

The Road Network

- 2.2 **Sha Tau Kok Road – Lung Yeuk Tau** is a Rural Road which runs between San Wan Road, Fanling in the west and Ping Che Road in the east. East of Ping Che Road, Sha Tau Kok Road continues towards Sha Tau Kok and the Sha Tau Kok Boundary Control Point. The Sha Tau Kok Interchange with Heung Yuen Wai Highway is located 3km to the east. In the vicinity of the Subject Site between Lau Shui Heung Road and Jockey Club Road, Sha Tau Kok Road – Lung Yeuk Tau is of dual-2 carriageway standard.
- 2.3 **Jockey Club Road** is a Primary Distributor running between Man Kam To Road to the north and Pak Wo Road to the south, where it connects with the Wo Hop Shek Interchange of Fanling Highway. It is of a dual-2 carriageway standard.
- 2.4 **So Kwun Po Road** is a Primary Distributor running between Pak Wo Road and Jockey Club Road. It connects with Fanling Highway via the So Kwun Po Interchange. So Kwun Po Road is generally of a dual-2/3 carriageway standard. To the east of Jockey Club Road, it continues as **Ma Sik Road** towards Luen Wo Hui and intersects with Sha Tau Kok Road – Lung Yeuk Tau.

Pedestrian and Cycling Facilities

- 2.5 Footpaths and at-grade signalized pedestrian crossings are provided along Sha Tau Kok Road – Lung Yeuk Tau in the vicinity of the Subject Site. A footbridge is also provided at the Sha Tau Kok Road / Lung Ma Road Roundabout.
- 2.6 Cycle track is provided west of Lung Ma Road along the south side of Sha Tau Kok Road – Lung Yeuk Tau, i.e. westbound side towards Fanling.

Existing Traffic Flows

- 2.7 To quantify the existing traffic flows in the vicinity, updated manual classified counts were conducted on weekdays, i.e. Thursday, 11th May 2023 and Friday, 12th May 2023, during the AM peak period between 0700 and 0900 hours, and during the PM peak periods between 1700 and 1900 hours at the following junctions:

- J01 - Junction of Sha Tau Kok Road / Lau Shui Heung Road
- J02 - Junction of Sha Tau Kok Road / Lung Ma Road
- J03 - Junction of Sha Tau Kok Road / Ma Sik Road
- J04 - Junction of Sha Tau Kok Road / Jockey Club Road
- J05 - Junction of So Kwun Po Road / Jockey Club Road / Ma Sik Road
- J06 - Roundabout of So Kwun Po Interchange
- J07 - Junction of Jockey Club Road / Lok Yip Road / San Wan Road
- J08 - Junction of Fanling Station Road / San Wan Road
- J09 - Roundabout of Sha Tau Kok Road / San Wan Road

- 2.8 **Figure 2.1** shows the Area of Influence (“AOI”) and the locations of the surveyed junctions; whereas **Figures 2.2 – 2.10** show their existing layouts.
- 2.9 The traffic counts are classified by vehicle type to enable traffic flows in passenger car units (“pcu”) to be calculated. The AM and PM peak hours identified from the surveys are found to be between 0800 and 0900 and 1800 - 1900 hours respectively, and the traffic flows in are shown in **Figure 2.11**.
- 2.10 The results from the above surveys are adopted in this revised TIA report.

Performance of the Surveyed Junctions

- 2.11 The existing performance of the surveyed junctions is calculated based on the observed traffic flows, and the analyses were undertaken using the methods outlined in Volume 2 of Transport Planning and Design Manual (“TPDM”). **Table 2.1** summarises the analysis results and the detailed calculations are found in **Appendix A**.

TABLE 2.1 EXISTING JUNCTION PERFORMANCE

Ref.	Junctions	Type of Junction	Parameter	AM Peak Hour	PM Peak Hour
J01	Sha Tau Kok Road / Lau Shui Heung Road	Roundabout	RFC	0.406	0.446
J02	Sha Tau Kok Road / Lung Ma Road	Roundabout	RFC	0.500	0.572
J03	Sha Tau Kok Road / Ma Sik Road	Signal	RC	74%	62%
J04	Sha Tau Kok Road / Jockey Club Road	Roundabout	RFC	0.528	0.474
J05	So Kwun Po Road / Jockey Club Road / Ma Sik Road	Signal	RC	34%	51%
J06	So Kwun Po Interchange	Roundabout	RFC	0.849	0.849
J07	Jockey Club Road / Lok Yip Road / San Wan Road	Signal	RFC	57%	61%
J08	Fanling Station Road / San Wan Road	Signal	RFC	54%	54%
J09	Sha Tau Kok Road / San Wan Road	Roundabout	RFC	0.476	0.514

Note: RFC - Ratio of Flow to Capacity RC – Reserve Capacity

- 2.12 The above results indicate the surveyed junctions operate with capacities.

Performance of the Surveyed Road Links

- 2.13 The existing performance, in terms of Peak Hourly Flows / Design Flow Ratio (“P/D_f”) of the surveyed road links shown in **Figure 2.1**, is calculated based on the observed traffic flows, and the analysis results are summarized in **Table 2.2**.

TABLE 2.2 EXISTING P/D_f OF SURVEYED ROAD LINKS

Ref.	Road Link	Section		Type (Note 1)	Config.	Design Flow (pcu/hr)	Peak Hour Flows / Design Flow Ratio (P/D _f)	
		From	To				AM Peak Hour	PM Peak Hour
L01	Sha Tau Kok Road	Lung Ma Road	Lau Shui Heung Road	RR	Dual-2	3,400	0.280	0.307
L02	Sha Tau Kok Road	Lau Shui Heung Road	Lung Ma Road	RR	Dual-2	3,400	0.311	0.354
L03	Sha Tau Kok Road	Ma Sik Road	Lung Ma Road	RR	Dual-2	3,400	0.411	0.396

(Note 1): RR – Rural Road DD – District Distributor PD – Primary Distributor
Config. Configuration

TABLE 2.2 EXISTING P/Df OF SURVEYED ROAD LINKS (CONT'D)

Ref.	Road Link	Section		Type (Note 1)	Config.	Design Flow (pcu/hr)	Peak Hour Flows / Design Flow Ratio (P/Df)	
		From	To				AM Peak Hour	PM Peak Hour
L05	Sha Tau Kok Road	Jockey Club Road	Ma Sik Road	RR	Dual-2	3,400	0.413	0.430
L06	Sha Tau Kok Road	Ma Sik Road	Jockey Club Road	RR	Dual-2	3,400	0.363	0.320
L07	Ma Sik Road	Jockey Club Road	Sha Tau Kok Road	DD	Dual-2	3,050	0.364	0.350
L08	Ma Sik Road	Sha Tau Kok Road	Jockey Club Road	DD	Dual-2	3,050	0.340	0.285
L09	Jockey Club Road	Ma Sik Road / So Kwun Po Road	Sha Tau Kok Road	PD	Dual-2	3,400	0.155	0.136
L10	Jockey Club Road	Sha Tau Kok Road	Ma Sik Road / So Kwun Po Road	PD	Dual-2	3,400	0.168	0.140
L11	So Kwun Po Road	Jockey Club Road	So Kwun Po Interchange	PD	Dual-2	3,400	0.368	0.296
L12	So Kwun Po Road	So Kwun Po Interchange	Jockey Club Road	PD	Dual-2	3,400	0.439	0.448
L13	Jockey Club Road	Sha Tau Kok Road	Lok Yip Street / San Wan Road	PD	Dual-2	3,400	0.114	0.135
L14	Jockey Club Road	Lok Yip Street / San Wan Road	Sha Tau Kok Road	PD	Dual-2	3,400	0.217	0.206
L15	San Wan Road	Fanling Station Road	Lok Yip Street / San Wan Road	DD	Dual-2	3,050	0.158	0.130
L16	San Wan Road	Lok Yip Street / San Wan Road	Fanling Station Road	DD	Dual-2	3,050	0.189	0.203

(Note 1): RR – Rural Road DD – District Distributor PD – Primary Distributor
Config. Configuration

2.14 The above results indicate the surveyed road links operate with capacities.

Historic Traffic Growth

2.15 The annual average daily traffic (“AADT”) of roads located in the vicinity of the Subject Site was obtained from the Annual Traffic Census (“ATC”) published by Transport Department, and **Table 2.3** summarises the AADT between 2015 and 2021, i.e. the latest 7 years.

TABLE 2.3 HISTORIC TRAFFIC INFORMATION FROM THE ATC

Station	5453	5824	5622	5623	5660	5860	Overall
Road	Sha Tau Kok Road						
From	Jockey Club Road	Jockey Club Road	Lok Yip Road	Luen Shing Street	On Kui Street	Ping Che Road	
To	San Wan Road	Lok Yip Road	Luen Shing St	On Kui Street	Ping Che Road	Shun Lung Street	
Year	Average Annual Daily Traffic ("AADT")						
2015	18,750	29,240*	17,300*	17,780	30,380	6,320*	113,450
2016	19,530*	29,270	21,540	20,840	33,580	6,550	124,760
2017	19,230*	27,180	21,390*	20,700*	33,050*	6,460	121,550
2018	19,700*	28,050*	22,070*	21,350*	33,870*	6,620	125,040
2019	20,320	29,170*	22,950*	22,200	33,630*	6,570*	128,270
2020	17,680	27,760*	18,260	17,080	23,740	6,300*	104,520
2021	18,380*	30,230	19,410	18,530	22,980	5,970	109,530
Average Annual Growth (2015 – 2019)	2.0%	-0.1%	7.3%	5.7%	2.6%	3.1%	3.1%

Note: * - Estimated by Growth Factor

2.16 It should be noted that AADT for 2020 and 2021 are presented for **reference only**, which have been excluded due to the impact of the COVID-19 pandemic.

2.17 **Table 2.3** shows that the overall traffic growth in the vicinity of the Subject Site is 3.1% per annum between 2015 and 2019.

Existing Pedestrian Flows

2.18 Pedestrian counts were conducted at footpaths and the signalised crossing on Sha Tau Kok Road – Lung Yeuk Tau between the Subject Site and the nearby bus stops, namely San Wai Barracks, during the AM peak period between 0700 and 0900 hours, and during the PM peak periods between 1700 and 1900 hours on Friday, 12th May 2023. **Figure 2.12** shows the surveyed locations.

2.19 The AM and PM peak hours identified from the surveys are found to be between 0745 and 0845, and 1800 - 1900 hours respectively.

Performance of the Pedestrian Facilities

2.20 Based on the surveyed pedestrian flows, the peak hour operational performance of the surveyed footpaths in terms on Levels of Service ("LOS"), and the surveyed signalised crossing in terms on volume-to-capacity ("v/c") ratios are calculated, and summarised in **Tables 2.4 and 2.5** respectively.

TABLE 2.4 EXISTING OPERATIONAL PERFORMANCES OF SURVEYED FOOTPATHS

Section		Measured Width (m)	Effective Width (m)	2-Way Flow (ped/hr)		2-Way Flow Rate (ped/m/min) [LOS]	
				AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
FP01	Sha Tau Kok Road – Southern Footpath	4.5m	4.0m	10	30	0.1 [A]	0.2 [A]
FP02	Sha Tau Kok Road – Southern Footpath	4.5m	4.0m	17	27	0.1 [A]	0.2 [A]
FP03	Sha Tau Kok Road – Northern Footpath	1.5m	1.0m	21	36	0.4 [A]	0.6 [A]

FP01 - Sha Tau Kok Road - Southern footpath between San Wai Barrack Bus Stop and Signalised Crossing

FP02 - Sha Tau Kok Road – Southern footpath between Subject Site and Signalised Crossing

FP03 - Sha Tau Kok Road – Northern footpath between San Wai Barrack Bus Stop and Signalised Crossing

TABLE 2.5 EXISTING OPERATIONAL PERFORMANCES OF SIGNALISED CROSSING

Pedestrian Crossing	Width (m)	Type / Capacity (ped/hour)	2-way Pedestrian Flow (ped/hour) and v/c Ratio		
			AM Peak Hour	PM Peak Hour	
XING01	Sha Tau Kok Road	5m	Signalised / 3,800 ^(Note 1)	11 [0.003]	13 [0.003]

XING01 - Signalised Crossing at Sha Tau Kok Road – Lung Yeuk Tau near San Wai Barrack

Note 1: Calculated based on TPDM Vol. 4 Chapter 3 with an assumption of a 65-second cycle including 26 seconds pedestrian green + flashing green time.

2.21 Tables 2.4 and 2.5 show the surveyed pedestrian facilities operate with capacity.

Population Projection

2.22 Reference is made to the “2019-based Territorial Population and Employment Data Matrix” for Northeast New Territories published by the Planning Department, and the detail is presented in Table 2.6.

TABLE 2.6 PROJECTED POPULATION AND EMPLOYMENT FOR NORTHEAST NEW TERRITORIES

Item	Year			Average Annual Growth	
	2019	2026	2031	2019 - 2026	2026 - 2031
Population	1,316,700	1,431,950	1,547,650	+1.2%	+1.6%
Employment	421,000	411,500	438,000	-0.3%	+1.3%
Total	1,737,700	1,843,450	1,985,650	+0.9%	+1.5%

2.23 Table 2.6 shows that the total population and employment in the Northeast New Territories is projected to increase by 0.9% per annum from 2019 to 2026, and 1.5% per annum from 2026 to 2031.

Existing Public Transport Services

2.24 At present, multiple franchised bus and green minibus (“GMB”) routes are available within 500m-radius from the Subject Site, and the details are presented in Table 2.7 and Figure 2.13.

TABLE 2.7 ROAD-BASED PUBLIC TRANSPORT SERVICES OPERATING WITHIN 500M OF THE SUBJECT SITE

Route	Routing	Frequency (minutes)
KMB 78A	Queen's Hill ↔ Fanling Station (Circular)	6 - 30
KMB 78B	Queen's Hill → Sheung Shui (Choi Yuen)	4 trips per day ⁽¹⁾⁽⁴⁾
KMB 78K	Sheung Shui / Sheung Shui (Tai Ping) ↔ Sha Tau Kok	10 - 30
	Sha Tau Kok → Wah Ming	5 - 12 ⁽¹⁾⁽⁴⁾
KMB 79K	Sheung Shui ↔ Ta Kwu Ling (Tsung Yuen Ha)	15 - 30
KMB 277A	Sha Tau Kok → Lam Tin Station	60 ⁽¹⁾
	Lam Tin Station → Sha Tau Kok	60 ⁽²⁾
KMB 278A	Queen's Hill ↔ Tsuen Wan (Nina Tower)	15 - 40
KMB N78	Sheung Shui → Sha Tau Kok	4 trips per day ⁽³⁾
	Sha Tau Kok → Sheung Shui	4 trips per day ⁽³⁾
CTB 56A	Queen's Hill Estate → Tuen Mun (Ching Tin and Wo Tin)	1 trip per AM, and 1 trip per PM ⁽⁴⁾
	Tuen Mun (Ching Tin and Wo Tin) → Queen's Hill Estate	2 trips per AM, and 1 trip per PM ⁽⁴⁾
CTB 78X	Queen's Hill Estate ↔ Kai Tak	30 - 60
CTB 79X	Queen's Hill Estate ↔ Cheung Sha Wan (Hoi Tat)	20 - 45
CTB 679	Queen's Hill Estate → Central (Hong Kong Station)	2 trips per AM ⁽¹⁾⁽⁴⁾
	Central (Hong Kong Station) → Queen's Hill Estate	1 trip per PM ⁽²⁾⁽⁴⁾
CTB 979	Queen's Hill Estate → Central (Hong Kong Station)	1 trip per AM ⁽¹⁾
	Central (Hong Kong Station) → Queen's Hill Estate	1 trip per PM ⁽²⁾
GMB 52B	Fanling Station ↔ Hok Tau	8 - 25
GMB 52K	Fanling Station ↔ Ping Che	4 - 10
GMB 55K	Sheung Shui Station ↔ Sha Tau Kok	4 - 10
GMB 56B	Fanling Station ↔ Tan Chuk Hang	15 - 30
GMB 56K	Fanling Station ↔ Luk Keng	10 - 30
GMB 503	Queen's Hill ↔ North District Hospital	10 - 20
GMB 503K	Queen's Hill ↔ Sheung Shui Station	8 - 15
RMB	Sheung Shui (Fu Hing Street) ↔ Ping Che / Ping Yeung	-

Note: KMB – Kowloon Motor Bus CTB – Citybus GMB – Green Minibus
⁽¹⁾ AM Peak hour service only ⁽²⁾ PM Peak hour service only ⁽³⁾ Overnight service only
⁽⁴⁾ No service on Saturdays, Sundays and public holidays
⁽²⁾ PM Peak hour service only ⁽³⁾ Overnight service only

Occupancy Survey of Existing Public Transport Services

Franchised Bus and Green Minibus

2.25 An occupancy survey of public transport services was conducted at the bus stops, namely the San Wai Barracks, at Sha Tau Kok Road – Lung Yeuk Tau on Friday, 12th May 2023 during the AM and PM peak periods between 0700 and 0900 hours, and 1700 and 1900 hours respectively. The San Wai Barracks bus stops are located some 200m west of the Subject Site. The AM and PM peak hours identified from the surveys are found to be between 0700 and 0800, and 1800 - 1900 hours respectively.

2.26 **Table 2.8** summaries the results for local services to and from the MTR Fanling / Sheung Shui Stations, and **Table 2.9** summaries the results for regional services to and from the urban area.

TABLE 2.8 RESULTS OF PEAK HOUR OCCUPANCY SURVEY FOR LOCAL SERVICES TO/FROM MTR FANLING / SHEUNG SHUI STATIONS

Peak Hour	Number of Trips Observed	Average Headway Observed (min)	Number of Passenger Observed (passenger/hour)	Total Hourly Capacity (passenger/hour) (Note 1)	Observed Occupancy	Surplus Capacity (passenger /hour)
To MTR Fanling / Sheung Shui Station (KMB 78K and 79K, and GMB 52B, 52K, 55K, 56B and 56K)						
AM	KMB: 18	3.3	1,915	2,712	71%	797
	GMB: 48	1.5				
PM	KMB: 4	15	895	1,160	77%	265
	GMB: 40	1.5				
From MTR Fanling / Sheung Shui Station (KMB 78K and 79K, and GMB 52B, 52K, 55K, 56B and 56K)						
AM	KMB: 4	15	964	1,369	70%	405
	GMB: 51	1.0				
PM	KMB: 6	10	1,080	1,303	83%	223
	GMB: 37	1.5				

Note 1: According to the Annual Transport Digest 2022 published by Transport Department, the average capacity of a double-decker bus is 124 passengers. To be conservative, an 80% load capacity is assumed, hence, a capacity of 100 passengers per vehicle is adopted. For GMB, a seating capacity of 19 passengers per vehicle is adopted.

TABLE 2.9 RESULTS OF PEAK HOUR OCCUPANCY SURVEY FOR REGIONAL SERVICES TO/FROM URABN AREA

Peak Hour	Number of Trips Observed	Average Headway Observed (min)	Number of Passenger Observed (passenger/hour)	Total Hourly Capacity ⁽¹⁾ (passenger/hour)	Observed Occupancy	Surplus Capacity (passenger /hour)
To Urban Area (KMB 277A, CTB 78X, 79X, 679 and 979)						
AM	8	7.5	279	800	35%	521
PM	1	60	10	100	10%	90
From Urban Area (KMB 277A, CTB 78X, 79X, 679 and 979)						
AM	No inbound service to Fanling during the AM peak hour.					
PM	6	10	335	600	56%	265

⁽¹⁾ According to the Annual Transport Digest 2022 published by Transport Department, the average capacity of a double-decker bus is 124 passengers. To be conservative, an 80% load capacity is assumed, hence, a capacity of 100 passengers per vehicle is adopted.

2.27 **Table 2.8** shows the local services to and from the MTR Fanling / Sheung Shui Station is frequent, and are around 70% to 80% utilized. **Table 2.9** shows the regional services to and from the urban area is no more than 60%, and the service frequency is considerably lower.

MTR East Rail Line

2.28 Based on the information obtained from the Legislative Council, the operational performance for MTR East Rail Line in 2022 is summarized in **Table 2.10**.

TABLE 2.10 OPERATIONAL PERFORMANCE OF MTR EAST RAIL LINE

Item	Parameters
Maximum carrying capacity when train frequency is maximized [a]	82,500 passengers / hour
Existing carrying capacity [b]	62,500 passengers / hour ^(Note 1)
Current Patronage [c]	37,700 passengers / hour ^(Note 2)
Current Loading [c]/[b] {Critical Link}	60% {Tai Wai to Kowloon Tong}
Loading in comparison with the maximum carrying capacity [c]/[a]	46% {Tai Wai to Kowloon Tong}

Source: Reply Serial No. TLB168 for Question Serial No. 1237, Controlling Officer's Reply, Examination of Estimates of Expenditure 2023-24. Finance Committee. Legislative Council. 14 April 2023. <https://www.legco.gov.hk/yr2023/english/fc/fc/w_q/tlb-e.pdf>

Note 1: According to the Reply Serial No. TLB168, existing service frequency has not yet increased to the maximum level and capacity as permitted by the signaling system.

Note 2: According to the Reply Serial No. TLB168, in view of the impact of COVID-2019, patronage shown is based on those months in 2022 when the pandemic situation was relatively eased.

2.29 **Table 2.10** shows that the MTR East Rail Line operates at 60% of its current capacity, or 46% of its maximum carrying capacity during the peak hour.

3.0 THE PROPOSED DEVELOPMENT

Proposed Development

3.1 **Table 3.1** summarises the parameters of the Proposed Development.

TABLE 3.1 PARAMETERS OF THE PROPOSED DEVELOPMENT

Use	Development Parameters		
Residential	Domestic Plot Ratio:	6.5	Flat Mix: GFA ≤ 40m ² 2,991 units 40m ² < GFA ≤ 70m ² 314 units
	Number of blocks:	5	
	Total number of flats:	3,305	
	Average Flat Size:	44m ² GFA	
	Estimated Population:	9,915	
Retail	5,570m ² GFA		

Proposed Internal Transport Facilities

Provision of Internal Transport Facilities for the Residential Flats

3.2 The internal transport facilities for the residential flats are provided based on the recommendation of the Hong Kong Planning Standards and Guidelines ("HKPSG"). **Table 3.2** compares the HKPSG recommendation and the proposed provision.

TABLE 3.2 COMPARISON OF INTERNAL TRANSPORT FACILITIES FOR RESIDENTIAL USE

HKPSG Recommendation		Proposed Provision
Private Car Parking Spaces		
(i)	<p>Residential: <i>Parking Requirement = GPS x R1 x R2 x R3</i></p> <p><u>Global Parking Standard (GPS):</u> Min: 1 space per 7 flats Max: 1 space per 4 flats</p> <p><u>Demand Adjustment Ratio (R1):</u></p> <ul style="list-style-type: none"> • Flat Size < 40m² = 0.5 • 40 < Flat Size ≤ 70 m² = 1.2 <p><u>Accessibility Adjustment Ratio (R2):</u></p> <ul style="list-style-type: none"> • Outside a 500m-radius of rail station = 1.0 <p><u>Development Intensity Adjustment Ratio (R3)</u></p> <ul style="list-style-type: none"> • 5.0 < Domestic Plot Ratio ≤ 8.0 = 0.9 <p>For Flat Size < 40m² (2,991 flats) Min: (2,991 / 7 x 0.5 x 1.0 x 0.9) = 192.3, say 193 nos. Max: (2,991 / 4 x 0.5 x 1.0 x 0.9) = 336.5, say 337 nos.</p> <p>For 40 < Flat Size ≤ 70 m²: (314 flats) Min: (314 / 7 x 1.2 x 1.0 x 0.9) = 48.4, say 49 nos. Max: (314 / 4 x 1.2 x 1.0 x 0.9) = 84.8, say 85 nos.</p> <p><u>Overall</u> Min: 193 + 49 = 242 nos. Max: 337 + 85 = 422 nos.</p>	<p>422 nos. (= HKPSG Max., OK)</p>

TABLE 3.2 COMPARISON OF PROVISION ON INTERNAL TRANSPORT FACILITIES FOR RESIDENTIAL USE (CONT'D)

HKPSG Recommendation		Proposed Provision
Private Car Parking Spaces		
(ii)	<p>Visitor Car Parking Spaces</p> <ul style="list-style-type: none"> - 1 - 5 no. per residential block with more than 75 units, or as determined by the Authority - At least 1 no. visitor car parking space shall be accessible peaking space. <p>For 5 blocks with 3,305 flats: Min: 1 x 5 = 5 nos. Max: 5 x 5 = 25 nos.</p>	<p>25 nos.</p> <p><u>(= HKPSG Max., OK)</u></p>
(iii)	<p>(i) + (ii)</p> <p>Min: 242 + 5 = 247 nos., <i>(including 243 nos. regular, and 4 nos. accessible)</i></p> <p>Max: 422 + 25 = 447 nos., <i>(including 442 nos. regular, and 5 nos. accessible)</i></p>	<p>447 nos., including: - 442 nos. regular, and - 5 nos. accessible</p> <p><u>(= HKPSG Max., OK)</u></p>
Motorcycle Parking Spaces		
(iv)	<p>At the rate of 1 motorcycle parking space per 100 - 150 flats</p> <p>Min: 3,305 / 150 = 22.03, say 23 nos. Max: 3,305 / 100 = 33.05, say 34 nos.</p>	<p>34 nos.</p> <p><u>(= HKPSG Max., OK)</u></p>
Goods Vehicle Loading / Unloading ("L/UL") Bay		
(v)	<p>1 bay per residential block</p> <p>For 5 residential blocks: 5 x 1 = 5 nos.</p>	<p>5 nos. HGV</p> <p><u>(= HKPSG, OK)</u></p>
Bicycle Parking Spaces		
(vi)	<p>At the rate of 1 cycle parking space for every 30 flats smaller than 70m² GFA for outside 2km radius of a rail station.</p> <p>3,305 / 30 = 110.2, says 111 nos</p>	<p>111 nos.</p> <p><u>(= HKPSG, OK)</u></p>

Provision of Internal Transport Facilities for Retail

3.4 The internal transport facilities for the retail use are provided based on the recommendation of the HKPSG, and Table 3.3 compares the HKPSG recommendation and the proposed provision.

TABLE 3.3 COMPARISON OF INTERNAL TRANSPORT FACILITIES FOR RETAIL USE

HKPSG Recommendation		Proposed Provision
Private Car Parking Spaces		
(vii)	<p>For 5,570m² GFA</p> <p>Min.: 5,570 / 300 = 18.6, say 19 nos. Max.: 5,570 / 150 = 37.1, say 38 nos.</p>	<p>38 nos., including: - 37 nos. regular, and - 1 no. accessible</p> <p><u>(= HKPSG Max., OK)</u></p>
Motorcycle Parking Spaces		
(viii)	<p>At 5% to 10% of car parking spaces provided</p> <p>Min.: 19 x 5% = 1.0, say 1 nos. Max.: 38 x 10% = 3.8, say 4 nos.</p>	<p>4 nos.</p> <p><u>(= HKPSG Max., OK)</u></p>

TABLE 3.3 COMPARISON OF INTERNAL TRANSPORT FACILITIES FOR RETAIL USE (CONT'D)

HKPSG Recommendation		Proposed Provision
Goods Vehicle Loading / Unloading ("L/UL") Bay		
(ix)	1 L/UL bay per 800 – 1,200 m ² GFA 65% LGV and 35% HGV For 5,570 m ² GFA: Min.: 5,570 / 1,200 = 4.68, say 5 nos. HGVS: 5 x 35% = 1.75, say 2 nos. LGVS: 5 – 2 = 3 nos. Max.: 5,570 / 800 = 6.96, say 7 nos. HGVS: 7 x 35% = 2.45, say 3 nos. LGVS: 7 – 3 = 4 nos.	7 nos. , including: - 3 nos. HGV, and - 4 nos. LGV (= HKPSG Max., OK)

Overall Provision of Internal Transport

3.5 **Table 3.4** summarises the overall provision of internal transport, which meets the high-end recommendation of the HKPSG.

TABLE 3.4 OVERALL PROVISION OF INTERNAL TRANSPORT FACILITIES

Type	Proposed Provision		
	Residential	Retail	Total
Car Parking Spaces @ 5.0m (L) x 2.5m (W) x 2.4m (H)	442	37	479
Accessible Car Parking Spaces @ 5.0m (L) x 3.5m (W) x 2.4m (H)	5	1	6
Motorcycle Parking Spaces @ 2.4m (L) x 1.0m (W) x 2.4m (H)	34	4	38
LGV Loading / Unloading Bays @ 7.0m (L) x 3.5m (W) x 3.6m (H)	-	4	4
HGV Loading / Unloading Bays @ 11.0m (L) x 3.5m (W) x 4.7m (H)	5	3	8
Bicycle Parking Spaces @ 1.65m (L) x 0.8m (W) or with parking racks	111	-	111

Internal Transport Layout

3.6 The proposed internal transport layouts are shown in **Figures 3.1 and 3.2**.

Proposed Vehicular Access

3.7 The proposed vehicular access is located on Sha Tau Kok Road westbound, and is detailed in **Figure 3.3**. Visibility at the proposed vehicular access meets the requirements as stipulated in the TPDM.

4.0 TRAFFIC IMPACT

Design Year

- 4.1 The Proposed Development is to be completed in 2031. Hence, the design year adopted is 2034, i.e. 3 years after completion.

Traffic Generation of the Proposed Development

- 4.2 To estimate the traffic generation associated with the Proposed Development, the TPDM trip rates are adopted, and are summarized in **Table 4.1**.

TABLE 4.1 TRIP RATES ADOPTED FROM THE TPDM

Item	AM Peak Hour		PM Peak Hour	
	Generation	Attraction	Generation	Attraction
Private Housing: High-Density / R(A) 60 m ² GFA (pcu/hour/flat)	0.0718	0.0425	0.0286	0.037
Retail (pcu/100m ² GFA/hour)	0.2296	0.2434	0.3100	0.3563

- 4.3 Trip rates for “Private Housing” provided in the TPDM is only available for unit with average flat size 60m² or larger; whereas the average flat size for the Proposed Development is only 44m², which is 27% smaller. Hence, it is opined the use of mean rates for larger flat size provides a more conservative, i.e. higher, estimation on traffic generation. **Table 4.2** presents the traffic generation for the Proposed Development.

TABLE 4.2 TRAFFIC GENERATION FOR THE PROPOSED DEVELOPMENT

Item	AM Peak Hour (pcu/hour)		PM Peak Hour (pcu/hour)	
	Generation	Attraction	Generation	Attraction
Residential (3,305 flats)	238	141	95	123
Retail (5,570m ² GFA)	13	14	18	20
TOTAL	251	155	113	143
	406 (2-Way)		256 (2-Way)	

- 4.4 **Table 4.2** shows that the Proposed Development is expected to generate some 406 and 256 pcu (2-way) during the AM and PM peak hours respectively.

Traffic Forecasting

- 4.5 Year 2034 traffic flows used for the capacity analysis are derived based on the following:
- (i) the 2023 existing traffic flow,
 - (ii) with reference to the 2026 traffic flows from the NTE1 Base District Traffic Model (“BDTM”) which is produced by Transport Department,
 - (iii) the estimated traffic growths from 2026 to 2034,
 - (iv) the expected traffic generation associated with other known planned / committed major developments,
 - (v) the planned traffic improvement works to be carried by other projects, and
 - (vi) the expected traffic generation associated to the Proposed Development

- 4.6 The traffic growth from 2026 to 2034 are calculated using the following equations, with X_i being the annual population growth of 1.1% per annum obtained from the “2019-based Territorial Population and Employment Data Matrix” published by Planning Department rates for 2026 – 2034.

$$2026 \text{ to } 2034 \text{ traffic growth factor} = (1 + X_i)^8$$

- 4.7 The total growths were then applied to the trips ends of the 2026 NTE1 BDTM model to develop the 2034 traffic model for producing the 2034 traffic flows.

Other Known Planned / Committed Major Developments in the Vicinity

- 4.8 Traffic generations associated with the other known planned / committed major developments located in the vicinity summarised in **Table 4.3** were considered and included in the 2034 traffic forecast. The locations of these other developments are shown in **Figure 4.1**.

TABLE 4.3 LIST OF OTHER KNOWN PLANNED / COMMITTED MAJOR DEVELOPMENTS

Ref.	Developments	Development Parameters (Approx.)
A.	Fanling North New Development Area (including Proposed Minor Relaxation of Plot Ratio and Building Height approved under TPB No. A/KTN/54, A/FLN/28, & A/FLN/30) ⁽¹⁾	Public Housing: 15,939 flats Private Housing: 8,990 flats G/IC: 32,837 m ² GFA Other non-domestic use (e.g. retail, kindergarten etc.): 129,657 m ² GFA Multiple Primary and Secondary Schools
B.	Private Residential Development at Sheung Shui Town Lot 262,8 Ma Sik Road, Fanling, (namely “One Innovale”) ⁽²⁾	Private Housing: 1,576 flats
C.	Proposed Public Housing Development at Queen’s Hill Extension ⁽³⁾	Public Housing: 4,000 flats G/IC
D.	New Territories East Cultural Centre in Area 11, Sha Tau Kok Road – Lung Yeuk Tau, Fanling ⁽⁴⁾	67,000 m ² CFA with 2,500 seats Public Vehicle Park
E.	Public Housing Development at San Wan Road ⁽⁵⁾	Public Housing: 450 flats G/IC, Kindergarten, Primary School, and Secondary School
F.	Mixed Housing Development Project at Pak Wo Road (TPB No. A/FSS/254) ^{(6) (9)}	Public Housing: 510 flats Subsidized Sale Flat: 696 flats Elderly Housing: 261 flats RCHE: 210 beds Retail: 6,500 m ² GFA Public Vehicle Park
G.	Public Housing Development at Fanling Area 17 ⁽⁷⁾	Public Housing: 8,300 flats G/IC, Social Welfare Facilities, Kindergarten, Community Hall, Retail, Market
H.	Subsidized Sale Flats at Jockey Club Road ^{(6) (8)}	Subsidized Sale Flat: 644 flats Retail: 3,000 m ² CFA Public Vehicle Park with
I.	Public Housing Development at Sheung Shui Areas 4 and 30 Site 1 & 2 (including Proposed Minor Relaxation of Plot Ratio and Building Height approved under TPB No. A/FSS/280) ^{(8) (9)}	Public Housing: 3,644 flats Retail: 1,100 m ² CFA G/IC Public Vehicle Park
J.	Public Housing Development at Po Shek Wu Road ⁽⁸⁾	Public Housing: 1,800 flats Retail: 3,000 m ² CFA Kindergarten

TABLE 4.3 LIST OF OTHER KNOWN PLANNED / COMMITTED MAJOR DEVELOPMENTS (CONT'D)

Ref.	Developments	Development Parameters (Approx.)
K.	Proposed House and Social Welfare Facility (Residential Care Home for the Elderly) at Ma Sik Road, Fanling (TPB No. A/FSS/276) ⁽⁹⁾	RCHE: 60 beds ⁽⁹⁾ Private Housing: 50 houses
L.	Proposed Social Welfare Facility (Residential Care Home for the Elderly) and Flat at Tin Ping Road, Sheung Shui (TPB No. A/FSS/279) ⁽⁹⁾	RCHE: 143 beds Private Housing: 28 flats
M.	Proposed Minor Relaxation of Domestic PR Restriction for Permitted Residential Development with Commercial Uses at 1 Luen Fat Street, Fanling (TPB No. A/FSS/282) ⁽⁹⁾	Private Housing: 119 flats Commercial: 161 m ² GFA
N.	Proposed Shop and Services (Showroom) and Office (Wholesale Conversion of an Existing Industrial Building) at 5 Lok Yip Road, Fanling (TPB No. A/FSS/283) ⁽⁹⁾	Retail: 4,075 m ² GFA
O.	Proposed Shop and Services, Eating Place and Other Uses at 33 On Lok Mun Street, Fanling (TPB No. A/FSS/284) ⁽⁹⁾	Retail: 2,392 m ² GFA
P.	Public Housing Development at Ching Hiu Road ⁽¹⁰⁾	Private Housing: 620 flats G/IC, & Social Welfare Facilities

Source:

- (1) Rural and New Town Planning Committee ("RNTPC") Paper No. A/FLN/30
- (2) One Innovale. <<http://www.oneinnovale.com.hk>>
- (3) North Committees Meetings Discussion Paper 9/2022. "Proposed Public Housing Development at Queen's Hill Extension". Dated 15 May 2022. North District Council.
- (4) LC Paper No. CB(2)614/2022(01). Legislative Council.
- (5) Planning Brief. Hong Kong Housing Authority.
<https://www.pland.gov.hk/pland_en/access/pec/planning_brief/San%20Wan%20Road%20PB.pdf>
- (6) HKHS Annual Report 2022. Hong Kong Housing Society.
- (7) Paper 2/2023. "粉嶺第 17 區公營房屋發展計劃". Dated 16 January 2023. North District Council.
- (8) North Committees Meetings Discussion Paper 5/2019. "Public Housing Development Programmes at Sites 1 and 2 in Sheung Shui Areas 4 and 30, a Site to the North of Po Shek Wu Road and a Site on Jockey Club Road, Fanling, and Proposed Amendments to the Approved Fanling/Sheung Shui Outline Zoning Plan No. S/FSS/22." Dated 21 January 2019. North District Council.
- (9) Statutory Planning Portal 2. Town Planning Board.
- (10) Paper 4/2023. "上水清曉路公營房屋發展之工地平整及基礎設施工程." Dated 16 January 2023. North District Council.

Future Road Network

- 4.9 Various traffic improvement works have been planned for implementation within the AOI, and the details are summarized in **Table 4.4**.

TABLE 4.4 PLANNED TRAFFIC IMPROVEMENT WORKS WITHIN THE AOI

Planned Traffic Improvements	Completion Year
Fanling Bypass Eastern Section ⁽¹⁾	By 2025
Lung Yeuk Tau Interchange of the Fanling Bypass Eastern Section ⁽¹⁾	By 2025
Fanling Bypass Western Section ⁽²⁾	By 2031
Improvement of So Kwun Po Interchange ⁽³⁾	By 2030
Local improvements at various junction along Ma Sik Road, So Kwun Po Road, and Jockey Club Road ⁽⁴⁾⁽⁵⁾	By 2031

- (1) Project Number 7747CL. "Advance Site Formation and Engineering Infrastructure Works at Kwu Tung North and Fanling North New Development Areas." Civil Engineering and Development Department.
<<https://www.cedd.gov.hk/eng/our-projects/major-projects/index-id-36.html>>

- (2) Project Number 7835CL. "Remaining Phase of Site Formation and Engineering Infrastructure Works at Kwu Tung North and Fanling North New Development Area - Detailed Design and Site Investigation" Civil Engineering and Development Department. < <https://www.cedd.gov.hk/eng/our-projects/major-projects/index-id-87.html> >
- (3) PP-616/2021 Improvement to So Kwun Po Interchange. Environmental Protection Department. < <https://www.epd.gov.hk/eia/register/profile/latest/esb338/esb338.pdf> >
- (4) A/FLN/30. "Proposed Minor Relaxation of PR and BH Restrictions for Permitted Public and Private Housing Developments; and Proposed Social Welfare Facilities, Shop and Services and Eating Place within Public Housing Developments." Town Planning Board.
- (5) Paper 2/2023. "粉嶺第 17 區公營房屋發展計劃". Dated 16 January 2023. North District Council.

4.10 The above listed traffic improvements will be implemented by 2031, i.e. prior to the completion of the Proposed Development and an overview of the road network adopted in the 2034 traffic model is also shown in **Figure 4.1**.

2034 Traffic Flows

4.11 Year 2034 traffic flows with the Proposed Development are derived as follows:

$$2034 \text{ Traffic Flows with the Proposed Development} = 2034 \text{ Traffic Flows without the Proposed Development} + \text{Traffic Generated by the Proposed Development}$$

4.12 **Figures 4.2 and 4.3** show the 2034 AM and PM peak hour traffic flows without and with the Proposed Development respectively.

2034 Junction Capacity Analysis

4.13 Year 2034 junction capacity analysis for the case without and with the Proposed Development are summarised in **Table 4.5** and detailed calculations are found in the **Appendix A**.

TABLE 4.5 2034 JUNCTION PERFORMANCE

Ref.	Junction	Type of Junction	Parameter	Without the Proposed Development		With the Proposed Development	
				AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
J01	Sha Tau Kok Road / Lau Shui Heung Road	Roundabout	RFC	0.453	0.514	0.519	0.578
J02	Sha Tau Kok Road / Lung Ma Road	Roundabout	RFC	0.606	0.649	0.734	0.705
J03	Sha Tau Kok Road / Ma Sik Road ^(Note 1)	Priority	RFC	0.638	0.632	0.652	0.638
J04	Sha Tau Kok Road / Jockey Club Road ^(Note 1)	Roundabout	RFC	0.686	0.623	0.713	0.624
J05	So Kwun Po Road / Jockey Club Road / Ma Sik Road ^(Note 1)	Signal	RC	21%	46%	20%	44%
J06	So Kwun Po Interchange ^(Note 1)	Roundabout	RFC	0.796	0.784	0.826	0.794
J07	Jockey Club Road / Lok Yip Road / San Wan Road	Signal	RFC	18%	25%	18%	25%
J08	Fanling Station Road / San Wan Road	Signal	RFC	18%	18%	18%	18%
J09	Sha Tau Kok Road / San Wan Road	Roundabout	RFC	0.580	0.599	0.593	0.603
J10	Lung Yeuk Tau Interchange ^(Note 1)	Roundabout	RFC	0.663	0.671	0.702	0.743
J11	Proposed Vehicular Access / Sha Tau Kok Road	Priority	RFC	n/a	n/a	0.372	0.176

Note 1: With planned traffic improvement works to be implemented by Others.
RFC - Ratio of Flow to Capacity RC – Reserve Capacity

4.14 **Table 4.5** shows that the junctions analyzed have capacity to accommodate the expected traffic growth to 2034, and the traffic generated by the Proposed Development.

2034 Road Link Capacity Analysis

4.15 Year 2034 road link capacity analysis for the cases without and with the Proposed Development are summarised in **Table 4.6**.

TABLE 4.6 2034 P/Df OF ROAD LINKS

Ref.	Road Link	Section		Type (Note 1)	Design Flow (pcu/hr)	Peak Hourly Flows / Design Flow Ratio (P/Df)			
		From	To			Without the Proposed Development		With the Proposed Development	
						AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
L01	Sha Tau Kok Road	Lung Ma Road	Lau Shui Heung Road	RR	3,400	0.315	0.354	0.361	0.398
L02	Sha Tau Kok Road	Lau Shui Heung Road	Lung Ma Road	RR	3,400	0.352	0.381	0.426	0.414
L03	Sha Tau Kok Road	Ma Sik Road	Lung Ma Road	RR	3,400	0.505	0.472	0.547	0.512
L04	Sha Tau Kok Road	Lung Ma Road	Ma Sik Road	RR	3,400	0.724	0.658	0.795	0.687
L05	Sha Tau Kok Road	Jockey Club Road	Ma Sik Road	RR	3,400	0.421	0.438	0.421	0.438
L06	Sha Tau Kok Road	Ma Sik Road	Jockey Club Road	RR	3,400	0.457	0.398	0.477	0.406
L07	Ma Sik Road	Jockey Club Road	Sha Tau Kok Road	DD	3,050	0.482	0.479	0.493	0.494
L08	Ma Sik Road	Sha Tau Kok Road	Jockey Club Road	DD	3,050	0.479	0.354	0.479	0.354
L09	Jockey Club Road	Ma Sik Road / So Kwun Po Road	Sha Tau Kok Road	PD	3,400	0.198	0.167	0.198	0.167
L10	Jockey Club Road	Sha Tau Kok Road	Ma Sik Road / So Kwun Po Road	PD	3,400	0.227	0.192	0.228	0.193
L11	So Kwun Po Road	Jockey Club Road	So Kwun Po Interchange	PD	3,400	0.523	0.380	0.523	0.380
L12	So Kwun Po Road	So Kwun Po Interchange	Jockey Club Road	PD	3,400	0.569	0.588	0.577	0.599
L13	Jockey Club Road	Sha Tau Kok Road	Lok Yip Street / San Wan Road	PD	3,400	0.172	0.191	0.172	0.191
L14	Jockey Club Road	Lok Yip Street / San Wan Road	Sha Tau Kok Road	PD	3,400	0.265	0.222	0.265	0.222
L15	San Wan Road	Fanling Station Road	Lok Yip Street / San Wan Road	DD	3,050	0.184	0.159	0.184	0.159
L16	San Wan Road	Lok Yip Street / San Wan Road	Fanling Station Road	DD	3,050	0.229	0.238	0.229	0.238

4.16 **Table 4.6** shows that, the road links analyzed have capacity to accommodate the expected traffic growth to 2034 and the traffic generated by the Proposed Development will have no adverse negative impact to the surrounding road network.

Mode of Transport and Pedestrian Generation of the Proposed Development

- 4.17 Reference is made to the “*Travel Characteristics Survey 2011 – Final Report*” published by the Transport Department and the “*Population By-census 2016*” published by the Census and Statistics Department. The passenger demand on public transport services and pedestrian generation associated with the Proposed Development are estimated and presented in **Table 4.7**.

TABLE 4.7 ESTIMATED PASSENGER DEMAND ON PUBLIC TRANSPORT AND PEDESTRIAN GENERATION ASSOCIATED WITH THE PROPOSED DEVELOPMENT

Item	Parameters				
Number of Peak Hour Mechanised Trips					
Estimated Population [a]	9,915				
Mechanised Trips Rate per Person [b] ⁽¹⁾	1.83				
Daily Trips generated by the Proposed Development [c] = [a]x[b]	9,915 x 1.83 = 18,145				
Percentage of Daily Trip during Peak Hours ⁽²⁾ [d]	12%				
Peak Hour Trips (2-way) [e] = [c]x[d]	18,145 x 12% = 2,178				
	AM Peak Hour		PM Peak Hour		
	Generation	Attraction	Generation	Attraction	
Peak Hour Trip Distribution ⁽³⁾ [f] (Based on in-house survey data)	80%	20%	50%	50%	
Peak Hour Trip Generation / Attraction [g] = [e]x[f]	1,525	653	1,089	1,089	
Passenger Demand on Main Mode of Transport					
Main Mode of Transport	Percentage	AM Peak Hour		PM Peak Hour	
		Generation	Attraction	Generation	Attraction
Private Car & Taxi	15% ⁽⁴⁾	262	66	164	164
Rail-based Public Transport [h] (MTR and Local Road-Based Services)	42% ⁽⁴⁾	733	183	458	458
Road-based Public Transport [i] (Regional Road-Based Services) [i]	43% ⁽⁴⁾	750	188	469	469
Peak Hour Pedestrian Generation [h] + [i]					
Pedestrian Generation		1,483	371	927	927

(1) Table 3.3, “*Travel Characteristics Survey 2011 – Final Report*”, Transport Department

(2) Paragraph 3.3.7, “*Travel Characteristics Survey 2011 – Final Report*”, Transport Department

(3) Based on CKM in-house database with surveys carried at various residential developments.

(4) Combined Percentage on Main Mode of Transport to Place of Work for North - Luen Wo Hui, North - Sha Ta, and North - Queen’s Hill. “*Population By-census 2016*”, Census and Statistics Department.

- 4.18 **Table 4.7** shows the Proposed Development is estimated to generate 1,854 pedestrian trips (2-way) during the AM and PM peak hour respectively.

Review on Public Transport Services

Local Road-Based Public Transport Services to/from MTR Stations

- 4.19 Based on the estimated mode of transport presented in **Table 4.7**, the analyses on local road-based public transport services, i.e. franchised buses and GMB, between the Proposed Development and the MTR Fanling / Sheung Shui Stations, are presented in **Table 4.8**.

TABLE 4.8 ANALYSES ON LOCAL ROAD-BASED PUBLIC TRANSPORT SERVICES TO/FROM MTR STATIONS

Item	Number of Passengers			
	AM Peak Hour		PM Peak Hour	
	To MTR Stations	From MTR Stations	To MTR Stations	From MTR Stations
Existing Surplus Capacity [a] (From Table 2.8)	797	405	265	223
Passenger Demand associated with the Proposed Development [b] (From Table 4.6)	733	183	458	458
Surplus or Deficit [c] = [a]-[b]	+ 64	+ 222	-193	-235
Additional Services by Double Decker Buses required	Not Required	Not Required	2 nos.	3 nos.

Note 1: To be conservative, a capacity of 100 passengers per vehicle is adopted.

4.20 **Table 4.8** shows that the existing local road-based public transport services from MTR Fanling / Sheung Shui Stations have capacity to serve the additional passenger demand associated with the Proposed Development during the AM peak hour. Whereas, additional 2 to 3 services shall be required during the PM peak hour.

4.21 **Table 2.6** shows that KMB 78K and 79K operate with a total of 4 services only during the PM peak hour, i.e. 2 services/route/hour with an average headway of 30 minutes. Hence, it is suggested to add, say, 2 to 3 additional services between the 2 existing KMB routes, shortening the headway from 30 minutes to 15 to 20 minutes for the 2 existing routes.

Rail-Based Public Transport Services (MTR East Rail)

4.22 **Table 4.7** shows that the additional demand on rail-based public transport services, i.e. MTR East Rail, associated with the Proposed Development is no more than 733 passengers during the peak hour. Whereas, as shown in **Table 2.10**, the MTR East Rail has a maximum carrying capacity of 82,500 passenger/hour/direction. Hence, the additional passenger demand is only 0.9% of the maximum carrying capacity [*Calculation: $733 \div 82,500 = 0.9\%$*], which is negligible and will not result in adverse impact on the MTR East Rail.

Regional Road-Based Public Transport Services to/from Urban Area

4.23 **Table 4.9** summarises the analyses on regional road-based public transport services, i.e. franchised buses, directly between the Proposed Development and the urban area.

TABLE 4.9 ANALYSES ON REGIONAL ROAD-BASED PUBLIC TRANSPORT SERVICES TO/FROM URBAN AREA

Item	Number of Passengers			
	AM Peak Hour		PM Peak Hour	
	To Urban Area	From Urban Area	To Urban Area	From Urban Area
Existing Surplus Capacity [a] (From Table 2.8)	521	n/a	90	265
Passenger Demand associated with the Proposed Development [b] (From Table 4.6)	750	188	469	469
Surplus or Deficit [c] = [a]-[b]	-229	-188	-379	-204
Additional Services by Double Decker Buses required	3 nos.	2 nos.	4 nos.	3 nos.

Note 1: To be conservative, a capacity of 100 passengers per vehicle is adopted.

- 4.24 **Table 4.9** shows that additional 2 to 4 regional road-based public transport services to/from the urban area during the AM and PM peak hour shall be required to serve the additional passenger demand associated with the Proposed Development.
- 4.25 **Table 2.9** show that the existing services to and from the urban area is limited during the AM and PM peak hour. Hence, it is suggested to add 3 to 4 additional services in either direction amongst the 5 existing KMB and CTB routes.

Pedestrian Forecasting

- 4.26 Year 2034 AM and PM peak hour pedestrian flows are estimated based on the existing pedestrian flow, and the estimated pedestrian growth from 2023 to 2024. With reference to **Table 2.6**, a growth rate of 1.1% per annum is adopted to derive the 2034 pedestrian flows as follow:

$$2034 \text{ Pedestrian Flows without the Proposed Development [a]} = \text{Existing Pedestrian Flows} + \text{Estimated Pedestrian Growth to 2034}$$

$$2034 \text{ Pedestrian Flows without the Proposed Development} = [a] + \text{Pedestrian Generation associated with the Proposed Development [Table 4.6]}$$

2034 Pedestrian Facilities Operational Performance

- 4.27 Operational performance of the selected pedestrian facilities are calculated, and summarized in **Tables 4.10 and 4.11**.

TABLE 4.10 YEAR 2034 OPERATIONAL PERFORMANCES OF FOOTPATH

Section		Measured Width (m)	Effective Width (m)	2-Way Flow (ped/hr) / Flow Rate (ped/m/min) [LOS]			
				2034 Without Proposed Development		2034 With Proposed Development	
				AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
FP01	Sha Tau Kok Road – Southern Footpath	4.5m	4.0m	12	35	933	962
				0.1 [A]	0.2 [A]	3.9 [A]	4.1 [A]
FP02	Sha Tau Kok Road – Southern Footpath	4.5m	4.0m	20	32	1,874	1,886
				0.1 [A]	0.2 [B]	7.9 [A]	7.9 [A]
FP03	Sha Tau Kok Road – Northern Footpath	1.5m	1.0m	25	42	958	969
				0.5 [B]	0.7 [B]	16.0 [B]	16.2 [B]

FP01 - Sha Tau Kok Road - Southern footpath between San Wai Barrack Bus Stop and Signalised Crossing

FP02 - Sha Tau Kok Road – Southern footpath between Subject Site and Signalised Crossing

FP03 - Sha Tau Kok Road – Northern footpath between San Wai Barrack Bus Stop

TABLE 4.11 YEAR 2034 OPERATIONAL PERFORMANCES OF SURVEYED SIGNALISED CROSSING

Pedestrian Crossing		Width (m)	Type / Capacity (ped/hour)	2-way Pedestrian Flow (ped/hour) [v/c Ratio]			
				2034 Without Proposed Development		2034 With Proposed Development	
				AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
XING01	Sha Tau Kok Road	5m	Signalised / 3,800 (Note 1)	13 [0.003]	16 [0.006]	946 [0.249]	943 [0.248]

XING01 - Sha Tau Kok Road – Signalised Crossing

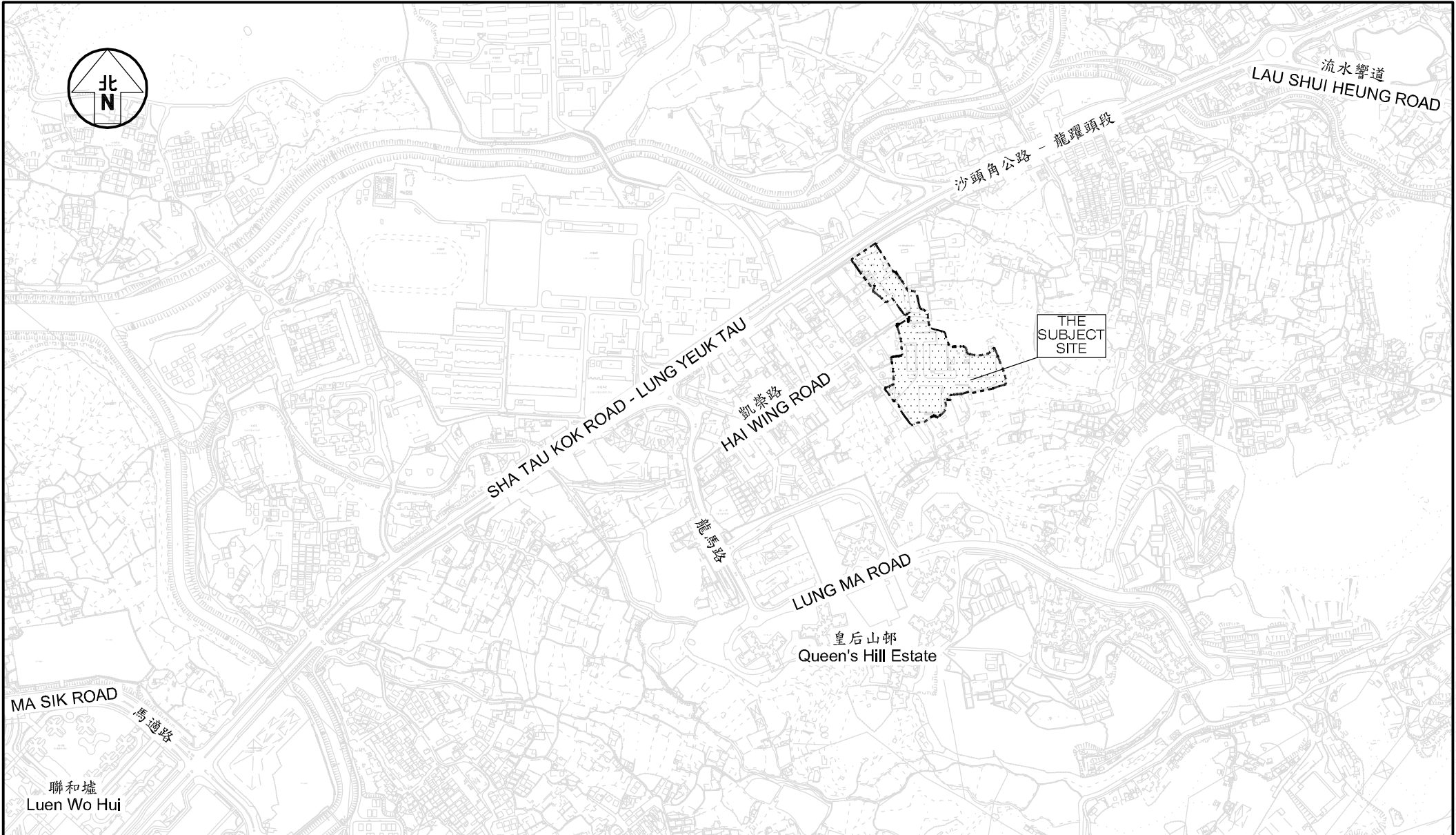
Note 1: Calculated based on TPDM Vol. 4 Chapter 3 with an assumption of a 65-second cycle including 26 seconds pedestrian green + flashing green time.

4.28 The above results indicate that pedestrian facilities assessed will operate with capacities during the AM and PM peak hour.

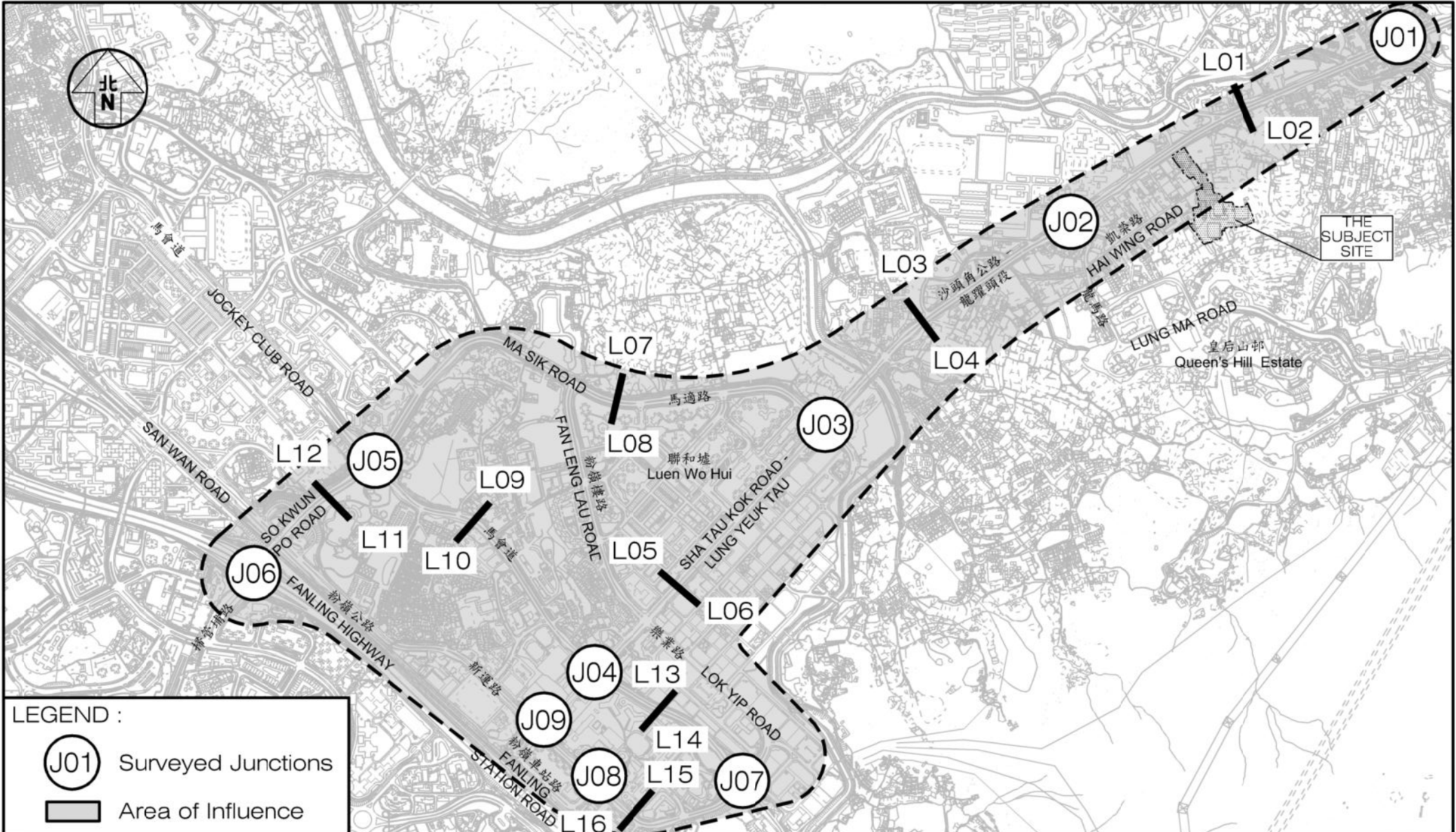
5.0 SUMMARY

- 5.1 The Proposed Development in various lots in D.D. 83, Lung Yeuk Tau in Fanling has 5 residential blocks including 3,305 flats with average flat size of 44m² GFA, and 5,570 m² retail GFA.
- 5.2 The proposed internal transport facilities meet the high-end recommendation of the HKPSG, and include the following:
- i) 479 car parking spaces @ 5.0m (L) x 2.5m (W) x Min. 2.4m (H),
 - ii) 6 accessible car parking spaces @ 5.0m (L) x 3.5m (W) x Min. 2.4 (H),
 - iii) 38 motorcycle parking spaces @ 2.4m (L) x 1.0m (W) x Min. 2.4m (H),
 - iv) 4 LGV loading / unloading bays @ 7.0m (L) x 3.5m (W) x Min. 3.6m (H),
 - v) 8 HGV loading / unloading bays @ 11.0m (L) x 3.5m (W) x Min. 4.7m (H),
 - vi) 111 bicycle parking spaces @ 1.65m (L) x 0.8m (W) or with parking rack.
- 5.3 Updated manual classified counts were conducted in May 2023 at selected junctions located in the AOI to establish the existing traffic flows during the AM and PM peak hours. The design year 2034 traffic flows were derived with reference to the BDTM, and have also taken into account the traffic generation and planned traffic improvement works associated with other known planned / committed major developments located in the vicinity.
- 5.4 Traffic generation for the Proposed Development is calculated based on the trip rates adopted from the TPDM, and conservatively, it is expected to generate some 406 and 256 pcu (2-way) during the AM and PM peak hours respectively.
- 5.5 The traffic analysis found that the surveyed junctions and road links analyzed currently operate with capacity. With the planned traffic improvement works to be implemented by others, the analyzed junction will have sufficient capacity to accommodate the expected traffic growth to 2034 and the traffic generated by the Proposed Development. Hence, traffic generated by the Proposed Development will result in no adverse impact to the surrounding road network.
- 5.6 Passenger demand on public transport services associated with the Proposed Development was estimated for local and regional road-based public transport services. During the AM peak hour, the local services are expected to have surplus capacity to accommodate the additional passenger demand, and additional 2 to 3 services by double decker buses are suggested to enhance the regional services. During the PM peak hour, additional 2 to 4 services by double decker buses are suggested for both local and regional services. Whereas, the MTR East Rail shall have capacity to accommodate the additional passenger demand associated with the Proposed Development.
- 5.7 Analyses for nearby pedestrian facilities on Sha Tau Kok Road – Lung Yeuk Tau were also reviewed, and these facilities shall have capacity to accommodate the additional pedestrian flows associated with the Proposed Development during the AM and PM peak hour.
- 5.8 In view of the above, it is concluded that the Proposed Development is acceptable from traffic engineering viewpoint.

FIGURES



Project Title	PROPOSED DEVELOPMENT AT VARIOUS LOTS IN D.D.83 AND ADJOINING GOVERNMENT LAND LUNG YEUK TAU, FANLING, N.T.	Figure No. 1.1	Revision B	CKM Asia Limited Traffic and Transportation Planning Consultants 21st Floor, Methodist House, 36 Hennessy Road, Wan Chai, Hong Kong Tel : (852) 2520 5990 Fax : (852) 2528 6343 Email : mail@ckmasia.com.hk	
Figure Title	LOCATION OF THE SUBJECT SITE	Designed by N C L	Drawn by S C Y		Checked by K C
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LEGEND :

(J01) Surveyed Junctions

▭ Area of Influence

Project Title: PROPOSED DEVELOPMENT AT VARIOUS LOTS IN D.D.83 AND ADJOINING GOVERNMENT LAND LUNG YEUK TAU, FANLING, N.T.

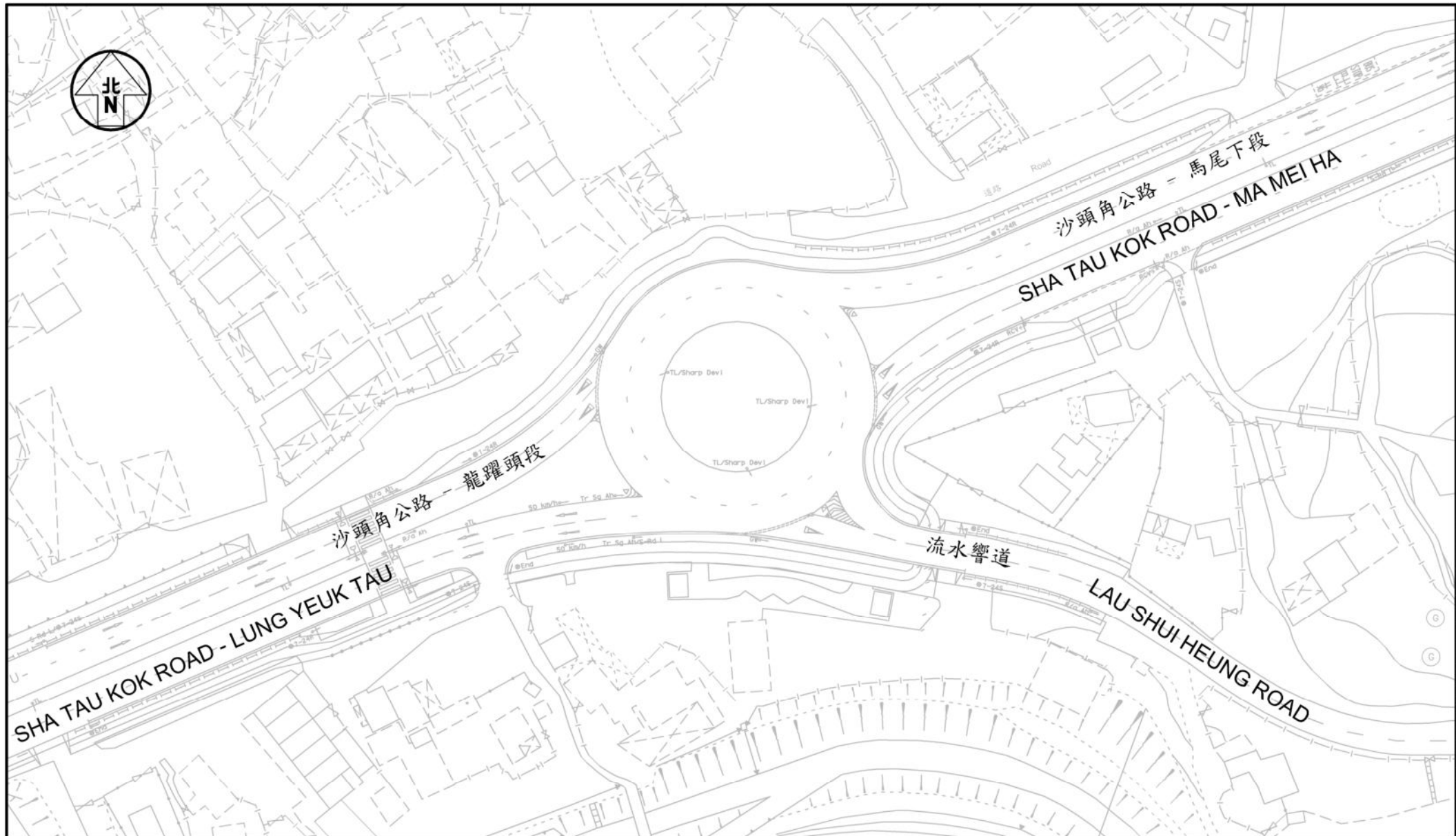
Figure No. 2.1
Revision B

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Figure Title: LOCATION OF THE SURVEYED JUNCTIONS AND ROAD LINKS

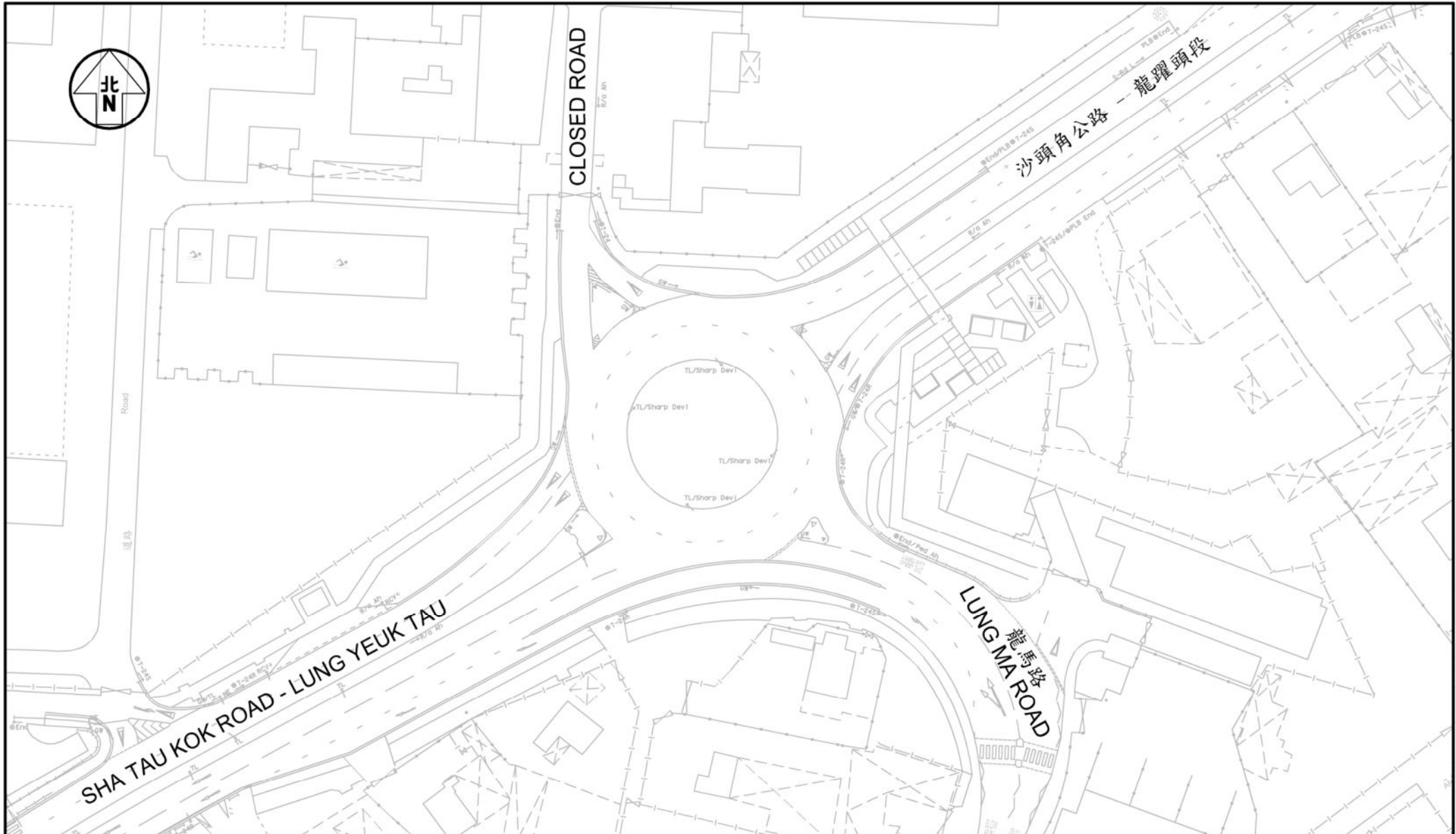
Designed by: NCL
Drawn by: SCY
Checked by: KC
Scale in A4: 1 : 15,000
Date: 21 JUN 2023

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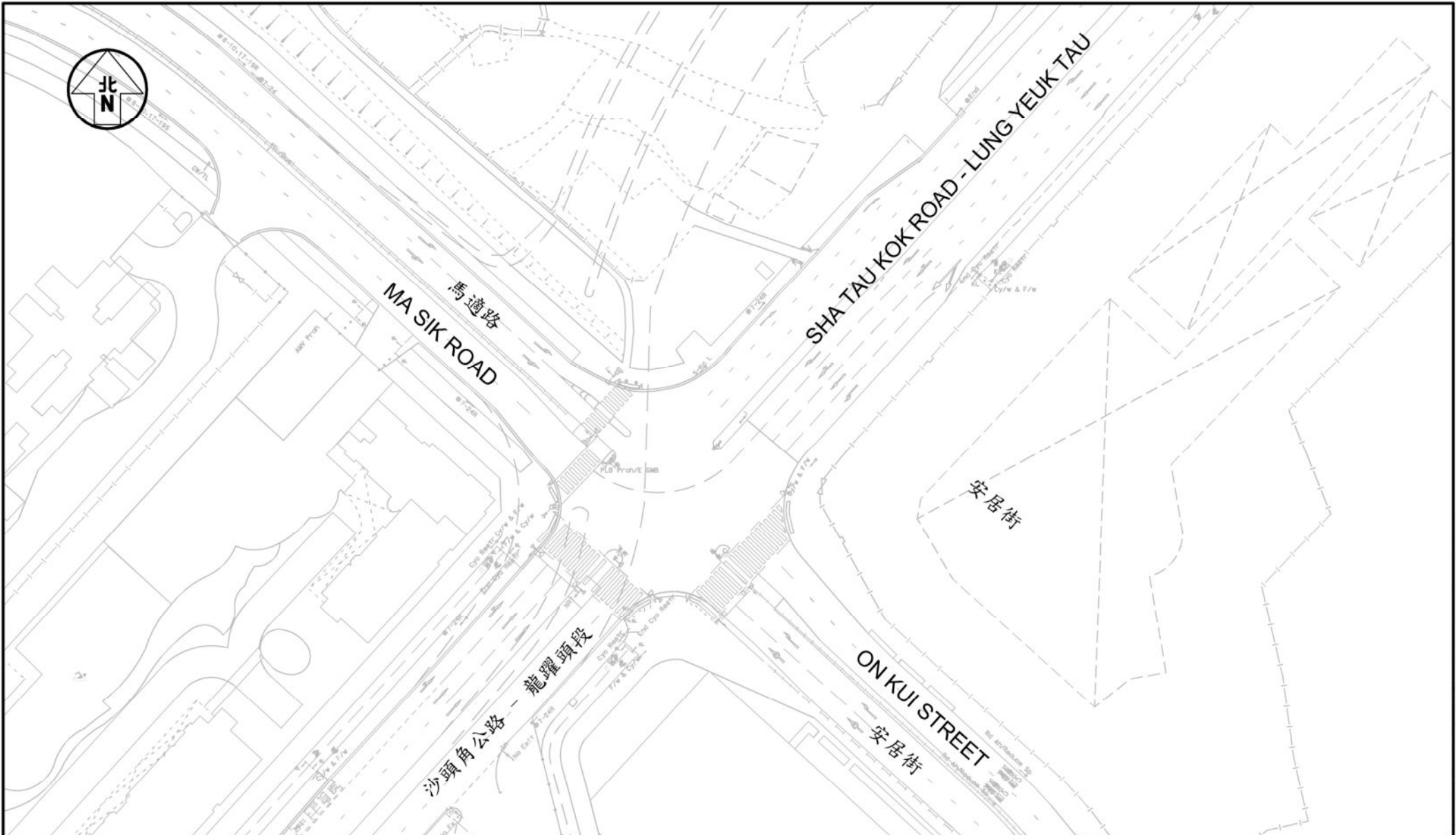
Project Title	PROPOSED DEVELOPMENT AT VARIOUS LOTS IN D.D.83 AND ADJOINING GOVERNMENT LAND LUNG YEUK TAU, FANLING, N.T.	Figure No. 2.2	Revision B	CKM Asia Limited Traffic and Transportation Planning Consultants 21st Floor, Methodist House, 36 Hennessy Road, Wan Chai, Hong Kong Tel : (852) 2520 5990 Fax : (852) 2528 6343 Email : mail@ckmasia.com.hk			
Figure Title	EXISTING LAYOUT - JUNCTION OF SHA TAU KOK ROAD / LAU SHUI HEUNG ROAD (J01)		Designed by N C L			Drawn by S C Y	Checked by K C
Scale in A4 1 : 1,000			Date 21 JUN 2023				

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Project Title	PROPOSED DEVELOPMENT AT VARIOUS LOTS IN D.D.83 AND ADJOINING GOVERNMENT LAND LUNG YEUK TAU, FANLING, N.T.	Figure No. 2.3	Revision B	CKM Asia Limited Traffic and Transportation Planning Consultants 21st Floor, Methodist House, 36 Hennessy Road, Wan Chai, Hong Kong Tel : (852) 2520 5990 Fax : (852) 2528 6343 Email : mail@ckmasia.com.hk	
Figure Title	EXISTING LAYOUT - JUNCTION OF SHA TAU KOK ROAD / LUNG MA ROAD (J02)	Designed by N C L	Drawn by S C Y		Checked by K C
		Scale in A4 1 : 1,000	Date 21 JUN 2023		

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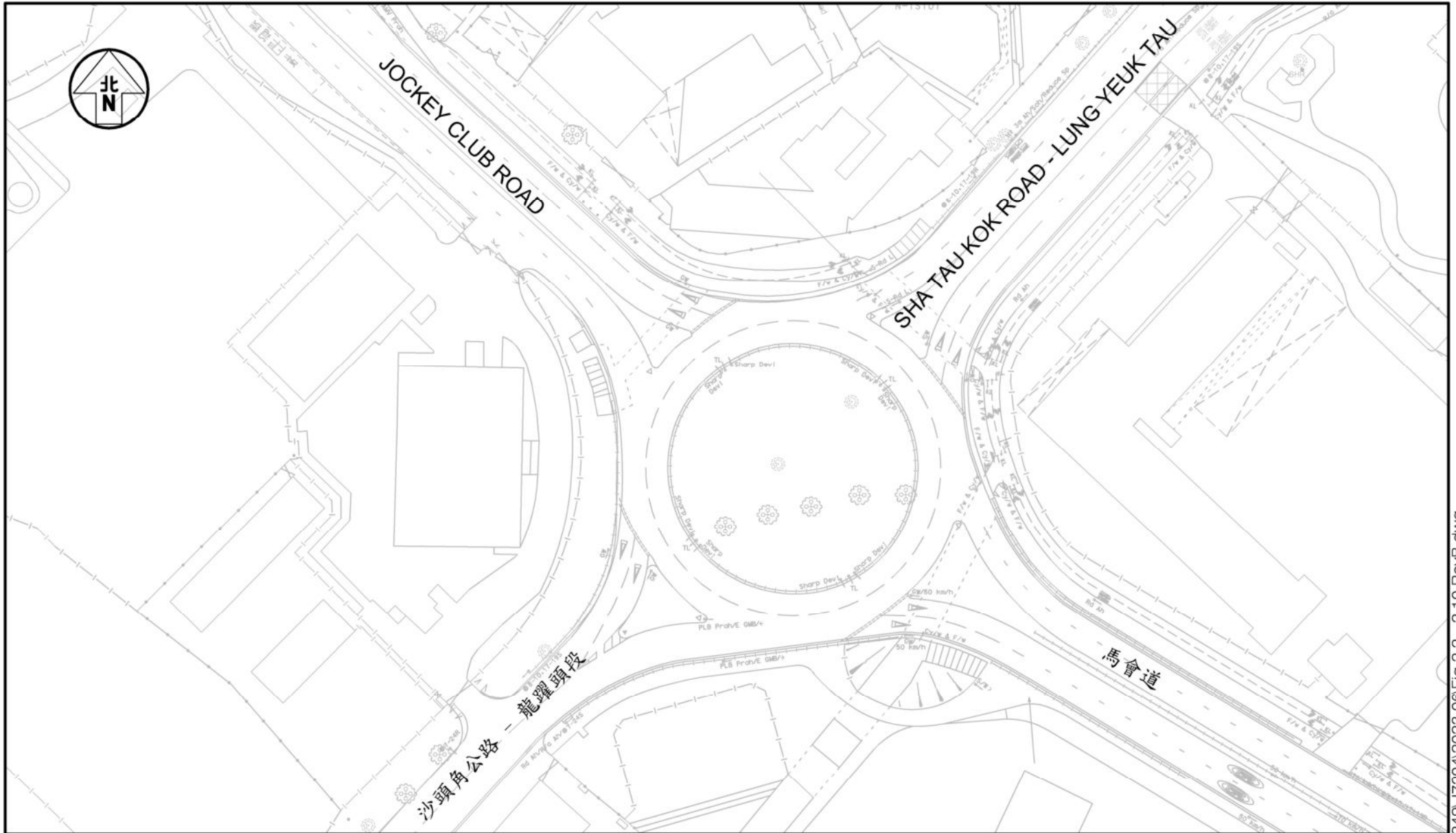
Project Title PROPOSED DEVELOPMENT AT VARIOUS LOTS IN D.D.83 AND ADJOINING GOVERNMENT LAND LUNG YEUK TAU, FANLING, N.T.

Figure No. 2.4
Revision B

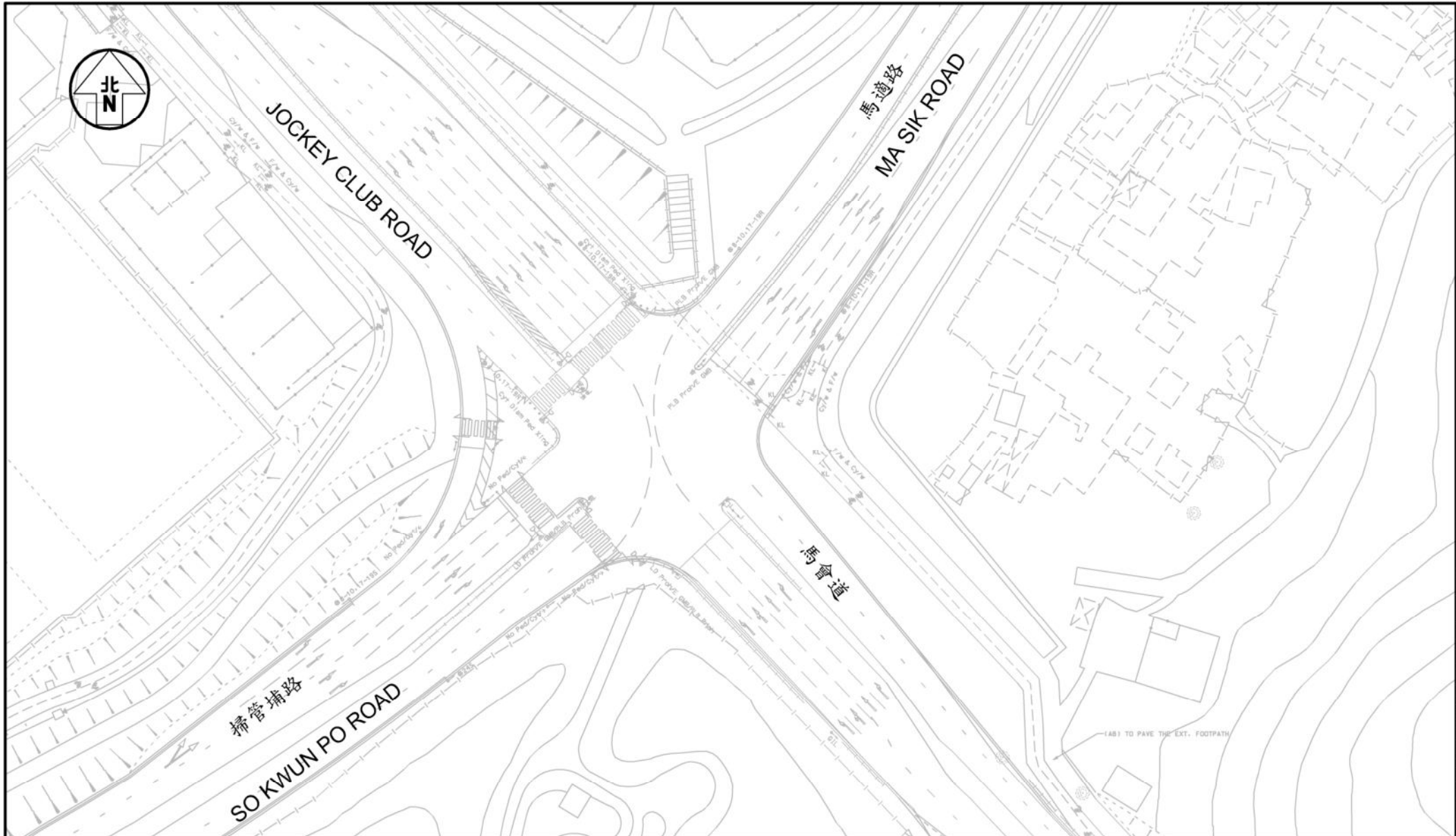
Figure Title EXISTING LAYOUT - JUNCTION OF SHA TAU KOK ROAD / MA SIK ROAD (J03)

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Checked by KC
Scale in A4 1 : 1,000
Date 21 JUN 2023

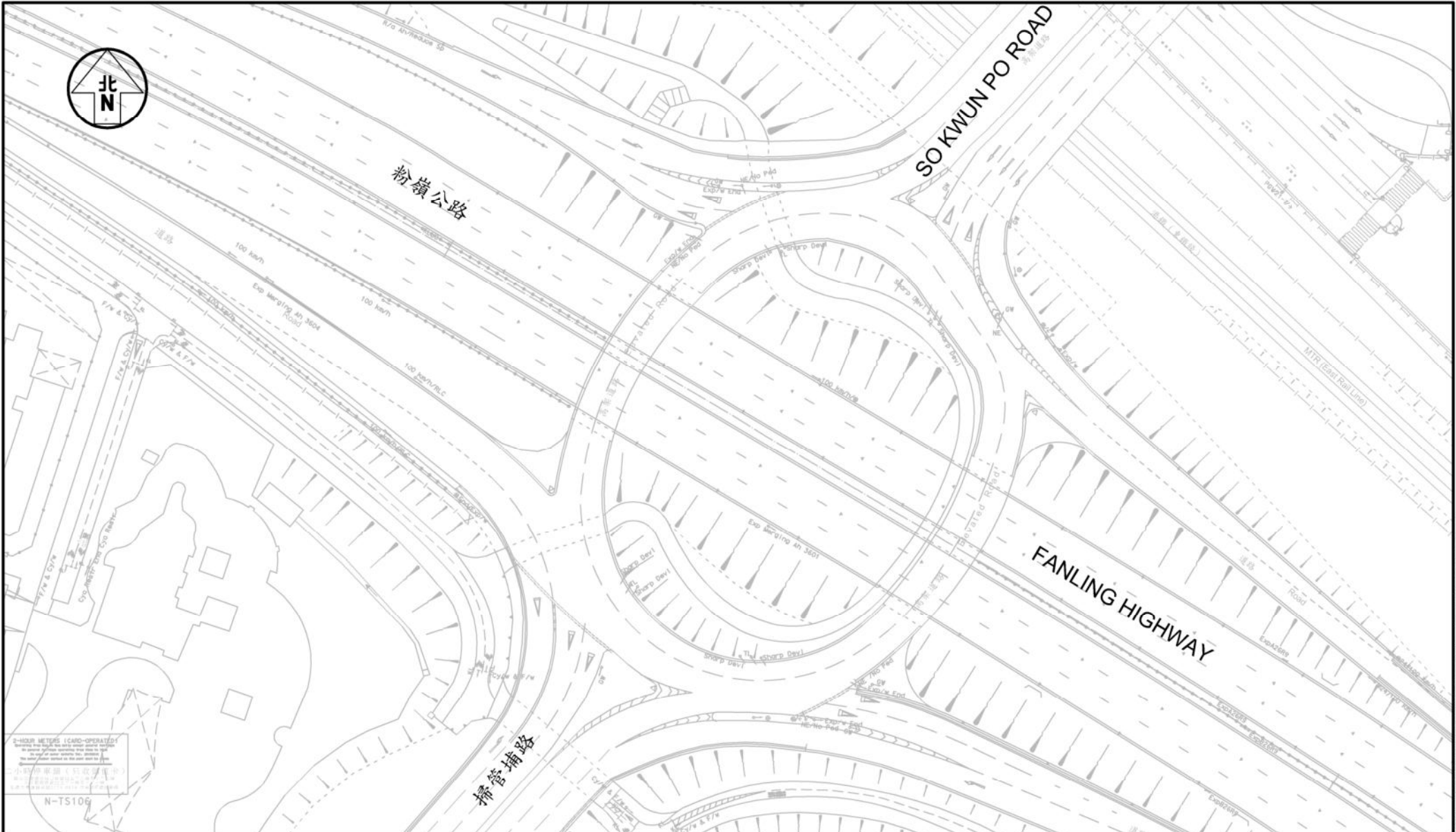
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Email : mail@ckmasia.com.hk



Project Title	PROPOSED DEVELOPMENT AT VARIOUS LOTS IN D.D.83 AND ADJOINING GOVERNMENT LAND LUNG YEUK TAU, FANLING, N.T.	Figure No. J7204 2.5	Revision B	CKM Asia Limited Traffic and Transportation Planning Consultants 21st Floor, Methodist House, 36 Hennessy Road, Wan Chai, Hong Kong Tel : (852) 2520 5990 Fax : (852) 2528 6343 Email : mail@ckmasia.com.hk	
Figure Title	EXISTING LAYOUT - JUNCTION OF SHA TAU KOK ROAD / JOCKEY CLUB ROAD (J04)	Designed by N C L	Drawn by S C Y		Checked by K C
		Scale in A4 1 : 1,000	Date 21 JUN 2023		

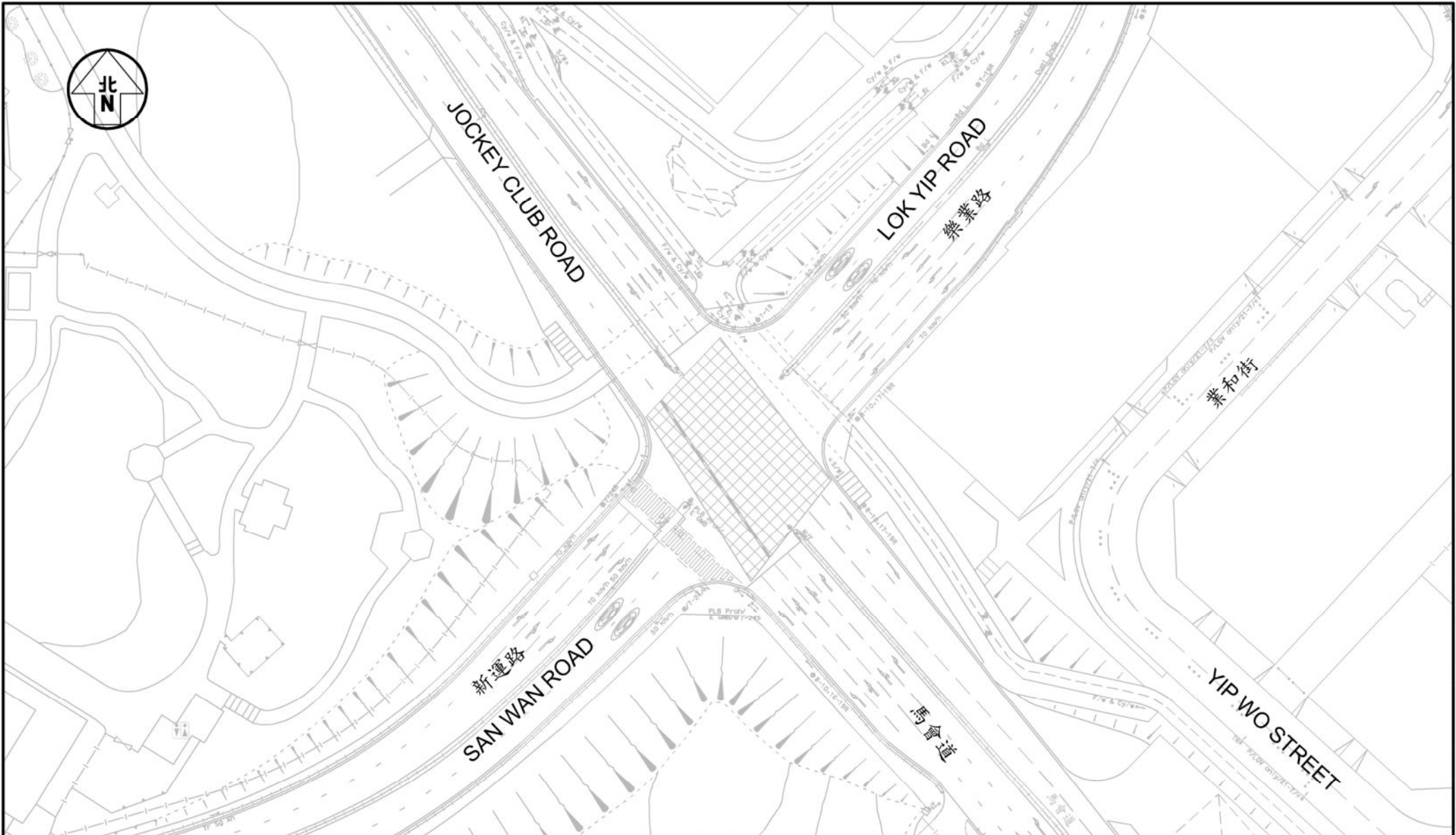


Project Title PROPOSED DEVELOPMENT AT VARIOUS LOTS IN D.D.83 AND ADJOINING GOVERNMENT LAND LUNG YEUK TAU, FANLING, N.T.	Figure No. 2.6	Revision B	CKM Asia Limited Traffic and Transportation Planning Consultants 21st Floor, Methodist House, 36 Hennessy Road, Wan Chai, Hong Kong Tel : (852) 2520 5990 Fax : (852) 2528 6343 Email : mail@ckmasia.com.hk
Figure Title EXISTING LAYOUT - JUNCTION OF SO KWUN PO ROAD / JOCKEY CLUB ROAD / MA SIK ROAD (J05)	Designed by N C L	Drawn by S C Y	
Scale in A4 1 : 1,000		Date 21 JUN 2023	

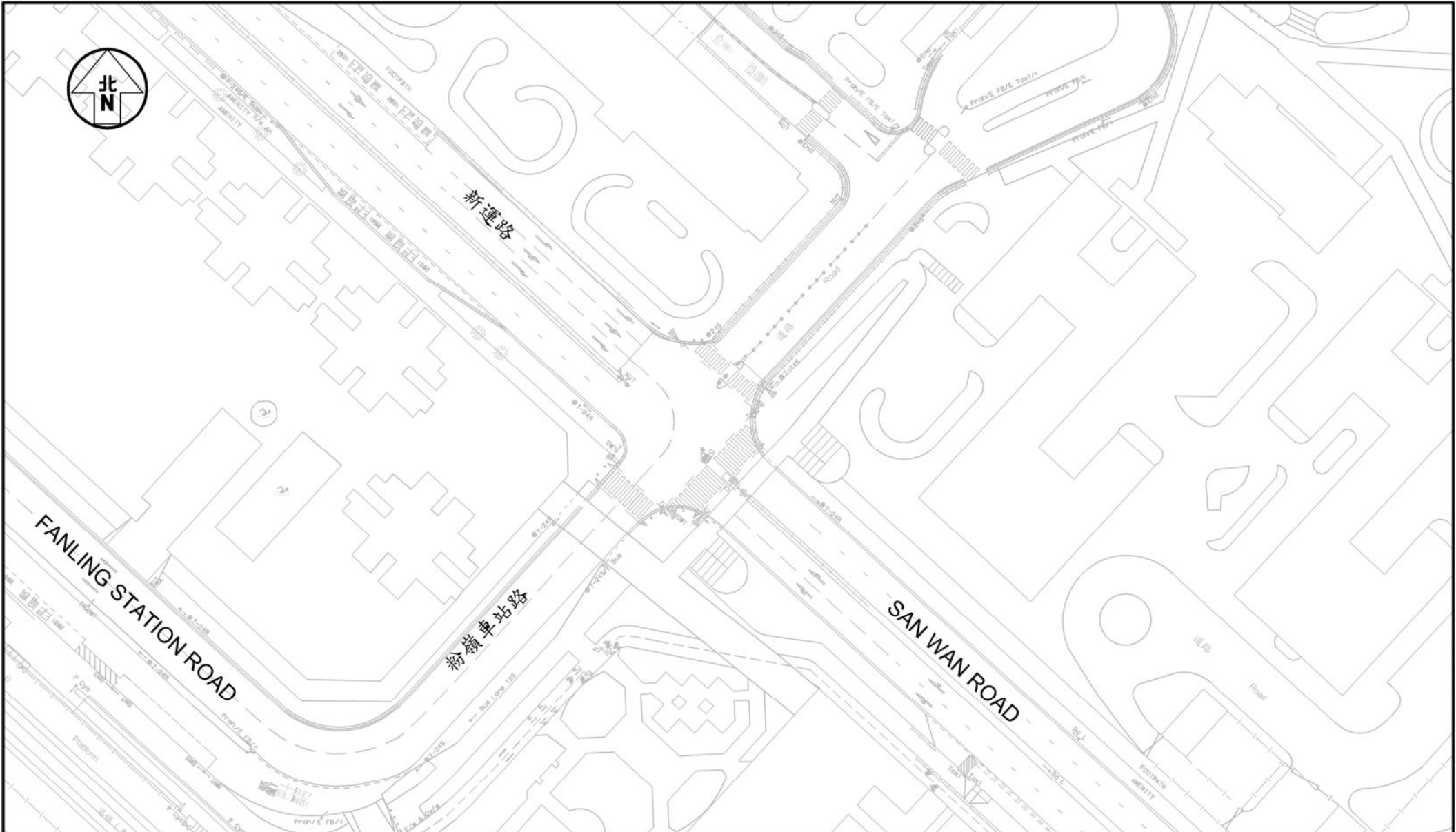


Project Title	PROPOSED DEVELOPMENT AT VARIOUS LOTS IN D.D.83 AND ADJOINING GOVERNMENT LAND LUNG YEUK TAU, FANLING, N.T.	Figure No. 2.7	Revision B	CKM Asia Limited Traffic and Transportation Planning Consultants 21st Floor, Methodist House, 36 Hennessy Road, Wan Chai, Hong Kong Tel : (852) 2520 5990 Fax : (852) 2528 6343 Email : mail@ckmasia.com.hk	
Figure Title	EXISTING LAYOUT - ROUNDABOUT OF SO KWUN PO ROAD INTERCHANGE (J06)	Designed by N C L	Drawn by S C Y		Checked by K C
		Scale in A4 1 : 1,000	Date 21 JUN 2023		

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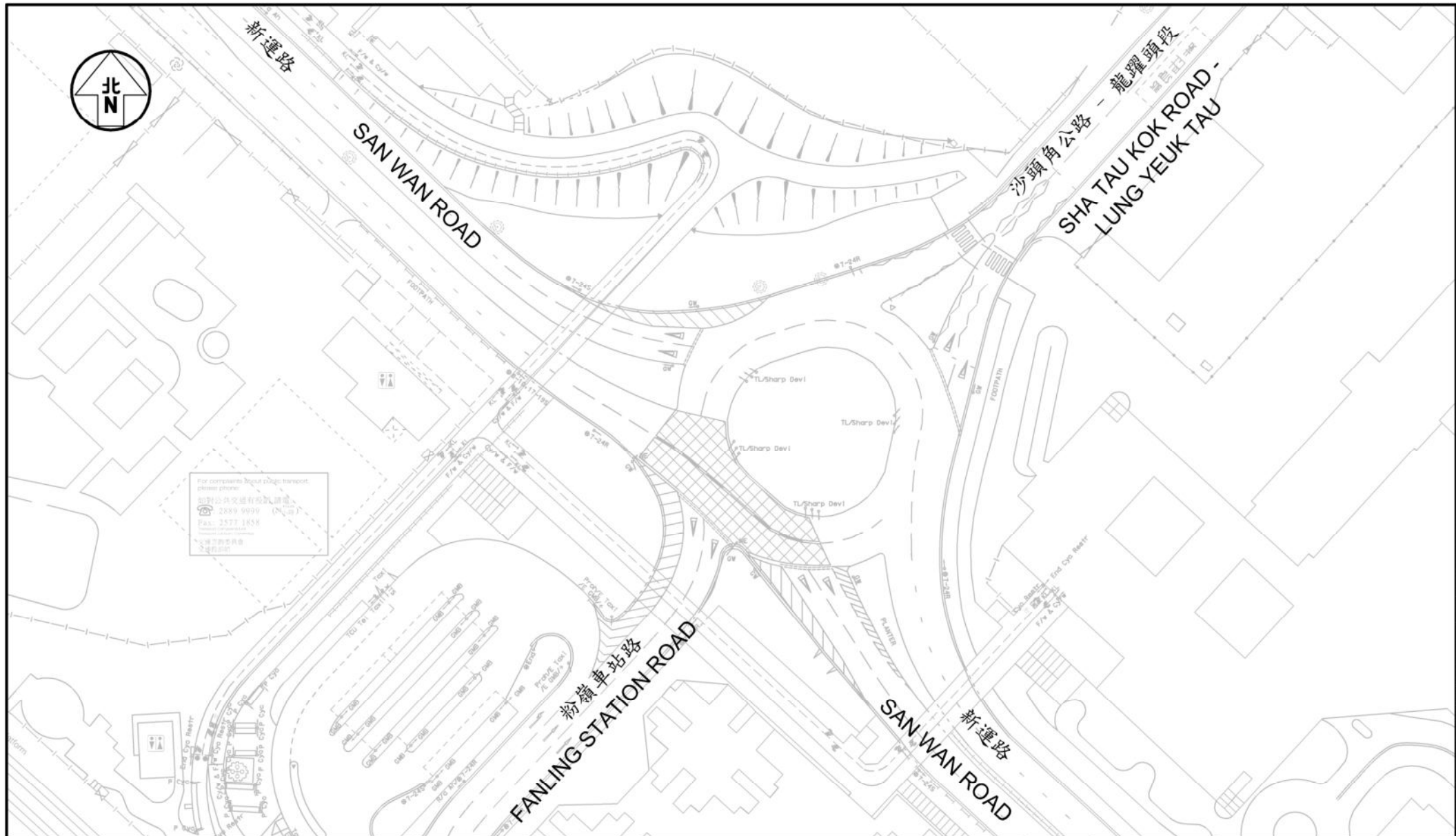


Project Title PROPOSED DEVELOPMENT AT VARIOUS LOTS IN D.D.83 AND ADJOINING GOVERNMENT LAND LUNG YEUK TAU, FANLING, N.T.	Figure No. 2.8	Revision B	CKM Asia Limited Traffic and Transportation Planning Consultants 21st Floor, Methodist House, 36 Hennessy Road, Wan Chai, Hong Kong Tel : (852) 2520 5990 Fax : (852) 2528 6343 Email : mail@ckmasia.com.hk	
Figure Title EXISTING LAYOUT - JUNCTION OF JOCKEY CLUB ROAD / LOK YIP ROAD / SAN WAN ROAD (J07)	Designed by N C L	Drawn by S C Y		Checked by K C
Scale in A4 1 : 1,000	Date 21 JUN 2023			



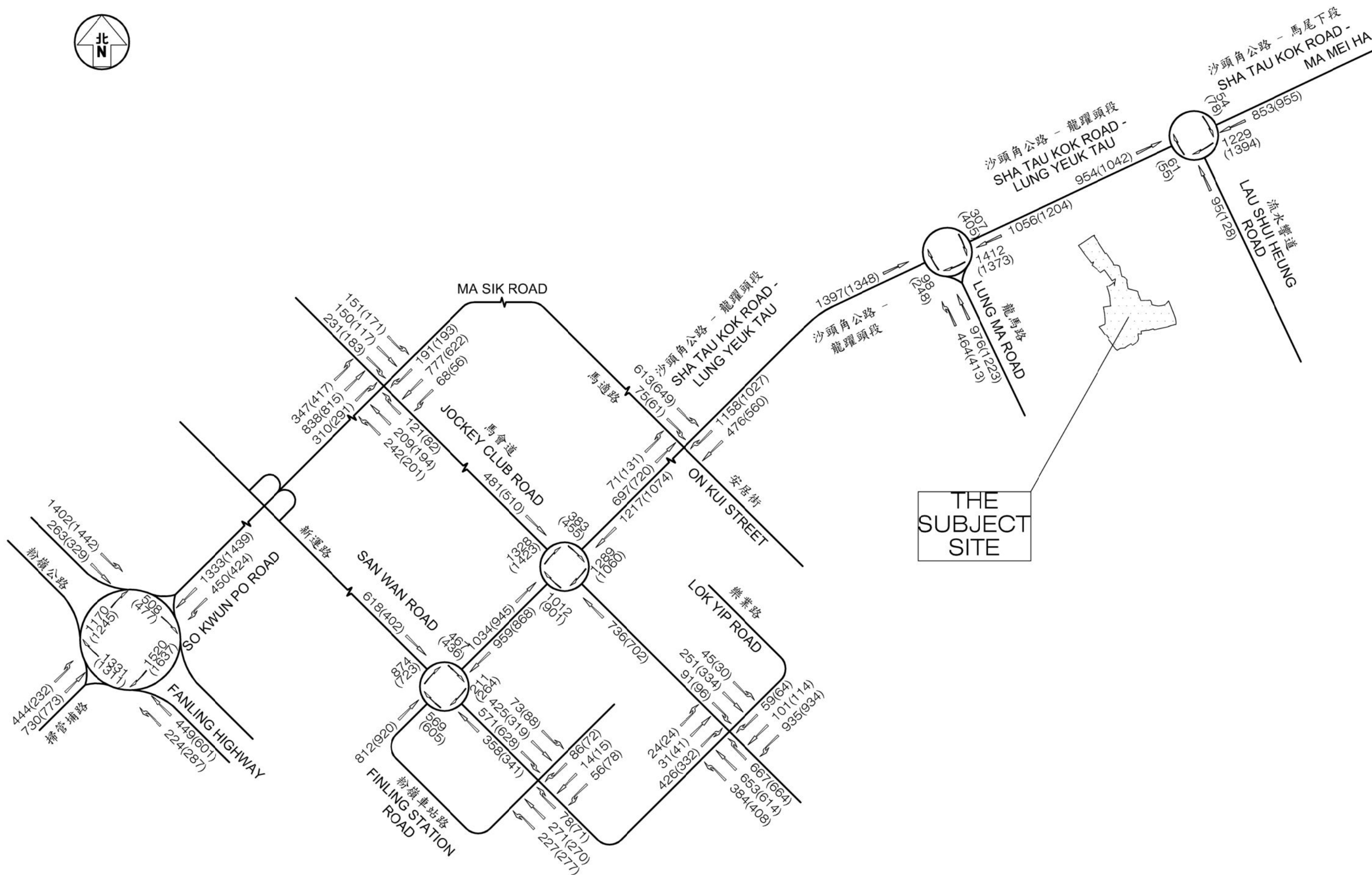
Project Title	PROPOSED DEVELOPMENT AT VARIOUS LOTS IN D.D.83 AND ADJOINING GOVERNMENT LAND LUNG YEUK TAU, FANLING, N.T.	Figure No. 2.9	Revision B	CKM Asia Limited Traffic and Transportation Planning Consultants 21st Floor, Methodist House, 36 Hennessy Road, Wan Chai, Hong Kong Tel : (852) 2520 5990 Fax : (852) 2528 6343 Email : mail@ckmasia.com.hk	
Figure Title	EXISTING LAYOUT - JUNCTION OF FANLING STATION ROAD / SAN WAN ROAD (J08)	Designed by N C L	Drawn by S C Y		Checked by K C
		Scale in A4 1 : 1,000	Date 21 JUN 2023		

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 如對公共交通有查詢,請電:
 ☎ 2889 9999 (N. H.K.)
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 交通諮詢熱線
 24小時

Project Title PROPOSED DEVELOPMENT AT VARIOUS LOTS IN D.D.83 AND ADJOINING GOVERNMENT LAND LUNG YEUK TAU, FANLING, N.T.	Figure No. 2.10	Revision B	CKM Asia Limited Traffic and Transportation Planning Consultants 21st Floor, Methodist House, 36 Hennessy Road, Wan Chai, Hong Kong Tel : (852) 2520 5990 Fax : (852) 2528 6343 Email : mail@ckmasia.com.hk	
Figure Title EXISTING LAYOUT - ROUNDABOUT OF SHA TAU KOK ROAD / SAN WAN ROAD (J09)	Designed by N C L	Drawn by S C Y		Checked by K C
	Scale in A4 1 : 1,000	Date 21 JUN 2023		



Project Title PROPOSED DEVELOPMENT AT VARIOUS LOTS IN D.D.83 AND ADJOINING GOVERNMENT LAND LUNG YEUK TAU, FANLING, N.T.

Figure Title EXISTING PEAK HOUR TRAFFIC FLOWS

Figure No. J7204

2.11

Revision B

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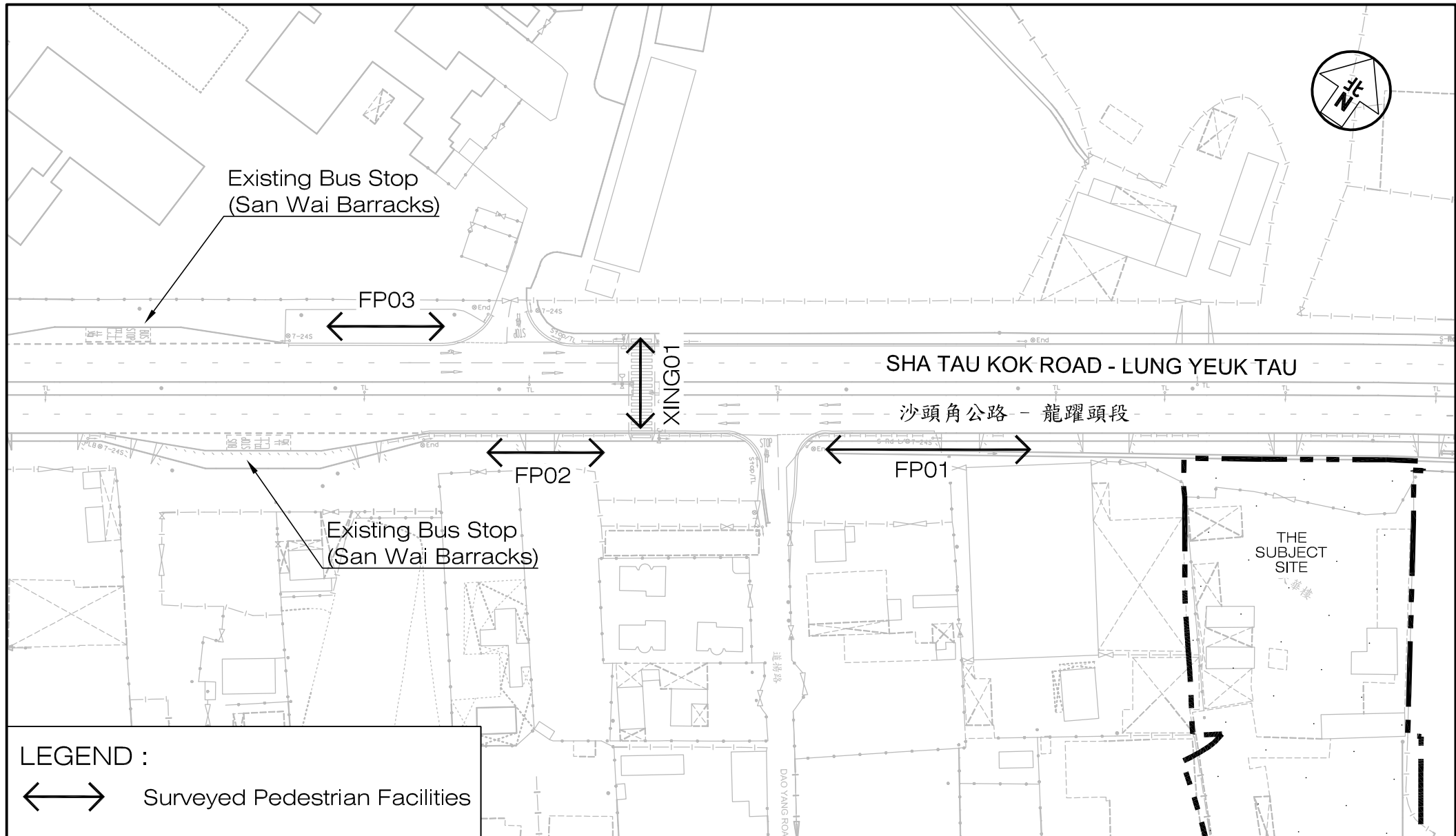
Designed by N C L

Drawn by S C Y

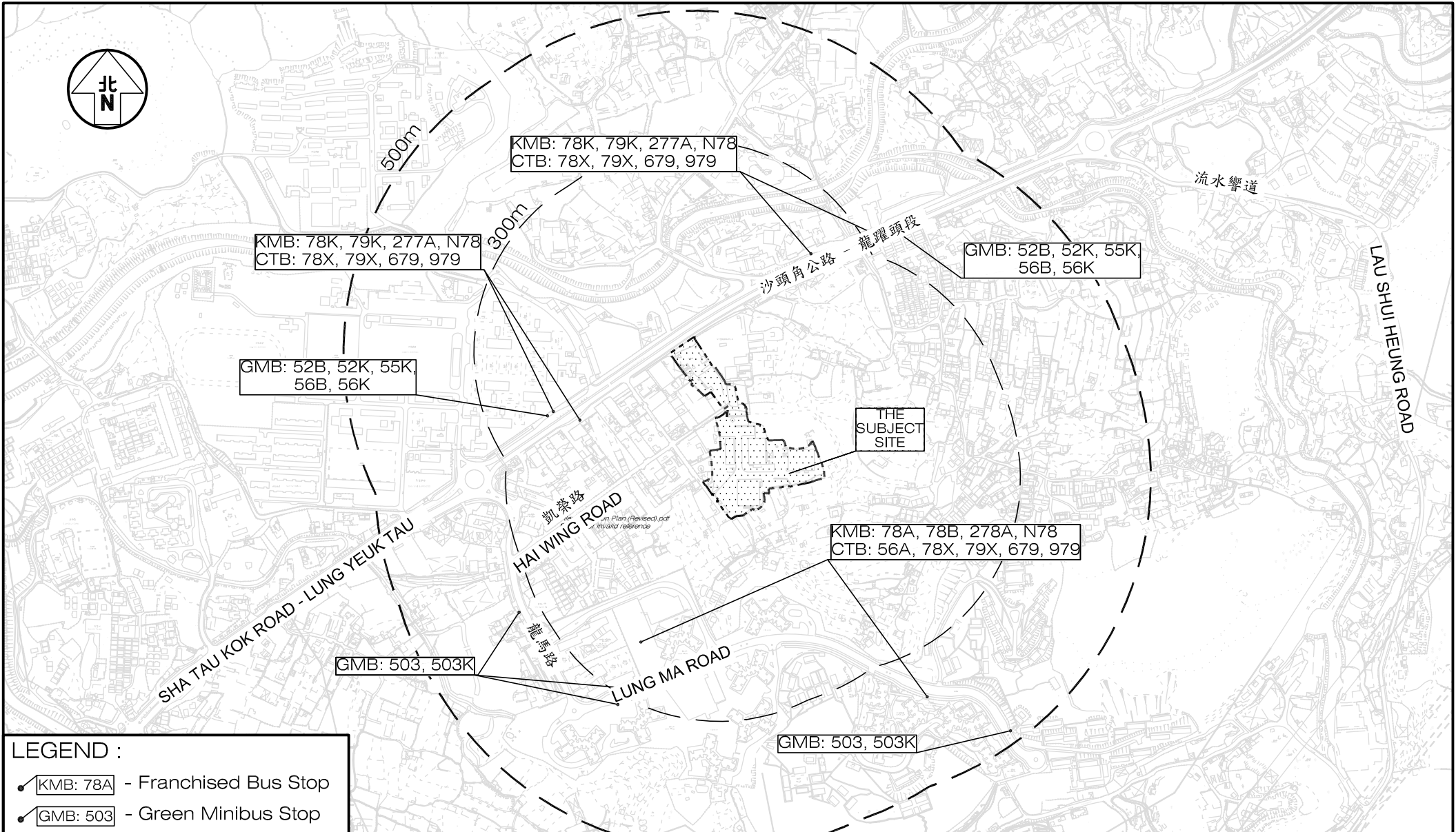
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Scale in A3 N.T.S.

Date 21 JUN 2023



Project Title	PROPOSED DEVELOPMENT AT VARIOUS LOTS IN D.D.83 AND ADJOINING GOVERNMENT LAND LUNG YEUK TAU, FANLING, N.T.	Figure No. J7204 2.12	Revision B	CKM Asia Limited Traffic and Transportation Planning Consultants 21st Floor, Methodist House, 36 Hennessy Road, Wan Chai, Hong Kong Tel : (852) 2520 5990 Fax : (852) 2528 6343 Email : mail@ckmasia.com.hk	
Figure Title	LOCATION OF THE SURVEYED PEDESTRIAN FACILITIES	Designed by N C L	Drawn by S C Y		Checked by K C
		Scale in A4 1 : 8,000	Date 21 JUN 2023		



LEGEND :

- ☐ KMB: 78A - Franchised Bus Stop
- ☐ GMB: 503 - Green Minibus Stop

Project Title **PROPOSED DEVELOPMENT AT VARIOUS LOTS IN D.D.83 AND ADJOINING GOVERNMENT LAND LUNG YEUK TAU, FANLING, N.T.**

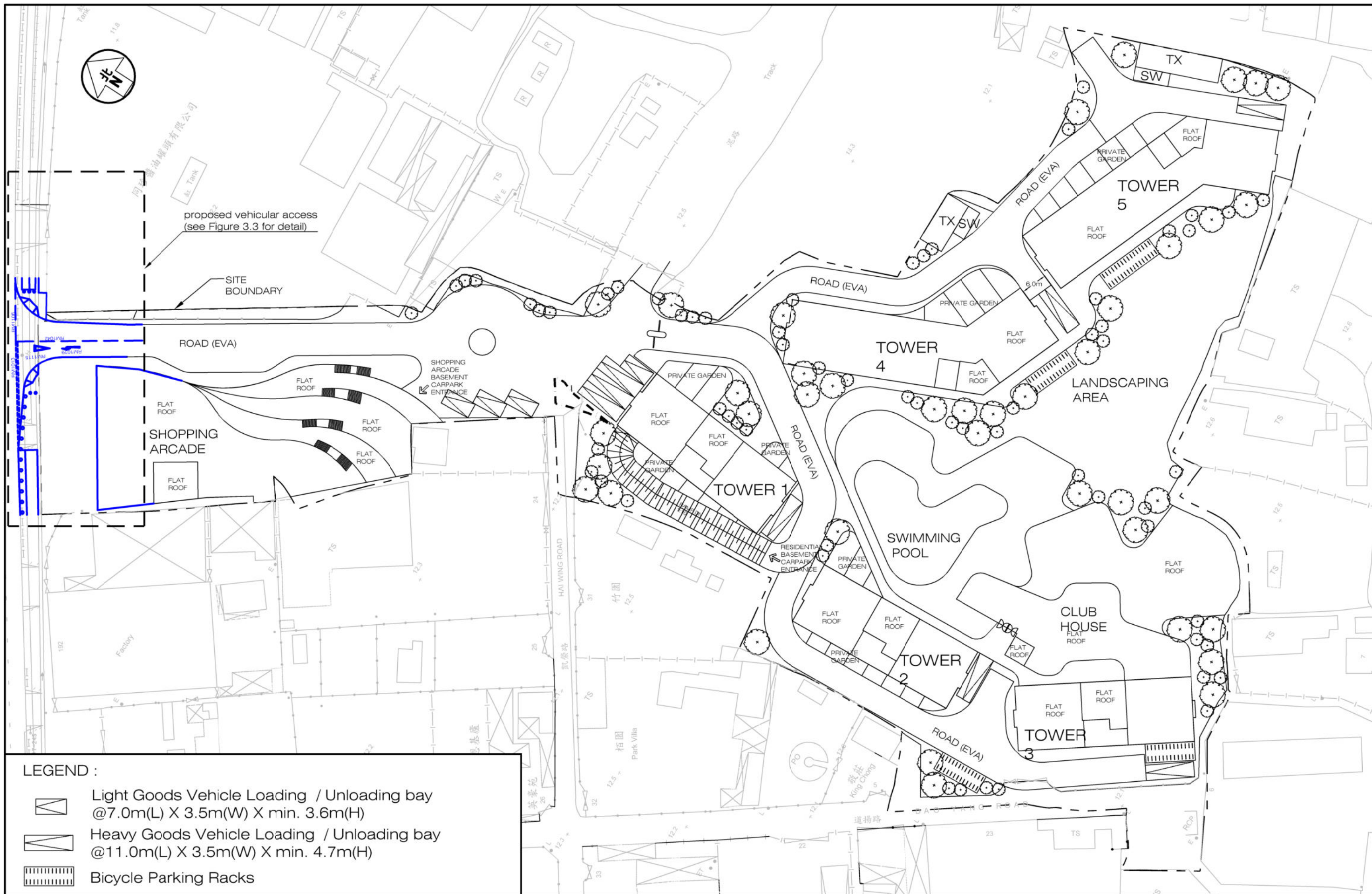
Figure No. **2.13** Revision **B**

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Figure Title **PUBLIC TRANSPORT SERVICES OPERATING WITHIN 500M RADIUS OF THE SUBJECT SITE**

Designed by **H H Y** Drawn by **S C Y** Checked by **K C**
Scale in A4 **1 : 8,000** Date **21 JUN 2023**

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LEGEND :

-  Light Goods Vehicle Loading / Unloading bay @7.0m(L) X 3.5m(W) X min. 3.6m(H)
-  Heavy Goods Vehicle Loading / Unloading bay @11.0m(L) X 3.5m(W) X min. 4.7m(H)
-  Bicycle Parking Racks

Project Title **PROPOSED DEVELOPMENT AT VARIOUS LOTS IN D.D.83 AND ADJOINING GOVERNMENT LAND LUNG YEUK TAU, FANLING, N.T.**

Figure No. **3.1**
J7024

Revision **B**

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Figure Title **PROPOSED INTERNAL TRANSPORT LAYOUT - GROUND FLOOR**

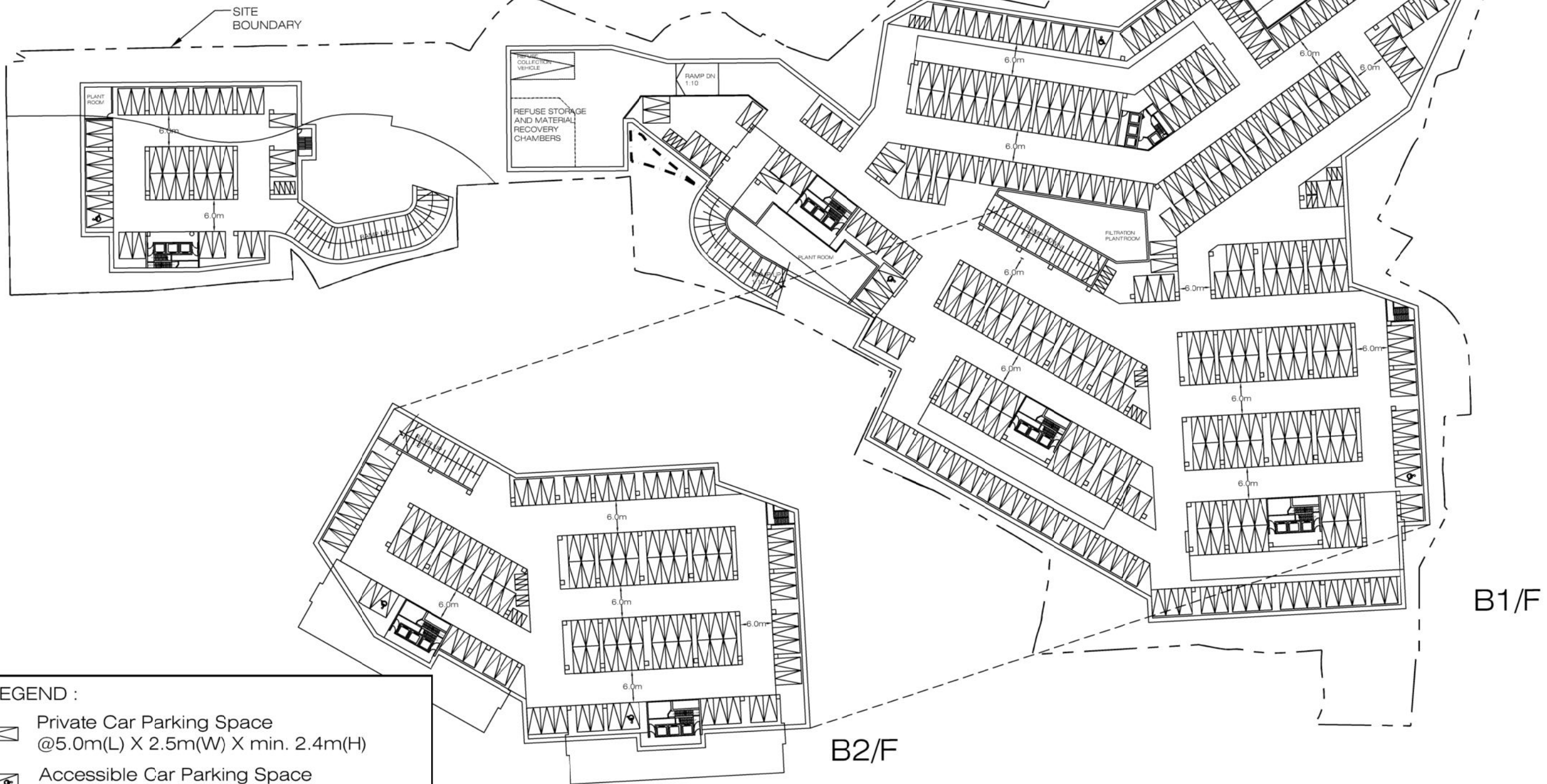
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Scale in A3 1 : 800	Date 21 JUN 2023	

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PARKING PROVIDED (RETAIL):
 PRIVATE CAR: 38 (B1/F)
 MOTORCYCLE: 4 (B1/F)
 LIGHT GOODS VEHICLE: 3 (G/F)
 HEAVY GOODS VEHICLE: 4 (G/F)

PARKING PROVIDED (RESIDENTIAL):
 PRIVATE CAR: 312 (B1/F)]
 110 (B2/F)] 422
 PRIVATE CAR (VISITOR): 25 (B1/F)
 MOTORCYCLE: 25 (B1/F)]
 9 (B2/F)] 34
 BICYCLE: 111 (G/F)
 HEAVY GOODS VEHICLE: 5 (G/F)

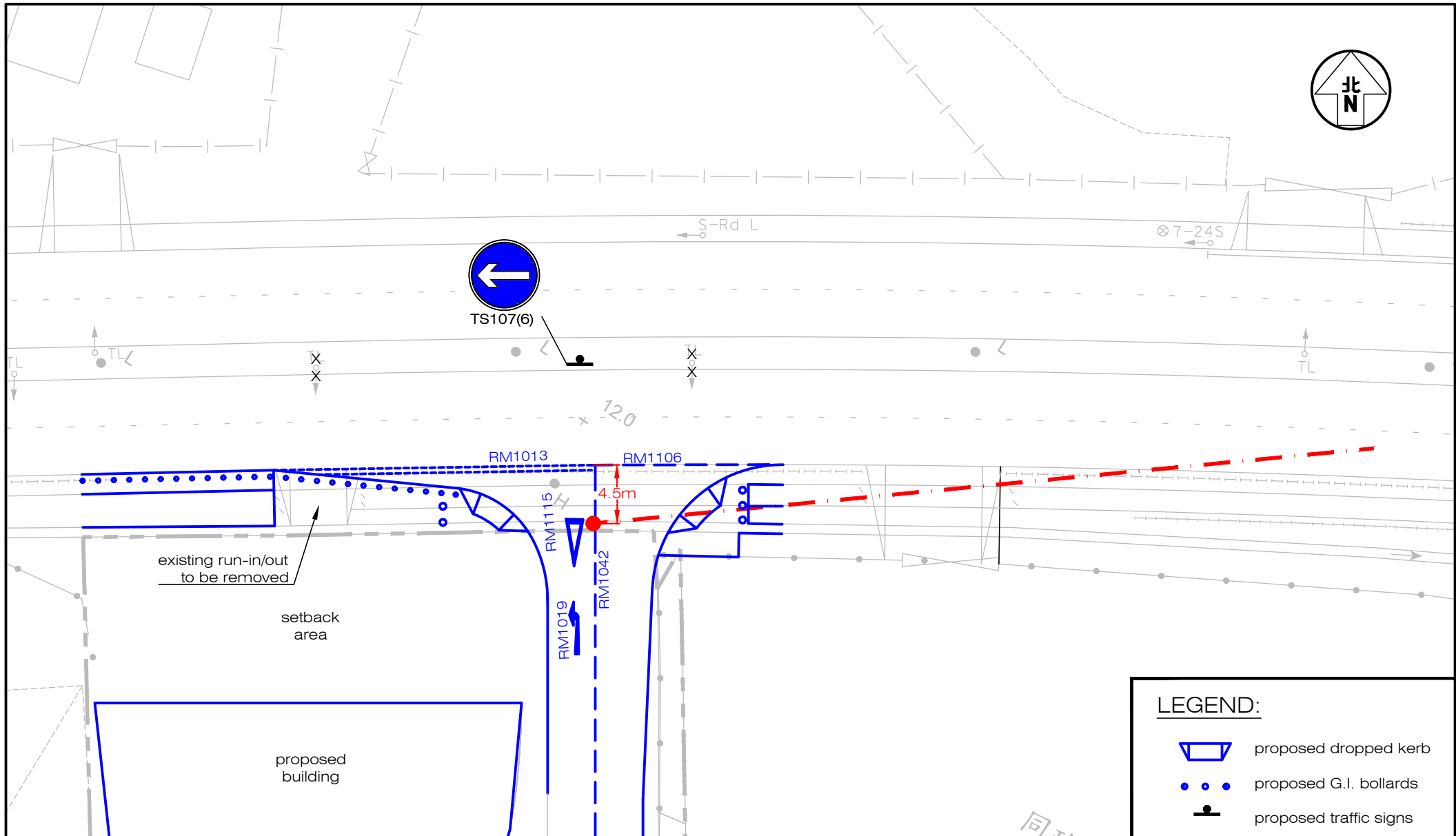


LEGEND :




- Private Car Parking Space @5.0m(L) X 2.5m(W) X min. 2.4m(H)
- Accessible Car Parking Space @5.0m(L) X 3.5m(W) X min. 2.4m(H)
- Motorcycle Parking Space @2.4m(L) X 1.0m(W) X min. 2.4m(H)

Project Title	PROPOSED DEVELOPMENT AT VARIOUS LOTS IN D.D.83 AND ADJOINING GOVERNMENT LAND LUNG YEUK TAU, FANLING, N.T.	Figure No.	3.2	Revision	B
Figure Title	PROPOSED INTERNAL TRANSPORT LAYOUT - BASEMENT FLOORS	Designed by	N C L	Drawn by	S C Y
		Checked by	K C	Date	21 JUN 2023
		Scale in A3	1 : 800	CKM Asia Limited Traffic and Transportation Planning Consultants 21st Floor, Methodist House, 36 Hennessy Road Wan Chai, Hong Kong Tel : (852) 2520 5990 Fax : (852) 2528 6343 Email : mail@ckmasia.com.hk	

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LEGEND:

-  proposed dropped kerb
-  proposed G.I. bollards
-  proposed traffic signs

Project Title **PROPOSED DEVELOPMENT AT VARIOUS LOTS IN D.D.83 AND ADJOINING GOVERNMENT LAND LUNG YEUK TAU, FANLING, N.T.**

Figure No. **3.3** Revision **B**

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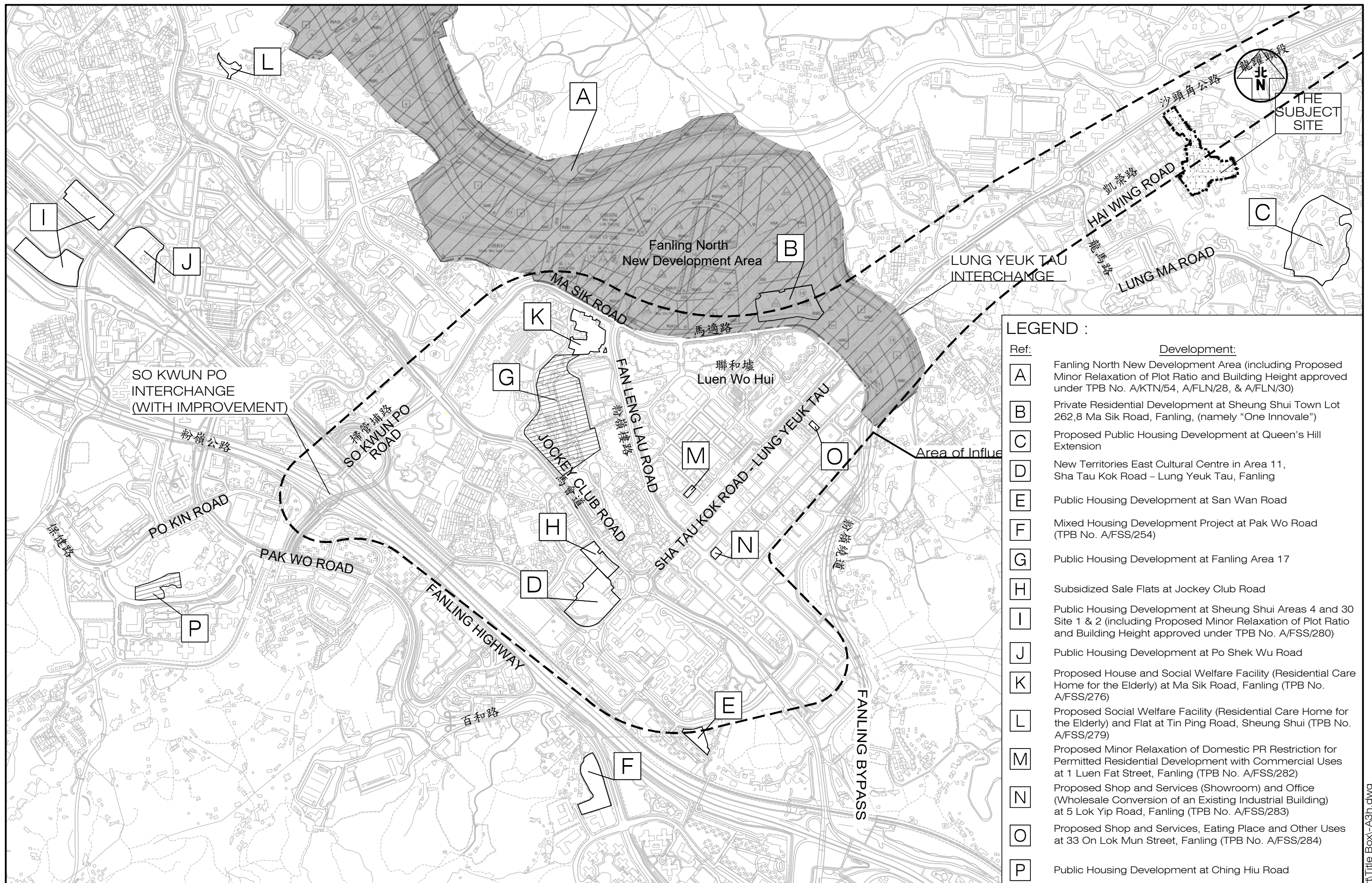
Figure Title **PROPOSED VEHICULAR ACCESS AT SHA TAU KOK ROAD - LUNG YEUK TAU (WESTBOUND)**

Designed by **N C L** Drawn by **S C Y** Checked by **K C**

Scale in A4 **1 : 500** Date **21 JUN 2023**

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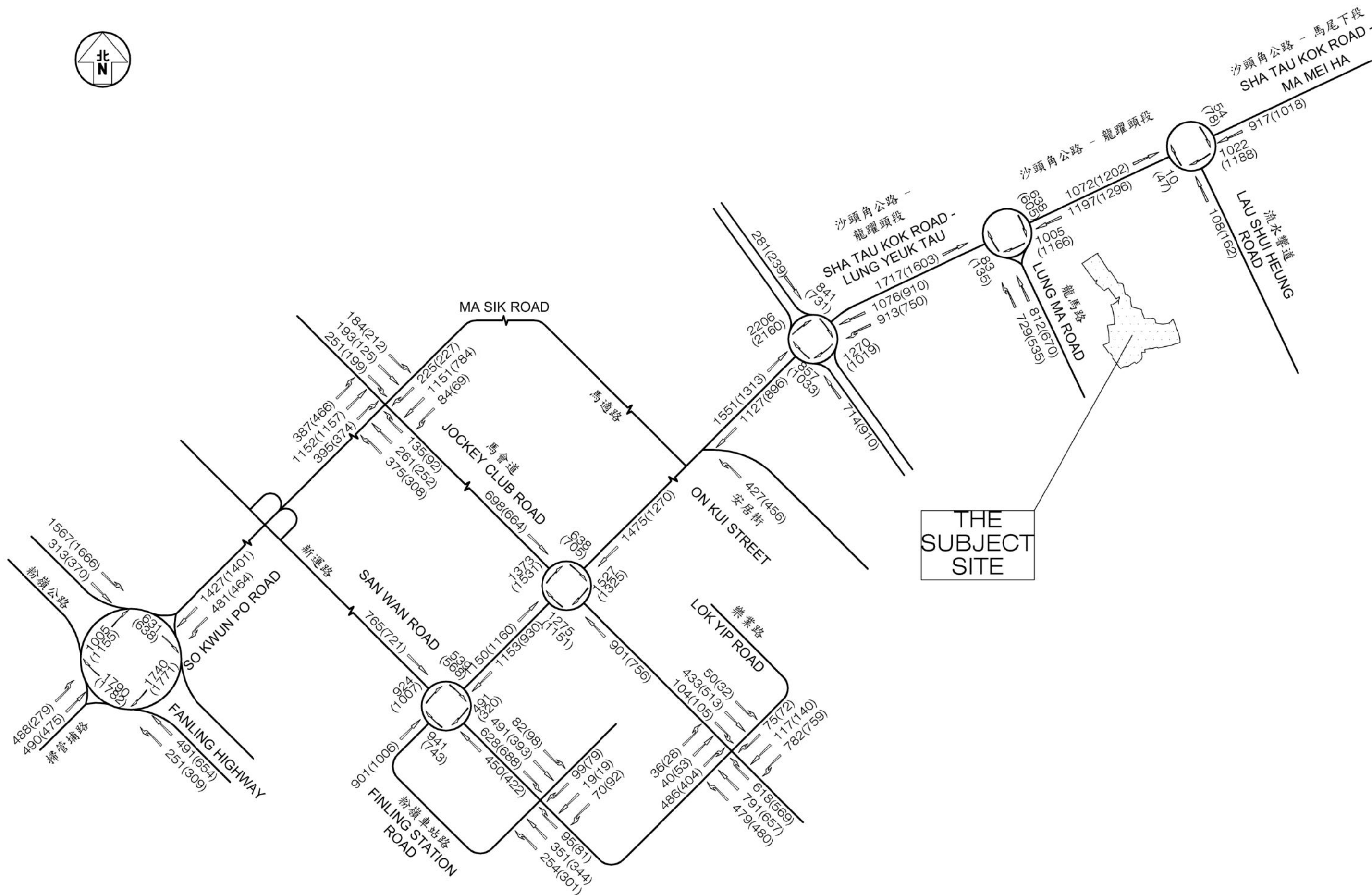
Ref:	Development:
A	Fanling North New Development Area (including Proposed Minor Relaxation of Plot Ratio and Building Height approved under TPB No. A/KTN/54, A/FLN/28, & A/FLN/30)
B	Private Residential Development at Sheung Shui Town Lot 262,8 Ma Sik Road, Fanling, (namely "One Innovale")
C	Proposed Public Housing Development at Queen's Hill Extension
D	New Territories East Cultural Centre in Area 11, Sha Tau Kok Road - Lung Yeuk Tau, Fanling
E	Public Housing Development at San Wan Road
F	Mixed Housing Development Project at Pak Wo Road (TPB No. A/FSS/254)
G	Public Housing Development at Fanling Area 17
H	Subsidized Sale Flats at Jockey Club Road
I	Public Housing Development at Sheung Shui Areas 4 and 30 Site 1 & 2 (including Proposed Minor Relaxation of Plot Ratio and Building Height approved under TPB No. A/FSS/280)
J	Public Housing Development at Po Shek Wu Road
K	Proposed House and Social Welfare Facility (Residential Care Home for the Elderly) at Ma Sik Road, Fanling (TPB No. A/FSS/276)
L	Proposed Social Welfare Facility (Residential Care Home for the Elderly) and Flat at Tin Ping Road, Sheung Shui (TPB No. A/FSS/279)
M	Proposed Minor Relaxation of Domestic PR Restriction for Permitted Residential Development with Commercial Uses at 1 Luen Fat Street, Fanling (TPB No. A/FSS/282)
N	Proposed Shop and Services (Showroom) and Office (Wholesale Conversion of an Existing Industrial Building) at 5 Lok Yip Road, Fanling (TPB No. A/FSS/283)
O	Proposed Shop and Services, Eating Place and Other Uses at 33 On Lok Mun Street, Fanling (TPB No. A/FSS/284)
P	Public Housing Development at Ching Hiu Road

Project Title **PROPOSED DEVELOPMENT AT VARIOUS LOTS IN D.D.83 AND ADJOINING GOVERNMENT LAND LUNG YEUK TAU, FANLING, N.T.**

Figure Title **LOCATIONS OF OTHER KNOWN PLANNED / COMMITTED MAJOR DEVELOPMENTS AND THE FUTURE ROAD NETWORK IN THE VICINITY OF THE SUBJECT SITE**

Figure No.	4.1	Revision	B
Designed by	N C L	Drawn by	S C Y
Checked by	K C	Date	21 JUN 2023
Scale in A3	1 : 11,000		

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Project Title PROPOSED DEVELOPMENT AT VARIOUS LOTS IN D.D.83 AND ADJOINING GOVERNMENT LAND LUNG YEUK TAU, FANLING, N.T.

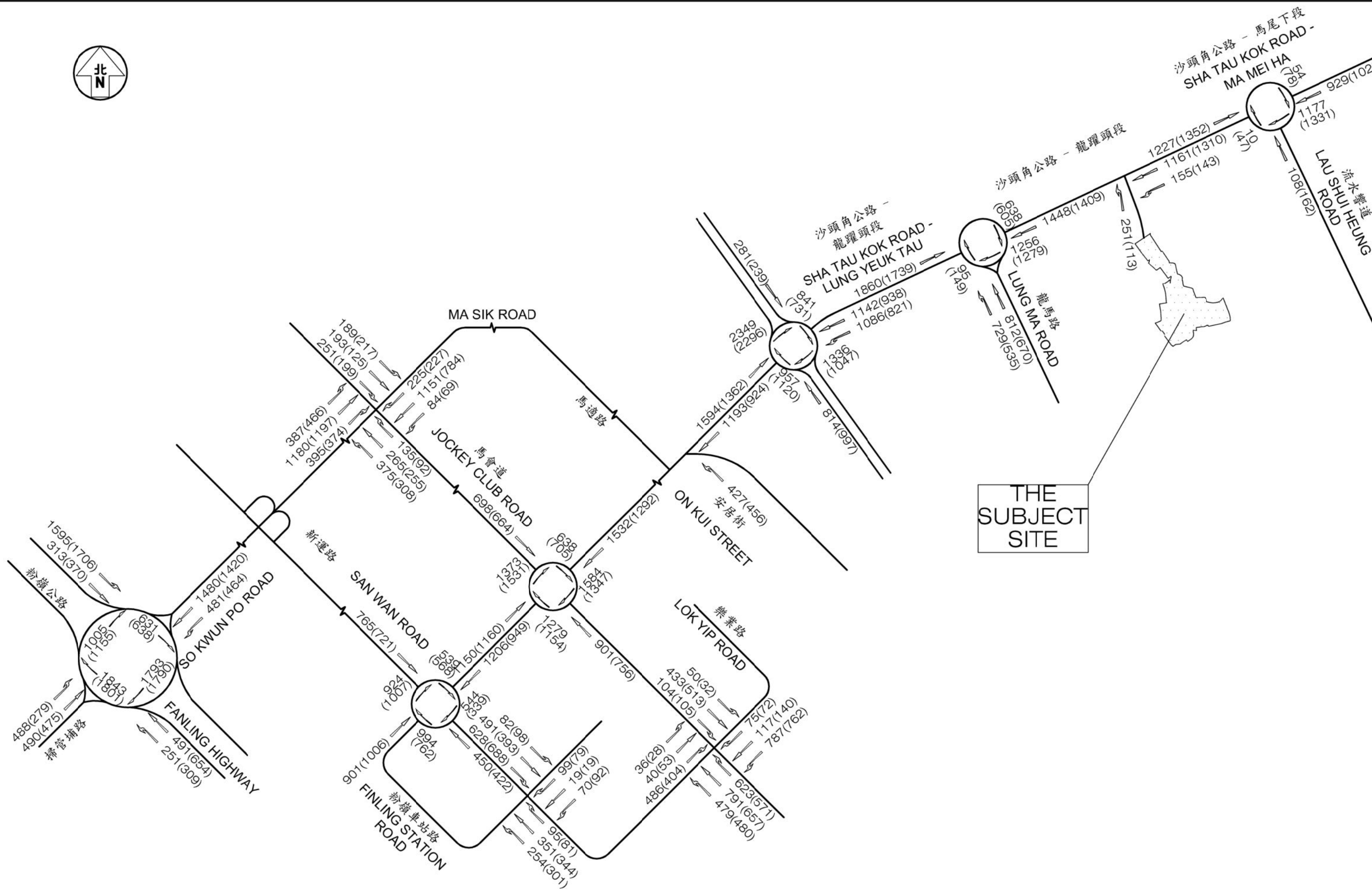
Figure Title 2034 TRAFFIC FLOWS WITHOUT THE PROPOSED DEVELOPMENT

Figure No. 4.2

Revision B

Scale in A3 N.T.S. Date 21 JUN 2023

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Project Title PROPOSED DEVELOPMENT AT VARIOUS LOTS IN D.D.83 AND ADJOINING GOVERNMENT LAND LUNG YEUK TAU, FANLING, N.T.

Figure Title 2034 TRAFFIC FLOWS WITH THE PROPOSED DEVELOPMENT

Figure No. 4.3

Revision B

Designed by N C L, Drawn by S C Y, Checked by K C

Scale in A3 N.T.S., Date 21 JUN 2023

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APPENDIX A
Junction Capacity Analysis

Roundabout Analysis

Junction: Sha Tau Kok Road / Lau Shui Heung Road Job Number: J7204
 Scenario: Existing Condition J1 - P. 1
 Design Year: 2023 Designed By: NCL Checked By: WCH Date: 23 June 2023

AM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q _c
From A		18	836						853	193
From B	34		61						95	918
From C	760	111	82						954	34
From D										
From E										
From F										
From G										
From H										
Total	794	128	979						1902	

PM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q _c
From A	6	7	942						955	235
From B	40		89						128	1083
From C	807	100	135						1042	46
From D										
From E										
From F										
From G										
From H										
Total	853	108	1166						2126	

Legend

Arm	Road (in clockwise order)
A	Sha Tau Kok Road - East
B	Lau Shui Heung Road
C	Sha Tau Kok Road - West
D	
E	
F	
G	
H	

Geometric Parameters

Arm	e (m)	v (m)	r (m)	L (m)	D (m)	∅ (°)	S
From A	7.3	7.3	55.0	100.0	55	15	0.0
From B	6.0	3.5	100.0	50.0	55	25	0.1
From C	7.3	7.3	80.0	50.0	55	15	0.0
From D							
From E							
From F							
From G							
From H							

Predictive Equation $Q_E = K(F - f_c q_c)$

Q _E	Entry Capacity
q _c	Circulating Flow across the Entry
K	$= 1 - 0.00347(\emptyset - 30) - 0.978[(1/r) - 0.05]$
F	$= 303x_2$
f _c	$= 0.210t_D(1 + 0.2x_2)$
t _D	$= 1 + 0.5/(1 + M)$
M	$= \exp[(D - 60)/10]$
x ₂	$= v + (e - v)/(1 + 2S)$
S	$= 1.6(e - v)/L$

Limitation

e	Entry Width	4.0 - 15.0 m
v	Approach Half Width	2.0 - 7.3 m
r	Entry Radius	6.0 - 100.0 m
L	Effective Length of Flare	1.0 - 100.0 m
D	Inscribed Circle Diameter	15 - 100 m
∅	Entry Angle	10° - 60°
S	Sharpness of Flare	0.0 - 3.0

Ratio-of-Flow to Capacity (RFC)

Arm	x ₂	M	t _D	K	F	f _c	Q _E		Entry Flow		RFC	
							AM	PM	AM	PM	AM	PM
From A	7.300	0.607	1.311	1.083	2212	0.677	2254	2223	853	955	0.379	0.430
From B	5.655	0.607	1.311	1.056	1714	0.587	1241	1139	95	128	0.077	0.113
From C	7.300	0.607	1.311	1.089	2212	0.677	2383	2374	954	1042	0.400	0.439
From D												
From E												
From F												
From G												
From H												

Roundabout Analysis

Junction: Sha Tau Kok Road / Lau Shui Heung Road Job Number: J7204
 Scenario: Without Proposed Development J1 - P. 2
 Design Year: 2034 Designed By: NCL Checked By: WCH Date: 23 June 2023

AM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q _c
From A	1	21	896						917	241
From B	9		99						108	1022
From C	831	117	125						1072	10
From D										
From E										
From F										
From G										
From H										
Total	841	137	1120						2098	

PM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q _c
From A	6	9	1002						1018	314
From B	40		122						162	1188
From C	888	136	179						1202	47
From D										
From E										
From F										
From G										
From H										
Total	935	145	1303						2383	

Legend

Arm	Road (in clockwise order)
A	Sha Tau Kok Road - East
B	Lau Shui Heung Road
C	Sha Tau Kok Road - West
D	
E	
F	
G	
H	

Geometric Parameters

Arm	e (m)	v (m)	r (m)	L (m)	D (m)	∅ (°)	S
From A	7.3	7.3	55.0	100.0	55	15	0.0
From B	6.0	3.5	100.0	50.0	55	25	0.1
From C	7.3	7.3	80.0	50.0	55	15	0.0
From D							
From E							
From F							
From G							
From H							

Predictive Equation $Q_E = K(F - f_c q_c)$

Q _E	Entry Capacity
q _c	Circulating Flow across the Entry
K	= 1-0.00347(∅-30)-0.978[(1/r)-0.05]
F	= 303x ₂
f _c	= 0.210t _D (1+0.2x ₂)
t _D	= 1+0.5/(1+M)
M	= exp[(D-60)/10]
x ₂	= v+(e-v)/(1+2S)
S	= 1.6(e-v)/L

Limitation

e	Entry Width	4.0 - 15.0 m
v	Approach Half Width	2.0 - 7.3 m
r	Entry Radius	6.0 - 100.0 m
L	Effective Length of Flare	1.0 - 100.0 m
D	Inscribed Circle Diameter	15 - 100 m
∅	Entry Angle	10° - 60°
S	Sharpness of Flare	0.0 - 3.0

Ratio-of-Flow to Capacity (RFC)

Arm	x ₃	M	t _D	K	F	f _c	Q _E		Entry Flow		RFC	
							AM	PM	AM	PM	AM	PM
From A	7.300	0.607	1.311	1.083	2212	0.677	2219	2165	917	1018	0.413	0.470
From B	5.655	0.607	1.311	1.056	1714	0.587	1177	1074	108	162	0.092	0.151
From C	7.300	0.607	1.311	1.089	2212	0.677	2401	2374	1072	1202	0.447	0.507
From D												
From E												
From F												
From G												
From H												

Roundabout Analysis

Junction: Sha Tau Kok Road / Lau Shui Heung Road Job Number: J7204
 Scenario: With Proposed Development J1 - P. 3
 Design Year: 2034 Designed By: NCL Checked By: WCH Date: 23 June 2023

AM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q _c
From A	1	21	908						929	384
From B	9		99						108	1177
From C	843	117	268						1227	10
From D										
From E										
From F										
From G										
From H										
Total	853	137	1275						2265	

PM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q _c
From A	6	9	1009						1025	450
From B	40		122						162	1331
From C	902	136	315						1352	47
From D										
From E										
From F										
From G										
From H										
Total	949	145	1446						2540	

Legend

Arm	Road (in clockwise order)
A	Sha Tau Kok Road - East
B	Lau Shui Heung Road
C	Sha Tau Kok Road - West
D	
E	
F	
G	
H	

Geometric Parameters

Arm	e (m)	v (m)	r (m)	L (m)	D (m)	∅ (°)	S
From A	7.3	7.3	55.0	100.0	55	15	0.0
From B	6.0	3.5	100.0	50.0	55	25	0.1
From C	7.3	7.3	80.0	50.0	55	15	0.0
From D							
From E							
From F							
From G							
From H							

Predictive Equation $Q_E = K(F - f_c q_c)$

Q _E	Entry Capacity
q _c	Circulating Flow across the Entry
K	$= 1 - 0.00347(\emptyset - 30) - 0.978[(1/r) - 0.05]$
F	$= 303x_2$
f _c	$= 0.210t_D(1 + 0.2x_2)$
t _D	$= 1 + 0.5/(1 + M)$
M	$= \exp[(D - 60)/10]$
x ₂	$= v + (e - v)/(1 + 2S)$
S	$= 1.6(e - v)/L$

Limitation

e	Entry Width	4.0 - 15.0 m
v	Approach Half Width	2.0 - 7.3 m
r	Entry Radius	6.0 - 100.0 m
L	Effective Length of Flare	1.0 - 100.0 m
D	Inscribed Circle Diameter	15 - 100 m
∅	Entry Angle	10° - 60°
S	Sharpness of Flare	0.0 - 3.0

Ratio-of-Flow to Capacity (RFC)

Arm	x ₄	M	t _D	K	F	f _c	Q _E		Entry Flow		RFC	
							AM	PM	AM	PM	AM	PM
From A	7.300	0.607	1.311	1.083	2212	0.677	2114	2065	929	1025	0.440	0.496
From B	5.655	0.607	1.311	1.056	1714	0.587	1081	985	108	162	0.100	0.165
From C	7.300	0.607	1.311	1.089	2212	0.677	2401	2374	1227	1352	0.511	0.570
From D												
From E												
From F												
From G												
From H												

Roundabout Analysis

Junction: Sha Tau Kok Road / Lung Ma Road Job Number: J7204
 Scenario: Existing Condition J2 - P. 1
 Design Year: 2023 Designed By: NCL Checked By: WCH Date: 23 June 2023

AM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q _c
From A		66	990						1056	452
From B	65								65	1028
From C	945	414	39						1397	65
From D										1461
From E										
From F										
From G										
From H										
Total	1009	480	1028						2517	

Free flow bypass from B to C = 464

PM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q _c
From A		87	1118						1204	461
From B	98								98	1205
From C	886	374	87						1348	98
From D										1446
From E										
From F										
From G										
From H										
Total	984	461	1205						2650	

Free flow bypass from B to C = 413

Legend

Arm	Road (in clockwise order)
A	Sha Tau Kok Road - East
B	Lung Ma Road
C	Sha Tau Kok Road - West
D	San Wai Barracks
E	
F	
G	
H	

Geometric Parameters

Arm	e (m)	v (m)	r (m)	L (m)	D (m)	∅ (°)	S
From A	7.5	7.5	40.0	100.0	55	15	0.1
From B	4.0	3.7	70.0	15.0	55	10	0.0
From C	9.5	9.5	35.0	100.0	55	10	0.1
From D	5.5	4.5	20.0	10.0	55	10	0.2
From E							
From F							
From G							
From H							

Predictive Equation $Q_E = K(F - f_c q_c)$

Q _E	Entry Capacity
q _c	Circulating Flow across the Entry
K	= 1-0.00347(∅-30)-0.978[(1/r)-0.05]
F	= 303x ₂
f _c	= 0.210t _D (1+0.2x ₂)
t _D	= 1+0.5/(1+M)
M	= exp[(D-60)/10]
x ₂	= v+(e-v)/(1+2S)
S	= 1.6(e-v)/L

Limitation

e	Entry Width	4.0 - 15.0 m
v	Approach Half Width	2.0 - 7.3 m
r	Entry Radius	6.0 - 100.0 m
L	Effective Length of Flare	1.0 - 100.0 m
D	Inscribed Circle Diameter	15 - 100 m
∅	Entry Angle	10° - 60°
S	Sharpness of Flare	0.0 - 3.0

Ratio-of-Flow to Capacity (RFC)

Arm	x ₂	M	t _D	K	F	f _c	Q _E		Entry Flow		RFC	
							AM	PM	AM	PM	AM	PM
From A	7.500	0.607	1.311	1.077	2273	0.688	2111	2104	1056	1204	0.500	0.572
From B	3.976	0.607	1.311	1.104	1205	0.494	769	673	65	98	0.084	0.146
From C	9.500	0.607	1.311	1.090	2879	0.799	3082	3053	1397	1348	0.453	0.441
From D	5.258	0.607	1.311	1.069	1593	0.565	821	830	0	0	0.000	0.000
From E												
From F												
From G												
From H												

Roundabout Analysis

Junction: Sha Tau Kok Road / Lung Ma Road Job Number: J7204
 Scenario: Without Proposed Development J2 - P. 2
 Design Year: 2034 Designed By: NCL Checked By: WCH Date: 23 June 2023

AM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q _c
From A	1	192	1004						1197	638
From B	83								83	1005
From C	1079	638							1717	83
From D										1800
From E										
From F										
From G										
From H										
Total	1162	830	1004						2996	

Free flow bypass from B to C = 729

PM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q _c
From A	1	134	1162						1296	605
From B	135								135	1166
From C	998	602	3						1603	135
From D										1739
From E										
From F										
From G										
From H										
Total	1133	736	1165						3034	

Free flow bypass from B to C = 535

Legend

Arm	Road (in clockwise order)
A	Sha Tau Kok Road - East
B	Lung Ma Road
C	Sha Tau Kok Road - West
D	San Wai Barracks
E	
F	
G	
H	

Geometric Parameters

Arm	e (m)	v (m)	r (m)	L (m)	D (m)	∅ (°)	S
From A	7.5	7.5	40.0	100.0	55	15	0.0
From B	4.0	3.7	70.0	15.0	55	10	0.0
From C	9.5	9.5	35.0	100.0	55	10	0.0
From D	5.5	4.5	20.0	10.0	55	10	0.2
From E							
From F							
From G							
From H							

Predictive Equation $Q_E = K(F - f_c q_c)$

Q _E	Entry Capacity
q _c	Circulating Flow across the Entry
K	= 1-0.00347(∅-30)-0.978[(1/r)-0.05]
F	= 303x ₂
f _c	= 0.210t _D (1+0.2x ₂)
t _D	= 1+0.5/(1+M)
M	= exp[(D-60)/10]
x ₂	= v+(e-v)/(1+2S)
S	= 1.6(e-v)/L

Limitation

e	Entry Width	4.0 - 15.0 m
v	Approach Half Width	2.0 - 7.3 m
r	Entry Radius	6.0 - 100.0 m
L	Effective Length of Flare	1.0 - 100.0 m
D	Inscribed Circle Diameter	15 - 100 m
∅	Entry Angle	10° - 60°
S	Sharpness of Flare	0.0 - 3.0

Ratio-of-Flow to Capacity (RFC)

Arm	x ₃	M	t _D	K	F	f _c	Q _E		Entry Flow		RFC	
							AM	PM	AM	PM	AM	PM
From A	7.500	0.607	1.311	1.077	2273	0.688	1974	1998	1197	1296	0.606	0.649
From B	3.976	0.607	1.311	1.104	1205	0.494	782	694	83	135	0.106	0.194
From C	9.500	0.607	1.311	1.090	2879	0.799	3066	3021	1717	1603	0.560	0.531
From D	5.258	0.607	1.311	1.069	1593	0.565	616	653	0	0	0.000	0.000
From E												
From F												
From G												
From H												

Roundabout Analysis

Junction: Sha Tau Kok Road / Lung Ma Road Job Number: J7204
 Scenario: With Proposed Development J2 - P. 3
 Design Year: 2034 Designed By: NCL Checked By: WCH Date: 23 June 2023

AM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q _c
From A	13	192	1243						1448	638
From B	83								83	1256
From C	1222	638							1860	95
From D										1955
From E										
From F										
From G										
From H										
Total	1317	830	1243						3390	

Free flow bypass from B to C = 729

PM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q _c
From A	15	134	1261						1409	605
From B	135								135	1279
From C	1134	602	3						1739	149
From D										1889
From E										
From F										
From G										
From H										
Total	1283	736	1264						3283	

Free flow bypass from B to C = 535

Legend

Arm	Road (in clockwise order)
A	Sha Tau Kok Road - East
B	Lung Ma Road
C	Sha Tau Kok Road - West
D	San Wai Barracks
E	
F	
G	
H	

Geometric Parameters

Arm	e (m)	v (m)	r (m)	L (m)	D (m)	∅ (°)	S
From A	7.5	7.5	40.0	100.0	55	15	0.0
From B	4.0	3.7	70.0	15.0	55	10	0.0
From C	9.5	9.5	35.0	100.0	55	10	0.0
From D	5.5	4.5	20.0	10.0	55	10	0.2
From E							
From F							
From G							
From H							

Predictive Equation $Q_E = K(F - f_c q_c)$

Q_E	Entry Capacity
q_c	Circulating Flow across the Entry
K	$= 1 - 0.00347(\emptyset - 30) - 0.978[(1/r) - 0.05]$
F	$= 303x_2$
f_c	$= 0.210t_D(1 + 0.2x_2)$
t_D	$= 1 + 0.5/(1 + M)$
M	$= \exp[(D - 60)/10]$
x_2	$= v + (e - v)/(1 + 2S)$
S	$= 1.6(e - v)/L$

Limitation

e	Entry Width	4.0 - 15.0 m
v	Approach Half Width	2.0 - 7.3 m
r	Entry Radius	6.0 - 100.0 m
L	Effective Length of Flare	1.0 - 100.0 m
D	Inscribed Circle Diameter	15 - 100 m
∅	Entry Angle	10° - 60°
S	Sharpness of Flare	0.0 - 3.0

Ratio-of-Flow to Capacity (RFC)

Arm	x_4	M	t_D	K	F	f_c	Q_E		Entry Flow		RFC	
							AM	PM	AM	PM	AM	PM
From A	7.500	0.607	1.311	1.077	2273	0.688	1974	1998	1448	1409	0.734	0.705
From B	3.976	0.607	1.311	1.104	1205	0.494	645	632	83	135	0.128	0.213
From C	9.500	0.607	1.311	1.090	2879	0.799	3056	3009	1860	1739	0.609	0.578
From D	5.258	0.607	1.311	1.069	1593	0.565	523	563	0	0	0.000	0.000
From E												
From F												
From G												
From H												

Signal Junction Analysis

Junction: Sha Tau Kok Road / Ma Sik Road Job Number: J7204
 Scenario: Existing Condition J3 - P. 1
 Design Year: 2023 Designed By: NCL Checked By: WCH Date: 23 June 2023

Approach	Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak					PM Peak				
						Turning %	Sat. Flow (pcu/hr)	Flow (pcu/hr)	y value	Critical y	Turning %	Sat. Flow (pcu/hr)	Flow (pcu/hr)	y value	Critical y
Sha Tau Kok Road - Lung Yeuk Tau SB	SA	A1	2	3.20			1935	559	0.289			1935	516	0.267	
	SA+RT	A2	2	3.20	26.00	0	2075	599	0.289		7	2066	551	0.267	
	RT	A3	2	3.20	23.00	100	1948	476	0.244		100	1948	519	0.267	
Ma Sik Road EB	LT	B1	2,3	3.50	15.0	100	1786	613	0.343	0.343	100	1786	649	0.363	
	RT	B2	3	3.50	20.0	100	1958	75	0.038		100	1958	61	0.031	
Sha Tau Kok Road - Lung Yeuk Tau NB	LT+SA	C1	1	3.50	15.0	30	1908	240	0.126	0.126	50	1872	262	0.140	
	SA	C2	1	3.50			2105	264	0.126			2105	294	0.140	
	SA	C3	1	3.50			2105	264	0.126			2105	294	0.140	

pedestrian phase	D _(P)	1	min crossing time =	5	sec GM +	8	sec FGM =	13	sec
	E _(P)	3	min crossing time =	5	sec GM +	10	sec FGM =	15	sec
	F _(P)	2,3	min crossing time =	5	sec GM +	9	sec FGM =	14	sec
	G _(P)	1	min crossing time =	5	sec GM +	7	sec FGM =	12	sec

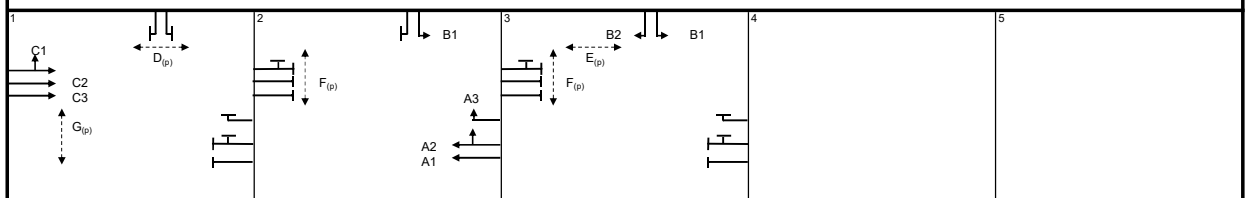
AM Traffic Flow (pcu/hr)

PM Traffic Flow (pcu/hr)

Note:

 $S = 1940 + 100(W - 3.25)$ $S = 2080 + 100(W - 3.25)$
 $S_M = S + (1 + 1.5f/r)$ $S_M = (S - 230) + (1 + 1.5f/r)$

	AM Peak Hour		PM Peak Hour	
	1+2+3	1+2,3	1+2+3	1+2,3
Sum y	0.453	0.469	0.438	0.503
L (s)	14	13	14	13
C (s)	136	136	136	136
practical y	0.807	0.814	0.807	0.814
R.C. (%)	78%	74%	84%	62%



AM	G =	I/G = 5	G =	I/G = 6	G =	I/G = 6	G =	I/G =	G =	I/G =
	G =	I/G = 8	G =	I/G =	G =	I/G = 6	G =	I/G =	G =	I/G =
PM	G =	I/G = 5	G =	I/G = 6	G =	I/G = 6	G =	I/G =	G =	I/G =
	G =	I/G = 8	G =	I/G =	G =	I/G = 6	G =	I/G =	G =	I/G =

Priority Junction Analysis

Junction:	Sha Tau Kok Road / On Kui Street	Job Number: J7204
Scenario:	Without Proposed Development	J3P - P. 2
Design Year:	2034	Designed By: NCL Checked By: WCH Date: 23 Jun 2023

Sha Tau Kok Road - Lung Yeuk Tau (Arm C) Sha Tau Kok Road - Lung Yeuk Tau (Arm A)



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

Geometry :	Input		Input		Input		Calculated	
	W	7.30	V-rBA	0	w-BA	0.00	D	0.5332
	W-CR	0.00	V-IBA	0	w-BC	7.40	E	1.2795
			V-rBC	60	w-CB	0.00	F	0.5860
			V-rCB	0			Y	0.4963

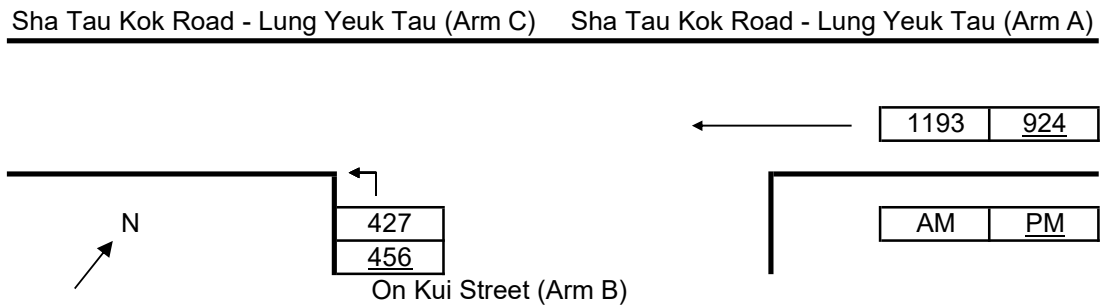
Analysis :

Traffic Flows, pcu/hr	AM	PM	Capacity, pcu/hr		AM	PM
q-CA	0	0	Q-BA		226	248
q-CB	0	0	Q-BC		693	746
q-AB	0	0	Q-CB		317	342
q-AC	1127	896	Q-BAC		693	746
q-BA	0	0				
q-BC	427	456				
f	1.000	1.000				

Ratio-of-flow to Capacity	AM	PM
B-A	0.000	0.000
B-C	0.617	0.611
C-B	0.000	0.000
B-AC	0.617	0.611

Priority Junction Analysis

Junction:	Sha Tau Kok Road / On Kui Street	Job Number: J7204
Scenario:	With Proposed Development	J3P - P. 3
Design Year:	2034	Designed By: NCL Checked By: WCH Date: 23 Jun 2023



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

Geometry :

	Input		Input		Input		Calculated	
W	7.30	V-rBA	0	w-BA	0.00	D	0.5332	
W-CR	0.00	V-IBA	0	w-BC	7.40	E	1.2795	
		V-rBC	60	w-CB	0.00	F	0.5860	
		V-rCB	0			Y	0.4963	

Analysis :

Traffic Flows, pcu/hr	AM	PM	Capacity, pcu/hr	AM	PM
q-CA	0	0	Q-BA	219	245
q-CB	0	0	Q-BC	677	740
q-AB	0	0	Q-CB	310	339
q-AC	1193	924	Q-BAC	677	740
q-BA	0	0			
q-BC	427	456			
f	1.000	1.000			

Ratio-of-flow to Capacity	AM	PM
B-A	0.000	0.000
B-C	0.630	0.616
C-B	0.000	0.000
B-AC	0.630	0.616

Roundabout Analysis

Junction: Jockey Club Road / Sha Tau Kok Road Job Number: J7204
 Scenario: Existing Condition J4 - P. 1
 Design Year: 2023 Designed By: NCL Checked By: WCH Date: 23 June 2023

AM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q _c
From A	14	127	814	262					1217	404
From B	384	26	68	258					736	1233
From C	743	121	40	131					1034	1011
From D	264	113	37	67					481	1328
From E										
From F										
From G										
From H										
Total	1404	388	959	717					3468	

PM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q _c
From A		138	680	256					1074	472
From B	498	46	78	79					702	1085
From C	700	145	34	67					945	919
From D	263	131	76	39					510	1423
From E										
From F										
From G										
From H										
Total	1462	461	868	441					3231	

Legend

Arm	Road (in clockwise order)
A	Sha Tau Kok Road - East
B	Jockey Club Road - South
C	Sha Tau Kok Road - West
D	Jockey Club Road - North
E	
F	
G	
H	

Geometric Parameters

Arm	e (m)	v (m)	r (m)	L (m)	D (m)	∅ (°)	S
From A	8.0	7.5	35.0	4.0	65	10	0.2
From B	7.5	7.0	25.0	1.0	65	10	0.8
From C	10.0	7.0	40.0	15.0	65	40	0.3
From D	8.5	8.0	60.0	2.0	65	20	0.4
From E							
From F							
From G							
From H							

Predictive Equation $Q_E = K(F - f_c q_c)$

Q _E	Entry Capacity
q _c	Circulating Flow across the Entry
K	= 1-0.00347(∅-30)-0.978[(1/r)-0.05]
F	= 303x ₂
f _c	= 0.210t _D (1+0.2x ₂)
t _D	= 1+0.5/(1+M)
M	= exp[(D-60)/10]
x ₂	= v+(e-v)/(1+2S)
S	= 1.6(e-v)/L

Limitation

e	Entry Width	4.0 - 15.0 m
v	Approach Half Width	2.0 - 7.3 m
r	Entry Radius	6.0 - 100.0 m
L	Effective Length of Flare	1.0 - 100.0 m
D	Inscribed Circle Diameter	15 - 100 m
∅	Entry Angle	10° - 60°
S	Sharpness of Flare	0.0 - 3.0

Ratio-of-Flow to Capacity (RFC)

Arm	x ₂	M	t _D	K	F	f _c	Q _E		Entry Flow		RFC	
							AM	PM	AM	PM	AM	PM
From A	7.857	1.649	1.189	1.090	2381	0.642	2313	2266	1217	1074	0.526	0.474
From B	7.192	1.649	1.189	1.079	2179	0.609	1542	1639	736	702	0.477	0.428
From C	8.829	1.649	1.189	0.990	2675	0.690	1957	2020	1034	945	0.528	0.468
From D	8.278	1.649	1.189	1.067	2508	0.663	1737	1670	481	510	0.277	0.305
From E												
From F												
From G												
From H												

Roundabout Analysis

Junction: Jockey Club Road / Sha Tau Kok Road Job Number: J7204
 Scenario: Without Proposed Development J4 - P. 2
 Design Year: 2034 Designed By: NCL Checked By: WCH Date: 23 June 2023

AM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q _c
From A	21	148	940	366					1475	638
From B	313	34	90	465					901	1527
From C	822	136	49	144					1150	1275
From D	278	269	74	77					698	1373
From E										
From F										
From G										
From H										
Total	1433	586	1153	1052					4224	

PM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q _c
From A	34	141	712	383					1270	705
From B	368	55	75	258					756	1325
From C	806	209	58	87					1160	1151
From D	282	245	85	52					664	1531
From E										
From F										
From G										
From H										
Total	1490	650	930	781					3851	

Legend

Arm	Road (in clockwise order)
A	Sha Tau Kok Road - East
B	Jockey Club Road - South
C	Sha Tau Kok Road - West
D	Jockey Club Road - North
E	
F	
G	
H	

Geometric Parameters

Arm	e (m)	v (m)	r (m)	L (m)	D (m)	∅ (°)	S
From A	7.3	7.3	35.0	100.0	65	10	0.0
From B	7.3	7.3	25.0	100.0	65	10	0.0
From C	10.0	7.0	40.0	15.0	65	40	0.3
From D	7.3	7.3	60.0	100.0	65	20	0.0
From E							
From F							
From G							
From H							

Predictive Equation $Q_E = K(F - f_c q_c)$

Q _E	Entry Capacity
q _c	Circulating Flow across the Entry
K	= 1-0.00347(∅-30)-0.978[(1/r)-0.05]
F	= 303x ₂
f _c	= 0.210t _D (1+0.2x ₂)
t _D	= 1+0.5/(1+M)
M	= exp[(D-60)/10]
x ₂	= v+(e-v)/(1+2S)
S	= 1.6(e-v)/L

Limitation

e	Entry Width	4.0 - 15.0 m
v	Approach Half Width	2.0 - 7.3 m
r	Entry Radius	6.0 - 100.0 m
L	Effective Length of Flare	1.0 - 100.0 m
D	Inscribed Circle Diameter	15 - 100 m
∅	Entry Angle	10° - 60°
S	Sharpness of Flare	0.0 - 3.0

Ratio-of-Flow to Capacity (RFC)

Arm	x ₃	M	t _D	K	F	f _c	Q _E		Entry Flow		RFC	
							AM	PM	AM	PM	AM	PM
From A	7.300	1.649	1.189	1.090	2212	0.614	1985	1939	1475	1270	0.743	0.655
From B	7.300	1.649	1.189	1.079	2212	0.614	1375	1509	901	756	0.655	0.501
From C	8.829	1.649	1.189	0.990	2675	0.690	1776	1861	1150	1160	0.647	0.623
From D	7.300	1.649	1.189	1.067	2212	0.614	1461	1357	698	664	0.478	0.489
From E												
From F												
From G												
From H												

Roundabout Analysis

Junction: Jockey Club Road / Sha Tau Kok Road Job Number: J7204
 Scenario: With Proposed Development J4 - P. 3
 Design Year: 2034 Designed By: NCL Checked By: WCH Date: 23 June 2023

AM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q _c
From A	21	148	993	370					1532	638
From B	313	34	90	465					901	1584
From C	822	136	49	144					1150	1279
From D	278	269	74	77					698	1373
From E										
From F										
From G										
From H										
Total	1433	586	1206	1056					4281	

PM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q _c
From A	34	141	731	386					1292	705
From B	368	55	75	258					756	1347
From C	806	209	58	87					1160	1154
From D	282	245	85	52					664	1531
From E										
From F										
From G										
From H										
Total	1490	650	949	784					3873	

Legend

Arm	Road (in clockwise order)
A	Sha Tau Kok Road - East
B	Jockey Club Road - South
C	Sha Tau Kok Road - West
D	Jockey Club Road - North
E	
F	
G	
H	

Geometric Parameters

Arm	e (m)	v (m)	r (m)	L (m)	D (m)	∅ (°)	S
From A	7.3	7.3	35.0	100.0	65	10	0.0
From B	7.3	7.3	25.0	100.0	65	10	0.0
From C	10.0	7.0	40.0	15.0	65	40	0.3
From D	7.3	7.3	60.0	100.0	65	20	0.0
From E							
From F							
From G							
From H							

Predictive Equation $Q_E = K(F - f_c q_c)$

Q _E	Entry Capacity
q _c	Circulating Flow across the Entry
K	= 1-0.00347(∅-30)-0.978[(1/r)-0.05]
F	= 303x ₂
f _c	= 0.210t _D (1+0.2x ₂)
t _D	= 1+0.5/(1+M)
M	= exp[(D-60)/10]
x ₂	= v+(e-v)/(1+2S)
S	= 1.6(e-v)/L

Limitation

e	Entry Width	4.0 - 15.0 m
v	Approach Half Width	2.0 - 7.3 m
r	Entry Radius	6.0 - 100.0 m
L	Effective Length of Flare	1.0 - 100.0 m
D	Inscribed Circle Diameter	15 - 100 m
∅	Entry Angle	10° - 60°
S	Sharpness of Flare	0.0 - 3.0

Ratio-of-Flow to Capacity (RFC)

Arm	x ₄	M	t _D	K	F	f _c	Q _E		Entry Flow		RFC	
							AM	PM	AM	PM	AM	PM
From A	7.300	1.649	1.189	1.090	2212	0.614	1985	1939	1532	1292	0.772	0.666
From B	7.300	1.649	1.189	1.079	2212	0.614	1337	1494	901	756	0.674	0.506
From C	8.829	1.649	1.189	0.990	2675	0.690	1774	1859	1150	1160	0.648	0.624
From D	7.300	1.649	1.189	1.067	2212	0.614	1461	1357	698	664	0.478	0.489
From E												
From F												
From G												
From H												

Signal Junction Analysis

Junction: Jockey Club Road / Ma Sik Road / So Kwun Po Road Job Number: J7204
 Scenario: Existing Condition J5 - P. 1
 Design Year: 2023 Designed By: NCL Checked By: WCH Date: 23 June 2023

Approach	Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak					PM Peak				
						Turning %	Sat. Flow (pcu/hr)	Flow (pcu/hr)	y value	Critical y	Turning %	Sat. Flow (pcu/hr)	Flow (pcu/hr)	y value	Critical y
Jockey Club Road EB	LT	A1	2	3.30	12.5	100	1737	90	0.052		100	1737	87	0.050	
Jockey Club Road EB	LT+SA	A2	2	3.30	15.0	59	1969	103	0.052		87	1919	97	0.051	0.051
Jockey Club Road EB	SA	A3	2	3.30			2085	108	0.052			2085	104	0.050	
Jockey Club Road EB	RT	A4	2	3.30	27.5	100	1977	116	0.059	0.059	100	1977	92	0.046	
Jockey Club Road EB	RT	A5	2	3.30	25.0	100	1967	115	0.059		100	1967	91	0.046	
So Kwun Po Road NB	LT	B1	1, 2	4.60	45.0	100	2008	347	0.173		100	2008	417	0.208	
So Kwun Po Road NB	SA	B2	1	3.30			2085	419	0.201	0.201		2085	408	0.195	0.195
So Kwun Po Road NB	SA+RT	B3	1	3.30	27.5	0	2085	419	0.201		0	2085	407	0.195	
So Kwun Po Road NB	RT	B4	1	3.30	25.0	100	1967	310	0.157		100	1967	291	0.148	
Jockey Club Road WB	LT	C1	3	3.30	25.0	100	1967	146	0.074		100	1967	128	0.065	0.065
Jockey Club Road WB	LT+SA	C2	3	3.30	27.5	64	2015	150	0.074	0.074	56	2023	131	0.065	
Jockey Club Road WB	SA	C3	3	3.30			2085	155	0.074			2085	136	0.065	
Jockey Club Road WB	RT	C4	3	3.60	25.0	100	1995	121	0.060		100	1995	82	0.041	
Ma Sik Road SB	LT	D1	4	3.70	12.5	100	1772	68	0.039		100	1772	56	0.031	
Ma Sik Road SB	SA	D2	4	3.80	15.0		2135	388	0.182	0.182		2135	311	0.146	
Ma Sik Road SB	SA	D3	4	3.80			2135	389	0.182			2135	311	0.146	
Ma Sik Road SB	RT	D4	4	3.50	25.0	100	1986	191	0.096		100	1986	193	0.097	0.097

pedestrian phase	E _(p)	1	min crossing time =	5	sec GM +	10	sec FGM =	15	sec
	F _(p)	2,3,4	min crossing time =	7	sec GM +	9	sec FGM =	16	sec
	G _(p)	1	min crossing time =	13	sec GM +	14	sec FGM =	27	sec
	H _(p)	3,4	min crossing time =	7	sec GM +	7	sec FGM =	14	sec

AM Traffic Flow (pcu/hr)

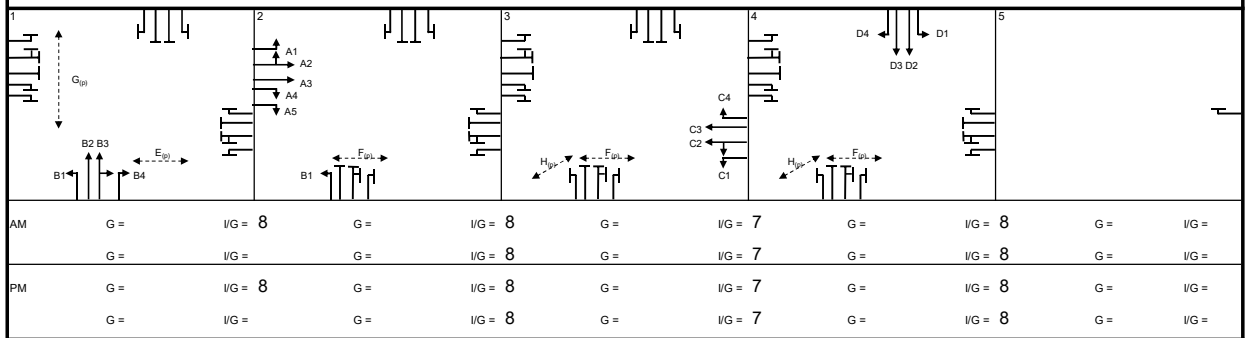
PM Traffic Flow (pcu/hr)

Note:

S=1940+100(W-3.25) S=2080+100(W-3.25)

S_M=S+(1+1.5f/r) S_M=(S-230)+(1+1.5f/r)

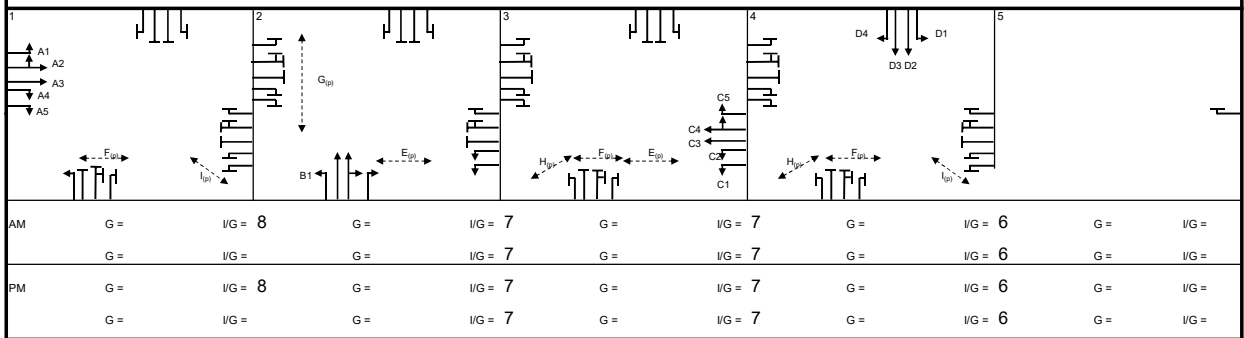
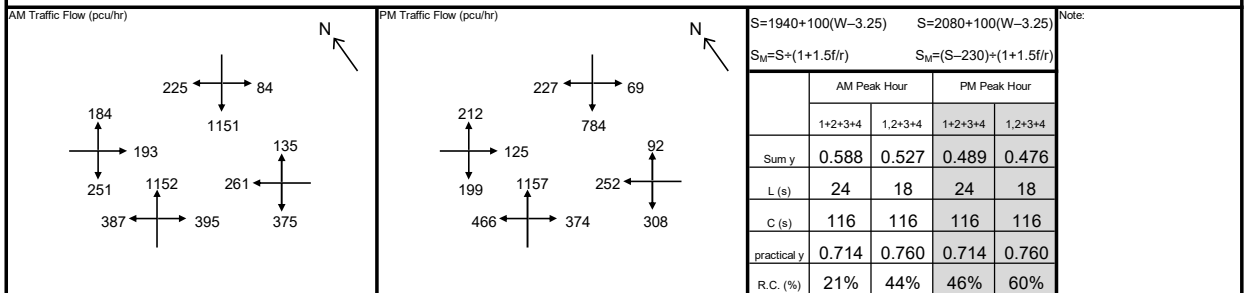
	AM Peak Hour		PM Peak Hour	
	1+2+3+4	1,2+3+4	1+2+3+4	1,2+3+4
Sum y	0.516	0.429	0.457	0.418
L (s)	27	21	27	21
C (s)	116	116	116	116
practical y	0.691	0.737	0.691	0.737
R.C. (%)	34%	72%	51%	76%



Signal Junction Analysis

Junction: Jockey Club Road / Ma Sik Road / So Kwun Po Road Job Number: J7204
 Scenario: Without Proposed Development J5 - P. 2
 Design Year: 2034 Designed By: NCL Checked By: WCH Date: 23 June 2023

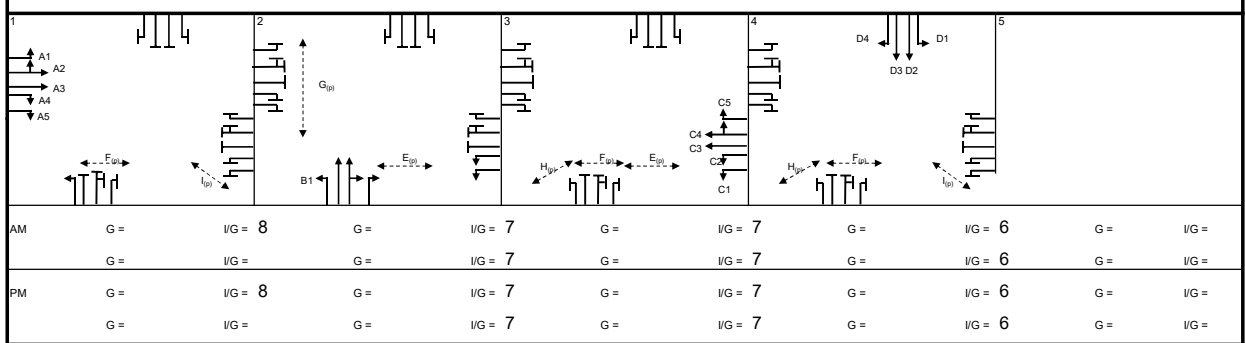
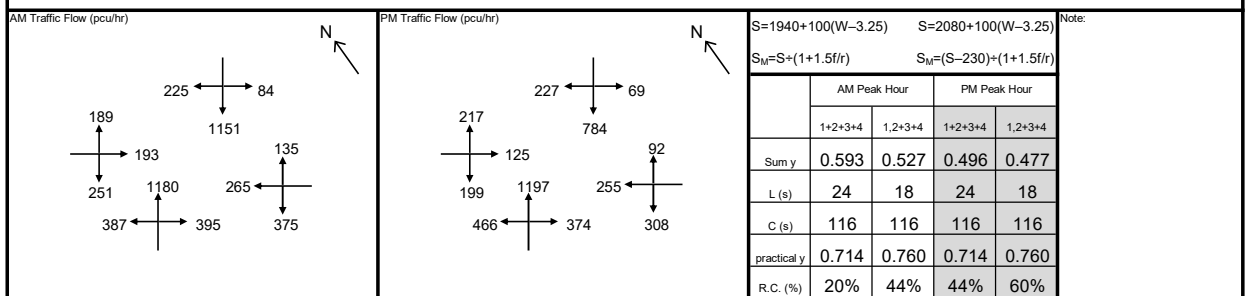
Approach	Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak					PM Peak				
						Turning %	Sat. Flow (pcu/hr)	Flow (pcu/hr)	y value	Critical y	Turning %	Sat. Flow (pcu/hr)	Flow (pcu/hr)	y value	Critical y
Jockey Club Road EB	LT	A1	1	3.30	12.5	100	1737	113	0.065		100	1737	102	0.059	
Jockey Club Road EB	LT+SA	A2	1	3.30	15.0	55	1976	129	0.065		98	1899	112	0.059	0.059
Jockey Club Road EB	SA	A3	1	3.30			2085	135	0.065			2085	123	0.059	
Jockey Club Road EB	RT	A4	1	3.30	27.5	100	1977	126	0.064	0.064	100	1977	100	0.050	
Jockey Club Road EB	RT	A5	1	3.30	25.0	100	1967	125	0.064		100	1967	99	0.050	
So Kwun Po Road NB	LT	B1	1, 2	4.60	45.0	100	2008	387	0.193		100	2008	466	0.232	
So Kwun Po Road NB	SA	B2	2	3.30			2085	392	0.188	0.188		2085	388	0.186	0.186
So Kwun Po Road NB	SA	B3	2	3.30			2085	392	0.188			2085	388	0.186	
So Kwun Po Road NB	SA+RT	B3	2	3.30	27.5	6	2078	393	0.189		2	2083	388	0.186	
So Kwun Po Road NB	RT	B4	2	3.30	25.0	100	1967	370	0.188		100	1967	367	0.186	
Jockey Club Road WB	LT	C1	2, 3	3.30	40.0	100	1875	181	0.097		100	1875	149	0.079	0.079
Jockey Club Road WB	LT	C2	2, 3	3.30	42.5	100	2014	194	0.097		100	2014	160	0.079	
Jockey Club Road WB	SA	C3	3	3.30			2085	133	0.064			2085	125	0.060	
Jockey Club Road WB	SA+RT	C4	3	3.60	27.5	5	2109	135	0.064		0	2115	127	0.060	
Jockey Club Road WB	RT	C5	3	3.60	25.0	100	1995	127	0.064		100	1995	92	0.046	
Ma Sik Road SB	LT	D1	4	3.70	12.5	100	1772	84	0.048	0.048	100	1772	69	0.039	
Ma Sik Road SB	SA	D2	4	3.80	15.0		2135	576	0.270			2135	392	0.184	
Ma Sik Road SB	SA	D3	4	3.80			2135	576	0.270			2135	392	0.184	0.184
Ma Sik Road SB	RT	D4	4	3.50	25.0	100	1986	225	0.114		100	1986	227	0.114	
pedestrian phase	$E_{(p)}$	1				min crossing time =	5	sec GM +	10		sec FGM =	15	sec		
	$F_{(p)}$	2,3,4				min crossing time =	7	sec GM +	9		sec FGM =	16	sec		
	$G_{(p)}$	1				min crossing time =	13	sec GM +	14		sec FGM =	27	sec		
	$H_{(p)}$	3,4				min crossing time =	7	sec GM +	7		sec FGM =	14	sec		
	$I_{(p)}$	1,4				min crossing time =	7	sec GM +	7		sec FGM =	14	sec		



Signal Junction Analysis

Junction: Jockey Club Road / Ma Sik Road / So Kwun Po Road Job Number: J7204
 Scenario: With Proposed Development J5 - P. 3
 Design Year: 2034 Designed By: NCL Checked By: WCH Date: 23 June 2023

Approach	Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak					PM Peak				
						Turning %	Sat. Flow (pcu/hr)	Flow (pcu/hr)	y value	Critical y	Turning %	Sat. Flow (pcu/hr)	Flow (pcu/hr)	y value	Critical y
Jockey Club Road EB	LT	A1	1	3.30	12.5	100	1737	114	0.066		100	1737	104	0.060	
Jockey Club Road EB	LT+SA	A2	1	3.30	15.0	57	1973	131	0.066		99	1897	114	0.060	0.060
Jockey Club Road EB	SA	A3	1	3.30			2085	137	0.066			2085	124	0.060	
Jockey Club Road EB	RT	A4	1	3.30	27.5	100	1977	126	0.064	0.064	100	1977	100	0.050	
Jockey Club Road EB	RT	A5	1	3.30	25.0	100	1967	125	0.064		100	1967	99	0.050	
So Kwun Po Road NB	LT	B1	1, 2	4.60	45.0	100	2008	387	0.193		100	2008	466	0.232	
So Kwun Po Road NB	SA	B2	2	3.30			2085	399	0.192	0.192		2085	399	0.191	0.191
So Kwun Po Road NB	SA	B3	2	3.30			2085	399	0.192			2085	399	0.191	
So Kwun Po Road NB	SA+RT	B3	2	3.30	27.5	4	2080	400	0.192		0	2085	399	0.191	
So Kwun Po Road NB	RT	B4	2	3.30	25.0	100	1967	377	0.192		100	1967	374	0.190	
Jockey Club Road WB	LT	C1	2, 3	3.30	40.0	100	1875	181	0.097		100	1875	149	0.079	0.079
Jockey Club Road WB	LT	C2	2, 3	3.30	42.5	100	2014	194	0.097		100	2014	160	0.079	
Jockey Club Road WB	SA	C3	3	3.30			2085	135	0.065			2085	127	0.061	
Jockey Club Road WB	SA+RT	C4	3	3.60	27.5	4	2110	136	0.065		0	2115	128	0.061	
Jockey Club Road WB	RT	C5	3	3.60	25.0	100	1995	129	0.065		100	1995	92	0.046	
Ma Sik Road SB	LT	D1	4	3.70	12.5	100	1772	84	0.048	0.048	100	1772	69	0.039	
Ma Sik Road SB	SA	D2	4	3.80	15.0		2135	576	0.270			2135	392	0.184	
Ma Sik Road SB	SA	D3	4	3.80			2135	576	0.270			2135	392	0.184	0.184
Ma Sik Road SB	RT	D4	4	3.50	25.0	100	1986	225	0.114		100	1986	227	0.114	
pedestrian phase	E _(p)	1				min crossing time =	5	sec GM +	10		sec FGM =	15	sec		
	F _(p)	2,3,4				min crossing time =	7	sec GM +	9		sec FGM =	16	sec		
	G _(p)	1				min crossing time =	13	sec GM +	14		sec FGM =	27	sec		
	H _(p)	3,4				min crossing time =	7	sec GM +	7		sec FGM =	14	sec		
	I _(p)	1,4				min crossing time =	7	sec GM +	7		sec FGM =	14	sec		



Roundabout Analysis

Junction: So Kwun Po Road / Fanling Highway Interchange Job Number: J7204
 Scenario: Existing Condition J6 - P. 1
 Design Year: 2023 Designed By: NCL Checked By: WCH Date: 23 June 2023

AM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q _c
From A	59		359	1144					1561	550
From B	427								427	1812
From C	396	299							695	1630
From D			251						251	1181
From E										
From F										
From G										
From H										
Total	882	299	609	1144					2934	

PM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q _c
From A	3		567	981					1550	575
From B	572								572	1863
From C	476	261							738	1556
From D			313						313	1313
From E										
From F										
From G										
From H										
Total	1051	261	880	981					3173	

Legend

Arm	Road (in clockwise order)
A	So Kwun Po Road - North
B	Fanling Highway - East
C	So Kwun Po Road - South
D	Fanling Highway - West
E	
F	
G	
H	

Geometric Parameters

Arm	e (m)	v (m)	r (m)	L (m)	D (m)	∅ (°)	S
From A	9.5	6.0	20.0	50.0	65	55	0.1
From B	7.0	3.5	90.0	50.0	65	25	0.1
From C	9.0	6.9	30.0	50.0	65	35	0.1
From D	7.5	3.5	55.0	50.0	65	30	0.1
From E							
From F							
From G							
From H							

Predictive Equation $Q_E = K(F - f_c q_c)$

Q _E	Entry Capacity
q _c	Circulating Flow across the Entry
K	$= 1 - 0.00347(\emptyset - 30) - 0.978[(1/r) - 0.05]$
F	$= 303x_2$
f _c	$= 0.210t_D(1 + 0.2x_2)$
t _D	$= 1 + 0.5/(1 + M)$
M	$= \exp[(D - 60)/10]$
x ₂	$= v + (e - v)/(1 + 2S)$
S	$= 1.6(e - v)/L$

Limitation

e	Entry Width	4.0 - 15.0 m
v	Approach Half Width	2.0 - 7.3 m
r	Entry Radius	6.0 - 100.0 m
L	Effective Length of Flare	1.0 - 100.0 m
D	Inscribed Circle Diameter	15 - 100 m
∅	Entry Angle	10° - 60°
S	Sharpness of Flare	0.0 - 3.0

Ratio-of-Flow to Capacity (RFC)

Arm	x ₂	M	t _D	K	F	f _c	Q _E		Entry Flow		RFC	
							AM	PM	AM	PM	AM	PM
From A	8.859	1.649	1.189	0.913	2684	0.692	2104	2088	1561	1550	0.742	0.742
From B	6.359	1.649	1.189	1.055	1927	0.567	949	918	427	572	0.450	0.623
From C	8.751	1.649	1.189	0.999	2652	0.687	1531	1582	695	738	0.454	0.466
From D	6.685	1.649	1.189	1.031	2025	0.583	1378	1299	251	313	0.182	0.241
From E												
From F												
From G												
From H												

Roundabout Analysis

Junction: So Kwun Po Road / Fanling Highway Interchange Job Number: J7204
 Scenario: Without Proposed Development J6 - P. 2
 Design Year: 2034 Designed By: NCL Checked By: WCH Date: 23 June 2023

AM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q _c
From A	24		128	1275					1427	631
From B	491								491	1740
From C	172	318							490	1790
From D			313						313	1005
From E										
From F										
From G										
From H										
Total	687	318	441	1275					2721	

PM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q _c
From A	27		273	1102					1401	638
From B	654								654	1771
From C	207	268							475	1782
From D			370						370	1155
From E										
From F										
From G										
From H										
Total	887	268	643	1102					2900	

Legend

Arm	Road (in clockwise order)
A	So Kwun Po Road - North
B	Fanling Highway - East
C	So Kwun Po Road - South
D	Fanling Highway - West
E	
F	
G	
H	

Geometric Parameters

Arm	e (m)	v (m)	r (m)	L (m)	D (m)	∅ (°)	S
From A	9.5	6.0	20.0	50.0	65	55	0.1
From B	7.0	3.5	90.0	50.0	65	25	0.1
From C	9.0	6.9	30.0	50.0	65	35	0.1
From D	7.5	3.5	55.0	50.0	65	30	0.1
From E							
From F							
From G							
From H							

Predictive Equation $Q_E = K(F - f_c q_c)$

Q _E	Entry Capacity
q _c	Circulating Flow across the Entry
K	$= 1 - 0.00347(\emptyset - 30) - 0.978[(1/r) - 0.05]$
F	$= 303x_2$
f _c	$= 0.210t_D(1 + 0.2x_2)$
t _D	$= 1 + 0.5/(1 + M)$
M	$= \exp[(D - 60)/10]$
x ₂	$= v + (e - v)/(1 + 2S)$
S	$= 1.6(e - v)/L$

Limitation

e	Entry Width	4.0 - 15.0 m
v	Approach Half Width	2.0 - 7.3 m
r	Entry Radius	6.0 - 100.0 m
L	Effective Length of Flare	1.0 - 100.0 m
D	Inscribed Circle Diameter	15 - 100 m
∅	Entry Angle	10° - 60°
S	Sharpness of Flare	0.0 - 3.0

Ratio-of-Flow to Capacity (RFC)

Arm	x ₃	M	t _D	K	F	f _c	Q _E		Entry Flow		RFC	
							AM	PM	AM	PM	AM	PM
From A	8.859	1.649	1.189	0.913	2684	0.692	2053	2048	1427	1401	0.695	0.684
From B	6.359	1.649	1.189	1.055	1927	0.567	992	973	491	654	0.495	0.671
From C	8.751	1.649	1.189	0.999	2652	0.687	1421	1426	490	475	0.345	0.333
From D	6.685	1.649	1.189	1.031	2025	0.583	1484	1394	313	370	0.211	0.265
From E												
From F												
From G												
From H												

Roundabout Analysis

Junction: So Kwun Po Road / Fanling Highway Interchange Job Number: J7204
 Scenario: With Proposed Development J6 - P. 3
 Design Year: 2034 Designed By: NCL Checked By: WCH Date: 23 June 2023

AM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q _c
From A	24		128	1328					1480	631
From B	491								491	1793
From C	172	318							490	1843
From D			313						313	1005
From E										
From F										
From G										
From H										
Total	687	318	441	1328					2774	

PM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q _c
From A	27		273	1121					1420	638
From B	654								654	1790
From C	207	268							475	1801
From D			370						370	1155
From E										
From F										
From G										
From H										
Total	887	268	643	1121					2919	

Legend

Arm	Road (in clockwise order)
A	So Kwun Po Road - North
B	Fanling Highway - East
C	So Kwun Po Road - South
D	Fanling Highway - West
E	
F	
G	
H	

Geometric Parameters

Arm	e (m)	v (m)	r (m)	L (m)	D (m)	∅ (°)	S
From A	9.5	6.0	20.0	50.0	65	55	0.1
From B	7.0	3.5	90.0	50.0	65	25	0.1
From C	9.0	6.9	30.0	50.0	65	35	0.1
From D	7.5	3.5	55.0	50.0	65	30	0.1
From E							
From F							
From G							
From H							

Predictive Equation $Q_E = K(F - f_c q_c)$

Q _E	Entry Capacity
q _c	Circulating Flow across the Entry
K	= 1-0.00347(∅-30)-0.978[(1/r)-0.05]
F	= 303x ₂
f _c	= 0.210t _D (1+0.2x ₂)
t _D	= 1+0.5/(1+M)
M	= exp[(D-60)/10]
x ₂	= v+(e-v)/(1+2S)
S	= 1.6(e-v)/L

Limitation

e	Entry Width	4.0 - 15.0 m
v	Approach Half Width	2.0 - 7.3 m
r	Entry Radius	6.0 - 100.0 m
L	Effective Length of Flare	1.0 - 100.0 m
D	Inscribed Circle Diameter	15 - 100 m
∅	Entry Angle	10° - 60°
S	Sharpness of Flare	0.0 - 3.0

Ratio-of-Flow to Capacity (RFC)

Arm	x ₄	M	t _D	K	F	f _c	Q _E		Entry Flow		RFC	
							AM	PM	AM	PM	AM	PM
From A	8.859	1.649	1.189	0.913	2684	0.692	2053	2048	1480	1420	0.721	0.693
From B	6.359	1.649	1.189	1.055	1927	0.567	960	962	491	654	0.511	0.679
From C	8.751	1.649	1.189	0.999	2652	0.687	1385	1413	490	475	0.354	0.336
From D	6.685	1.649	1.189	1.031	2025	0.583	1484	1394	313	370	0.211	0.265
From E												
From F												
From G												
From H												

Signal Junction Analysis

Junction: Jockey Club Road / Lok Yip Road / San Wan Road Job Number: J7204
 Scenario: Existing Condition J8 - P. 1
 Design Year: 2023 Designed By: NCL Checked By: WCH Date: 23 June 2023

Approach	Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak					PM Peak					
						Turning %	Sat. Flow (pcu/hr)	Flow (pcu/hr)	y value	Critical y	Turning %	Sat. Flow (pcu/hr)	Flow (pcu/hr)	y value	Critical y	
Jockey Club Road EB	LT+SA	A1	1	3.30	13.0		37	1864	121	0.065	0.065	21	1900	146	0.077	
Jockey Club Road EB	SA	A2	1	3.30				2085	135	0.065			2085	159	0.076	0.076
Jockey Club Road EB	RT+SA	A3	1	3.30	28.0		70	2010	131	0.065		62	2018	155	0.077	
San Wan Road NB	LT+SA	B1	4	3.30	12.0		43	1846	55	0.030		37	1859	65	0.035	
San Wan Road NB	SA+RT	B2	4	3.30	22.5		100	1955	214	0.110	0.110	100	1955	167	0.085	0.085
San Wan Road NB	RT	B3	4	3.30	19.0		100	1932	212	0.110		100	1932	165	0.085	
Jockey Club Road WB	LT	C1	2	3.30	13.0		100	1744	379	0.217		100	1744	375	0.215	
Jockey Club Road WB	LT+SA	C2	2	3.30	15.0		1	2083	453	0.217	0.217	7	2070	446	0.215	
Jockey Club Road WB	SA+RT	C3	2	3.30	27.0		54	2025	440	0.217		54	2024	436	0.216	0.216
Jockey Club Road WB	RT	C4	2	3.30	29.0		100	1982	431	0.217		100	1982	427	0.215	
Lok Yip Road SB	LT	D1	2,3	3.30	11.0		100	1712	445	0.260		100	1712	445	0.260	
Lok Yip Road SB	LT	D2	2,3	3.30	14.0		100	1883	490	0.260		100	1883	489	0.260	
Lok Yip Road SB	SA	D3	3	3.30				2085	101	0.049	0.049		2085	114	0.054	0.054
Lok Yip Road SB	RT	D4	3	3.30	17.5		100	1920	59	0.031		100	1920	64	0.033	

pedestrian phase	$E_{(p)}$	1,2,3		min crossing time =	7	sec GM +	9	sec FGM =	16	sec
	$F_{(p)}$	4		min crossing time =	6	sec GM +	12	sec FGM =	18	sec

AM Traffic Flow (pcu/hr)

PM Traffic Flow (pcu/hr)

Note:

 $S=1940+100(W-3.25)$ $S=2080+100(W-3.25)$
 $S_M=S+(1+1.5f/r)$ $S_M=(S-230)+(1+1.5f/r)$

	AM Peak Hour		PM Peak Hour	
	1+2+3+4	1+2,3+4	1+2+3+4	1+2,3+4
Sum y	0.441	0.435	0.432	0.422
L (s)	28	22	27	21
C (s)	120	120	120	120
practical y	0.690	0.735	0.698	0.743
R.C. (%)	57%	69%	61%	76%

1	2	3	4	5
AM	G = I/G = 9	G = I/G = 8	G = I/G = 7	G = I/G = 8
PM	G = I/G = 8	G = I/G = 8	G = I/G = 7	G = I/G = 8

Signal Junction Analysis

Junction: Jockey Club Road / Lok Yip Road / San Wan Road Job Number: J7204
 Scenario: Without Proposed Development J8 - P. 2
 Design Year: 2034 Designed By: NCL Checked By: WCH Date: 23 June 2023

Approach	Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak					PM Peak				
						Turning %	Sat. Flow (pcu/hr)	Flow (pcu/hr)	y value	Critical y	Turning %	Sat. Flow (pcu/hr)	Flow (pcu/hr)	y value	Critical y
Jockey Club Road EB	LT+SA	A1	1	3.30	13.0	41	1857	121	0.065	0.065	22	1897	146	0.077	
Jockey Club Road EB	SA	A2	1	3.30			2085	336	0.161			2085	350	0.168	0.168
Jockey Club Road EB	RT+SA	A3	1	3.30	28.0	80	2000	130	0.065		68	2011	154	0.077	
San Wan Road NB	LT+SA	B1	4	3.30	12.0	47	1836	75	0.041		35	1864	81	0.044	
San Wan Road NB	SA+RT	B2	4	3.30	22.5	100	1955	245	0.125	0.125	100	1955	203	0.104	0.104
San Wan Road NB	RT	B3	4	3.30	19.0	100	1932	242	0.125		100	1932	201	0.104	
Jockey Club Road WB	LT	C1	2	3.30	13.0	100	1744	379	0.217		100	1744	375	0.215	
Jockey Club Road WB	LT+SA	C2	2	3.30	15.0	23	2039	443	0.217	0.217	24	2036	438	0.215	
Jockey Club Road WB	SA+RT	C3	2	3.30	27.0	38	2042	494	0.242		32	2049	448	0.218	0.218
Jockey Club Road WB	RT	C4	2	3.30	29.0	100	1982	431	0.217		100	1982	427	0.215	
Lok Yip Road SB	LT	D1	2,3	3.30	11.0	100	1712	372	0.217		100	1712	362	0.211	
Lok Yip Road SB	LT	D2	2,3	3.30	14.0	100	1883	409	0.217		100	1883	398	0.211	
Lok Yip Road SB	SA	D3	3	3.30			2085	117	0.056	0.056		2085	140	0.067	0.067
Lok Yip Road SB	RT	D4	3	3.30	17.5	100	1920	75	0.039		100	1920	72	0.037	

pedestrian phase	$E_{(p)}$	1,2,3		min crossing time =	7	sec GM +	9	sec FGM =	16	sec
	$F_{(p)}$	4		min crossing time =	6	sec GM +	12	sec FGM =	18	sec

AM Traffic Flow (pcu/hr)

PM Traffic Flow (pcu/hr)

Note:

 $S=1940+100(W-3.25)$ $S=2080+100(W-3.25)$
 $S_M=S+(1+1.5f/r)$ $S_M=(S-230)+(1+1.5f/r)$

	AM Peak Hour		PM Peak Hour	
	1+2+3+5	1+2,3+5	1+2+3+5	1+2,3+5
Sum y	0.584	0.504	0.558	0.483
L (s)	28	22	27	21
C (s)	120	120	120	120
practical y	0.690	0.735	0.698	0.743
R.C. (%)	18%	46%	25%	54%

AM	G = I/G = 9	G = I/G = 9	G = I/G = 8	G = I/G = 7	G = I/G = 8	G = I/G =
PM	G = I/G = 8	G = I/G = 8	G = I/G = 8	G = I/G = 7	G = I/G = 8	G = I/G =

Signal Junction Analysis

Junction: Jockey Club Road / Lok Yip Road / San Wan Road Job Number: J7204
 Scenario: With Proposed Development J8 - P. 3
 Design Year: 2034 Designed By: NCL Checked By: WCH Date: 23 June 2023

Approach	Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak					PM Peak					
						Turning %	Sat. Flow (pcu/hr)	Flow (pcu/hr)	y value	Critical y	Turning %	Sat. Flow (pcu/hr)	Flow (pcu/hr)	y value	Critical y	
Jockey Club Road EB	LT+SA	A1	1	3.30	13.0		41	1857	121	0.065	0.065	22	1897	146	0.077	
Jockey Club Road EB	SA	A2	1	3.30				2085	336	0.161			2085	350	0.168	0.168
Jockey Club Road EB	RT+SA	A3	1	3.30	28.0		80	2000	130	0.065		68	2011	154	0.077	
San Wan Road NB	LT+SA	B1	4	3.30	12.0		47	1836	75	0.041		35	1864	81	0.044	
San Wan Road NB	SA+RT	B2	4	3.30	22.5		100	1955	245	0.125	0.125	100	1955	203	0.104	0.104
San Wan Road NB	RT	B3	4	3.30	19.0		100	1932	242	0.125		100	1932	201	0.104	
Jockey Club Road WB	LT	C1	2	3.30	13.0		100	1744	379	0.217		100	1744	375	0.215	
Jockey Club Road WB	LT+SA	C2	2	3.30	15.0		23	2039	443	0.217	0.217	24	2036	438	0.215	
Jockey Club Road WB	SA+RT	C3	2	3.30	27.0		39	2041	495	0.243		32	2048	448	0.219	0.219
Jockey Club Road WB	RT	C4	2	3.30	29.0		100	1982	431	0.217		100	1982	427	0.215	
Lok Yip Road SB	LT	D1	2,3	3.30	11.0		100	1712	375	0.219		100	1712	363	0.212	
Lok Yip Road SB	LT	D2	2,3	3.30	14.0		100	1883	412	0.219		100	1883	399	0.212	
Lok Yip Road SB	SA	D3	3	3.30				2085	117	0.056	0.056		2085	140	0.067	0.067
Lok Yip Road SB	RT	D4	3	3.30	17.5		100	1920	75	0.039		100	1920	72	0.037	

pedestrian phase	E(p)	1,2,3		min crossing time =	7	sec GM +	9	sec FGM =	16	sec
	F(p)	4		min crossing time =	6	sec GM +	12	sec FGM =	18	sec

AM Traffic Flow (pcu/hr)

PM Traffic Flow (pcu/hr)

Note:

$$S=1940+100(W-3.25) \quad S=2080+100(W-3.25)$$

$$S_M=S+(1+1.5f/r) \quad S_M=(S-230)+(1+1.5f/r)$$

	AM Peak Hour		PM Peak Hour	
	1+2+3+6	1+2,3+6	1+2+3+6	1+2,3+6
Sum y	0.585	0.505	0.558	0.484
L (s)	28	22	27	21
C (s)	120	120	120	120
practical y	0.690	0.735	0.698	0.743
R.C. (%)	18%	45%	25%	53%

1	2	3	4	5
AM G = I/G = 9	G = I/G = 9	G = I/G = 8	G = I/G = 7	G = I/G = 8
PM G = I/G = 8	G = I/G = 8	G = I/G = 8	G = I/G = 7	G = I/G = 8

Signal Junction Analysis

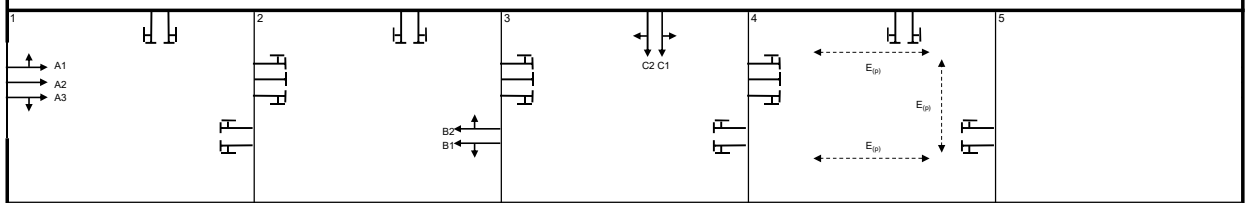
Junction: San Wan Road / Fanling Station Road Job Number: J7204
 Scenario: Existing Condition J9 - P. 1
 Design Year: 2023 Designed By: NCL Checked By: WCH Date: 23 June 2023

Approach	Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak					PM Peak				
						Turning %	Sat. Flow (pcu/hr)	Flow (pcu/hr)	y value	Critical y	Turning %	Sat. Flow (pcu/hr)	Flow (pcu/hr)	y value	Critical y
San Wan Road EB	LT	A1	1	3.30	13.0	100	1744	73	0.042		100	1744	88	0.050	
San Wan Road EB	SA+RT	A2	1	3.30		17	2085	511	0.245		34	2085	486	0.233	0.233
San Wan Road EB	RT	A3	1	3.30	28.0	100	1979	485	0.245	0.245	100	1979	461	0.233	
San Wan Road WB	LT+SA	C1	2	3.60	13.0	84	1800	269	0.149	0.149	97	1776	285	0.161	0.161
San Wan Road WB	SA+RT	C2	2	3.60	15.0	25	2062	308	0.149		21	2071	333	0.161	
Access Road to Cheung Wah Estate SB	LT+SA	D1	3	3.00	11.0	80	1727	70	0.040		100	1686	79	0.047	0.047
Access Road to Cheung Wah Estate SB	SA+RT	D1	3	3.00	11.0	100	1808	86	0.048	0.048	83	1845	86	0.047	

pedestrian phase	$E_{(p)}$	4		min crossing time =	6	sec GM +	15	sec FGM =	21	sec
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Remarks:
 - Pedestrian phase is assumed to be actuated once every two

<p>AM Traffic Flow (pcu/hr)</p>	<p>PM Traffic Flow (pcu/hr)</p>	<p>S=1940+100(W-3.25) S=2080+100(W-3.25) $S_M=S+(1+1.5f/r)$ $S_M=(S-230)+(1+1.5f/r)$</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2"></th> <th colspan="2">AM Peak Hour</th> <th colspan="2">PM Peak Hour</th> </tr> <tr> <th>1+2+3+4</th> <th>1+2+3</th> <th>1+2+3+4</th> <th>1+2+3</th> </tr> </thead> <tbody> <tr> <td>Sum y</td> <td>0.442</td> <td>0.442</td> <td>0.440</td> <td>0.440</td> </tr> <tr> <td>L (s)</td> <td>31</td> <td>17</td> <td>31</td> <td>17</td> </tr> <tr> <td>C (s)</td> <td>124</td> <td>124</td> <td>122</td> <td>122</td> </tr> <tr> <td>practical y</td> <td>0.682</td> <td>0.777</td> <td>0.679</td> <td>0.775</td> </tr> <tr> <td>R.C. (%)</td> <td>54%</td> <td>76%</td> <td>54%</td> <td>76%</td> </tr> </tbody> </table> <p>Note: $< (1+2+3+4)$ Average lost time with ped phase actuated every 2 cycles.</p>		AM Peak Hour		PM Peak Hour		1+2+3+4	1+2+3	1+2+3+4	1+2+3	Sum y	0.442	0.442	0.440	0.440	L (s)	31	17	31	17	C (s)	124	124	122	122	practical y	0.682	0.777	0.679	0.775	R.C. (%)	54%	76%	54%	76%
	AM Peak Hour			PM Peak Hour																																
	1+2+3+4	1+2+3	1+2+3+4	1+2+3																																
Sum y	0.442	0.442	0.440	0.440																																
L (s)	31	17	31	17																																
C (s)	124	124	122	122																																
practical y	0.682	0.777	0.679	0.775																																
R.C. (%)	54%	76%	54%	76%																																



AM	G =	I/G = 7	G =	I/G = 6	G =	I/G = 9	G = 21	I/G = 3	G =	I/G =
	G =	I/G = 7	G =	I/G = 6	G =	I/G = 6	G =	I/G =	G =	I/G =
PM	G =	I/G = 7	G =	I/G = 6	G =	I/G = 9	G = 21	I/G = 3	G =	I/G =
	G =	I/G = 7	G =	I/G = 6	G =	I/G = 6	G =	I/G =	G =	I/G =

Signal Junction Analysis

Junction: San Wan Road / Fanling Station Road Job Number: J7204
 Scenario: Without Proposed Development J9 - P. 2
 Design Year: 2034 Designed By: NCL Checked By: WCH Date: 23 June 2023

Approach	Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak					PM Peak					
						Turning %	Sat. Flow (pcu/hr)	Flow (pcu/hr)	y value	Critical y	Turning %	Sat. Flow (pcu/hr)	Flow (pcu/hr)	y value	Critical y	
San Wan Road EB	LT	A1	1	3.30	13.0		100	1744	82	0.047		100	1744	98	0.056	
San Wan Road EB	SA+RT	A2	1	3.30			14	2085	574	0.275		29	2085	555	0.266	0.266
San Wan Road EB	RT	A3	1	3.30	28.0		100	1979	545	0.275	0.275	100	1979	526	0.266	
San Wan Road WB	LT+SA	C1	2	3.60	13.0		78	1813	327	0.180	0.180	90	1790	336	0.188	0.188
San Wan Road WB	SA+RT	C2	2	3.60	15.0		25	2063	372	0.180		21	2072	389	0.188	
Access Road to Cheung Wah Estate SB	LT+SA	D1	3	3.00	11.0		79	1729	89	0.051		102	1681	90	0.054	0.054
Access Road to Cheung Wah Estate SB	SA+RT	D1	3	3.00	11.0		100	1808	99	0.055	0.055	80	1854	99	0.054	

pedestrian phase	E(p)	4		min crossing time =	6	sec GM +	15	sec FGM =	21	sec
Remarks:										
- Pedestrian phase is assumed to be actuated once every two										

AM Traffic Flow (pcu/hr)

PM Traffic Flow (pcu/hr)

Note:

S=1940+100(W-3.25) S=2080+100(W-3.25)

S_M=S+(1+1.5f/r) S_M=(S-230)+(1+1.5f/r)

	AM Peak Hour		PM Peak Hour	
	1+2+3+4	1+2+3	1+2+3+4	1+2+3
Sum y	0.510	0.510	0.508	0.508
L (s)	31	17	31	17
C (s)	124	124	122	122
practical y	0.682	0.777	0.679	0.775
R.C. (%)	34%	52%	34%	53%

< (1+2+3+4) Average lost time with ped phase actuated every 2 cycles.

	1	2	3	4	5
AM	G = I/G = 7	G = I/G = 7	G = I/G = 6	G = I/G = 9	G = 21 I/G = 3
PM	G = I/G = 7	G = I/G = 7	G = I/G = 6	G = I/G = 9	G = 21 I/G = 3

Signal Junction Analysis

Junction: San Wan Road / Fanling Station Road Job Number: J7204
 Scenario: With Proposed Development J9 - P. 3
 Design Year: 2034 Designed By: NCL Checked By: WCH Date: 23 June 2023

Approach	Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak					PM Peak				
						Turning %	Sat. Flow (pcu/hr)	Flow (pcu/hr)	y value	Critical y	Turning %	Sat. Flow (pcu/hr)	Flow (pcu/hr)	y value	Critical y
San Wan Road EB	LT	A1	1	3.30	13.0	100	1744	82	0.047		100	1744	98	0.056	
San Wan Road EB	SA+RT	A2	1	3.30		14	2085	574	0.275		29	2085	555	0.266	0.266
San Wan Road EB	RT	A3	1	3.30	28.0	100	1979	545	0.275	0.275	100	1979	526	0.266	
San Wan Road WB	LT+SA	C1	2	3.60	13.0	78	1813	327	0.180	0.180	90	1790	336	0.188	0.188
San Wan Road WB	SA+RT	C2	2	3.60	15.0	25	2063	372	0.180		21	2072	389	0.188	
Access Road to Cheung Wah Estate SB	LT+SA	D1	3	3.00	11.0	79	1729	89	0.051		102	1681	90	0.054	0.054
Access Road to Cheung Wah Estate SB	SA+RT	D1	3	3.00	11.0	100	1808	99	0.055	0.055	80	1854	99	0.054	

pedestrian phase	E(p)	4	min crossing time =	6	sec GM +	15	sec FGM =	21	sec
Remarks:									
- Pedestrian phase is assumed to be actuated once every two									

AM Traffic Flow (pcu/hr)

PM Traffic Flow (pcu/hr)

Note:

S=1940+100(W-3.25) S=2080+100(W-3.25)

S_M=S+(1+1.5f/r) S_M=(S-230)+(1+1.5f/r)

	AM Peak Hour		PM Peak Hour	
	1+2+3+4	1+2+3	1+2+3+4	1+2+3
Sum y	0.510	0.510	0.508	0.508
L (s)	31	17	31	17
C (s)	124	124	122	122
practical y	0.682	0.777	0.679	0.775
R.C. (%)	34%	52%	34%	53%

< (1+2+3+4) Average lost time with ped phase actuated every 2 cycles.

	1	2	3	4	5
AM	G = I/G = 7	G = I/G = 7	G = I/G = 6	G = I/G = 9	G = 21 I/G = 3
PM	G = I/G = 7	G = I/G = 7	G = I/G = 6	G = I/G = 9	G = 21 I/G = 3

Roundabout Analysis

Junction: Sha Tau Kok Road / San Wan Road / Fanling Station Road Job Number: J7204
 Scenario: Existing Condition J10 - P. 1
 Design Year: 2023 Designed By: NCL Checked By: WCH Date: 23 June 2023

AM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q _c
From A		456	163						618	870
From B	343		615						959	454
From C	211	147							358	343
From D	89	432	291						812	701
From E										
From F										
From G										
From H										
Total	643	1034	1070						2747	

PM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q _c
From A		269	143						412	931
From B	231		637						868	397
From C	190	152							341	231
From D	141	525	254						920	572
From E										
From F										
From G										
From H										
Total	561	945	1035						2541	

Legend

Arm	Road (in clockwise order)
A	San Wan Road - West
B	Sha Tau Kok Road - North
C	San Wan Road - East
D	Fanling Station Road - South
E	
F	
G	
H	

Geometric Parameters

Arm	e (m)	v (m)	r (m)	L (m)	D (m)	∅ (°)	S
From A	9.0	7.5	45.0	50.0	55	30	0.0
From B	9.5	6.0	50.0	50.0	55	25	0.1
From C	9.5	7.5	100.0	50.0	55	30	0.1
From D	8.5	5.0	20.0	15.0	55	60	0.4
From E							
From F							
From G							
From H							

Predictive Equation $Q_E = K(F - f_c q_c)$

Q _E	Entry Capacity
q _c	Circulating Flow across the Entry
K	$= 1 - 0.00347(\emptyset - 30) - 0.978[(1/r) - 0.05]$
F	$= 303x_2$
f _c	$= 0.210t_D(1 + 0.2x_2)$
t _D	$= 1 + 0.5/(1 + M)$
M	$= \exp[(D - 60)/10]$
x ₂	$= v + (e - v)/(1 + 2S)$
S	$= 1.6(e - v)/L$

Limitation

e	Entry Width	4.0 - 15.0 m
v	Approach Half Width	2.0 - 7.3 m
r	Entry Radius	6.0 - 100.0 m
L	Effective Length of Flare	1.0 - 100.0 m
D	Inscribed Circle Diameter	15 - 100 m
∅	Entry Angle	10° - 60°
S	Sharpness of Flare	0.0 - 3.0

Ratio-of-Flow to Capacity (RFC)

Arm	x ₂	M	t _D	K	F	f _c	Q _E		Entry Flow		RFC	
							AM	PM	AM	PM	AM	PM
From A	8.869	0.607	1.311	1.027	2687	0.764	2078	2030	618	412	0.298	0.203
From B	8.859	0.607	1.311	1.047	2684	0.763	2447	2492	959	868	0.392	0.348
From C	9.273	0.607	1.311	1.039	2810	0.786	2639	2731	358	341	0.135	0.125
From D	7.004	0.607	1.311	0.896	2122	0.661	1486	1563	812	920	0.546	0.589
From E												
From F												
From G												
From H												

Roundabout Analysis

Junction: Sha Tau Kok Road / San Wan Road / Fanling Station Road Job Number: J7204
 Scenario: Without Proposed Development J10 - P. 1
 Design Year: 2034 Designed By: NCL Checked By: WCH Date: 23 June 2023

AM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q _c
From A	5	552	207						765	924
From B	486	0	667						1153	539
From C	304	139	6						450	491
From D	122	458	320						901	941
From E										
From F										
From G										
From H										
Total	917	1150	1201						3268	

PM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q _c
From A	6	438	277						721	1007
From B	315		616						930	568
From C	248	168	6						422	320
From D	173	555	278						1006	743
From E										
From F										
From G										
From H										
Total	742	1160	1178						3080	

Legend

Arm	Road (in clockwise order)
A	San Wan Road - West
B	Sha Tau Kok Road - North
C	San Wan Road - East
D	Fanling Station Road - South
E	
F	
G	
H	

Geometric Parameters

Arm	e (m)	v (m)	r (m)	L (m)	D (m)	∅ (°)	S
From A	9.0	7.5	45.0	50.0	55	30	0.0
From B	9.5	6.0	50.0	50.0	55	25	0.1
From C	9.5	7.5	100.0	50.0	55	30	0.1
From D	8.5	5.0	20.0	15.0	55	60	0.4
From E							
From F							
From G							
From H							

Predictive Equation $Q_E = K(F - f_c q_c)$

Q _E	Entry Capacity
q _c	Circulating Flow across the Entry
K	$= 1 - 0.00347(\emptyset - 30) - 0.978[(1/r) - 0.05]$
F	$= 303x_2$
f _c	$= 0.210t_D(1 + 0.2x_2)$
t _D	$= 1 + 0.5/(1 + M)$
M	$= \exp[(D - 60)/10]$
x ₂	$= v + (e - v)/(1 + 2S)$
S	$= 1.6(e - v)/L$

Limitation

e	Entry Width	4.0 - 15.0 m
v	Approach Half Width	2.0 - 7.3 m
r	Entry Radius	6.0 - 100.0 m
L	Effective Length of Flare	1.0 - 100.0 m
D	Inscribed Circle Diameter	15 - 100 m
∅	Entry Angle	10° - 60°
S	Sharpness of Flare	0.0 - 3.0

Ratio-of-Flow to Capacity (RFC)

Arm	x ₃	M	t _D	K	F	f _c	Q _E		Entry Flow		RFC	
							AM	PM	AM	PM	AM	PM
From A	8.869	0.607	1.311	1.027	2687	0.764	2035	1970	765	721	0.376	0.366
From B	8.859	0.607	1.311	1.047	2684	0.763	2379	2356	1153	930	0.485	0.395
From C	9.273	0.607	1.311	1.039	2810	0.786	2518	2658	450	422	0.179	0.159
From D	7.004	0.607	1.311	0.896	2122	0.661	1344	1461	901	1006	0.670	0.689
From E												
From F												
From G												
From H												

Roundabout Analysis

Junction: Sha Tau Kok Road / San Wan Road / Fanling Station Road Job Number: J7204
 Scenario: With Proposed Development J10 - P. 2
 Design Year: 2034 Designed By: NCL Checked By: WCH Date: 23 June 2023

AM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q _c
From A	5	552	207						765	924
From B	539	0	667						1206	539
From C	304	139	6						450	544
From D	122	458	320						901	994
From E										
From F										
From G										
From H										
Total	970	1150	1201						3321	

PM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q _c
From A	6	438	277						721	1007
From B	334		616						949	568
From C	248	168	6						422	339
From D	173	555	278						1006	762
From E										
From F										
From G										
From H										
Total	761	1160	1178						3099	

Legend

Arm	Road (in clockwise order)
A	San Wan Road - West
B	Sha Tau Kok Road - North
C	San Wan Road - East
D	Fanling Station Road - South
E	
F	
G	
H	

Geometric Parameters

Arm	e (m)	v (m)	r (m)	L (m)	D (m)	∅ (°)	S
From A	9.0	7.5	45.0	50.0	55	30	0.0
From B	9.5	6.0	50.0	50.0	55	25	0.1
From C	9.5	7.5	100.0	50.0	55	30	0.1
From D	8.5	5.0	20.0	15.0	55	60	0.4
From E							
From F							
From G							
From H							

Predictive Equation $Q_E = K(F - f_c q_c)$

Q _E	Entry Capacity
q _c	Circulating Flow across the Entry
K	$= 1 - 0.00347(\emptyset - 30) - 0.978[(1/r) - 0.05]$
F	$= 303x_2$
f _c	$= 0.210t_D(1 + 0.2x_2)$
t _D	$= 1 + 0.5/(1 + M)$
M	$= \exp[(D - 60)/10]$
x ₂	$= v + (e - v)/(1 + 2S)$
S	$= 1.6(e - v)/L$

Limitation

e	Entry Width	4.0 - 15.0 m
v	Approach Half Width	2.0 - 7.3 m
r	Entry Radius	6.0 - 100.0 m
L	Effective Length of Flare	1.0 - 100.0 m
D	Inscribed Circle Diameter	15 - 100 m
∅	Entry Angle	10° - 60°
S	Sharpness of Flare	0.0 - 3.0

Ratio-of-Flow to Capacity (RFC)

Arm	x ₄	M	t _D	K	F	f _c	Q _E		Entry Flow		RFC	
							AM	PM	AM	PM	AM	PM
From A	8.869	0.607	1.311	1.027	2687	0.764	2035	1970	765	721	0.376	0.366
From B	8.859	0.607	1.311	1.047	2684	0.763	2379	2356	1206	949	0.507	0.403
From C	9.273	0.607	1.311	1.039	2810	0.786	2475	2642	450	422	0.182	0.160
From D	7.004	0.607	1.311	0.896	2122	0.661	1313	1450	901	1006	0.686	0.694
From E												
From F												
From G												
From H												

Roundabout Analysis

Junction: Sha Tau Kok Road / Fanling Bypass Interchange Job Number: J7204
 Scenario: Without Proposed Development J7 - P. 1
 Design Year: 2034 Designed By: NCL Checked By: WCH Date: 23 June 2023

AM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q _c
From A			937	139					1076	841
From B	659			55					714	1270
From C	807	647	93	4					1551	857
From D	180		97	4					281	2206
From E										
From F										
From G										
From H										
Total	1646	647	1127	201					3622	

PM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q _c
From A			789	120					910	731
From B	850			60					910	1019
From C	622	622	68	2					1313	1033
From D	197		38	3					239	2160
From E										
From F										
From G										
From H										
Total	1669	622	896	186					3372	

Legend

Arm	Road (in clockwise order)
A	Sha Tau Kok Road - North
B	Fanling Bypass - East
C	Sha Tau Kok Road - South
D	Fanling Bypass - West
E	
F	
G	
H	

Geometric Parameters

Arm	e (m)	v (m)	r (m)	L (m)	D (m)	∅ (°)	S
From A	9.0	7.0	25.0	50.0	75	40	0.1
From B	6.0	5.5	45.0	50.0	75	25	0.0
From C	9.5	9.0	35.0	50.0	75	30	0.0
From D	8.5	4.5	40.0	50.0	75	45	0.1
From E							
From F							
From G							
From H							

Predictive Equation $Q_E = K(F - f_c q_c)$

Q _E	Entry Capacity
q _c	Circulating Flow across the Entry
K	$= 1 - 0.00347(\emptyset - 30) - 0.978[(1/r) - 0.05]$
F	$= 303x_2$
f _c	$= 0.210t_D(1 + 0.2x_2)$
t _D	$= 1 + 0.5/(1 + M)$
M	$= \exp[(D - 60)/10]$
x ₂	$= v + (e - v)/(1 + 2S)$
S	$= 1.6(e - v)/L$

Limitation

e	Entry Width	4.0 - 15.0 m
v	Approach Half Width	2.0 - 7.3 m
r	Entry Radius	6.0 - 100.0 m
L	Effective Length of Flare	1.0 - 100.0 m
D	Inscribed Circle Diameter	15 - 100 m
∅	Entry Angle	10° - 60°
S	Sharpness of Flare	0.0 - 3.0

Ratio-of-Flow to Capacity (RFC)

Arm	x ₃	M	t _D	K	F	f _c	Q _E		Entry Flow		RFC	
							AM	PM	AM	PM	AM	PM
From A	8.773	4.482	1.091	0.975	2658	0.631	2075	2142	1076	910	0.519	0.425
From B	5.984	4.482	1.091	1.045	1813	0.503	1226	1358	714	910	0.582	0.670
From C	9.484	4.482	1.091	1.021	2874	0.664	2354	2234	1551	1313	0.659	0.588
From D	7.685	4.482	1.091	0.972	2328	0.581	1017	1043	281	239	0.276	0.229
From E												
From F												
From G												
From H												

Roundabout Analysis

Junction: Sha Tau Kok Road / Fanling Bypass Interchange Job Number: J7204
 Scenario: With Proposed Development J7 - P. 2
 Design Year: 2034 Designed By: NCL Checked By: WCH Date: 23 June 2023

AM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q _c
From A			1003	139					1142	841
From B	759			55					814	1336
From C	850	647	93	4					1594	957
From D	180		97	4					281	2349
From E										
From F										
From G										
From H										
Total	1789	647	1193	201					3831	

PM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q _c
From A			817	120					938	731
From B	937			60					997	1047
From C	671	622	68	2					1362	1120
From D	197		38	3					239	2296
From E										
From F										
From G										
From H										
Total	1805	622	924	186					3536	

Legend

Arm	Road (in clockwise order)
A	Sha Tau Kok Road - North
B	Fanling Bypass - East
C	Sha Tau Kok Road - South
D	Fanling Bypass - West
E	
F	
G	
H	

Geometric Parameters

Arm	e (m)	v (m)	r (m)	L (m)	D (m)	∅ (°)	S
From A	9.0	7.0	25.0	50.0	75	40	0.1
From B	6.0	5.5	45.0	50.0	75	25	0.0
From C	9.5	9.0	35.0	50.0	75	30	0.0
From D	8.5	4.5	40.0	50.0	75	45	0.1
From E							
From F							
From G							
From H							

Predictive Equation $Q_E = K(F - f_c q_c)$

Q _E	Entry Capacity
q _c	Circulating Flow across the Entry
K	$= 1 - 0.00347(\emptyset - 30) - 0.978[(1/r) - 0.05]$
F	$= 303x_2$
f _c	$= 0.210t_D(1 + 0.2x_2)$
t _D	$= 1 + 0.5/(1 + M)$
M	$= \exp[(D - 60)/10]$
x ₂	$= v + (e - v)/(1 + 2S)$
S	$= 1.6(e - v)/L$

Limitation

e	Entry Width	4.0 - 15.0 m
v	Approach Half Width	2.0 - 7.3 m
r	Entry Radius	6.0 - 100.0 m
L	Effective Length of Flare	1.0 - 100.0 m
D	Inscribed Circle Diameter	15 - 100 m
∅	Entry Angle	10° - 60°
S	Sharpness of Flare	0.0 - 3.0

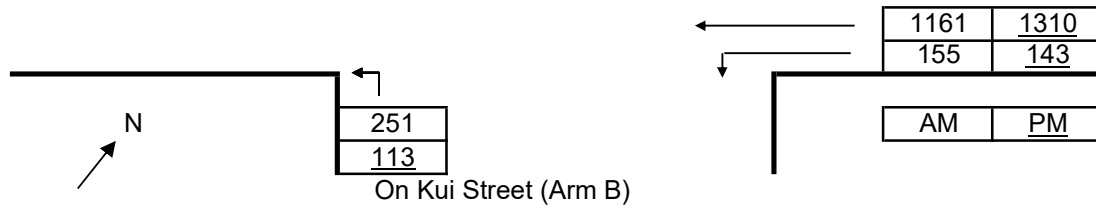
Ratio-of-Flow to Capacity (RFC)

Arm	x ₄	M	t _D	K	F	f _c	Q _E		Entry Flow		RFC	
							AM	PM	AM	PM	AM	PM
From A	8.773	4.482	1.091	0.975	2658	0.631	2075	2142	1142	938	0.551	0.438
From B	5.984	4.482	1.091	1.045	1813	0.503	1192	1344	814	997	0.683	0.742
From C	9.484	4.482	1.091	1.021	2874	0.664	2286	2175	1594	1362	0.697	0.626
From D	7.685	4.482	1.091	0.972	2328	0.581	936	966	281	239	0.300	0.247
From E												
From F												
From G												
From H												

Priority Junction Analysis

Junction:	Proposed Vehicular Access / Sha Tau Kok Road	Job Number: J7204
Scenario:	With Proposed Development	J11 - P. 1
Design Year:	2034	Designed By: NCL Checked By: WCH Date: 23 Jun 2023

Sha Tau Kok Road - Lung Yeuk Tau (Arm C) Sha Tau Kok Road - Lung Yeuk Tau (Arm A)



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

Geometry :

	Input		Input		Input		Calculated	
W	7.30	V-rBA	0	w-BA	0.00	D	0.5332	
W-CR	0.00	V-IBA	0	w-BC	7.50	E	1.2884	
		V-rBC	60	w-CB	0.00	F	0.5860	
		V-rCB	0			Y	0.4963	

Analysis :

Traffic Flows, pcu/hr	AM	PM	Capacity, pcu/hr	AM	PM
q-CA	0	0	Q-BA	217	203
q-CB	0	0	Q-BC	675	642
q-AB	155	143	Q-CB	297	283
q-AC	1161	1310	Q-BAC	675	642
q-BA	0	0			
q-BC	251	113			
f	1.000	1.000			

Ratio-of-flow to Capacity	AM	PM
B-A	0.000	0.000
B-C	0.372	0.176
C-B	0.000	0.000
B-AC	0.372	0.176