Appendix 3

Traffic Impact Assessment

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

Traffic Impact Assessment Final Report

15th December 2022

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

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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 of the Subject Site intends to develop the Subject Site into a development with 5 residential blocks comprising 3,305 flats, and 5,570 m^2 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 report presents the findings of the TIA for the Proposed Development.

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 proposed provision of internal transport facilities;
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 22,500m^2, 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.

Public Transport Services

2.2 At present, the Subject Site is served by franchised bus and green minibus ("GMB"), and the details are presented in Table 2.1 and Figure 2.1.

TABLE 2.1 ROAD–BASED PUBLIC TRANSPORT SERVICES OPERATING CLOSE TO THE SUBJECT SITE

Route	Routing	Frequency (minutes)
KMB 78A	Queen's Hill ↔ Fanling Station (Circular)	6 - 30
KMB 78K	Sheung Shui (Tai Ping) ↔ Sha Tau Kok	15 - 20
KMB 79K	Sheung Shui ↔ Ta Kwu Ling (Tsung Yuen Ha)	20 - 30
KMB 277A	Sha Tau Kok → Lam Tin Station Lam Tin Station → Sha Tau Kok	60[(1)] 60[(2)]
KMB 278A	Queen's Hill ↔ Tsuen Wan (Nina Tower)	20 - 30
KMB N78	Sheung Shui → Sha Tau Kok Sha Tau Kok → Sheung Shui	2 trips per day[(3)] 2 trips per day[(3)]
CTB 78X	Queen's Hill Estate ↔ Kai Tak	30 - 60
CTB 79X	Queen's Hill Estate ↔ Cheung Sha Wan (West)	30 - 40
CTB 679	Queen's Hill Estate →Central (Hong Kong Station)	2 per AM[(1)]
	Central (Hong Kong Station) → Queen's Hill Estate	1 per PM[(2)]
CTB 979	Queen's Hill Estate → Central (Hong Kong Station) Central (Hong Kong Station) → Queen's Hill Estate	1 per AM[(1)] 1 per PM[(2)]
GMB 52K	Fanling Station ↔ Ping Che	4 - 10
GMB 503	Queen's Hill ↔ North District Hospital	10 - 20
GMB 503k	Queen's Hill ↔ Sheung Shui Station	8 - 15

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

The Road Network

2.3 **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.

2.4 **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.

2.5 **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

2.6 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.

2.7 Cycle track is provided along the south side of Sha Tau Kok Road – Lung Yeuk Tau, i.e. westbound side towards Fanling.

Existing Traffic Flows

2.8 To quantify the existing traffic flows in the vicinity, manual classified counts were conducted on weekdays, i.e. Monday, 18th July 2022 and Tuesday, 19th July 2022, during the AM and PM peak periods 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

2.9 Figure 2.2 shows the locations of the surveyed junctions, and Figures 2.3 – 2.8 show their existing layouts.

2.10 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 0745 - 0845 and 1730 - 1830 hours respectively, and the traffic flows in are shown in Figure 2.9.

Potential Influence on Traffic Flow due to COVID-19 Pandemic

2.11 To determine if the observed peak hour traffic flows obtained in July 2022 are representative and not affected by the COVID-19 pandemic, reference is made to the 2019 observed peak hour traffic flows obtained from CKM's in-house database. Table 2.2 summarises and compares the 2019 and 2022 peak hour traffic flow.

TABLE 2.2 COMPARISON OF PEAK HOUR TRAFFIC FLOWS

Road Link	Section	Observed 2-way Traffic Flow (pcu/hour)			
		AM Peak Hour		PM Peak Hou	
		2019	2022	2019	2022
Sha Tau Kok Road – Lung Yeuk Tau	Between Fan Leng Lau Road / Lok Yip Road and Ma Sik Road / On Kui Street	1,711 (2)	1,915 (1)	1,655 (2)	1,857 (1)
Jockey Club Road	Between Ma Sik Road and Sha Tau Kok Road – Lung Yeuk Tau	1,260	1,100	766	941
Po Shek Wu Road	Between Po Shek Wu Interchange and Jockey Club Road	2,825	2,745	2,500	2,529
TOTAL		**5,796**	**5,760**	**4,921**	**5,327**
% Difference between 2019 & 2022		**-0.6%**		**+8.3%**	

Note:
(1) With On Kui Street between On Chuen Street and Sha Tau Kok Road – Lung Yeuk Tau temporarily closed to facilitate construction of the Fanling Bypass Eastern Section.
(2) Adjusted to include additional traffic flow of On Kui Street for comparison purpose.

2.12 As shown in Table 2.2, the 2022 observed AM peak hour traffic flow is only 0.6% less than the 2019 AM peak hour traffic flow, which is negligible, and is 8.3% higher for the PM peak hour; hence, the 2022 observed peak hour traffic flow is representable, and no adjustment was necessary.

Performance of the Surveyed Junctions

2.13 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 2.3 summarises the analysis results and the detailed calculations are found in Appendix A.

TABLE 2.3 EXISTING JUNCTION PERFORMANCE

Ref.	Junction	Type of Junction	Parameter	AM Peak Hour	PM Peak Hour
J01	Sha Tau Kok Road / Lau Shui Heung Road	Roundabout	RFC	0.379	0.414
J02	Sha Tau Kok Road / Lung Ma Road	Roundabout	RFC	0.481	0.54
J03	Sha Tau Kok Road / Ma Sik Road	Signal	RC	75%	64%
J04	Sha Tau Kok Road / Jockey Club Road	Roundabout	RFC	0.5148	0.4608
J05	So Kwun Po Road / Jockey Club Road / Ma Sik Road	Signal	RC	33%	46%
J06	So Kwun Po Interchange	Roundabout	RFC	0.8485	0.8491

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

2.14 The above results indicate the surveyed junctions operate with capacities.

Performance of the Surveyed Road Links

2.15 The existing performance, in terms of Peak Hourly Flows / Design Flow Ratio ("P/Df") of the surveyed road links is calculated based on the observed traffic flows, and the analyses were undertaken based on the design flow of different road type outlined in Volume 2 of the TPDM. Details of the surveyed road links and the analysis results are summarized in Table 2.4.

TABLE 2.4 EXISTING P/Df OF SURVEYED ROAD LINKS

Ref.	Road Link	Section		Type (Note 1)	Config-uration.	Design Flow (vph)	Adjusted Design Flow (vph) (Note 2)	Peak Hour Flows / Design Flow Ratio (P/Df)	
		From	To					AM Peak Hour	PM Peak Hour
L01	Sha Tau Kok Road	Lung Ma Road	Lau Shui Heung Road	RR	Dual-2	2,800	2,520	0.3566	0.3863
L02	Sha Tau Kok Road	Lau Shui Heung Road	Lung Ma Road	RR	Dual-2	2,800	2,520	0.3957	0.4454
L03	Sha Tau Kok Road	Ma Sik Road	Lung Ma Road	RR	Dual-2	2,800	2,520	0.5390	0.5138
L04	Sha Tau Kok Road	Lung Ma Road	Ma Sik Road	RR	Dual-2	2,800	2,520	0.5253	0.6282
L05	Sha Tau Kok Road	Jockey Club Road	Ma Sik Road	RR	Dual-2	2,800	2,520	0.5324	0.5599

Note 1: RR – Rural Road DD – District Distributor PD – Primary Distributor
Note 2: Reduced design flow by 10% due to percentage of heavy vehicles exceeds 20%

TABLE 2.4 EXISTING P/Df OF SURVEYED ROAD LINKS (CONT'D)

Ref.	Road Link	Section		Type (Note 1)	Config.	Design Flow (vph)	Adjusted Design Flow (vph) (Note 2)	Peak Hour Flows / Design Flow Ratio (P/Df)	
		From	To					AM Peak Hour	PM Peak Hour
L06	Sha Tau Kok Road	Ma Sik Road	Jockey Club Road	RR	Dual-2	2,800	2,520	0.4674	0.4128
L07	Ma Sik Road	Jockey Club Road	Sha Tau Kok Road	DD	Dual-2	2,000	1,800	0.6161	0.5934
L08	Ma Sik Road	Sha Tau Kok Road	Jockey Club Road	DD	Dual-2	2,000	1,800	0.5753	0.4838
L09	Jockey Club Road	Ma Sik Road / So Kwun Po Road	Sha Tau Kok Road	PD	Dual-2	2,800	2,520	0.2095	0.1836
L10	Jockey Club Road	Sha Tau Kok Road	Ma Sik Road / So Kwun Po Road	PD	Dual-2	2,800	2,520	0.2268	0.1893
L11	So Kwun Po Road	Jockey Club Road	So Kwun Po Interchange	PD	Dual-2	2,800	2,520	0.4960	0.3993
L12	So Kwun Po Road	So Kwun Po Interchange	Jockey Club Road	PD	Dual-2	2,800	2,520	0.5928	0.6041

Note 1: RR – Rural Road DD – District Distributor PD – Primary Distributor
Note 2: Reduced design flow by 10% due to percentage of heavy vehicles exceeds 20%

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

Historic Traffic Growth

2.17 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 2.5 summarises the AADT between 2015 and 2021, i.e. the latest 7 years.

TABLE 2.5 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

2.18 It should be noted that "*The Annual Traffic Census 2020*" and "*The Annual Traffic Census 2021*" stated that due to the outbreak of COVID-19 in 2020 and 2021, normal traffic flow pattern across Hong Kong were affected with reduction in traffic flows in view of work-from-home arrangement for many offices, suspension of face-to-face classes for schools, and disruption of tourism, etc. Hence, the 2020 and 2021 traffic data were not adopted to determine the average annual growth, but included in Table 2.5 for reference only.

2.19 Table 2.5 shows that the traffic growth in the vicinity of the Subject Site is some -0.1% to 7.3% per annum, and overall annual growth of 3.1% per annum between 2015 and 2019.

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:	
	Number of blocks:	5	GFA ≤ 40m^2	2,991 units
	Total number of flats:	3,305	40m^2 < GFA ≤ 70m^2	314 units
Retail	5,570 m^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 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)	**Residential:** *Parking Requirement = GPS x R1 x R2 x R3* *Global Parking Standard (GPS):* *Min: 1 space per 7 flats* *Max: 1 space per 4 flats* *Demand Adjustment Ratio (R1):* • *Flat Size <40m^2 = 0.5* • *40 < Flat Size ≤ 70 m^2 = 1.2* *Accessibility Adjustment Ratio (R2):* • *Outside a 500m-radius of rail station =1.0* *Development Intensity Adjustment Ratio (R3)* • *5.0 < Domestic Plot Ratio ≤ 8.0 = 0.9* For Flat Size <40m^2 (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. For 40 < Flat Size ≤ 70 m^2: (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. Overall Min: 193 + 49 = 242 nos. Max: 337 + 85 = **422 nos.**	**422 nos.** **(=HKPSG Max., OK)**

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

	HKPSG Recommendation	Proposed Provision
	Private Car Parking Spaces	
(ii)	Visitor Car Parking Spaces - 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. For 5 blocks with 3,305 flats: Min: 1 x 5 = 5 nos. Max: 5 x 5 = **25 nos.**	**25 nos.** (=HKPSG Max., OK)
(iii)	(i) + (ii) Min: 242 + 5 = 247 nos., *(including 243 nos. regular, and 4 nos. accessible)* Max: 422 + 25 = 447 nos., *(including 441 nos. regular, and 5 nos. accessible)*	**447 nos.,** including: - 442 nos. regular , and - 5 nos. accessible (=HKPSG Max., OK)
	Motorcycle Parking Spaces	
(iv)	At the rate of 1 motorcycle parking space per 100 - 150 flats Min: 3,305 / 150 = 22.03, say 23 nos. Max: 3,305 / 100 = 33.05, say 34 nos.	**34 nos.** (=HKPSG Max., OK)
	Goods Vehicle Loading / Unloading ("L/UL") Bay	
(v)	1 bay per residential block For 5 residential blocks: 5 x 1 = 5 nos.	**5 nos. HGV** (=HKPSG, OK)
	Bicycle Parking Spaces	
(vi)	At the rate of 1 cycle parking space for every 30 flats smaller than 70m^2 GFA for outside 2km radius of a rail station. 3,305 / 30 = 110.2, says 111 nos.@ 1.65m (L) x 0.8m (W) or provided with parking racks.	**111 nos.** (=HKPSG, OK)

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 PROPOSED PROVISION OF INTERNAL TRANSPORT FACILITIES FOR RETAIL

	HKPSG Recommendation	Proposed Provision
	Private Car Parking Spaces	
(vii)	For 5,570m^2 GFA Min.: 5,570 / 300 = 18.6, say 19 nos. Max.: 5,570 / 150 = 37.1, say 38 nos.	**38 nos.,** including: - 37 nos. regular, and - 1 no. accessible (=HKPSG Max., OK)
	Motorcycle Parking Spaces	
(viii)	At 5% to 10% of car parking spaces provided Min.: 19 x 5% = 1.0, say 1 nos. Max.: 38 x 10% = 3.8, say 4 nos.	**4 nos.** (=HKPSG Max., OK)

TABLE 3.3 PROPOSED PROVISION OF INTERNAL TRANSPORT FACILITIES FOR RETAIL

	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. HGV: 5 x 35% = 1.75, say 2 nos. LGV: 5 – 2 = 3 nos. Max.: 5,570 / 800 = 6.96, say 7 nos. HGV: 7 x 35% = 2.45, say 3 nos. LGV: 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 Space @ 5.0m (L) x 2.5m (W) x 2.4m (H)	442	37	479	485
Accessible Car Parking Space @ 5.0m (L) x 2.5m (W) x 2.4m (H)	5	1	6	
Motorcycle Parking Space @ 2.4m (L) x 2.5m (W) x 2.4m (H)	34	4	38	
LGV Loading / Unloading Bay @ 11.0m (L) x 3.5m (W) x 4.7m (H)	-	4	4	
HGV Loading / Unloading Bay @ 11.0m (L) x 3.5m (W) x 4.7m (H)	5	3	8	
Bicycle Parking Space @ 1.65m (L) x 0.8m (W) or with parking rack	111	-	111	

4.0 TRAFFIC IMPACT

Design Year

4.1 The Proposed Development is anticipated to be completed no later than 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 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 as follows: (i) with reference to the 2026 traffic flows from the NTE1 Base District Traffic Model ("BDTM") which is produced by Transport Department, (ii) the estimated traffic growths from 2026 to 2034, (iii) the expected traffic generation associated with other known planned / committed major developments, (iv) the planned traffic improvement works to be carried by other projects, and (v) 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_1 being the annual population growth obtained from the "*2014-based Territorial Population and Employment Data Matrix*" published by Planning Department rates for 2026 – 2034.

$$2026 \text{ to } 2034 \text{ traffic growth factor} = (1+X_1)^5$$

4.7 The total growths were 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.	Redevelopment of Junior Police Officers Married Quarters, Fan Garden, Fanling [7]	G/IC (Staff Quarters): 1,184 flats
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
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

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

Ref.	Developments	Development Parameters (Approx.)
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

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) PWSC(2016-17)42. Legislative 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.

Future Road Network

4.9 Various traffic improvement works have been planned for implementation, including the Fanling Bypass Eastern and Western Sections, Lung Yeuk Tau Interchange of the Fanling Bypass Eastern Section at Sha Tau Kok Road – Lung Yeuk Tau, various local junction improvements along Ma Sik Road, Jockey Club Road associated with the FLN NDA and other developments located within Fanling / Sheung Shui area, and the Improvement of So Kwun Po Interchange etc. Figure 4.1 also shows an overview of the road network adopted in the 2034 traffic model.

2034 Traffic Flows

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

2034 Traffic Flows with the Proposed Development = *2034 Traffic Flows without the Proposed Development + Traffic Generated by the Proposed Development*

4.11 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

4.12 Year 2034 junction capacity analysis for the case without and with the Proposed Development are summarised in Table 4.4 and detailed calculations are found in the Appendix A.

TABLE 4.4 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	0.4509	0.5116	0.5164	0.5757
J02	Sha Tau Kok Road / Lung Ma Road	Roundabout	RFC	0.6124	0.6559	0.7415	0.7133
J03	Sha Tau Kok Road / Ma Sik Road (Note 1)	Priority	RFC	0.7857	0.7340	0.8190	0.7453
J04	Sha Tau Kok Road / Jockey Club Road	Roundabout	RFC	0.6547	0.5939	0.6800	0.5945
J05	So Kwun Po Road / Jockey Club Road / Ma Sik Road (Note 1)	Signal	RC	17%	33%	16%	31%
J06	So Kwun Po Interchange (Note 1)	Roundabout	RFC	0.7697	0.7656	0.7993	0.7763
J07	Lung Yeuk Tau Interchange (Note 1)	Roundabout	RFC	0.6617	0.6691	0.7002	0.7411

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

4.13 Table 4.4 shows that the junctions analyzed have capacity to accommodate the expected traffic growth to 2034, and the traffic generated by the Proposed Development will have no adverse impact to the surrounding road network.

2034 Road Link Capacity Analysis

4.14 Year 2034 road link capacity analysis for the cases without and with the Proposed Development are summarised in Table 4.5.

TABLE 4.5 2034 P/Df OF SURVEYED ROAD LINKS

Ref.	Road Link	Section		Type (Note 1)	Adjusted Design Flow (vph) (Note 2)	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	2,520	0.4232	0.4747	0.4847	0.5342
L02	Sha Tau Kok Road	Lau Shui Heung Road	Lung Ma Road	RR	2,520	0.4722	0.5120	0.5718	0.5568
L03	Sha Tau Kok Road	Ma Sik Road	Lung Ma Road	RR	2,520	0.6789	0.6338	0.7356	0.6878
L04	Sha Tau Kok Road	Lung Ma Road	Ma Sik Road	RR	2,520	0.6850	0.6724	0.7799	0.7116

TABLE 4.5 2034 P/Df OF SURVEYED ROAD LINKS (CONT')

Ref.	Road Link	Section		Type (Note 1)	Adjusted Design Flow (vph) (Note 2)	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
L05	Sha Tau Kok Road	Jockey Club Road	Ma Sik Road	RR	2,520	0.5686	0.5911	0.5686	0.5911
L06	Sha Tau Kok Road	Ma Sik Road	Jockey Club Road	RR	2,520	0.6168	0.5363	0.6429	0.5474
L07	Ma Sik Road	Jockey Club Road	Sha Tau Kok Road	DD	1,800	0.8167	0.8117	0.8350	0.8367
L08	Ma Sik Road	Sha Tau Kok Road	Jockey Club Road	DD	1,800	0.8076	0.5966	0.8076	0.5966
L09	Jockey Club Road	Ma Sik Road / So Kwun Po Road	Sha Tau Kok Road	PD	2,520	0.2483	0.2126	0.2483	0.2126
L10	Jockey Club Road	Sha Tau Kok Road	Ma Sik Road / So Kwun Po Road	PD	2,520	0.2873	0.2461	0.2889	0.2473
L11	So Kwun Po Road	Jockey Club Road	So Kwun Po Interchange	PD	2,520	0.6867	0.4998	0.6867	0.4998
L12	So Kwun Po Road	So Kwun Po Interchange	Jockey Club Road	PD	2,520	0.7518	0.7825	0.7629	0.7984

4.15 Table 4.5 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.

5.0 SUMMARY

5.1 The Subject Site is located in various lots in D.D. 83, Lung Yeuk Tau in Fanling,

5.2 The Proposed Development has 5 residential blocks with 3,305 flats and 5,570 m^2 retail GFA.

5.3 The proposed internal transport facilities meets 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.

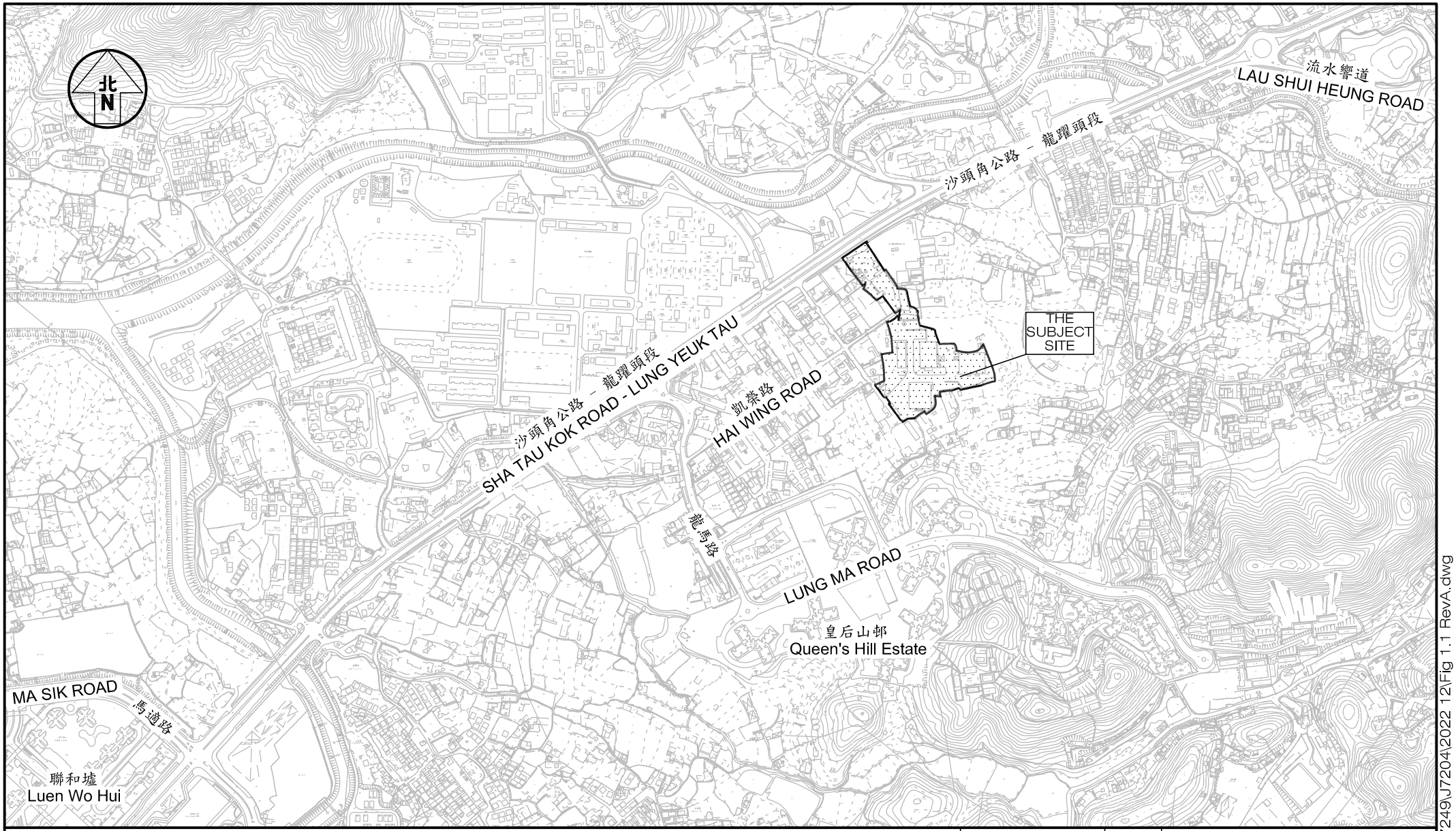
5.4 Manual classified counts were conducted at selected junctions located in the vicinity in order to establish the existing traffic flows during the AM and PM peak hours. The design year 2034 traffic flows were derived with reference to the BDTM, and have also taken into account the traffic generation and planned traffic improvement works associated with other known planned / committed major developments located in the vicinity.

5.5 Traffic generation for the Proposed Development is calculated based on the trip rates adopted from the TPDM, and is expected to generate some 406 and 256 pcu (2-way) during the AM and PM peak hours respectively.

5.6 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.

5.7 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 MA LIU SHUI SAN TSUEN, FANLING, N.T.	J7204	Figure No. 1.1 / Revision A
Figure Title	LOCATION OF THE SUBJECT SITE		Designed by N C L / Drawn by S C Y / Checked by K C
			Scale in A4 1 : 8,000 / Date 13 DEC 2022

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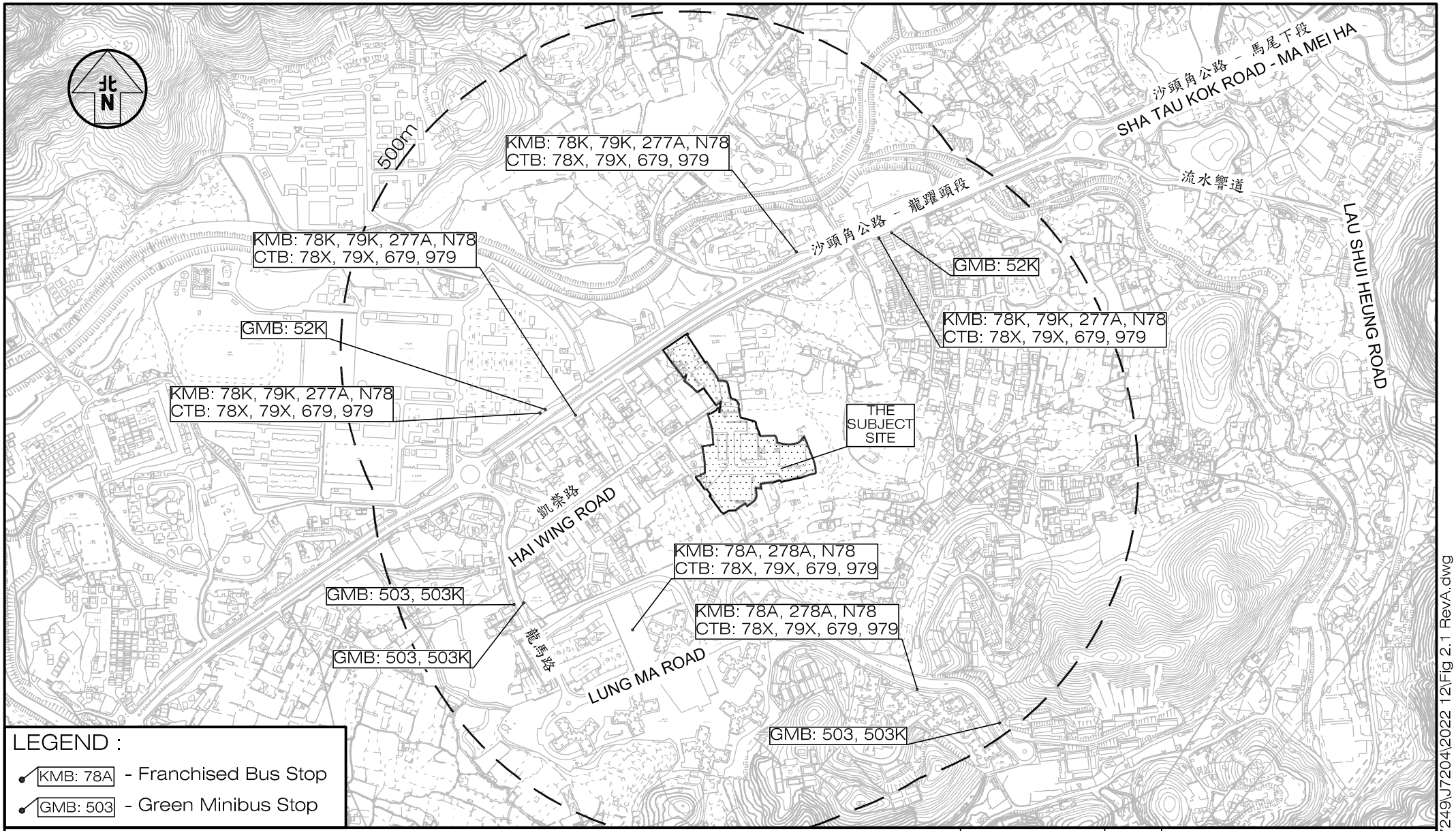

Project Title

PROPOSED DEVELOPMENT AT VARIOUS LOTS IN D.D.83
AND ADJOINING GOVERNMENT LAND MA LIU SHUI SAN TSUEN, FANLING, N.T.

J7204

Figure Title

PUBLIC TRANSPORT SERVICES OPERATING IN VICINITY OF THE SUBJECT SITE

Figure No.	Revision
2.1	A

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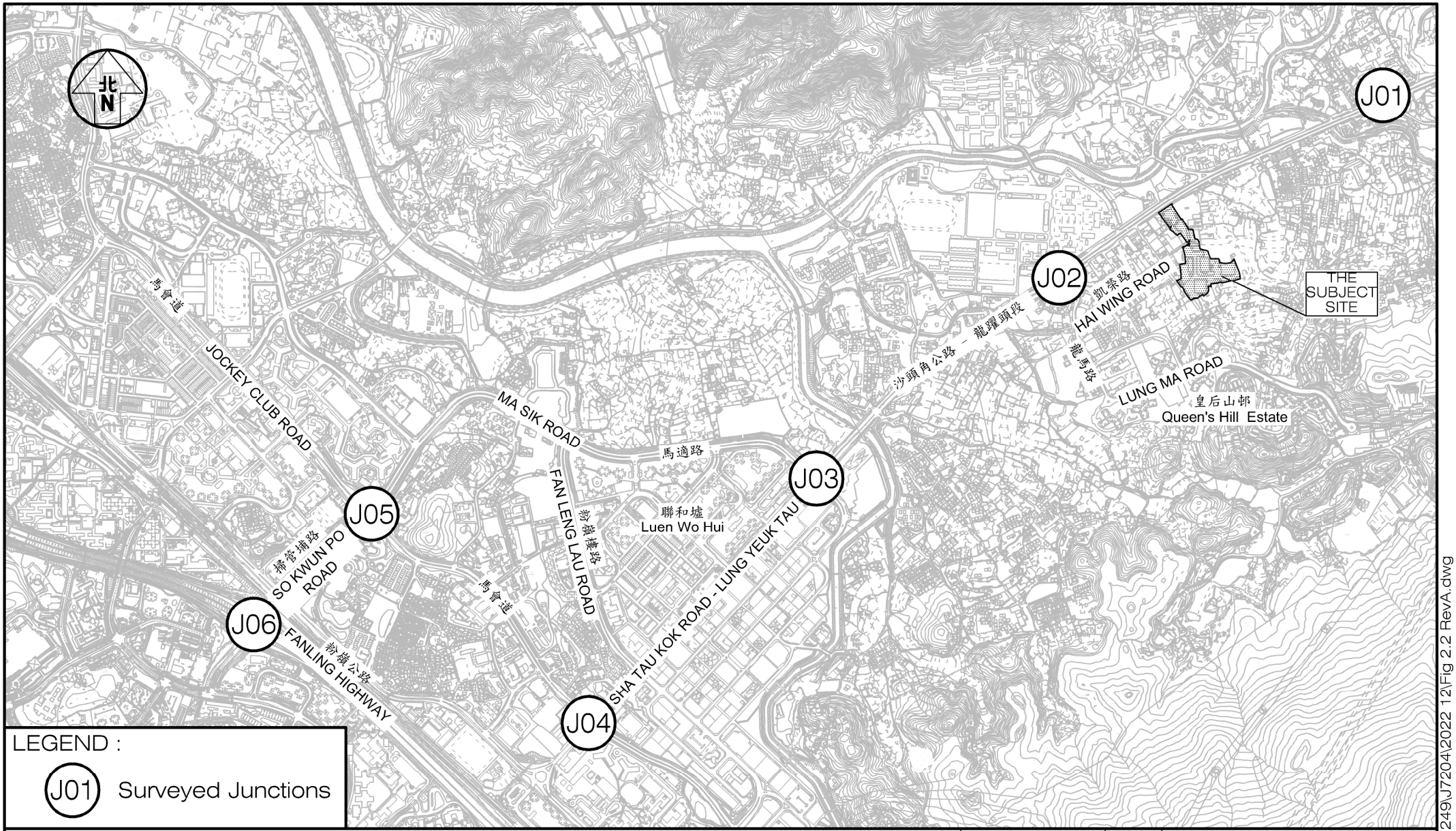

LEGEND :

J01 Surveyed Junctions

Project Title	PROPOSED DEVELOPMENT AT VARIOUS LOTS IN D.D.83 AND ADJOINING GOVERNMENT LAND MA LIU SHUI SAN TSUEN, FANLING, N.T.	J7204	Figure No. 2.2 / Revision A
Figure Title	LOCATION OF THE SURVEYED JUNCTIONS		Designed by N C L / Drawn by S C Y / Checked by K C
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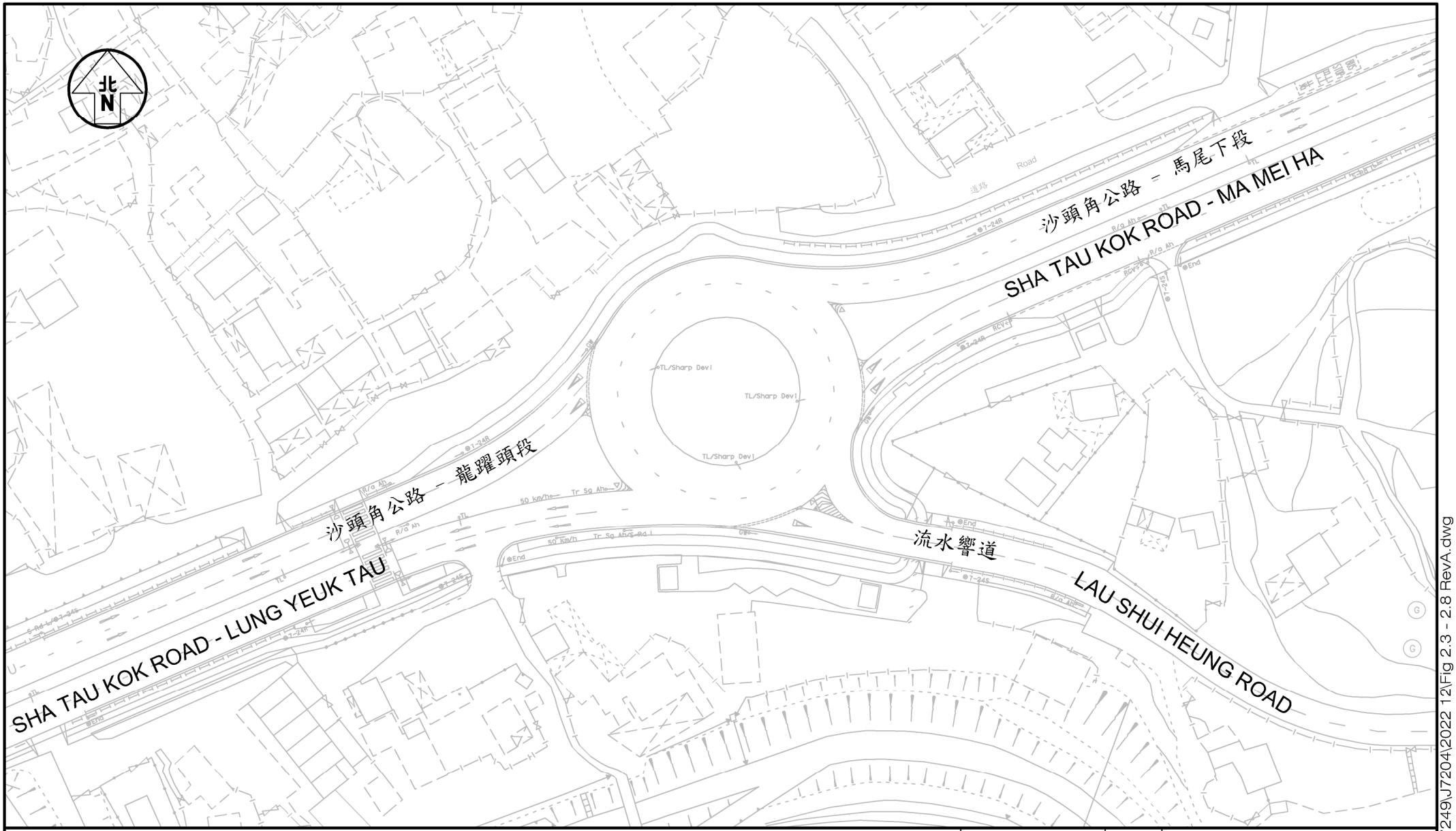

Project Title	PROPOSED DEVELOPMENT AT VARIOUS LOTS IN D.D.83 AND ADJOINING GOVERNMENT LAND MA LIU SHUI SAN TSUEN, FANLING, N.T.	J7204	Figure No. 2.3 / Revision A
Figure Title	EXISTING LAYOUT – JUNCTION OF SHA TAU KOK ROAD / LAU SHUI HEUNG ROAD (J01)		Designed by N C L / Drawn by S C Y / Checked by K C / Scale in A4 1 : 1,000 / Date 13 DEC 2022

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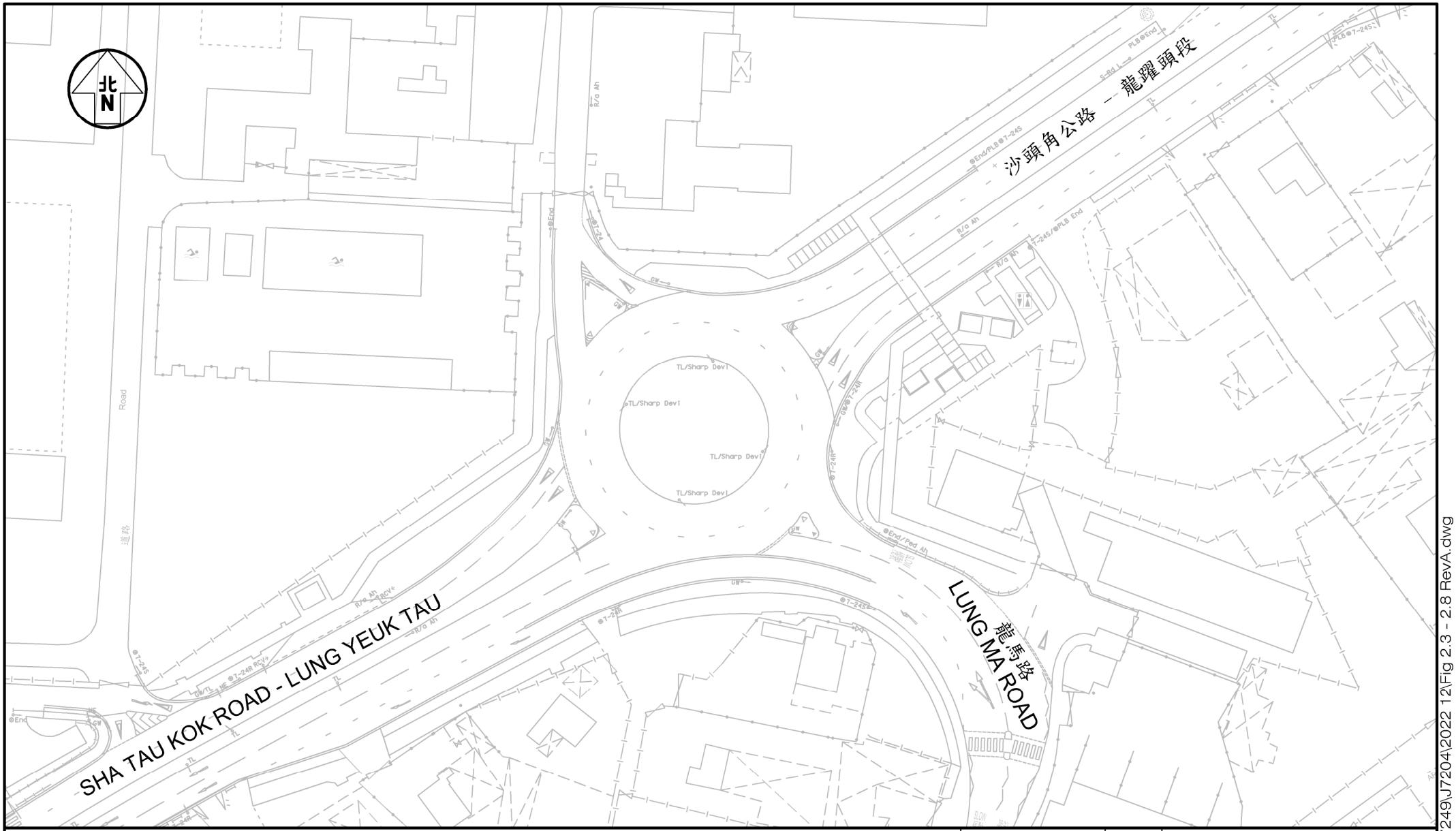

Project Title	PROPOSED DEVELOPMENT AT VARIOUS LOTS IN D.D.83 AND ADJOINING GOVERNMENT LAND MA LIU SHUI SAN TSUEN, FANLING, N.T. J7204	Figure No. 2.4	Revision A
Figure Title	EXISTING LAYOUT – JUNCTION OF SHA TAU KOK ROAD / LUNG MA ROAD (J02)	Designed by N C L / Drawn by S C Y / Checked by K C	
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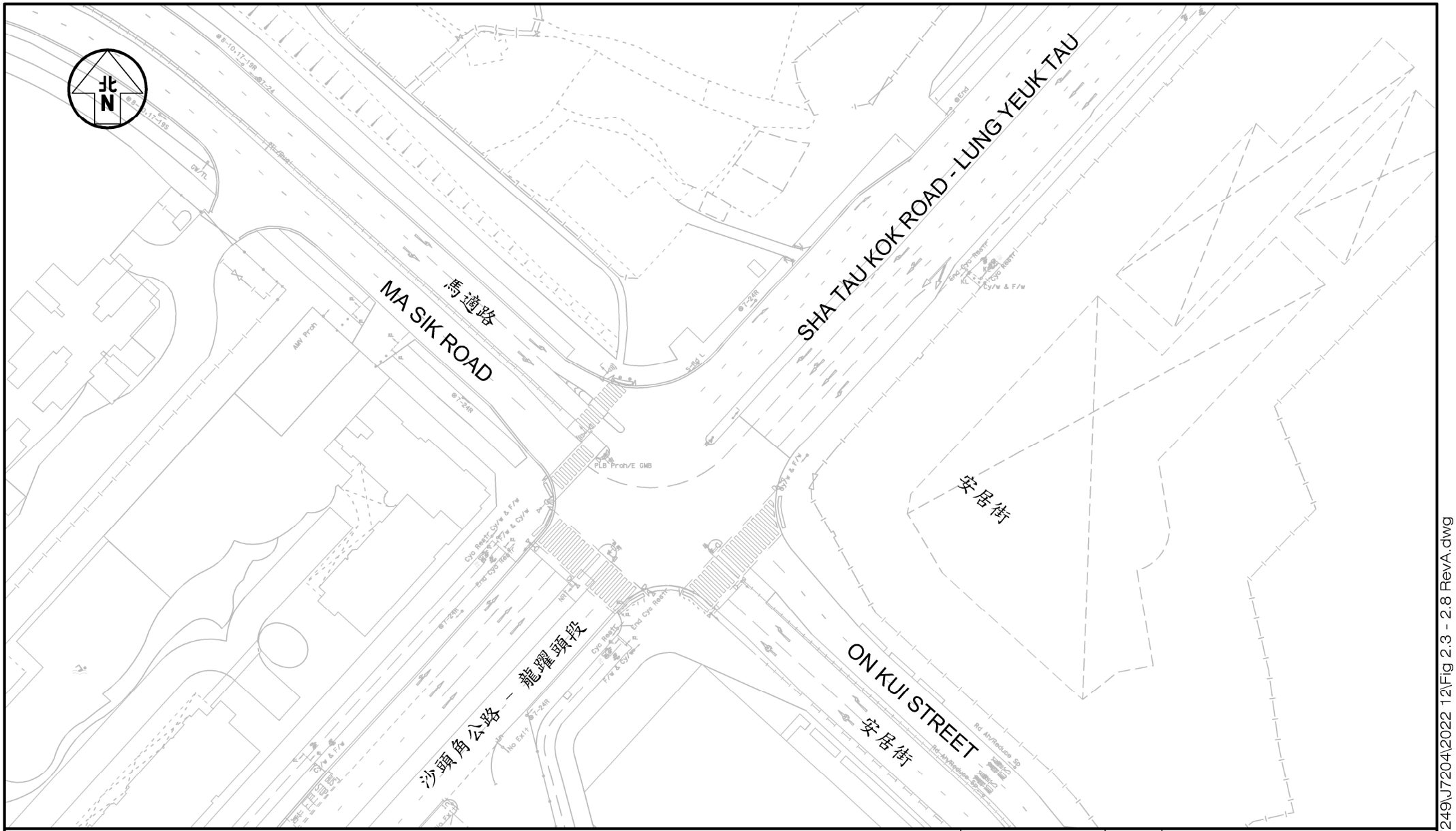

Project Title	PROPOSED DEVELOPMENT AT VARIOUS LOTS IN D.D.83 AND ADJOINING GOVERNMENT LAND MA LIU SHUI SAN TSUEN, FANLING, N.T. J7204	Figure No. 2.5	Revision A
Figure Title	EXISTING LAYOUT – JUNCTION OF SHA TAU KOK ROAD / MA SIK ROAD (J03)	Designed by N C L / Drawn by S C Y / Checked by K C	
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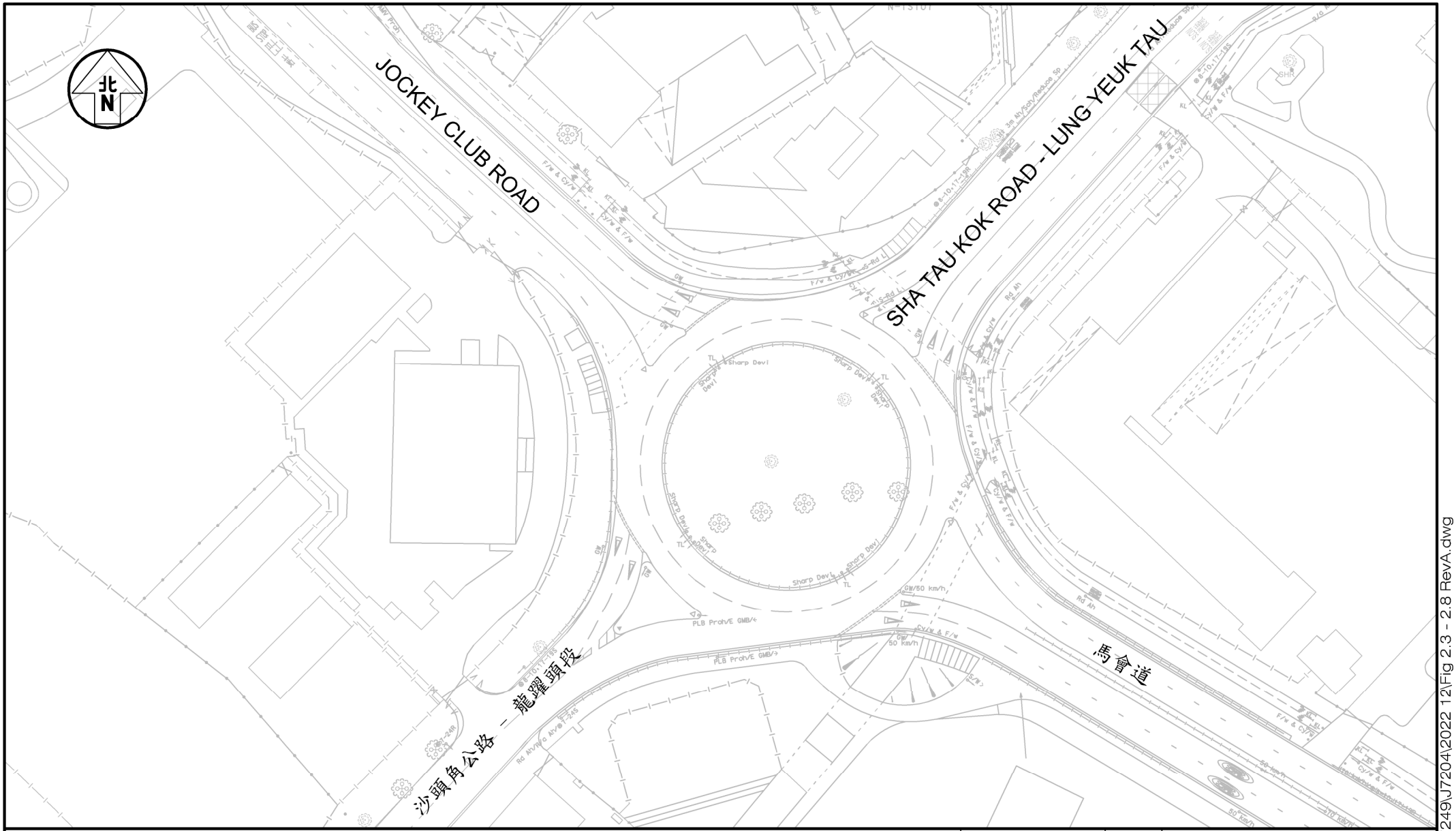

Project Title	PROPOSED DEVELOPMENT AT VARIOUS LOTS IN D.D.83 AND ADJOINING GOVERNMENT LAND MA LIU SHUI SAN TSUEN, FANLING, N.T.	J7204	Figure No. 2.6	Revision A
Figure Title	EXISTING LAYOUT – JUNCTION OF SHA TAU KOK ROAD / JOCKEY CLUB ROAD (J04)		Designed by N C L / Drawn by S C Y / Checked by K C	
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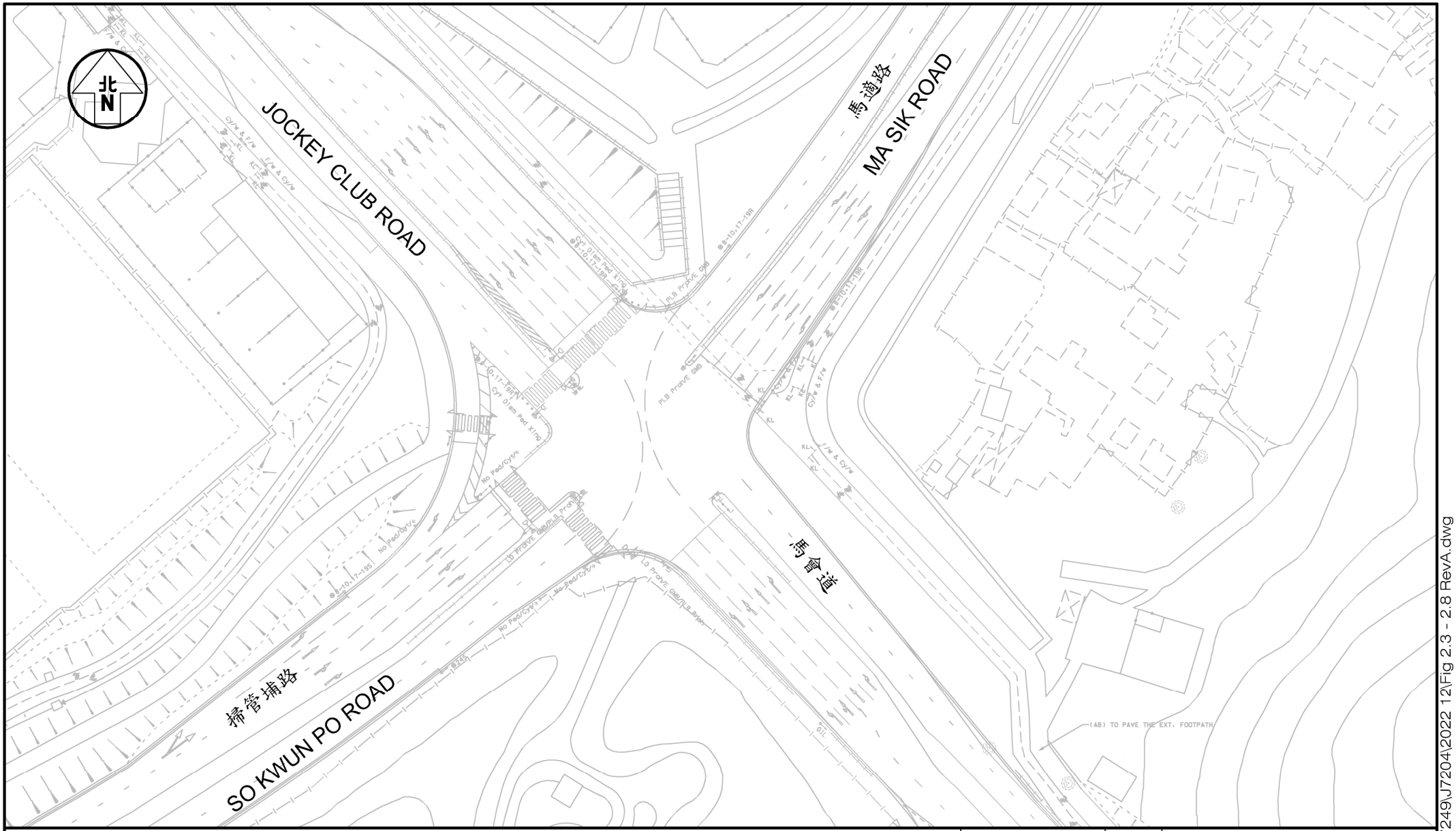

Project Title	PROPOSED DEVELOPMENT AT VARIOUS LOTS IN D.D.83 AND ADJOINING GOVERNMENT LAND MA LIU SHUI SAN TSUEN, FANLING, N.T. J7204	Figure No. 2.7	Revision A
Figure Title	EXISTING LAYOUT – JUNCTION OF SO KWUN PO ROAD / JOCKEY CLUB ROAD / MA SIK ROAD (J05)	Designed by N C L / Drawn by S C Y / Checked by K C	
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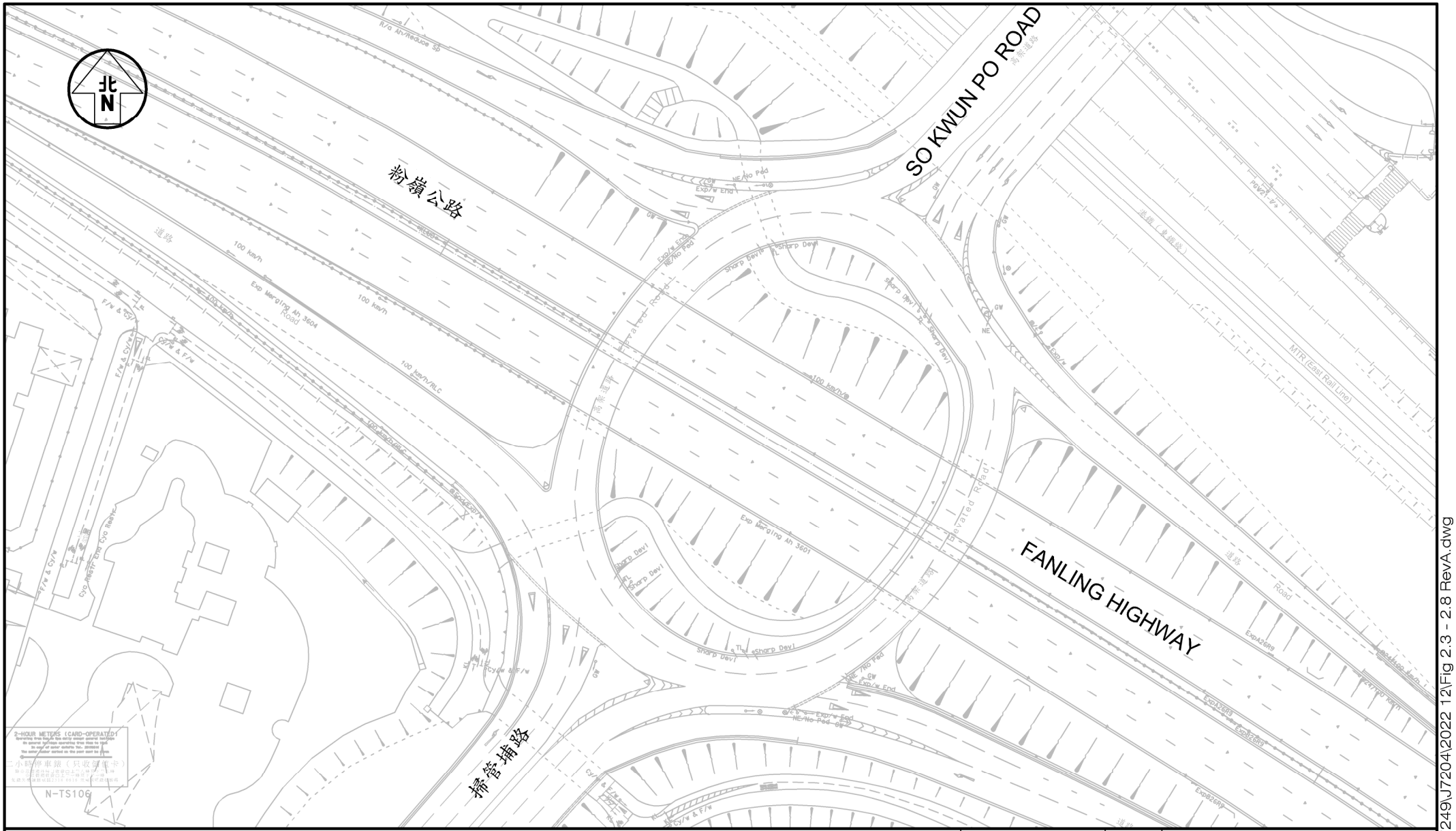

Project Title	PROPOSED DEVELOPMENT AT VARIOUS LOTS IN D.D.83 AND ADJOINING GOVERNMENT LAND MA LIU SHUI SAN TSUEN, FANLING, N.T.	J7204	Figure No. 2.8 / Revision A
Figure Title	EXISTING LAYOUT – ROUNDABOUT OF SO KWUN PO ROAD INTERCHANGE (J06)		Designed by N C L / Drawn by S C Y / Checked by K C
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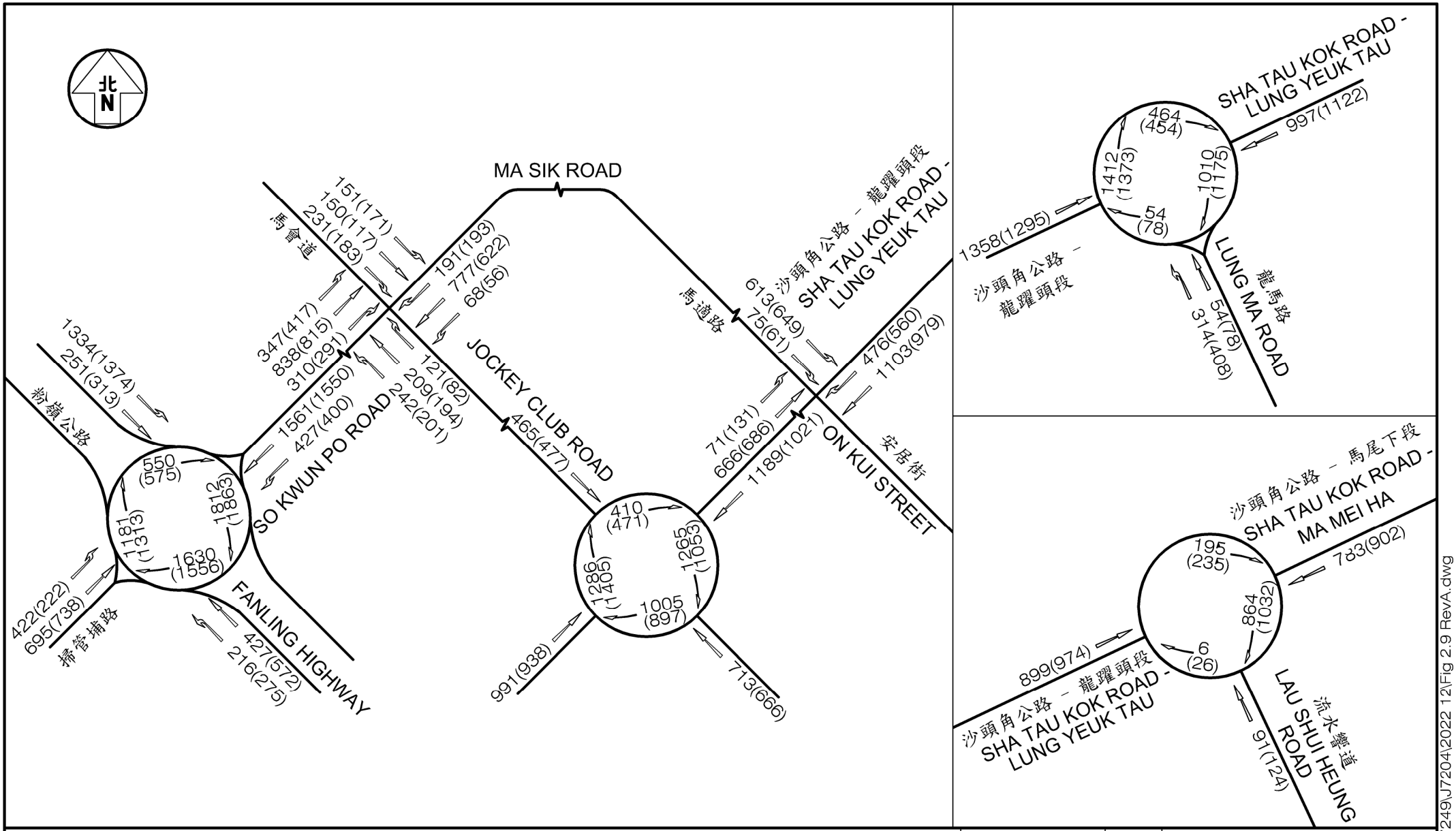

Project Title	PROPOSED DEVELOPMENT AT VARIOUS LOTS IN D.D.83 AND ADJOINING GOVERNMENT LAND MA LIU SHUI SAN TSUEN, FANLING, N.T.	J7204	Figure No. 2.9 / Revision A
Figure Title	EXISTING PEAK HOUR TRAFFIC FLOWS		Designed by H H Y / Drawn by S C Y / Checked by K C
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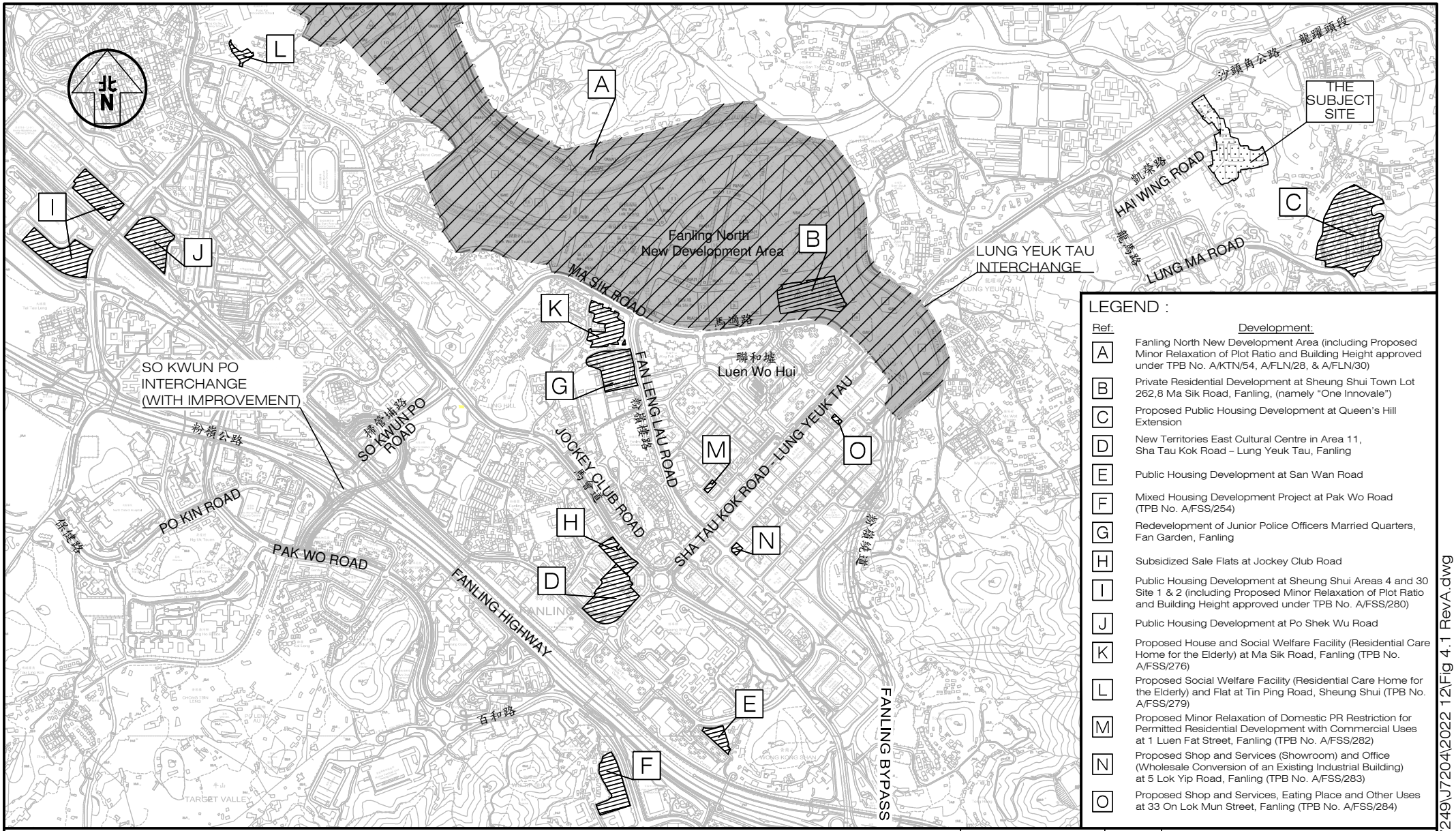

LEGEND :

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	Redevelopment of Junior Police Officers Married Quarters, Fan Garden, Fanling
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)

Project Title
PROPOSED DEVELOPMENT AT VARIOUS LOTS IN D.D.83
AND ADJOINING GOVERNMENT LAND MA LIU SHUI SAN TSUEN, FANLING, N.T.
J7204

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

Figure No.	Revision
4.1	A

Designed by	Drawn by	Checked by
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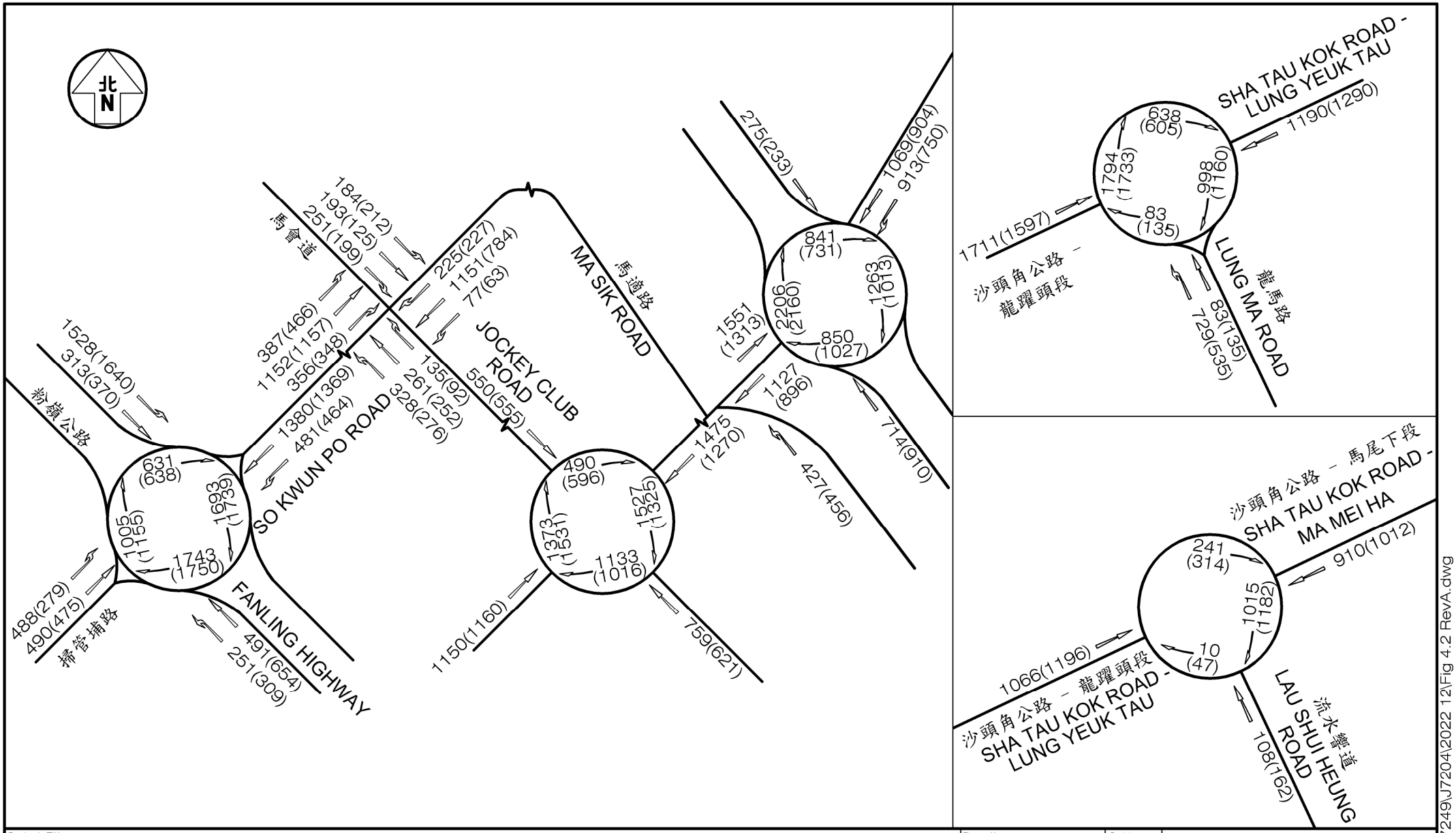

Project Title	PROPOSED DEVELOPMENT AT VARIOUS LOTS IN D.D.83 AND ADJOINING GOVERNMENT LAND MA LIU SHUI SAN TSUEN, FANLING, N.T.	J7204	Figure No. 4.2 / Revision A
Figure Title	2034 TRAFFIC FLOWS WITHOUT THE PROPOSED DEVELOPMENT		Designed by H H Y / Drawn by S C Y / Checked by K C
			Scale in A4 N.T.S. / Date 13 DEC 2022

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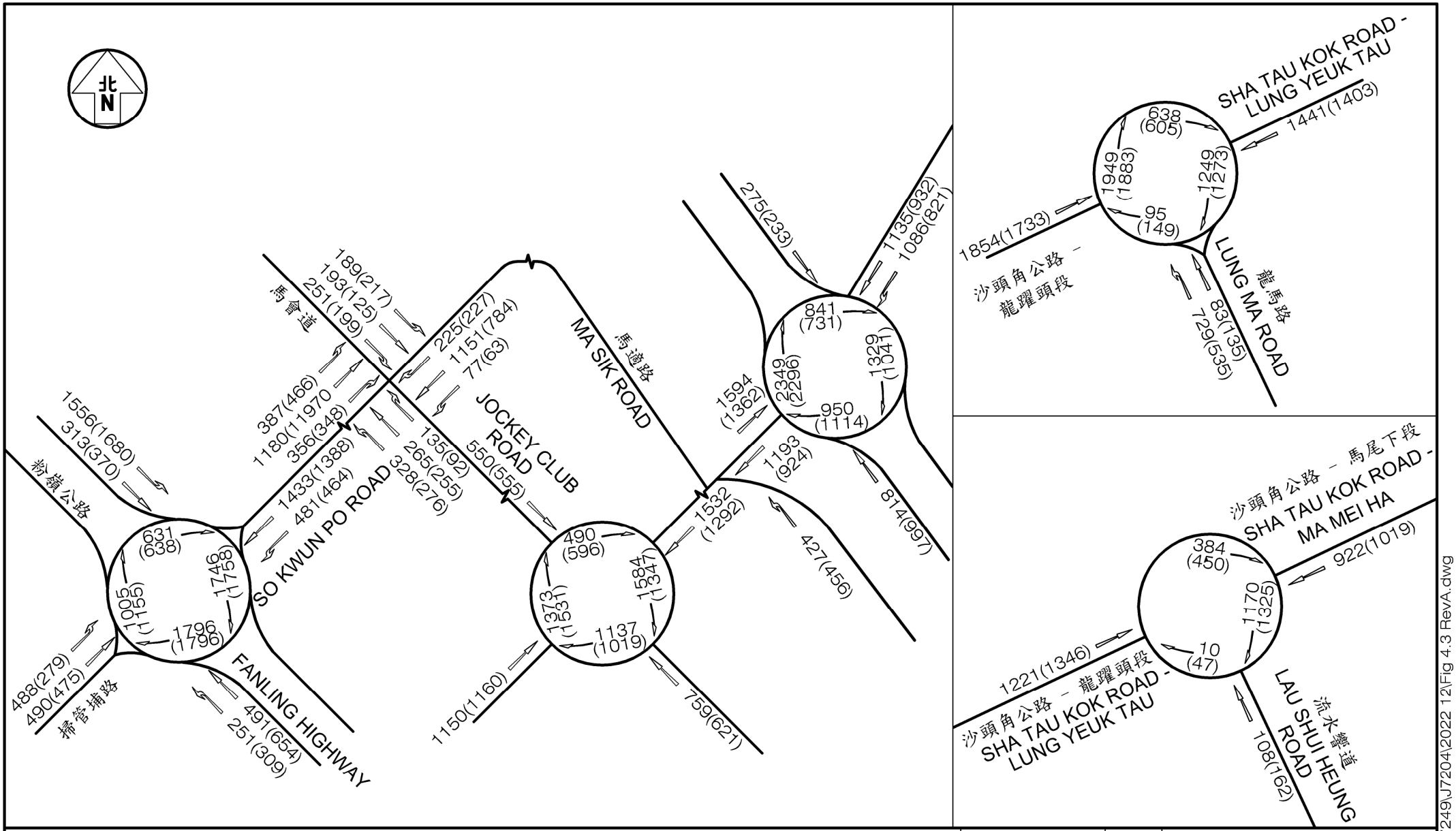

Project Title	PROPOSED DEVELOPMENT AT VARIOUS LOTS IN D.D.83 AND ADJOINING GOVERNMENT LAND MA LIU SHUI SAN TSUEN, FANLING, N.T.	J7204	Figure No. 4.3 / Revision A
Figure Title	2034 TRAFFIC FLOWS WITH THE PROPOSED DEVELOPMENT		Designed by H H Y / Drawn by S C Y / Checked by K C
			Scale in A4 N.T.S. / Date 13 DEC 2022

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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: 2022 — Designed By: NCL — Checked By: WCH — Date: 13 December 2022

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	11	771						783	195
From B	5		86						91	864
From C	703	103	92						899	6
From D										
From E										
From F										
From G										
From H										
Total	709	114	949						1772	

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	17	880						902	235
From B	20		104						124	1032
From C	738	89	146						974	26
From D										
From E										
From F										
From G										
From H										
Total	764	106	1130						2000	

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	7.5	7.0	55.0	1.0	55	15	0.8
From B	6.0	3.5	100.0	8.0	55	25	0.5
From C	7.5	7.0	80.0	1.0	55	15	0.8
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)

							Q_E		Entry Flow		RFC	
Arm	x_2	M	t_D	K	F	f_c	AM	PM	AM	PM	AM	PM
From A	7.192	0.607	1.311	1.083	2179	0.671	2218	2190	783	902	0.353	0.412
From B	4.750	0.607	1.311	1.056	1439	0.537	1030	935	91	124	0.088	0.132
From C	7.192	0.607	1.311	1.089	2179	0.671	2368	2354	899	974	0.379	0.414
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: 13 December 2022

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	889						910	241
From B	9		99						108	1015
From C	825	117	125						1066	10
From D										
From E										
From F										
From G										
From H										
Total	835	137	1113						2085	

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	996						1012	314
From B	40		122						162	1182
From C	882	136	179						1196	47
From D										
From E										
From F										
From G										
From H										
Total	929	145	1297						2371	

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	7.5	7.0	55.0	1.0	55	15	0.8
From B	6.0	3.5	100.0	8.0	55	25	0.5
From C	7.5	7.0	80.0	1.0	55	15	0.8
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)

							Q_E		Entry Flow		RFC	
Arm	x_3	M	t_D	K	F	f_c	AM	PM	AM	PM	AM	PM
From A	7.192	0.607	1.311	1.083	2179	0.671	2185	2132	910	1012	0.417	0.475
From B	4.750	0.607	1.311	1.056	1439	0.537	945	850	108	162	0.115	0.191
From C	7.192	0.607	1.311	1.089	2179	0.671	2365	2338	1066	1196	0.451	0.512
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: 13 December 2022

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	901						922	384
From B	9		99						108	1170
From C	837	117	268						1221	10
From D										
From E										
From F										
From G										
From H										
Total	847	137	1268						2252	

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	1003						1019	450
From B	40		122						162	1325
From C	896	136	315						1346	47
From D										
From E										
From F										
From G										
From H										
Total	943	145	1440						2528	

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	7.5	7.0	55.0	1.0	55	15	0.8
From B	6.0	3.5	100.0	8.0	55	25	0.5
From C	7.5	7.0	80.0	1.0	55	15	0.8
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)

							Q_E		Entry Flow		RFC	
Arm	x_6	M	t_D	K	F	f_c	AM	PM	AM	PM	AM	PM
From A	7.192	0.607	1.311	1.083	2179	0.671	2081	2033	922	1019	0.443	0.501
From B	4.750	0.607	1.311	1.056	1439	0.537	857	769	108	162	0.127	0.211
From C	7.192	0.607	1.311	1.089	2179	0.671	2365	2338	1221	1346	0.516	0.576
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: 2022 — Designed By: NCL — Checked By: WCH — Date: 13 December 2022

AM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q_c
From A		64	934						997	461
From B	54								54	1010
From C	897	385	76						1358	54
From D										1412
From E										
From F										
From G										
From H										
Total	952	449	1010						2410	

PM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q_c
From A		61	1061						1122	454
From B	78								78	1175
From C	841	340	114						1295	78
From D										1373
From E										
From F										
From G										
From H										
Total	919	401	1175						2495	

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	7.0	40.0	6.0	55	15	0.1
From B	4.0	3.5	70.0	15.0	55	10	0.1
From C	9.5	7.5	35.0	25.0	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)

							Q_E		Entry Flow		RFC	
Arm	x_2	M	t_D	K	F	f_c	AM	PM	AM	PM	AM	PM
From A	7.395	0.607	1.311	1.077	2241	0.683	2073	2078	997	1122	0.481	0.540
From B	3.952	0.607	1.311	1.104	1197	0.493	773	683	54	78	0.070	0.114
From C	9.092	0.607	1.311	1.090	2755	0.776	2958	2938	1358	1295	0.459	0.441
From D	5.258	0.607	1.311	1.069	1593	0.565	850	874	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:	13 December 2022

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	997						1190	638
From B	83								83	998
From C	1073	638							1711	83
From D										1794
From E										
From F										
From G										
From H										
Total	1156	830	997						2983	

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	1156						1290	605
From B	135								135	1160
From C	992	602	3						1597	135
From D										1733
From E										
From F										
From G										
From H										
Total	1127	736	1159						3022	

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	7.0	40.0	6.0	55	15	0.1
From B	4.0	3.5	70.0	15.0	55	10	0.1
From C	9.5	7.5	35.0	25.0	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)

							Q_E		Entry Flow		RFC	
Arm	x_3	M	t_D	K	F	f_c	AM	PM	AM	PM	AM	PM
From A	7.395	0.607	1.311	1.077	2241	0.683	1943	1967	1190	1290	0.612	0.656
From B	3.952	0.607	1.311	1.104	1197	0.493	779	691	83	135	0.106	0.195
From C	9.092	0.607	1.311	1.090	2755	0.776	2933	2889	1711	1597	0.583	0.553
From D	5.258	0.607	1.311	1.069	1593	0.565	620	657	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: 13 December 2022

AM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	qc
From A	13	192	1236						1441	638
From B	83								83	1249
From C	1216	638							1854	95
From D										1949
From E										
From F										
From G										
From H										
Total	1311	830	1236						3377	

PM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	qc
From A	15	134	1255						1403	605
From B	135								135	1273
From C	1128	602	3						1733	149
From D										1883
From E										
From F										
From G										
From H										
Total	1277	736	1258						3271	

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	7.0	40.0	6.0	55	15	0.1
From B	4.0	3.5	70.0	15.0	55	10	0.1
From C	9.5	7.5	35.0	25.0	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)

							Q_E		Entry Flow		RFC	
Arm	x_6	M	t_D	K	F	f_c	AM	PM	AM	PM	AM	PM
From A	7.395	0.607	1.311	1.077	2241	0.683	1943	1967	1441	1403	0.742	0.713
From B	3.952	0.607	1.311	1.104	1197	0.493	642	629	83	135	0.129	0.214
From C	9.092	0.607	1.311	1.090	2755	0.776	2923	2878	1854	1733	0.634	0.602
From D	5.258	0.607	1.311	1.069	1593	0.565	526	566	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

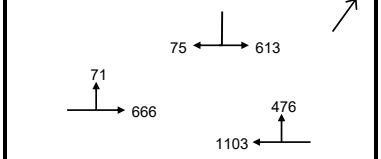
Scenario: Existing Condition — J3 - P. 1

Design Year: 2022 — Designed By: NCL — Checked By: WCH — Date: 13 December 2022

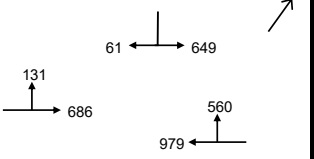
Approach		Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak Turning %	AM Peak Sat. Flow (pcu/hr)	AM Peak Flow (pcu/hr)	AM Peak y value	AM Peak Critical y	PM Peak Turning %	PM Peak Sat. Flow (pcu/hr)	PM Peak Flow (pcu/hr)	PM Peak y value	PM Peak Critical y
Sha Tau Kok Road - Lung Yeuk Tau SB	SA	A1	2	3.20				1935	532	0.275			1935	501	0.259	
	SA+RT	A2	2	3.20	26.00		0	2075	571	0.275		10	2063	534	0.259	
	RT	A3	2	3.20	23.00		100	1948	476	0.244		100	1948	504	0.259	
Ma Sik Road EB	LT	B1	2,3	3.50	15.0		100	1786	613	0.343	0.343	100	1786	649	0.363	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		31	1906	230	0.121	0.121	52	1868	251	0.134	0.134
	SA	C2	1	3.50				2105	254	0.121			2105	283	0.134	
	SA	C3	1	3.50				2105	254	0.121			2105	283	0.134	

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)

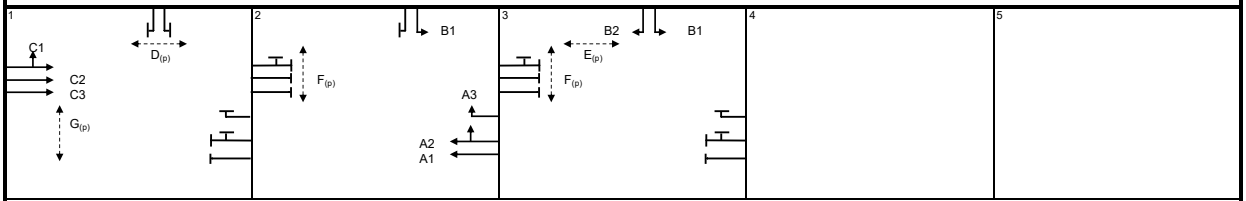


$S=1940+100(W-3.25)$ $S=2080+100(W-3.25)$

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

Note:

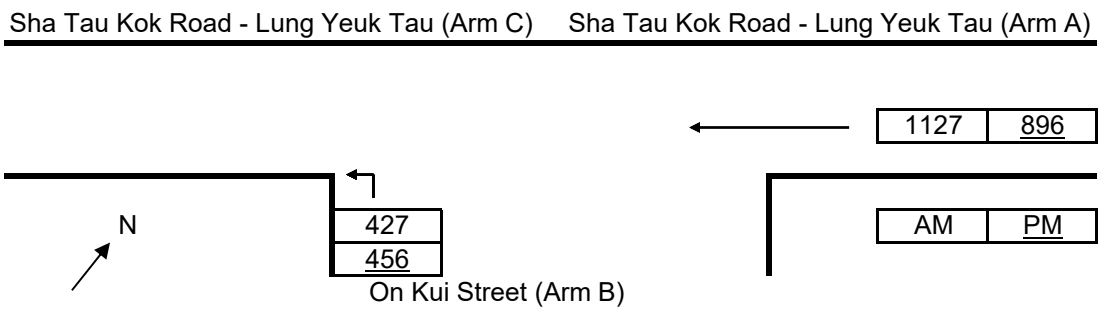
	AM Peak Hour		PM Peak Hour	
	1+2,3		1+2,3	
Sum y	0.464		0.498	
L (s)	13		13	
C (s)	136		136	
practical y	0.814		0.814	
R.C. (%)	75%		64%	



AM	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =
	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =
PM	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =
	G =	I/G =	G =	I/G =	G =	I/G =	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: 13 December 2022



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

Geometry :	Input		Input		Input		Calculated	
	W	7.40	V-rBA	0	w-BA	0.00	D	0.5332
	W-CR	0.00	V-lBA	0	w-BC	7.40	E	1.2369
			V-rBC	25	w-CB	0.00	F	0.5860
			V-rCB	0			Y	0.7447

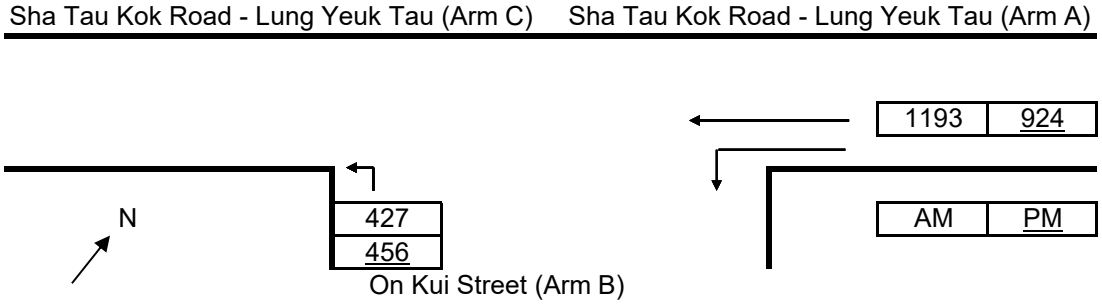
Analysis :

Traffic Flows, pcu/hr	AM	PM	Capacity, pcu/hr	AM	PM
q-CA	0	0	Q-BA	171	205
q-CB	0	0	Q-BC	544	621
q-AB	0	0	Q-CB	258	294
q-AC	1127	896	Q-BAC	544	621
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	0.786	0.734
C-B	0.000	0.000
B-AC	0.786	0.734

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:	13 December 2022



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

Geometry :	Input		Input		Input		Calculated	
	W	7.40	V-rBA	0	w-BA	0.00	D	0.5332
	W-CR	0.00	V-lBA	0	w-BC	7.40	E	1.2369
			V-rBC	25	w-CB	0.00	F	0.5860
			V-rCB	0			Y	0.7447

Analysis :

Traffic Flows, pcu/hr	AM	PM	Capacity, pcu/hr	AM	PM
q-CA	0	0	Q-BA	162	201
q-CB	0	0	Q-BC	521	612
q-AB	0	0	Q-CB	247	290
q-AC	1193	924	Q-BAC	521	612
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	0.819	0.745
C-B	0.000	0.000
B-AC	0.819	0.745

Roundabout Analysis

Junction: Jockey Club Road / Sha Tau Kok Road — Job Number: J7204

Scenario: Existing Condition — J4 - P. 1

Design Year: 2022 — Designed By: NCL — Checked By: WCH — Date: 13 December 2022

AM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q_c
From A	15	84	794	296					1189	410
From B	377	23	76	236					713	1265
From C	717	115	39	121					991	1005
From D	233	111	64	58					465	1286
From E										
From F										
From G										
From H										
Total	1342	333	973	710					3357	

PM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	q_c
From A		104	656	261					1021	471
From B	505	36	61	64					666	1053
From C	651	174	39	74					938	897
From D	255	125	67	31					477	1405
From E										
From F										
From G										
From H										
Total	1411	439	822	430					3102	

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)

							Q_E		Entry Flow		RFC	
Arm	x_2	M	t_D	K	F	f_c	AM	PM	AM	PM	AM	PM
From A	7.857	1.649	1.189	1.090	2381	0.642	2309	2266	1189	1021	0.515	0.450
From B	7.192	1.649	1.189	1.079	2179	0.609	1521	1660	713	666	0.469	0.401
From C	8.829	1.649	1.189	0.990	2675	0.690	1961	2035	991	938	0.505	0.461
From D	8.278	1.649	1.189	1.067	2508	0.663	1767	1683	465	477	0.263	0.284
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: 13 December 2022

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	490
From B	313	34	90	323					759	1527
From C	822	136	49	144					1150	1133
From D	278	121	74	77					550	1373
From E										
From F										
From G										
From H										
Total	1433	438	1153	910					3934	

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	596
From B	368	55	75	123					621	1325
From C	806	209	58	87					1160	1016
From D	282	136	85	52					555	1531
From E										
From F										
From G										
From H										
Total	1490	541	930	646					3607	

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)

							Q_E		Entry Flow		RFC	
Arm	x_3	M	t_D	K	F	f_c	AM	PM	AM	PM	AM	PM
From A	7.857	1.649	1.189	1.090	2381	0.642	2253	2178	1475	1270	0.655	0.583
From B	7.192	1.649	1.189	1.079	2179	0.609	1349	1481	759	621	0.563	0.420
From C	8.829	1.649	1.189	0.990	2675	0.690	1873	1953	1150	1160	0.614	0.594
From D	8.278	1.649	1.189	1.067	2508	0.663	1705	1594	550	555	0.322	0.348
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:	13 December 2022

AM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	qc
From A	21	148	993	370					1532	490
From B	313	34	90	323					759	1584
From C	822	136	49	144					1150	1137
From D	278	121	74	77					550	1373
From E										
From F										
From G										
From H										
Total	1433	438	1206	914					3991	

PM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	qc
From A	34	141	731	386					1292	596
From B	368	55	75	123					621	1347
From C	806	209	58	87					1160	1019
From D	282	136	85	52					555	1531
From E										
From F										
From G										
From H										
Total	1490	541	949	649					3629	

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)

							Q_E		Entry Flow		RFC	
Arm	x_6	M	t_D	K	F	f_c	AM	PM	AM	PM	AM	PM
From A	7.857	1.649	1.189	1.090	2381	0.642	2253	2178	1532	1292	0.680	0.593
From B	7.192	1.649	1.189	1.079	2179	0.609	1311	1467	759	621	0.579	0.424
From C	8.829	1.649	1.189	0.990	2675	0.690	1871	1951	1150	1160	0.615	0.594
From D	8.278	1.649	1.189	1.067	2508	0.663	1705	1594	550	555	0.322	0.348
From E												
From F												
From G												
From H												

Signal Junction Analysis

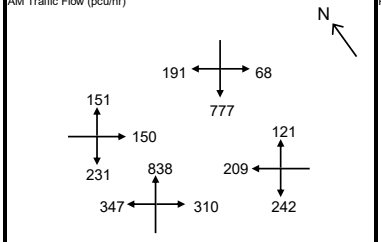
Junction: Jockey Club Road / Ma Sik Road / So Kwun Po Road — Job Number: J7204

Scenario: Existing Condition — J5 - P. 1

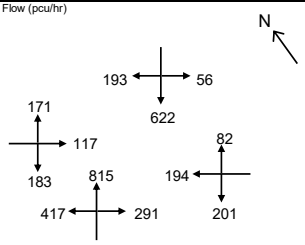
Design Year: 2022 — Designed By: NCL — Checked By: WCH — Date: 13 December 2022

Approach		Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak Turning %	AM Peak Sat. Flow (pcu/hr)	AM Peak Flow (pcu/hr)	AM Peak y value	AM Peak Critical y	PM Peak Turning %	PM Peak Sat. Flow (pcu/hr)	PM Peak Flow (pcu/hr)	PM Peak y value	PM Peak Critical y
Jockey Club Road EB	LT	A1	3	3.30	12.5		100	1737	90	0.052		100	1737	87	0.050	
Jockey Club Road EB	LT+SA	A2	3	3.30	15.0		59	1969	103	0.052		87	1919	97	0.051	0.051
Jockey Club Road EB	SA	A3	3	3.30				2085	108	0.052			2085	104	0.050	
Jockey Club Road EB	RT	A4	3	3.30	27.5		100	1977	116	0.059	0.059	100	1977	92	0.046	
Jockey Club Road EB	RT	A5	3	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	2	3.30	25.0		100	1835	139	0.076		100	1835	122	0.067	0.067
Jockey Club Road WB	LT+SA	C2	2	3.30	27.5		67	2012	154	0.077	0.077	59	2020	134	0.066	
Jockey Club Road WB	SA	C3	2	3.30				2085	158	0.076			2085	139	0.067	
Jockey Club Road WB	RT	C4	2	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	2.0		100	1203	191	0.158		100	1203	193	0.160	0.160
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)

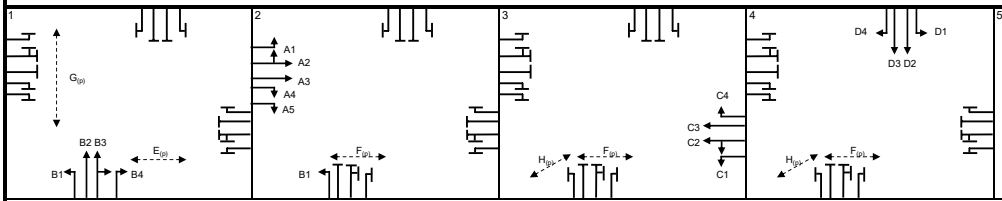


$S=1940+100(W-3.25)$ $S=2080+100(W-3.25)$

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

	AM Peak Hour		PM Peak Hour	
	1+2+3+4		1+2+3+4	
Sum y	0.518		0.473	
L (s)	27		27	
C (s)	116		116	
practical y	0.691		0.691	
R.C. (%)	33%		46%	

Note:



AM	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =
	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =
PM	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =
	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =

Signal Junction Analysis

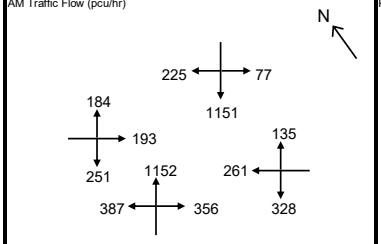
Junction: Jockey Club Road / Ma Sik Road / So Kwun Po Road — Job Number: J7204

Scenario: Without Proposed Development — J5 - P. 2

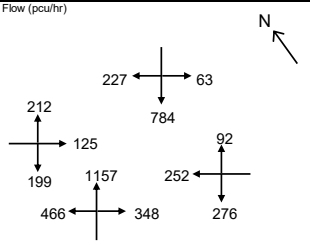
Design Year: 2034 — Designed By: NCL — Checked By: WCH — Date: 13 December 2022

Approach		Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak Turning %	AM Peak Sat. Flow (pcu/hr)	AM Peak Flow (pcu/hr)	AM Peak y value	AM Peak Critical y	PM Peak Turning %	PM Peak Sat. Flow (pcu/hr)	PM Peak Flow (pcu/hr)	PM Peak y value	PM Peak Critical y
Jockey Club Road EB	LT	A1	3	3.30	12.5		100	1737	113	0.065	0.065	100	1737	102	0.059	0.059
Jockey Club Road EB	LT+SA	A2	3	3.30	15.0		55	1976	129	0.065		98	1899	112	0.059	
Jockey Club Road EB	SA	A3	3	3.30				2085	135	0.065			2085	123	0.059	
Jockey Club Road EB	RT	A4	3	3.30	27.5		100	1977	126	0.064		100	1977	100	0.050	
Jockey Club Road EB	RT	A5	3	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	1	3.30				2085	382	0.183	0.183		2085	386	0.185	0.185
So Kwun Po Road NB	SA	B3	1	3.30				2085	382	0.183			2085	386	0.185	
So Kwun Po Road NB	SA+RT	B4	1	3.30	27.5		0	2085	382	0.183		0	2085	386	0.185	
So Kwun Po Road NB	RT	B5	1	3.30	25.0		100	1967	356	0.181		100	1967	348	0.177	
Jockey Club Road WB	LT	C1	2	3.30	25.0		100	1835	182	0.099		100	1835	163	0.089	0.089
Jockey Club Road WB	LT+SA	C2	2	3.30	27.5		73	2005	200	0.100	0.100	63	2016	179	0.089	
Jockey Club Road WB	SA	C3	2	3.30				2085	207	0.099			2085	186	0.089	
Jockey Club Road WB	RT	C4	2	3.60	25.0		100	1995	135	0.068		100	1995	92	0.046	
Ma Sik Road SB	LT	D1	4	3.70	12.5		100	1772	77	0.044		100	1772	63	0.035	
Ma Sik Road SB	LT+SA	D2	4	3.80	15.0		0	2135	518	0.242	0.242		2135	396	0.185	0.185
Ma Sik Road SB	SA	D3	4	3.80				2135	518	0.242			2135	396	0.185	
Ma Sik Road SB	SA+RT	D4	4	3.50	2.0		66	1407	341	0.242		103	1186	220	0.185	
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)

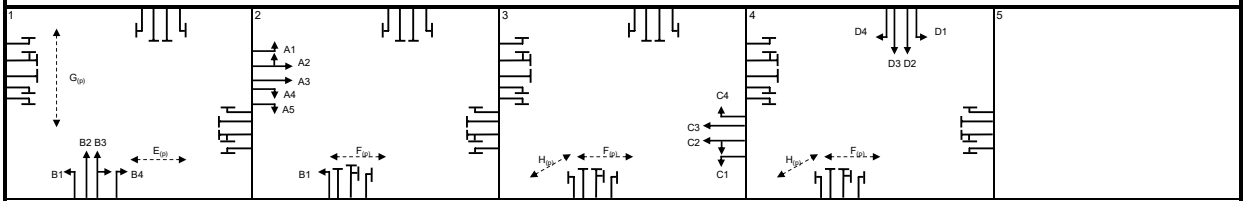


$S=1940+100(W-3.25)$ $S=2080+100(W-3.25)$

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

Note:

	AM Peak Hour		PM Peak Hour	
	1+2+3+4		1+2+3+4	
Sum y	0.590		0.518	
L (s)	27		27	
C (s)	116		116	
practical y	0.691		0.691	
R.C. (%)	17%		33%	



AM	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =
	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =
PM	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =
	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =

Signal Junction Analysis

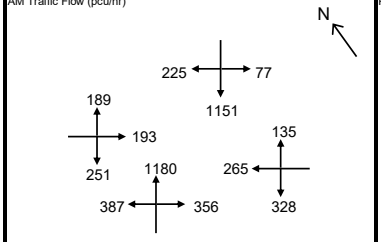
Junction: Jockey Club Road / Ma Sik Road / So Kwun Po Road — Job Number: J7204

Scenario: With Proposed Development — J5 - P. 3

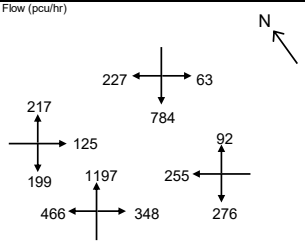
Design Year: 2034 — Designed By: NCL — Checked By: WCH — Date: 13 December 2022

Approach		Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak Turning %	AM Peak Sat. Flow (pcu/hr)	AM Peak Flow (pcu/hr)	AM Peak y value	AM Peak Critical y	PM Peak Turning %	PM Peak Sat. Flow (pcu/hr)	PM Peak Flow (pcu/hr)	PM Peak y value	PM Peak Critical y
Jockey Club Road EB	LT	A1	3	3.30	12.5		100	1737	114	0.066		100	1737	104	0.060	
Jockey Club Road EB	LT+SA	A2	3	3.30	15.0		57	1973	131	0.066		100	1895	114	0.060	
Jockey Club Road EB	SA	A3	3	3.30				2085	137	0.066			2085	125	0.060	
Jockey Club Road EB	RT	A4	3	3.30	27.5		100	1977	126	0.064		100	1977	100	0.050	
Jockey Club Road EB	RT	A5	3	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	1	3.30				2085	389	0.187			2085	399	0.191	
So Kwun Po Road NB	SA	B3	1	3.30				2085	389	0.187			2085	399	0.191	
So Kwun Po Road NB	SA+RT	B4	1	3.30	27.5		0	2085	389	0.187		0	2085	399	0.191	
So Kwun Po Road NB	RT	B5	1	3.30	25.0			1967	356	0.181			1967	348	0.177	
Jockey Club Road WB	LT	C1	2	3.30	25.0		100	1835	184	0.100		100	1835	164	0.089	
Jockey Club Road WB	LT+SA	C2	2	3.30	27.5			2006	200	0.100			2016	180	0.089	
Jockey Club Road WB	SA	C3	2	3.30			0	2085	209	0.100		0	2085	187	0.089	
Jockey Club Road WB	RT	C4	2	3.60	25.0			1995	135	0.068			1995	92	0.046	
							0					0				
Ma Sik Road SB	LT	D1	4	3.70	12.5			1772	77	0.044			1772	63	0.035	
Ma Sik Road SB	LT+SA	D2	4	3.80	15.0			2135	518	0.242			2135	396	0.185	
Ma Sik Road SB	SA	D3	4	3.80			0	2135	518	0.242		0	2135	396	0.185	
Ma Sik Road SB	SA+RT	D4	4	3.50	2.0			1408	341	0.242			1186	220	0.185	
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)

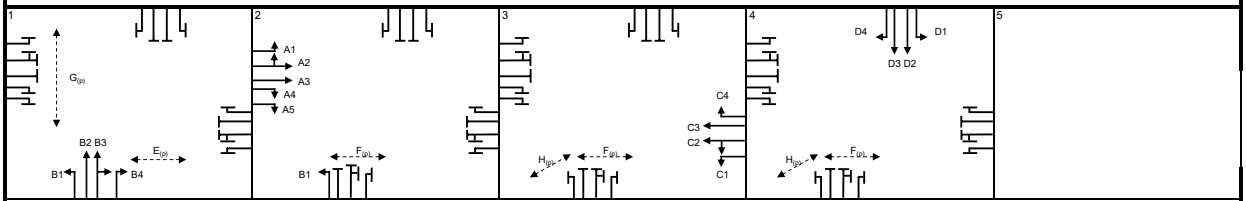


$S=1940+100(W-3.25)$ $S=2080+100(W-3.25)$

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

Note:

	AM Peak Hour		PM Peak Hour	
	1+2+3+4		1+2+3+4	
Sum y	0.596		0.526	
L (s)	27		27	
C (s)	116		116	
practical y	0.691		0.691	
R.C. (%)	16%		31%	



AM	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =
	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =
PM	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =
	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =

Roundabout Analysis

Junction: So Kwun Po Road / Fanling Highway Interchange — Job Number: J7204
Scenario: Existing Condition — J6 - P. 1
Design Year: 2022 — Designed By: NCL — Checked By: WCH — Date: 13 December 2022

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	12.0	65	55	0.5
From B	7.0	3.5	90.0	34.0	65	25	0.2
From C	9.0	6.9	30.0	17.0	65	35	0.2
From D	7.5	3.5	55.0	19.0	65	30	0.3
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)

							Q_E		Entry Flow		RFC	
Arm	x_2	M	t_D	K	F	f_c	AM	PM	AM	PM	AM	PM
From A	7.810	1.649	1.189	0.913	2367	0.640	1840	1826	1561	1550	0.848	0.849
From B	6.133	1.649	1.189	1.055	1858	0.556	898	868	427	572	0.476	0.659
From C	8.405	1.649	1.189	0.999	2547	0.669	1454	1504	695	738	0.478	0.491
From D	5.890	1.649	1.189	1.031	1785	0.544	1178	1104	251	313	0.213	0.284
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: 13 December 2022

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	1228					1380	631
From B	491								491	1693
From C	172	318							490	1743
From D			313						313	1005
From E										
From F										
From G										
From H										
Total	687	318	441	1228					2674	

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	1070					1369	638
From B	654								654	1739
From C	207	268							475	1750
From D			370						370	1155
From E										
From F										
From G										
From H										
Total	887	268	643	1070					2868	

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	12.0	65	55	0.5
From B	7.0	3.5	90.0	34.0	65	25	0.2
From C	9.0	6.9	30.0	17.0	65	35	0.2
From D	7.5	3.5	55.0	19.0	65	30	0.3
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)

							Q_E		Entry Flow		RFC	
Arm	x_3	M	t_D	K	F	f_c	AM	PM	AM	PM	AM	PM
From A	7.810	1.649	1.189	0.913	2367	0.640	1793	1789	1380	1369	0.770	0.766
From B	6.133	1.649	1.189	1.055	1858	0.556	968	941	491	654	0.507	0.695
From C	8.405	1.649	1.189	0.999	2547	0.669	1379	1374	490	475	0.355	0.346
From D	5.890	1.649	1.189	1.031	1785	0.544	1277	1193	313	370	0.245	0.310
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: 13 December 2022

AM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	qc
From A	24		128	1281					1433	631
From B	491								491	1746
From C	172	318							490	1796
From D			313						313	1005
From E										
From F										
From G										
From H										
Total	687	318	441	1281					2727	

PM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	qc
From A	27		273	1089					1388	638
From B	654								654	1758
From C	207	268							475	1769
From D			370						370	1155
From E										
From F										
From G										
From H										
Total	887	268	643	1089					2887	

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	12.0	65	55	0.5
From B	7.0	3.5	90.0	34.0	65	25	0.2
From C	9.0	6.9	30.0	17.0	65	35	0.2
From D	7.5	3.5	55.0	19.0	65	30	0.3
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)

							Q_E		Entry Flow		RFC	
Arm	x_6	M	t_D	K	F	f_c	AM	PM	AM	PM	AM	PM
From A	7.810	1.649	1.189	0.913	2367	0.640	1793	1789	1433	1388	0.799	0.776
From B	6.133	1.649	1.189	1.055	1858	0.556	937	930	491	654	0.524	0.703
From C	8.405	1.649	1.189	0.999	2547	0.669	1343	1361	490	475	0.365	0.349
From D	5.890	1.649	1.189	1.031	1785	0.544	1277	1193	313	370	0.245	0.310
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: 13 December 2022

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	132					1069	841
From B	659			55					714	1263
From C	807	647	93	4					1551	850
From D	174		97	4					275	2206
From E										
From F										
From G										
From H										
Total	1640	647	1127	194					3609	

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	114					904	731
From B	850			60					910	1013
From C	622	622	68	2					1313	1027
From D	191		38	3					233	2160
From E										
From F										
From G										
From H										
Total	1663	622	896	180					3360	

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	18.0	75	40	0.2
From B	6.0	5.5	45.0	34.0	75	25	0.0
From C	9.5	9.0	35.0	10.0	75	30	0.1
From D	8.5	4.5	40.0	19.0	75	45	0.3
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)

							Q_E		Entry Flow		RFC	
Arm	x_3	M	t_D	K	F	f_c	AM	PM	AM	PM	AM	PM
From A	8.475	4.482	1.091	0.975	2568	0.618	1998	2064	1069	904	0.535	0.438
From B	5.978	4.482	1.091	1.045	1811	0.503	1228	1360	714	910	0.581	0.669
From C	9.431	4.482	1.091	1.021	2858	0.661	2344	2224	1551	1313	0.662	0.590
From D	6.890	4.482	1.091	0.972	2088	0.545	861	885	275	233	0.319	0.263
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: 13 December 2022

AM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	qc
From A			1003	132					1135	841
From B	759			55					814	1329
From C	850	647	93	4					1594	950
From D	174		97	4					275	2349
From E										
From F										
From G										
From H										
Total	1783	647	1193	194					3818	

PM Peak

Arm	To A	To B	To C	To D	To E	To F	To G	To H	Total	qc
From A			817	114					932	731
From B	937			60					997	1041
From C	671	622	68	2					1362	1114
From D	191		38	3					233	2296
From E										
From F										
From G										
From H										
Total	1799	622	924	180					3524	

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	18.0	75	40	0.2
From B	6.0	5.5	45.0	34.0	75	25	0.0
From C	9.5	9.0	35.0	10.0	75	30	0.1
From D	8.5	4.5	40.0	19.0	75	45	0.3
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)

							Q_E		Entry Flow		RFC	
Arm	x_6	M	t_D	K	F	f_c	AM	PM	AM	PM	AM	PM
From A	8.475	4.482	1.091	0.975	2568	0.618	1998	2064	1135	932	0.568	0.451
From B	5.978	4.482	1.091	1.045	1811	0.503	1194	1345	814	997	0.682	0.741
From C	9.431	4.482	1.091	1.021	2858	0.661	2276	2165	1594	1362	0.700	0.629
From D	6.890	4.482	1.091	0.972	2088	0.545	785	813	275	233	0.350	0.287
From E												
From F												
From G												
From H												