
Appendix H

Revised Traffic Impact Assessment

**SECTION 16 PLANNING APPLICATION FOR PROPOSED
RESIDENTIAL DEVELOPMENT WITH MINOR RELAXATION OF
PLOT RATIO RESTRICTION AT LOTS 1027, 1029, 1030, 1034A,
1034B, 1039 (PART), 1040, 1042 RP, 1043 RP, 1044 RP
(PART), 1045, 1047, 2233 (PART), 2251 S.A RP, 2256 RP, 2315
(PART) AND 2316 RP (PART) IN D.D. 92 AND ADJOINING
GOVERNMENT LAND (NEW LOT TO BE KNOWN AS LOT 2644
IN D.D. 92), KWU TUNG SOUTH, SHEUNG SHUI, NEW
TERRITORIES**



TRAFFIC IMPACT ASSESSMENT

TABLE OF CONTENTS		PAGE
1	INTRODUCTION	1
1.1	BACKGROUND	1
1.2	STUDY OBJECTIVES	1
1.3	STRUCTURE OF THE REPORT	2
2	EXISTING TRAFFIC CONDITIONS	3
2.1	EXISTING ROAD NETWORK	3
2.2	CRITICAL JUNCTIONS AND ROAD LINKS	3
2.3	PUBLIC TRANSPORT SERVICES	4
3	THE PROPOSED DEVELOPMENT	6
3.1	SITE LOCATION	6
3.2	PROPOSED DEVELOPMENT	6
3.3	VEHICULAR AND PEDESTRIAN ACCESS	6
3.4	PROVISIONS OF PARKING AND SERVICING FACILITIES	7
3.5	PROPOSED ROAD IMPROVEMENT WORKS	8
4	FUTURE TRAFFIC CONDITIONS	9
4.1	DESIGN YEAR	9
4.2	COMMITTED ROAD IMPROVEMENT WORKS	9
4.3	REFERENCE TRAFFIC FORECASTS	10
4.4	DESIGN TRAFFIC FORECASTS	13
4.5	TRAFFIC FORECASTS FOR ENVIRONMENTAL ASSESSMENT (EA)	15
5	TRAFFIC IMPACT ASSESSMENT	16
5.1	JUNCTION AND ROAD LINK ASSESSMENT	16
5.2	PUBLIC TRANSPORT ASSESSMENT	17
6	SUMMARY AND CONCLUSION	21
6.1	SUMMARY	21
6.2	CONCLUSION	22

LIST OF TABLES	PAGE	
Table 2.1	Identified Critical Junctions for Assessment	3
Table 2.2	Operational Performance of Critical Junctions in 2024	4
Table 2.3	Operational Performance of Critical Road Links in 2024	4
Table 2.4	Existing Conditions of Bus Stops in Vicinity of Application Site	5
Table 2.5	Existing Public Transport Services	5
Table 3.1	Design Parameters for Proposed Development	6
Table 3.2	Parking Requirements by HKPSG for Private Housing Developments (AUG 2021 Edition)	7
Table 3.3	Provision of Parking and Servicing Facilities by the Application Site	8
Table 4.1	ATC Counting Station Records in the Local Area	10
Table 4.2	Population and Employment Base Data in 2019-based TPEDM	10
Table 4.3	Major Committed Developments in Kwu Tung	11
Table 4.4	Traffic Generations of Committed Development in Kwu Tung (Reference 2035)	12
Table 4.5	Trip Rates Adopted in Traffic Forecast	13
Table 4.6	Traffic Generations of Proposed Development (Design 2035)	14
Table 5.1	Layout and Arrangement of Critical Junctions in 2035	16
Table 5.2	Operational Performance of Critical Junctions in 2035	16
Table 5.3	Operational Performance of Critical Road Links in 2035	17
Table 5.4	Derivation of Public Transport Demand in Year 2035	18
Table 5.5	Proposed Enhancement to Public Transport Services in Year 2035	20

ANNEXES

Annex A	Traffic Flows
Annex B	Calculation Details
Annex C	Traffic Generation / Attraction Rates from TPDM
Annex D	Technical Note on Traffic Forecast for EA
Annex E	Swept Path Analysis

LIST OF DRAWINGS

Drawing 1.1 Site Location

Drawing 2.1 Existing Road Network

Drawing 2.2 Existing Junction Layout of Hang Tau Road / Kam Hang Road (J1) and Kam Hang Road / Kwu Tung Road (J2)

Drawing 2.3 Current Provision of Public Transport Services

Drawing 3.1 Master Layout Plan

Drawing 3.2 **Proposed Road Improvement Works at Hang Tau Road**

Drawing 3.3 **Proposed Extent for Road Improvement Works at Hang Tau Road**

Drawing 4.1 Proposed Road Improvement Works by Others at Kam Hang Road (A/NE-KTS/506)

Drawing 4.2 Proposed Road Improvement Works by Others at Kam Hang Road (Y/NE-KTS/14)

Drawing 4.2 Proposed Road Improvement Works by Others at Hang Tau Road (Y/NE-KTS/13)

Drawing 4.4 Planned / Committed Developments in NENT

Drawing 5.1 Future Road Improvement Works in Kwu Tung South

Drawing 5.2 Proposed Enhancement to Public Transport Services in Kwu Tung South

1 INTRODUCTION

1.1 Background

1.1.1 The Application Site is located at various lots (New Lot to be known as Lot 2644) in D.D. 92 abutting Hang Tau Road in Kwu Tung South, which is currently zoned as “Comprehensive Development Area (3)” (“CDA(3)”) in the Approved Kwu Tung South Outline Zoning Plan (OZP No. S/NE-KTS/22). The site location is shown in **Drawing 1.1**.

1.1.2 According to the S12A planning application (No. Y/NE-KTS/15) partially agreed by the Town Planning Board in October 2022, the Application Site was approved for the residential development of 909 units with a maximum plot ratio of 2.0.

1.1.3 In support of the Section 16 Planning Application for the Proposed Development in the “CDA(3)” zone, a traffic impact assessment (TIA) is prepared to examine the impact of the traffic generated by the proposed residential development on the existing and planned road networks in the near vicinity.

1.2 Study Objectives

1.2.1 The main objectives of the study are as follows:

- To assess the existing traffic conditions in the vicinity of the Proposed Development;
- To present the Master Layout Plan (MLP) and the planning parameters of the Proposed Development;
- To derive the provision requirements of parking and loading/unloading for the Proposed Developments based on Hong Kong Planning Standards and Guidelines (HKPSG);
- To review the proposed access arrangement and road traffic improvements at Hang Tau Road;
- To estimate the traffic generated by the Proposed Development and future traffic forecast on the adjacent road network in the design year 2035; and
- To assess the impacts of traffic generated by the Proposed Development on the adjacent road network and recommend any improvement measures if necessary.

1.3 Structure of the Report

1.3.1 Following this introductory chapter, there are five further chapters.

- **Chapter 2 – Existing Traffic Conditions**, which describes the existing transport context in the vicinity of the Proposed Development, including current road network, summary of traffic count survey and assessment of existing traffic conditions.
- **Chapter 3 – The Proposed Development**, which briefs the planning parameters of the Proposed Development, including the access arrangements, internal transport provision and public transport facilities.
- **Chapter 4 – Future Traffic Conditions**, which presents the traffic forecasting methodology and estimates the future traffic conditions with the major committed developments in the vicinity.
- **Chapter 5 – Traffic Impact Assessment**, which estimates the traffic generation and assesses the traffic impacts of the Proposed Development in the future design year. Recommendation of improvement measures will be included if necessary.
- **Chapter 6 – Summary and Conclusion**, which summarises the findings of the study and presents the conclusion regarding the traffic issues of the Proposed Development.

2 EXISTING TRAFFIC CONDITIONS

2.1 Existing Road Network

2.1.1 The existing road network in the vicinity of the Application Site is shown in **Drawing 2.1**, which comprises the following local distributors:

- Kwu Tung Road;
- Hang Tau Road;
- Kam Hang Road

2.1.2 Kwu Tung Road is a single two-lane local distributor providing local connection between Kwu Tung and San Tin areas to the south of Fanling Highway. It connects with Castle Peak Road – Kwu Tung Section in the east and Castle Peak Road – San Tin Section in the west.

2.1.3 Kam Hang Road is a single two-lane local distributor serving the local villages in Kam Tsin. It intersects with Kwu Tung Road in the west and connects Kam Tsin Road in the east.

2.1.4 Hang Tau Road is a single two-lane local distributor providing vehicular access for the Application Site and local villages further south in Hang Tau Tai Po. It intersects with Kam Hang Road in the north for external connection.

2.2 Critical Junctions and Road Links

2.2.1 The critical junctions as identified for assessment of traffic impact due to the Proposed Development, which are listed in **Table 2.1** below:

Table 2.1 Identified Critical Junctions for Assessment

Index	Junction	Type	Drawing No.
J1	Hang Tau Road / Kam Hang Road	Priority	Drawing 2.2
J2	Kam Hang Road / Kwu Tung Road	Priority	Drawing 2.2

2.2.2 The locations of the above critical junctions are illustrated in **Drawing 2.1**. The existing junction layout and corresponding traffic arrangements are shown in **Drawing 2.2**.

2.2.3 In order to appraise the existing traffic conditions, a traffic survey in form of manual classified count was conducted at a typical weekday in May 2024 during AM and PM peak periods respectively.

2.2.4 The observed traffic flows are shown in **Annex A**, of which the corresponding peak hours are identified below:

- AM Peak Hour: 07:45 – 08:45
- PM Peak Hour: 17:15 – 18:15

2.2.5 Operational performance of the critical junctions have been assessed in accordance with the existing traffic flows and the results are summarised in **Table 2.2** below. Details of junction assessment are enclosed in the **Annex B**.

Table 2.2 Operational Performance of Critical Junctions in 2024

Index	Junction	Type	RC ⁽¹⁾ /DFC ⁽²⁾	Observed 2024	
				AM Peak	PM Peak
J1	Hang Tau Road / Kam Hang Road	Priority	DFC	0.34	0.24
J2	Kam Hang Road / Kwu Tung Road	Priority	DFC	0.63	0.41

Note:

(1) RC = Reserve Capacity for signal junctions;

(2) DFC = Design flow / capacity ratio for priority / roundabout junctions

2.2.6 It is indicated that all junctions in the vicinity of the Application Site are currently operating with ample capacities.

2.2.7 The performance of road links in the vicinity of the Application Site have also been reviewed in terms of the Flow to Capacity (V/C) ratio. **Table 2.3** below shows that all of the road links are operating with ample capacity.

Table 2.3 Operational Performance of Critical Road Links in 2024

Index	Road Links	Type ⁽¹⁾ and Conf'g ⁽²⁾	Capacity (pcu/hr) ⁽³⁾	Observed 2024			
				Flow (pcu/hr)		V/C Ratio	
				AM	PM	AM	PM
L1	Hang Tau Road (South of Kam Hang Road)	LD-S2	900	345	295	0.38	0.33
L2	Kam Hang Road (East of Hang Tau Road)	LD-S2	900	200	165	0.22	0.18
L3	Kwu Tung Road (West of Kam Hang Road)	LD -S2	900	350	325	0.39	0.36
L4	Kwu Tung Road (East of Kam Hang Road)	LD-S2	900	335	345	0.37	0.38

Note:

(1) Road Type: LD = Local Distributor;

(2) Configurations: S2 = Single 2 lanes

(3) Link capacities expressed in PCU/hour with reference to corresponding road type and lane configurations.

2.3 Public Transport Services

2.3.1 The public transport services for the Subject Site are available at Hang Tau Road, as well as along Kam Hang Road, Kwu Tung Road and Castle Peak Road – Kwu Tung respectively. The location of bus stops are shown in **Drawing 2.3**.

2.3.2 GMB Route 50K is serving the village settlement along Hang Tau Road, including the Application Site. GMB Route 50A is also available at Kam Hang Road about 5 minute walk from the Application Site. Both GMB routes provide connection to Sheung Shui MTR Station, which is the most readily accessible railway station from the Application Site.

2.3.3 Besides, there is bus route 76K running between Ching Ho Estate in Sheung Shui and Long Ping Estate in Yuen Long. It serves Kwu Tung Road westbound towards Yuen Long and Castle Peak Road – Kwu Tung Section towards Sheung Shui.

2.3.4 The bus stops are within walking distance for a journey of 7-14 minutes from the Application Site as summarised in **Table 2.4** below, although some of which may be outside typical service catchment. The existing footpaths along Kwu Tung Road are relatively gentle with provision dropped kerbs across Kam Hang Road.

Table 2.4 Existing Conditions of Bus Stops in Vicinity of Application Site

Bus Stop Location	(A) Kwu Tung Kwu Tung Road (Yuen Long Bound)	(B) Kwu Tung Castle Peak Road (Sheung Shui Bound)	(C) Hang Tau Kwu Tung Road (Yuen Long Bound)	(D) Ho Tung Bridge Castle Peak Road (Sheung Shui Bound)
Walking Distance	500m (via Kwu Tung Road Footpath)	900m (via footbridge across Fanling Highway)	550m (via Kwu Tung Road Footpath)	650m (via Kwu Tung Road Footpath)
Journey Time	7 minutes	14 minutes ⁽¹⁾	8 minutes	10 minutes ⁽¹⁾
Bus Stop Facilities	Lay-by with shelter	Lay-by only	Lay-by only	Lay-by with shelter

Note:

(1) Bus stop location may be outside the typical service catchment.

2.3.5 Public Light Bus (PLB) route 17, as known as the red-minibus, is available along Castle Peak Road – Kwu Tung Section serving between Sheung Shui and Yuen Long.

2.3.6 The existing public transport services are summarised in **Table 2.5** below.

Table 2.5 Existing Public Transport Services

Route	Service	Destinations	Nearest Stop	Peak Hour Headway (minutes)	Average Occupancy
50A	GMB	Sheung Shui – Kwu Tung (South)	Kam Hang Road	AM: 10-15	100% (Sheung Shui Bound)
				PM: 10-15	100% (Kwu Tung South Bound)
50K	GMB	Sheung Shui – Hang Tau	Hang Tau Road	AM: 3-5	100% (Sheung Shui Bound)
				PM: 5	100% (Hang Tau Bound)
76K	BUS	Ching Ho Estate – Long Ping Estate	Castle Peak Road	AM: 20-30	About 30% (Sheung Shui Bound)
				PM: 30	About 30% (Yuen Long Bound)
17	PLB	Sheung Shui – Yuen Long	Castle Peak Road	Flexible Schedule ⁽¹⁾	N/A

Note:

(1) Peak hour frequency is observed to be 3-5 minutes.

2.3.7 It is noted that the GMB routes are often full-loaded at their origin (e.g. Hang Tau) during the AM peak hour. There are unlikely spare capacity to cope with additional passenger demand. Meanwhile, the service level of PLB (red mini-bus) along Castle Peak Road is flexible in terms of fare and frequency, subject to the actual passenger demand.

2.3.8 Based on the on-site observation at bus stops near Kam Tsin, Castle Peak Road, the occupancy of bus route 76K between Yuen Long and Sheung Shui are about 30% for both directions during AM and PM peak hours.

3 THE PROPOSED DEVELOPMENT

3.1 Site Location

3.1.1 As shown by the master layout plan in **Drawing 3.1**, the Application Site is located in Kwu Tung South, which is bounded by Kwu Tung Road to the north, Hang Tau Road to the east and an existing footpath to the south connecting to the river bank of River Beas running along the west of the Application Site.

3.1.2 According to the approved planning application (No. Y/NE-KTS/15), the Application Site has been approved for the development of 909 units with a plot ratio of 2.0.

3.2 Proposed Development

3.2.1 The Proposed Development is planned for private residential use, which comprises a total of 1,062 residential units.

3.2.2 The development parameters are summarised in **Table 3.1**. The Proposed Development is scheduled to be completed by 2032.

Table 3.1 Design Parameters for Proposed Development

Parameters	Units
Application Site Area	About 19,591 m ²
Plot Ratio	Not more than 2.012 ⁽¹⁾
GFA	Not more than 39,400 m ²
Total Number of Residential Blocks	3
Total Number of Units	1,062
Average Unit Size	Approximately 37.1 m ²
Anticipated population	About 2,868 ⁽²⁾

Note:

(1) Proposed minor relaxation of plot ratio restriction (from 2.0 to 2.012) for Proposed Scheme is the result of reduced site area while maintaining the GFA (39,400m²) as per the Approved Scheme.

(2) The anticipated population is assumed to be 2.7 person-per-flat, with reference to Census and Statistics Department's website released in April 2024 (https://www.censtatd.gov.hk/en/web_table.html?id=130-06806) which shows North District average household size in 2023.

3.3 Vehicular and Pedestrian Access

3.3.1 The vehicular access point will be provided in form of run-in/out at Hang Tau Road to the east of the Application Site. All vehicular movements in/out of the Application Site will be permitted at the proposed vehicular access.

3.3.2 Pedestrian access will be provided next to the proposed vehicular access point at Hang Tau Road.

3.4 Provisions of Parking and Servicing Facilities

3.4.1 The provision of parking and servicing facilities for the proposed residential development are generally recommended in accordance with HKPSG, which are tabulated in **Table 3.2** below.

Table 3.2 Parking Requirements by HKPSG for Private Housing Developments (AUG 2021 Edition)

Parking Facilities	HKPSG Requirement				Required Provision	
Car Parking Spaces	Global Parking Standard (GPS) ⁽²⁾ 1 per 4-7 units with adjustment factors (R1) x (R2) x (R3)			Parking Ratio (unit/space) GPS=5	No. of Units	No. of Parking GPS=5
	Flat Size (m ²)	R1	R2			
<40	0.5	1.0	1.1	9.1	825	91
	40-70	1.2	1.0	1.1	3.8	235
	70-100	2.4	1.0	1.1	1.9	2
	100-130	4.1	1.0	1.1	1.1	0
	130-160	5.5	1.0	1.1	0.8	0
	>160	7.0	1.0	1.1	0.6	0
					Total	1,062 units
Visitor Parking Spaces	5 spaces per block				3 blocks	15 spaces
					Subtotal	171 spaces
Resident Loading Space	1 space per Block				3 blocks	3 spaces
Motorcycle Spaces	1 space per 100-150 units				1,062 units	11 spaces
Bicycle Parking Spaces	1 space per 15 flats with flat size smaller than 70m ² for site outside 2km radius of a rail station				1,060 units	71 spaces

Note:

(1) Demand Adjustment Ratio (R1) on flat size according to the latest HKPSG requirements;
Accessibility Adjustment Ratio (R2=1) for outside a 500m - radius of rail station;
Development Intensity Adjustment Ratio (R3=1.1) for Domestic Plot Ratio in between 1.0 and 2.0

3.4.2 With respect to the comments from TD under the approved S12A planning application (No. Y/NE-KTS/15), the GPS value of 1 per 5 units (GPS=5) is adopted for the Application Site with the following considerations:

- The basement footprint is highly constrained by the irregular shape of site area.
- The public transport services will be enhanced with proximity and convenience for access by the proposed road widening and public transport facilities at Hang Tau Road and Kam Hang Road.

3.4.3 The provision of parking and servicing facilities for the proposed development are summarised in **Table 3.3** below.

Table 3.3 Provision of Parking and Servicing Facilities by the Application Site

Parking and Servicing Facilities	Development Parameters	HKPSG (AUG 2021)
Residential Car Parking Spaces	1,062 units	156 ⁽¹⁾
Visitor Car Parking Space	3 blocks	15 spaces
Total No. of Parking Space		171 ⁽²⁾
Loading / Unloading Spaces	Domestic: 3 blocks	3 spaces
Motorcycle Spaces	1,062 units	11 spaces
Bicycle Parking Space	1,060 units (with flat size smaller than 70m ²)	71

Note:

(1) Assumed the GPS value of 1 per 5 is adopted;
 (2) Given that the number of parking provision is between 151-250, it is required to provide 3 accessible parking spaces for persons with disabilities among the visitor parking spaces according to HKPSG.

3.5 Proposed Road Improvement Works

3.5.1 With reference to the approved S12A Planning Application (No. Y/NE-KTS/15), the proposed road improvement works will include **widening of existing Hang Tau Road with 7.3m carriageway and 2.0m footpath abutting the Application Site as shown in **Drawings 3.2 and 3.3****.

3.5.2 A GMB lay-by with queuing area and a cautionary pedestrian crossing are also proposed at Hang Tau Road near the pedestrian access of the Application Site to enhance the public transport and pedestrian accessibility for the Proposed Development.

3.5.3 The level of conflicts among the vehicular and pedestrian movements are expected to be low, whilst the development traffic will travel to/from north of Hang Tau Road and the pedestrian traffic will use the cautionary crossing and GMB layby in the south of the run-in/out.

3.5.4 Supplementary traffic signs (TS460) and road markings (RM1141) will be provided on both directions of Hang Tau Road as shown in **Drawing 3.2** of the TIA to alert motorists the proposed pedestrian crossing.

3.5.5 It is assumed that the above road improvement works will be completed on or before completion of the Proposed Development.

3.5.6 As shown in **Drawing 3.4**, the existing footpaths along Hang Tau Road have an effective width of 1.0m (excluding railing and street furniture such as fire hydrant), which can be operated within LOS A (16 peds/m/min) with anticipated population intake of the proposed development and passage of wheelchair.

3.5.7 The committed road improvement works by other planned developments are summarised in **Section 4.2**.

4 FUTURE TRAFFIC CONDITIONS

4.1 Design Year

4.1.1 It is anticipated that the proposed residential development will be completed by 2032. Year 2035 is hence adopted to be the design year, which is 3 years upon completion.

4.2 Committed Road Improvement Works

Junctions J1 & J2 – Hang Tau Road / Kam Hang Road & Kam Hang Road / Kwu Tung Road

4.2.1 The junctions of Hang Tau Road / Kam Hang Road (Junction J1) and Kam Hang Road / Kwu Tung Road (Junction J2) are proposed to be improved by other planned developments, such as:

- Private Residential Development at Kam Hang Road near Kam Tsin (No. A/NE-KTS/506) – Proposed Improvement of Junctions J1 and J2
- Private Residential Development near junction of Kam Hang Road / Hang Tau Road (No. Y/NE-KTS/14) – Further Improvement of Junctions J1 and J2

4.2.2 The planned layout of proposed road improvement works are shown in **Drawing Nos. 4.1 and 4.2**. It is assumed that the above road improvement works will be completed before design year 2035.

Planned Roundabout and GMB Layby at Hang Tau Road

4.2.3 With reference to the approved S12A planning application (No. Y/NE-KTS/13) by OTHERS, it was proposed a roundabout for GMB turning around to the south of Hang Tau Road Public Toilet. The planned layout of roundabout and GMB layby outside the OTHER development site are shown in **Drawing 4.3**.

4.2.4 It is understood that the design of the turnaround facility is currently under discussion between Transport Department (TD) and the applicant of the OTHER application. Whether it is an external mini-roundabout or any other form of turnaround facilities, it is understood that a turnaround to facilitate the routing of GMB will be available upon the completion of the OTHER development.

4.2.5 In case that this permanent GMB turnaround by OTHERS is not completed on time for the intake of the subject application site, the GMB can still turn around near the south of Hang Tau Road Public Toilet with swept path analysis in **Annex E** as an alternative arrangement based on existing road layouts, subject to the GMB trial run on-site.

4.2.6 This temporary turn-around arrangement is comparable to the current operation of GMB 50A near Kam Tsin Village and Kwu Tung Market with a similar service level of 10-15 minutes during peak hours as shown in swept path analysis in **Annex E**.

4.3 Reference Traffic Forecasts

Historical Growth Trend

4.3.1 The Annual Traffic Census (ATC) published by the Transport Department (TD) provides a comprehensive record of traffic flows in the territory. The records from the ATC stations in the vicinity of the Application Site for 2013-2022 were summarized in **Table 4.1**.

Table 4.1 ATC Counting Station Records in the Local Area

ATC Station No.	Road Name	Average Annual Daily Traffic (A.A.D.T)										Growth Rate (p.a.) ⁽¹⁾
		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	
6602	Castle Peak Road (Kwu Tung)	10,670	11,120	10,560	10,690	11,540	10,800	10,660	11,000	11,000	10,480	+4.1%
6606	Kwu Tung Road	2,980	3,290	3,670	4,070	4,450	4,630	4,610	4,050	4,290	4,280	-0.2%
	Total	13,650	14,410	14,230	14,760	15,990	15,430	15,270	15,050	15,290	14,760	+0.9%

Note:

(1) The best-fitted growth is estimated by an exponential trend line (i.e. $y = b * m^x$) by regression analysis.

4.3.2 As indicated in **Table 4.1**, the average growth between 2013 and 2022 is represented by a rate of **+0.9% per annum**.

Population and Employment Data in the Vicinity Area

4.3.3 Reference was also made to the 2019-based Territorial Population and Employment Data Matrix (TPEDM) available in the Public Domain as summarized in **Table 4.2**.

Table 4.2 Population and Employment Base Data in 2019-based TPEDM

Planning Data District	Population			Population Growth Rate (p.a.)	
	2019	2026	2031	19/26	26/31
Fanling/ Sheung Shui	258,300	274,100	352,350	1.2%	5.2%
NENT (Other Area)	105,400	143,050	240,600	6.3%	11.0%
Total	363,700	417,150	592,950	2.8%	7.3%
Planning Data District	Employment			Employment Growth Rate (p.a.)	
	2019	2026	2031	19/26	26/31
Fanling/ Sheung Shui	64,100	66,650	79,400	0.8%	3.6%
NENT (Other Area)	36,050	38,300	65,550	1.2%	11.3%
Total	100,150	104,950	144,950	0.9%	6.7%
Planning Data District	Population + Employment			Combined Growth Rate (p.a.)	
	2019	2026	2031	19/26	26/31
Fanling/ Sheung Shui	322,400	340,750	431,750	1.1%	4.8%
NENT (Other Area)	141,450	181,350	306,150	5.1%	11.0%
Total	463,850	522,100	737,900	2.4%	7.2%

4.3.4 Based on the population and employment planning data as shown in **Table 4.2**, growth rate of 2019/2026 and 2026/2031 are around **+2.4% and +7.2% per annum** respectively.

4.3.5 However, it is important to note that the key population growth between 2026 and 2031 from TPEDM are widely distributed in Fanling / Sheung Shui and NENT (Other Areas), including the anticipated population intakes in Kwu Tung North New Development Area (KTN NDA).

Major Committed Developments in the vicinity of Kwu Tung

4.3.6 The major committed developments in Fanling / Sheung Shui and NENT (Other Area), which would have traffic contributions to the road network in the vicinity of the Application Site in Kwu Tung are summarised in **Table 4.3** Their corresponding locations are shown in **Drawing 4.4**.

Table 4.3 Major Committed Developments in Kwu Tung

Ref.	Location	Planned Use	Design Parameter	Population Intake (2024- 2035)	Reference
Application Site	Hang Tau Road	Private Residential (Medium Density)	909 units	2,450 ⁽¹⁾	Planning Application No. Y/NE-KTS/15
Committed Private Developments in Kwu Tung South					
A	Kam Hang Road	Private Residential (Medium Density)	2,589 units	7,000 ⁽¹⁾	Planning Application No. A/NE-KTS/506
B	Kam Hang Road / Hang Tau Road	Private Residential (Medium Density)	971 units	2,600 ⁽¹⁾	Planning Application No. Y/NE-KTS/14
C	Kam Hang Road / Hang Tau Road	Private Residential (Medium Density)	360 units	1,000 ⁽¹⁾	Planning Application No. Y/NE-KTS/17
D	Kam Hang Road	Residential Care Home for Elderly	150 beds	150	Planning Application No. Y/NE-KTS/16
E	Hang Tau Tai Po	Private Residential (Medium Density)	320 units	900 ⁽¹⁾	Planning Application No. Y/NE-KTS/13
F	106 Hang Tau Road	Private Residential (Low Density)	2 houses	200 ⁽¹⁾	Planning Application No. A/NE-KTS/528
G	Various Lots in D.D. 94, Hang Tau Tai Po	Private Residential (Low Density)	19 houses		Planning Application No. A/NE-KTS/466
H	Various Lots in D.D. 94, Hang Tau Tai Po	Private Residential (Low Density)	42 houses		Planning Application No. A/NE-KTS/525
Private Residential Developments in Kwu Tung South			Total:	Approx. 14,300	
Planned Developments in Kwu Tung North					
P1	KTN NDA	Mixed Use	49,900 units	131,600	Planning Application No. A/KTN/93
P2	Yin Kong	Private Residential (Medium Density)	527 units	1,400 ⁽¹⁾	Planning Application No. Y/ KTN/2

Note:

(1) Average household size assumed to be 2.7

Adopted Growth Rate

4.3.7 Taking account of the extensive coverage by the NENT (Other Area) in TPEDM, it can be seen that most of the increment in population between 2024-2035 have been accounted by the KTN NDA.

Section 16 Planning Application for Proposed Residential Development with Minor Relaxation of Plot Ratio Restriction at Lots 1027, 1029, 1030, 1034A, 1034B, 1039 (Part), 1040, 1042 RP, 1043 RP, 1044 RP (Part), 1045, 1047, 2233 (Part), 2251 S.A RP, 2256 RP, 2315 (Part) and 2316 RP (Part) in D.D. 92 and Adjoining Government Land (New Lot to be known as Lot 2644 in D.D. 92), Kwu Tung South, Sheung Shui, New Territories

CHK50793310

4.3.8 Nevertheless, the major access routes and road network for the Planned Developments in Kwu Tung South (including the Application Site) would be substantially different from those in KTN NDA, with the anticipated completion of improvement works to Pak Shek Au Interchange and the new Kwu Tung Interchange in mid-2030 by CEDD. The traffic contributions by KTN NDA to the road network in Kwu Tung South would be very marginal.

4.3.9 Therefore, the holistic growth rate in population and employment of the entire NENT may not accurately represent the traffic growth for the local road network in Kwu Tung South.

4.3.10 Instead, the growth rate from ATC of +1.0% per annum is adopted for traffic projection from 2024 to 2035. On top of the projected 2035 traffic flow, the future traffic generation from the major committed developments in Kwu Tung South as shown in **Table 4.3** would be incorporated for the reference traffic forecast of design year 2035.

4.3.11 With reference to the trip rates from Transport and Planning Design Manual (TPDM) Volume 1 Chapter 3 as shown in **Annex C**, the number of trips generated by the major committed developments in Kwu Tung South are summarised in **Table 4.4** below.

Table 4.4 Traffic Generations of Committed Development in Kwu Tung (Reference 2035)

Ref.	No. of Units	Adopted Trip Rate	Estimated Number of Trips (pcu/hr) ⁽¹⁾				
			AM Peak		PM Peak		
			Generation	Attraction	Generation	Attraction	
Approved Scheme at Application Site (No. Y/NE-KTS/15)							
Application Site	909 units	R(A)-45	60	40	30	35	
Committed Private Development in Kwu Tung South							
A	2,589 units +Retail 1,000m ²	R(A)-45 + Retail	170	110	80	100	
B	971 units	R(A)-70	85	50	35	45	
C	360 units	R(A)-70	30	20	15	15	
D	RCHE 150 beds	RCHE	5	5	5	5	
E	320 units +Retail 406m ² +RCHE 100 beds	R(C)-180 + Retail + RCHE	35	20	15	20	
F	2 houses	R(C)-240	20	15	15	20	
G	19 houses						
H	42 houses						
Sub-total:			405	260	190	240	
Additional Public Transport in Kwu Tung South							
Potential New Bus and GMB Routes (Kam Hang Road & Hang Tau Road)			80	80	80	80	
Planned Developments in Kwu Tung North							
P1	49,900 units	PRH-40	2,160	1,630	1,190	1,510	
P2	527 units	R(A)-50 + R(C)-180	45	30	25	25	

Note

(1) The estimated no. of trips were rounded up to the nearest 5

4.3.12 The anticipated 2035 reference traffic forecasts (with Approved Scheme) are presented in **Annex A** and can be derived by the equation below:

2035 Reference Flows

$$\begin{aligned}
 = 2024 \text{ Observed Flows} & + \text{Background Traffic Growth from 2024 to 2035 (+1.0% p.a.)} \\
 & + \text{Approved Scheme of the Application Site} \\
 & + \text{Committed Private Developments (Sites A to H)} \\
 & + \text{Potential Additional Public Transport in Kwu Tung South} \\
 & + \text{Planned Developments Kwu Tung North (Sites P1 & P2)}
 \end{aligned}$$

4.4 Design Traffic Forecasts

4.4.1 With reference to Transport and Planning Design Manual (TPDM) Volume 1 Chapter 3, the trip rates adopted are extracted in **Table 4.5** below.

Table 4.5 Trip Rates Adopted in Traffic Forecast

Development Parameters	Index	Adopted Trip Rates (pcu/hr/unit or 100m ² GFA)			
		AM Peak		PM Peak	
		Generation	Attraction	Generation	Attraction
The Proposed Development					
Average Flat Size 45m ² (Mean)	R(A)-45	0.0623	0.0401	0.0277	0.0361

Source: TPDM 2021, Volume 1, Chapter 3, Appendix D, Table 1

Note (1): Trip rates obtained by interpolation

4.4.2 The “Mean” value is commonly adopted for a number of approved planning applications in Kwu Tung South, which reflects the travel characteristics and public transport accessibility in the area. The Subject Site is a private residential development with an average flat size of about 37.1m² whilst the trip rates for comparable flat size (40m² or 50m²) are only available for the subsidised housing in TPDM.

4.4.3 Therefore, the adopted trip rates (45m² for private development) are derived by interpolation among the subsidised housing and private residential developments as elaborated in **Annex C** of the TIA.

4.4.4 Nonetheless, to further elaborate the trip generation rates adopted in **Table 4.6** of TIA, we have arranged additional traffic surveys at the residential developments with the following criteria:

- Average Flat Size <60sqm
- Car Park Ratio = 4 to 8 units per CP
- Beyond 500m walking distance from rail station

4.4.5 As shown in the findings in **Annex C**, the adopted trip rates are more conservative than the sites with comparable flat size, car park ratio and public transport accessibility.

4.4.6 Based on the development parameters given in **Tables 3.1 and 4.5**, the number of trips generated by the major committed and Proposed Developments are summarised in Table **4.6** below.

Table 4.6 Traffic Generations of Proposed Development (Design 2035)

Ref.	No. of Units	Adopted Trip Rate	Estimated Number of Trips (pcu/hr) ⁽¹⁾				
			AM Peak		PM Peak		
			Generation	Attraction	Generation	Attraction	
Proposed Developments at Application Site							
Application Site (Subject S16)	1,062	R(A)-45	65	45	30	40	
Application Site (Approved S12A)	909	R(A)-45	60	40	30	35	
Net Difference			5	5	5	5	
Committed Private Development							
A	2,589 units +Retail 1,000m ²	R(A)-45 + Retail	170	110	80	100	
B	971 units	R(A)-70	85	50	35	45	
C	360 units	R(A)-70	30	20	15	15	
D	RCHE 150 beds	RCHE	5	5	5	5	
E	320 units +Retail 406m ² +RCHE 100 beds	R(C)-180 + Retail + RCHE	35	20	15	20	
F	2 houses	R(C)-240	20	15	15	20	
G	19 houses						
H	42 houses						
Sub-total:			410	265	195	245	
Additional Public Transport in Kwu Tung South							
Potential New Bus and GMB Routes (Kam Hang Road & Hang Tau Road)			80	80	80	80	
Planned Developments in Kwu Tung North							
P1	49,900 units	PRH-40	2,160	1,630	1,190	1,510	
P2	527 units	R(A)-50 + R(C)-180	45	30	25	25	

Notes:

(1) The estimated no. of trips were rounded up to the nearest 5.

4.4.7 With the 1,062 nos. of residential units for the Proposed Development, it is estimated that the traffic generation and attraction will be 110 pcu/hr (2-way) and 70 pcu/hr (2-way) in AM and PM peak hours, which are comparable to the approved scheme of 909 units with the same domestic GFA.

4.4.8 By superimposing the net increase in development traffic flows and the 2035 reference traffic forecast (with Approved Scheme), the 2035 design traffic forecasts (with Proposed Development) can be derived as below:

$$\begin{aligned} 2035 \text{ Design Flows} &= 2035 \text{ Reference Flows} - \text{Approved Development Traffic} \\ &\quad + \text{Proposed Development Traffic} \end{aligned}$$

4.4.9 The 2035 design traffic forecast (with Proposed Development) are presented in **Annex A**.

4.5 Traffic Forecasts for Environmental Assessment (EA)

- 4.5.1 In support of the Environmental Assessment for the Proposed Development, a set of long-term traffic forecast in year 2047 is prepared, which is 15 years after completion.
- 4.5.2 Results of the EA traffic forecast and details of methodology and assumptions are presented in the Technical Note enclosed in **Annex D**.

5 TRAFFIC IMPACT ASSESSMENT

5.1 Junction and Road Link Assessment

5.1.1 With the road improvement works by others as summarised in **Drawing 5.1**, the junction layouts adopted in design year 2035 for the operational assessments of the critical junctions are summarised in **Table 5.1**.

Table 5.1 Layout and Arrangement of Critical Junctions in 2035

Index	Junction	Type	Existing / Future Layout	Proposed Road Improvements by Others
J1	Hang Tau Road / Kam Hang Road	Priority	Drawing 2.2	Drawing 4.1⁽¹⁾
J2	Kam Hang Road / Kwu Tung Road	Priority	Drawing 2.2	Drawing 4.1⁽¹⁾

Notes:

(1) Refer to **Section 4.2** for the committed junction improvement works.

5.1.2 To assess the traffic impact due to the Proposed Development, capacity analysis of the identified critical junctions and road links in the study area for both reference and design scenarios in year 2035 have been carried out. The results were summarised and presented in **Tables 5.2** and **5.3**.

Table 5.2 Operational Performance of Critical Junctions in 2035

Index	Junction	Type	RC ⁽¹⁾ / DFC ⁽²⁾	Reference 2035		Design 2035	
				AM Peak	PM Peak	AM Peak	PM Peak
J1	Hang Tau Road / Kam Hang Road <i>(With improvement)</i>	Priority	DFC	0.78	0.42	0.79	0.43
J2	Kam Hang Road / Kwu Tung Road <i>(With improvement)</i>	Priority	DFC	0.77	0.45	0.79	0.45

Note:

(1) RC = Reserve Capacity for signal junctions;

(2) DFC = Design flow / capacity ratio for priority / roundabout junctions

5.1.3 It can be revealed from **Table 5.2** that the key junctions in Kwu Tung South will operate with ample capacity with the committed road improvement works by others. The local road links will also operate with ample capacity in 2035 as shown in **Table 5.3**.

Table 5.3 Operational Performance of Critical Road Links in 2035

Index	Road Links	Type ⁽¹⁾ and Conf'g ⁽²⁾	Capacity (pcu/hr) ⁽³⁾	Reference 2035				Design 2035			
				Flow (pcu/hr)		V/C Ratio		Flow (pcu/hr)		V/C Ratio	
				AM	PM	AM	PM	AM	PM	AM	PM
L1	Hang Tau Road (South of Kam Hang Road)	LD-S2	900	690	540	0.77	0.60	700	550	0.78	0.61
L2	Kam Hang Road (East of Hang Tau Road)	LD-S2	900	705	505	0.78	0.56	705	505	0.78	0.56
L3	Kwu Tung Road (West of Kam Hang Road)	LD-S2	900	755	630	0.84	0.70	755	635	0.84	0.71
L4	Kwu Tung Road (East of Kam Hang Road)	LD-S2	900	710	605	0.79	0.67	720	610	0.80	0.68

Note:

(1) Road Type: LD = Local Distributor;

(2) Configurations: S2 = Single 2 lanes

(3) Link capacities expressed in PCU/hour with reference to corresponding road type and lane configurations.

5.2 Public Transport Assessment

5.2.1 With reference to the Travel Characteristics Survey 2011 (TCS 2011) by the TD, the average daily mechanised trips per person (excluding non-home-based and employers' business trips) is 1.61. For the worst-case scenario, the average daily mechanised trips per person for all-purpose trips is 1.83 is adopted to the Subject Application Site in the sensitivity test.

5.2.2 The overall peak hours for mechanised trips were identified with a large proportion of "Home-based Work" commuting trips, whilst the AM and PM peak hours accounted for about 12% of the daily trip in total.

5.2.3 Assuming that 90% of the trips are generated (outbound) and attracted (inbound) during AM and PM peak hour respectively, the travel demand during AM and PM peak hours is 0.1739 trip per person per hour respectively. For the worst-case scenario, the travel demand becomes $1.83 \times 12\% \times 0.9$ (AM outbound / PM inbound) = 0.1976 trips per person, which is almost equivalent to 20 trips per 100 residents.

5.2.4 Furthermore, the distribution modal split for public transport is assumed to be 70%, taking into account the existing service level of public transport and the mode share among rail, franchised bus and public light bus in TCS 2011. For the worst-case scenario, the public transport modal split of 90% is adopted with reference to the 2021 Population Census.

5.2.5 According to the demographic data from the 2021 Population Census, the population for residential developments in Hang Tau Tai Po is approximately 4,647, whilst the estimated population intake by the Proposed Development is 2,868.

5.2.6 Based on the above assumptions, the public transport demand for the existing and the Proposed Development are derived from first principle by the estimated population as shown in **Table 5.4** below.

Table 5.4 Derivation of Public Transport Demand in Year 2035

Parameters	Formula	Existing Hang Tau Tai Po	Other Planned Developments in Kwu Tung South	Application Site	Sensitivity Test
Estimated population	(a)	4,647 ⁽¹⁾	10,600 ⁽³⁾⁽⁴⁾⁽⁵⁾	2,868 ⁽²⁾	2,868 ⁽²⁾
Average daily mechanised trips per person	(b)	1.61	1.61	1.61	1.83
Peak hour factors (AM / PM) to daily total	(c)	12%	12%	12%	12%
Estimated mechanised trips per hour (AM / PM peak) per person	(d) = (b) x (c) x 0.9	0.1739	0.1739	0.1739	0.1976
Estimated mechanised trips per hour (AM / PM peak)	(e) = (a) x (d)	808	1,843	499	567 (+68)
Mode share of public transport (excluding private cars and taxis)	(f)	70%	70%	70%	80%
Estimated public transport demand per hour (AM / PM peak) per person	(g) = (d) x (f)	0.1217	0.1217	0.1217	0.1581
Estimated public transport demand per hour (AM / PM peak)	(h) = (e) x (f)	565	1,290	350	455 (+105)
Additional Total Demand:			1,640		1,745 (+105)

Notes:

- (1) 2021 Population Census – Small Street Block Group 547/04
- (2) Proposed Development: 1,062 units and PPOF 2.7
- (3) No. A/NE-KTS/506: 2,589 units and PPOF 2.7 = 7,000 population
- (4) No. Y/NE-KTS/14: 971 units and PPOF 2.7 = 2,600 population
- (5) No. Y/NE-KTS/17: 360 units and PPOF 2.7 = 1,000 population

5.2.7 With reference to the on-site observation of boarding and alighting passengers at the bus stops near Kam Tsin, Castle Peak Road, the directional split to/from Yuen Long (NT West) and Sheung Shui (NT East) is derived to be 20% and 80% respectively. The travel demands to/from NT East and NT West can both use the future Kwu Tung Station with East Rail Line (by 2027) and Northern Link (by 2034) respectively.

5.2.8 For the worst-case scenario in the sensitivity test, there will be up to 455 passengers per hour during the AM and PM peak hour for the future intake of 2,868 residents by the Subject Application Site. In overall terms, the additional public transport demand will become 1,745 passengers per hour for the future intake of 13,468 residents by the proposed and other planned private residential developments in Kwu Tung South.

Proposed Enhancement to Public Transport Services by the Subject Application Site

5.2.9 For minimizing disturbance to the traffic on Hang Tau Road due to the kerbside passengers' boarding and alighting of GMBs while providing proper waiting spaces for the GMB users, an on-street GMB layby is proposed at Hang Tau Road for the **short-working route of GMB 50K**, assuming with a 10-minute headway during peak hours. The temporary GMB turnaround near Hang Tau Road Public Toilet has also been identified in **Para. 4.2.4 – 4.2.6** of this TIA, in case of any programme mismatch for the permanent GMB turnaround by **OTHERS**.

5.2.10 A pedestrian crossing is also proposed between the GMB lay-by and the Application Site Access at Hang Tau Road to cope with the potential crossing demand as shown in **Drawings 3.2**.

Proposed Enhancement to Public Transport Services by OTHER Developments

5.2.11 In addition to the new GMB facilities at Hang Tau Road, the Application Site is within the 400m walking distance from Kam Hang Road, **which will be viable for 12.8m double decker buses with the proposed and approved road widening under S16 Planning Application (No. A/NE-KTS/506)** as shown in **Drawing 4.1 and 4.2**.

5.2.12 With the public transport facilities proposed at Kam Hang Road, new franchised bus route between Kwu Tung South and the future Kwu Tung Station can be considered with rail connections to East Rail Line in 2027 and the Northern Link (NOL) in 2034 respectively. Not only the accessibility of Kwu Tung south area can be improved, but also relief the burden of Public Transport Interchange at existing Sheung Shui Station.

5.2.13 The additional travel demand of the planned developments in Kwu Tung South (including the Application Site) can be sufficiently served by 13 nos. of 12.8m double decker buses per hour (i.e. peak frequency of 4-5 minutes) during the peak hour. It will benefit the existing residents at Kwu Tung South with an increase of PT choice in the area.

5.2.14 The spare capacity of Bus Route 76K can also be utilized to serve part of the public transport demand arising from the proposed and planned developments in Kwu Tung South.

Overview of Public Transport Services in Kwu Tung South in Year 2035

5.2.15 The **tentative short-working GMB 50K and Franchised Bus routes** are indicated on **Drawing 5.2**. The proposed enhancement to public transport services during peak hours for the private residential development are summarised in **Table 5.5** below.

Table 5.5 Proposed Enhancement to Public Transport Services in Year 2035

Private Residential Developments	Anticipated Population Intake	Passenger Demand (pax/hr)
Application Site at Hang Tau Road	2,868 residents	455
Other Planned Developments in Kwu Tung South	10,600 residents	1,290
Total in Kwu Tung South	13,468 residents	1,745
Public Transport Service	Anticipated Service Level	Public Transport Capacity (pax/hr)
Proposed Enhancement to Public Transport Services by the Subject Application Site		
Short-Working Route of GMB 50K ⁽¹⁾ (Hang Tau Road – Sheung Shui)	10-minute headway (6 nos. of 19-seater GMB)	110
Proposed Enhancement to Public Transport Services by the OTHER Developments		
New Franchised Bus Route ⁽²⁾ (Kam Hang Road – Kwu Tung Station)	4-5 minute headway (13 nos. of 12.8m DD bus) ⁽³⁾	1,400
Spare Capacity of Existing Bus Route 76K (Ching Ho Estate – Long Ping Estate)	20-minute headway (3 nos. of 12m DD bus) ⁽⁴⁾	250
	Total	1,760

Notes:

- (1) The additional GMB at Hang Tau Road is assumed as **a short-working route of GMB 50K** with a service level of 10 minute headway in peak hours
- (2) The new franchised bus route at Kam Hang Road is assumed for a service level of 4-5 minute headway in peak hours.
- (3) The capacity of 12.8m double-decker (DD) bus is assumed to be **120 passengers with 90% maximum capacity**.
- (4) The spare capacity of bus route 76K is assumed to be **250 passengers with an average occupancy of 30%**.

6 SUMMARY AND CONCLUSION

6.1 Summary

6.1.1 The Application Site is located at various lots (New Lot to be known as Lot 2644) in D.D. 92 abutting Hang Tau Road in Kwu Tung South, which is currently zoned as "CDA(3)" in the Draft Kwu Tung South Outline Zoning Plan (OZP No. S/NE-KTS/22).

6.1.2 According to the approved S12A planning application (No. Y/NE-KTS/15) in October 2022, the Application Site was approved for the residential development of 909 units with a maximum plot ratio of 2.0.

6.1.3 The Proposed Development is planned for private residential use, which comprises a total of 1,062 residential units. Proposed minor relaxation of plot ratio for Proposed Scheme is the result of reduced site area while maintaining the GFA (39,400m²) under Approved Scheme. To achieve this GFA, plot ratio 2.012 is therefore proposed.

6.1.4 The vehicular access point will be provided in form of run-in/out at Hang Tau Road to the east of the Application Site. All vehicular movements in/out of the Application Site will be permitted at the proposed vehicular access. Pedestrian access will be provided next to the proposed vehicular access point at Hang Tau Road.

6.1.5 With respect to the comments from TD under the approved S12A planning application (No. Y/NE-KTS/15), the GPS value of 1 per 5 units (GPS=5) is adopted for the Application Site with the following considerations:

- The basement footprint is highly constrained by the irregular shape of site area.
- The public transport services will be enhanced with proximity and convenience for access by the proposed road widening and public transport facilities at Hang Tau Road and Kam Hang Road.

6.1.6 To facilitate the Proposed Development, it is proposed to widen the existing Hang Tau Road into 7.3m carriageway and 2.0m footpath abutting the Application Site. A GMB layby with queuing area and a cautionary pedestrian crossing are also proposed at Hang Tau Road to enhance the public transport and pedestrian accessibility for the Proposed Development.

6.1.7 Year 2035 is adopted to be the design year, which is 3 years upon the anticipated completion in 2032.

6.1.8 The 2035 reference traffic forecasts have been projected from the observed year 2024 with a growth factor of +1.0% per annum to year 2035. The traffic generations and attractions from the major committed developments in Kwu Tung South are also included on top of the projected forecast.

6.1.9 Based on the trip rates derived from TPDM, it is estimated that the traffic generations by the proposed 1,062 nos. of residential units will be some 110 pcu/hr (2-way) and 70 pcu/hr (2-way) in AM and PM peak hours which are comparable to the approved scheme.

6.1.10 In terms of public transport, the demand for the existing and proposed developments are derived from first principle by the estimated population, based on the assumptions from TCS 2011 and the 2021 Population Census.

6.1.11 A short-working route of GMB 50K between Hang Tau Road and Sheung Shui is proposed at the new GMB lay-by at Hang Tau Road, assuming with a 10-minute headway during peak hours. The temporary GMB turnaround near Hang Tau Road Public Toilet has also been identified TIA, in case of any programme mismatch for the permanent GMB turnaround by OTHERS.

6.1.12 The Application Site is also within the 400m walking distance from Kam Hang Road, which will be viable for 12.8m double decker buses with the proposed and approved road improvement works by OTHER committed developments.

6.1.13 Therefore, the public transport demand from the Application Site in Kwu Tung South can be supplemented by the short-working route of GMB 50K at Hang Tau Road, as well as the potential franchised bus service at Kam Hang Road, connecting the future Kwu Tung Station for East Rail Line by 2027 and the Northern Link (NOL) by 2034 respectively.

6.1.14 The spare capacity of Bus Route 76K can also be utilized to serve part of the public transport demand arising from the proposed development.

6.2 Conclusion

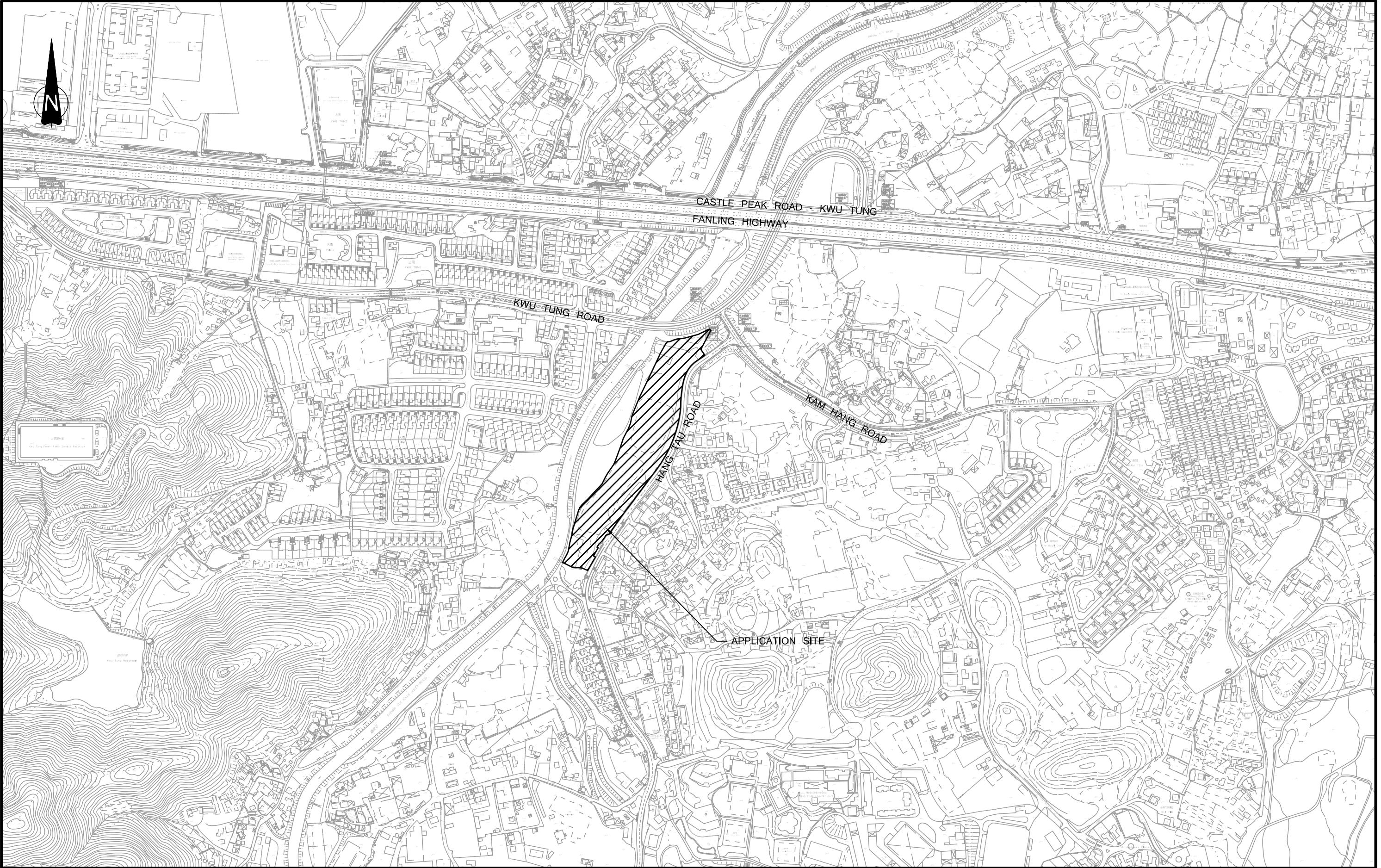
6.2.1 The TIA has demonstrated that the traffic generation by the Proposed Development, as well as the cumulative traffic impact by other potential residential development in Kwu Tung South area, can all be absorbed by the external road network with the proposed and committed junction improvement schemes.

6.2.2 The arrangements of vehicular access, as well as provision of internal transport facilities and public transport facilities are also justified for the Proposed Development.

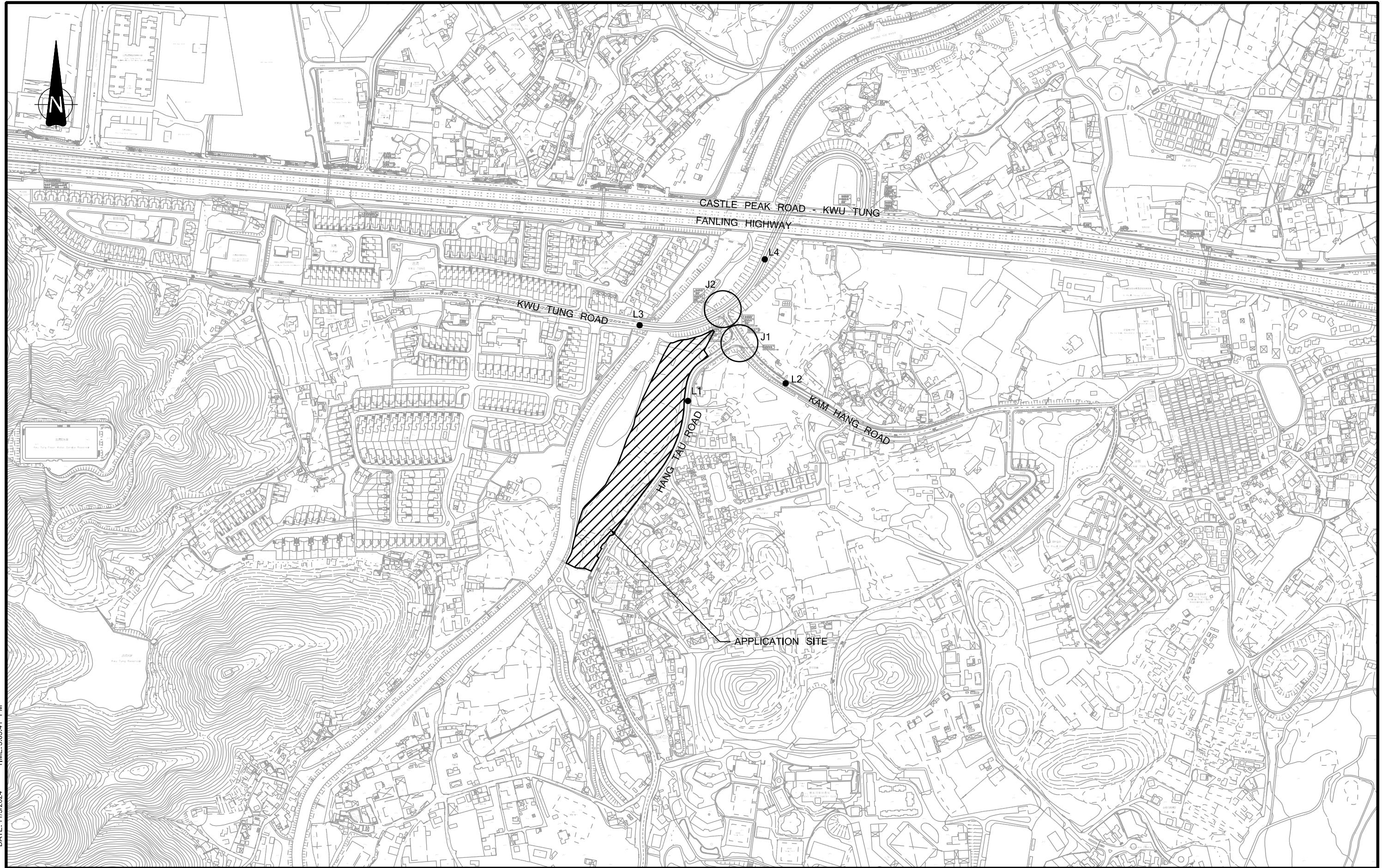
6.2.3 It can be shown that the proposed service levels of existing and proposed Bus & GMB route(s) can adequately serve the anticipated public transport demand in Kwu Tung South.

6.2.4 Therefore, it can be concluded that the Proposed Development is acceptable in traffic engineering terms.

DRAWINGS



Rev.	Description	Checked	Date	Project Title	Drawing Title	Designed	TSO	Checked	LHW	Scale	1:5000(A3)	Date	NOV 2024	Drawing No.	1.1	Rev.
-	-	-	-	SECTION 16 PLANNING APPLICATION FOR PROPOSED RESIDENTIAL DEVELOPMENT WITH MINOR RELAXATION OF PLOT RATIO RESTRICTION AT LOTS 1027, 1029, 1030, 1034A, 1034B, 1039 (PART), 1040, 1042 RP, 1043 RP, 1044 RP (PART), 1045, 1047, 2233 (PART), 2251 S.A RP, 2256 RP, 2315 (PART) AND 2316 RP (PART) IN D.D. 92 AND ADJOINING GOVERNMENT LAND (NEW LOT TO BE KNOWN AS LOT 2644 IN D.D. 92), KWU TUNG SOUTH, SHEUNG SHUI, NEW TERRITORIES	SITE LOCATION											
-	-	-	-													
-	-	-	-													
-	-	-	-													
-	-	-	-													



Project Title
SECTION 16 PLANNING APPLICATION FOR PROPOSED RESIDENTIAL
DEVELOPMENT WITH MINOR RELAXATION OF PLOT RATIO RESTRICTION AT
LOTS 1027, 1029, 1030, 1034A, 1034B, 1039 (PART), 1040, 1042 RP,
1043 RP, 1044 RP (PART), 1045, 1047, 2233 (PART), 2251 S.A RP, 2256 RP,
2315 (PART) AND 2316 RP (PART) IN D.D. 92 AND ADJOINING
GOVERNMENT LAND (NEW LOT TO BE KNOWN AS LOT 2644 IN D.D. 92),
KWU TUNG SOUTH, SHEUNG SHUI, NEW TERRITORIES

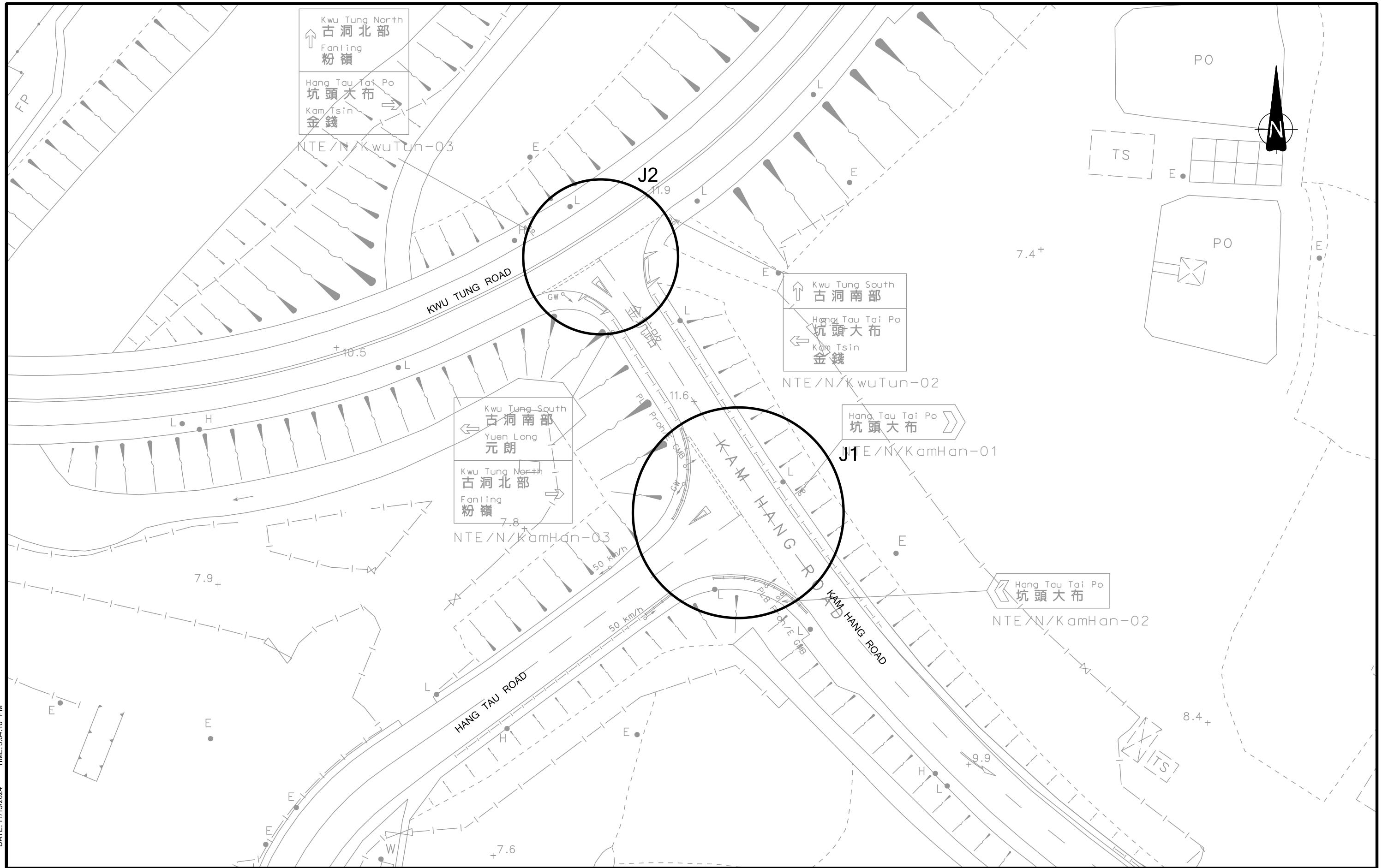
Drawing Title

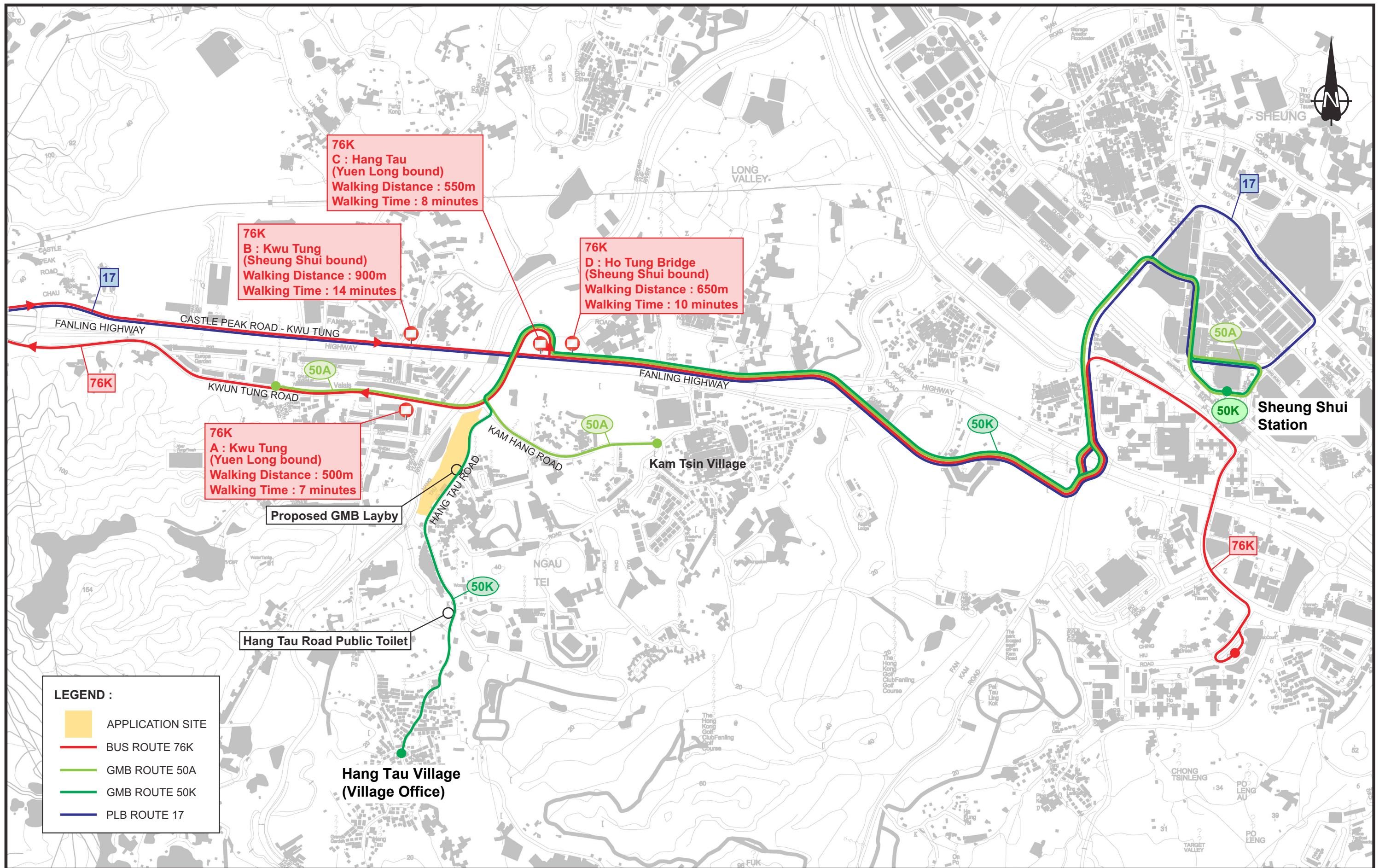
EXISTING ROAD NETWORK

Designed TSO Checked LHW Scale 1:5000(A3) Date NOV 2024 Drawing No. 2.1 Rev. -

SYSTRA
MVA

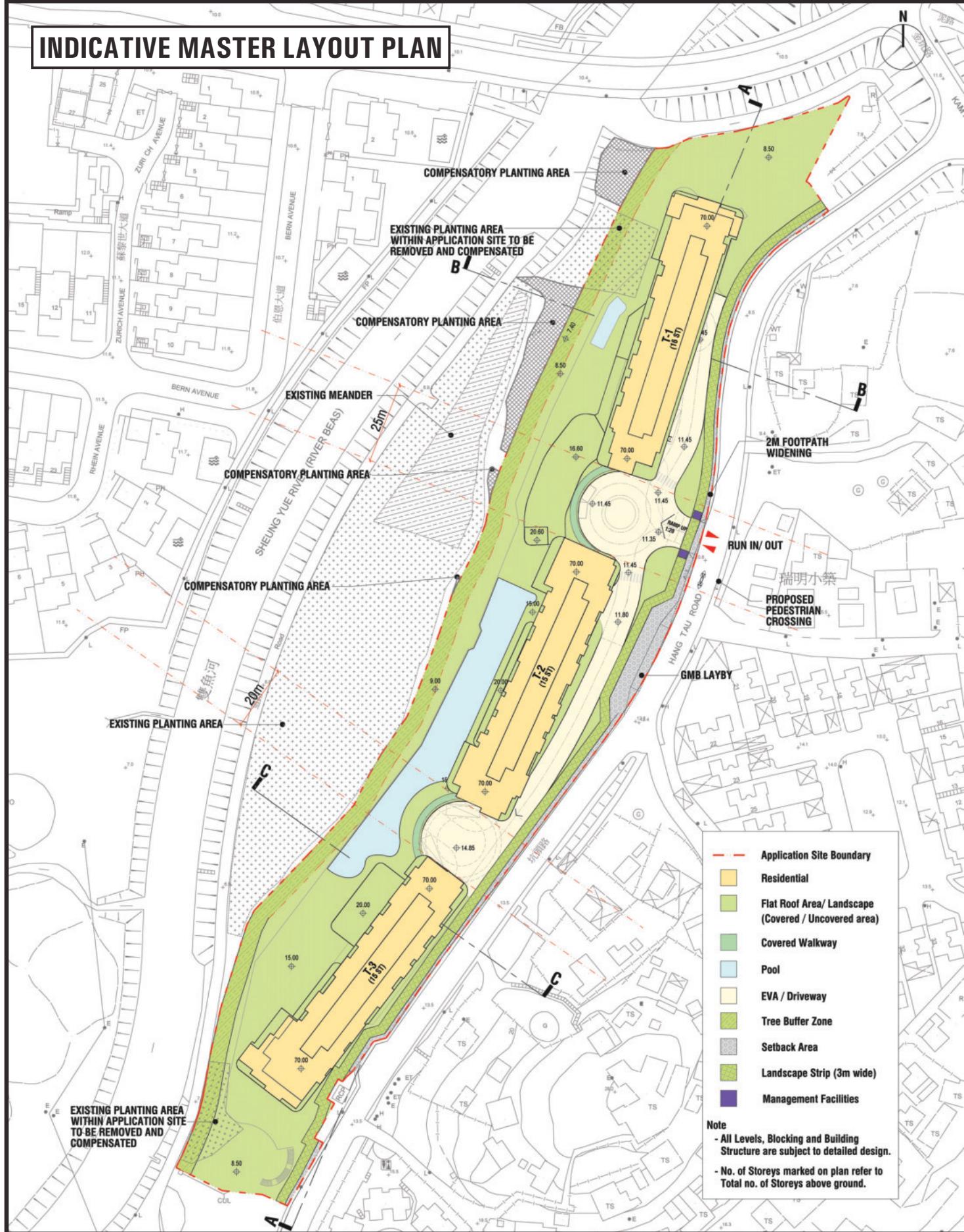
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-	-	-	-	Project Title
-	-	-	-	SECTION 16 PLANNING APPLICATION FOR PROPOSED RESIDENTIAL DEVELOPMENT WITH MINOR RELAXATION OF PLOT RATIO RESTRICTION AT LOTS 1027, 1029, 1030, 1034A, 1034B, 1039 (PART), 1040, 1042 RP, 1043 RP, 1044 RP (PART), 1045, 1047, 2233 (PART), 2251 S.A RP, 2256 RP, 2315 (PART) AND 2316 RP (PART) IN D.D. 92 AND ADJOINING GOVERNMENT LAND (NEW LOT TO BE KNOWN AS LOT 2644 IN D.D. 92), KWU TUNG SOUTH, SHEUNG SHUI, NEW TERRITORIES
B	TD COMMENTS (PRE-SUBMISSION)	LHW	4DEC25	Drawing Title
A	TD COMMENTS (PRE-SUBMISSION)	LHW	25JUL25	CURRENT PROVISION OF PUBLIC TRANSPORT SERVICES
Rev.	Description	Checked	Date	Designed TSO Checked LHW Scale NTS Date JUN 2025 Drawing No. 2.3 Rev. B

INDICATIVE MASTER LAYOUT PLAN



INDICATIVE CARPARK PLAN



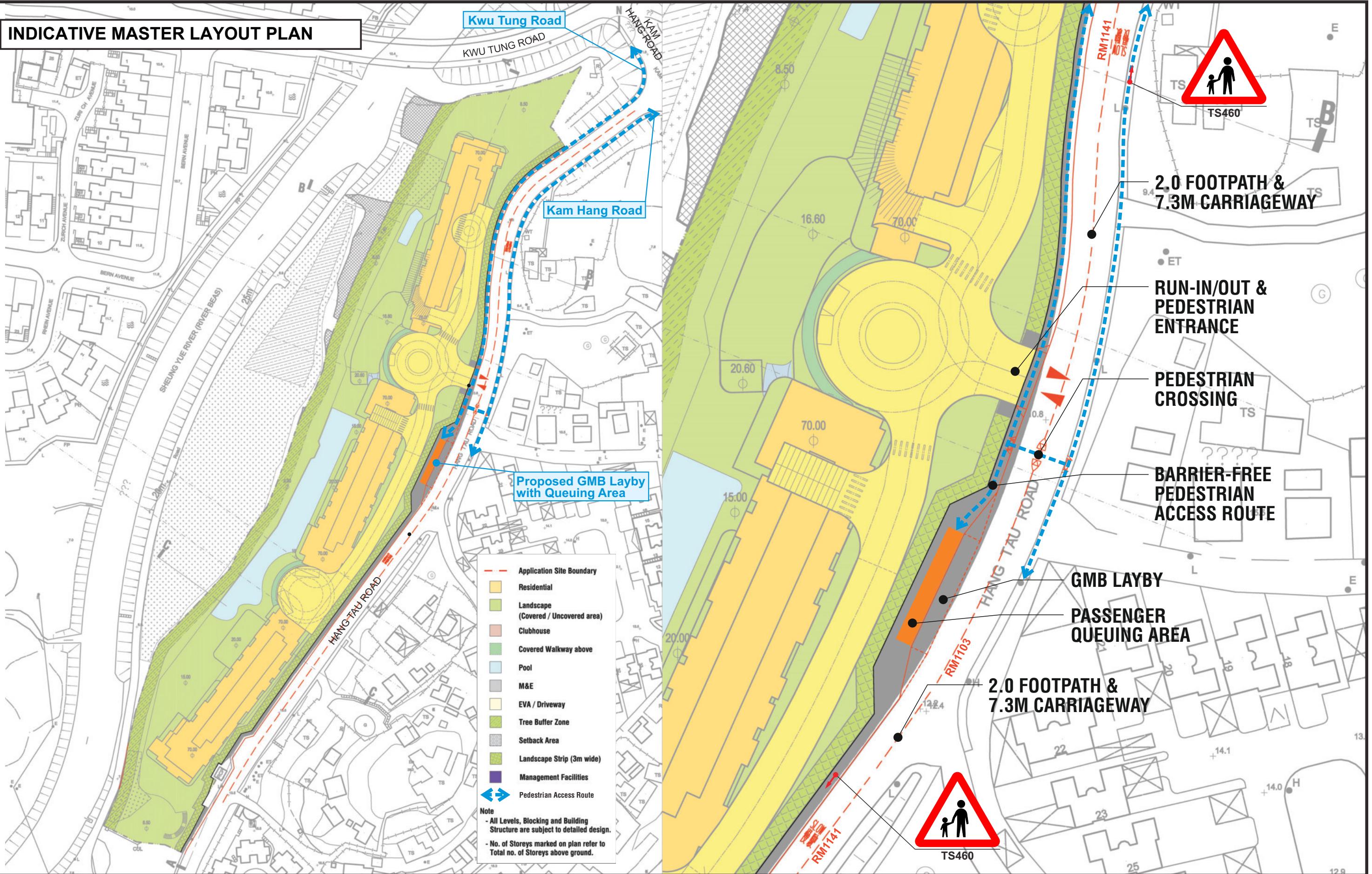
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B	TD COMMENTS (S16 SUBMISSION)	LHW	6NOV25
A	TD COMMENTS (PRE-SUBMISSION)	LHW	28AUG25

Rev. Description Checked Date

Project Title: SECTION 16 PLANNING APPLICATION FOR PROPOSED RESIDENTIAL DEVELOPMENT WITH MINOR RELAXATION OF PLOT RATIO RESTRICTION AT LOTS 1027, 1029, 1030, 1034A, 1034B, 1039 (PART), 1040, 1042 RP, 1043 RP, 1044 RP (PART), 1045, 1047, 2233 (PART), 2251 S.A RP, 2256 RP, 2315 (PART) AND 2316 RP (PART) IN D.D. 92 AND ADJOINING GOVERNMENT LAND (NEW LOT TO BE KNOWN AS LOT 2644 IN D.D. 92), KWU TUNG SOUTH, SHEUNG SHUI, NEW TERRITORIES

Designed	TSO	Checked	LHW	Scale	NTS	Date	JUN 2025	Drawing No.	3.1	Rev.	B
MASTER LAYOUT PLAN											

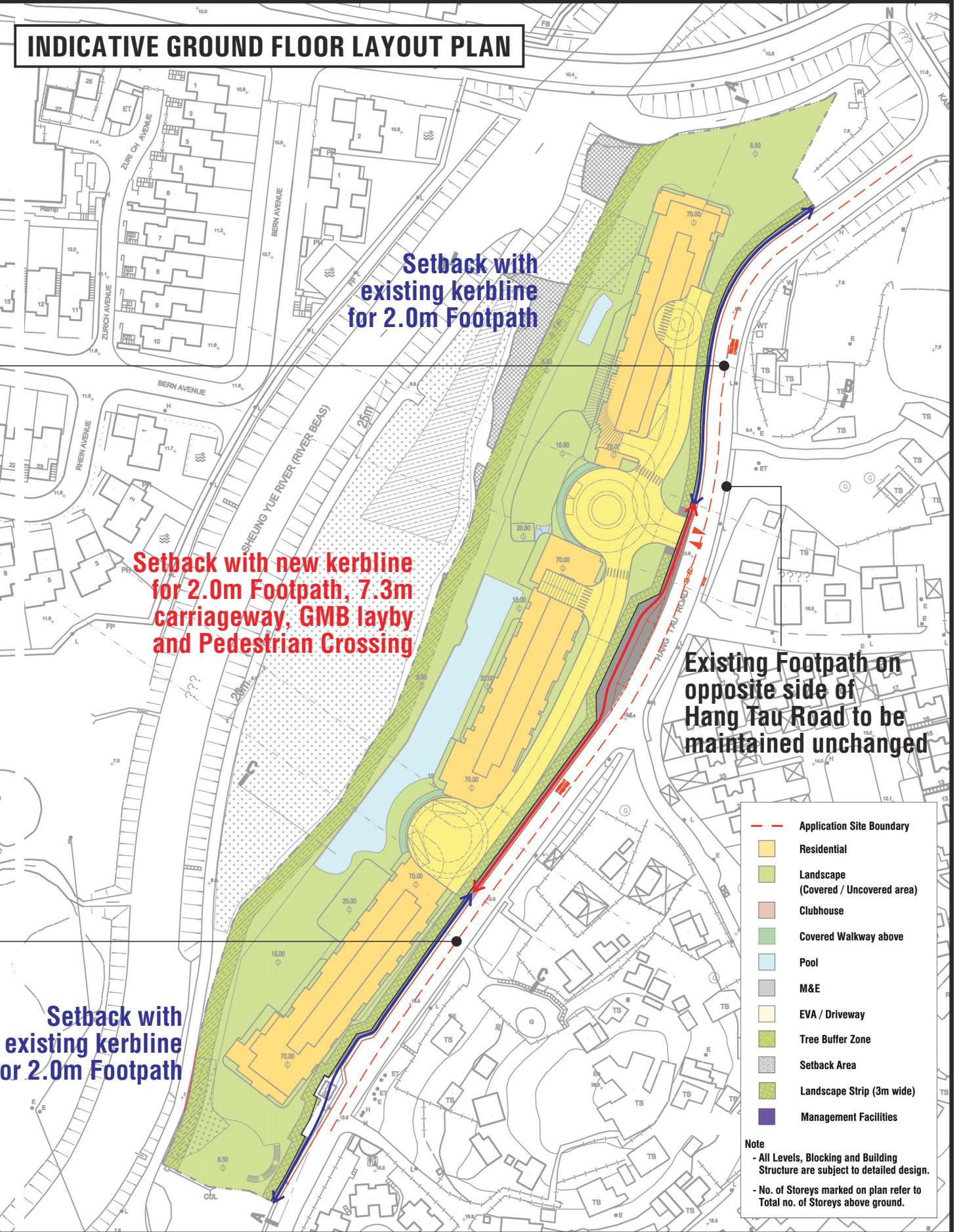
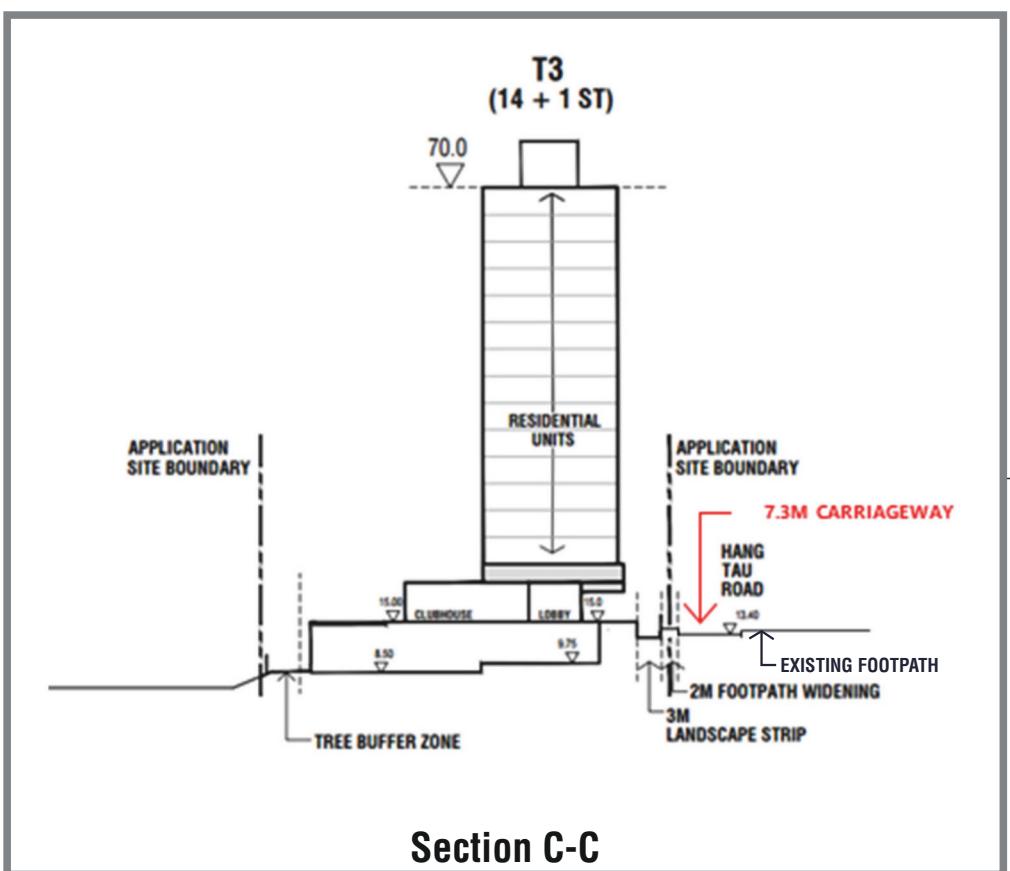
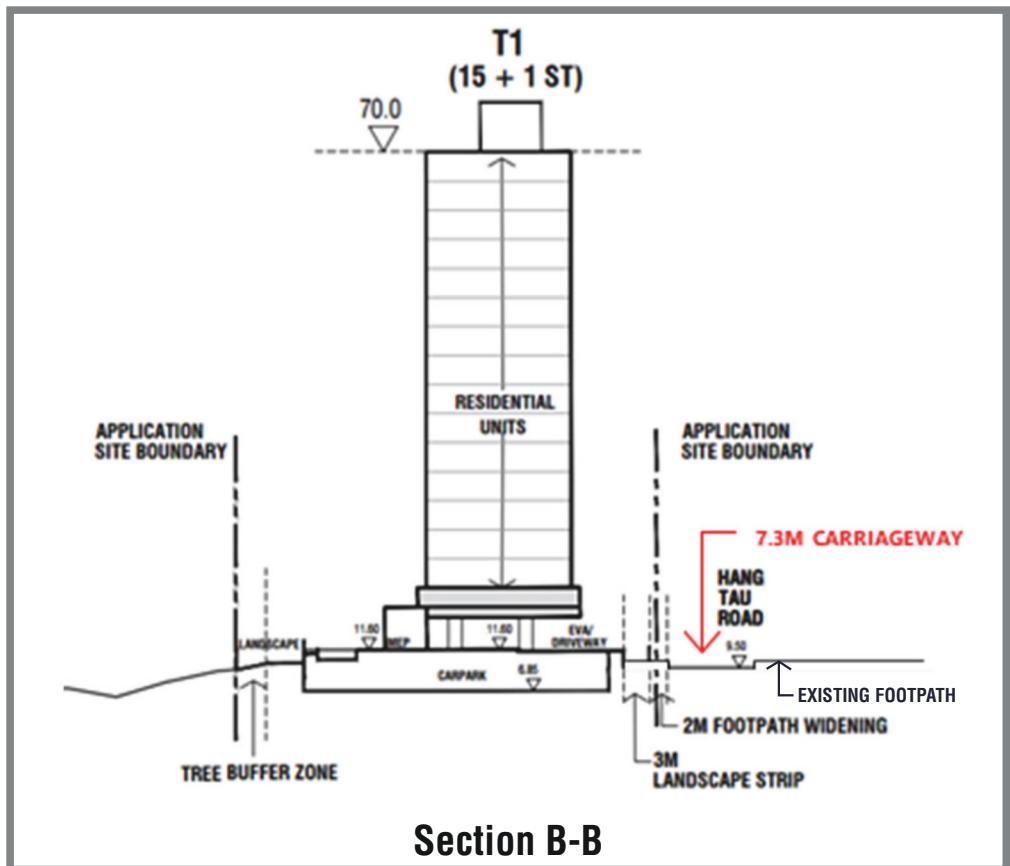
SYSTRA
MVA



-	-	-	-
-	-	-	-
B	TD COMMENTS (S16 SUBMISSION)	LHW	10NOV25
A	TD COMMENTS (PRE-SUBMISSION)	LHW	28AUG25

Project Title
SECTION 16 PLANNING APPLICATION FOR PROPOSED RESIDENTIAL DEVELOPMENT WITH MINOR RELAXATION OF PLOT RATIO RESTRICTION AT LOTS 1027, 1029, 1030, 1034A, 1034B, 1039 (PART), 1040, 1042 RP, 1043 RP, 1044 RP (PART), 1045, 1047, 2233 (PART), 2251 S.A RP, 2256 RP, 2315 (PART) AND 2316 RP (PART) IN D.D. 92 AND ADJOINING GOVERNMENT LAND (NEW LOT TO BE KNOWN AS LOT 2644 IN D.D. 92), KWU TUNG SOUTH, SHEUNG SHUI, NEW TERRITORIES

Rev.	Description	Checked	Date	Designed	TSO	Checked	LHW	Scale	NTS	Date	JUN 2025	Drawing No.	3.2	Rev.
														B



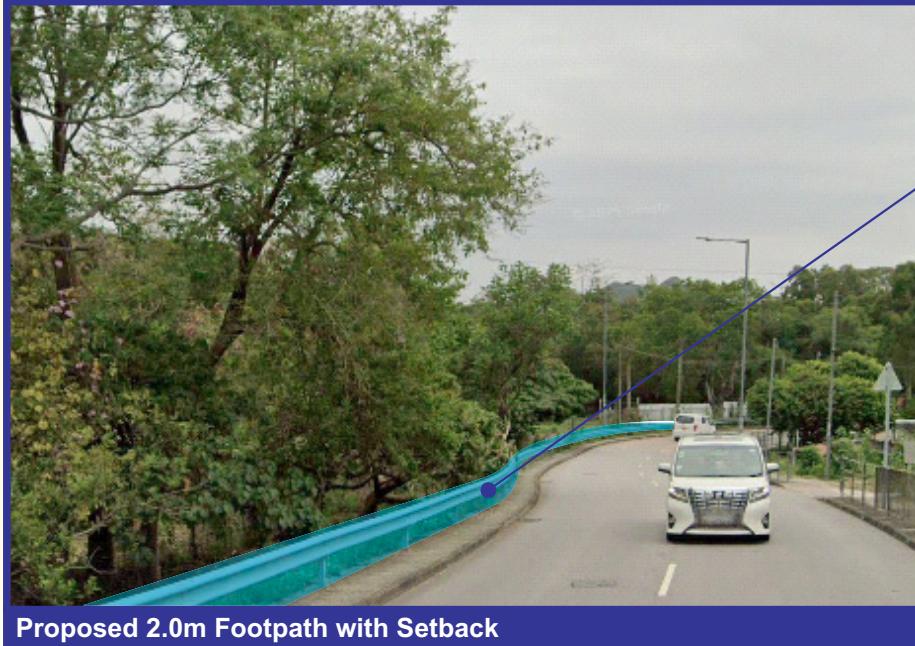
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Rev.	Description	Checked	Date

Project Title SECTION 16 PLANNING APPLICATION FOR PROPOSED RESIDENTIAL DEVELOPMENT WITH MINOR RELAXATION OF PLOT RATIO RESTRICTION AT LOTS 1027, 1029, 1030, 1034A, 1034B, 1039 (PART), 1040, 1042 RP, 1043 RP, 1044 RP (PART), 1045, 1047, 2233 (PART), 2251 S.A RP, 2256 RP, 2315 (PART) AND 2316 RP (PART) IN D.D. 92 AND ADJOINING GOVERNMENT LAND (NEW LOT TO BE KNOWN AS LOT 2644 IN D.D. 92), KWU TUNG SOUTH, SHEUNG SHUI, NEW TERRITORIES

Drawing Title	PROPOSED EXTENT OF ROAD IMPROVEMENT WORKS AT HANG TAU ROAD							SYSTRA MVA
Designed	TSO	Checked	LHW	Scale	NTS	Date	NOV 2025	Drawing No. 3.3 Rev. -



Existing Footpath with effective width 1.0m (excluding railing & street furniture)



Proposed 2.0m Footpath with Setback



Existing Footpath with effective width 1.0m (excluding railing & street furniture)



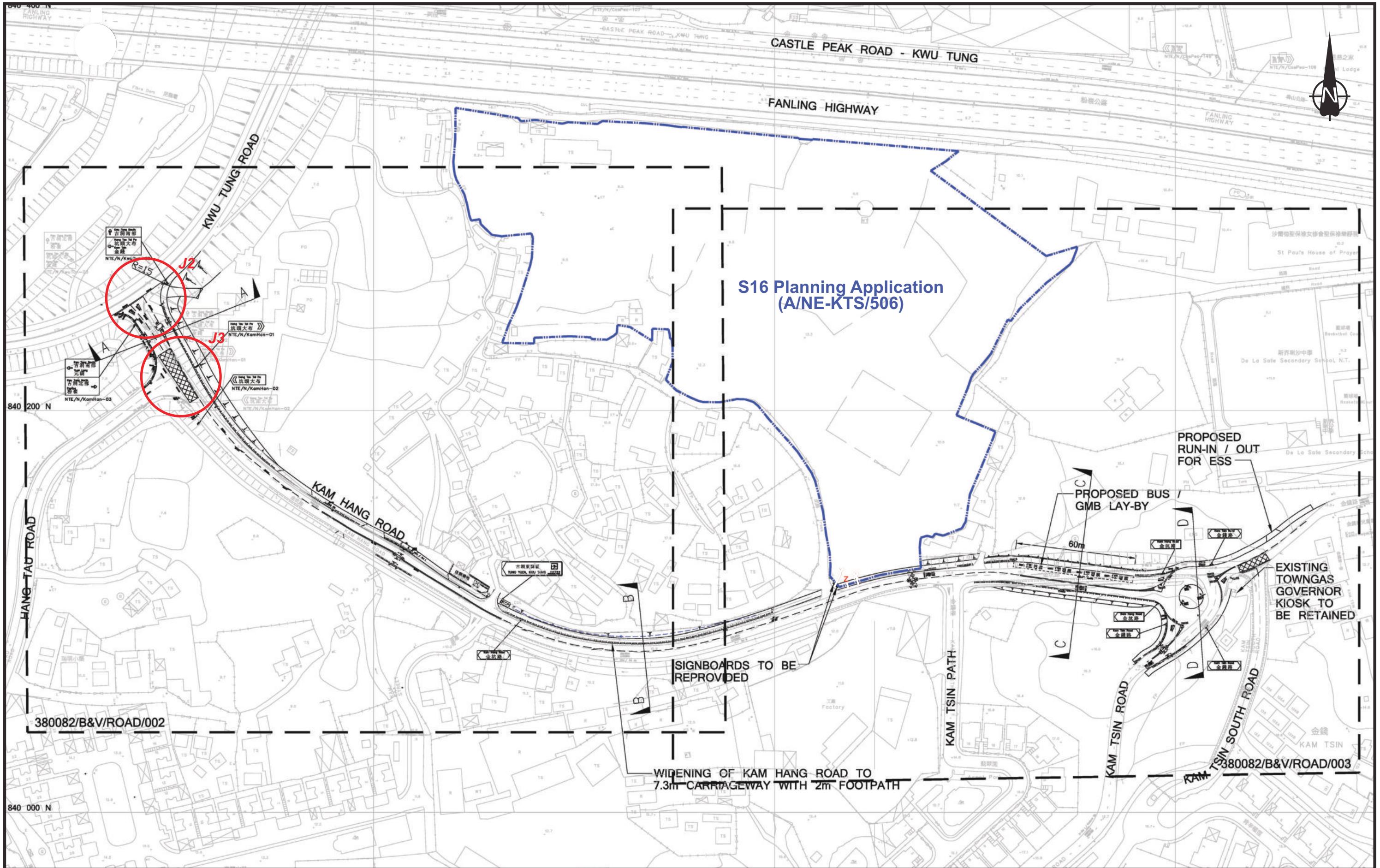
Existing Footpath with effective width 1.0m (excluding railing & street furniture)

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-	-	-	-
-	-	-	-
-	-	-	-
Rev.	Description	Checked	Date

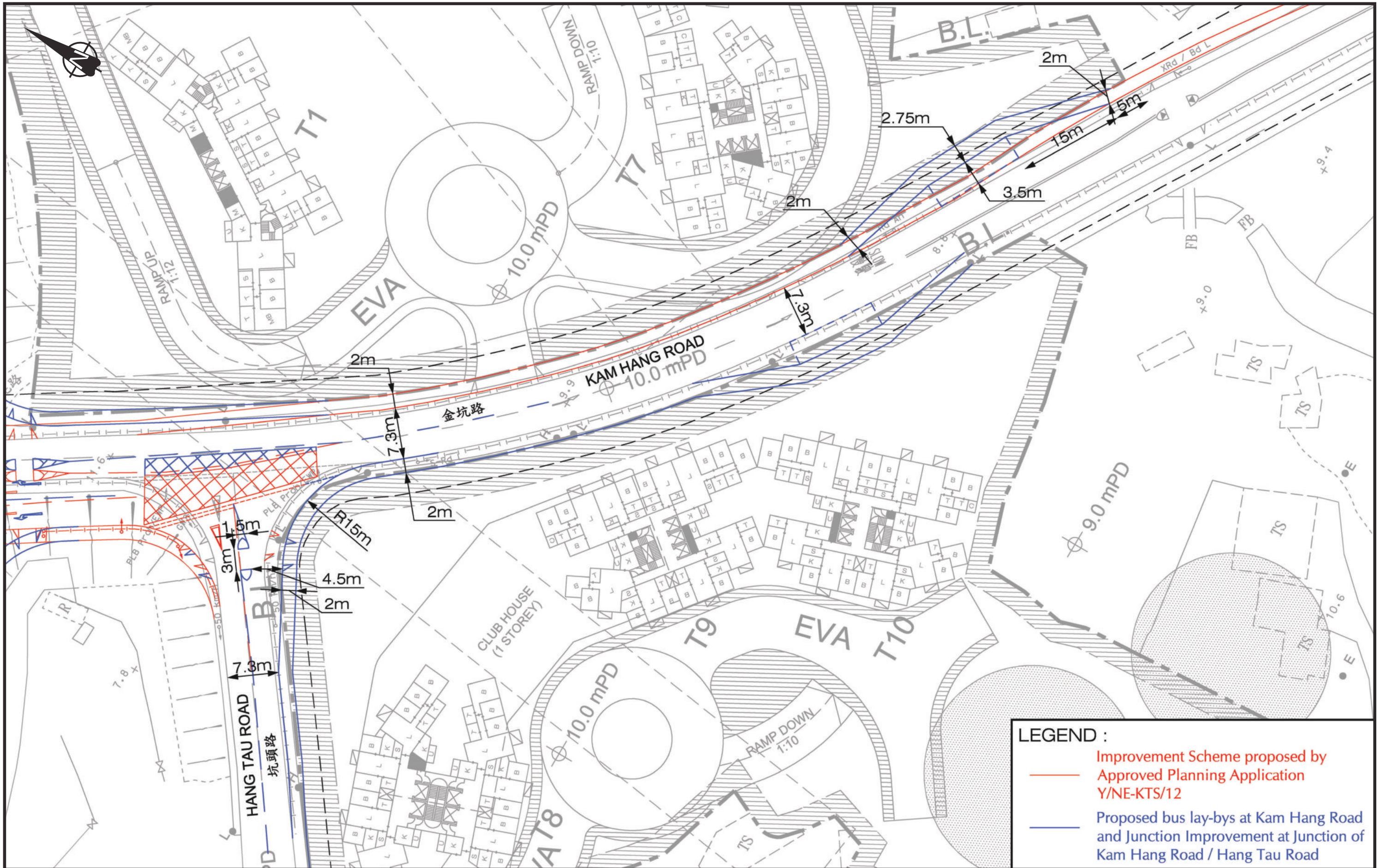
Project Title
**SECTION 16 PLANNING APPLICATION FOR PROPOSED
 RESIDENTIAL DEVELOPMENT WITH MINOR RELAXATION OF PLOT RATIO
 RESTRICTION AT LOTS 1027, 1029, 1030, 1034A, 1034B, 1039 (PART),
 1040, 1042 RP, 1043 RP, 1044 RP (PART), 1045, 1047, 2233 (PART),
 2251 S.A RP, 2256 RP, 2315 (PART) AND 2316 RP (PART) IN D.D. 92
 AND ADJOINING GOVERNMENT LAND (NEW LOT TO BE KNOWN AS
 LOT 2644 IN D.D. 92), KWU TUNG SOUTH, SHEUNG SHUI,
 NEW TERRITORIES**

Drawing Title								Drawing No.	Rev.
Designed	TSO	Checked	LHW	Scale	NTS	Date			
						NOV 2025	3.4		

**EXISTING AND PROPOSED FOOTPATH WIDTHS
 ALONG HANG TAU ROAD**



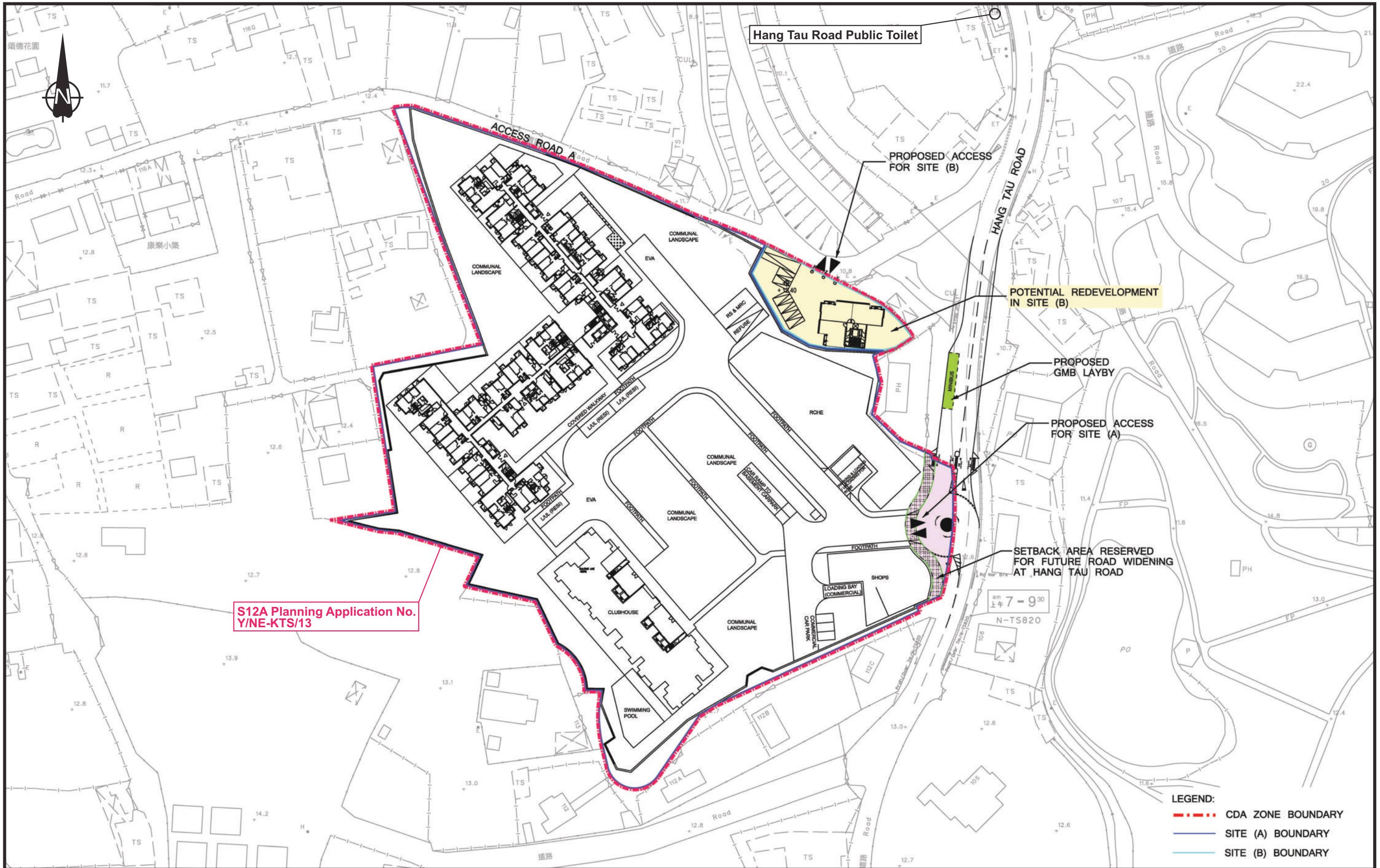
-	-	-	-	Project Title		Drawing Title						SYSTRA MVA	
-	-	-	-	PROPOSED ROAD IMPROVEMENT WORKS BY OTHERS AT KAM HANG ROAD (A/NE-KTS/506)									
A	TD COMMENTS (PRE-SUBMISSION)	LHW	25JUL25	Designed	TSO	Checked	LHW	Scale	NTS	Date	JUN 2025	Drawing No. 4.1	Rev. A
Rev.	Description	Checked	Date										



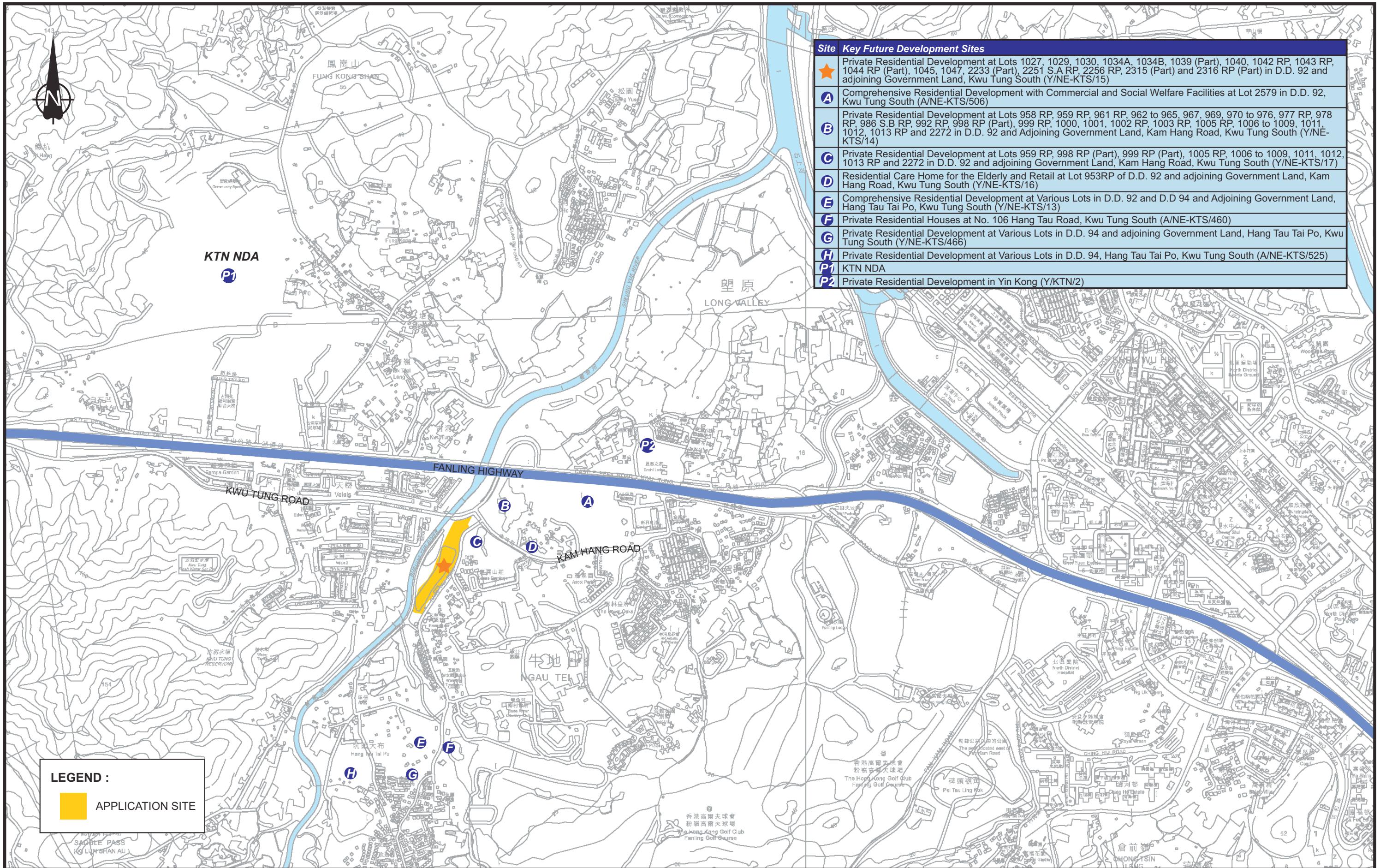
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Rev.	Description	Checked	Date

Project Title
SECTION 16 PLANNING APPLICATION FOR PROPOSED RESIDENTIAL DEVELOPMENT WITH MINOR RELAXATION OF PLOT RATIO RESTRICTION AT LOTS 1027, 1029, 1030, 1034A, 1034B, 1039 (PART), 1040, 1042 RP, 1043 RP, 1044 RP (PART), 1045, 1047, 2233 (PART), 2251 S.A RP, 2256 RP, 2315 (PART) AND 2316 RP (PART) IN D.D. 92 AND ADJOINING GOVERNMENT LAND (NEW LOT TO BE KNOWN AS LOT 2644 IN D.D. 92), KWU TUNG SOUTH, SHEUNG SHUI, NEW TERRITORIES

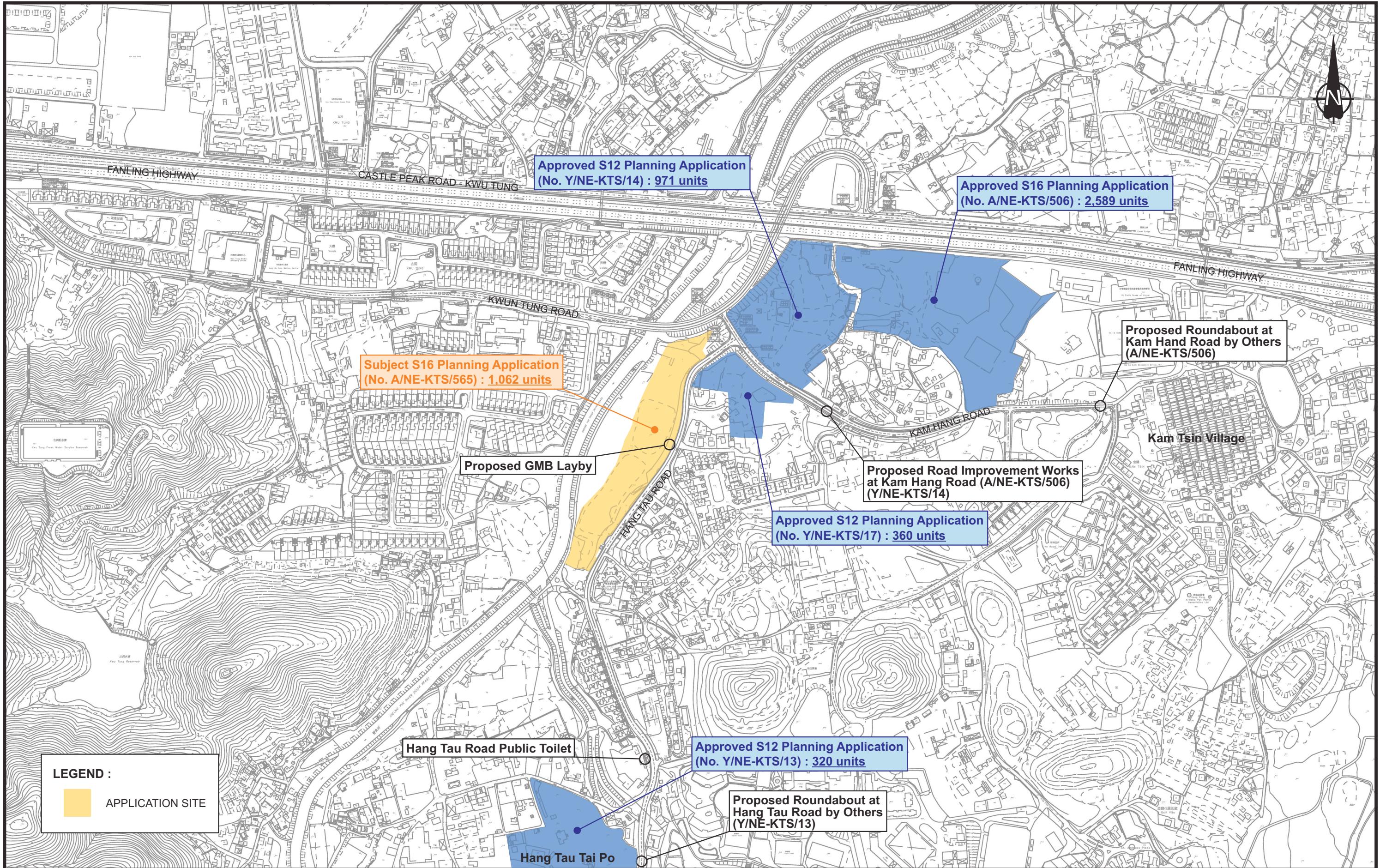
Drawing Title	PROPOSED ROAD IMPROVEMENT WORKS BY OTHERS AT KAM HANG ROAD (Y/NE-KTS/14)							SYSTRA MVA
Designed	TSO	Checked	LHW	Scale	NTS	Date	JUN 2025	Drawing No. 4.2 Rev. A



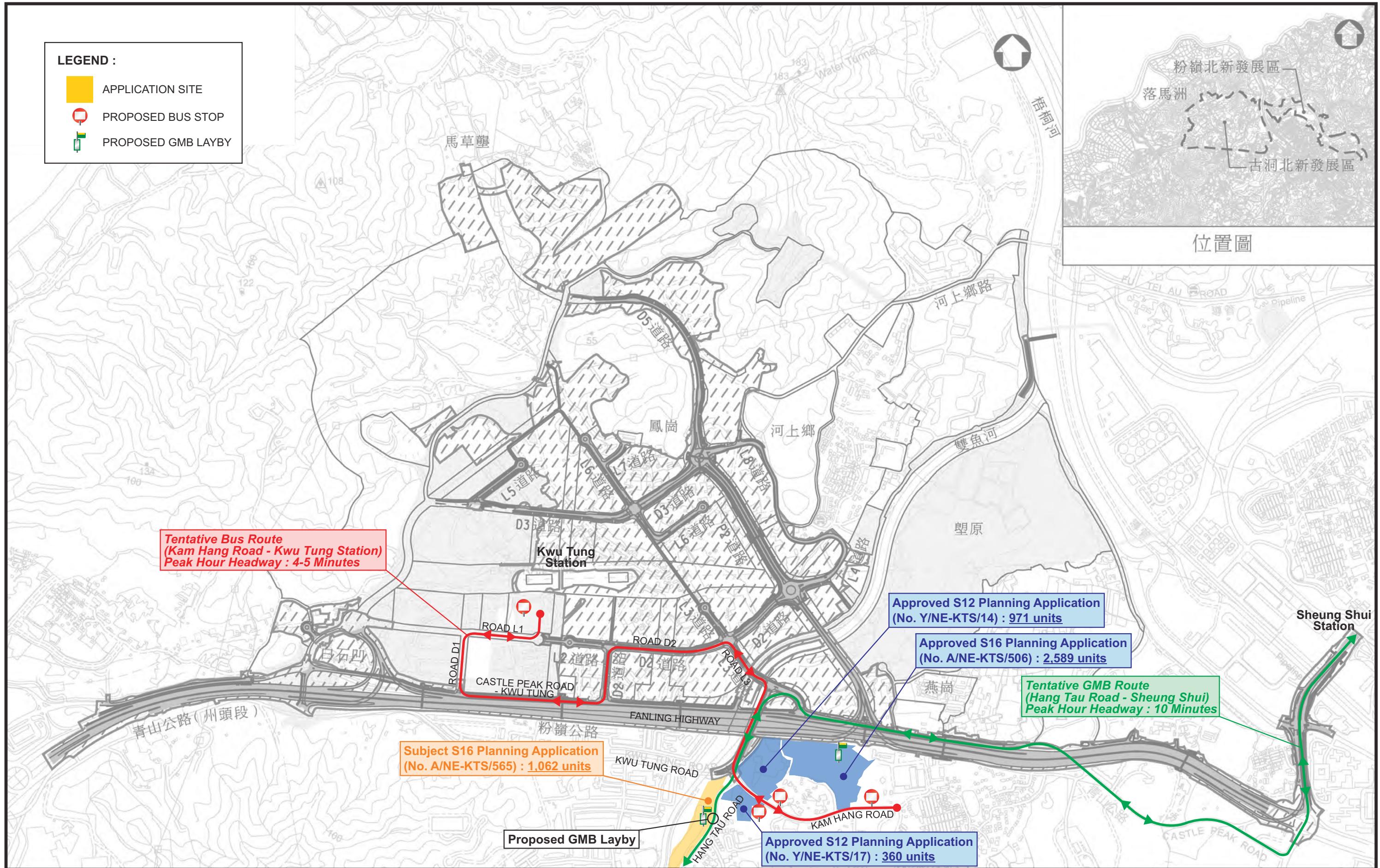
-	-	-	-	Project Title	Drawing Title	PROPOSED ROAD IMPROVEMENT WORKS BY OTHERS AT HANG TAU ROAD (Y/NE-KTS/13)					SYSTRA MVA					
-	-	-	-	SECTION 16 PLANNING APPLICATION FOR PROPOSED RESIDENTIAL DEVELOPMENT WITH MINOR RELAXATION OF PLOT RATIO RESTRICTION AT LOTS 1027, 1029, 1030, 1034A, 1034B, 1039 (PART), 1040, 1042 RP, 1043 RP, 1044 RP (PART), 1045, 1047, 2233 (PART), 2251 S.A RP, 2256 RP, 2315 (PART) AND 2316 RP (PART) IN D.D. 92 AND ADJOINING GOVERNMENT LAND (NEW LOT TO BE KNOWN AS LOT 2644 IN D.D. 92), KWU TUNG SOUTH, SHEUNG SHUI, NEW TERRITORIES	Designed	TSO	Checked	LHW	Scale	NTS	Date	JUN 2025	Drawing No.	4.3	Rev.	-
Rev.	Description	Checked	Date													



Project Title	Drawing Title										SYSTRA MVA			
PLANNED / COMMITTED DEVELOPMENTS IN NENT														
Rev.	Description	Checked	Date	Designed	TSO	Checked	LHW	Scale	NTS	Date	JUN 2025	Drawing No.	4.4	Rev.
-	-	-	-	SECTION 16 PLANNING APPLICATION FOR PROPOSED RESIDENTIAL DEVELOPMENT WITH MINOR RELAXATION OF PLOT RATIO RESTRICTION AT LOTS 1027, 1029, 1030, 1034A, 1034B, 1039 (PART), 1040, 1042 RP, 1043 RP, 1044 RP (PART), 1045, 1047, 2233 (PART), 2251 S.A RP, 2256 RP, 2315 (PART) AND 2316 RP (PART) IN D.D. 92 AND ADJOINING GOVERNMENT LAND (NEW LOT TO BE KNOWN AS LOT 2644 IN D.D. 92), KWU TUNG SOUTH, SHEUNG SHUI, NEW TERRITORIES	-	-	-	-	-	-	-	-	-	-



-	-	-	-	Project Title	Drawing Title	FUTURE ROAD IMPROVEMENT WORKS IN KWU TUNG SOUTH	SYSTRA MVA
-	-	-	-	SECTION 16 PLANNING APPLICATION FOR PROPOSED RESIDENTIAL DEVELOPMENT WITH MINOR RELAXATION OF PLOT RATIO RESTRICTION AT LOTS 1027, 1029, 1030, 1034A, 1034B, 1039 (PART), 1040, 1042 RP, 1043 RP, 1044 RP (PART), 1045, 1047, 2233 (PART), 2251 S.A RP, 2256 RP, 2315 (PART) AND 2316 RP (PART) IN D.D. 92 AND ADJOINING GOVERNMENT LAND (NEW LOT TO BE KNOWN AS LOT 2644 IN D.D. 92), KWU TUNG SOUTH, SHEUNG SHUI, NEW TERRITORIES	Designed TSO Checked LHW Scale NTS Date JUN 2025 Drawing No. 5.1 Rev. A		
A	TD COMMENTS (S16 SUBMISSION)	LHW	19NOV25				
Rev. Description	Checked	Date					



-	-	-	-
-	-	-	-
B	TD COMMENTS (S16 SUBMISSION)	LHW	19NOV25
A	TD COMMENTS (PRE-SUBMISSION)	LHW	25JUL25

Rev. Description Checked Date

Project Title
SECTION 16 PLANNING APPLICATION FOR PROPOSED
RESIDENTIAL DEVELOPMENT WITH MINOR RELAXATION OF PLOT RATIO
RESTRICTION AT LOTS 1027, 1029, 1030, 1034A, 1034B, 1039 (PART),
1040, 1042 RP, 1043 RP, 1044 RP (PART), 1045, 1047, 2233 (PART),
2251 S.A RP, 2256 RP, 2315 (PART) AND 2316 RP (PART) IN D.D. 92
AND ADJOINING GOVERNMENT LAND (NEW LOT TO BE KNOWN AS
LOT 2644 IN D.D. 92), KWU TUNG SOUTH, SHEUNG SHUI,
NEW TERRITORIES

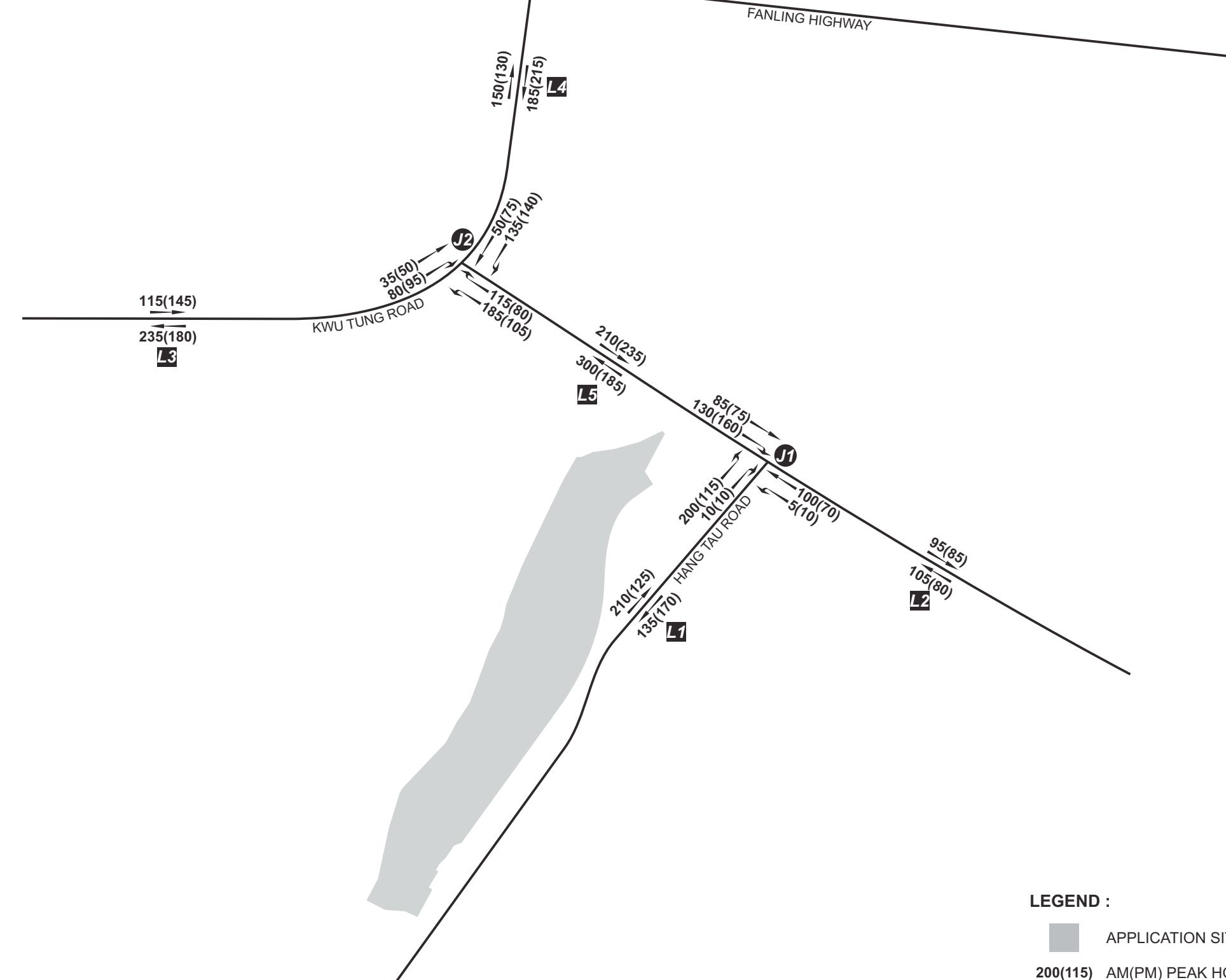
Drawing Title
PROPOSED ENHANCEMENT TO PUBLIC TRANSPORT SERVICES

Designed	TSO	Checked	LHW	Scale	NTS	Date	JUN 2025	Drawing No.	5.2	Rev.	B
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SYSTRA
MVA

ANNEX A

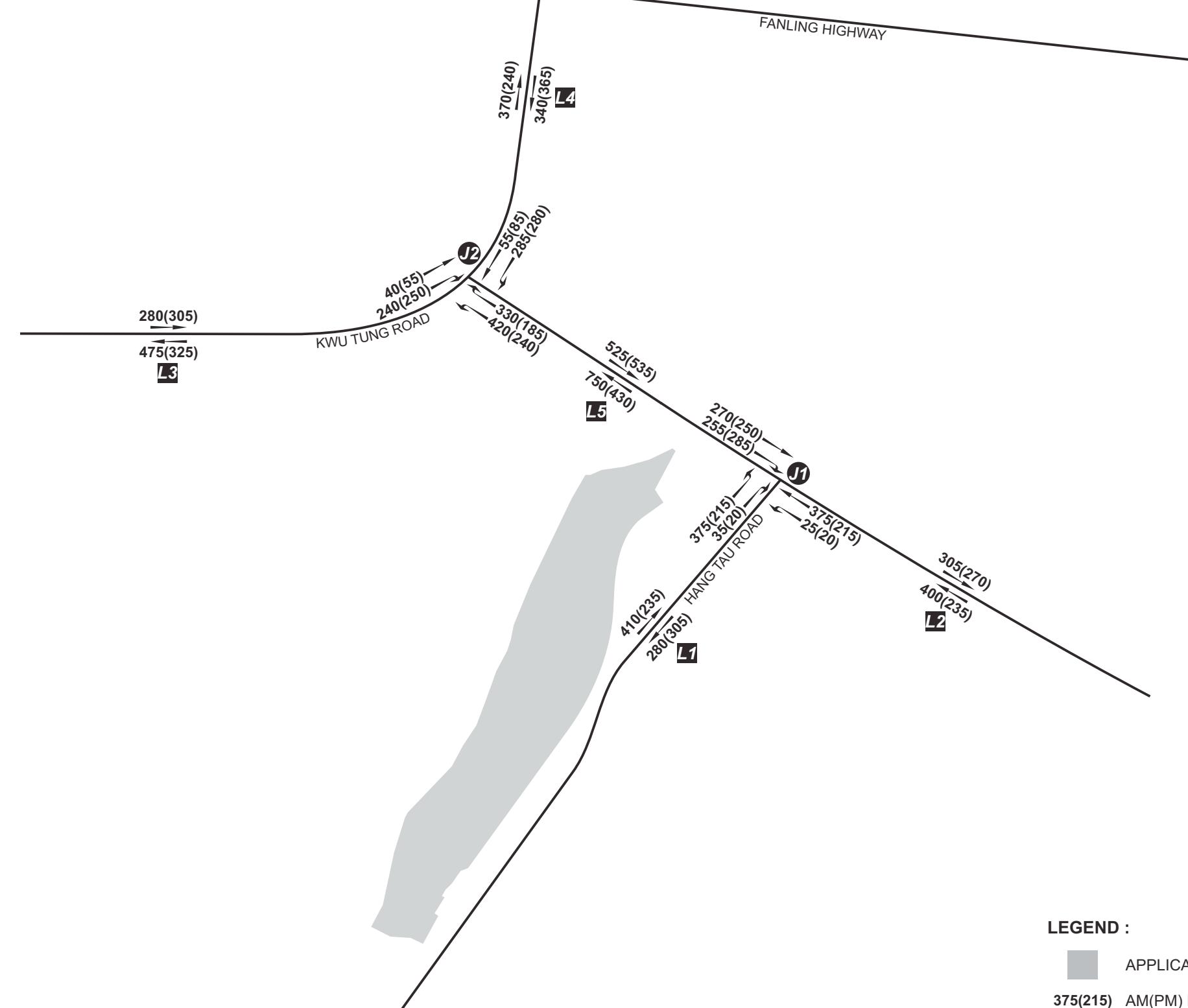
Traffic Flows

**LEGEND :**

APPLICATION SITE

200(115) AM(PM) PEAK HOUR TRAFFIC FLOWS (PCU/HR)

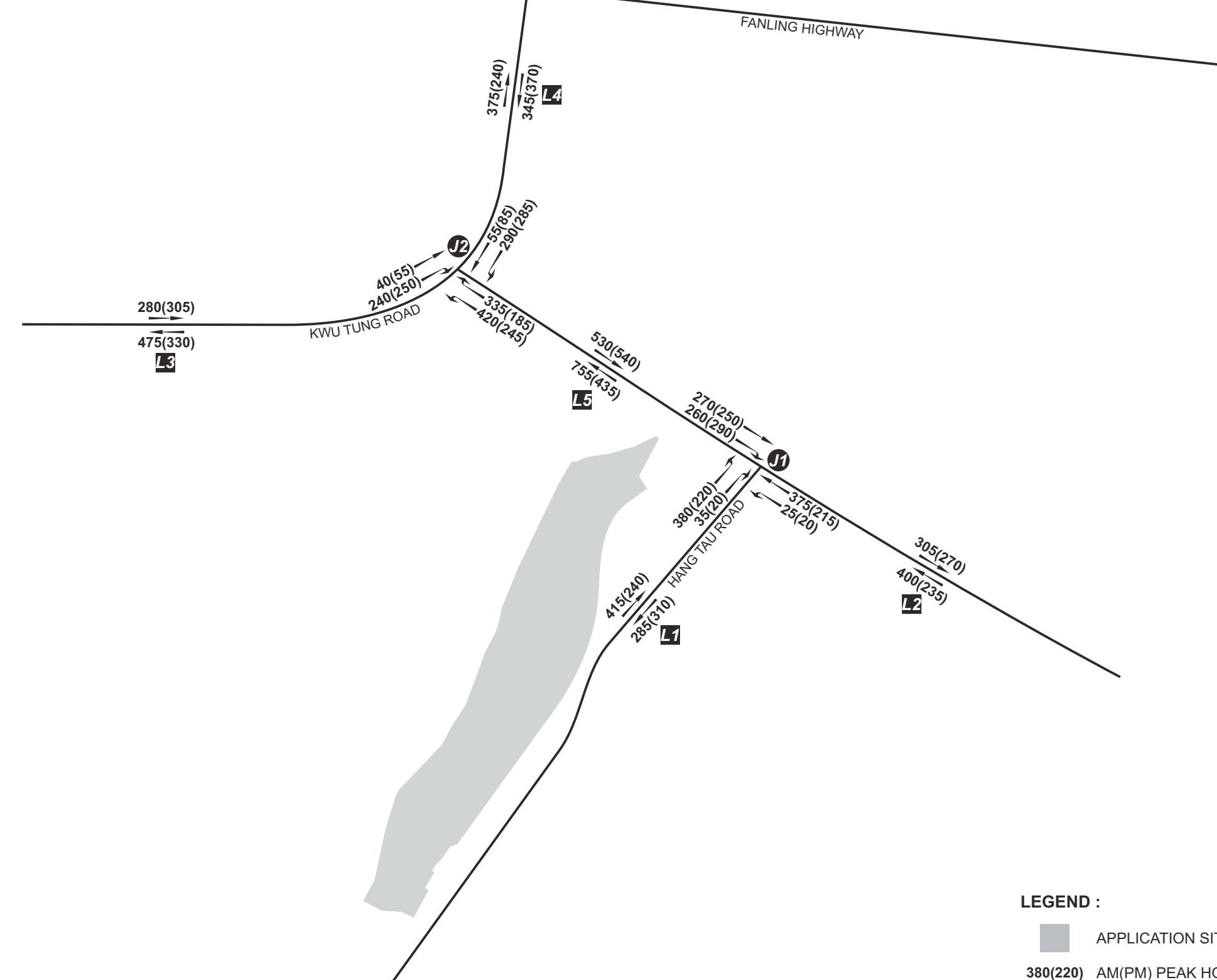
-	-	-	-	Project Title SECTION 16 PLANNING APPLICATION FOR PROPOSED RESIDENTIAL DEVELOPMENT WITH MINOR RELAXATION OF PLOT RATIO RESTRICTION AT LOTS 1027, 1029, 1030, 1034A, 1034B, 1039 (PART), 1040, 1042 RP, 1043 RP, 1044 RP (PART), 1045, 1047, 2233 (PART), 2251 S.A RP, 2256 RP, 2315 (PART) AND 2316 RP (PART) IN D.D. 92 AND ADJOINING GOVERNMENT LAND (NEW LOT TO BE KNOWN AS LOT 2644 IN D.D. 92), KWU TUNG SOUTH, SHEUNG SHUI, NEW TERRITORIES	Drawing Title 2024 OBSERVED TRAFFIC FLOWS	
Rev.	Description	Checked	Date	Designed TSO Checked LHW Scale NTS Date NOV 2024 Drawing No. ANNEX A1	Rev. -	
CHK50793310/TIA/AA1.CDR/LLH/4NOV24						
					Original Size : A3	

**LEGEND :**

APPLICATION SITE

375(215) AM(PM) PEAK HOUR TRAFFIC FLOWS (PCU/HR)

-	-	-	-	-	Project Title SECTION 16 PLANNING APPLICATION FOR PROPOSED RESIDENTIAL DEVELOPMENT WITH MINOR RELAXATION OF PLOT RATIO RESTRICTION AT LOTS 1027, 1029, 1030, 1034A, 1034B, 1039 (PART), 1040, 1042 RP, 1043 RP, 1044 RP (PART), 1045, 1047, 2233 (PART), 2251 S.A RP, 2256 RP, 2315 (PART) AND 2316 RP (PART) IN D.D. 92 AND ADJOINING GOVERNMENT LAND (NEW LOT TO BE KNOWN AS LOT 2644 IN D.D. 92), KWU TUNG SOUTH, SHEUNG SHUI, NEW TERRITORIES	Drawing Title 2035 REFERENCE TRAFFIC FLOWS	Drawing No. ANNEX A2 Rev. -								
-	-	-	-	-			Designed	TSO	Checked	LHW	Scale	NTS	Date	NOV 2024	
-	-	-	-	-											
-	-	-	-	-											
-	-	-	-	-											
Rev.	Description	Checked	Date												

**LEGEND :**

APPLICATION SITE

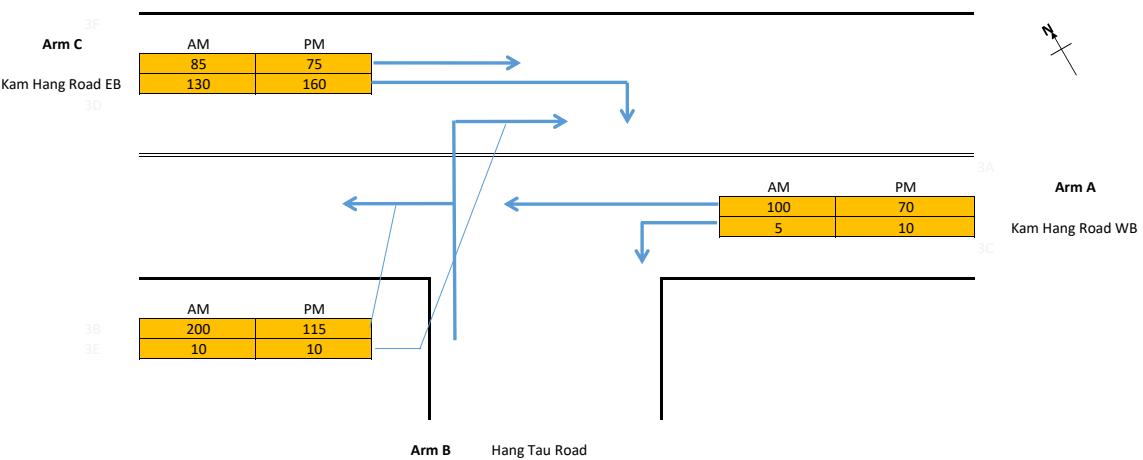
380(220) AM(PM) PEAK HOUR TRAFFIC FLOWS (PCU/HR)

-	-	-	-	Project Title SECTION 16 PLANNING APPLICATION FOR PROPOSED RESIDENTIAL DEVELOPMENT WITH MINOR RELAXATION OF PLOT RATIO RESTRICTION AT LOTS 1027, 1029, 1030, 1034A, 1034B, 1039 (PART), 1040, 1042 RP, 1043 RP, 1044 RP (PART), 1045, 1047, 2233 (PART), 2251 S.A RP, 2256 RP, 2315 (PART) AND 2316 RP (PART) IN D.D. 92 AND ADJOINING GOVERNMENT LAND (NEW LOT TO BE KNOWN AS LOT 2644 IN D.D. 92), KWU TUNG SOUTH, SHEUNG SHUI, NEW TERRITORIES	Drawing Title 2035 DESIGN TRAFFIC FLOWS	
Rev.	Description	Checked	Date	Designed TSO Checked LHW Scale NTS Date NOV 2024 Drawing No. ANNEX A3 Rev. -		
CHK50793310/TIA/AA3.CDR/LLH/4NOV24					Original Size : A3	

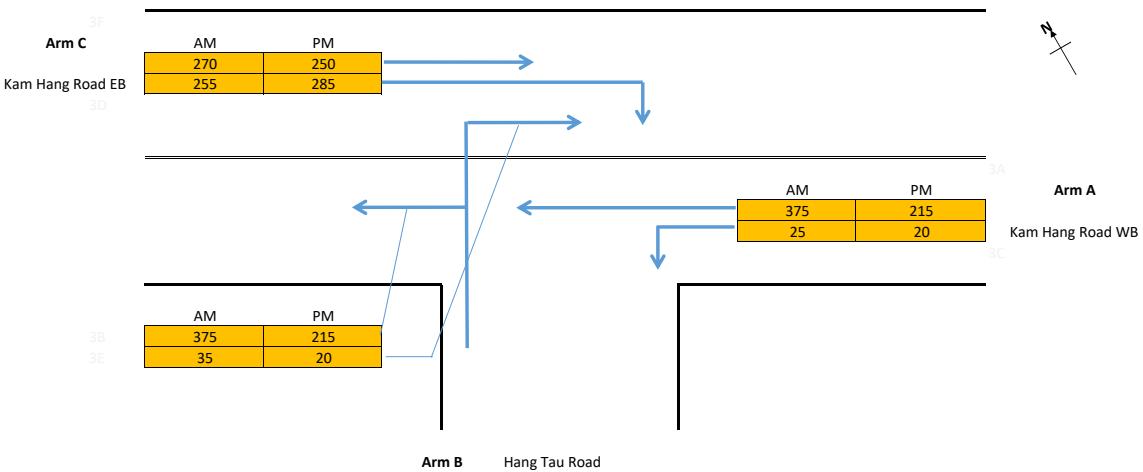
ANNEX B

Calculation Details

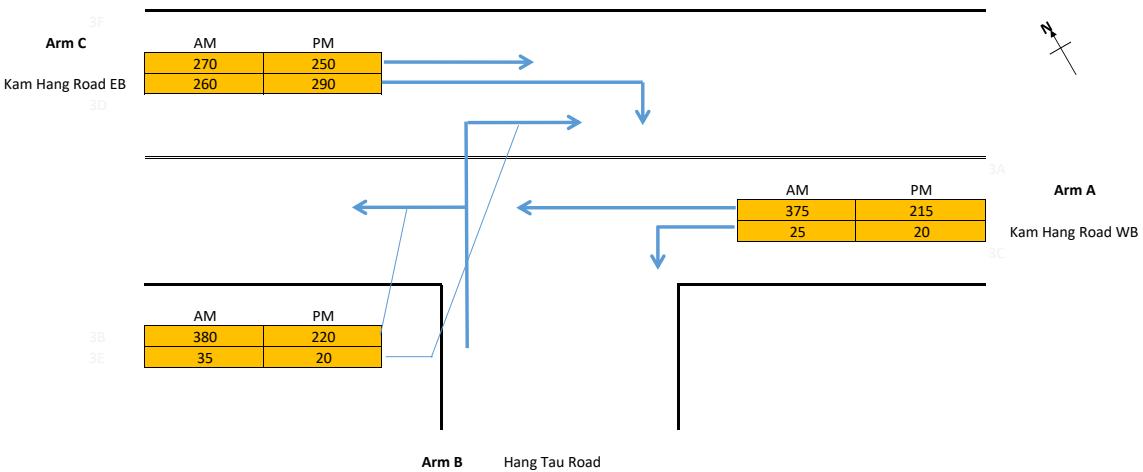
Simplified Priority Junction Capacity Calculation

Job Title: Section 16 Planning Application for Proposed Residential Development with Minor Relaxation of Plot Ratio Restriction at Lots 1027, 1029, 1030, 1034A, 1034B, 1039 (Part), 1040, 1042 RP, 1043 RP, 1044 RP (Part), 1045, 1047, 2233 (Part), 2251 S.A RP, 2256 RP, 2315 (Part) and 2316 RP (Part) in D.D. 92 and Adjoining Government Land (New Lot to be known as Lot 2644 in D.D. 92), Kwu Tung South, Sheung Shui, New Territories		Designed by: TSO																								
Junction: (J1) Kam Hang Road / Hang Tau Road	Checked by: LHW																									
Scheme: Existing		Date: Nov-25																								
Design Year: 2024	Job No.: CHK50793310																									
Arm A: Kam Hang Road WB																										
Arm B: Hang Tau Road																										
Arm C: Kam Hang Road EB																										
																										
GEOMETRY																										
Major Road Width (m)	W	6.60																								
Central Reserve Width (m)	W _{cr}	0.00																								
Blockage of major road right turn	Y/N?	Y																								
Combined stream on minor arm	Y/N?	Y																								
Visibility Distances (m)	V _{r(b-a)}	50																								
	V _{l(b-a)}	30																								
	V _{r(b-c)}	50																								
	V _{r(c-b)}	80																								
ANALYSIS																										
TRAFFIC FLOWS (pcu/hr)		<table> <thead> <tr> <th></th><th>AM PEAK</th><th>PM PEAK</th></tr> </thead> <tbody> <tr> <td>q(c-a)</td><td>85</td><td>75</td></tr> <tr> <td>q(c-b)</td><td>130</td><td>160</td></tr> <tr> <td>q(a-b)</td><td>5</td><td>10</td></tr> <tr> <td>q(a-c)</td><td>100</td><td>70</td></tr> <tr> <td>q(b-a)</td><td>10</td><td>10</td></tr> <tr> <td>q(b-c)</td><td>200</td><td>115</td></tr> <tr> <td>f</td><td>0.95</td><td>0.92</td></tr> </tbody> </table>		AM PEAK	PM PEAK	q(c-a)	85	75	q(c-b)	130	160	q(a-b)	5	10	q(a-c)	100	70	q(b-a)	10	10	q(b-c)	200	115	f	0.95	0.92
	AM PEAK	PM PEAK																								
q(c-a)	85	75																								
q(c-b)	130	160																								
q(a-b)	5	10																								
q(a-c)	100	70																								
q(b-a)	10	10																								
q(b-c)	200	115																								
f	0.95	0.92																								
CAPACITIES (pcu/hr)		<table> <thead> <tr> <th></th><th>AM PEAK</th><th>PM PEAK</th></tr> </thead> <tbody> <tr> <td>Q(b-ac)</td><td>615.70329</td><td>599.9528</td></tr> <tr> <td>Q(c-a)</td><td>1449.193</td><td>1372.437</td></tr> <tr> <td>Q(c-b)</td><td>667.03335</td><td>673.5854</td></tr> </tbody> </table>		AM PEAK	PM PEAK	Q(b-ac)	615.70329	599.9528	Q(c-a)	1449.193	1372.437	Q(c-b)	667.03335	673.5854												
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Q(c-b)	667.03335	673.5854																								
RFC's		<table> <thead> <tr> <th></th><th>AM PEAK</th><th>PM PEAK</th></tr> </thead> <tbody> <tr> <td>c-a</td><td>0.06</td><td>0.05</td></tr> <tr> <td>c-b</td><td>0.19</td><td>0.24</td></tr> <tr> <td>b-ac</td><td>0.34</td><td>0.21</td></tr> </tbody> </table>		AM PEAK	PM PEAK	c-a	0.06	0.05	c-b	0.19	0.24	b-ac	0.34	0.21												
	AM PEAK	PM PEAK																								
c-a	0.06	0.05																								
c-b	0.19	0.24																								
b-ac	0.34	0.21																								
RFC																										
Where V_r and V_l are visibility distances to the left or right of the respective streams $D = (1+0.094(w(b-a)-3.65))(1+0.0009(V_r(b-a)-120))(1+0.0006(V_l(b-a)-150))$ $E = (1+0.094(w(b-c)-3.65))(1+0.0009(V_r(b-c)-120))(1+0.0006(V_l(b-c)-150))$ $F = (1+0.094(wc-b)-3.65))(1+0.0009(V_r(c-b)-120))(1+0.0006(V_l(c-b)-150))$ $Y = 1-0.0345W$ $f = \text{proportion of minor traffic turning left}$ $Q(b-ac) = Q(b-c)*Q(b-a)/(1-f)*Q(b-c)+f*Q(b-a)$																										
Capacity of combined streams																										
<i>All the above formulas are in accordance to T.P.D.M. Volume 2 Chapter 4 Appendix 1</i>																										

Simplified Priority Junction Capacity Calculation

Job Title: Section 16 Planning Application for Proposed Residential Development with Minor Relaxation of Plot Ratio Restriction at Lots 1027, 1029, 1030, 1034A, 1034B, 1039 (Part), 1040, 1042 RP, 1043 RP, 1044 RP (Part), 1045, 1047, 2233 (Part), 2251 S.A RP, 2256 RP, 2315 (Part) and 2316 RP (Part) in D.D. 92 and Adjoining Government Land (New Lot to be known as Lot 2644 in D.D. 92), Kwu Tung South, Sheung Shui, New Territories		Designed by: TSO
Junction: (J1) Kam Hang Road / Hang Tau Road	Scheme: Reference (with Improvement scheme under Y/NE-KTS/12)	Checked by: LHW
Design Year: 2035	Job No.: CHK50793310	Date: Nov-25
Arm A: Kam Hang Road WB		
Arm B: Hang Tau Road		
Arm C: Kam Hang Road EB		
		
GEOMETRY		
Major Road Width (m)	W	10.00
Central Reserve Width (m)	Wcr	0.00
Blockage of major road right turn	Y/N?	Y
Combined stream on minor arm	Y/N?	Y
Visibility Distances (m)	Vr(b-a)	50
	Vl(b-a)	30
	Vr(b-c)	50
	Vr(c-b)	80
Lane widths (m)	w(b-a)	0.00
	w(b-c)	3.30
	w(c-b)	5.00
Calculated Parameters	D	0.5712
	E	0.9062
	F	1.0863
	Y	0.655
ANALYSIS		
TRAFFIC FLOWS (pcu/hr)		
q(c-a)		270
q(c-b)		255
q(a-b)		25
q(a-c)		375
q(b-a)		35
q(b-c)		375
f		0.91
	AM PEAK	PM PEAK
	250	20
CAPACITIES (pcu/hr)		
Q(b-ac)		523.137
Q(c-a)		1149.6
Q(c-b)		705.716
	556.02	1114.6
	748.45	
RFC's		
c-a		0.23
c-b		0.36
b-ac		0.78
	0.22	0.38
	0.42	
RFC		0.78
		0.42
Where Vl and Vr are visibility distances to the left or right of the respective streams $D = (1+0.094(w(b-a)-3.65))(1+0.0009(Vr(b-a)-120))(1+0.0006(Vl(b-a)-150))$ $E = (1+0.094(w(b-c)-3.65))(1+0.0009(Vr(b-c)-120))$ $F = (1+0.094(w(c-b)-3.65))(1+0.0009(Vr(c-b)-120))$ $Y = 1-0.0345W$ f = proportion of minor traffic turning left $Q(b-ac) = Q(b-c)*Q(b-a)/(1-f)*Q(b-c)+f*Q(b-a)$ Capacity of combined streams		
<i>All the above formulas are in accordance to T.P.D.M. Volume 2 Chapter 4 Appendix 1</i>		

Simplified Priority Junction Capacity Calculation

Job Title: Section 16 Planning Application for Proposed Residential Development with Minor Relaxation of Plot Ratio Restriction at Lots 1027, 1029, 1030, 1034A, 1034B, 1039 (Part), 1040, 1042 RP, 1043 RP, 1044 RP (Part), 1045, 1047, 2233 (Part), 2251 S.A RP, 2256 RP, 2315 (Part) and 2316 RP (Part) in D.D. 92 and Adjoining Government Land (New Lot to be known as Lot 2644 in D.D. 92), Kwu Tung South, Sheung Shui, New Territories		Designed by: TSO																																														
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Simplified Priority Junction Capacity Calculation

Job Title: Section 16 Planning Application for Proposed Residential Development with Minor Relaxation of Plot Ratio Restriction at Lots 1027, 1029, 1030, 1034A, 1034B, 1039 (Part), 1040, 1042 RP, 1043 RP, 1044 RP (Part), 1045, 1047, 2233 (Part), 2251 S.A RP, 2256 RP, 2315 (Part) and 2316 RP (Part) in D.D. 92 and Adjoining Government Land (New Lot to be known as Lot 2644 in D.D. 92), Kwu Tung South, Sheung Shui, New Territories

Junction: (J2) Kwu Tung Road / Kam Hang Road Designed by: TSO

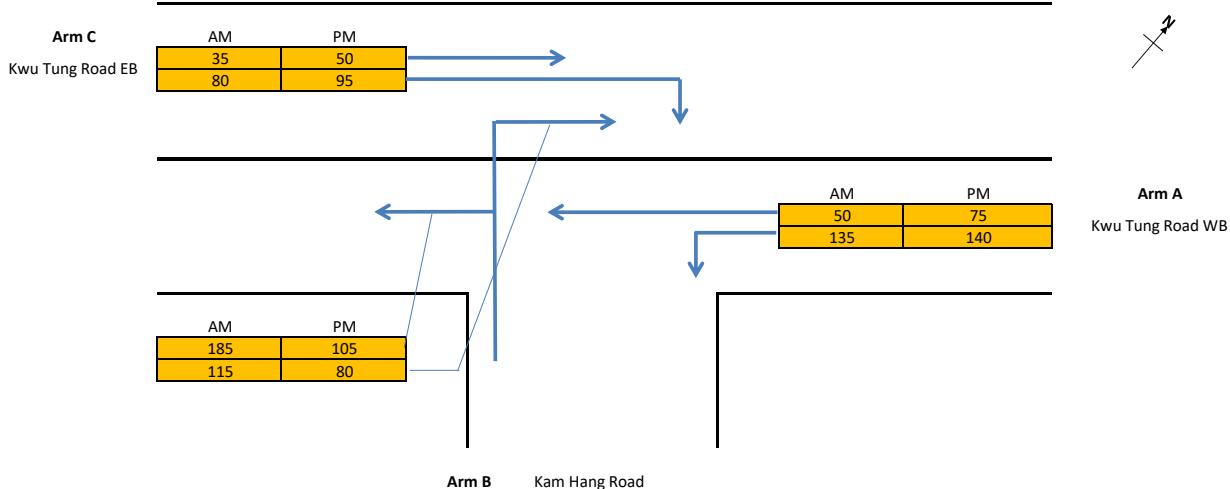
Scheme: Existing Checked by: LHW

Design Year: 2024 Job No.: CHK50793310 Date: Nov-25

Arm A: Kwu Tung Road WB

Arm B: Kam Hang Road

Arm C: Kwu Tung Road EB



GEOMETRY

Major Road Width (m)	W	7.30	Lane widths (m)	w(b-a)	0.00
Central Reserve Width (m)	Wcr	0.00	w(b-c)	3.75	
Blockage of major road right turn	Y/N?	Y	w(c-b)	3.60	
Combined stream on minor arm	Y/N?	Y			

Visibility Distances (m)	Vr(b-a)	55	Calculated Parameters	D	0.570231
	Vl(b-a)	20		E	0.95035
	Vr(b-c)	55		F	0.950512
	Vr(c-b)	70		Y	0.74815

ANALYSIS

TRAFFIC FLOWS (pcu/hr)	AM PEAK		PM PEAK	
	q(c-a)	q(c-b)	q(a-b)	q(a-c)
	35	80	135	75
	80	95	140	105
	135	140	185	115
	50	75	115	80
	115	80	185	105
	185	105	0.62	0.57
CAPACITIES (pcu/hr)	Q(b-ac)	Q(c-a)	Q(c-b)	
	475.74694	1581.8988	660.2439	448.2796
				1537.922
				652.4784
RFC's	c-a	c-b	b-ac	
	0.02	0.12	0.63	0.03
				0.15
				0.41
RFC				0.63
				0.41

Where Vl and Vr are visibility distances to the left or right of the respective streams

$$D = (1+0.094(w(b-a)-3.65))(1+0.0009(Vr(b-a)-120))(1+0.0006(Vl(b-a)-150))$$

$$E = (1+0.094(w(b-c)-3.65))(1+0.0009(Vr(b-c)-120))$$

$$F = (1+0.094(wc-b)-3.65))(1+0.0009(Vr(c-b)-120))$$

$$Y = 1-0.0345W$$

$$f = \text{proportion of minor traffic turning left}$$

$$Q(b-ac) = Q(b-c)*Q(b-a)/(1-f)*Q(b-c)+f*Q(b-a)$$

Capacity of combined streams

All the above formulas are in accordance to T.P.D.M. Volume 2 Chapter 4 Appendix 1

Simplified Priority Junction Capacity Calculation

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Junction: (J2) Kwu Tung Road / Kam Hang Road Designed by: TSO

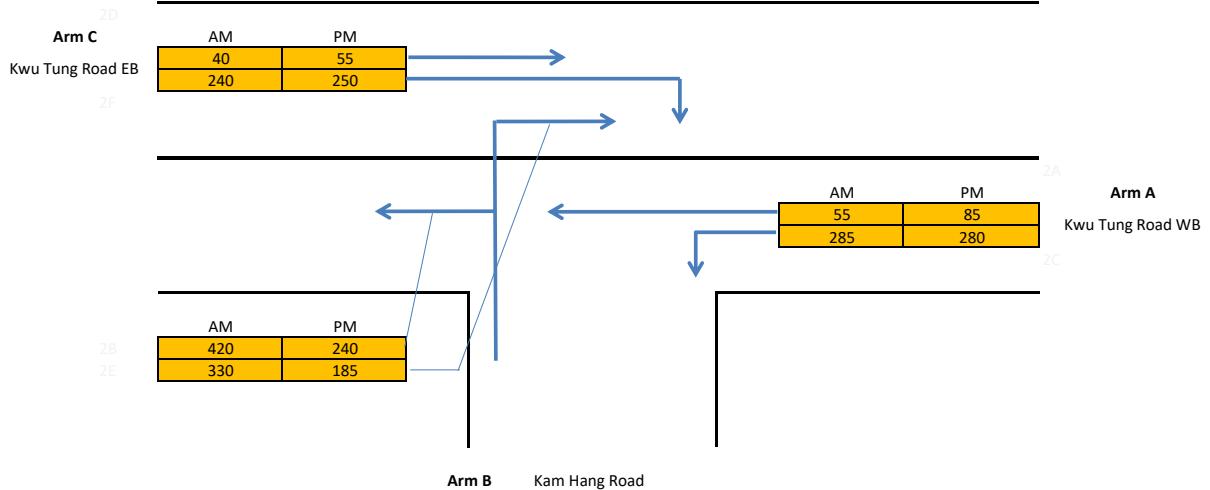
Scheme: Reference (with Improvement scheme under Y/NE-KTS/12) Checked by: LHW

Design Year: 2035 Job No.: CHK50793310 Date: Nov-25

Arm A: Kwu Tung Road WB

Arm B: Kam Hang Road

Arm C: Kwu Tung Road EB



GEOMETRY

Major Road Width (m)	W	7.30	Lane widths (m)	w(b-a)	4.00
Central Reserve Width (m)	W _{cr}	0.00	w(b-c)	4.00	
Blockage of major road right turn	Y/N?	Y	w(c-b)	3.60	
Combined stream on minor arm	Y/N?	N			

Visibility Distances (m)	V _{r(b-a)}	30	Calculated Parameters	D	0.8866
	V _{l(b-a)}	40		E	0.9632
	V _{r(b-c)}	45		F	0.9595
	V _{r(c-b)}	80		Y	0.7482

ANALYSIS

		AM PEAK		PM PEAK	
TRAFFIC FLOWS (pcu/hr)	q(c-a)		40	55	
	q(c-b)		240	250	
	q(a-b)		285	280	
	q(a-c)		55	85	
	q(b-a)		330	185	
	q(b-c)		420	240	
	f		0.56	0.56	
CAPACITIES (pcu/hr)	Q(b-a)		426.533	414.04	
	Q(b-c)[0] Q(b-c)		543.29	673.569	591.80 666.22
	Q(c-a)		1109.87	1073.5	
	Q(c-b)		625.966	619.43	
RFC's	c-a		0.04	0.05	
	c-b		0.38	0.40	
	b-a		0.77	0.45	
	b-c[0] b-c		0.77	0.62	0.41 0.36
RFC			0.77	0.45	

Where V_l and V_r are visibility distances to the left or right of the respective streams

$$D = (1+0.094(w(b-a)-3.65))(1+0.0009(V_r(b-a)-120))(1+0.0006(V_l(b-a)-150))$$

$$E = (1+0.094(w(b-c)-3.65))(1+0.0009(V_r(b-c)-120))$$

$$F = (1+0.094(wc-b)-3.65))(1+0.0009(V_r(c-b)-120))$$

$$Y = 1-0.0345W$$

f = proportion of minor traffic turning left

$$Q(b-ac) = Q(b-c)*Q(b-a)/(1-f)*Q(b-c)+f*Q(b-a)$$

Capacity of combined streams

All the above formulas are in accordance to T.P.D.M. Volume 2 Chapter 4 Appendix 1

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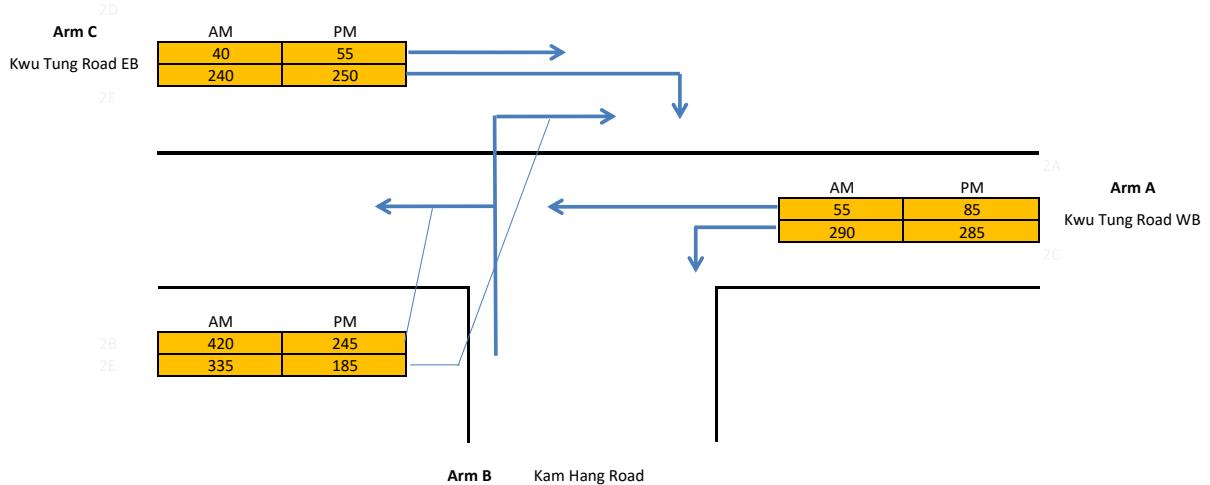
Scheme: Design (with Improvement scheme under Y/NE-KTS/12) Checked by: LHW

Design Year: 2035 Job No.: CHK50793310 Date: Nov-25

Arm A: Kwu Tung Road WB

Arm B: Kam Hang Road

Arm C: Kwu Tung Road EB



GEOMETRY

Major Road Width (m)	W	7.30	Lane widths (m)	w(b-a)	4.00
Central Reserve Width (m)	W _{cr}	0.00	w(b-c)	4.00	
Blockage of major road right turn	Y/N?	Y	w(c-b)	3.60	
Combined stream on minor arm	Y/N?	N			
Visibility Distances (m)	V _{r(b-a)}	30	Calculated Parameters	D	0.8866
	V _{l(b-a)}	40		E	0.9632
	V _{r(b-c)}	45		F	0.9595
	V _{r(c-b)}	80		Y	0.7482

ANALYSIS

		AM PEAK	PM PEAK
TRAFFIC FLOWS (pcu/hr)	q(c-a) q(c-b) q(a-b) q(a-c) q(b-a) q(b-c) f	40 240 290 55 335 420 0.56	55 250 285 85 185 245 0.57
CAPACITIES (pcu/hr)	Q(b-a) Q(b-c)[0] Q(b-c) Q(c-a) Q(c-b)	426.055 540.75 673.05 1108.42 624.66	413.56 591.25 665.7 1072 618.13
RFC's	c-a c-b b-a b-c[0] b-c	0.04 0.38 0.79 0.78	0.05 0.40 0.45 0.62 0.41 0.37
RFC		0.79	0.45

Where V_l and V_r are visibility distances to the left or right of the respective streams

$$D = (1+0.094(w(b-a)-3.65))(1+0.0009(V_r(b-a)-120))(1+0.0006(V_l(b-a)-150))$$

$$E = (1+0.094(w(b-c)-3.65))(1+0.0009(V_r(b-c)-120))$$

$$F = (1+0.094(wc-b)-3.65))(1+0.0009(V_r(c-b)-120))$$

$$Y = 1-0.0345W$$

f = proportion of minor traffic turning left

$$Q(b-ac) = Q(b-c)*Q(b-a)/(1-f)*Q(b-c)+f*Q(b-a)$$

Capacity of combined streams

All the above formulas are in accordance to T.P.D.M. Volume 2 Chapter 4 Appendix 1

ANNEX C

Traffic Generation / Attraction Rates from TPDM

Trip Generation Rates on Residential Developments

Development Density / OZP Zoning	Average Flat Size (sq.m)	Upper Limit / Mean / Lower Limit	AM Generation Rate	AM Attraction Rate	PM Generation Rate	PM Attraction Rate
			(pcu/hr/flat)			
Subsidised Housing: Public Rental	30	Upper Limit	0.0413	0.0406	0.0242	0.0262
		Mean	0.0242	0.0226	0.0177	0.0201
		Lower Limit	0.0071	0.0046	0.0112	0.0140
Subsidised Housing: Public Rental	40	Upper Limit	0.0539	0.0439	0.0278	0.0339
		Mean	0.0432	0.0326	0.0237	0.0301
		Lower Limit	0.0325	0.0213	0.0196	0.0263
Subsidised Housing: HOS / PSPS	50	Upper Limit	0.0761	0.0573	0.035	0.0451
		Mean	0.0622	0.0426	0.0297	0.0401
		Lower Limit	0.0483	0.0279	0.0244	0.0351
Private Housing: High-Density / R(A)	40	Upper Limit	0.0780	0.0574	0.0347	0.0402
		Mean	0.0575	0.0376	0.0262	0.0336
		Lower Limit	0.0370	0.0177	0.0177	0.0270
Private Housing: High-Density / R(A)	45	Upper Limit	0.0836	0.0608	0.0365	0.0430
		Mean	0.0623	0.0401	0.0277	0.0361
		Lower Limit	0.0410	0.0194	0.0189	0.0292
Private Housing: High-Density / R(A)	50	Upper Limit	0.0891	0.0641	0.0383	0.0458
		Mean	0.0670	0.0426	0.0292	0.0386
		Lower Limit	0.0449	0.0210	0.0201	0.0314
Private Housing: High-Density / R(A)	60	Upper Limit	0.1021	0.0709	0.0415	0.0464
		Mean	0.0718	0.0425	0.0286	0.0370
		Lower Limit	0.0415	0.0141	0.0157	0.0276
Private Housing: High-Density / R(A)	70	Upper Limit	0.1117	0.0729	0.0454	0.0551
		Mean	0.0888	0.0515	0.0356	0.0480
		Lower Limit	0.0659	0.0301	0.0258	0.0409
Private Housing: High-Density / R(A)	80	Upper Limit	0.1379	0.0905	0.0563	0.0689
		Mean	0.1058	0.0605	0.0426	0.0590
		Lower Limit	0.0737	0.0305	0.0289	0.0491

From TPDM

Step 1:

Private Housing R(A) 40sqm
 $= [\text{Public Rental } 40\text{sqm} + \text{Private Housing R(A) } 60\text{sqm}]/2$

Step 2:

Private Housing R(A) 50sqm
 $= [\text{Public Rental } 50\text{sqm} + \text{Private Housing R(A) } 60\text{sqm}]/2$

Estimated Trip Rate by Interpolation

Step 3:

Private Housing R(A) 45sqm
 $= [\text{Private Housing R(A) } 40\text{sqm} + \text{Private Housing R(A) } 50\text{sqm}]/2$

From TPDM

Supplementary Traffic Surveys

To further elaborate the trip generation rates adopted in the TIA, supplementary traffic surveys have been arranged at the below residential developments with the following criteria:

- Average Flat Size <60sqm
- Car Park Ratio = 4 to 8 units per CP
- Beyond 500m walking distance from rail station

As shown in the findings below, the trip rates adopted for the subject planning application are more conservative than the below residential developments with comparable flat size, car park ratio and public transport accessibility.

Location	Nearest Rail Station	Walking Distance	OZP Zoning	Plot Ratio	No. of Units	No. of Parking	Car Park Ratio	Average Size	AM Generation	AM Attraction	PM Generation	PM Attraction
Hang Tau Road (Application Site)	Kwu Tung	>1km	CDA	2.0	1,062	156	6.8 units/CP	37 sqm	0.0623	0.0401	0.0277	0.0361
Royal Green 御皇庭	Sheung Shui	0.5-1km	R(B)2	5.0	922	126	7.3 units/CP	50 sqm	0.0369	0.0195	0.0184	0.0195
Glorious Peak 顯峯	Sheung Shui	0.5-1km	R(B)2	5.0	218	38	5.7 units/CP	45 sqm	0.0367	0.0046	0.0046	0.0321
8 Royal Green 御景峰	Sheung Shui	0.5-1km	R(B)2	5.0	362	81	4.5 units/CP	60 sqm	0.0387	0.0193	0.0249	0.0359
The Regent 天鑽	Tai Po Market	>1km	R(B)8	3.0	1620	358	4.5 units/CP	60 sqm	0.0512	0.0154	0.0278	0.0358
The Reach 尚悅	Yuen Long	>1km	R(B)	3.5	2580	457	5.6 units/CP	50 sqm	0.0391	0.0143	0.0240	0.0275
Park Signature 漥柏	Long Ping	>1km	R(A)1	5.0	1620	329	4.9 units/CP	60 sqm	0.0586	0.0179	0.0253	0.0340
The Bloomsway – The Laguna 滿名山 滿庭	Tuen Mun	>3km	R(B)1	1.3	936	235	4.0 units/CP	60 sqm	0.0609	0.0299	0.0288	0.0374

ANNEX D

Technical Note on Traffic Forecast for EA

SECTION 16 PLANNING APPLICATION FOR PROPOSED RESIDENTIAL DEVELOPMENT WITH MINOR RELAXATION OF PLOT RATIO RESTRICTION AT LOTS 1027, 1029, 1030, 1034A, 1034B, 1039 (PART), 1040, 1042 RP, 1043 RP, 1044 RP (PART), 1045, 1047, 2233 (PART), 2251 S.A RP, 2256 RP, 2315 (PART) AND 2316 RP (PART) IN D.D. 92 AND ADJOINING GOVERNMENT LAND (NEW LOT TO BE KNOWN AS LOT 2644 IN D.D. 92), KWU TUNG SOUTH, SHEUNG SHUI, NEW TERRITORIES

ANNEX D

TECHNICAL NOTE ON TRAFFIC FORECASTS FOR EA PURPOSE

1. This technical note is prepared for summarizing the approach and results of the traffic forecasts in support of the environmental assessment for the Proposed Development in Kwu Tung South. The Proposed Development comprises a total of 1,062 residential units.
2. The completion year of the Proposed Development is Year 2032. For environmental assessment, a set of long-term traffic forecast in Year 2047 is derived, which is 15 years after completion. The road links covered in the environment assessment are shown in **Drawing 1**.
3. Due to the long-term design year of 2047, an intermediate medium-term forecast year of 2035 (i.e. the same design year as in the Traffic Impact Assessment (TIA) report for the captioned planning application) has been identified for further projection of traffic forecast by the application of annual growth rates. The adjacent planned developments being considered and the traffic flows in Year 2035 are shown in **Table 1** and **Table 2** respectively.

Table 1 Planned Developments in the Vicinity of the Subject Site

Ref.	Location	Planned Use	Design Parameter	Reference
Application Site	Hang Tau Road	Private Residential (Medium Density)	1,062 units	
Committed Private Developments in Kwu Tung South				
A	Kam Hang Road	Private Residential (Medium Density)	2,589 units	Planning Application No. A/NE-KTS/506
B	Kam Hang Road / Hang Tau Road	Private Residential (Medium Density)	971 units	Planning Application No. Y/NE-KTS/14
C	Kam Hang Road / Hang Tau Road	Private Residential (Medium Density)	360 units	Planning Application No. Y/NE-KTS/17
D	Kam Hang Road	Residential Care Home for Elderly	150 beds	Planning Application No. Y/NE-KTS/16
E	Hang Tau Tai Po	Private Residential (Medium Density)	320 units	Planning Application No. Y/NE-KTS/13
F	106 Hang Tau Road	Private Residential (Low Density)	2 houses	Planning Application No. A/NE-KTS/528
G	Various Lots in D.D. 94, Hang Tau Tai Po	Private Residential (Low Density)	19 houses	Planning Application No. A/NE-KTS/466
H	Various Lots in D.D. 94, Hang Tau Tai Po	Private Residential (Low Density)	42 houses	Planning Application No. A/NE-KTS/525
Planned Developments in Kwu Tung North				
P1	KTN NDA	Mixed Use	49,900 units	Planning Application No. A/KTN/93
P2	Yin Kong	Private Residential (Medium Density)	527 units	Planning Application No. Y/ KTN/2

Section 16 Planning Application for Proposed Residential Development with Minor Relaxation of Plot Ratio Restriction at Lots 1027, 1029, 1030, 1034A, 1034B, 1039 (Part), 1040, 1042 RP, 1043 RP, 1044 RP (Part), 1045, 1047, 2233 (Part), 2251 S.A RP, 2256 RP, 2315 (Part) and 2316 RP (Part) in D.D. 92 and Adjoining Government Land (New Lot to be known as Lot 2644 in D.D. 92), Kwu Tung South, Sheung Shui, New Territories

Table 2 Traffic Flows in Design Year 2035

Index	Road Name	Direction	AM Peak Traffic Flow (veh/hr)	PM Peak Traffic Flow (veh/hr)	Speed Limit (km/h)
19a	Kwu Tung Road	EB	202	195	50
19b	Kwu Tung Road	WB	340	236	50
20a	Kam Hang Road	EB	311	313	50
20b	Kam Hang Road	WB	461	277	50
21a	Kam Hang Road	EB	193	158	50
21b	Kam Hang Road	WB	230	156	50
25a	Hang Tau Road	NB	255	145	50
25b	Hang Tau Road	SB	147	188	50

4. According to the “Improvement of Tai Tau Leng Roundabout and Fanling Highway (Kwu Tung Section) – Design and Construction” (Agreement No. CE20/2019(HY)) commissioned by CEDD, the existing Fanling Highway will be widened from dual 3-lane to dual 4-lane with hard shoulder between San Tin Interchange and Po Shek Wu Interchange. Improvement works to the existing Pak Shek Au Interchange and a new elevated Kwu Tung Interchange will be implemented to serve the future Kwu Tung North (KTN) NDA.
5. With reference to the latest gazette of road network and the development parameters in Kwu Tung North New Development Area (KTN NDA), the proposed modification to Kwu Tung Road across Fanling Highway will have minimal impact to the long-term traffic forecast, given that the configuration of single 2-lane carriageway will be maintained as current situation. The traffic forecast in Kwu Tung South is also anticipated to be more conservative with reference to the assumptions in the Traffic Impact Assessment (TIA) report under the current S16 planning application.
6. Therefore, the traffic forecast in Year 2047 for Fanling Highway, Castle Peak Road – Kwu Tung Section and the new roads proposed in the future Kwu Tung North NDA would be estimated with reference to the Year 2047 traffic flows in the Environment Impact Assessment (EIA) report under the Approved S16 Planning Application (No. A/KTN/93).
7. For other local roads mentioned in **Table 2**, traffic flows for Year 2047 would be derived from the expected growth of traffic in the area based on the historical growth trend in Annual Traffic Census (ATC). The traffic counts at key road links in the vicinity of the Subject Site between 2013 and 2022 are summarised in **Table 3** below.

Table 3 ATC Counting Station Records

ATC Station No.	Road Name	Average Annual Daily Traffic (A.A.D.T)										Growth Rate (p.a.) ⁽¹⁾
		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	
6602	Castle Peak Road (Kwu Tung)	10,670	11,120	10,560	10,690	11,540	10,800	10,660	11,000	11,000	10,480	+4.1%
6606	Kwu Tung Road	2,980	3,290	3,670	4,070	4,450	4,630	4,610	4,050	4,290	4,280	-0.2%
	Total	13,650	14,410	14,230	14,760	15,990	15,430	15,270	15,050	15,290	14,760	+0.9%

(1) The best-fitted growth is estimated by an exponential trend line (i.e. $y = b * m^x$) by regression analysis.

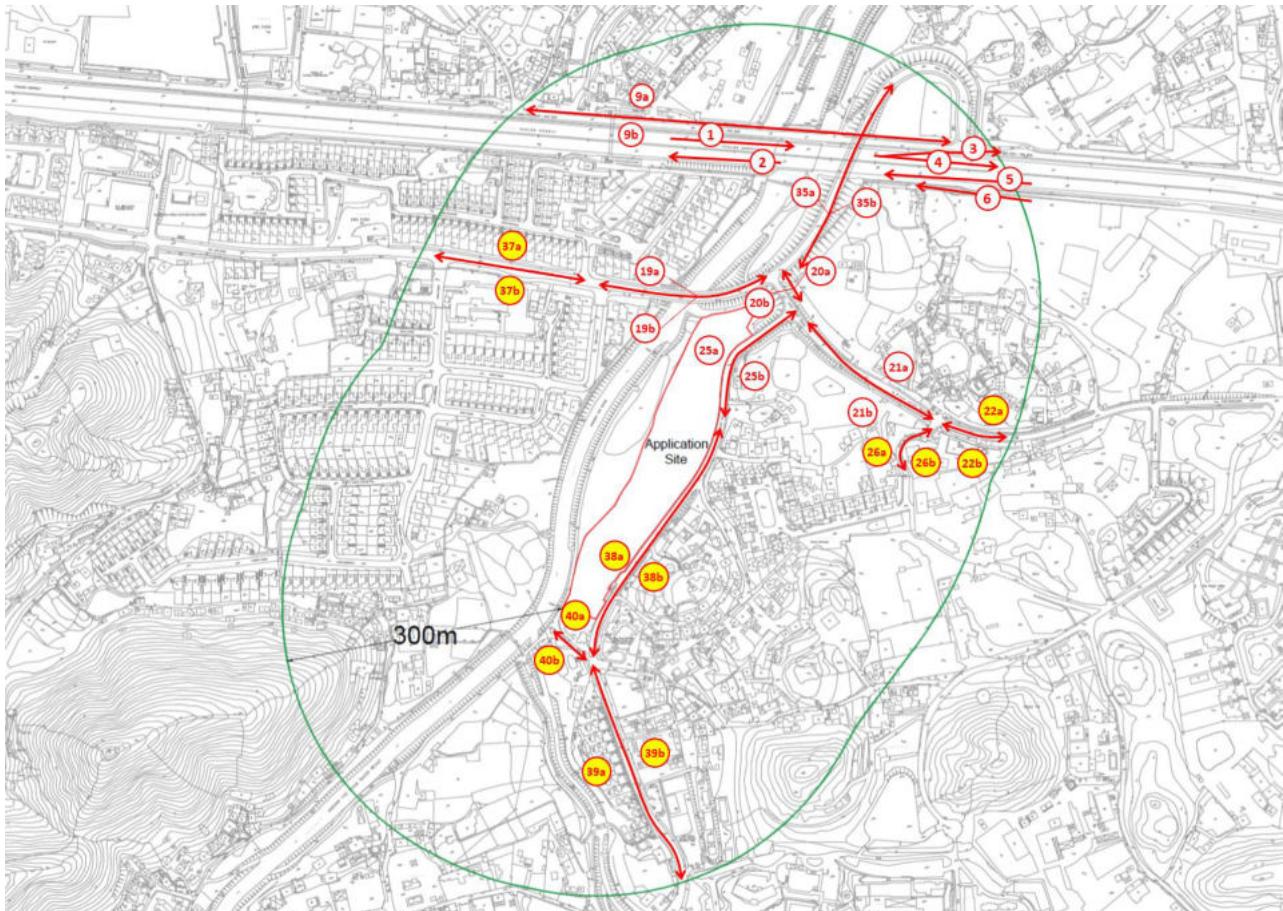
8. As indicated in **Table 3**, the average growth between 2013 and 2022 is represented by a rate of +1.0% per annum which has been adopted for the long-term traffic forecast from 2035 to 2047 for the local roads in Kwu Tung South.
9. The estimated traffic flows for Year 2047 are tabulated in **Table 4** below. The flows have been converted to units in veh/hr for environmental assessment purposes.

Table 4 Estimated Traffic Flows in Design Year 2047

Index	Road	Road Type & Direction	AM Peak Traffic Flow (veh/hr)	AM Peak HV (%)	PM Peak Traffic Flow (veh/hr)	PM Peak HV (%)	Speed Limit (km/h)
1	Fanling Highway	EX EB	4,036	38.1%	5,370	23.7%	100
2	Fanling Highway	EX WB	5,024	31.2%	5,026	30.1%	100
3	Fanling Highway Slip Road	EX EB	86	21.5%	135	11.9%	50
4	Fanling Highway	EX EB	3,950	38.5%	5,235	24.0%	100
5	Fanling Highway	EX WB	4,725	32.1%	4,878	30.4%	100
6	Fanling Highway Slip Road	EX WB	299	17.7%	150	20.3%	50
9a	Castle Peak Road - Kwu Tung	LD EB	258	38.0%	255	34.4%	50
9b	Castle Peak Road - Kwu Tung	LD WB	183	43.8%	238	32.7%	50
37a	Kwu Tung Road	LD NB	200	43.1%	218	29.2%	50
37b	Kwu Tung Road	LD SB	337	27.0%	235	25.0%	50
19a	Kwu Tung Road	LD NB	211	40.9%	229	27.8%	50
19b	Kwu Tung Road	LD SB	355	25.6%	247	23.8%	50
20a	Kam Hang Road	LD EB	323	27.9%	345	23.8%	50
20b	Kam Hang Road	LD WB	479	22.3%	287	26.7%	50
21a	Kam Hang Road	LD EB	199	23.3%	164	27.1%	50
21b	Kam Hang Road	LD WB	235	24.3%	163	28.2%	50
22a	Kam Hang Road	LD EB	182	25.3%	168	30.0%	50
22b	Kam Hang Road	LD WB	234	25.2%	171	23.9%	50
25a	Hang Tau Road	LD NB	269	23.1%	156	21.9%	50
25b	Hang Tau Road	LD SB	155	27.7%	198	19.2%	50
26a	Kam Ka Street	LD NB	11	24.0%	6	12.5%	50
26b	Kam Ka Street	LD SB	15	23.3%	12	8.3%	50
38a	Hang Tau Road	LD NB	218	23.1%	133	21.9%	50
38b	Hang Tau Road	LD SB	123	27.7%	171	19.2%	50
39a	Hang Tau Road	LD NB	216	23.3%	131	22.2%	50
39b	Hang Tau Road	LD SB	122	28.0%	170	19.3%	50
40a	DSD Access Road	RR EB	5	52.8%	5	15.0%	50
40b	DSD Access Road	RR WB	4	87.4%	5	20.0%	50

Note:

- Road Type: EX = Expressway;
- Road Type: LD = Local Distributor;
- Road Type: RR = Rural Road



Drawing 1 Key Index Plan of Traffic Forecast for Traffic Noise Impact Assessment

Section 16 Planning Application for Proposed Residential Development with Minor Relaxation of Plot Ratio Restriction at Lots 1027, 1029, 1030, 1034A, 1034B, 1039 (Part), 1040, 1042 RP, 1043 RP, 1044 RP (Part), 1045, 1047, 2233 (Part), 2251 S.A RP, 2256 RP, 2315 (Part) and 2316 RP (Part) in D.D. 92 and Adjoining Government Land (New Lot to be known as Lot 2644 in D.D. 92), Kwu Tung South, Sheung Shui, New Territories

ANNEX E

Swept Path Analysis

Annex E1: Swept Path Analysis

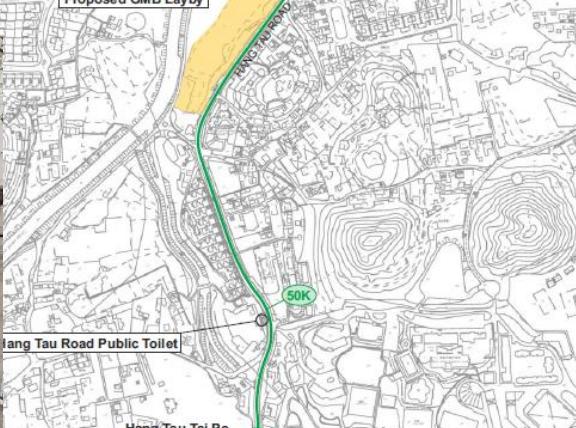
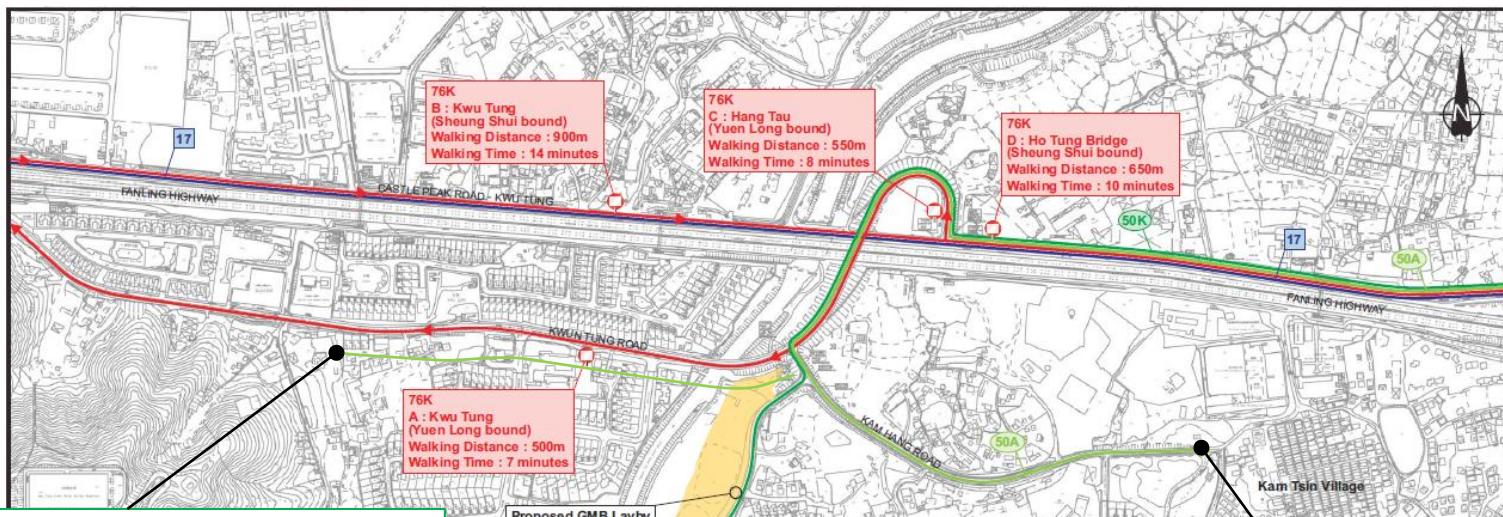
- 8m GMB U-turn near Hang Tau Road Public Toilet
(Temporary Arrangement)

Hang Tau Road Public Toilet

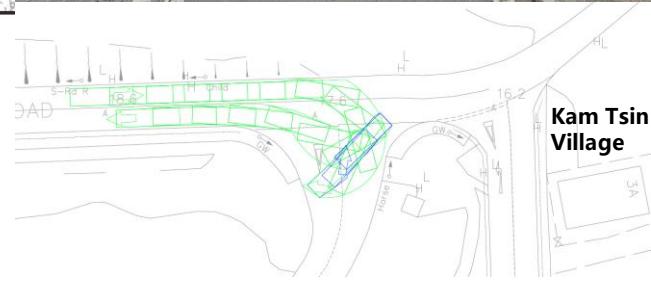
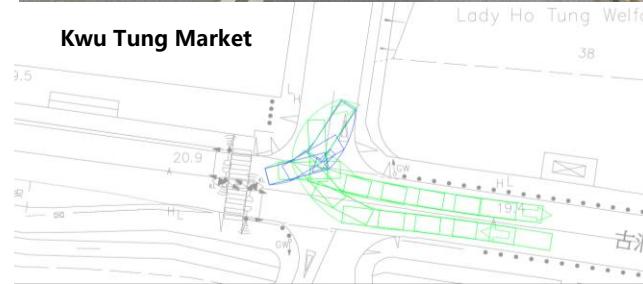


Annex E2: Swept Path Analysis

- 8m GMB U-turn near Kwu Tung Market and Kam Tsin Village
(Existing Arrangement of GMB 50A)



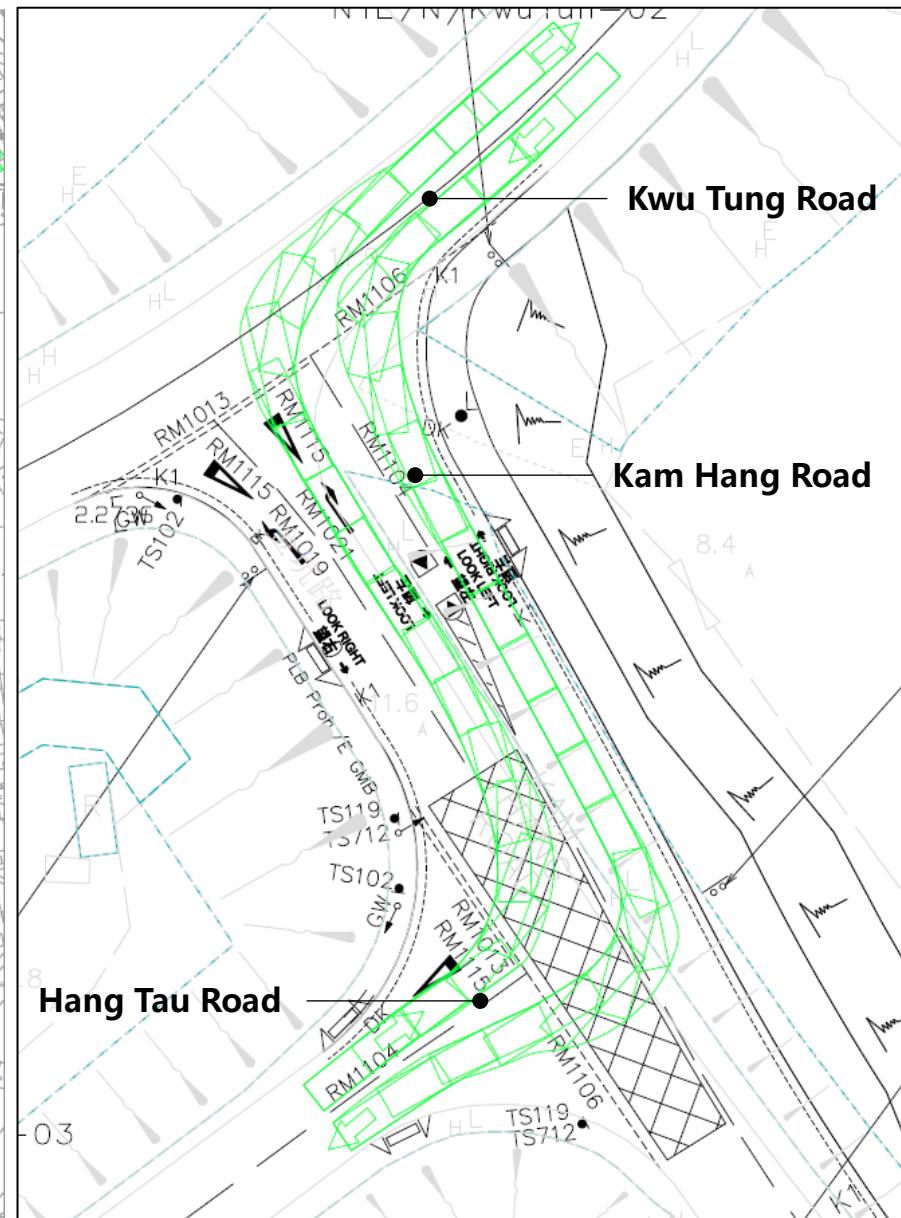
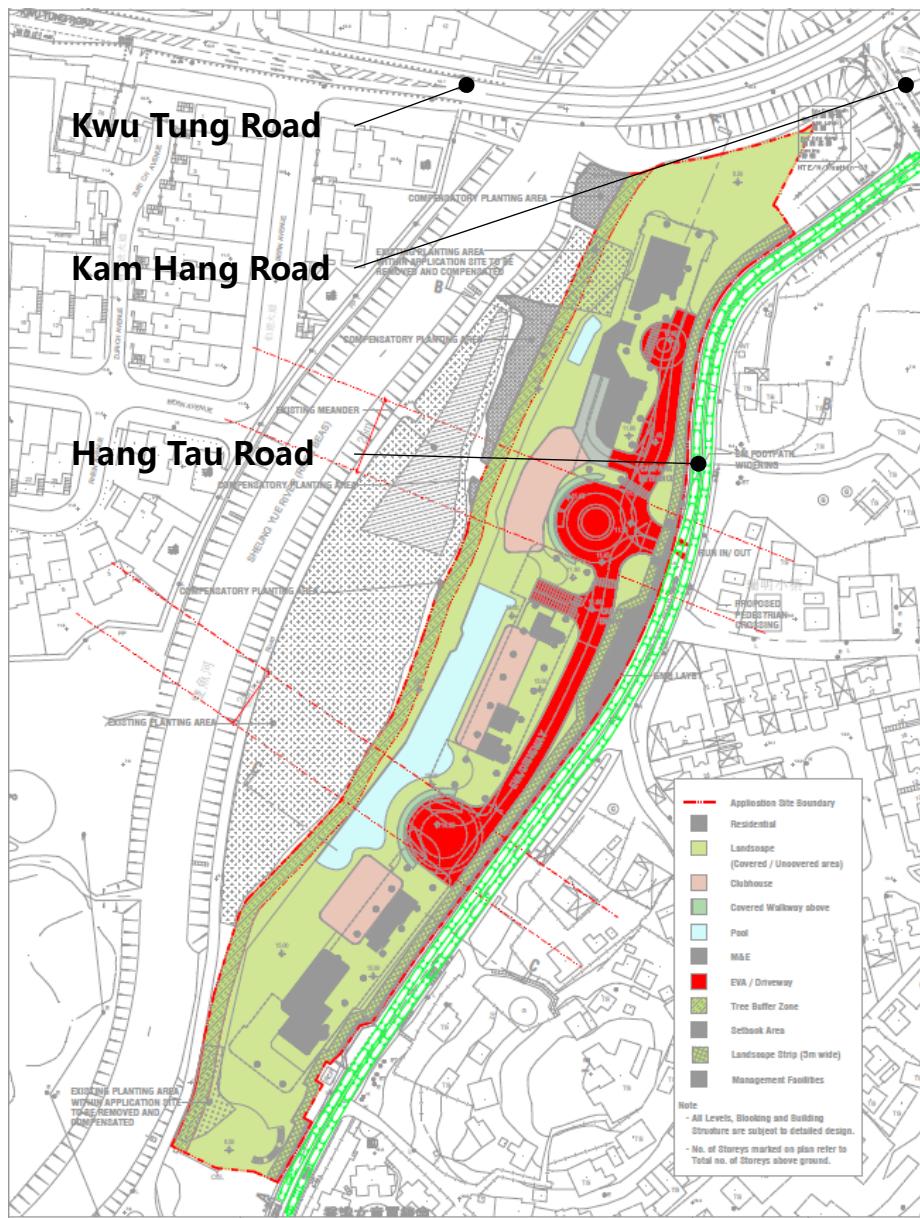
Kwu Tung Market



Kam Tsin Village

Annex E3: Swept Path Analysis

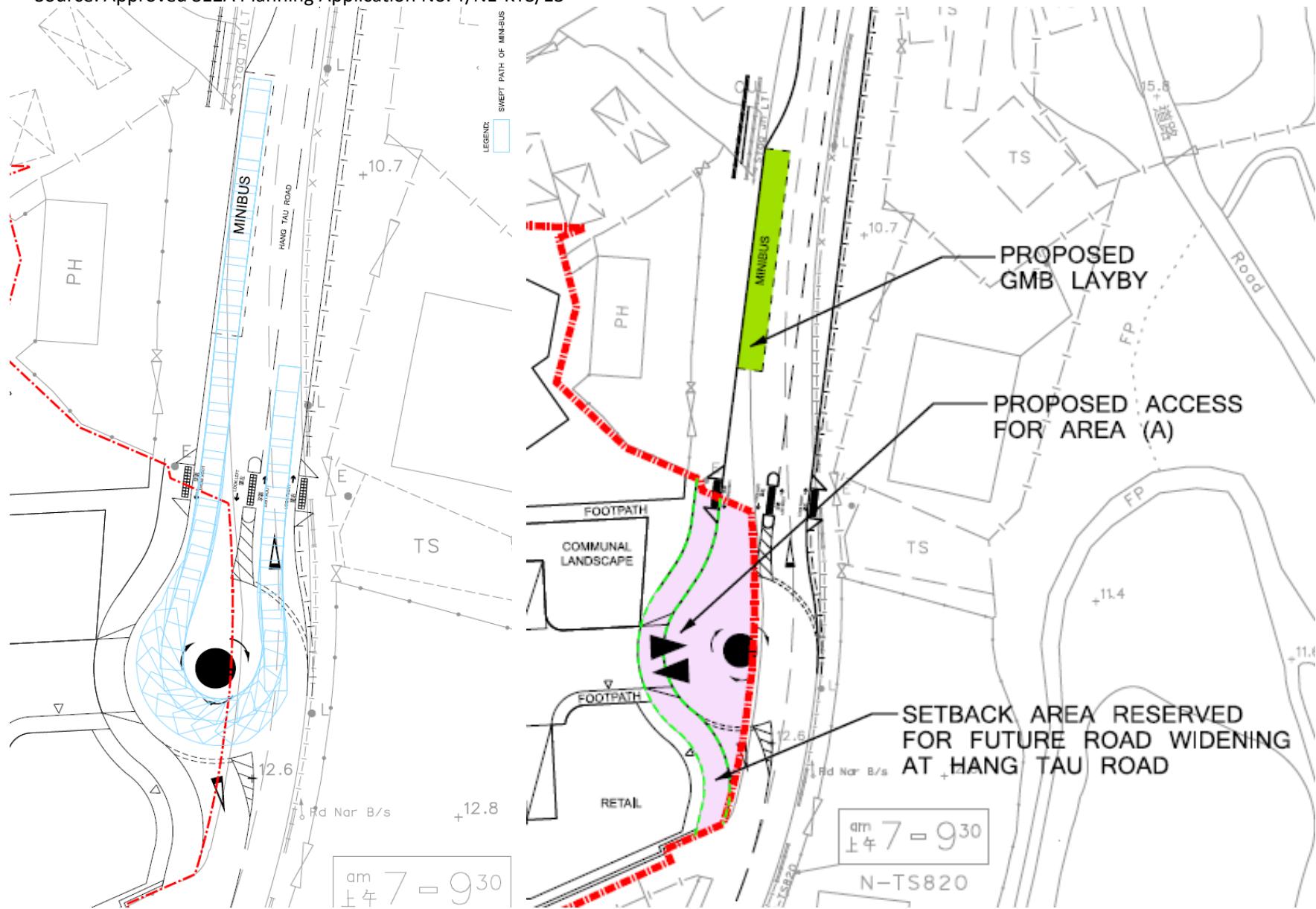
- 8m GMB along Hang Tau Road / Kam Hang Road / Kwu Tung Road



Annex E4: Swept Path Analysis

- 8m GMB at roundabout junction south of Hang Tau Road Public Toilet (by OTHERS)

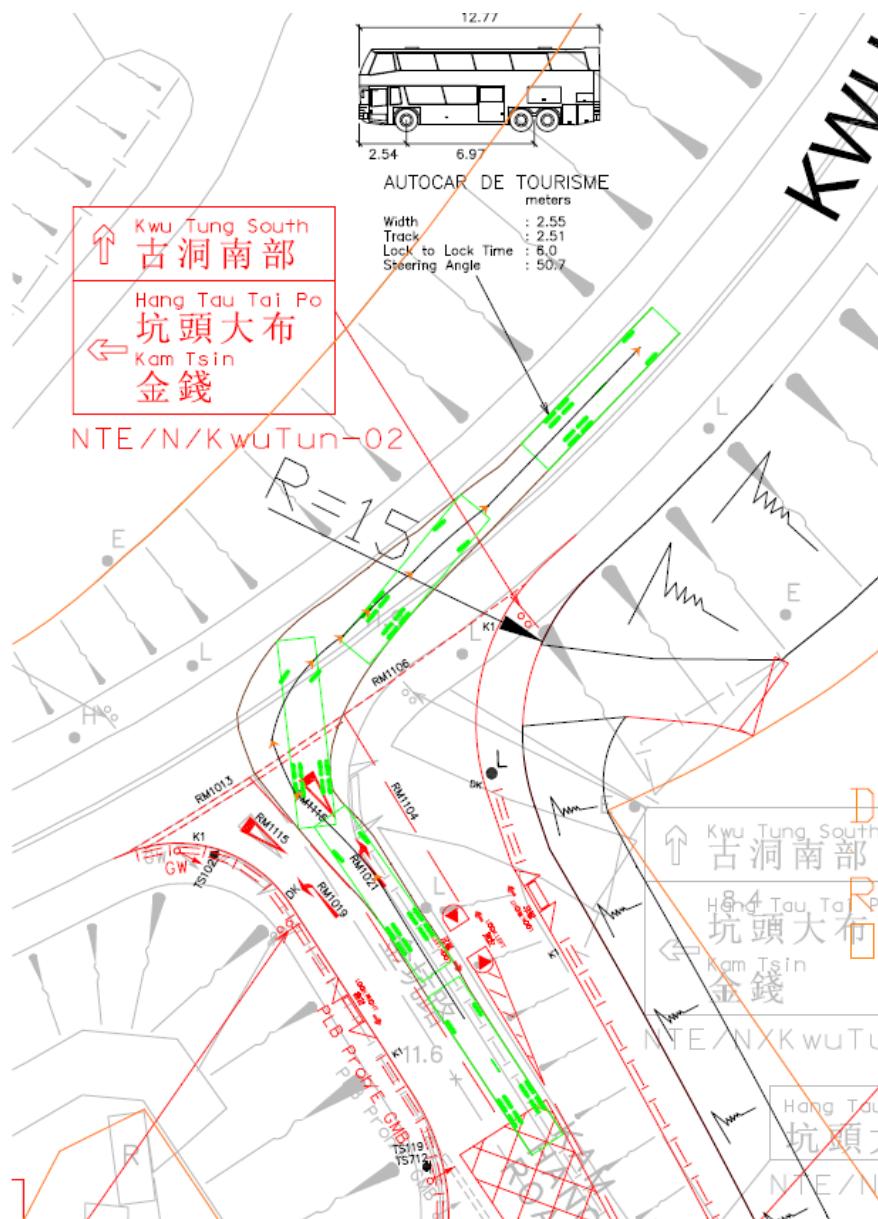
Source: Approved S12A Planning Application No. Y/NE-KTS/13



Annex E5: Swept Path Analysis

- 12.8m double decker bus at junction of Kam Hang Road / Kwu Tung Road (By OTHERS)

Source: Approved S16 Planning Application No. A/NE-KTS/506



Annex E5: Swept Path Analysis

- 12.8m double decker bus at roundabout junction of Kam Hang Road / Kam Tsin Road (By OTHERS)

Source: Approved S16 Planning Application No. A/NE-KTS/506

