

**Proposed Columbarium at
45 Tan Kwai Tsuen, Hung Shui Kiu,
Yuen Long, New Territories
(Lot No. 3971 RP in D.D. 124)**

**Traffic Impact Assessment
Final Report
30 September 2022**

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1.0 INTRODUCTION

Background

- 1.1 The Application Site includes part of the existing 2 buildings, namely Building 1 and Building 2, within Yat Tak Kwun (“一德觀”), which is located at 45 Tan Kwai Tsuen in Hung Shui Kiu, Yuen Long. At present, the G/F of Building 1 and Building 2 are being used for storage of cremated human bodies, i.e. columbarium (hereinafter “the Proposed Columbarium”). Figure 1.1 shows the location of the Yat Tak Kwun, and the Application Site..
- 1.2 The Applicant has the intention to regularise the existing columbarium use. Hence, CKM Asia Limited, a traffic and transportation planning consultancy firm, was commissioned to carry out a Traffic Impact Assessment (“TIA”) in support of the Proposed Columbarium.

Contents of the Report

- 1.6 After this introduction, the remaining chapters contain the following:

- Chapter Two – Describes the existing situation;
- Chapter Three – Outline the development proposal;
- Chapter Four – Presents the traffic and pedestrian impact analyses; and
- Chapter Five – Gives the overall conclusion.

2.0 THE EXISTING SITUATION

Yat Tak Kwun and the Application Site

- 2.1 Yat Tak Kwun is located in Tan Kwai Tsuen, Hung Shui Kiu, Yuen Long. It is bounded by a footpath and a cycle track to the west along a nullah, a residential development (i.e. the Verdancy) to the east, and various other temporary developments to the north and to the south. The Application Site is part of the existing 2 buildings within Yat Tak Kwun.
- 2.2 Yat Tak Kwun does not abut any road carriageway and therefore cannot be accessed by vehicular traffic. Two (2) pedestrian accesses are located to the west at the footpath along the nullah, and a third pedestrian access is located to the east at the footpath within Tan Kwai Tsuen leading towards Tan Kwai Tsuen Road.

The Road Network

- 2.3 Yat Tak Kwun is served by Wo Ping San Tsuen Lane, Tan Kwai Tsuen Road, and Castle Peak Road – Hung Shui Kiu.
- 2.4 Wo Ping San Tsuen Lane is of a single-2 carriageway local road. It is some 6m wide and 350m long running parallel to the nullah from Castle Peak Road – Hung Shui Kiu and terminates as a cul-de-sac. It serves the existing developments in Wo Ping San Tsuen and Tan Kwai Tsuen along both sides of the nullah. Wo Ping San Tsuen Lane is only accessible from and to Castle Peak Road – Hung Shui Kiu westbound.
- 2.5 Tan Kwai Tsuen Road in the vicinity of Yat Tak Kwun is a single-2 carriageway local road. It is some 7.3m wide and 900m long running from Castle Peak Road – Hung Shui Kiu and terminates as a single track access road within Tan Kwai Tsuen to the south. It serves numbers of residential and industrial developments within Tan Kwai Tsuen. Tan Kwai Tsuen Road is only accessible from Castle Peak Road – Hung Shui Kiu eastbound, and to Castle Peak Road – Hung Shui Kiu westbound.
- 2.6 Castle Peak Road – Hung Shui Kiu is a dual-2/3 carriageway Rural Trunk Road with 3 eastbound traffic lanes towards Yuen Long, and 2 westbound traffic lanes towards Tuen Mun. It intersects with the Lam Tei Interchange to the west and the Tin Shui Wai West Interchange via Hung Tin Road to the east where providing regional access to and from Yat Tak Kwun via Tuen Mun Road and Yuen Long Highway respectively.

Public Transport Services

- 2.7 Yat Tak Kwun is served by road-based public transport, in particular along Castle Peak Road – Hung Shui Kiu, where there are many franchised bus, green minibus (“GMB”), red minibus (“RMB”), and MTR Light Rail Transit (“LRT”) routes. Figure 2.1 shows the location of the public transport service stops, and details of these services are summarised in Table 2.1.

TABLE 2.1 ROAD-BASED PUBLIC TRANSPORT SERVICES OPERATING NEAR
YAT TAK KWUN

Route	Origin - Destination	Frequency (min)	Remark
KMB 53	Yoho Mall (Yuen Long) ↔ Tsuen Wan (Nina Tower)	25 - 35	
KMB 63X	Hung Shui Kiu (Hung Fuk Estate) ↔ Jordan (West Kowloon Station)	12 - 30	
KMB 68A	Long Ping Estate ↔ Tsing Yi Station	8 - 25	
KMB 68X	Mong Kok (Park Avenue) ↔ Hung Shui Kiu (Hung Fuk Estate)	9 - 25	
KMB 258A	Hung Shui Kiu (Hung Fuk Estate) → Lam Tin Station	2 per AM	(1)
KMB 258P	Hung Shui Kiu (Hung Fuk Estate) → Lam Tin Station	12 - 30	(3)
	Lam Tin Station → Hung Shui Kiu (Hung Fuk Estate)	20 - 30	(4)
KMB 261P	Tuen Mun (Siu Hong Court) → Sheung Shui (Tin Ping)	2 - 3 per AM	(3)
	Sheung Shui (Tin Ping) → Tuen Mun (Siu Hong Court)	1 per PM	(2)
KMB 268X	Hung Shui Kiu (Hung Fuk Estate) ↔ Jordan (West Kowloon Station)	6 - 30	
KMB 276P	Tin Shui Wai Station ↔ Sheung Shui	5 - 20	
KMB 960A	Central → Hung Shui Kiu (Hung Fuk Estate)	1 per PM	(2)
KMB 960P	Hung Shui Kiu (Hung Yuen Road) → Causeway Bay (Victoria Park)	10 - 35	(5)
KMB 960X	Hung Shui Kiu (Hung Yuen Road) → Quarry Bay	8 per AM	(1)
LWB A34	Hung Shui Kiu (Hung Yuen Road) ↔ Airport (Ground Transportation Centre)	20 - 60	
LWB NA37	Tin Shui Wai Town Centre → Cathay Pacific City	4 per Day	(6)
CTB N969	Tin Shui Wai Town Centre ↔ Causeway Bay (Moreton Terrace)	20 - 30	(6)
MTRB K75A	Tin Shui Wai Station ↔ Hung Shui Kiu	30	
MTRB K75P	Tin Shui ↔ Hung Shui Kiu	10 - 15	
NLB B2	Yuen Long Station ↔ Shenzhen Bay Port	60	
GMB 32	Yuen Long Station ↔ Tan Kwai Estate	10 - 15	
GMB 621	Hung Fuk Estate ↔ Tin Shui Wai Hospital	20 - 30	
GMB 622	Hung Fuk Estate ↔ Long Ping Station	15 - 30	(6)
GMB 606S	Yuen Long (Fung Cheung Road) ↔ Tsim Sha Tsui East	6 - 13	
RMB	Tuen Mun (Chi Lok Fa Yuen) ↔ Yuen Long (Yuen Long Hong Lok Rd)	n/a	
RMB	Tsuen Wan (Chung On St) → Tuen Mun and Yuen Long	n/a	(6)
RMB	Mong Kok (Reclamation St) → Tuen Mun and Yuen Long	n/a	
RMB	Yuen Long ↔ Jordan Rd (Parkes St)	n/a	
LRT 610	Yuen Long ↔ Tuen Mun Ferry Pier	7 - 17	
LRT 614	Yuen Long ↔ Tuen Mun Ferry Pier	14 - 23	
LRT 615	Yuen Long ↔ Tuen Mun Ferry Pier	9 - 23	
LRT 751	Tin Yat ↔ Yau Oi	6 - 15	

Note: KMB – Kowloon Motor Bus LWB – Long Wing Bus CTB – City Bus
MTRB – MTR Feeder Services NLB – New Lantao Bus GMB – Green Minibus
RMB – Red Minibus LRT – MTR Light Rail Transit

Remarks: (1) Monday to Friday, AM Peak Only. Except Public Holidays.
(2) Monday to Friday, PM Peak Only. Except Public Holidays.
(3) Monday to Saturday, AM Peak Only. Except Public Holidays.
(4) Monday to Saturday, PM Peak Only. Except Public Holidays.
(5) Monday to Sunday, AM Only. Except Public Holidays.
(6) Overnight Services.

2.8 The above franchised bus routes provide convenient transfer service at the Tuen Mun Road Bus Interchange and the Tai Lam Tunnel Bus Interchange. Whereas, the LRT services provide transfer to the MTR West Rail at Siu Hong, Tin Shui Wai and Yuen Long Stations. Hence, the nearby public transport services provide excellent access throughout the New Territories, Kowloon and Hong Kong Island.

Traffic and Pedestrian Flow Surveys

- 2.9 In view that Yat Tak Kwun has only 8 occupied niches and there is no other existing columbarium located in the vicinity of Yat Tak Kwun, the transport services nearby do not currently serve any grave sweeping traffic during the Chung Yeung and Ching Ming Festival periods. Hence, the traffic and pedestrian flow surveys were conducted on Sunday, 5th July 2020, which was a general holiday to replicate the Ching Ming Festival Day condition.
- 2.10 The traffic and pedestrian flow surveys were carried out between 1100 and 1400 hours, which are the typical peak operation period associated to a columbarium facility.
- 2.11 Manual classified count surveys were conducted to enable traffic flows in passenger car units ("pcu") to be calculated. The surveys were conducted at the following junctions:
- J01 – Castle Peak Road – Hung Shui Kiu / Tan Kwai Tsuen Road,
 - J02 – Castle Peak Road – Hung Shui Kiu / Hung Shui Kiu Main Street, and
 - J02 – Castle Peak Road – Hung Shui Kiu / Wo Ping San Tsuen Lane,
- 2.12 Locations of the surveyed junctions are shown in Figure 2.2, and the peak hour traffic flows are presented in Figure 2.3.
- 2.13 Figure 2.4 shows the location of the pedestrian flow surveys and the locations include the following:
- FP01 – Footpath along Nullah between Yat Tak Kwun and Castle Peak Road – Hung Shui Kiu, and
 - FP02 – Footpath along Castle Peak Road – Hung Shui Kiu westbound between Tan Kwai Tsuen Road and Nullah, and
 - FP03 – Footpath along Castle Peak Road – Hung Shui Kiu westbound between Nullah and Wo Ping San Tsuen Lane

Junction Capacity Analysis

- 2.14 Junction capacity analyses are calculated based on the columbarium peak hour traffic flows, and the analyses were undertaken using the methods outlined in Volume 2 of the Transport Planning and Design Manual ("TPDM"). Table 2.2 summarises the results and the detailed calculations are found in Appendix A.

TABLE 2.2 EXISTING JUNCTION OPERATIONAL PERFORMANCE

	Junction	Junction Control	Performance Indicator	Columbarium Peak Hour
J01	Castle Peak Road – Hung Shui Kiu / Tan Kwai Tsuen Road	Signalised	RC	> 100%
J02	Castle Peak Road – Hung Shui Kiu / Hung Shui Kiu Main Street	Signalised	RC	> 100%
J03	Castle Peak Road – Hung Shui Kiu / Wo Ping San Tsuen Lane	Priority	RFC	0.010

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

- 2.15 The above result indicates that the surveyed junctions operate with capacities during the columbarium peak hour.

Footpath Levels of Service Analysis

- 2.16 Based on the peak hour pedestrian flows shown in Figure 2.5, the Levels of Service ("LOS") analysis was conducted. The LOS grading is as per TPDM Vol 6, Section 10.4, and LOS 'C' is generally considered as desirable at streets with dominant 'living' pedestrian activities. Table 2.3 summarizes the analysis results.

TABLE 2.3 EXISTING FOOTPATH OPERATIONAL PERFORMANCE

Pedestrian Facilities		Clear Width ⁽¹⁾ (m)	Ching Ming Festival Day Columbarium Peak Hour	
			Observed 2-way Pedestrian Flow (ped/hour)	Flow Rates [LOS] (ped/m/min)
FP01	Footpath along Nullah between Yat Tak Kwun and Castle Peak Road – Hung Shui Kiu	3.0m	137	0.76 [A]
FP02	Footpath along Castle Peak Road – Hung Shui Kiu westbound between Tan Kwai Tsuen Road and Nullah	4.5m	219	0.81 [A]
FP03	Footpath along Castle Peak Road – Hung Shui Kiu westbound between Nullah and Wo Ping San Tsuen Lane	3.0m	218	1.21 [A]

Note: (1) Width of adjacent cycle track excluded.

Population Projection

- 2.17 Reference is made to the latest "2019 – based Territorial Population and Employment Data Matrix" ("2019-based TPEDM") published by the Planning Department for the "Northwest New Territories (Other Area)", where Yat Tak Kwun is located. Table 2.4 summarises the projected population and employment obtained from the 2019-based TPEDM.

TABLE 2.4 PROJECTED POPULATION AND EMPLOYMENT BY 2019-BASED TPEDM FOR NORTHWEST NEW TERRITORIES (OTHER AREA)

Item	Year 2019	Year 2031	Average Annual Percentage Change (2021 – 2026)
Population	228,000	353,900	3.7%
Employment	58,400	140,150	7.6%
Total	286,400	494,050	4.7%

- 2.18 Table 2.4 shows that the overall population and employment in the Northwest New Territories (Other Area) is projected to increase by some 4.7% per annum between 2019 and 2031.
- 2.19 The high annual growth rate is likely due to the expected population intake of various New Development Areas ("NDA") within the Northwest New Territories (Other Area), such as the Hung Shui Kiu and the Yuen Long South NDAs etc.

Historic Traffic Flow

- 2.20 Table 2.5 summarises the historic Annual Average Daily Traffic ("AADT") between 2010 and 2019 obtained from the Annual Traffic Census ("ATC") which is published by Transport Department, for the roads located in the vicinity of Yat Tak Kwun.

TABLE 2.5 AADT OF ATC STATIONS LOCATED IN THE VICINITY OF YAT
TAK KWUN

ATC Station No.	6213	5658	5252
Road	Castle Peak Road – Hung Shui Kiu	Tin Ha Rd	Castle Peak Road – Ping Shan
Road Type	Rural Trunk	Rural Road	Rural Trunk
From	Tin Ha Road	Castle Peak Road – Hung Shui Kiu	Ping Ha Road
To	Lam Tei INT	Ping Ha Rd	Tin Ha Rd
Year	Annual Average Daily Traffic (vehicles / day)		
2010	31,280	6,750	16,660*
2011	30,910	6,860	16,900*
2012	31,210	6,820*	16,740*
2013	30,520	6,880*	15,780
2014	33,510	6,800*	17,050
2015	31,720	6,280	17,840*
2016	33,490	7,300	18,840*
2017	34,140	7,190*	18,710*
2018	32,740	7,370*	18,270
2019	33,220	7,320*	19,290
Average Annual Growth (2010 – 2019)	0.7%	0.9%	1.6%

Note: * Estimated by Growth Factor

- 2.1 It should be noted that “*The Annual Traffic Census 2020*” stated that due to the outbreak of COVID-19 in 2020, normal traffic flow pattern across Hong Kong were affected with significant drop in traffic flows in view of work-from-home arrangement for many government and private sector offices, suspension of face-to-face classes for schools, and disruption of tourism, etc. Hence, the traffic data of 2020 is not adopted to determine the average annual growth.
- 2.21 Table 2.6 shows that the overall average annual growth in AADT between 2010 and 2020 is some 0.7% to 1.6%.

3.0 THE PROPOSED COLUMBARIUM

Development Schedule

- 3.1 Figure 3.1 shows the layout of the Proposed Columbarium which consists of 2 buildings, i.e. Buildings 1 and 2, of which Building 1 is an existing 2-storey building and the G/F is being used as a columbarium, and Building 2 is an existing 1-storey building also being used as a columbarium.
- 3.2 According to the Applicant, Table 3.1 summarise the existing niche status found in the Proposed Columbarium.

TABLE 3.1 EXISTING NICHE STATUS OF THE PROPOSED COLUMBARIUM

Status		Number of Niches		
		Building 1	Building 2	Total
Occupied	Sold and occupied [a]	8 (0.2%)	0 (0.0%)	8 (0.2%)
Vacant	Sold but vacant [b]	574 (12.9%)	0 (0.0%)	582 (13.1%)
	Unsold (and vacant) [c]	1,882 (42.2%)	1,992 (44.7%)	3,874 (86.9%)
	<i>Subtotal [b] + [c]</i>	<i>2,456, (55.1%)</i>	<i>1,992 (44.7%)</i>	<i>4,448 (99.8%)</i>
TOTAL [a] + [b] + [c]		2,464 (55.3%)	1,992 (44.7%)	4,456 (100.0%)

Provision of Internal Transport Facilities

- 3.3 Yat Tak Kwun does not abut any road carriageway, and is inaccessible by vehicles; hence no internal transport facilities are provided for the Proposed Columbarium.

Special Traffic and Crowd Arrangements on Ching Ming and Chung Yeung Festival Periods

- 3.4 Special traffic and crowd arrangements are proposed by the Proposed Columbarium to manage and minimise the potential traffic and pedestrian impact associated with the Proposed Columbarium. The details are described in paragraphs below:

Implementation Period

- 3.5 The special traffic arrangements will be implemented during the Ching Ming and Chung Yeung Festival Periods including:
- (i) 3 weekends (Saturdays and Sundays) before the Ching Ming and Chung Yeung Festival Days,
 - (ii) On the Ching Ming and Chung Yeung Festival Days,
 - (iii) 3 weekends (Saturdays and Sundays) after the Ching Ming and Chung Yeung Festival Days, and
 - (iv) Any public holidays within the 3 weekends (Saturdays and Sundays) before and after the Ching Ming and Chung Yeung Festival Days.

Visit-by-Appointment Arrangement

- 3.6 The Applicant will implement a mandatory Visit-by-Appointment Arrangement requiring all visitors to register with the Applicant prior to visiting Yat Tak Kwun during each Ching Ming and Chung Yeung Festival Period. Hence, the number of visitors can be regulated.
- 3.7 The registration will be available via smartphone application, or by phone. Visitors are required to provide the Applicant with the number of people visiting in their group, the columbarium hall and niche to be visited, and the intended visiting time and date. The registration will be regarded as successful after the Applicant has confirmed the visiting details with the visitor.

- 3.8 The visiting capacity with the Visit-by-Appointment arrangement is calculated and is presented in Table 3.2.

TABLE 3.2 VISITING CAPACITY WITH VISIT-BY-APPOINTMENT ARRANGEMENT

Itemh	Proposed Columbarium	
	Building 1	Building 2
Approximate Gross Floor Area [a]	124m ²	55m ²
Housing Capacity [b] ^(Note 1)	3m ² of gross floor area per person	
Visiting Capacity per Grave Sweeping Session [c] = [a] ÷ [b] (Rounded-down to nearest 5)	40 persons	15 persons
	<i>Subtotal: 55 persons per session</i>	
Duration of Grave Sweeping per Session [d]	20 minutes	20 minutes
Number of Grave Sweeping per Hour [e] = 60 ÷ [d]	3 sessions	3 sessions
Visiting Capacity per Hour [d] = [a]x[c]	120 persons per hour	45 persons per hour
TOTAL	165 persons per hour	

Note 1: PNAP APP-154, "Design Requirements for Columbarium Facilities", Buildings Department. Assessment of population density = 2m² of **usable** floor area per person, i.e. approximate 3m² of **gross** floor area per person.

- 3.9 As shown in Table 3.2, the Applicant will impose three 20-minute grave sweeping sessions per hour with a maximum 55 persons per session, i.e. an hourly visiting capacity of 165 persons per hour.

Waiting and Queuing Area

- 3.10 Yat Tak Kwun has an open yard within its premise, and an area of some 600m² (Figure 3.2 refers) will be set as waiting and queuing area for grave sweepers to wait before entering the respective columbarium. With a standing capacity of 4 persons per square metre, the holding area can hold some 2,400 persons, which is sufficient to hold the expected visitors.

Mandatory No Car Parking Policy

- 3.11 In view that the Proposed Columbarium is inaccessible by vehicles and it has no internal transport facilities, the Applicant will remind and implement a no car parking policy to its grave sweepers during the Ching Ming and Chung Yeung Festival Periods to discourage grave sweepers from driving to Yat Tak Kwun, and at the same time remind and encourage grave sweepers to visit by public transport.

Operation Hours of the Proposed Columbarium

- 3.12 The normal operation hours of the Proposed Columbarium are from 0900 to 1700 hours, including the Ching Ming and Chung Yeung Festival Periods.

Mandatory Policy Agreement in Condition of Sale

- 3.13 The Applicant will specify the above mandatory policies and the operation hours of the Proposed Columbarium in the condition of sale. All niche owners must agree and abide to the policies in order to purchase and visit the Proposed Columbarium.

On-Site One-Way Pedestrian Flow and Provision of Holding and Queuing Areas

- 3.14 One-way pedestrian flow will be implemented, as illustrated in Figure 3.2. A holding area will also be provided within Yat Tak Kwun for grave sweepers waiting to enter the columbarium.

Data Collection and Review of the Special Traffic Arrangement

- 3.15 The Applicant will maintain a record of visitors, and number of niches occupied, etc. throughout the Ching Ming and Chung Yeung Festival Periods. This information could be reviewed to evaluate the operation efficiency of the special traffic arrangement. If necessary, the information can be provided to the Government for review and comments in order to improve the overall special traffic arrangement with a goal to minimise the traffic impact to the general public.

Stationing of In-House Staff

- 3.16 In-house trained staff will be stationed within Yat Tak Kwun to ensure smooth pedestrian flow and safety of visitors.

Comparison on Visiting Demand and Visiting Capacity

- 3.17 Table 3.3 compares the estimated visitor demand and visiting capacity for the Proposed Columbarium during the Ching Ming and Chung Yeung Festival Periods.

TABLE 3.3 COMPARISON ON VISITOR DEMAND AND VISITING CAPACITY

Visitor Demand per Festival Period	
Number of visitors per sold and occupied niches	= 2.89 visitors/niche (based on CKM's in-house data)
Total number of niches	= 4,456 niches
Total number of visitor (Visitor Demand per Festival Period)	= 4,456 niches x 2.89 visitors/niche = 12,878 visitors
Visiting Capacity per Festival Period	
Visiting capacity	= 55 persons per session
Number of sessions per hour	= 60 min/hr ÷ 20 min/session = 3 sessions/hr
Opening hours of the Subject Site	= 0900 to 1700 hours = 8 hr/day
Number of sessions per day	= 8 hr / day x 3 sessions/hr = 24 sessions/day
Daily visiting capacity	= 55 visitors/session x 24 sessions / day = 1,320 visitors/day
Number of Days within the Festival Period	= Minimum 12 Days (including 3 weekends before and 3 weekends after the Festival Day, and assuming the Festival Day falls on a Saturday or Sunday; other public holidays in between also excluded.)
Minimum Visiting Capacity per Festival Period	= 1,320 visitors / day x 12 days = 15,840 visitors > Visitor Demand of 12,878 visitors, hence, OK

- 3.18 As shown in Table 3.3, the visitor demand is estimated to be some 12,878 across the Festival Period; whereas the visiting capacity for minimum 12 days will be 15,840 visitors, i.e. at least 1.2 times more than the visitor demand.
- 3.19 Hence, the proposed visiting capacity of 55 persons for each visiting session with the proposed implementation period of minimum 12 days, i.e. 3 weekends before and 3 weekends after the festival day, is considered appropriate and will be sufficient to accommodate the expected visitor demand.
- 3.20 In addition, special arrangement can also be requested by the visitors to visit the Proposed Columbarium on a weekday. Visitors must contact the Applicant in-advance for this special arrangement. The number of visitors on weekday is expected to be negligible, and shall not result in any adverse traffic impact.

Estimation on Pedestrian and Traffic Generation

Traffic Generation at Other Existing Columbarium

- 3.21 To predict the number of visitor and mode of transport associated with the Proposed Columbarium, reference is made to the transport mode of Gig Lok Monastery located at Tuen Fu Lane, Tuen Mun. Gig Lok Monastery has an existing columbarium and it is located around 3km the Proposed Columbarium.
- 3.22 Similar to the Proposed Columbarium, Gig Lok Monastery is also well-served by public transport services, including many franchised bus, GMB and RMB routes along Castle Peak Road – Lingnan, and the MTR and LRT Siu Hong Stations. Hence, the transport characteristics, i.e. road and public transport network, between the Gig Lok Monastery and the Proposed Columbarium are similar, and therefore, the mode of transport of Gig Lok Monastery is adopted which is summarised in Table 3.4.

TABLE 3.4 MODE OF TRANSPORT USED BY VISITORS OF GIG LOK MONASTERY

Mode of Transport	Number of Visitors	Average Occupancy	Percentage
LRT and MTR	573	-	53.6%
Private Car	207	4.8	19.3%
Green / Red Minibus and Franchised Bus	104	-	9.7%
Taxi	87	3.8	8.1%
Walk	83	-	7.8%
TOTAL	1,070	-	100%

- 3.23 Based on Table 3.4, the pedestrian and traffic generations associated with the Proposed Columbarium with the special traffic and crowd management implemented, i.e. with an hourly visiting capacity of 165 persons, are estimated and summarised in Table 3.5.

TABLE 3.5 ESTIMATED TRAFFIC AND PEDESTRIAN GENERATIONS OF THE PROPOSED COLUMBARIUM

Mode of Transport	Percentage	Pedestrian Generation (ped/hour)	Average Occupancy (persons/veh)	Traffic Generation (pcu/hour)
LRT and MTR	53.6%	88	-	-
Private Car	19.3%	32	4.8	7
Green / Red Minibus and Franchised Bus	9.7%	19	-	-
Taxi	8.1%	13	3.8	4
Walk	7.8%	13	-	-
TOTAL	100%	165	-	11

- 3.24 Table 3.5 shows that, with the special traffic and crowd arrangement implemented during the Ching Ming and Chung Yeung Festival Period, the Proposed Columbarium is expected to generate 165 persons per hour, 7 private car trips per hour, and 4 taxi trips per hour.

4.0 TRAFFIC AND PEDESTRIAN IMPACT

Traffic and Pedestrian Forecast

- 4.1 Reference is made to the TPDM which states “the planning horizon for traffic forecast... should be set at the time when the development is completed or preferably at a design year within 5 years of the completion.”
- 4.2 In view the Proposed Columbarium is an existing building which has been completed; the design year is set to be 5 years from Year 2022, i.e. Year 2027.
- 4.3 Two design scenarios were assessed including (i) Year 2027 Festival Days without the Proposed Columbarium, and (ii) Year 2027 Festival Days with the Proposed Columbarium.
- 4.4 After the review of the population projection (Table 2.4) and the historic traffic growth (Table 2.5), a conservative growth rate of 5.0% per annum is adopted to derive the 2027 traffic flows, which is assumed to include the additional traffic and pedestrian generation due to other new developments located in the vicinity of Yat Tak Kwun, such as the Hung Shui Kiu NDA.
- 4.5 Hence, the year 2027 columbarium peak hour traffic flows on the Festival Days are derived as follows:

$$\begin{array}{l} \text{2027 Traffic / Pedestrian Flows} \\ \text{Without the Proposed} \\ \text{Columbarium [A]} \end{array} = \begin{array}{l} \text{Existing Traffic / Pedestrian Flows} + \\ \text{Estimated Traffic / Pedestrian Growth from} \\ \text{2020 to 2027} \end{array}$$

$$\begin{array}{l} \text{2027 Traffic / Pedestrian Flows} \\ \text{With the Proposed Columbarium} \end{array} = \begin{array}{l} \text{[A]} + \text{Traffic / Pedestrian Generation} \\ \text{associated with the Proposed} \\ \text{Columbarium} \end{array}$$

2027 Junction Capacity Analysis

- 4.6 The Year 2027 columbarium peak hour traffic flows without and with the Proposed Columbarium on Ching Ming Festival Day are shown in Figures 4.1 and 4.2 respectively.
- 4.7 Junction capacity analyses for Year 2027 columbarium peak hour are summarised in Table 4.1 and detailed calculations are presented in the Appendix A.

TABLE 4.1 2027 JUNCTION OPERATIONAL PERFORMANCE

Junction		Junction Control	Performance Indicator	Year 2026 Columbarium Peak Hour on Ching Ming Festival Day	
				Without the Proposed Columbarium	With the Proposed Columbarium
J01	Castle Peak Road – Hung Shui Kiu / Tan Kwai Tsuen Road	Signalised	RC	69%	69%
J02	Castle Peak Road – Hung Shui Kiu / Hung Shui Kiu Main Street	Signalised	RC	79%	76%
J03	Castle Peak Road – Hung Shui Kiu / Wo Ping San Tsuen Lane	Priority	RFC	0.0158	0.0159

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

- 4.8 The above results indicate that the analysed junctions are expected to operate with capacity during the columbarium peak hour on the Ching Ming and Chung Yeung Festival Days, and the Proposed Columbarium will have no adverse traffic impact to the junctions analysed.

2027 Footpath Levels of Service Analysis

- 4.9 Table 4.2 summarises the columbarium peak hour pedestrian flow and results of the LOS analysis on the Ching Ming Festival Day without and with the Proposed Columbarium.

TABLE 4.2 2027 FOOTPATH OPERATIONAL PERFORMANCE

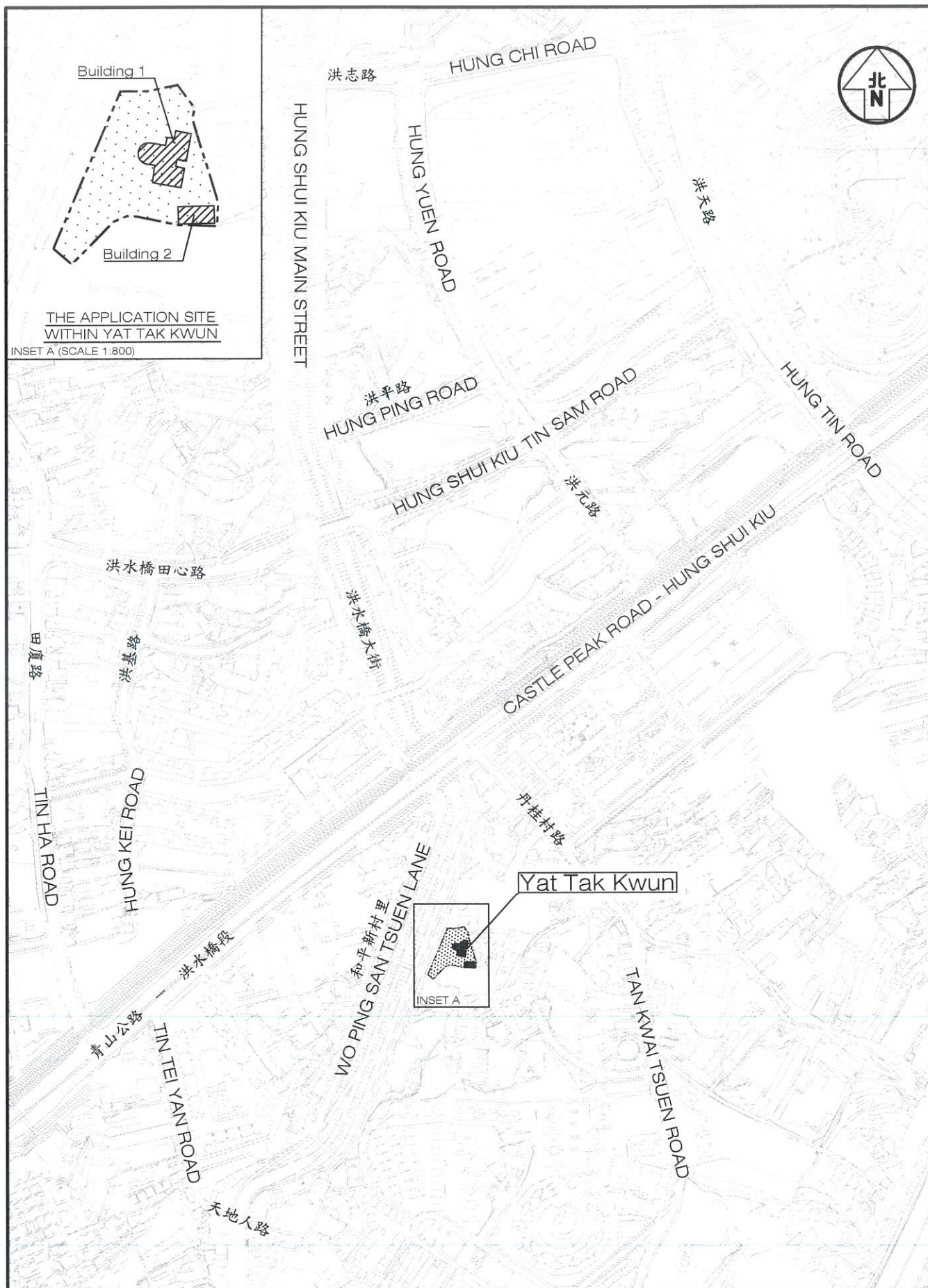
Pedestrian Facilities		Clear Width (m) ⁽¹⁾	Year 2026 Ching Ming Festival Day Columbarium Peak Hour			
			2-way Pedestrian Flow (ped/hour)		Flow Rates [LOS] (ped/m/min)	
			Without the Proposed Columbarium	With the Proposed Columbarium	Without the Proposed Columbarium	With the Proposed Columbarium
FP01	Footpath along Nullah between Yat Tak Kwun and Castle Peak Road – Hung Shui Kiu	3.0m	184	514	1.0 [A]	2.9 [A]
FP02	Footpath along Castle Peak Road – Hung Shui Kiu westbound between Tan Kwai Tsuen Road and Nullah	4.5m	294	624	1.1 [A]	2.3 [A]
FP03	Footpath along Castle Peak Road – Hung Shui Kiu westbound between Nullah and Wo Ping San Tsuen Lane	3.0m	293	623	1.6 [A]	3.5 [A]

Note: (1) Width of adjacent cycle track excluded.

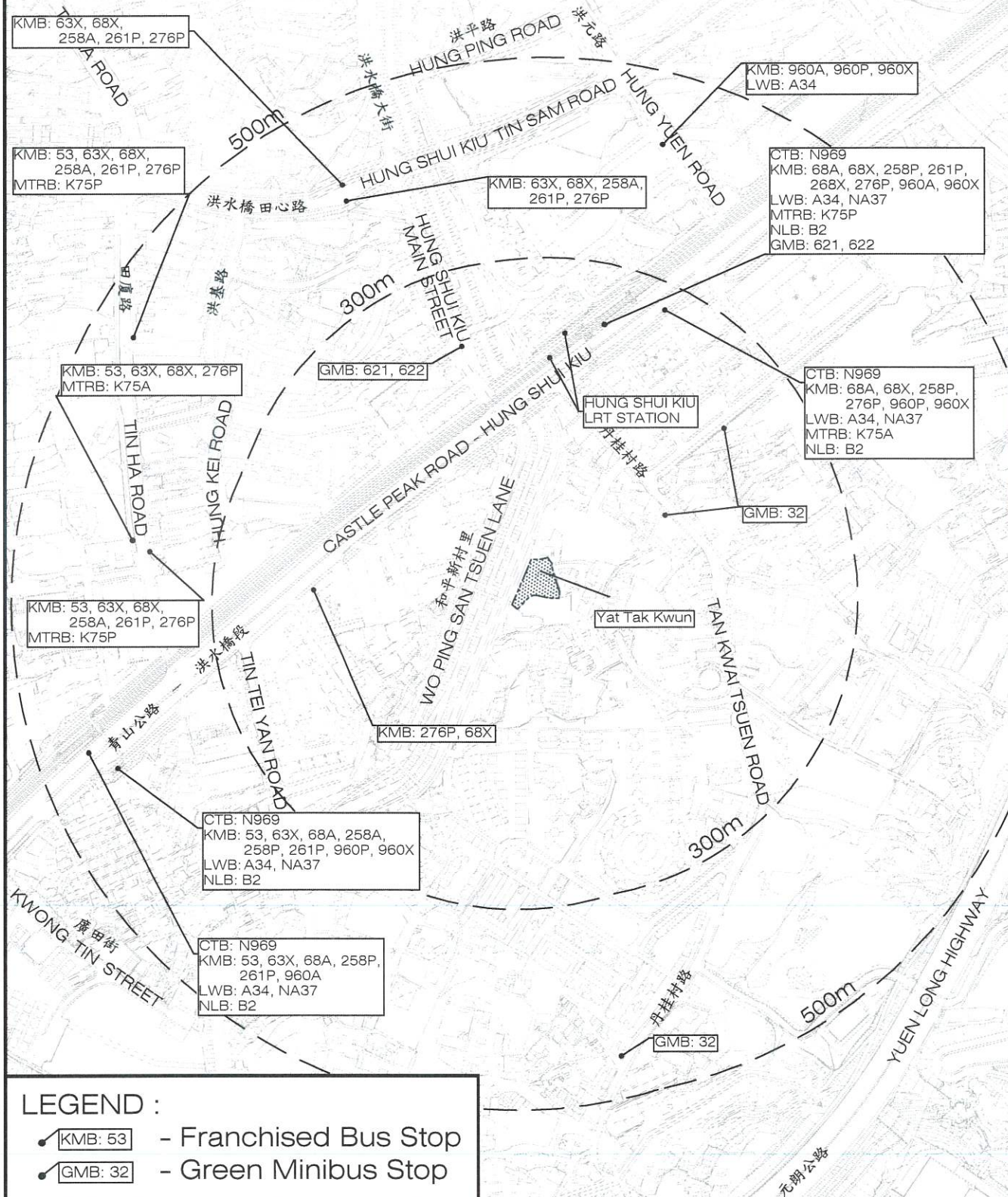
- 4.10 The above results indicate that the footpaths analysed are expected to operate with capacity during the columbarium peak hour on the Ching Ming and Chung Yeung Festival Days. Hence, it can be concluded that the Proposed Columbarium will have no adverse pedestrian impact to the footpaths analysed.

5.0 SUMMARY

- 5.1 The Application Site includes part of the 2 existing buildings within Yat Tak Kwun (一德觀) located at 45 Tan Kwai Tsuen in Hung Shui Kiu, Yuen Long. The Applicant has the intention to regularise 4,456 niches, of which 8 niches are now sold and occupied, 582 niches are sold but vacant, and the remaining 3,866 niches are unsold and vacant.
- 5.2 Special traffic and crowd arrangements will be implemented during the Ching Ming and Chung Yeung Festival Periods, which include the Ching Ming and Chung Yeung Festival Days, 3 weekends before and 3 weekends after the Festival Days, and any public holidays occurring during these periods. This special arrangements include:
- (i) Mandatory Visit-by-Appointment Arrangement
 - (ii) Reminder on the mandatory no parking policy,
 - (iii) Operation hours will be from 0900 to 1700 hours,
 - (iv) On-site 1-way pedestrian flow, and provision of holding and queuing areas, and
 - (v) Data collection and review of the special traffic arrangement.
- 5.3 Traffic and pedestrian generations of the Proposed Columbarium during the columbarium peak hour on Ching Ming Festival Day were estimated based on the mode of transport obtained surveys conducted at the Gig Lok Monastery which is located in the vicinity.
- 5.4 Special traffic and pedestrian traffic arrangement will be implemented during the Ching Ming and Chung Yeung Festival periods to minimise the potential traffic impact, which includes implementation of the Visit-By-Appointment arrangement. With the Visit-By-Appointment arrangement, the Proposed Columbarium can limit the number of visitors to 55 persons per 20-minute visiting session.
- 5.5 The year 2027 junction capacity and footpath LOS analyses concluded that, the junctions and footpaths analysed are expected to have capacity to accommodate the expected traffic growth and the traffic generated by the Proposed Columbarium.
- 5.6 From traffic engineering aspect, the Proposed Columbarium is acceptable.



Project Title YAT TAK KWUN, NO. 45 TAN KWAI TSUEN, HUNG SHUI KIU, YUEN LONG, NEW TERRITORIES (LOT NO. 3971 RP IN D.D. 124)	Job No. J6963	Figure No. 1.1	Scale In A4 1 : 1,500
Figure Title LOCATIONS OF YAT TAK KWUN AND THE APPLICATION SITE	Designed by W C H	Drawn by S C Y	Checked by K C
		Revision C	Date 30 SEP 2022
	CKM Asia Limited Traffic and Transportation Planning Consultants 21st Floor, Methodist House, 36 Hennessy Road, Wan Chai, Hong Kong Tel : (852) 2520 5990 Fax : (852) 2528 6343 Email : mail@ckmasia.com.hk		



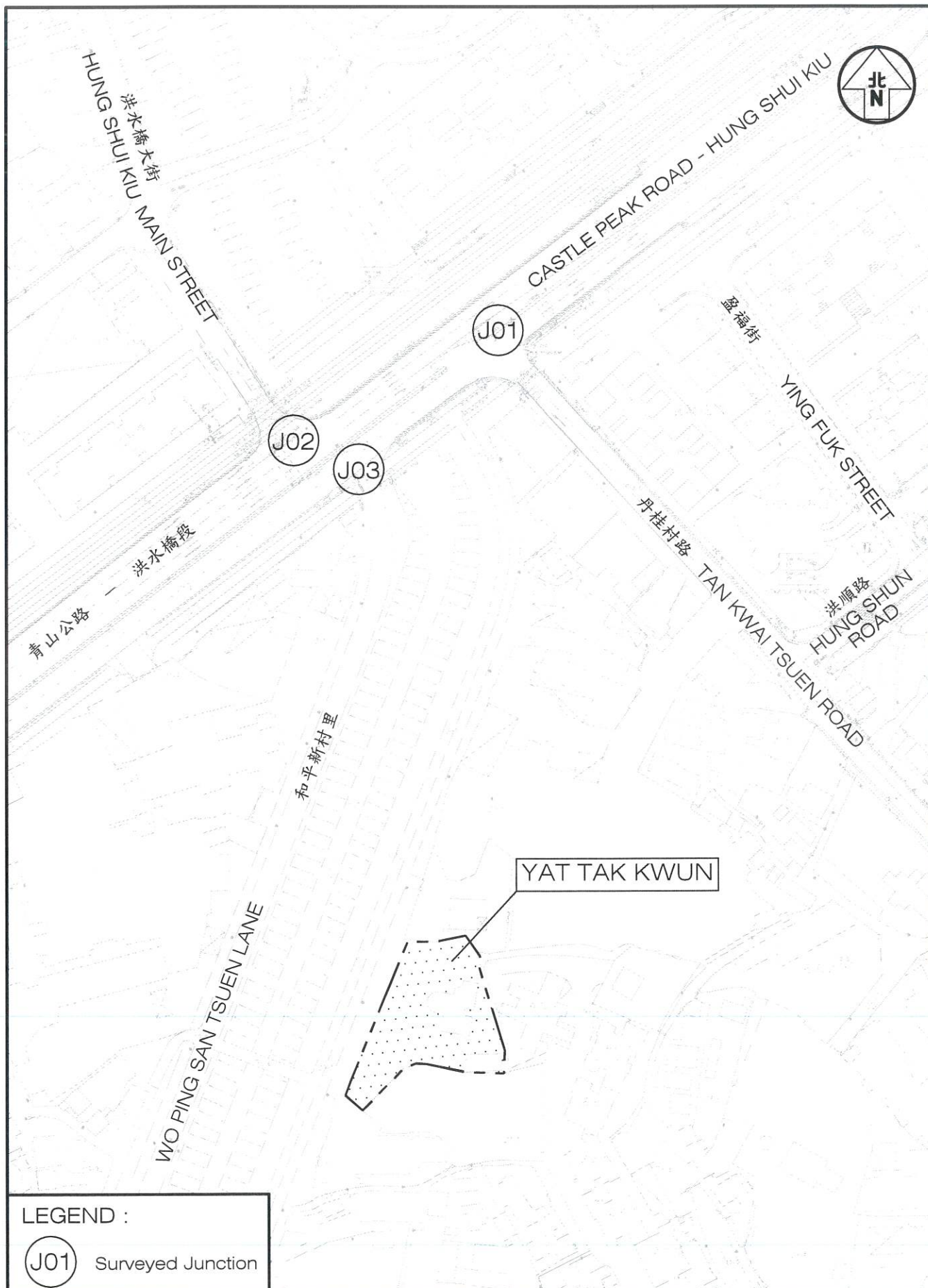
Project Title
**YAT TAK KWUN, NO. 45 TAN KWAI TSUEN, HUNG SHUI KIU,
YUEN LONG, NEW TERRITORIES (LOT NO. 3971 RP IN D.D. 124)**

Figure Title
**ROAD-BASED PUBLIC TRANSPORT SERVICES
OPERATING NEAR YAT TAK KWUN**

Job No. J6963	Figure No. 2.1	Scale In A4 1 : 5,500
Designed by WCH	Drawn by SCY	Checked by KC
	Revision B	Date 30 SEP 2022

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T:\JOB\6963\2022 09\Fig 2.1 RevC.dwg



LEGEND :



Surveyed Junction

Project Title
YAT TAK KWUN, NO. 45 TAN KWAI TSUEN, HUNG SHUI KIU,
YUEN LONG, NEW TERRITORIES (LOT NO. 3971 RP IN D.D. 124)

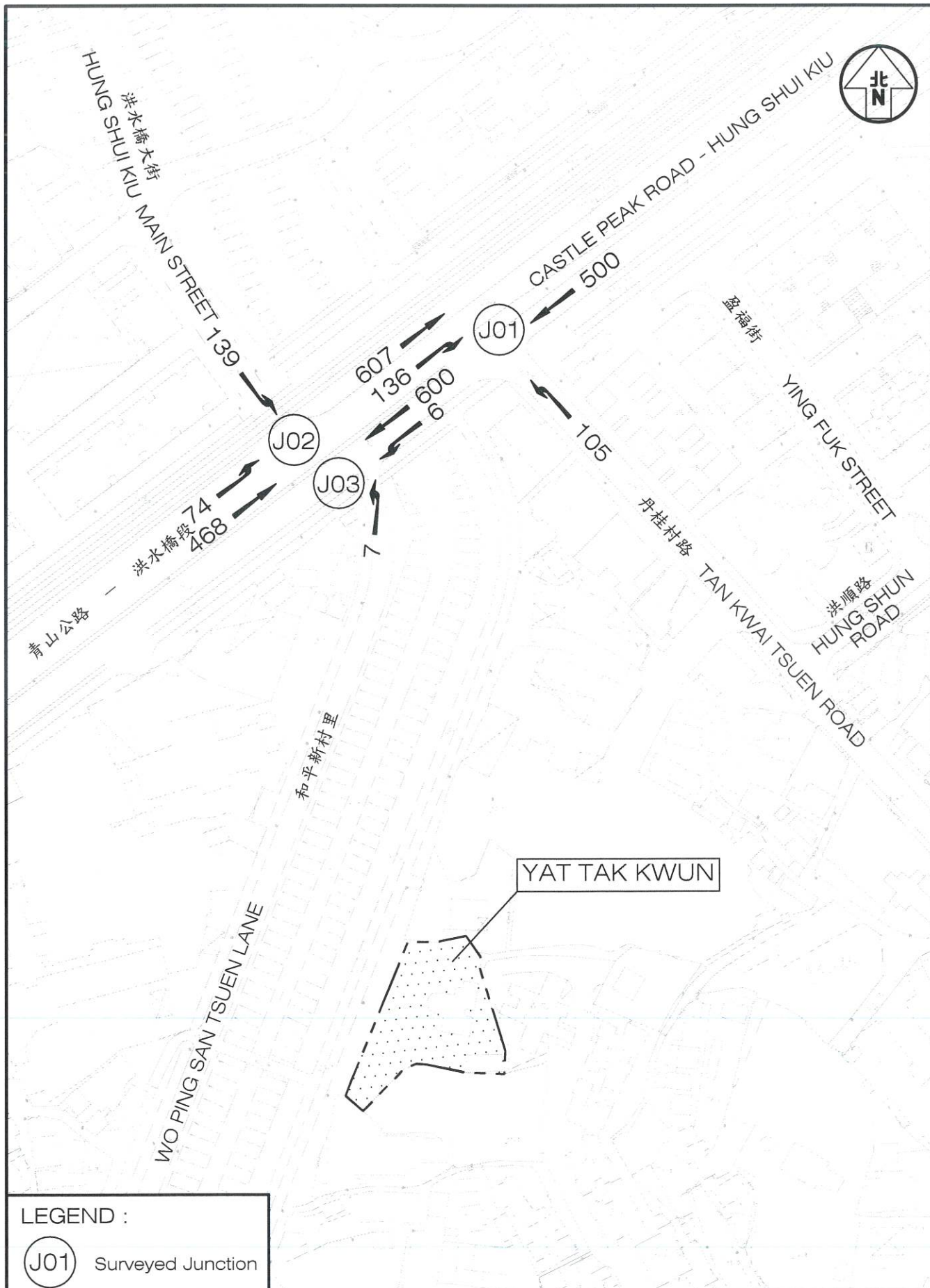
Figure Title

LOCATION AND LAYOUT OF THE SURVEYED JUNCTIONS

Job No. J6963	Figure No. 2.2	Scale in A4 1 : 1,500
Designed by W C H	Drawn by S C Y	Checked by K C
	Revision B	Date 30 SEP 2022

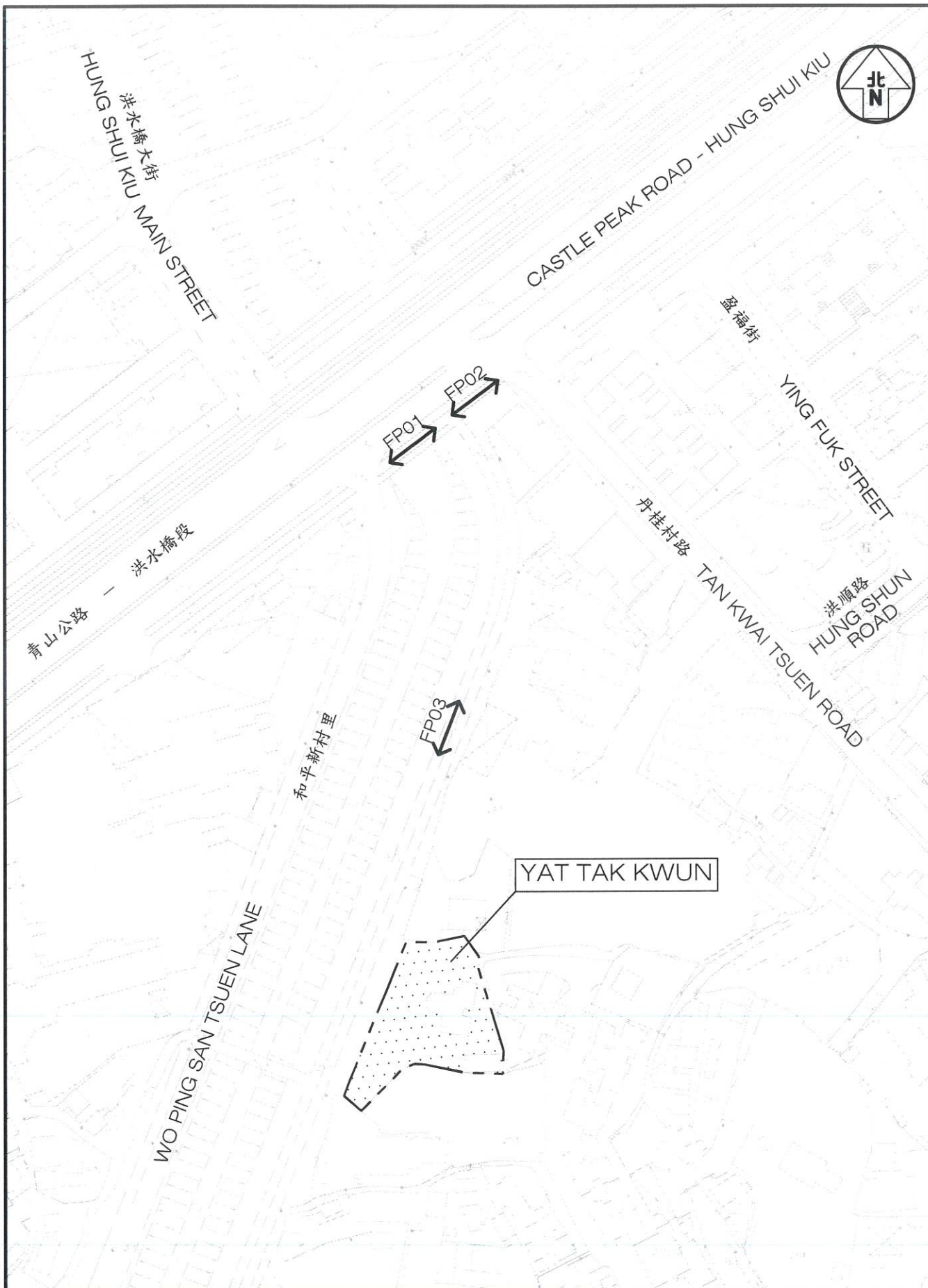
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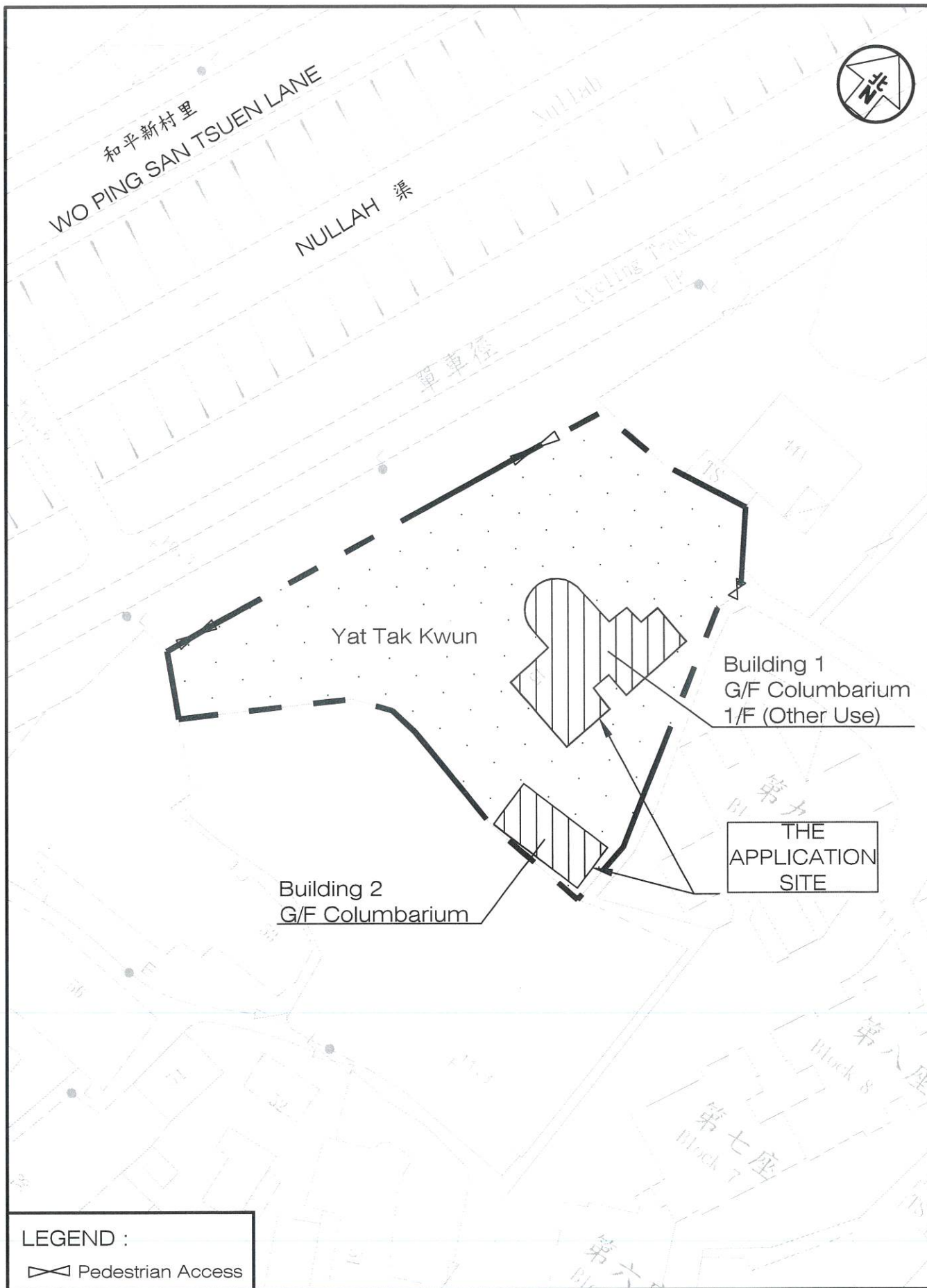
Project Title	YAT TAK KWUN, NO. 45 TAN KWAI TSUEN, HUNG SHUI KIU, YUEN LONG, NEW TERRITORIES (LOT NO. 3971 RP IN D.D. 124)	Job No. J6963	Figure No. 2.3	Scale In A4 1 : 1,500
Figure Title	YEAR 2020 COLUMBARIUM PEAK HOUR TRAFFIC FLOWS	Designed by W C H	Drawn by S C Y	Checked by K C
			Revision B	Date 30 SEP 2022
		CKM Asia Limited Traffic and Transportation Planning Consultants 21st Floor, Methodist House, 36 Hennessy Road, Wan Chai, Hong Kong Tel : (852) 2520 5990 Fax : (852) 2528 6343 Email : mail@ckmasia.com.hk		

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Project Title YAT TAK KWUN, NO. 45 TAN KWAI TSUEN, HUNG SHUI KIU, YUEN LONG, NEW TERRITORIES (LOT NO. 3971 RP IN D.D. 124)	Job No. J6963	Figure No. 2.4	Scale in A4 1 : 1,500
Figure Title LOCATION OF THE SURVEYED FOOTPATH	Designed by W C H	Drawn by S C Y	Checked by K C
		Revision B	Date 30 SEP 2022
	CKM Asia Limited Traffic and Transportation Planning Consultants 21st Floor, Methodist House, 36 Hennessy Road, Wan Chai, Hong Kong Tel : (852) 2520 5990 Fax : (852) 2528 6343 Email : mail@ckmasia.com.hk		

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LEGEND :

— Pedestrian Access

Project Title
YAT TAK KWUN, NO. 45 TAN KWAI TSUEN, HUNG SHUI KIU,
YUEN LONG, NEW TERRITORIES (LOT NO. 3971 RP IN D.D. 124)

Figure Title
**LAYOUT OF YAT TAK KWUN
AND LOCATIONS OF THE PROPOSED COLUMBARIUM**

Job No. J6963	Figure No. 3.1	Scale In A4 1 : 500
Designed by W C H	Drawn by S C Y	Checked by K C
		Revision B
		Date 30 SEP 2022

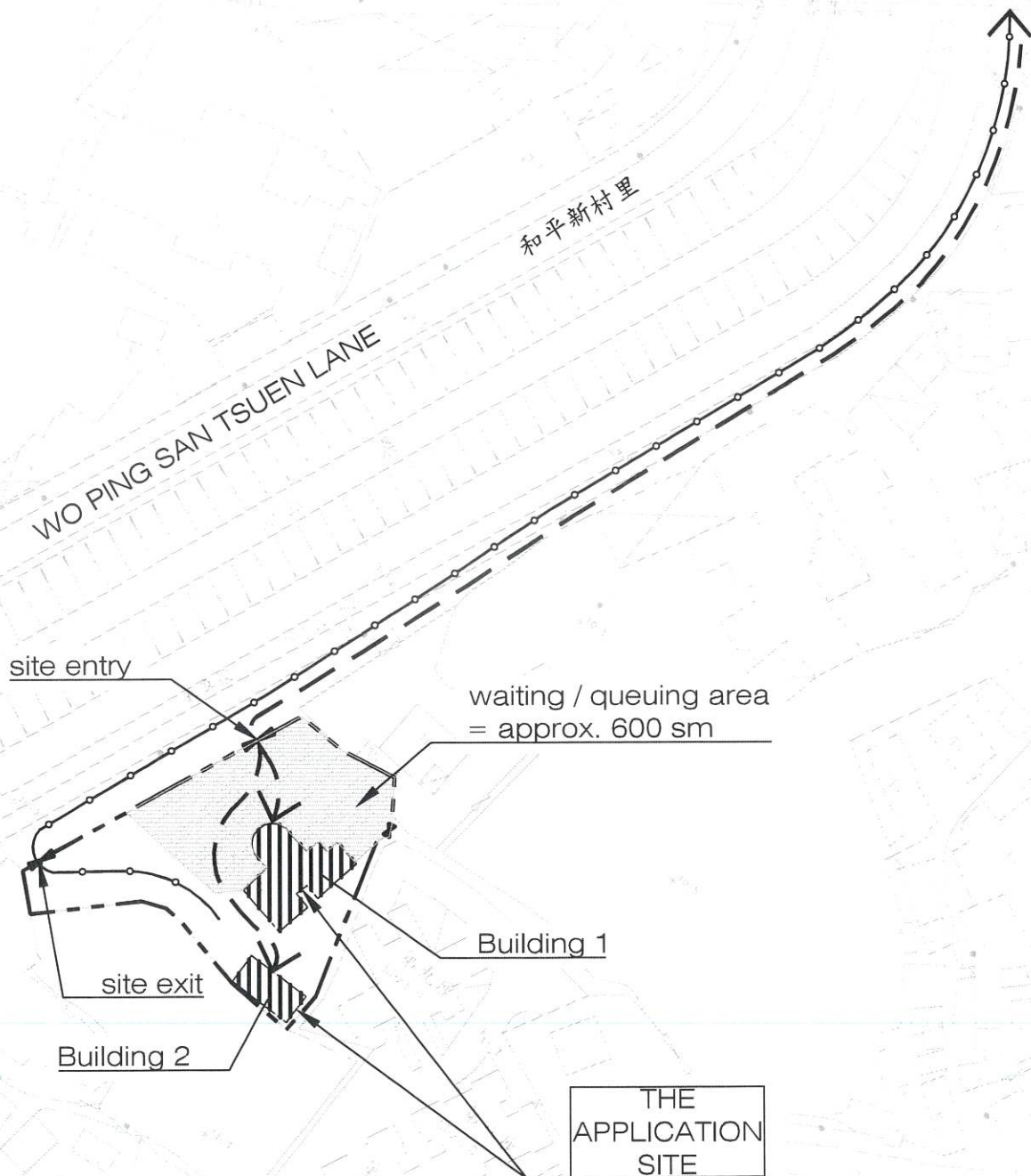
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Tel : (852) 2520 5990 Fax : (852) 2528 6343 Email : mail@ckmasia.com.hk

T:\JOB\J6960-J6999\J6963\2022 09\Fig 2.X; 3.X & 4.X RevC.dwg

青山公路 — 洪水橋段

CASTLE PEAK ROAD - HUNG SHUI KIU



LEGEND :

- — — — — Arrival Route
— o — o — o — o — Departure Route

Project Title
YAT TAK KWUN, NO. 45 TAN KWAI TSUEN, HUNG SHUI KIU,
YUEN LONG, NEW TERRITORIES (LOT NO. 3971 RP IN D.D. 124)

Figure Title

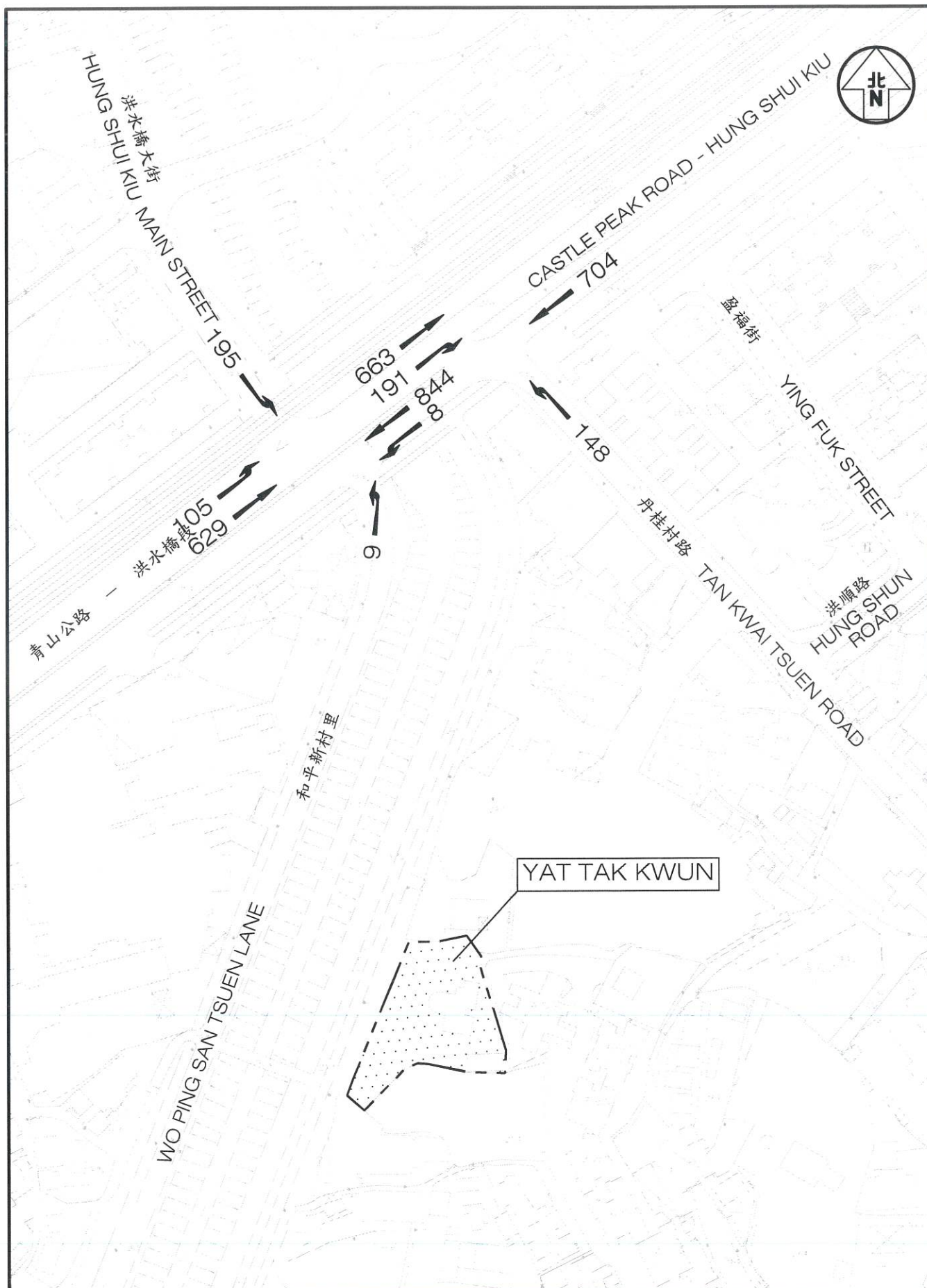
PEDESTRIAN ROUTING TO/FROM THE PROPOSED COLUMBARIUM

Job No. J6963	Figure No. 3.2	Scale In A4 1 : 1,000
Designed by W C H	Drawn by S C Y	Checked by K C
		Revision B
		Date 30 SEP 2022

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Project Title
YAT TAK KWUN, NO. 45 TAN KWAI TSUEN, HUNG SHUI KIU,
YUEN LONG, NEW TERRITORIES (LOT NO. 3971 RP IN D.D. 124)

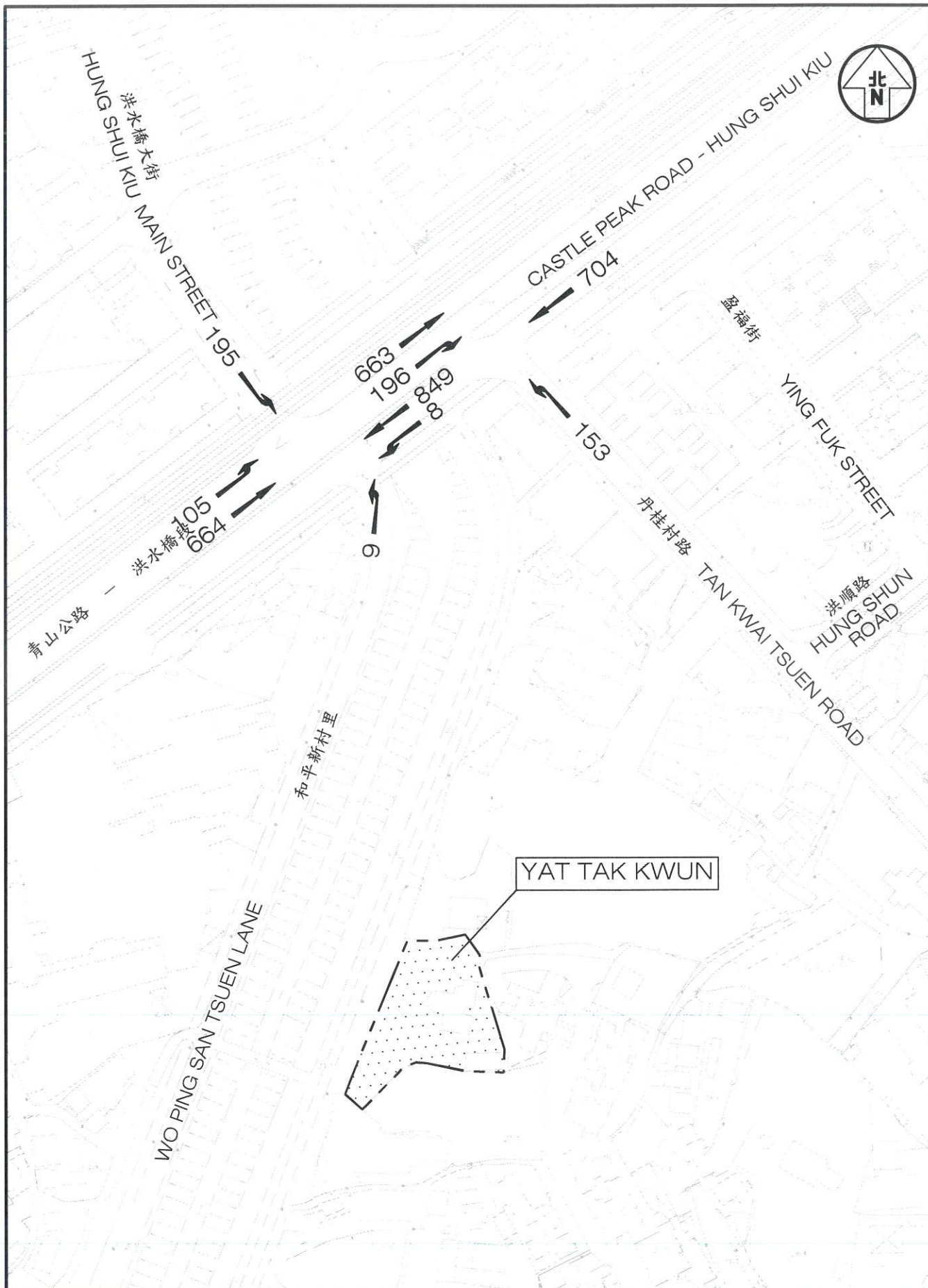
Figure Title
2027 COLUMBARIUM PEAK HOUR TRAFFIC FLOW
WITHOUT THE PROPOSED COLUMBARIUM

Job No. J6963	Figure No. 4.1	Scale In A4 1 : 1,500
Designed by W C H	Drawn by S C Y	Checked by K C
		Revision B
		Date 30 SEP 2022

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Project Title	YAT TAK KWUN, NO. 45 TAN KWAI TSUEN, HUNG SHUI KIU, YUEN LONG, NEW TERRITORIES (LOT NO. 3971 RP IN D.D. 124)	Job No. J6963	Figure No. 4.2			Scale In A4 1 : 1,500	
		Designed by W C H	Drawn by S C Y	Checked by K C	Revision B	Date 30 SEP 2022	
Figure Title	2027 COLUMBARIUM PEAK HOUR TRAFFIC FLOW WITH THE PROPOSED COLUMBARIUM	CKM Asia Limited Traffic and Transportation Planning Consultants 21st Floor, Methodist House, 36 Hennessy Road, Wan Chai, Hong Kong Tel : (852) 2520 5990 Fax : (852) 2528 6343 Email : mail@ckmasia.com.hk					

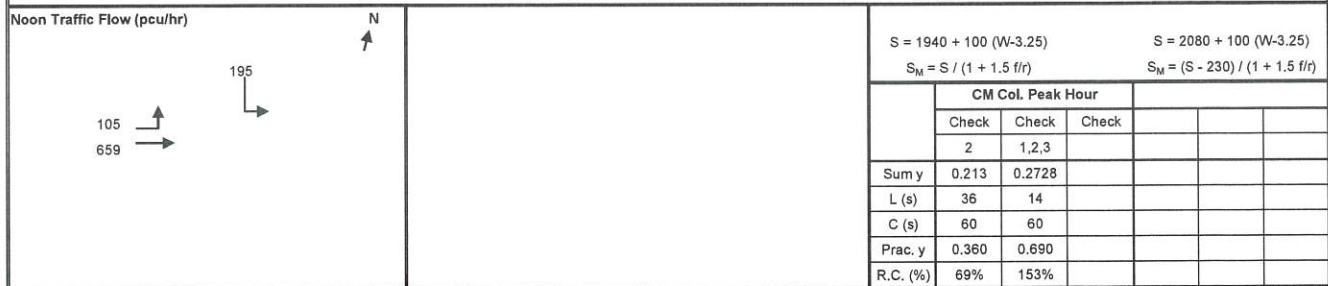
Appendix A – Junction Capacity Analysis

Signal Junction Analysis

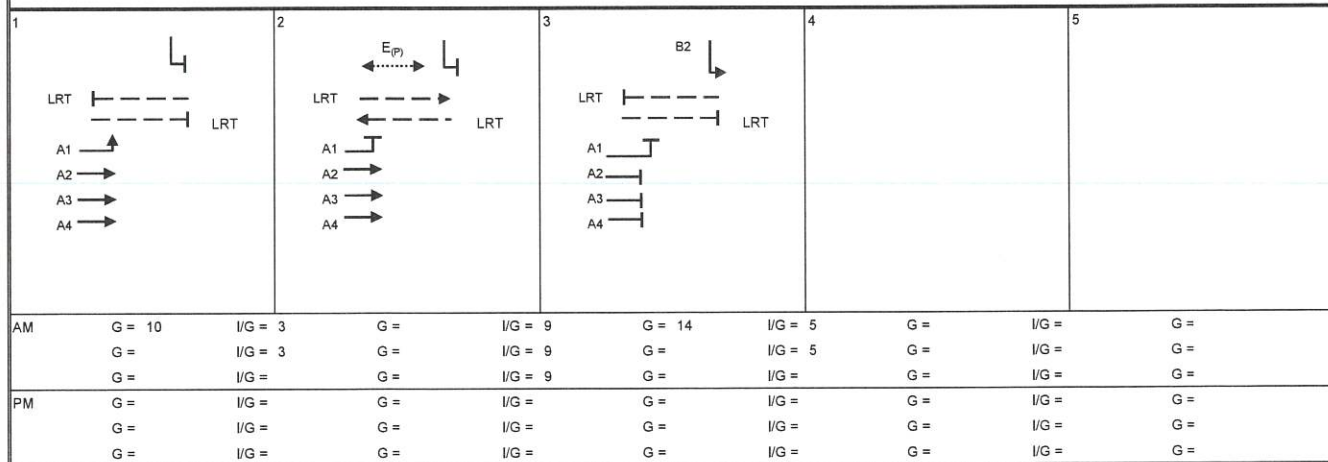
[illegible]

Signal Junction Analysis

Junction:	Castle Peak Road – Hung Shui Kiu / Hung Shui Kiu Main Street				Job Number:	J6963
Scenario:	Without Proposed Columbarium				Page	2
Design Year:	2026	Designed By:	HCF	Checked By:	WCH	Date: 30 September 2022

[illegible]

NOTE:



Signal Junction Analysis

[illegible]

Signal Junction Analysis

[illegible]

Signal Junction Analysis

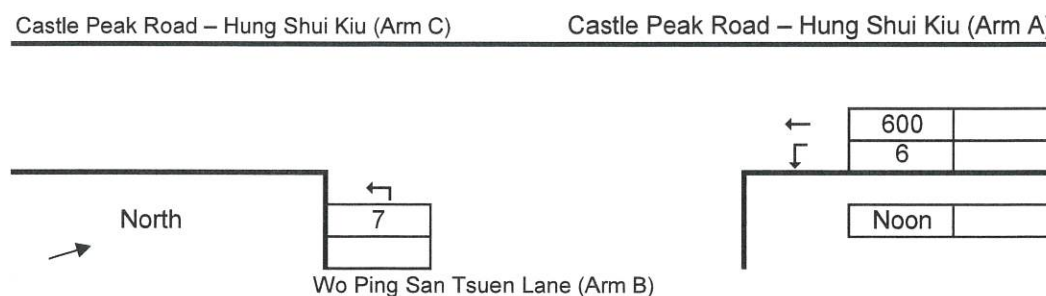
[illegible]

Signal Junction Analysis

[illegible]

Priority Junction Analysis

Junction:	Castle Peak Road – Hung Shui Kiu / Wo Ping San Tsuen Lane			Job Number:	J6963
Scenario:	Existing Condition			P. 7	
Design Year:	2020	Designed By:	Checked By:	Date:	30/9/2022



The predictive equations of capacity of movement are:

$$Q\text{-BA} = D[627 + 14W\text{-CR} - Y(0.364q\text{-AC} + 0.144q\text{-AB} + 0.229q\text{-CA} + 0.52q\text{-CB})]$$

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

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

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

$$D = [1 + 0.094(w\text{-BA} - 3.65)][1 + 0.0009(V\text{-rBA} - 120)][1 + 0.0006(V\text{-IBA} - 150)]$$

$$E = [1 + 0.094(w\text{-BC} - 3.65)][1 + 0.0009(V\text{-rBC} - 120)]$$

$$F = [1 + 0.094(w\text{-CB} - 3.65)][1 + 0.0009(V\text{-rCB} - 120)]$$

where $Y = 1 - 0.0345W$

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

W = major road width

W-CR = central reserve width

w-BA, etc = lane width to vehicle

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

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

Geometry :	Input		Input		Input		Calculated	
	W	7.30	V-rBA		w-BA		D	0.5332
	W-CR	0.00	V-IBA		w-BC	5.00	E	1.1066
			V-rBC	100	w-CB		F	0.5860
			V-rCB				Y	0.7482

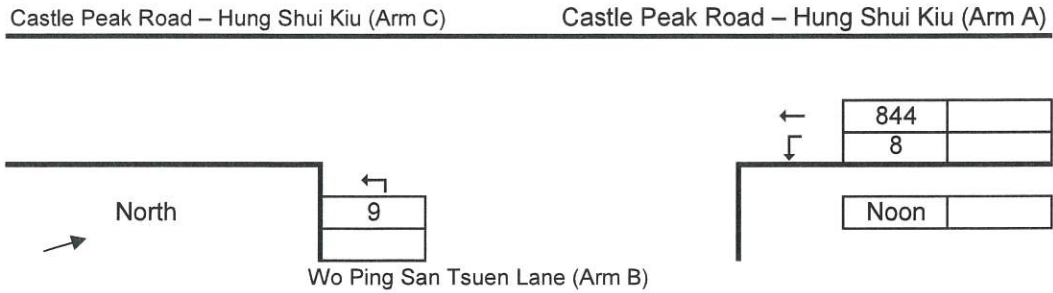
Analysis :

Traffic Flows, pcu/hr	Noon	Capacity, pcu/hr	Noon
q-CA	0	Q-BA	247
q-CB	0	Q-BC	643
q-AB	6	Q-CB	340
q-AC	600	Q-BAC	643
q-BA	0		
q-BC	7		
f	1.000		

Ratio-of-flow to Capacity	AM
B-C	0.010

Priority Junction Analysis

Junction:	Castle Peak Road – Hung Shui Kiu / Wo Ping San Tsuen Lane	Job Number: J6963
Scenario:	Without Proposed Columbarium	P. 8
Design Year:	2026	Designed By: _____ Checked By: _____ Date: 30/9/2022



The predictive equations of capacity of movement are:

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

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

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

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

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

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

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

where $Y = 1 - 0.0345W$

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

W = major road width

W-CR = central reserve width

w-BA, etc = lane width to vehicle

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

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

Geometry :

Input		Input		Input		Calculated	
W	7.30	V-rBA	0	w-BA	0.00	D	0.5332
W-CR	0.00	V-IBA	0	w-BC	5.00	E	1.1066
		V-rBC	100	w-CB	0.00	F	0.5860
		V-rCB	0			Y	0.7482

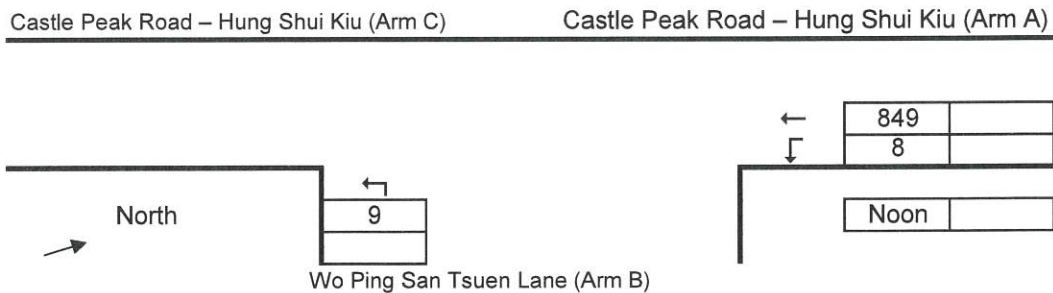
Analysis :

Traffic Flows, pcu/hr	Noon	Capacity, pcu/hr	Noon
q-CA	0	Q-BA	211
q-CB	0	Q-BC	569
q-AB	8	Q-CB	301
q-AC	844	Q-BAC	569
q-BA	0		
q-BC	9		
f	1.000		

Ratio-of-flow to Capacity	AM
B-C	0.016

Priority Junction Analysis

Junction: Castle Peak Road – Hung Shui Kiu / Wo Ping San Tsuen Lane Job Number: J6963
 Scenario: With Proposed Columbarium P. 9
 Design Year: 2026 Designed By: _____ Checked By: _____ Date: 44834



The predictive equations of capacity of movement are:

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

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

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

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

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

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

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

where $Y = 1 - 0.0345W$

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

W = major road width

W-CR = central reserve width

w-BA, etc = lane width to vehicle

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

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

Geometry :

Input		Input		Input		Calculated	
W	7.30	V-rBA	0	w-BA	0.00	D	0.5332
W-CR	0.00	V-IBA	0	w-BC	5.00	E	1.1066
		V-rBC	100	w-CB	0.00	F	0.5860
		V-rCB	0			Y	0.7482

Analysis :

Traffic Flows, pcu/hr	Noon	Capacity, pcu/hr	Noon
q-CA	0	Q-BA	211
q-CB	0	Q-BC	568
q-AB	8	Q-CB	300
q-AC	849	Q-BAC	568
q-BA	0		
q-BC	9		
f	1.000		

Ratio-of-flow to Capacity	AM
B-C	0.016