Proposed Minor Relaxation for "Residential" Use at 42 Grampian Road, Kowloon City Kowloon (New Kowloon Inland Lot No. 3535)

Traffic Impact Assessment
Revised Report
October 2026

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Proposed Minor Relaxation for "Residential" Use at 42 Grampian Road, Kowloon City Kowloon (New Kowloon Inland Lot No. 3535)

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1.0 INTRODUCTION

Background

1.1 The Subject Site is located at 42 Grampian Road in Kowloon City. It is currently occupied by a residential building which is known as the Carmen Garden ("Existing Building"). The location of the Subject Site is shown in Figure 1.1.

1.2 The Owner has the intention to develop the Subject Site into a residential development with 30 flats (the "Proposed Development").

1.3 Against this background, CKM Asia Limited, a traffic and transportation planning consultancy firm, was commissioned to conduct a Traffic Impact Assessment ("TIA") in support of the Proposed Development. The report presents the findings and recommendations of the TIA for the Proposed Development.

Scope of the Assessment

1.4 The main objectives of this TIA are as follows:

- To assess the existing traffic issues in the vicinity of the Subject Site;
- To quantify the amount of traffic and pedestrian generated by the Proposed Development; and
- To examine the traffic and pedestrian impact on the local road network in the vicinity of the Subject Site.

Contents of the Report

1.5 After this introduction, the remaining chapters contain the following:

Chapter Two	-	describes the existing situation;
Chapter Three	-	outlines the development proposal;
Chapter Four	-	presents the traffic impact analysis;
Chapter Five	-	presents the traffic impact analysis during the construction stage;
Chapter Six	-	presents the pedestrian impact analysis; and
Chapter Seven	-	summarises the overall conclusion

2.0 THE EXISTING SITUATION

The Subject Site

2.1 The Subject Site is located on the eastern side of Grampian Road and is bounded by Gar Fook Court to the north, a building known as J17 to the east and the CLP Power Hong Kong Limited Grampian Road Substation to the south.

Existing Road Network

2.2 Grampian Road is a local distributor, and it is of single carriageway 2-lane standard. It connects Dumbarton Road to the north and Nga Tsin Wai Road to the south.

2.3 Dumbarton Road is a local distributor, and it is of single carriageway 2-lane standard. It connects Junction Road to the east and Inverness Road to the west.

2.4 In the vicinity of the Subject Site, on-street metered parking spaces are found along Grampian Road, Dumbarton Road, Inverness Road, Sau Chuk Yuen and College Road.

Traffic Survey

2.5 To quantify the traffic flows at the junctions chosen for the capacity analysis, manual classified counts were conducted on Tuesday, 14th October 2025 during the AM and PM peak periods. The locations of the surveyed junctions are presented in Figure 2.1 and their layouts are shown in Figures 2.2 to 2.10.

2.6 The surveyed junctions include the following:

- J1: Inverness Road / Dumbarton Road;
- J2: Dumbarton Road / Grampian Road;
- J3: Junction Road / Dumbarton Road;
- J4: Junction Road / Carpenter Road;
- J5: Junction Road / Nga Tsin Wai Road;
- J6: Nga Tsin Wai Road / Grampian Road;
- J7: Grampian Road / Boundary Street;
- J8: Junction Road / Prince Edward Road West / Boundary Street; and
- J9: Junction Road / Tung Tau Tsuen Road.

2.7 The counts were classified by vehicle type to enable traffic flows in passenger car units ("pcu") to be calculated. From the survey, the AM and PM peak hours were found to be between 0730 – 0830 and 1745 – 1845 hours respectively, and the existing AM and PM peak hour traffic flows are presented in Figure 2.11.

Operational Performance of the Surveyed Junctions

2.8 The existing operational performance of the surveyed junctions is calculated based on the observed traffic counts and the analysis is undertaken using the methods outlined in Volume 2 of Transport Planning and Design Manual ("TPDM"). The existing operational performance of the junctions are summarised in Table 2.1 and the detailed calculations are found in Appendix 1.

TABLE 2.1 EXISTING JUNCTION OPERATIONAL PERFORMANCE

Ref.	Junction	Type of Junction	Parameter[1]	AM Peak Hour	PM Peak Hour
J1	Inverness Road / Dumbarton Road	Priority	RFC	0.425	0.257
J2	Dumbarton Road / Grampian Road	Priority	RFC	0.631	0.550
J3	Junction Road / Dumbarton Road	Signal	RC	37%	81%
J4	Junction Road / Carpenter Road	Signal	RC	83%	99%
J5	Junction Road / Nga Tsin Wai Road	Signal	RC	56%	68%
J6	Nga Tsin Wai Road / Grampian Road	Signal	RC	> 100%	> 100%
J7	Grampian Road / Boundary Street	Signal	RC	> 100%	> 100%
J8	Junction Road / Prince Edward Road West / Boundary Street	Signal	RC	39%	64%
J9	Junction Road / Tung Tau Tsuen Road	Signal	RC	64%	53%

Notes: [1] RC – reserve capacity RFC – Ratio of Flow to Capacity

Link Capacity Assessment for the Existing Condition

2.9 The existing link capacity is assessed and the results are shown in Table 2.2.

TABLE 2.2 LINK CAPACITY ASSESSMENT FOR THE EXISTING CONDITION

Ref	Links	Design Flow (veh/hr)	Traffic Flow (veh/hr)		V/C Ratio	
			AM Peak	PM Peak	AM Peak	PM Peak
L1	Inverness Road	800	662	320	0.828	0.400
L2	Grampian Road	800	336	292	0.420	0.365
L3	Junction Road	1900	1263	1096	0.665	0.577
L4	Tung Tau Tsuen Road	1900	430	400	0.226	0.211
L5	Dumbarton Road	800	559	320	0.699	0.400
L6	Nga Tsin Wai Road	1900	871	704	0.458	0.371
L7	Prince Edward Road West	4800	2264	2009	0.472	0.419

Public Transport Facilities

2.10 The Subject Site is located close to road-based public transport services with numerous franchised bus and public light bus routes operating in the vicinity. In addition, the Subject Site is located closed to the Sung Wong Toi MTR Station and the nearest entrance, i.e., Entrance B3, is at Nam Kok Road, which is some 650 metres or 9 minutes' walk away.

2.11 Details of the franchised bus and green minibus ("GMB") routes operating in the vicinity of the Subject Site are presented in Table 2.3 and shown in Figure 2.12.

TABLE 2.3 FRANCHISED BUS AND GMB SERVICES OPERATING CLOSE TO THE SUBJECT SITE

Route	Routing	Frequency (minutes)
KMB 1	Chuk Yuen Estate – Star Ferry	9 – 25
KMB 2D	Chak On Estate – Wong Tai Sin	20 – 30
KMB 7B	Lok Fu – Hung Hom (Hung Luen Road)	20 – 35
KMB 10	Choi Wan – Tai Kok Tsui (Circular)	15 – 30
KMB 11D	Lok Fu – Kwun Tong Ferry	15 – 30
KMB 11K	Chuk Yuen Estate – Hung	20 – 30
KMB 75X	Tai Mei Tuk – Tai Po Market Station	10 – 25
KMB 85	Kowloon City Ferry – Fo Tan Chun Yueng Estate	20 – 30
KMB 85A	Kowloon City Ferry – Kwong Yuen	25 – 30
KMB 85B	Chun Shek – Kowloon City Ferry	AM Peak
KMB/CTB 113	Choi Hung – Kennedy Town (Belcher Bay)	15 – 30

GMB 13	Kowloon Tong (Broadcast Drive) – Hung Hom (Hung Luen Road)	15 – 30
GMB 25A	Kowloon Tong (Suffolk Road) Public Transport Interchange – Tung Tau Estate	15 – 20
GMB 25M	Kowloon Tong (Suffolk Road) Public Transport Interchange – La Salle Road	6 – 8
GMB 39M	Lok Fu – Tung Tau (Circular)	6 – 8
GMB 66S	Hammer Hill Road – Mong Kok	30
GMB 69	Kowloon City (Lion Rock Road) – Laguna City	20 – 30

Note: KMB – Kowloon Motor Bus CTB – City Bus GMB – Green Minibus

Pedestrian Facilities

2.12 Footpaths are provided alongside the roads located in the vicinity of the Proposed Development. In addition, at-grade pedestrian crossings are found at most major roads leading from the Proposed Development.

3.0 THE PROPOSED DEVELOPMENT

Development Schedule

3.1 The Proposed Development flat mix is shown in Table 3.1.

TABLE 3.1 DETAILS OF THE RESIDENTIAL FLATS

Flat Size (GFA)	Number of Flats
40.1 – 70m^2	30

HKPSG Recommendation of the Internal Transport Facilities

3.2 The Hong Kong Planning Standards and Guidelines ("HKPSG") recommendation on the provision of internal transport facilities is calculated and is presented in Table 3.2.

TABLE 3.2 HKPSG RECOMMENDATION OF INTERNAL TRANSPORT FACILITIES

Use	HKPSG Recommendation 30 flats @ 40.1 – 70m^2	Proposed Provision
	Car Parking Space	
Residential (I)	Number of space = GPS x R1 x R2 x R3, where: Global Parking Standard (GPS) = 1 space per 4 – 7 flats R1 = 1.2 for flat size of 40.1 – 70 m^2 R2 = 1.0 for development outside 500m of rail station R3 = 0.9 for domestic plot ratio (PR) = 6.0 Minimum = (30x1.2x1x0.9÷7) = 4.63, say 5 nos. Maximum = (30x1.2x1x0.9÷4) = 8.10, say 9 nos.	10 nos. including (i) 9 @ 5m (L) x 2.5m (W) x 2.4m (H); (ii) 1 @ 5m (L) x 3.5m (W) x 2.4m (H); = maximum, OK
Visitor (II)	Visitor car parking spaces: For private residential developments with 75 units or less per block, the visitor car parking provision will be determined by Transport Department (TD) on a case-by-case basis. TD's requirement = 1 no.	
Total (I) + (II)	Minimum = 5 + 1 = 6 nos. Maximum = 9 + 1 = 10 nos.	
	Loading / Unloading Bay	
Residential	Minimum of 1 loading / unloading bay for goods vehicles within the site for every 800 flats or part thereof, subject to a minimum of 1 bay for each housing block Minimum = 1no.	1 no. for LGV @ 7m (L) x 3.5m (W) x 3.6m (H) = HKPSG recommendation, OK

3.3 Table 3.2 shows that the internal transport facilities provided for the Proposed Development comply with the maximum recommendations of the HKPSG.

3.4 The G/F, 1/F and basement layout plans are shown in Figures 3.1 – 3.3.

Swept Path Analysis

3.5 The CAD-based swept path analysis program, Autodesk Vehicle Tracking, was used to check the ease of vehicle manoeuvring. Vehicles are found to have no

manoeuvring problems and all vehicles could enter and leave the spaces with ease. The swept path analysis drawings for critical movements are found in Appendix 2.

Vehicle Lift Analysis

3.6 A vehicle lift is provided to access the carpark located on 1/F and basement. A vehicle lift analysis was conducted to check on the operation of the vehicle lift system, and it was found that the vehicle lift system is acceptable and can serve the Proposed Development. The vehicle lift analysis is attached in Appendix 3.

4.0 TRAFFIC IMPACT

Design Year

4.1 The Proposed Development is expected to be completed by 2030, and the design year adopted for the capacity analysis is 2033, i.e. 3 years after the completion of the Proposed Development.

Traffic Forecasting

4.2 The 2033 traffic flows used for the junction analysis are produced with reference to the following:

(i) 2031 traffic flows derived with reference to Base District Traffic Model ("BDTM");

(ii) traffic growth from 2031 to 2033 based on the higher of: (a) Hong Kong Population Projections from 2031 to 2033, published by Census and Statistics Department, or (b) historic Annual Average Daily Traffic Growth ("AADT") from the Annual Traffic Census published by Transport Department;

(iii) Other developments in the vicinity of the Proposed Development; and

(iv) Traffic generated by the Proposed Development.

4.3 The (ii) estimated traffic growth from 2031 to 2033, (iii) the other developments in the vicinity of the Proposed Development, and (iv) traffic generated by the Proposed Development are presented in the paragraphs below.

(ii) Estimated Traffic Growth Rate from 2031 to 2033

4.4 The (a) Hong Kong Population Projections from 2031 to 2033 and (b) historic AADT are summarised in Tables 4.1 – 4.2 respectively.

TABLE 4.1 HONG KONG POPULATION PROJECTIONS 2031 – 2033

Whole Territory Population		Annual Growth Rate
Year 2031	Year 2033	2031 to 2033
7,820,200	7,903,600	0.53%

TABLE 4.2 AADT OF THE CORE STATION LOCATED IN THE VICINITY OF THE SUBJECT SITE

Year \ Station	3016	3254	3458	3852	4079	4613	Overall
2015	16,900	6,580	16,390	12,010	10,330	3,350	65,560
2016	16,940	6,480	16,130	12,100	10,170	3,760	65,580
2017	16,700	6,510	16,200	12,650	11,560	3,720	67,340
2018	16,800	5,540	16,270	12,700	11,340	3,870	66,520
2019	16,700	6,580	15,070	12,800	11,420	3,310	65,880
2020	15,060	6,160	15,350	11,980	10,690	3,640	62,880
2021	15,220	6,420	16,000	12,180	11,140	3,460	64,420
2022	14,160	6,120	15,250	12,390	11,290	3,450	62,660
2023	15,140	5,620	16,090	13,070	13,730	3,380	67,030
2024	14,900	5,280	13,940	12,660	13,310	3,300	63,390
Average Annual Growth							-0.37%

Note: 3016 – Junction Road (from Nga Tsin Wai Road to Tung Tau Tsuen Road)
3254 – Tung Tau Tsuen Road (from Tung Tsing Road to Junction Road)
3458 – Junction Road (from Boundary Street to Nga Tsin Wai Road)
3852 – Nga Tsin Wai Road (from La Salle Road to Junction Road)
4079 – Nga Tsin Wai Road (from Tak Ku Ling Road to Junction Road)
4613 – Grampian Road (from Boundary Street to Dumbarton Road)

4.5 Table 4.1 shows that the annual growth rate from 2031 to 2033 is +0.53%, and Table 4.2 shows that in the historic AADT of the stations between 2015 and 2024 in the vicinity has average annual growth rate of -0.37% per annum. To be conservative, the growth rate of +1.00% per annum is adopted for the traffic growth between 2031 and 2033.

(iii) Other Developments in the Vicinity of the Proposed Development

4.6 The major planned developments in the vicinity of the Proposed Development are summarized in Table 4.3, and are included in the traffic forecast.

TABLE 4.3 DETAILS OF MAJOR PLANNED DEVELOPMENTS

Site	Address	Use	Development Parameter (Approx.)
A	26A – 26B Grampian Road	Residential	around 67 flats
B	84 – 89 Junction Road	Residential, Retail	around 140 flats, retail GFA of around 1380m^2
C	57A Nga Tsin Wai Road	Residential	around 11 flats
D	4 – 24 Nam Kok Road	Residential, Retail	around 313 flats, retail GFA of around 1,830m^2
E	65, 73 & 75 Lion Rock Road	Residential, Retail	around 150 flats, retail GFA of around 640m^2
F	93-95 Hau Wong Road	Residential, Retail	around 50 flats, retail GFA of around 450m^2
G	55 Nga Tsin Wai Road	Residential	around 5 flats
H	URA Project at Nga Tsin Wai Road / Carpenter Road (KC-017)	Residential, Retail, G/IC	around 4,353 flats, retail GFA of around 25,310m^2, G/IC of around 47,000m^2 and public vehicle park of around 360 spaces
I	Redevelopment of Kowloon City Plaza at New Kowloon Inland Lot No. 6056	Residential, Retail	around 850 flats, retail GFA of around 8,890m^2 and public vehicle park of around 400 spaces
J	URA Project at Kai Tak Road / Sa Po Road (KC-015)	Residential, Retail	around 810 flats, retail GFA of around 8,030m^2 and public vehicle park of around 300 spaces
M	Redevelopment of Mei Tung Estate	Public Housing	around 2,800 flats
N	28A, 28B Grampian Road	Residential	around 65 flats
O	30 Grampian Road	Residential	around 55 flats
P	67 - 83 Fuk Lo Tsun Road	Residential, Retail	around 180 flats, retail GFA of around 1,910m^2
Q	20 - 20A Grampian Road	Residential	around 55 flats
R	124 - 126 Nga Tsin Wai Road	Residential, Retail	around 55 flats

(iv) Additional Traffic Generated by the Proposed Development

4.7 Traffic generated by the Existing Building and the Proposed Development is calculated based on trip generation rates found in the TPDM, and these are presented in Table 4.4, and the calculated traffic generation is found in Table 4.5.

TABLE 4.4 TRIP RATES OF RESIDENTIAL USE FROM TPDM

Item	AM Peak Hour		PM Peak Hour	
	In	Out	In	Out
Trip Rate from TPDM (pcu/hour/flat)				
Average flat size = 70m^2	0.0515	0.0888	0.0480	0.0356
Average flat size = 140m^2	0.1372	0.2604	0.1722	0.1275

TABLE 4.5 COMPARISON OF TRAFFIC GENERATION BETWEEN EXISTING BUILDING AND THE PROPOSED DEVELOPMENT

Use	No. of Flats	Traffic Generation (pcu/hour)					
		AM Peak Hour			PM Peak Hour		
		IN	OUT	2-way	IN	OUT	2-way
Existing Building [a](1)	7	1	2	3	2	1	3
The Proposed Development [b](2)	30	2	3	5	2	2	4
Difference [b] – [a]		+1	+1	+2	+0	+1	+1

Note: (1) Trip rate of average flat size of 140m^2 is adopted
(2) Trip rate of average flat size of 70m^2 is adopted

4.8 Table 4.5 shows that the compared with the Existing Building, the Proposed Development generates only 2 and 1 additional pcu (2-way) during the AM and PM peak hours respectively, which is negligible.

4.9 The ingress / egress route for additional traffic generated by the Proposed Development is shown in Figure 4.1.

2033 Traffic Flows

4.10 Year 2033 traffic flows for the following cases are derived:

2033 without the Proposed Development [A] = (i) 2031 traffic flows derived with reference to BDTM + (ii) estimated total growth from 2031 to 2033 + (iii) Other developments in the vicinity of the Proposed Development

2033 with the Proposed Development [B] = [A] + (iv) Additional traffic generated by the Proposed Development (Table 4.5)

4.11 The 2033 peak hour traffic flows for the cases without and with the Proposed Development, are shown in Figures 4.2 – 4.3, respectively.

2033 Junction Operational Performance

4.12 Year 2033 capacity analysis for the cases without and with the Proposed Development are summarised in Table 4.6 and detailed calculations are found in Appendix 1.

TABLE 4.6 2033 JUNCTION OPERATIONAL PERFORMANCE

Ref.	Junction	Type of Junction / Parameter(1)	Without the Proposed Development		With the Proposed Development	
			AM Peak	PM Peak	AM Peak	PM Peak
J1	Inverness Road / Dumbarton Road	Priority / RFC	0.445	0.277	0.445	0.277
J2	Dumbarton Road / Grampian Road	Priority / RFC	0.719	0.633	0.721	0.635
J3	Junction Road / Dumbarton Road	Signal / RC	17%	51%	17%	51%
J4	Junction Road / Carpenter Road	Signal / RC	39%	41%	39%	41%
J5	Junction Road / Nga Tsin Wai Road	Signal / RC	29%	34%	29%	34%
J6	Nga Tsin Wai Road / Grampian Road	Signal / RC	91%	> 100%	91%	> 100%
J7	Grampian Road / Boundary Street	Signal / RC	> 100%	> 100%	> 100%	> 100%

Ref.	Junction	Type of Junction / Parameter[(1)]	Without the Proposed Development		With the Proposed Development	
			AM Peak	PM Peak	AM Peak	PM Peak
J8	Junction Road / Prince Edward Road West / Boundary Street	Signal / RC	15%	27%	15%	27%
J9	Junction Road / Tung Tau Tsuen Road	Signal / RC	31%	32%	31%	31%

Notes: [(1)] RC – reserve capacity RFC – Ratio of Flow to Capacity

4.13 Table 4.6 shows that the junctions operate with capacities during the AM and PM peak hours for the cases without and with the Proposed Development.

2033 Link Capacity Assessment

4.14 2033 link capacity is assessed and the results are shown in Table 4.7.

TABLE 4.7 2033 LINK CAPACITY ASSESSMENT

Ref	Link	Design Flow (veh/hr)	Scenario	Traffic Flow (veh/hr)		V/C Ratio	
				AM Peak	PM Peak	AM Peak	PM Peak
L1	Inverness Road	800	Without Development	699	337	0.874	0.421
			With Development	699	337	0.874	0.421
L2	Grampian Road	800	Without Development	378	330	0.473	0.413
			With Development	379	331	0.474	0.414
L3	Junction Road	1900	Without Development	1564	1333	0.823	0.702
			With Development	1566	1334	0.824	0.702
L4	Tung Tau Tsuen Road	1900	Without Development	574	532	0.302	0.280
			With Development	574	532	0.302	0.280
L5	Dumbarton Road	800	Without Development	612	360	0.765	0.450
			With Development	614	360	0.768	0.450
L6	Nga Tsin Wai Road	1900	Without Development	945	785	0.497	0.413
			With Development	945	785	0.497	0.413
L7	Prince Edward Road West	4800	Without Development	2465	2245	0.514	0.468
			With Development	2465	2245	0.514	0.468

4.15 Table 4.7 shows that the traffic generation associated with the Proposed Development has negligible traffic impact to the road link analysed.

5.0 TRAFFIC IMPACT DURING CONSTRUCTION STAGE

Design Year

5.1 Since the construction programme is now not available, but to be conservative, a construction traffic impact assessment is undertaken for year 2033.

Construction Vehicles

5.2 The type of vehicles and number of construction vehicles frequently generated during the construction stage are summarised in Table 5.1.

TABLE 5.1 MAJOR CONSTRUCTION ACTIVITIES AND VEHICLES

Activity	Vehicle Type	Frequency
Steel reinforcement delivery	lorry	2 lorries per day
Concrete delivery	concrete mixer truck	2 vehicles per hour

5.3 Based on the above, a total of 4 construction vehicles (or equivalent to 10 pcu/hour) are assumed to be generated during the AM and PM peak hours.

Traffic Forecasting

5.4 The 2033 traffic flows for the following cases are derived:

2033 with the Construction Vehicles	=	2033 without the Proposed Development in Paragraph 4.10 + traffic generation associated with construction activities in Table 5.1

5.5 The ingress / egress route for traffic generated by the construction activities is shown in Figure 5.1. The 2033 peak hour traffic flows with the construction vehicles are shown in Figures 5.2.

2033 Junction Operational Performance during Construction Stage

5.6 2033 junction capacity analysis for the cases with the construction vehicles are summarised in Table 5.2, and detailed calculations are found in Appendix 1.

TABLE 5.2 2033 JUNCTION PERFORMANCE DURING CONSTRUCTION STAGE

Ref.	Junction	Type of Junction / Parameter[(1)]	With the construction activities	
			AM Peak	PM Peak
J1	Inverness Road / Dumbarton Road	Priority / RFC	0.445	0.277
J2	Dumbarton Road / Grampian Road	Priority / RFC	0.730	0.644
J3	Junction Road / Dumbarton Road	Signal / RC	36%	61%
J4	Junction Road / Carpenter Road	Signal / RC	39%	41%
J5	Junction Road / Nga Tsin Wai Road	Signal / RC	27%	32%
J6	Nga Tsin Wai Road / Grampian Road	Signal / RC	78%	> 100%
J7	Grampian Road / Boundary Street	Signal / RC	> 100%	> 100%
J8	Junction Road / Prince Edward Road West / Boundary Street	Signal / RC	15%	27%
J9	Junction Road / Tung Tau Tsuen Road	Signal / RC	31%	31%

Notes: [(1)] RC – reserve capacity DFC – design flow/capacity ratio

5.7 Table 5.2 shows that the junctions analysed have capacity to accommodate the traffic generation associated with the construction activities.

2033 Link Capacity Assessment during Construction Stage

5.8 2033 link capacity is assessed and the results are shown in Table 5.3.

TABLE 5.3 2033 LINK CAPACITY ASSESSMENT DURING CONSTRUCTION STAGE

Ref	Links	Design Flow (veh/hr)	Traffic Flow (veh/hr)		V/C Ratio	
			AM Peak	PM Peak	AM Peak	PM Peak
L1	Inverness Road	800	699	337	0.874	0.421
L2	Grampian Road	800	386	339	0.483	0.424
L3	Junction Road	1900	1573	1341	0.828	0.706
L4	Tung Tau Tsuen Road	1900	574	532	0.302	0.280
L5	Dumbarton Road	800	620	368	0.775	0.460
L6	Nga Tsin Wai Road	1900	949	790	0.499	0.416
L7	Prince Edward Road West	4800	2469	2250	0.514	0.469

5.9 Table 5.3 shows that traffic generation associated with the construction activities has negligible traffic impact to the road link analysed.

6.0 PEDESTRIAN ASSESSMENT

Location of Surveyed Footpaths

6.1 The pedestrian assessment is undertaken for footpaths likely used by the residents of the Proposed Development. The location of the surveyed footpaths is shown in Figure 6.1.

Estimation of Future Pedestrian Flows

6.2 The year 2033 pedestrian flow is estimated based on the following:
(i) 2025 existing pedestrian flows;
(ii) Estimated annual pedestrian growth rates from 2025 to 2033; and
(iii) Pedestrians generated by the Proposed Development.

2025 Existing Pedestrian Flows

6.3 To quantify the existing pedestrian flows using the footpaths presented in Figure 6.1, pedestrian counts were conducted during the AM and PM peak periods on Tuesday, 14th October 2025. The existing peak 15-minute two-way pedestrian flows are presented in Figure 6.2.

Estimated Annual Pedestrian Growth Rates from 2025 to 2033

6.4 The 2033 reference pedestrian flow is estimated based on the 2025 observed pedestrian flows and the annual pedestrian growth rate from 2025 to 2033. The pedestrian growth rate from 2025 to 2033 is assumed to be +1.00% per annum which is taken from Paragraph 4.5.

Pedestrian Generated by the Proposed Development

6.5 Pedestrian generation of the Proposed Development is calculated with reference to Travel Characteristic Survey 2011 and is presented in Table 6.1.

TABLE 6.1 PEDESTRAIN GNEREATION OF RESIDENTIAL USE

Item	Quantity
No. of flats in the Proposed Development [a]	30
Average Household Size(1) [b]	2.9
Mechanised trip rate per person(2) [c]	1.83
AM and PM Peak hour factor of daily mechanised trips(3) [d]	12%
Public Transport mode boardings proportion(4) (5) [e]	70%
Expected number of pedestrian generation in ped / hr [f] = [a] x [b] x [c] x [d] x [e]	14
Expected number of pedestrian generation in ped / 15 min [f] /4	4

Note: (1) From Table E.1, Travel Characteristics Survey 2011 Final Report
(2) From Table E.2, Travel Characteristics Survey 2011 Final Report
(3) From Para. 3.3.7, Travel Characteristics Survey 2011 Final Report
(4) From Table 3.6, Travel Characteristics Survey 2011 Final Report
(5) Including rail, franchised bus and public light bus, by assuming people take franchised bus/public light bus to rail stations to interchange rail

6.6 Based on Table 6.1, the pedestrian generation of the Proposed Development is presented in Table 6.2.

TABLE 6.2 PEDESTRIAN GENERATION OF THE PROPOSED DEVELOPMENT

Item	Pedestrian Generation (ped / 15 min)					
	AM Peak Hour			PM Peak Hour		
	In	Out	2-way	In	Out	2-way
The Proposed Development	4	4	8	4	4	8

6.7 Table 6.2 shows that the pedestrian generated by the Proposed Development is only 8 ped/15-min (2-way) during the AM and PM peak hours.

2033 Pedestrian Flows

6.8 The 2033 pedestrian flows without and with the Proposed Development are derived using the following method:

2033 without the Proposed Development [A]	=	(i) 2025 existing pedestrian flows + (ii) estimated annual pedestrian growth rates from 2025 to 2033
2033 with the Proposed Development [B]	=	[A] + (iii) pedestrian generated by the Proposed Development (Table 6.2)

6.9 The 2033 pedestrian flows without and with the Proposed Development are presented in Figures 6.3 and 6.4.

Level-of-Service

6.10 The level-of-service (LOS) of a pedestrian facility is dependent on its width and the number of pedestrians using the facility. Description of the LOS is obtained from the Transport Planning and Design Manual, and is given in Table 6.3.

TABLE 6.3 DESCRIPTION OF PEDESTRIAN FACILITY LOS

LOS	Maximum Pedestrian Flow Rate - ped/min/m	Description
A	< = 16	Pedestrians basically move in desired paths without altering their movements in response to other pedestrians. Walking speeds are freely selected and conflicts between pedestrians are unlikely.
B	> 16 - 23	Sufficient space is provided for pedestrians to freely select walking speeds, to bypass other pedestrians and to avoid crossing conflicts with others. At this level, pedestrians begin to be aware of other pedestrians and to respond to their presence in the selection of walking paths.
C	> 23 – 33	Sufficient space is available to select normal walking speeds and to bypass other pedestrians primarily in unidirectional streams. Where reverse directions or crossing movements exist, minor conflicts will occur, and speed and volume will be somewhat lower.
D	> 33 - 49	Freedom to select individual walking speed and bypass other pedestrians is restricted. Where crossing or reverse-flow movements exist, the probability of conflict is high and its avoidance requires frequent changes in speed and position. The LOS provides reasonably fluid flow; however considerable friction and interaction between pedestrians is likely to occur.
E	> 49 – 75	Virtually, all pedestrians would have their normal walking speed restricted. At the lower range of this LOS, forward movement is possible only by shuffling. Space is insufficient to pass over slower pedestrians. Cross- or reverse-flow movements are possible only with extreme difficulties. Design volumes approach the limit of walkway capacity with resulting stoppages and interruptions to flow.
F	> 75	Walking speeds are severely restricted. Forward progress is made only by "shuffling". There is frequent and unavoidable contact with other pedestrians. Cross- and reverse-flow movements are virtually impossible. Flow is sporadic and unstable. Space is more characteristic of queued pedestrians than of moving pedestrian streams.

Source: Transport Planning & Design Manual Volume 6, Transport Department

6.11 The effective width of the surveyed footpaths is presented in Table 6.4.

TABLE 6.4 EFFECTIVE WIDTH OF THE SURVEYED FOOTPATHS

Ref.	Location		Footpath Width (m)	Effective Width (m)
1	Grampian Road between Dumbarton Road and Nga Tsin Wai Road	Eastern footpath	3.1	2.1
2	Grampian Road between Dumbarton Road and Nga Tsin Wai Road	Western footpath	2.9	1.9

6.12 The 2033 weekday LOS at the surveyed footpaths for the cases without and with the Proposed Development is presented in Table 6.5.

TABLE 6.5 2033 LOS WITHOUT AND WITH THE PROPOSED DEVELOPMENT

Ref.	Location		Peak Period	Year 2033 without the Proposed Development			Year 2033 with the Proposed Development		
				Ped / 15min	Ped / min/m	LOS	Ped / 15min	Ped / min/m	LOS
1	Grampian Road between Dumbarton Road and Nga Tsin Wai Road	Eastern footpath	AM	78	2.5	A	82	2.6	A
			PM	19	0.6	A	23	0.7	A
2	Grampian Road between Dumbarton Road and Nga Tsin Wai Road	Western footpath	AM	137	4.8	A	141	4.9	A
			PM	76	2.7	A	80	2.8	A

6.13 Table 6.5 shows that all surveyed footpaths operate with LOS A for the case without and with the Proposed Development. Hence, it can be concluded that the Proposed Development will result in no impact to the footpaths assessed.

7.0 CONCLUSION

7.1 The Subject Site is located at 42 Grampian Road in Kowloon City. It is currently occupied by a residential building which is known as the Carmen Garden. The Owner now intends to redevelop the Subject Site to provide residential block with 30 flats.

7.2 Manual classified counts were conducted at junctions located in the vicinity of the Proposed Development in order to establish the peak hour traffic flows. Currently, these junctions and road links operate with capacities during the AM and PM peak hours.

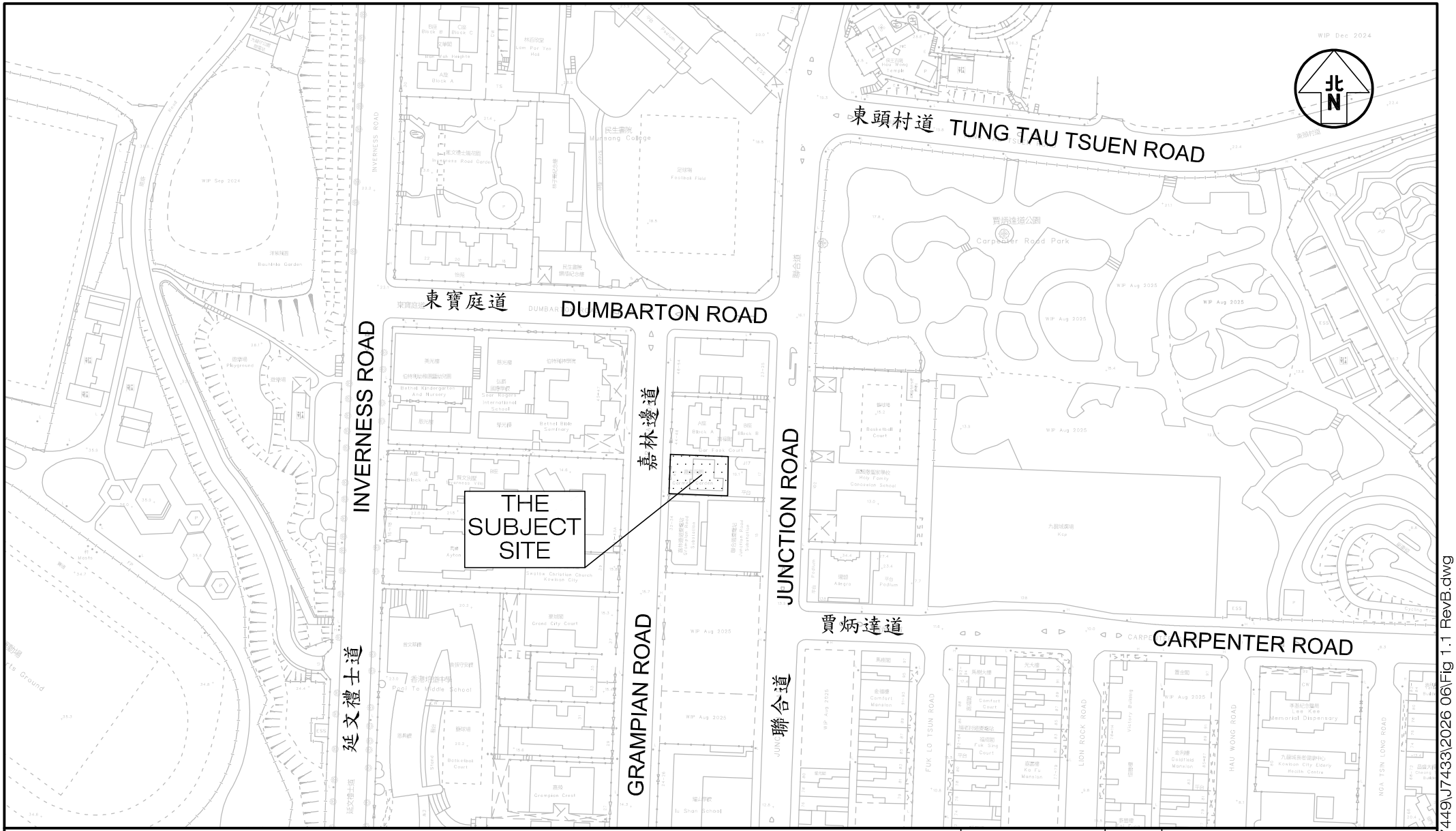
7.3 The internal transport facilities provided for the Proposed Development comply with the recommendations of the HKPSG. A vehicle lift is provided to access the car park located on 1/F and basement. All vehicles could enter and leave the Proposed Development and their respective space with ease.

7.4 The Proposed Development is expected to be completed by 2030, and the junction capacity analysis is undertaken for year 2033. For the design year 2033, the junctions and road links analysed are expected to operate with capacities during the peak hours for the case without and with the Proposed Development.

7.5 The pedestrian assessment conducted found that the surveyed footpaths would operate with LOS A in 2033 for the cases without and with the Proposed Development.

7.6 It is concluded that the Proposed Development will result in no adverse traffic impact to the surrounding road network. From traffic engineering grounds, the Proposed Development is acceptable.

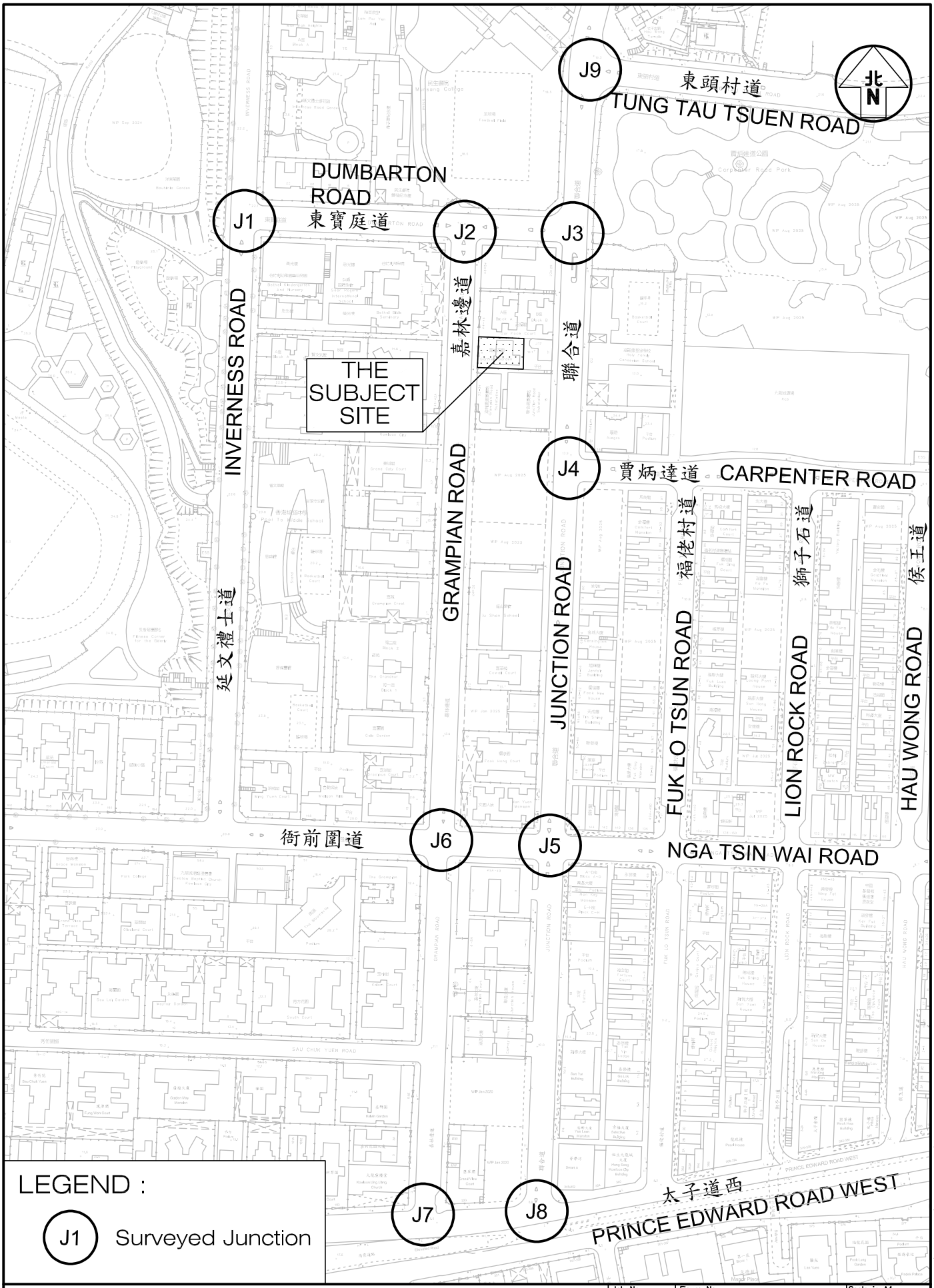
Figures



Project Title	PROPOSED MINOR RELAXATION FOR "RESIDENTIAL" USE AT 42 GRAMPIAN ROAD, KOWLOON CITY KOWLOON (NEW KOWLOON INLAND LOT NO. 3535)	J7433	
Figure Title	LOCATION OF SUBJECT SITE	Figure No. 1.1	Revision B
		Designed by C Y Y / Drawn by N C M / Checked by K C	
		Scale in A4 1 : 2000 / Date 29 JUN 2026	

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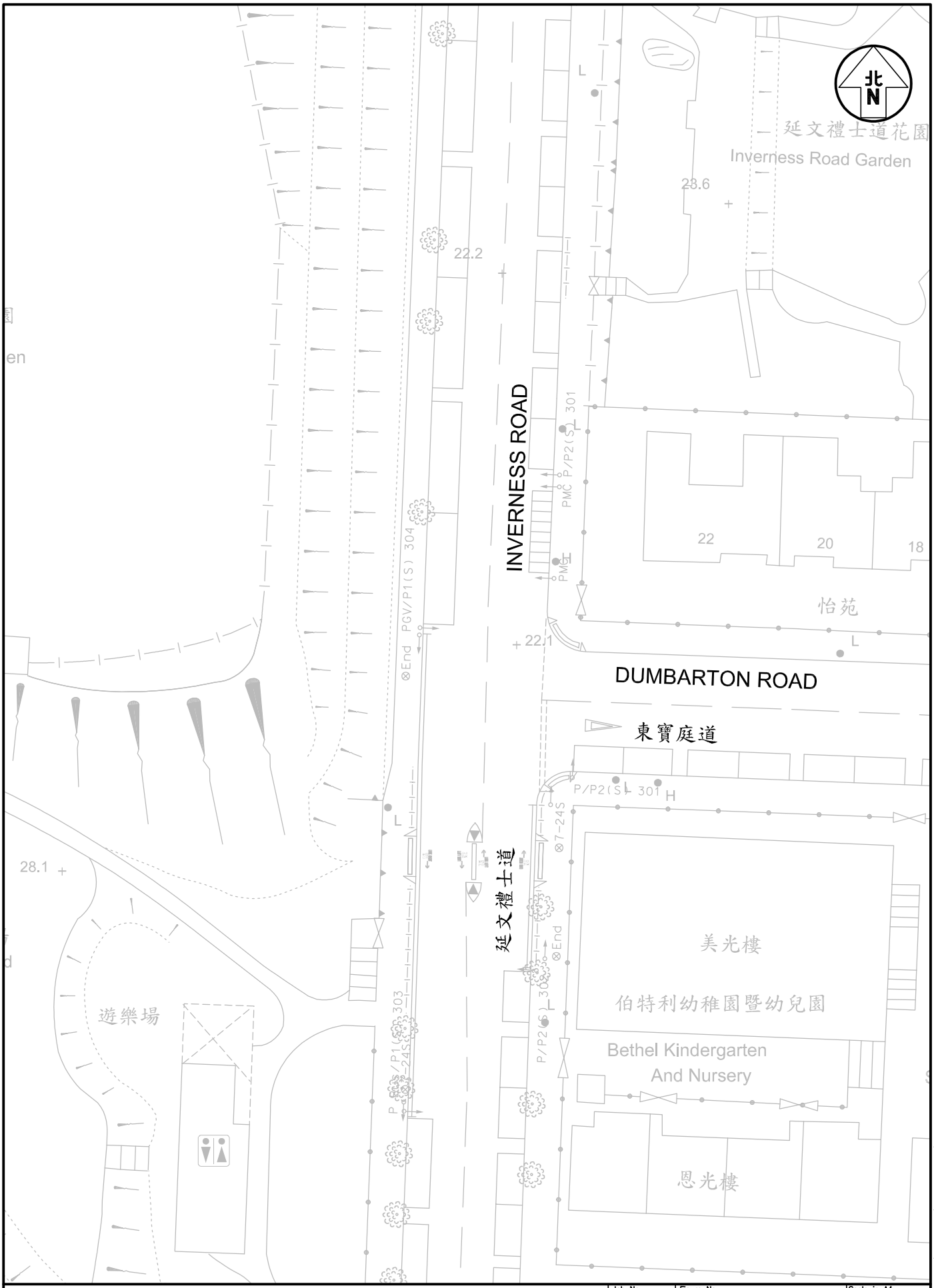
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PROPOSED MINOR RELAXATION FOR "RESIDENTIAL" USE AT 42 GRAMPIAN ROAD, KOWLOON CITY KOWLOON (NEW KOWLOON INLAND LOT NO. 3535)

Figure Title
LOCATION OF SURVEYED JUNCTIONS

Job No.	Figure No.			Scale in A4
J7433	2.1			1 : 2500
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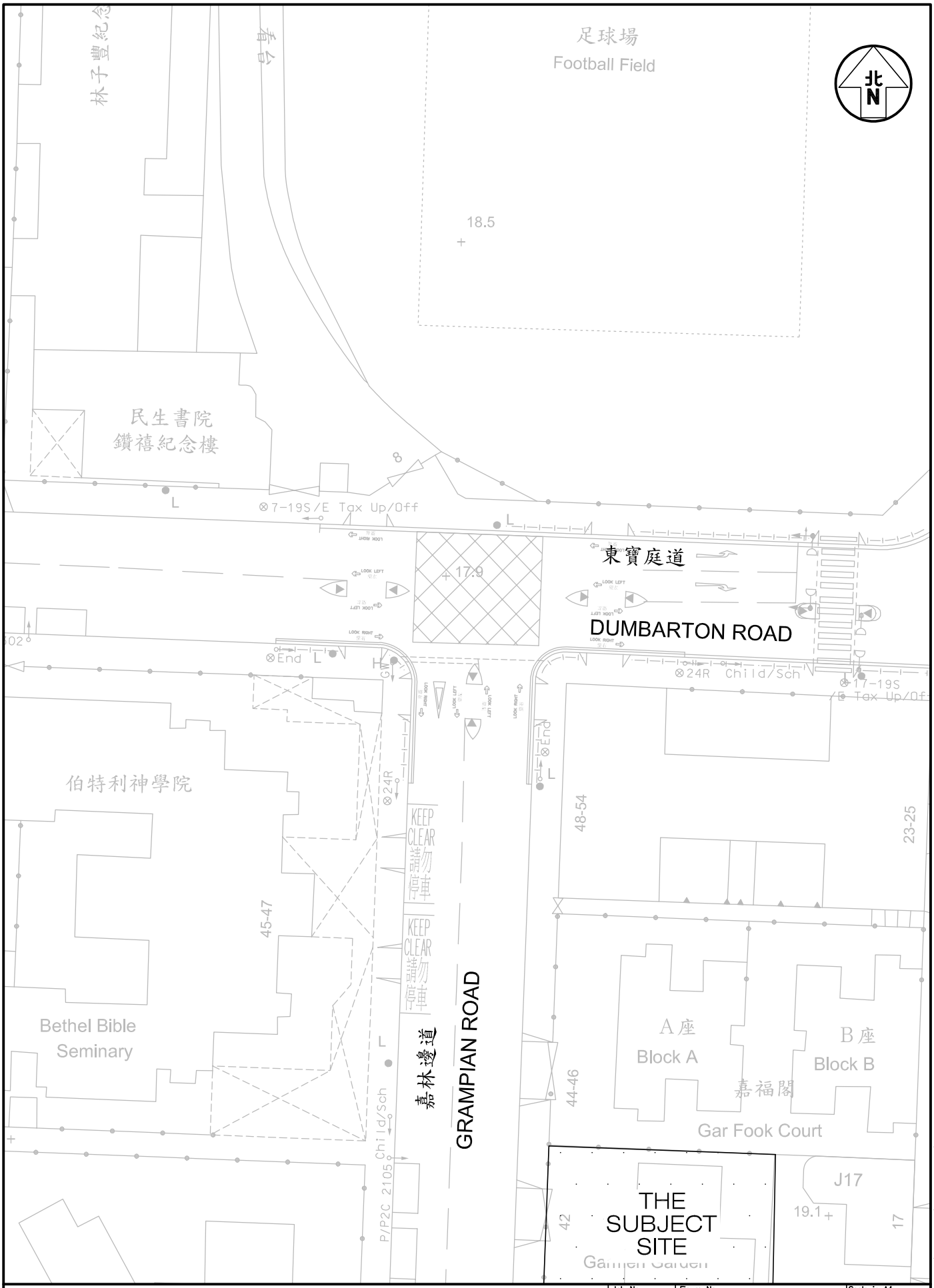
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PROPOSED MINOR RELAXATION FOR "RESIDENTIAL" USE AT 42 GRAMPIAN ROAD, KOWLOON CITY KOWLOON (NEW KOWLOON INLAND LOT NO. 3535)

Figure Title
JUNCTION LAYOUT OF INVERNESS ROAD / DUMBARTON ROAD

Job No.	Figure No.			Scale in A4
J7433	2.2			1 : 500
Designed by	Drawn by	Checked by	Revision	Date
C Y Y	N C M	K C	B	29 JUN 2026

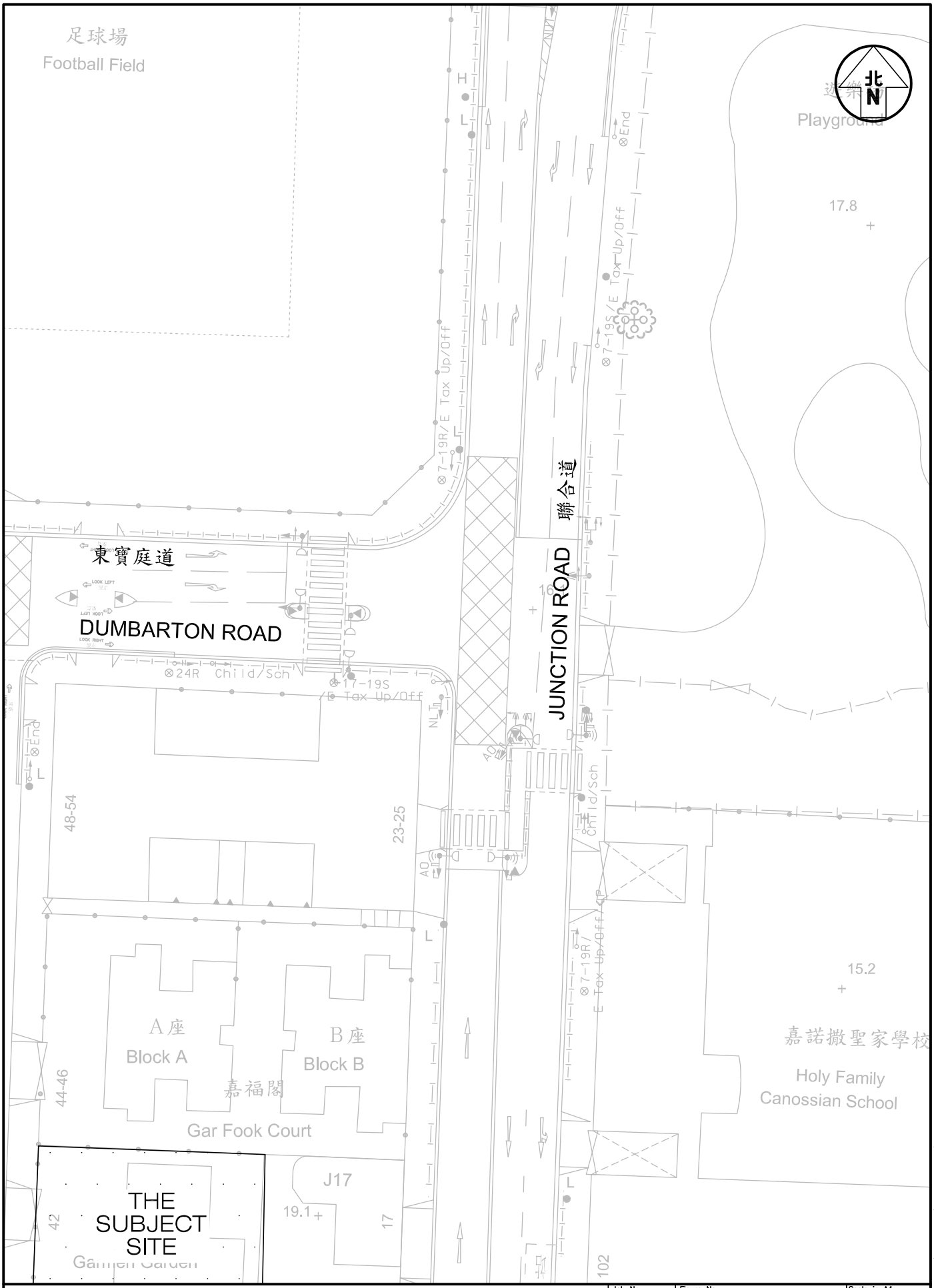
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Project Title: PROPOSED MINOR RELAXATION FOR "RESIDENTIAL" USE AT 42 GRAMPIAN ROAD, KOWLOON CITY KOWLOON (NEW KOWLOON INLAND LOT NO. 3535)	Job No. J7433	Figure No. 2.3			Scale in A4 1 : 500
	Designed by C Y Y	Drawn by N C M	Checked by K C	Revision B	Date 29 JUN 2026
Figure Title: JUNCTION LAYOUT OF DUMBARTON ROAD / GRAMPIAN ROAD	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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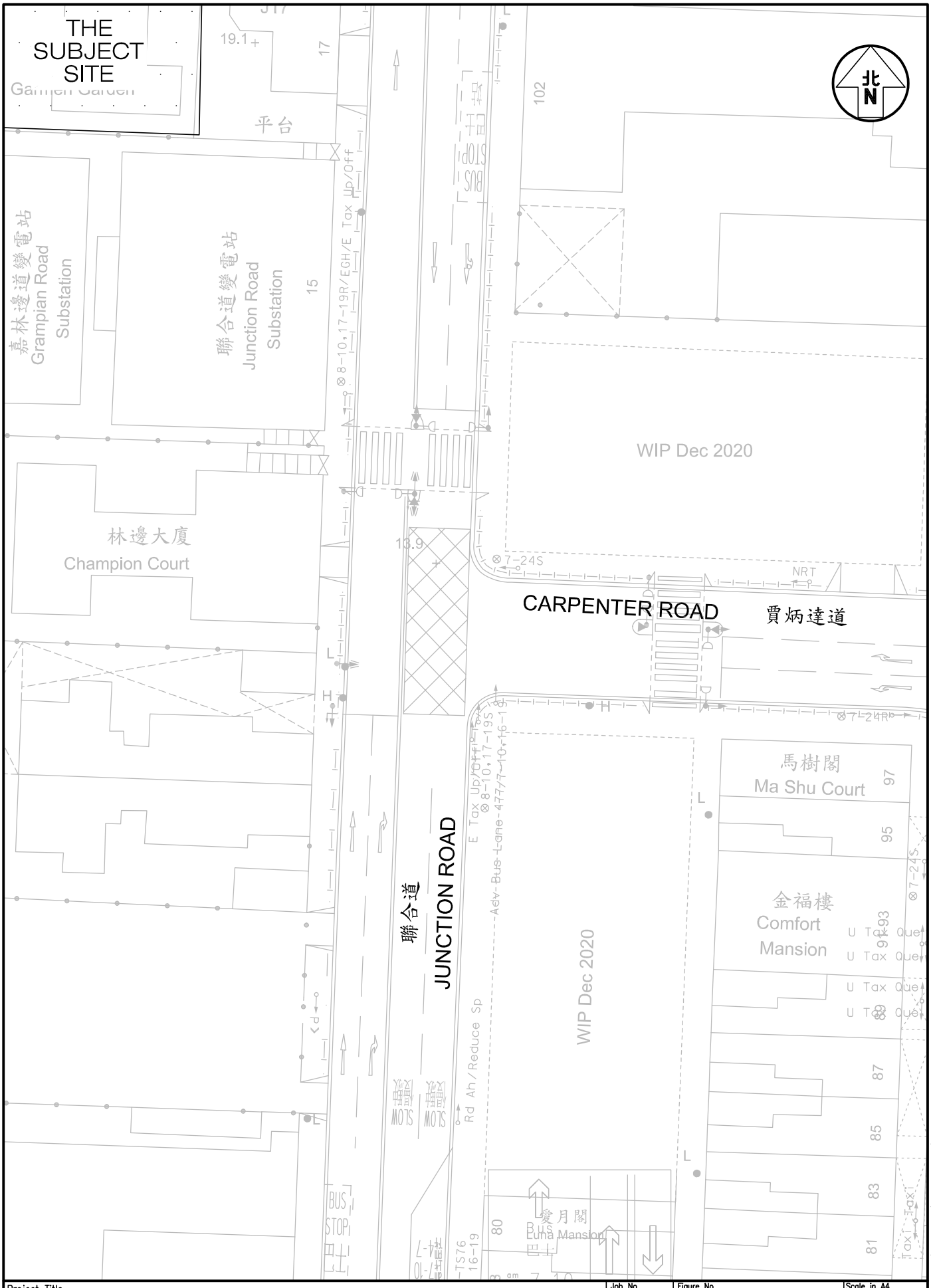
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PROPOSED MINOR RELAXATION FOR "RESIDENTIAL" USE AT 42 GRAMPIAN ROAD, KOWLOON CITY KOWLOON (NEW KOWLOON INLAND LOT NO. 3535)

Figure Title
JUNCTION LAYOUT OF JUNCTION ROAD / DUMBARTON ROAD

Job No.	Figure No.			Scale in A4
J7433	2.4			1 : 500
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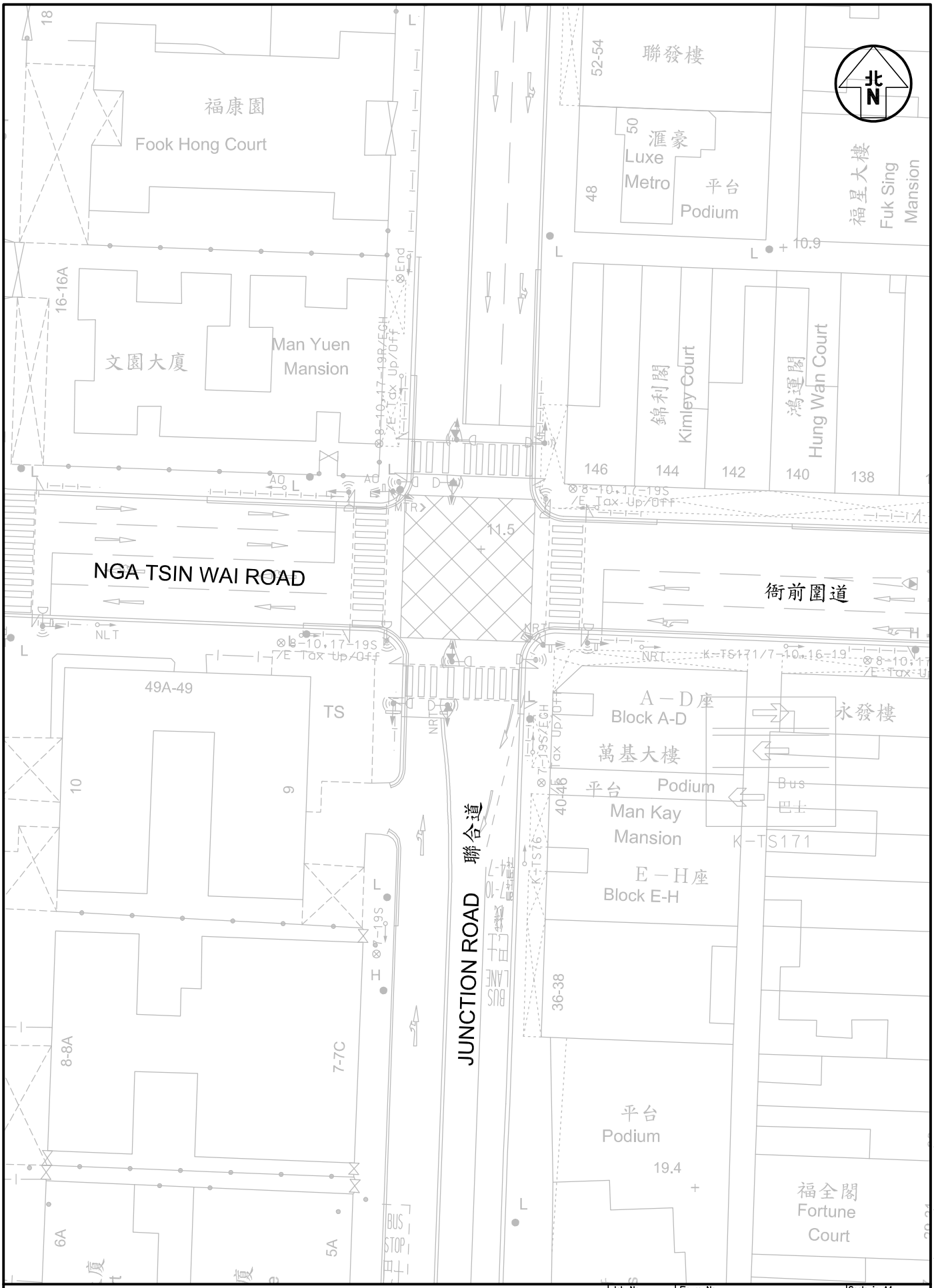
Project Title
PROPOSED MINOR RELAXATION FOR "RESIDENTIAL" USE AT 42 GRAMPIAN ROAD, KOWLOON CITY KOWLOON (NEW KOWLOON INLAND LOT NO. 3535)

Figure Title
JUNCTION LAYOUT OF JUNCTION ROAD / CARPENTER ROAD

Job No.	Figure No.			Scale in A4
J7433	2.5			1 : 500
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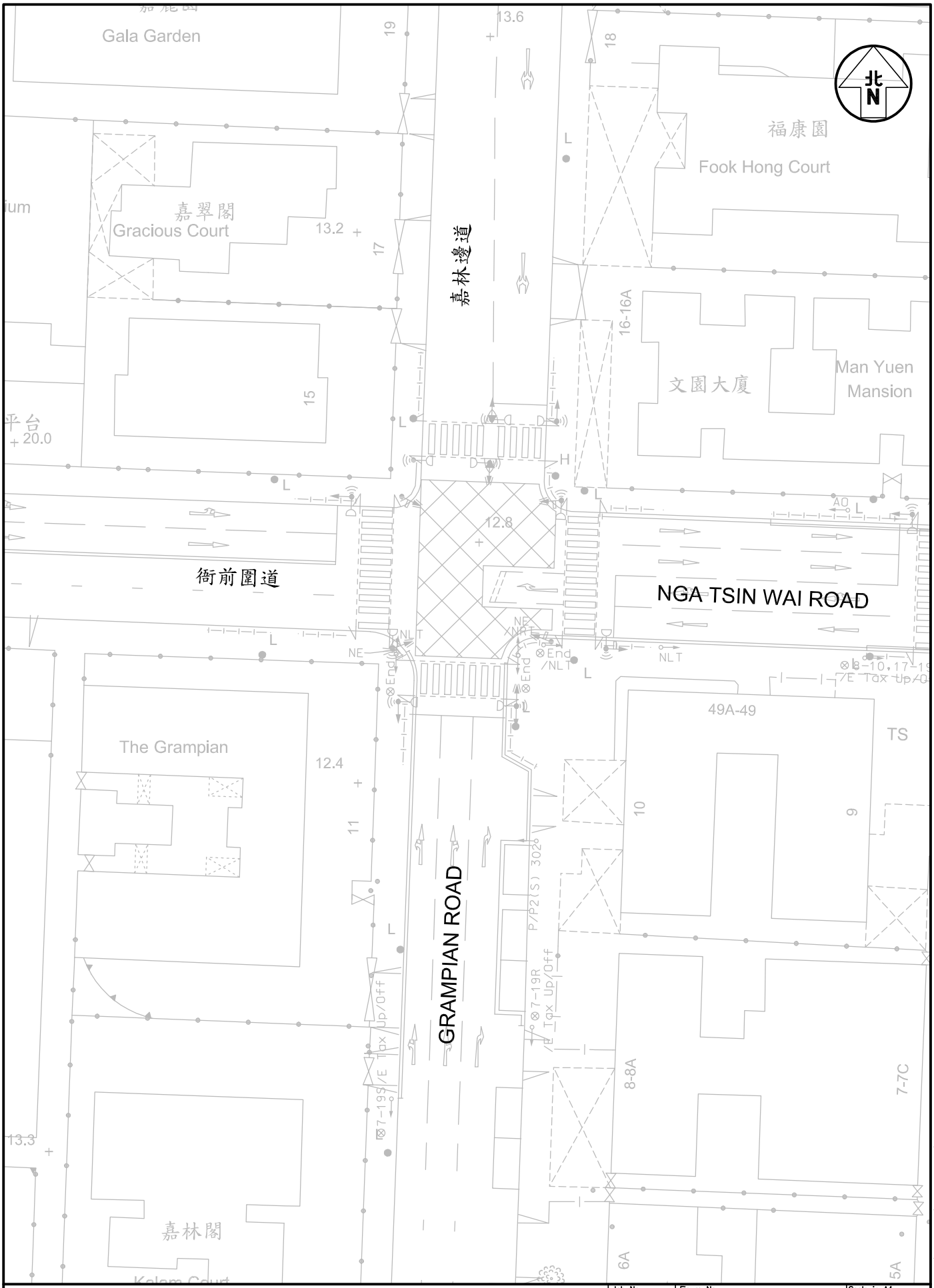
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PROPOSED MINOR RELAXATION FOR "RESIDENTIAL" USE AT 42 GRAMPIAN ROAD, KOWLOON CITY KOWLOON (NEW KOWLOON INLAND LOT NO. 3535)

Figure Title
JUNCTION LAYOUT OF JUNCTION ROAD / NGA TSIN WAI ROAD

Job No.	Figure No.			Scale in A4
J7433	2.6			1 : 500
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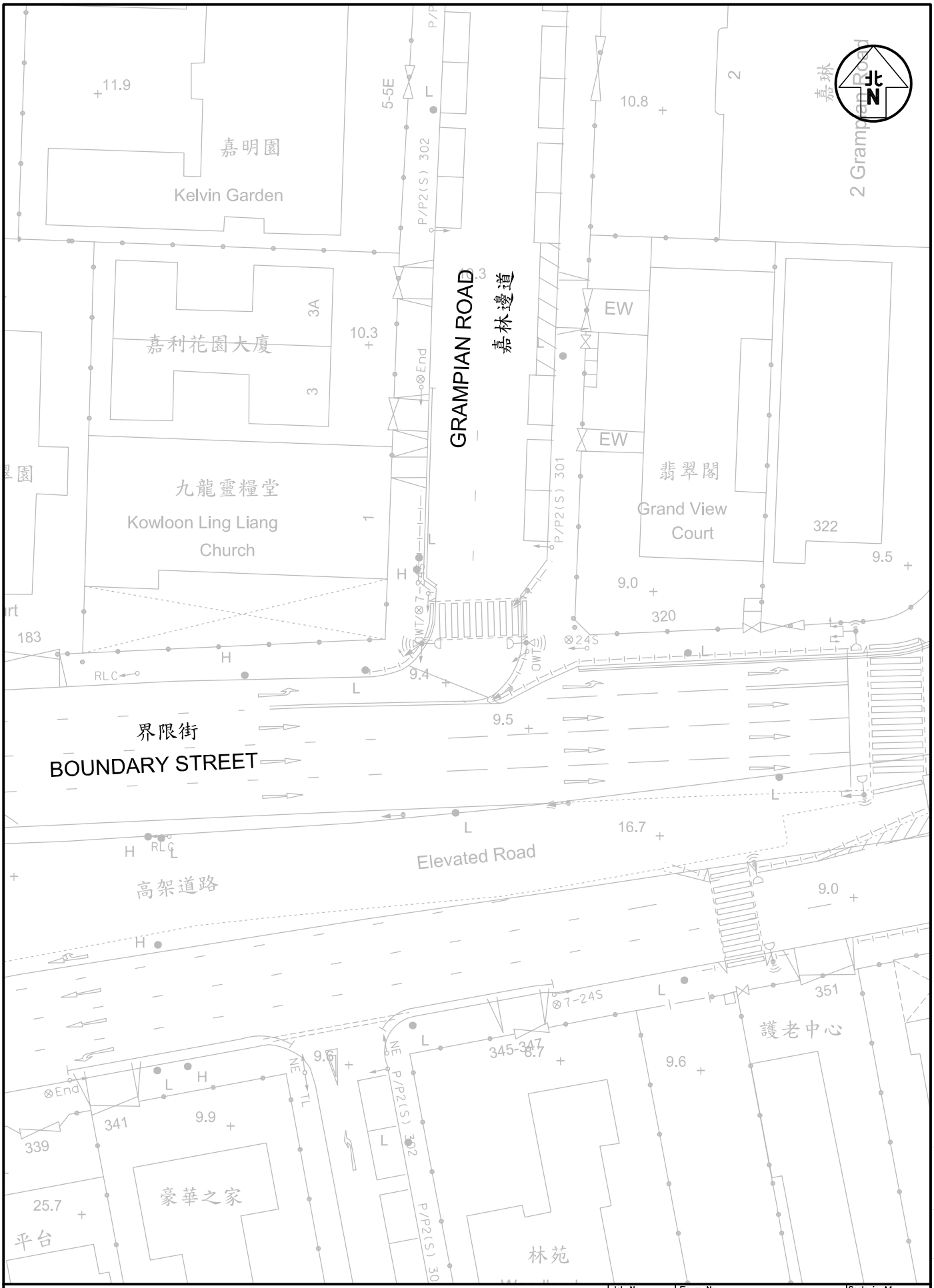
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PROPOSED MINOR RELAXATION FOR "RESIDENTIAL" USE AT 42 GRAMPIAN ROAD, KOWLOON CITY KOWLOON (NEW KOWLOON INLAND LOT NO. 3535)

Figure Title
JUNCTION LAYOUT OF NGA TSIN WAI ROAD / GRAMPIAN ROAD

Job No.	Figure No.			Scale in A4
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Designed by	Drawn by	Checked by	Revision	Date
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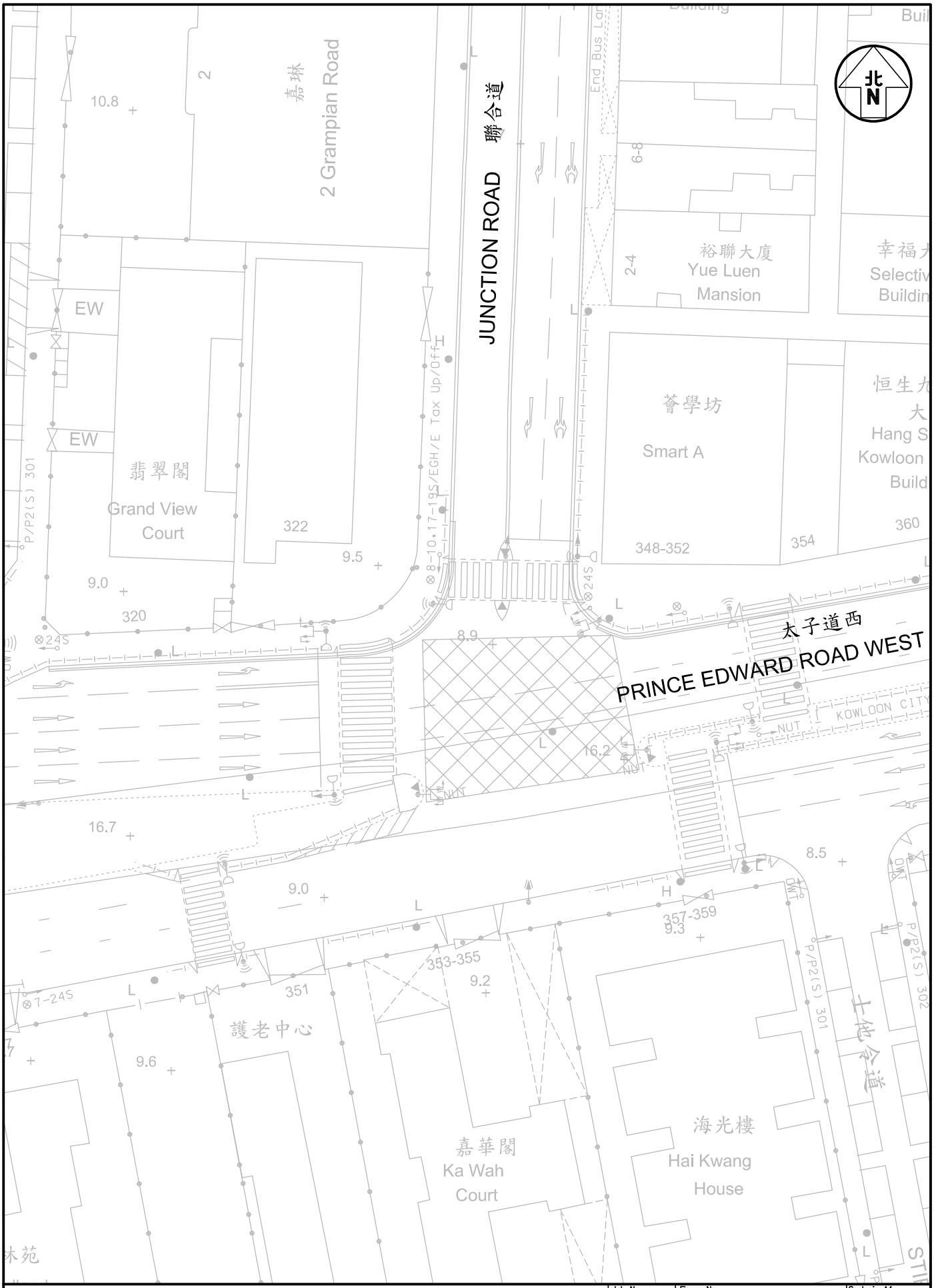
Project Title
PROPOSED MINOR RELAXATION FOR "RESIDENTIAL" USE AT 42 GRAMPIAN ROAD, KOWLOON CITY KOWLOON (NEW KOWLOON INLAND LOT NO. 3535)

Figure Title
JUNCTION LAYOUT OF GRAMPIAN ROAD / BOUNDARY STREET

Job No.	Figure No.			Scale in A4
J7433	2.8			1 : 500
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Project Title
PROPOSED MINOR RELAXATION FOR "RESIDENTIAL" USE AT 42 GRAMPIAN ROAD, KOWLOON CITY KOWLOON (NEW KOWLOON INLAND LOT NO. 3535)

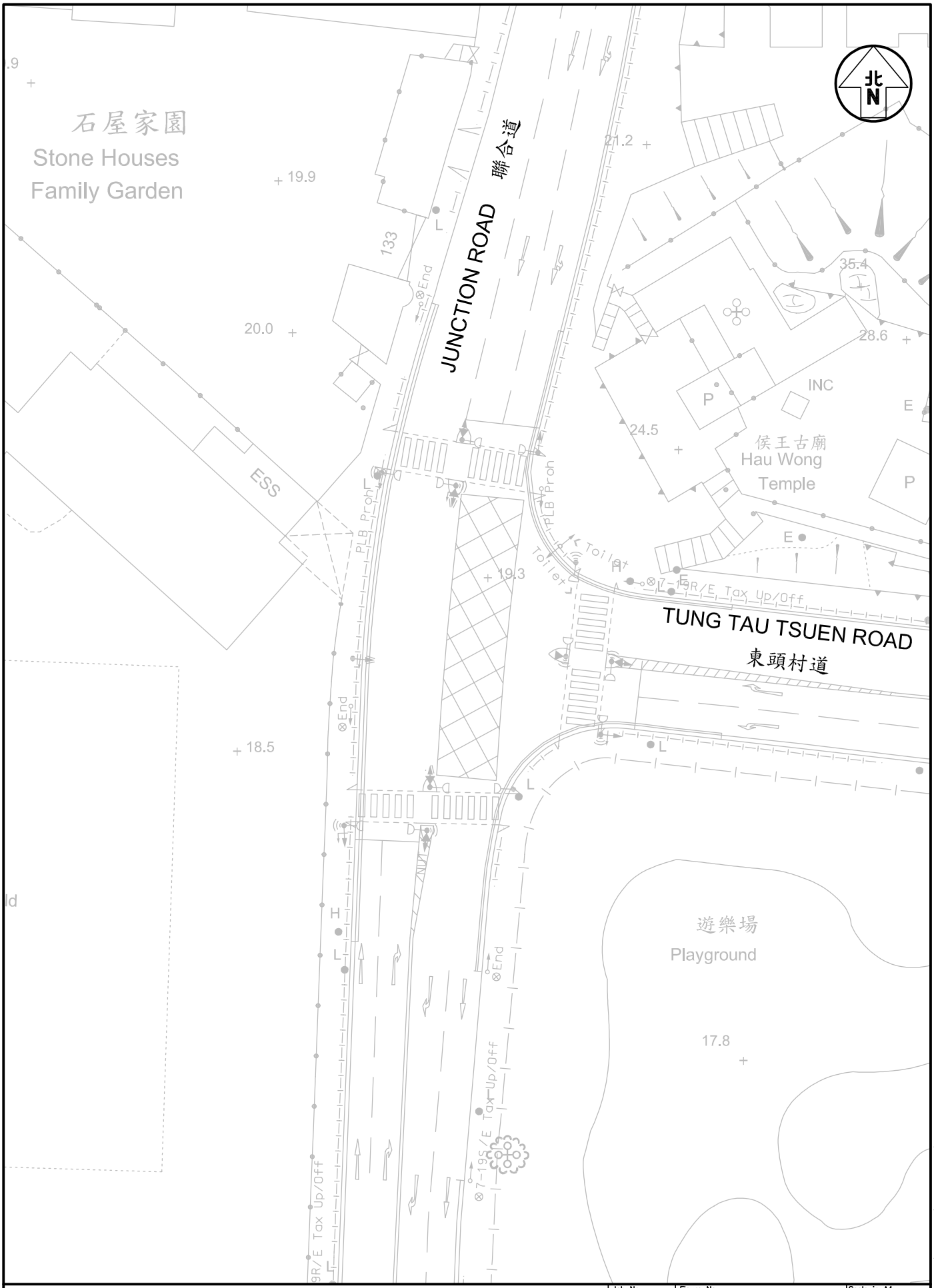
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Figure Title
JUNCTION LAYOUT OF JUNCTION ROAD / PRINCE EDWARD ROAD WEST / BOUNDARY STREET

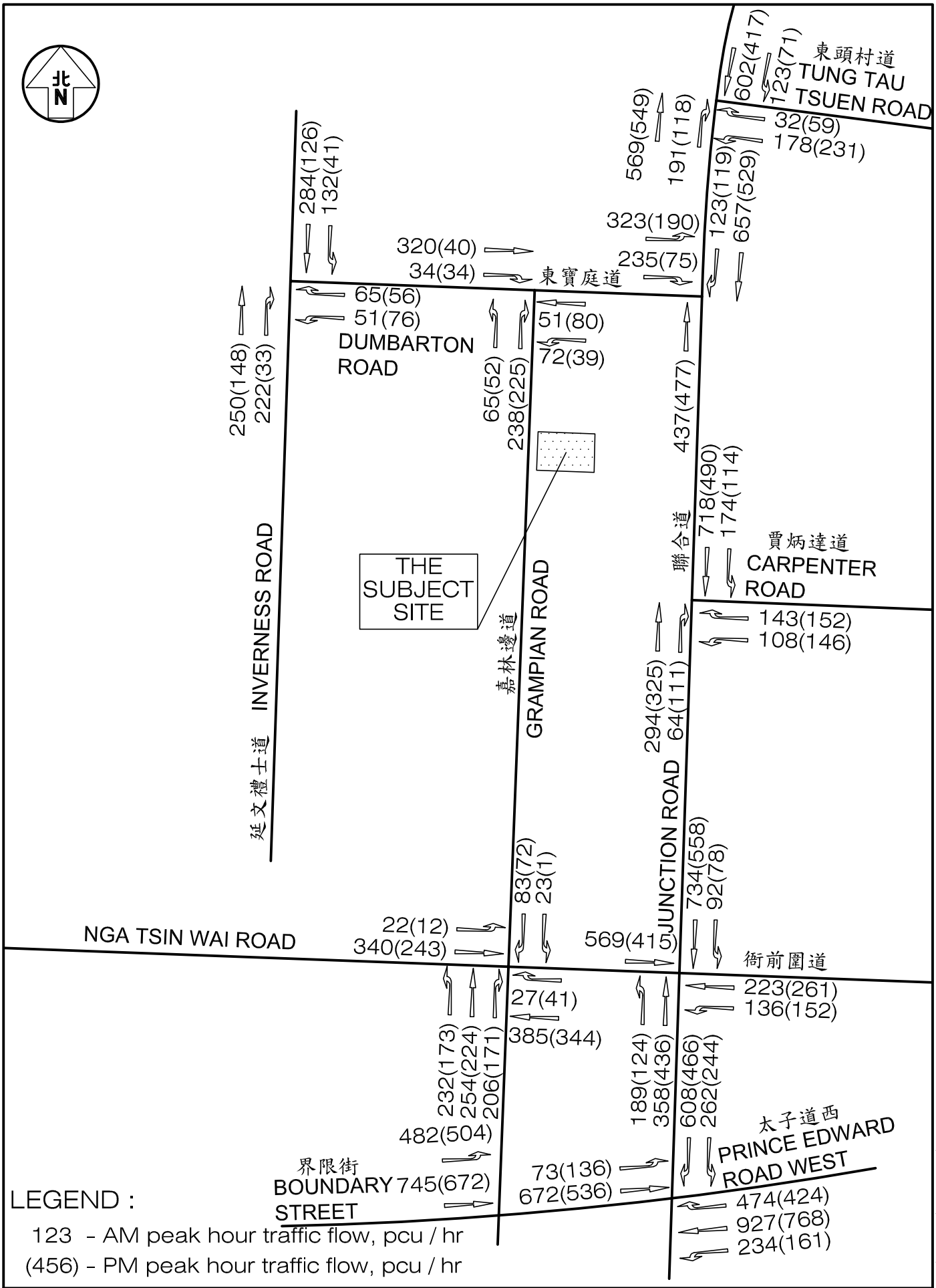
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	Designed by C Y Y	Drawn by N C M	Checked by K C	Revision B	Date 29 JUN 2026
Figure Title: JUNCTION LAYOUT OF JUNCTION ROAD / TUNG TAU TSUEN ROAD	CKM Asia Limited Traffic and Transportation Planning Consultants 21st Floor, Methodist House, 36 Hennessy Road, Wan Chai, Hong Kong Tel : (852) 2520 5990 Fax : (852) 2528 6343 Email : mail@ckmasia.com.hk				

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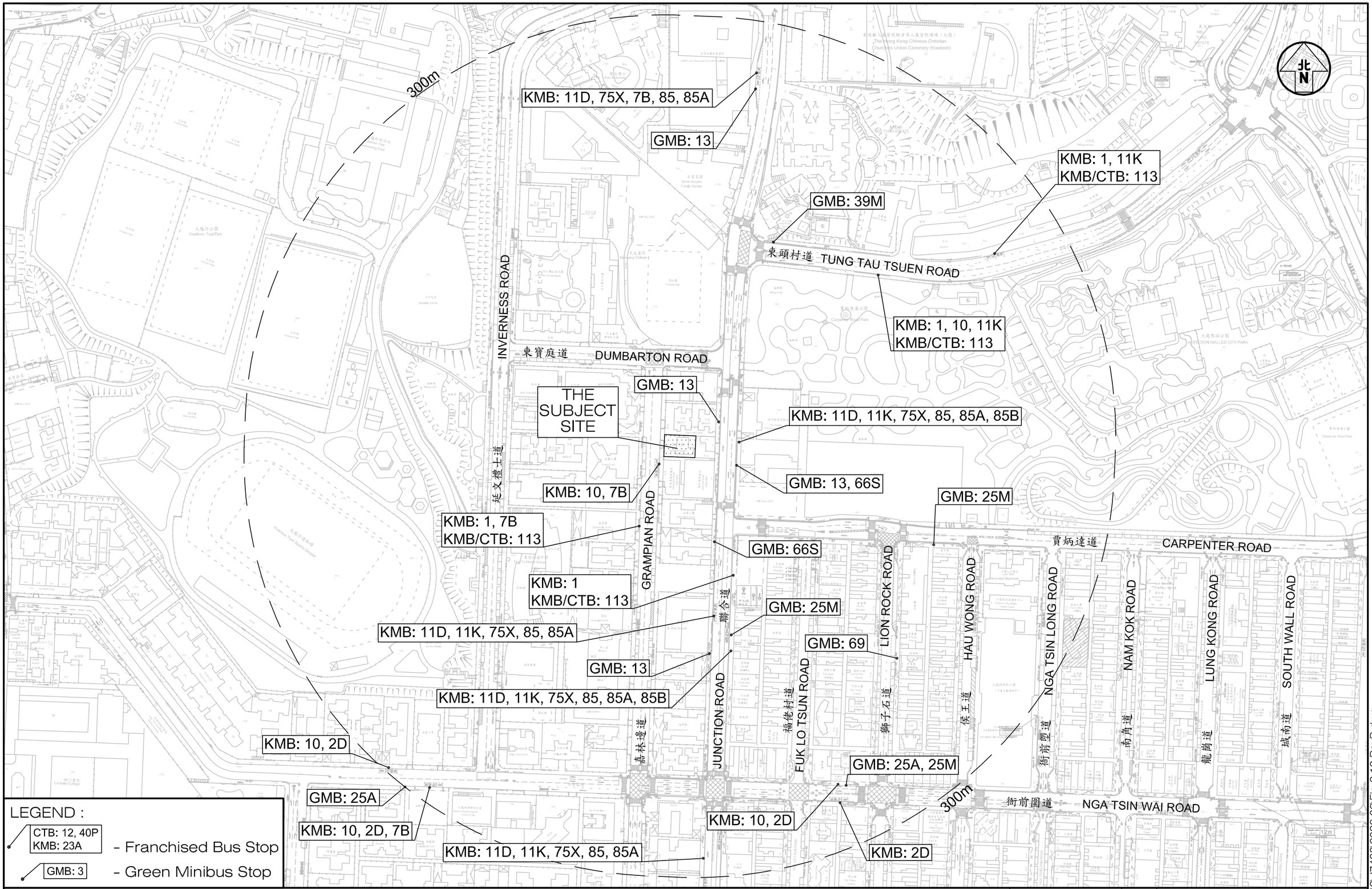
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PROPOSED MINOR RELAXATION FOR "RESIDENTIAL" USE AT 42 GRAMPIAN ROAD, KOWLOON CITY KOWLOON (NEW KOWLOON INLAND LOT NO. 3535)

Job No.	Figure No.			Scale in A4
J7433	2.11			N.T.S.
Designed by	Drawn by	Checked by	Revision	Date
C Y Y	N C M	K C	B	29 JUN 2026

Figure Title
EXISTING PEAK HOUR TRAFFIC FLOWS

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Project Title

PROPOSED MINOR RELAXATION FOR "RESIDENTIAL" USE AT 42 GRAMPIAN ROAD, KOWLOON CITY KOWLOON (NEW KOWLOON INLAND LOT NO. 3535)

J7433

Figure Title

THE PUBLIC TRANSPORT SERVICES PROVIDED IN THE VICINITY OF THE SUBJECT SITE

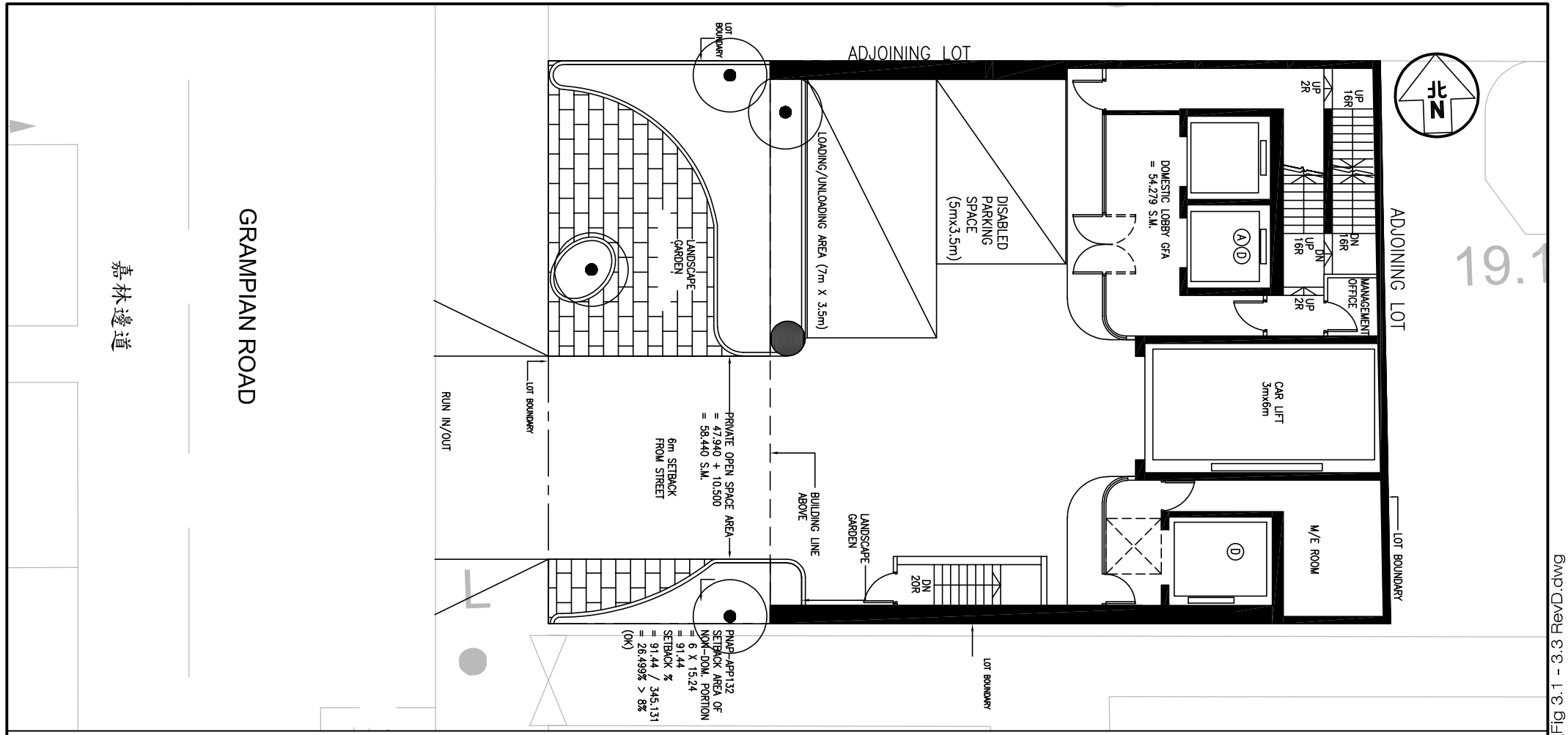
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2.12	B

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Scale in A3	Date
1 : 2500	29 JUN 2026

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LEGEND :

LOADING/UNLOADING AREA (7m X 3.5m)

LGV loading / unloading bay
@7m(L) X 3.5m(W) X 3.6m(H)

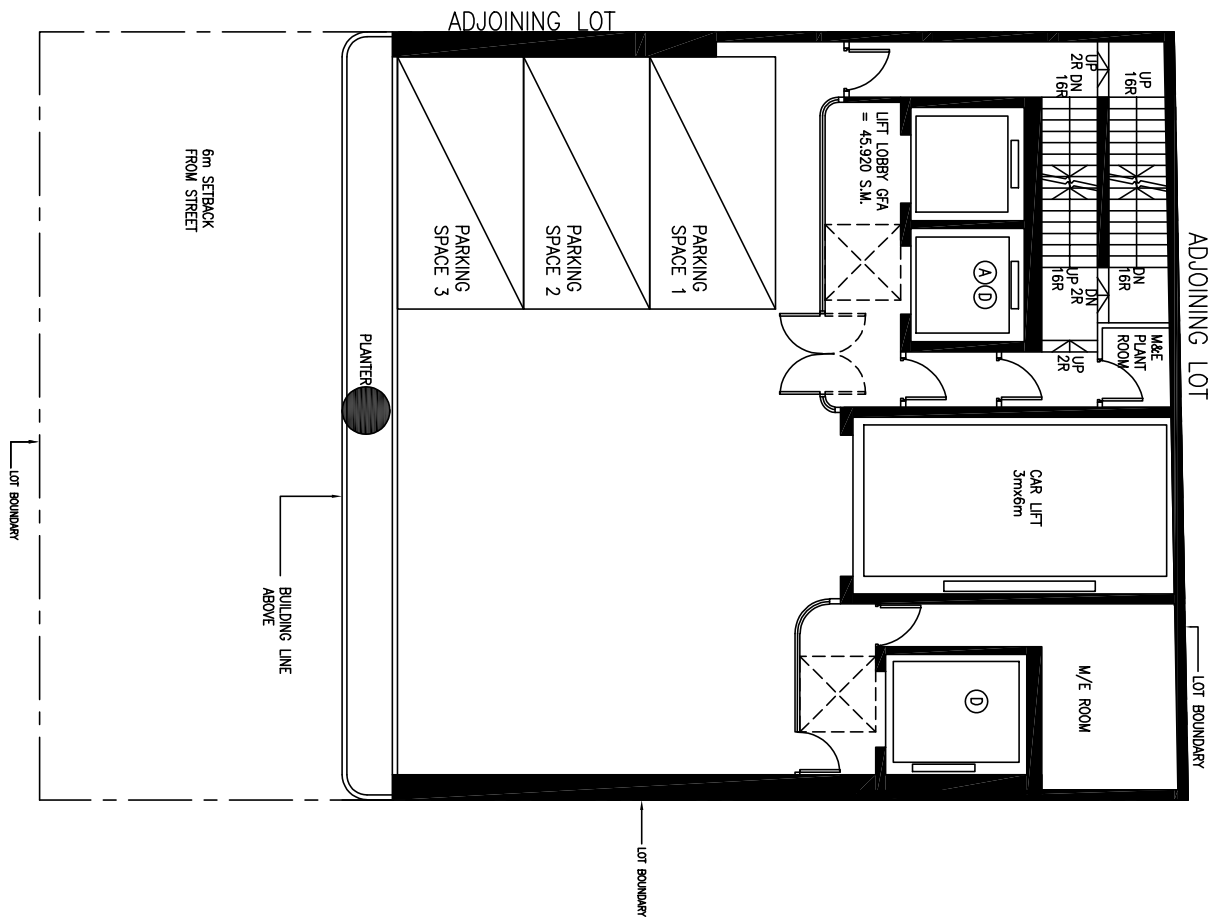
DISABLED PARKING SPACE (5mx3.5m)

Accessible car parking space
@5m(L) X 3.5m(W) X 2.4m(H)

Project Title	PROPOSED MINOR RELAXATION FOR "RESIDENTIAL" USE AT 42 GRAMPIAN ROAD, KOWLOON CITY KOWLOON (NEW KOWLOON INLAND LOT NO. 3535) J7433	Figure No. 3.1	Revision D
Figure Title	G/F LAYOUT PLAN	Designed by C Y Y / Drawn by N C M / Checked by K C	
		Scale in A4 1 : 150	Date 26 OCT 2026

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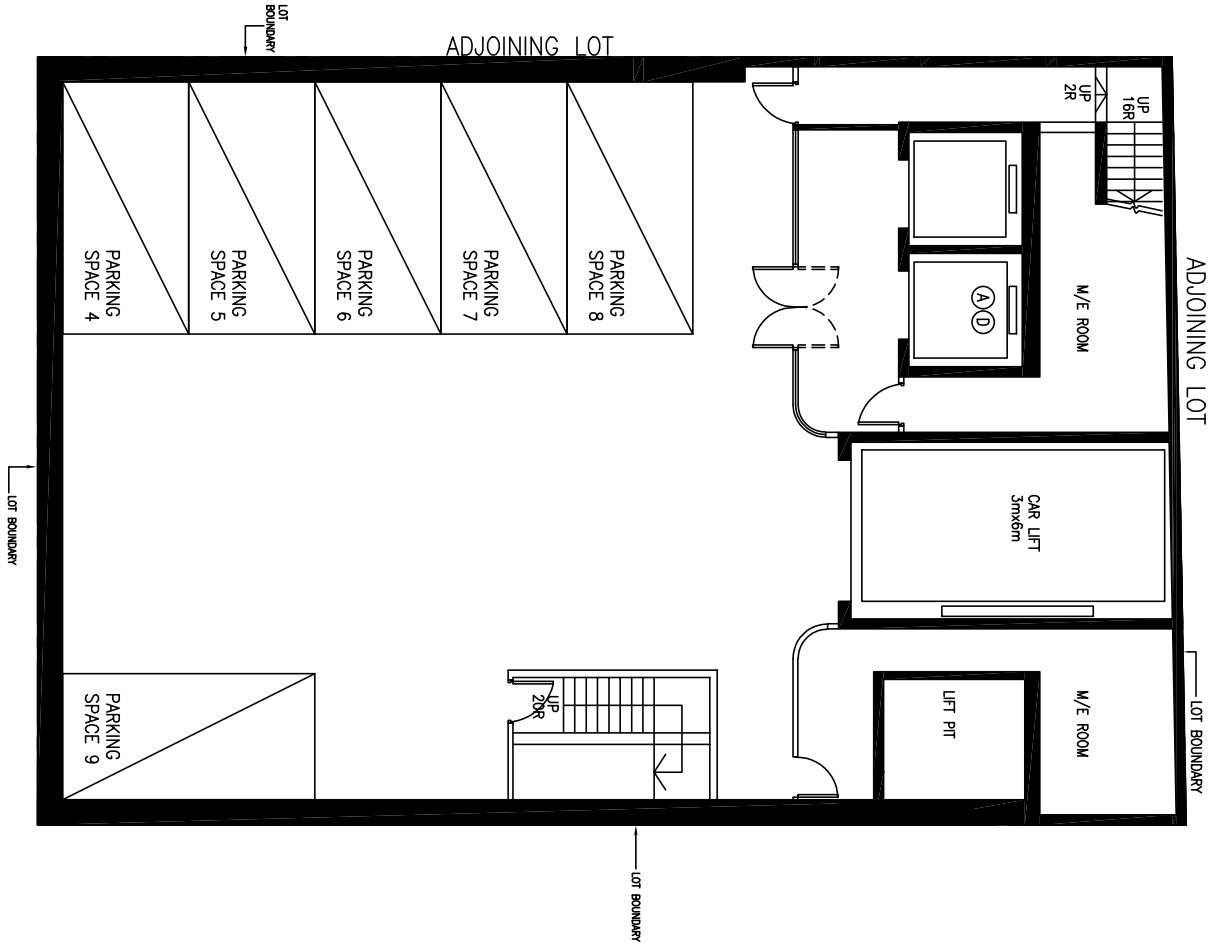
PARKING SPACE 1

Private car parking space
@5m(L) X 2.5m(W) X 2.4m(H)

Project Title	PROPOSED MINOR RELAXATION FOR "RESIDENTIAL" USE AT 42 GRAMPIAN ROAD, KOWLOON CITY KOWLOON (NEW KOWLOON INLAND LOT NO. 3535) J7433	Figure No. 3.2	Revision D
Figure Title	1/F LAYOUT PLAN	Designed by C Y Y / Drawn by N C M / Checked by K C	
		Scale in A4 1 : 150	Date 26 OCT 2026

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LEGEND :

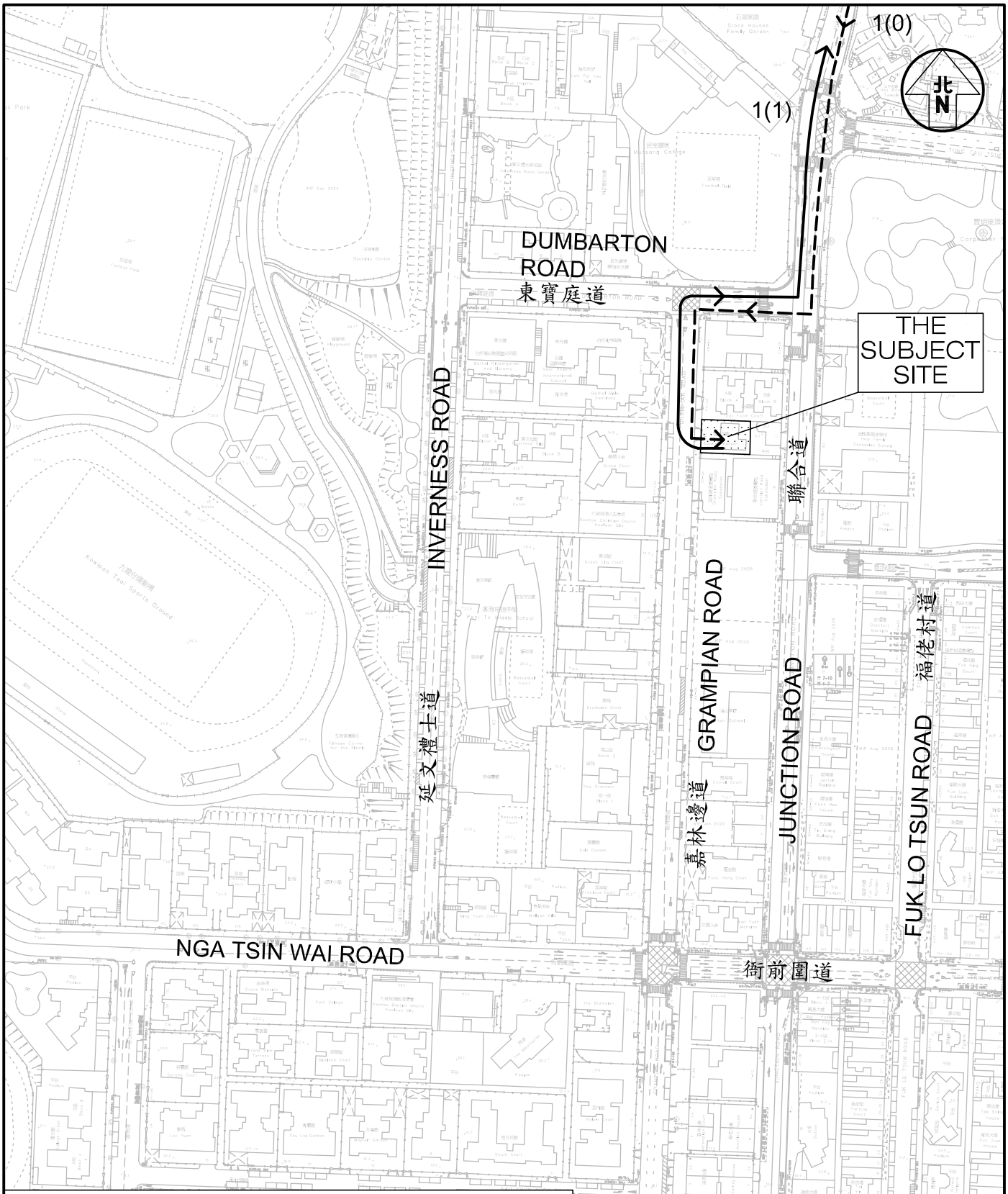
PARKING SPACE 4

Private car parking space
@5m(L) X 2.5m(W) X 2.4m(H)

Project Title	PROPOSED MINOR RELAXATION FOR "RESIDENTIAL" USE AT 42 GRAMPIAN ROAD, KOWLOON CITY KOWLOON (NEW KOWLOON INLAND LOT NO. 3535) J7433	Figure No. 3.3	Revision D
Figure Title	B/F LAYOUT PLAN	Designed by C Y Y / Drawn by N C M / Checked by K C	
		Scale in A4 1 : 150	Date 26 OCT 2026

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T:\JOB\J7400-J7449\J7433\2026 10\Fig 3.1 - 3.3 RevD.dwg



LEGEND :

Ingress Route

Egress Route

123 - AM peak hour traffic flow, pcu / hr

(456) - PM peak hour traffic flow, pcu / hr

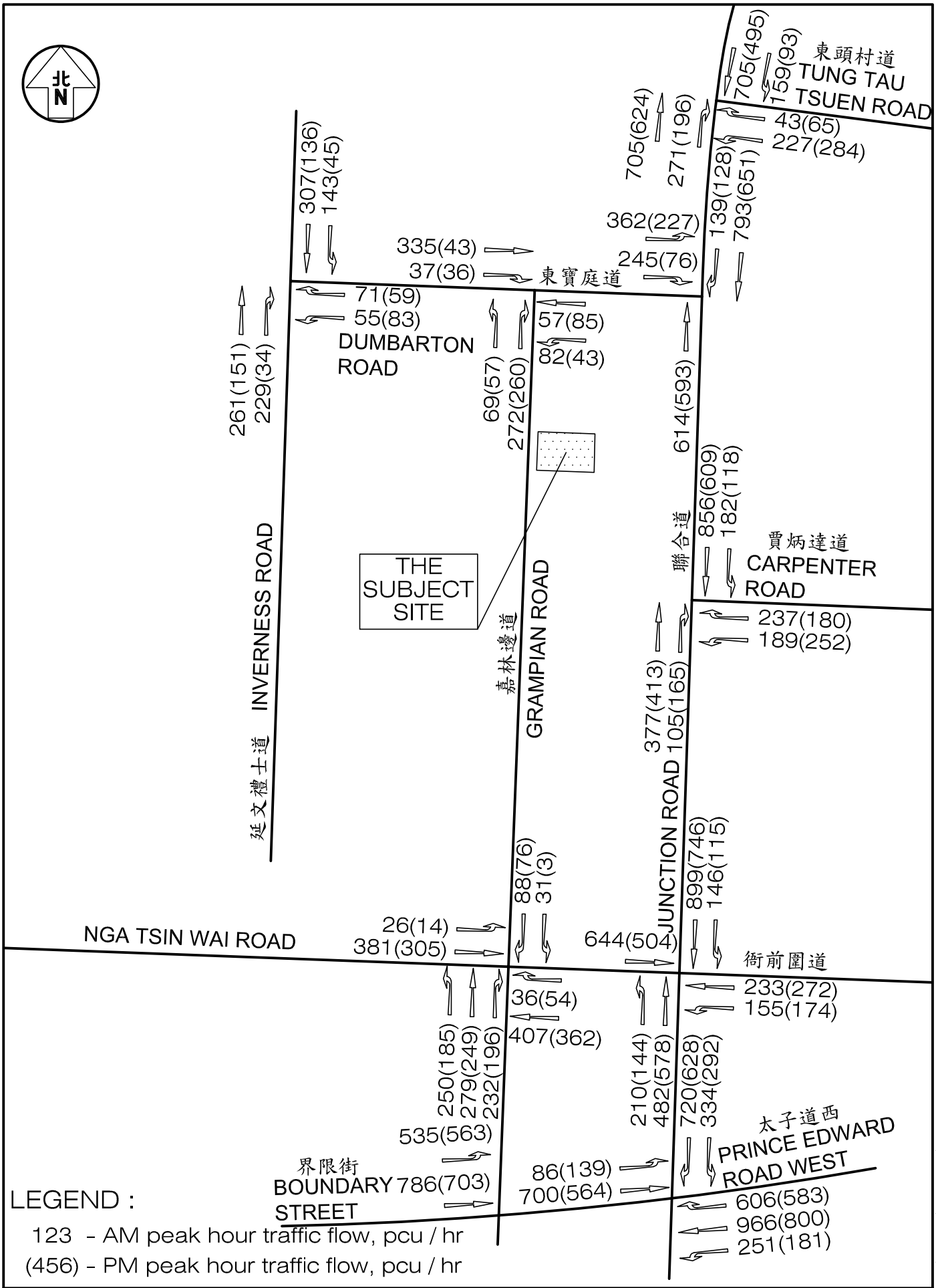
Project Title
PROPOSED MINOR RELAXATION FOR "RESIDENTIAL" USE AT 42 GRAMPIAN ROAD, KOWLOON CITY KOWLOON (NEW KOWLOON INLAND LOT NO. 3535)

Figure Title
INGRESS / EGRESS ROUTE FOR ADDITIONAL TRAFFIC GENERATED BY THE PROPOSED DEVELOPMENT

Job No.	Figure No.			Scale in A4
J7433	4.1			1 : 2500
Designed by	Drawn by	Checked by	Revision	Date
C Y Y	N C M	K C	D	26 OCT 2026

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T:\JOBs\J7400-J7449\J7433\2026 10\Fig 4.1 RevD.dwg



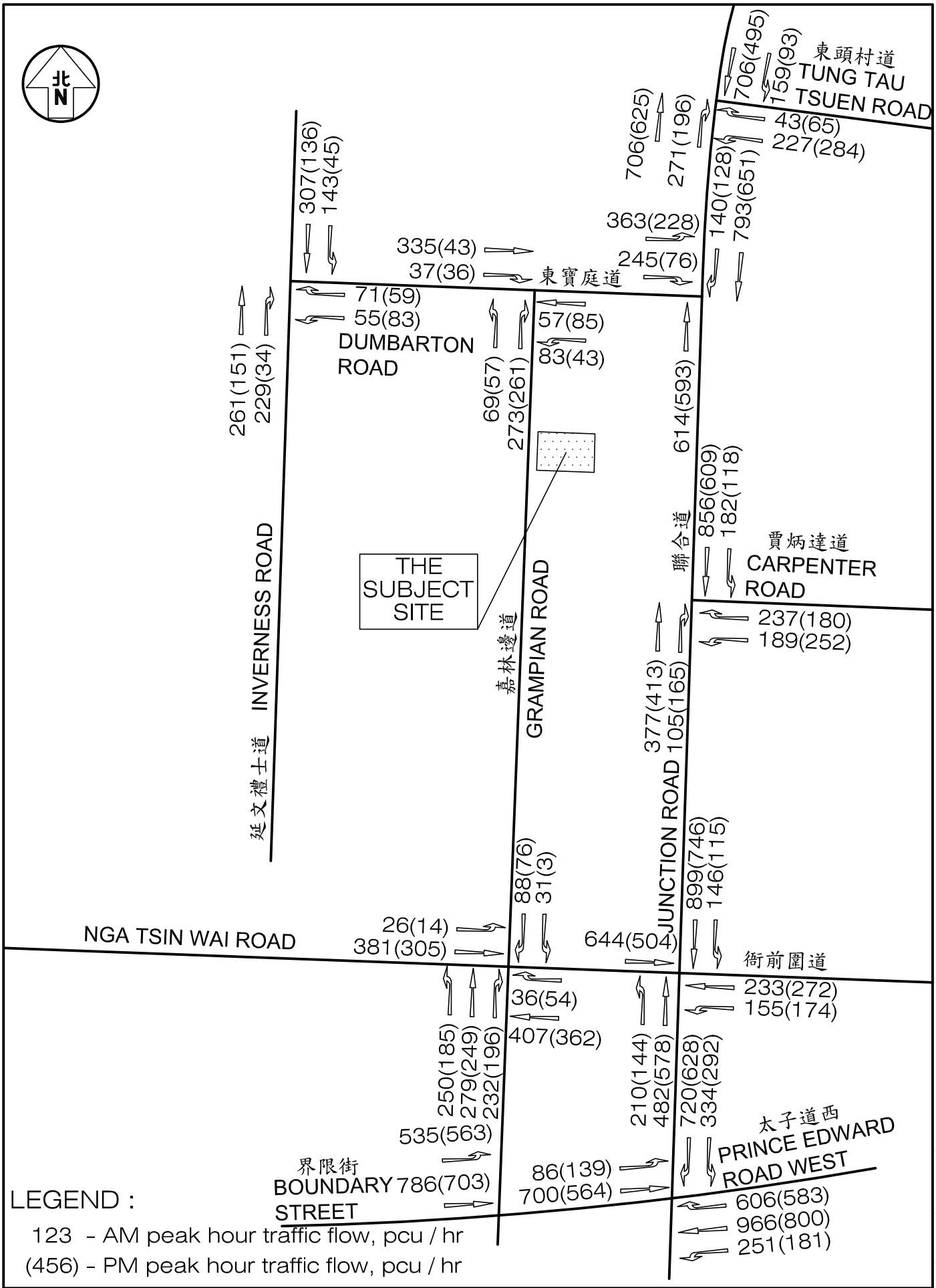
Project Title
PROPOSED MINOR RELAXATION FOR "RESIDENTIAL" USE AT 42 GRAMPIAN ROAD, KOWLOON CITY KOWLOON (NEW KOWLOON INLAND LOT NO. 3535)

Job No.	Figure No.			Scale in A4
J7433	4.2			N.T.S.
Designed by	Drawn by	Checked by	Revision	Date
C Y Y	N C M	K C	B	29 JUN 2026

Figure Title
YEAR 2033 PEAK HOUR TRAFFIC FLOWS
WITHOUT THE PROPOSED REDEVELOPMENT

CKM Asia Limited
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T:\JOBs\J7400-J7449\J7433\2026 06\Fig 4.2 RevB.dwg



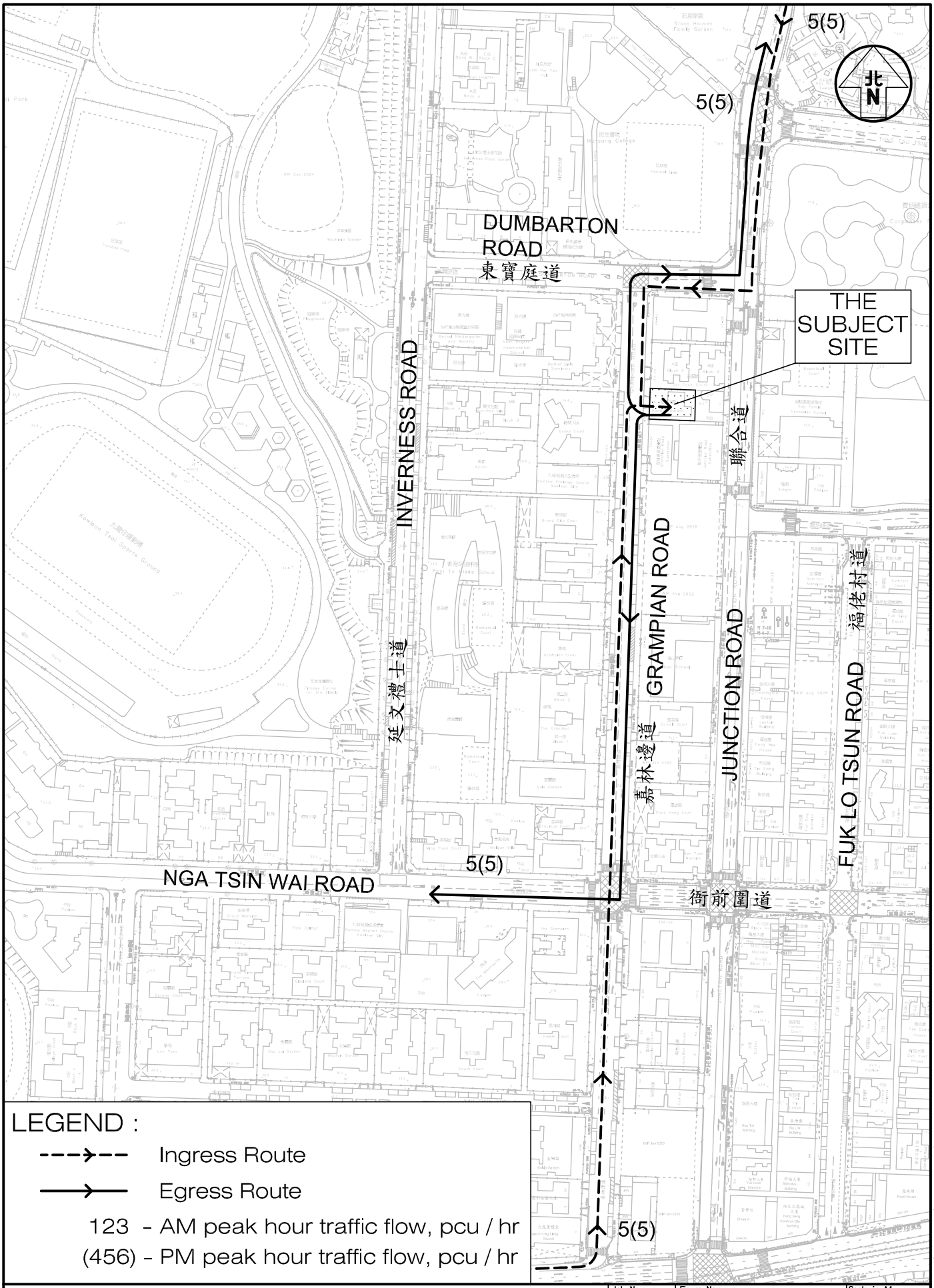
Project Title
PROPOSED MINOR RELAXATION FOR "RESIDENTIAL" USE AT 42 GRAMPIAN ROAD, KOWLOON CITY KOWLOON (NEW KOWLOON INLAND LOT NO. 3535)

Job No.	Figure No.			Scale in A4
J7433	4.3			N.T.S.
Designed by	Drawn by	Checked by	Revision	Date
C Y Y	N C M	K C	D	26 OCT 2026

Figure Title
YEAR 2033 PEAK HOUR TRAFFIC FLOWS WITH THE PROPOSED REDEVELOPMENT

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T:\JOBs\J7400-J7449\J7433\2026 10\Fig 4.3 RevD.dwg



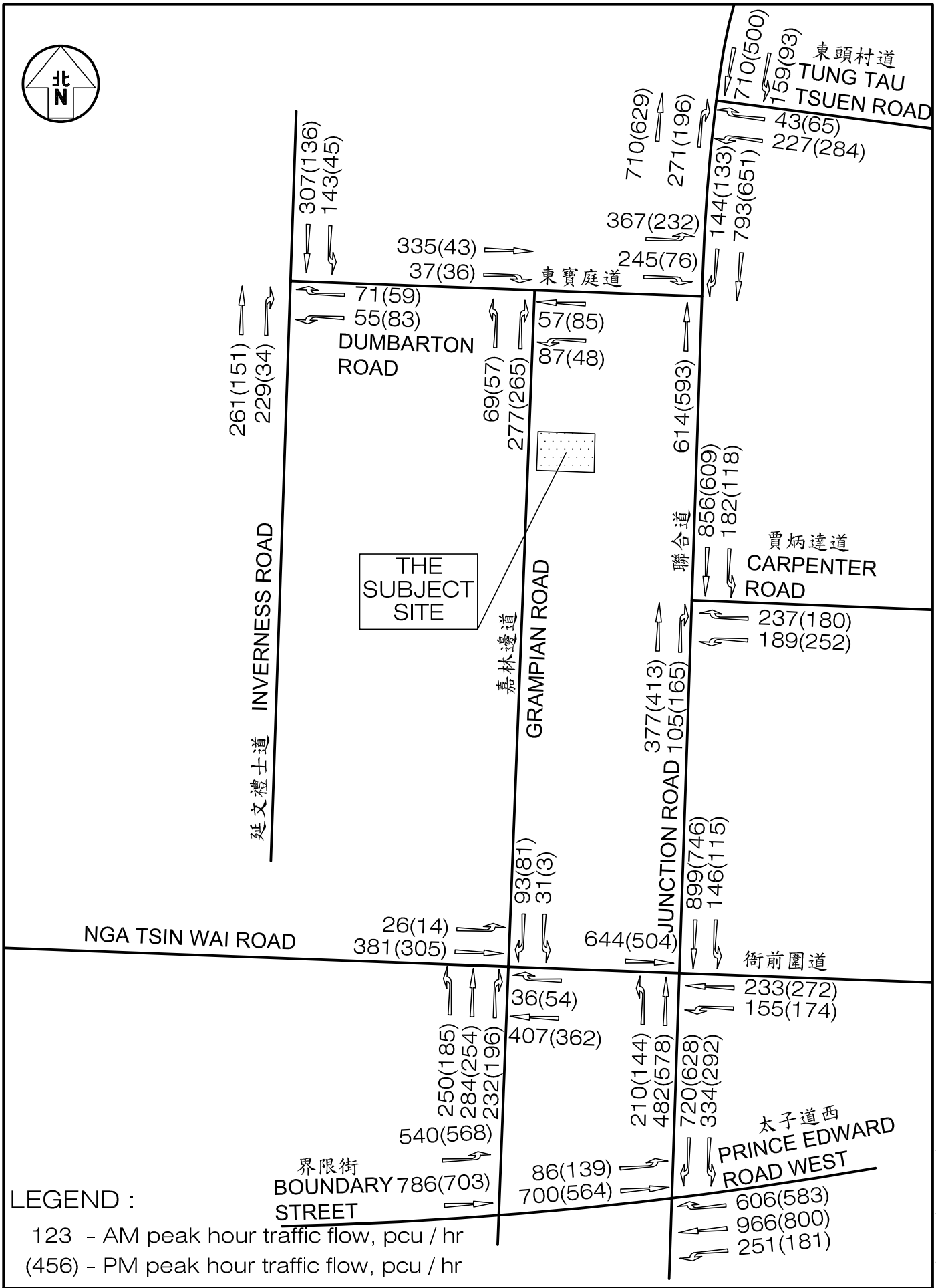
Project Title
PROPOSED MINOR RELAXATION FOR "RESIDENTIAL" USE AT 42 GRAMPIAN ROAD, KOWLOON CITY KOWLOON (NEW KOWLOON INLAND LOT NO. 3535)

Job No.	Figure No.			Scale in A4
J7433	5.1			1 : 2500
Designed by	Drawn by	Checked by	Revision	Date
C Y Y	N C M	K C	B	29 JUN 2026

Figure Title
INGRESS / EGRESS ROUTE FOR THE CONSTRUCTION VEHICLES

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T:\JOBs\J7400-J7449\J7433\2026 03\Fig 5.1 RevB.dwg



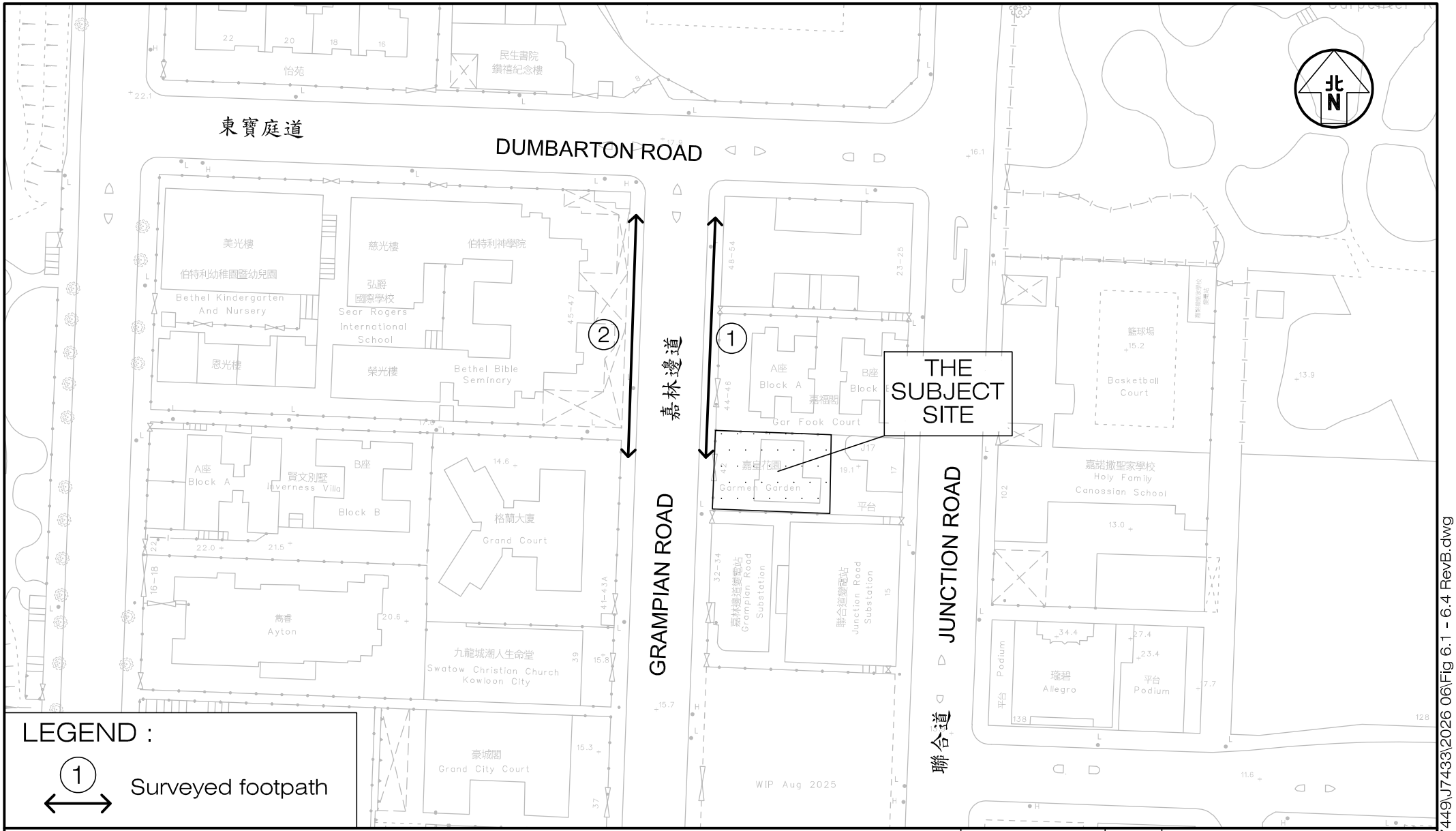
LEGEND :

123 - AM peak hour traffic flow, pcu / hr

(456) - PM peak hour traffic flow, pcu / hr

Project Title: PROPOSED MINOR RELAXATION FOR "RESIDENTIAL" USE AT 42 GRAMPIAN ROAD, KOWLOON CITY KOWLOON (NEW KOWLOON INLAND LOT NO. 3535)	Job No. J7433	Figure No. 5.2			Scale in A4 N.T.S.
	Designed by T T O	Drawn by N C M	Checked by K C	Revision B	Date 29 JUN 2026
Figure Title: YEAR 2033 PEAK HOUR TRAFFIC FLOWS WITH THE CONSTRUCTION VEHICLES	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				

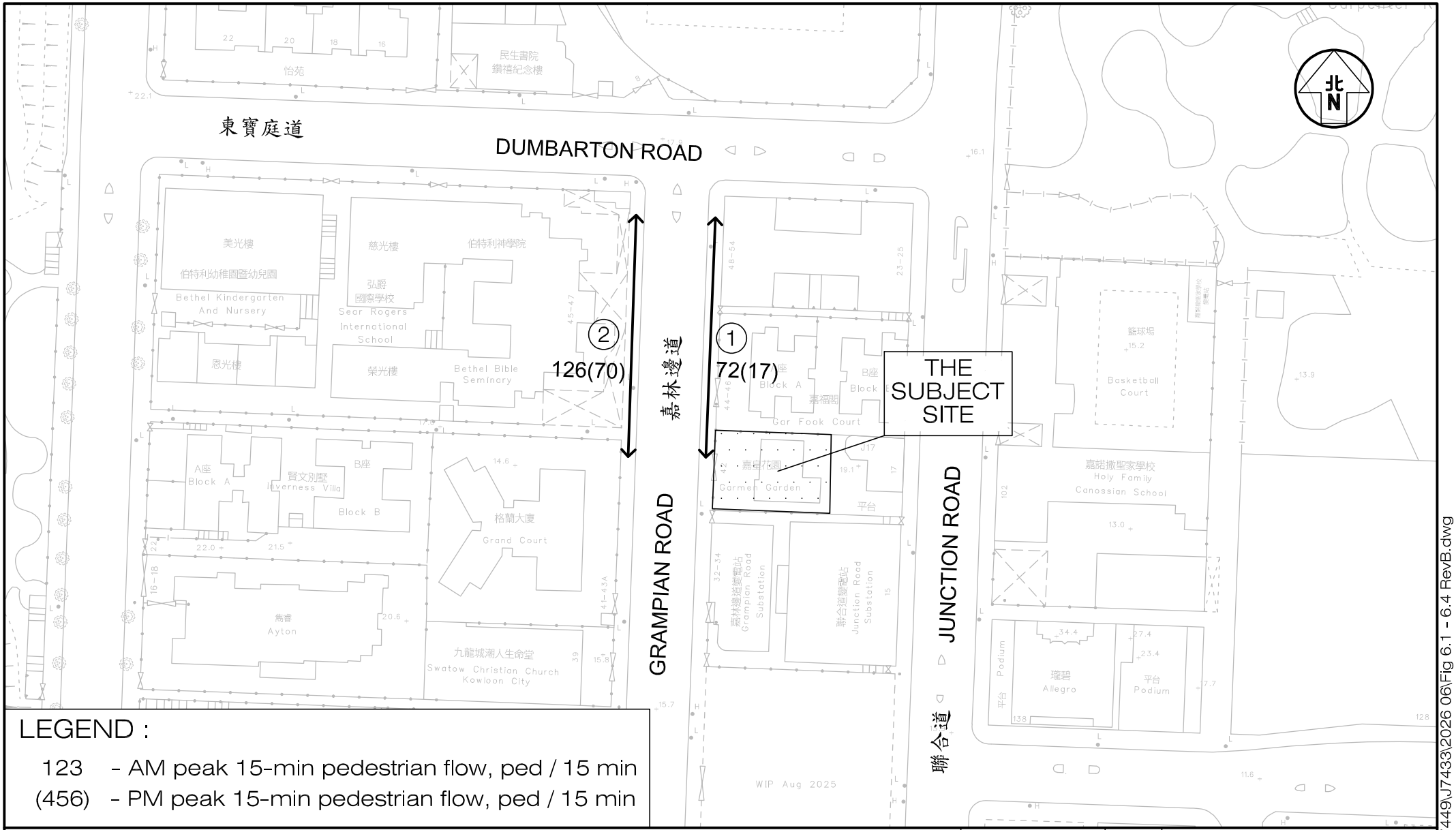
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Project Title	PROPOSED MINOR RELAXATION FOR "RESIDENTIAL" USE AT 42 GRAMPIAN ROAD, KOWLOON CITY KOWLOON (NEW KOWLOON INLAND LOT NO. 3535)	J7433	Figure No. 6.1 / Revision B
Figure Title	LOCATION OF SURVEYED FOOTPATHS		Designed by C Y Y / Drawn by N C M / Checked by K C / Scale in A4 1 : 1000 / Date 29 JUN 2026

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T:\JOB\J7400-J7449\J7433\2026 06\Fig 6.1 - 6.4 RevB.dwg



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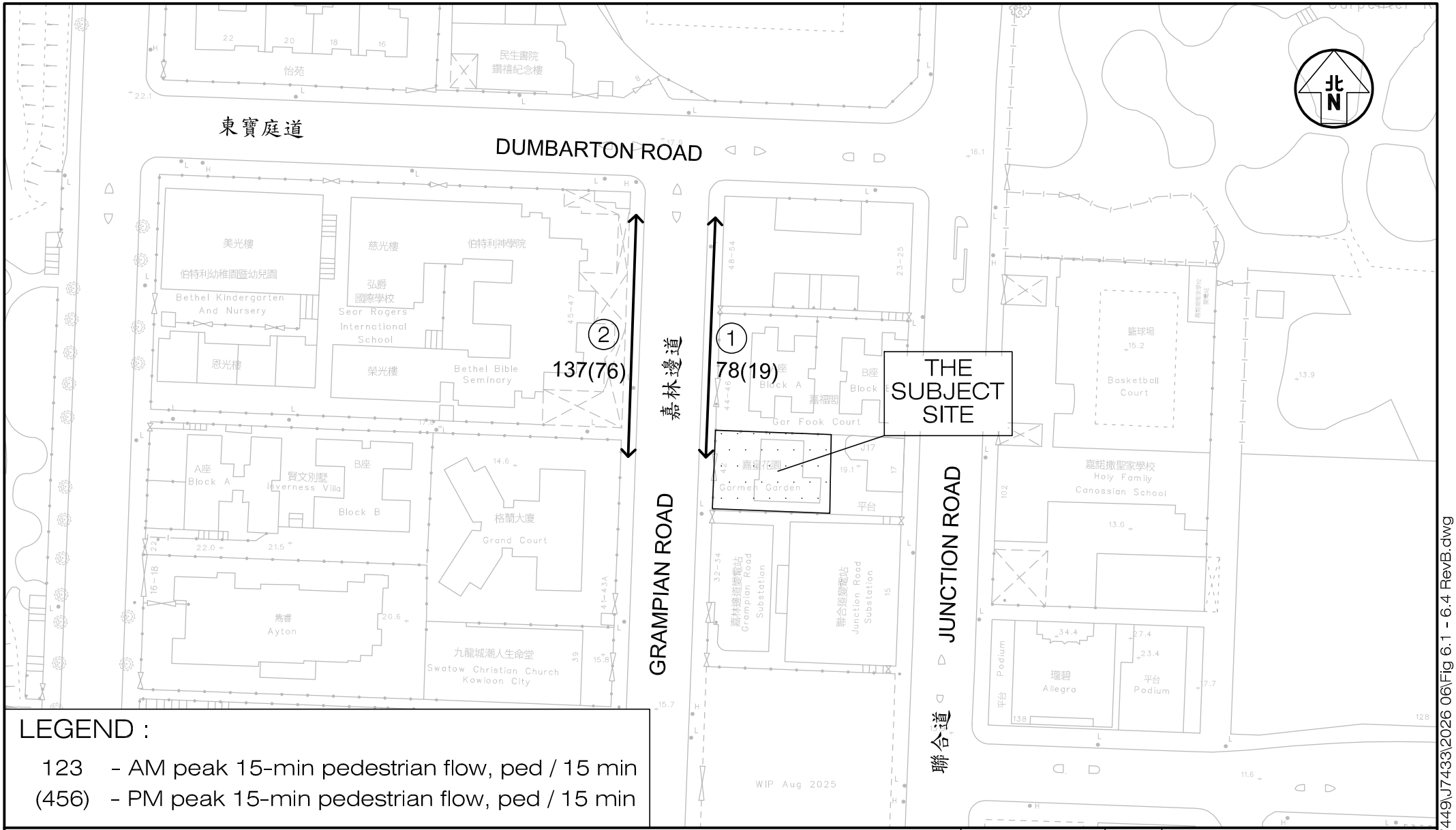
123 - AM peak 15-min pedestrian flow, ped / 15 min

(456) - PM peak 15-min pedestrian flow, ped / 15 min

Project Title	PROPOSED MINOR RELAXATION FOR "RESIDENTIAL" USE AT 42 GRAMPIAN ROAD, KOWLOON CITY KOWLOON (NEW KOWLOON INLAND LOT NO. 3535)
	J7433
Figure Title	EXISTING PEAK 15-MINUTE TWO-WAY PEDESTRIAN FLOWS
Figure No.	6.2
Revision	B
Designed by	C Y Y
Drawn by	N C M
Checked by	K C
Scale in A4	1 : 1000
Date	29 JUN 2026

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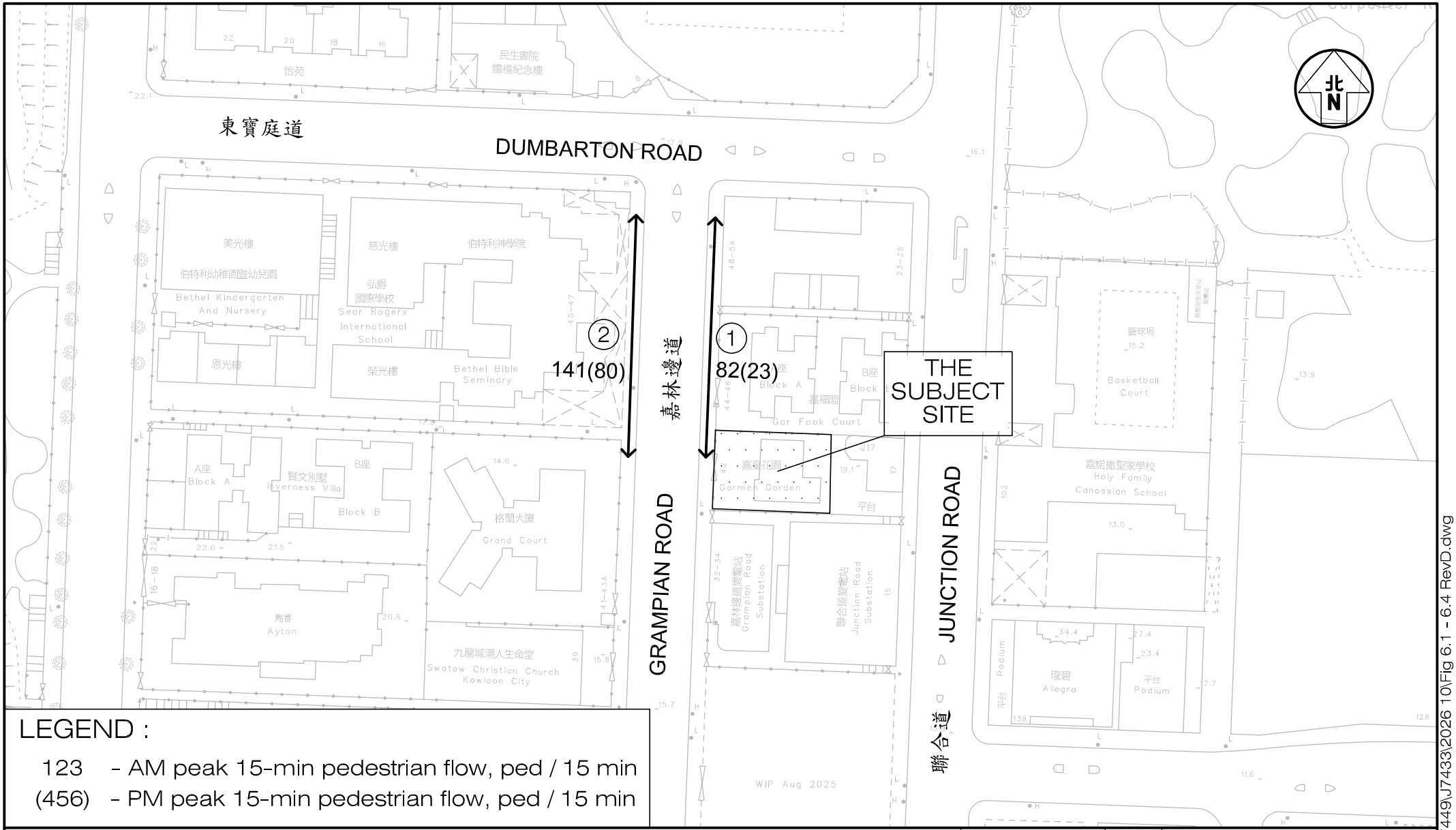
123 - AM peak 15-min pedestrian flow, ped / 15 min

(456) - PM peak 15-min pedestrian flow, ped / 15 min

Project Title	PROPOSED MINOR RELAXATION FOR "RESIDENTIAL" USE AT 42 GRAMPIAN ROAD, KOWLOON CITY KOWLOON (NEW KOWLOON INLAND LOT NO. 3535)	J7433	Figure No. 6.3 / Revision B
Figure Title	YEAR 2033 PEDESTRIAN FLOWS WITHOUT THE PROPOSED DEVELOPMENT		Designed by C Y Y / Drawn by N C M / Checked by K C / Scale in A4 1 : 1000 / Date 29 JUN 2026

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T:\JOB\J7400-J7449\J7433\2026 06\Fig 6.1 - 6.4 RevB.dwg



LEGEND :

123 - AM peak 15-min pedestrian flow, ped / 15 min

(456) - PM peak 15-min pedestrian flow, ped / 15 min

Project Title	PROPOSED MINOR RELAXATION FOR "RESIDENTIAL" USE AT 42 GRAMPIAN ROAD, KOWLOON CITY KOWLOON (NEW KOWLOON INLAND LOT NO. 3535)	J7433	Figure No. 6.4 / Revision D
Figure Title	YEAR 2033 PEDESTRIAN FLOWS WITH THE PROPOSED DEVELOPMENT		Designed by C Y Y / Drawn by N C M / Checked by K C / Scale in A4 1 : 1000 / Date 26 OCT 2026

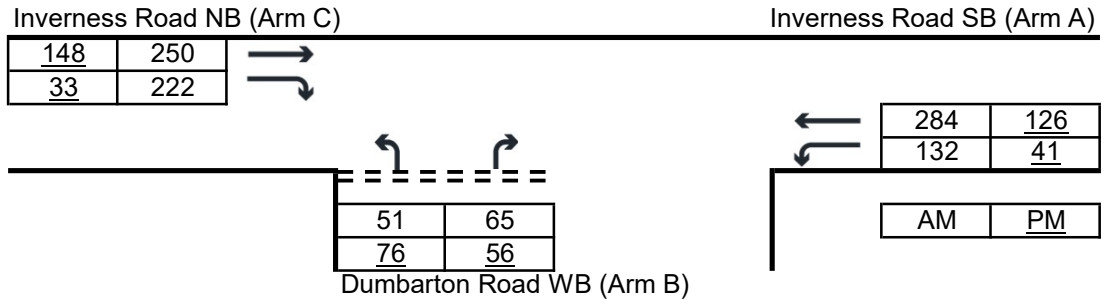
CKM Asia Limited
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Appendix 1 – Calculation

Priority Junction Analysis

Junction:	Inverness Road / Dumbarton Road				
Design Year:	2025	Job Number:	J7433	Date:	26 Oct 2026
Scenario:	Existing Condition				Page 1



The predictive equations of capacity of movement are:

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

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

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

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

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

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

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

where Y = 1 - 0.0345W

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

W = major road width

W-CR = central reserve width

w-BA, etc = lane width to vehicle

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

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

Geometry :	Input		Input		Input		Calculated	
	W	8.40	V-rBA	32	w-BA	2.65	D	0.7742
	W-CR	0.80	V-lBA	30	w-BC	2.65	E	0.8342
			V-rBC	32	w-CB	2.45	F	0.8193
			V-rCB	35			Y	0.7102

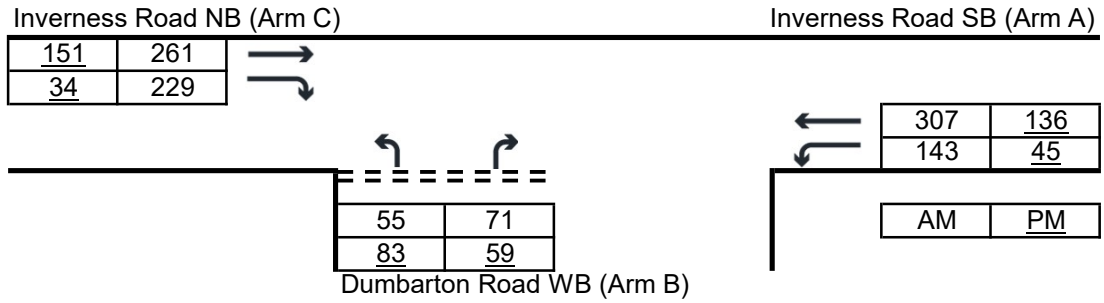
Analysis :

Traffic Flows, pcu/hr	AM	PM	Capacity, pcu/hr	AM	PM
q-CA	250	148	Q-BA	332	438
q-CB	222	33	Q-BC	549	591
q-AB	132	41	Q-CB	522	575
q-AC	284	126	Q-BAC	402	514
q-BA	65	56			
q-BC	51	76			
f	0.440	0.576			

Ratio-of-flow to Capacity	AM	PM
B-A	0.196	0.128
B-C	0.093	0.129
C-B	0.425	0.057
B-AC	0.289	0.257

Priority Junction Analysis

Junction:	Inverness Road / Dumbarton Road				
Design Year:	2033	Job Number:	J7433	Date:	26 Oct 2026
Scenario:	Future Condition (Without Proposed Development)			Page	2



The predictive equations of capacity of movement are:

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

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

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

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

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

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

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

where Y = 1 - 0.0345W

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

W = major road width

W-CR = central reserve width

w-BA, etc = lane width to vehicle

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

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

Geometry :	Input		Input		Input		Calculated	
	W	8.40	V-rBA	32	w-BA	2.65	D	0.7742
	W-CR	0.80	V-lBA	30	w-BC	2.65	E	0.8342
			V-rBC	32	w-CB	2.45	F	0.8193
			V-rCB	35			Y	0.7102

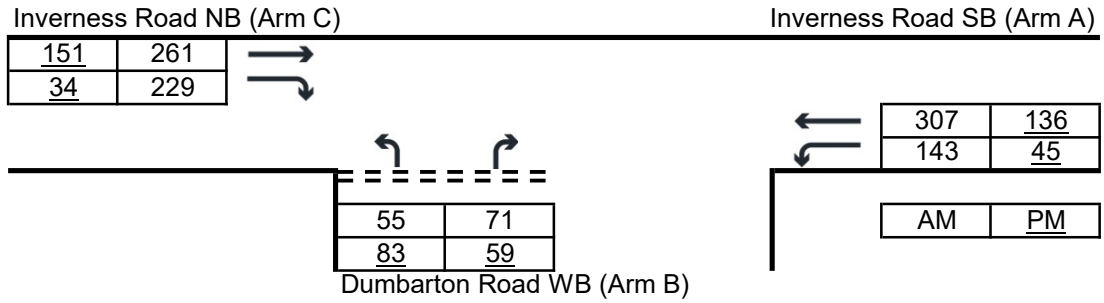
Analysis :

Traffic Flows, pcu/hr	AM	PM	Capacity, pcu/hr	AM	PM
q-CA	261	151	Q-BA	323	435
q-CB	229	34	Q-BC	543	588
q-AB	143	45	Q-CB	515	572
q-AC	307	136	Q-BAC	392	513
q-BA	71	59			
q-BC	55	83			
f	0.437	0.585			

Ratio-of-flow to Capacity	AM	PM
B-A	0.220	0.136
B-C	0.101	0.141
C-B	0.445	0.059
B-AC	0.321	0.277

Priority Junction Analysis

Junction:	Inverness Road / Dumbarton Road				
Design Year:	2033	Job Number:	J7433	Date:	26 Oct 2026
Scenario:	Future Condition (With Proposed Development)			Page	3



The predictive equations of capacity of movement are:

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

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

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

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

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

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

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

where Y = 1 - 0.0345W

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

W = major road width

W-CR = central reserve width

w-BA, etc = lane width to vehicle

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

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

Geometry :	Input		Input		Input		Calculated	
	W	8.40	V-rBA	32	w-BA	2.65	D	0.7742
	W-CR	0.80	V-lBA	30	w-BC	2.65	E	0.8342
			V-rBC	32	w-CB	2.45	F	0.8193
			V-rCB	35			Y	0.7102

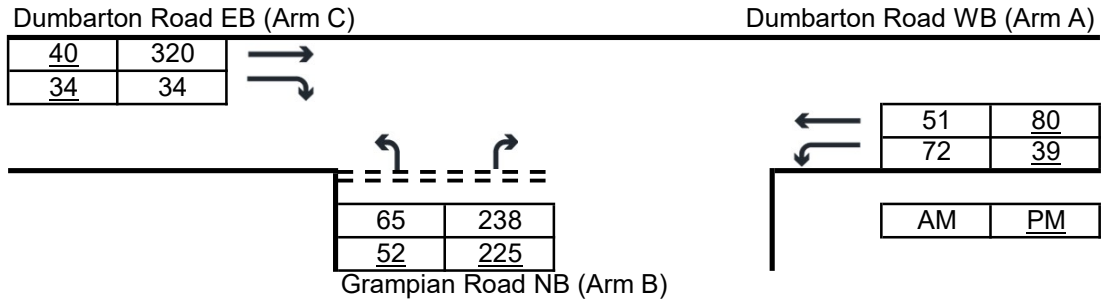
Analysis :

Traffic Flows, pcu/hr	AM	PM	Capacity, pcu/hr	AM	PM
q-CA	261	151	Q-BA	323	435
q-CB	229	34	Q-BC	543	588
q-AB	143	45	Q-CB	515	572
q-AC	307	136	Q-BAC	392	513
q-BA	71	59			
q-BC	55	83			
f	0.437	0.585			

Ratio-of-flow to Capacity	AM	PM
B-A	0.220	0.136
B-C	0.101	0.141
C-B	0.445	0.059
B-AC	0.321	0.277

Priority Junction Analysis

Junction:	Grampian Road / Dumbarton Road				
Design Year:	2025	Job Number:	J7433	Date:	26 Oct 2026
Scenario:	Existing Condition				Page 4



The predictive equations of capacity of movement are:

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

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

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

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

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

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

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

where Y = 1 - 0.0345W

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

W = major road width

W-CR = central reserve width

w-BA, etc = lane width to vehicle

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

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

Geometry :	Input		Input		Input		Calculated	
	W	9.70	V-rBA	35	w-BA	2.90	D	0.7940
	W-CR	1.60	V-lBA	25	w-BC	2.90	E	0.8584
			V-rBC	35	w-CB	2.50	F	0.8237
			V-rCB	35			Y	0.6654

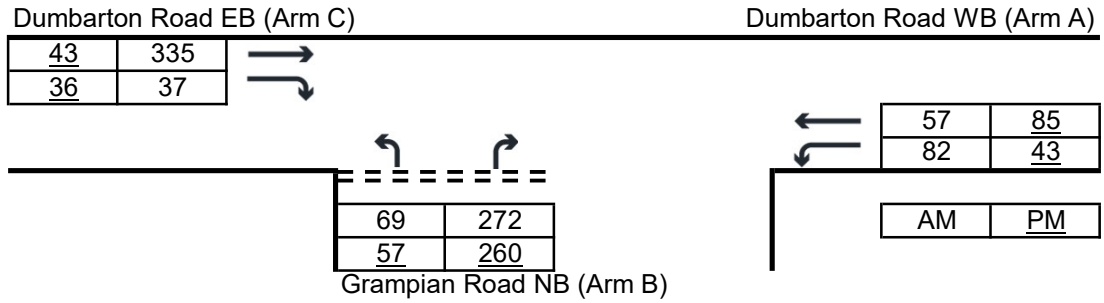
Analysis :

Traffic Flows, pcu/hr	AM	PM	Capacity, pcu/hr	AM	PM
q-CA	320	40	Q-BA	452	483
q-CB	34	34	Q-BC	623	620
q-AB	72	39	Q-CB	589	590
q-AC	51	80	Q-BAC	481	504
q-BA	238	225			
q-BC	65	52			
f	0.215	0.188			

Ratio-of-flow to Capacity	AM	PM
B-A	0.526	0.466
B-C	0.104	0.084
C-B	0.058	0.058
B-AC	0.631	0.550

Priority Junction Analysis

Junction:	Grampian Road / Dumbarton Road				
Design Year:	2033	Job Number:	J7433	Date:	26 Oct 2026
Scenario:	Future Condition (Without Proposed Development)			Page	5



The predictive equations of capacity of movement are:

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

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

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

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

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

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

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

where Y = 1 - 0.0345W

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

W = major road width

W-CR = central reserve width

w-BA, etc = lane width to vehicle

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

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

Geometry :	Input		Input		Input		Calculated	
	W	9.70	V-rBA	35	w-BA	2.90	D	0.7940
	W-CR	1.60	V-lBA	25	w-BC	2.90	E	0.8584
			V-rBC	35	w-CB	2.50	F	0.8237
			V-rCB	35			Y	0.6654

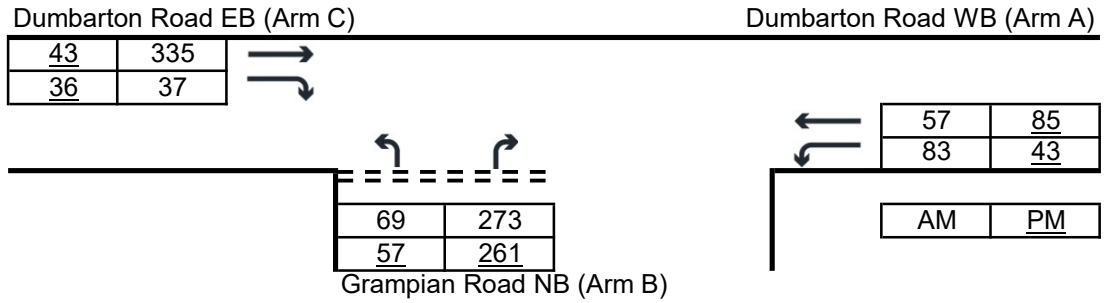
Analysis :

Traffic Flows, pcu/hr	AM	PM	Capacity, pcu/hr	AM	PM
q-CA	335	43	Q-BA	448	481
q-CB	37	36	Q-BC	621	618
q-AB	82	43	Q-CB	586	588
q-AC	57	85	Q-BAC	475	501
q-BA	272	260			
q-BC	69	57			
f	0.202	0.180			

Ratio-of-flow to Capacity	AM	PM
B-A	0.607	0.541
B-C	0.111	0.092
C-B	0.063	0.061
B-AC	0.719	0.633

Priority Junction Analysis

Junction:	Grampian Road / Dumbarton Road				
Design Year:	2033	Job Number:	J7433	Date:	26 Oct 2026
Scenario:	Future Condition (With Proposed Development)			Page	6



The predictive equations of capacity of movement are:

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

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

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

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

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

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

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

where Y = 1 - 0.0345W

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

W = major road width

W-CR = central reserve width

w-BA, etc = lane width to vehicle

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

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

Geometry :	Input		Input		Input		Calculated	
	W	9.70	V-rBA	35	w-BA	2.90	D	0.7940
	W-CR	1.60	V-lBA	25	w-BC	2.90	E	0.8584
			V-rBC	35	w-CB	2.50	F	0.8237
			V-rCB	35			Y	0.6654

Analysis :

Traffic Flows, pcu/hr	AM	PM	Capacity, pcu/hr	AM	PM
q-CA	335	43	Q-BA	448	481
q-CB	37	36	Q-BC	621	618
q-AB	83	43	Q-CB	586	588
q-AC	57	85	Q-BAC	474	501
q-BA	273	261			
q-BC	69	57			
f	0.202	0.179			

Ratio-of-flow to Capacity	AM	PM
B-A	0.610	0.543
B-C	0.111	0.092
C-B	0.063	0.061
B-AC	0.721	0.635

Signal Junction Analysis

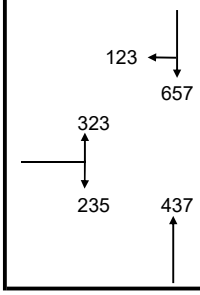
Junction: Junction Road / Dumbarton Road — Job Number: J7433

Scenario: Existing Condition — P. 7

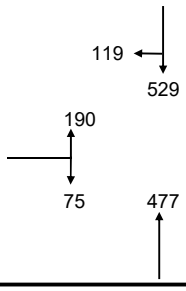
Design Year: 2025 — Designed By: — Checked By: — Date: 26 Oct 2026

Approach		Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak Turning %	AM Peak Sat. Flow (pcu/hr)	AM Peak Flow (pcu/hr)	AM Peak y value	AM Peak Critical y	PM Peak Turning %	PM Peak Sat. Flow (pcu/hr)	PM Peak Flow (pcu/hr)	PM Peak y value	PM Peak Critical y
Junction Road SB	SA	A1	1	3.00				2055	657	0.320	0.320		2055	529	0.257	0.257
	RT	A2	2	3.00	15.0		100	1868	123	0.066	0.066	100	1868	119	0.064	0.064
Junction Road NB	SA	B1	1	5.00				2115	437	0.207			2115	477	0.226	
Dumbarton Road EB	LT	C1	3	3.00	15.0		100	1741	323	0.186	0.186	100	1741	190	0.109	0.109
	RT	C2	3	3.00	20.0		100	1912	235	0.123		100	1912	75	0.039	
pedestrian phase		D(p)	1		min crossing time =		7	sec GM +		7	sec FGM =		14	sec		
		E(p)	2,3		min crossing time =		7	sec GM +		6	sec FGM =		13	sec		
		F(p)	2		min crossing time =		6	sec GM +		5	sec FGM =		11	sec		

AM Traffic Flow (pcu/hr)



PM Traffic Flow (pcu/hr)

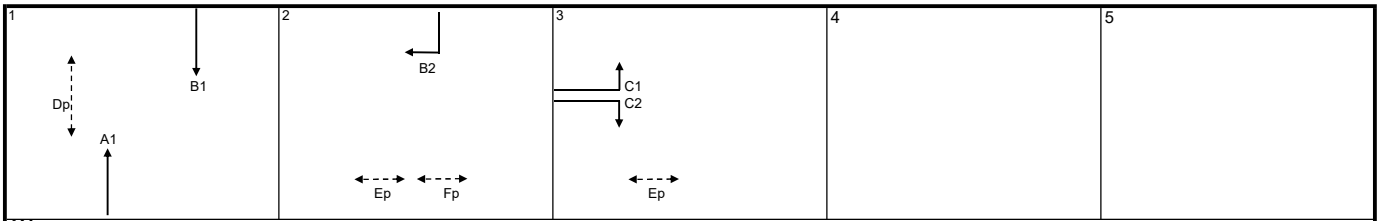


$S=1940+100(W-3.25)$ $S=2080+100(W-3.25)$

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

	AM Peak		PM Peak	
Group	1+2+3		1+2+3	
Sum y	0.571		0.430	
L (s)	16		16	
C (s)	125		120	
practical y	0.785		0.780	
R.C. (%)	37%		81%	

Note:



| | | | |

Signal Junction Analysis

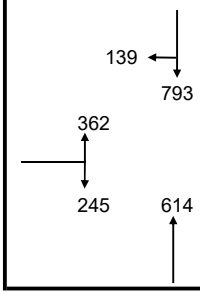
Junction: Junction Road / Dumbarton Road — Job Number: J7433

Scenario: Future Condition (Without Proposed Development) — P. 8

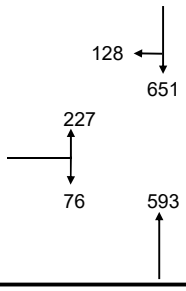
Design Year: 2033 — Designed By: — Checked By: — Date: 26 Oct 2026

Approach		Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak Turning %	AM Peak Sat. Flow (pcu/hr)	AM Peak Flow (pcu/hr)	AM Peak y value	AM Peak Critical y	PM Peak Turning %	PM Peak Sat. Flow (pcu/hr)	PM Peak Flow (pcu/hr)	PM Peak y value	PM Peak Critical y
Junction Road SB	SA	A1	1	3.00				2055	793	0.386	0.386		2055	651	0.317	0.317
	RT	A2	2	3.00	15.0		100	1868	139	0.074	0.074	100	1868	128	0.069	0.069
Junction Road NB	SA	B1	1	5.00				2115	614	0.290			2115	593	0.280	
Dumbarton Road EB	LT	C1	3	3.00	15.0		100	1741	362	0.208	0.208	100	1741	227	0.130	0.130
	RT	C2	3	3.00	20.0		100	1912	245	0.128		100	1912	76	0.040	
pedestrian phase		D(p)	1		min crossing time =		7	sec GM +		7	sec FGM =		14	sec		
		E(p)	2,3		min crossing time =		7	sec GM +		6	sec FGM =		13	sec		
		F(p)	2		min crossing time =		6	sec GM +		5	sec FGM =		11	sec		

AM Traffic Flow (pcu/hr)



PM Traffic Flow (pcu/hr)

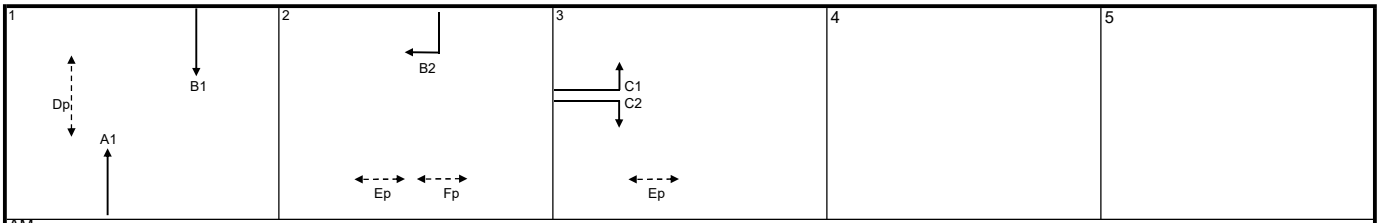


$S=1940+100(W-3.25)$ $S=2080+100(W-3.25)$

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

	AM Peak		PM Peak	
Group	1+2+3		1+2+3	
Sum y	0.668		0.516	
L (s)	16		16	
C (s)	125		120	
practical y	0.785		0.780	
R.C. (%)	17%		51%	

Note:



AM	G =		I/G =	7	G =		I/G =	5	G =		I/G =	7	G =		I/G =		G =		I/G =		
	G =		I/G =		G =		I/G =		G =		I/G =		G =		I/G =		G =		I/G =		
PM	G =		I/G =	7	G =		I/G =	5	G =		I/G =	7	G =		I/G =		G =		I/G =		
	G =		I/G =		G =		I/G =		G =		I/G =		G =		I/G =		G =		I/G =		

Signal Junction Analysis

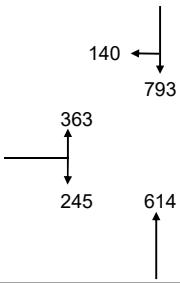
Junction: Junction Road / Dumbarton Road — Job Number: J7433

Scenario: Future Condition (With Proposed Development) — P. 9

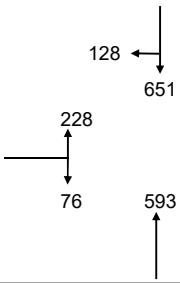
Design Year: 2033 — Designed By: — Checked By: — Date: 26 Oct 2026

Approach		Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak Turning %	AM Peak Sat. Flow (pcu/hr)	AM Peak Flow (pcu/hr)	AM Peak y value	AM Peak Critical y	PM Peak Turning %	PM Peak Sat. Flow (pcu/hr)	PM Peak Flow (pcu/hr)	PM Peak y value	PM Peak Critical y
Junction Road SB	SA	A1	1	3.00				2055	793	0.386	0.386		2055	651	0.317	0.317
	RT	A2	2	3.00	15.0		100	1868	140	0.075	0.075	100	1868	128	0.069	0.069
Junction Road NB	SA	B1	1	5.00				2115	614	0.290			2115	593	0.280	
Dumbarton Road EB	LT	C1	3	3.00	15.0		100	1741	363	0.209	0.209	100	1741	228	0.131	0.131
	RT	C2	3	3.00	20.0		100	1912	245	0.128		100	1912	76	0.040	
pedestrian phase		D(p)	1		min crossing time =		7	sec GM +		7	sec FGM =		14	sec		
		E(p)	2,3		min crossing time =		7	sec GM +		6	sec FGM =		13	sec		
		F(p)	2		min crossing time =		6	sec GM +		5	sec FGM =		11	sec		

AM Traffic Flow (pcu/hr)



PM Traffic Flow (pcu/hr)

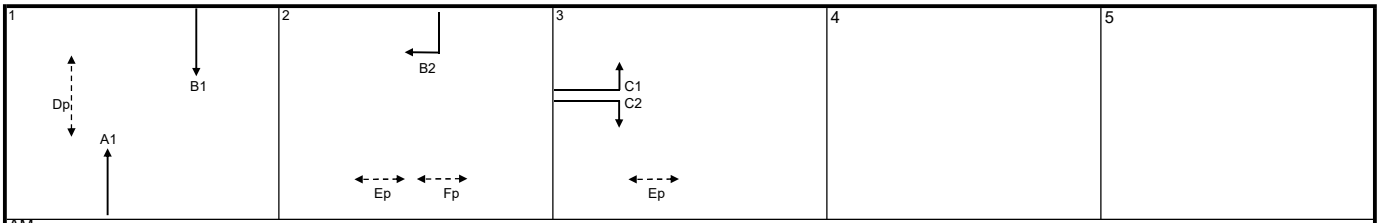


$S=1940+100(W-3.25)$ $S=2080+100(W-3.25)$

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

	AM Peak		PM Peak	
Group	1+2+3		1+2+3	
Sum y	0.669		0.516	
L (s)	16		16	
C (s)	125		120	
practical y	0.785		0.780	
R.C. (%)	17%		51%	

Note:



AM	G =	I/G =	7	G =	I/G =	5	G =	I/G =	7	G =	I/G =		G =	I/G =							
	G =	I/G =		G =	I/G =		G =	I/G =		G =	I/G =		G =	I/G =							
PM	G =	I/G =	7	G =	I/G =	5	G =	I/G =	7	G =	I/G =		G =	I/G =							
	G =	I/G =		G =	I/G =		G =	I/G =		G =	I/G =		G =	I/G =							

Signal Junction Analysis

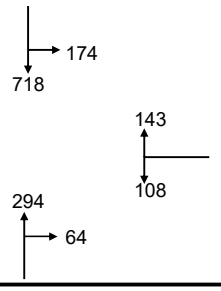
Junction: Junction Road / Carpenter Road Job Number: J7433

Scenario: Existing Condition P. 10

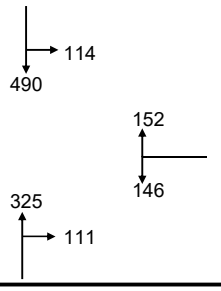
Design Year: 2025 Designed By: Checked By: Date: 26 Oct 2026

Approach		Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak Turning %	AM Peak Sat. Flow (pcu/hr)	AM Peak Flow (pcu/hr)	AM Peak y value	AM Peak Critical y	PM Peak Turning %	PM Peak Sat. Flow (pcu/hr)	PM Peak Flow (pcu/hr)	PM Peak y value	PM Peak Critical y
Junction Road SB	LT+SA	A1	1	3.30	7.5		42	1794	413	0.230	0.230	41	1798	280	0.156	0.156
	SA	A2	1	3.30				2085	479	0.230			2085	324	0.155	
Junction Road NB	SA	B1	1,2	3.00				1915	294	0.154			1915	325	0.170	
	RT	B2	2	3.00	15.0		100	1868	64	0.034	0.034	100	1868	111	0.059	0.059
Carpenter Road WB	LT	C1	3	3.20	7.5		100	1613	108	0.067		100	1613	146	0.091	0.091
	RT	C2	3	3.20	20.0		100	1930	143	0.074	0.074	100	1930	152	0.079	
pedestrian phase		D(p)	4		min crossing time =		7	sec GM +		7	sec FGM =		14	sec		
		E(p)	4		min crossing time =		7	sec GM +		8	sec FGM =		15	sec		

AM Traffic Flow (pcu/hr)



PM Traffic Flow (pcu/hr)

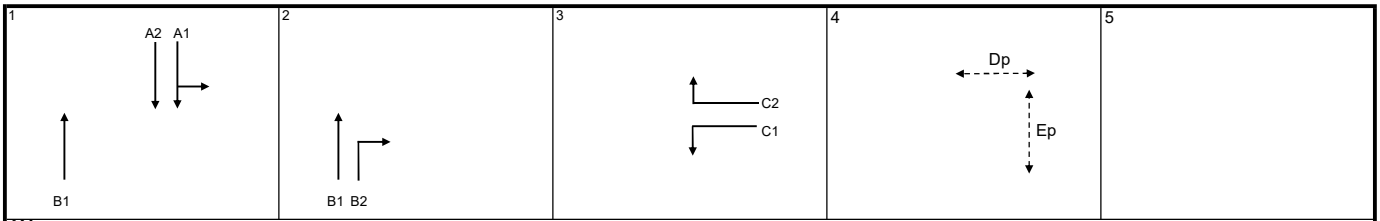


$S=1940+100(W-3.25)$ $S=2080+100(W-3.25)$

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

	AM Peak		PM Peak	
Group	1+2+3		1+2+3	
Sum y	0.339		0.306	
L (s)	39		39	
C (s)	125		120	
practical y	0.619		0.608	
R.C. (%)	83%		99%	

Note:



AM	G =		I/G =	6	G =		I/G =	5	G =		I/G =	13	G =	7	I/G =	11	G =		I/G =		
	G =		I/G =		G =		I/G =		G =		I/G =		G =		I/G =		G =		I/G =		
PM	G =		I/G =	6	G =		I/G =	5	G =		I/G =	13	G =	7	I/G =	11	G =		I/G =		
	G =		I/G =		G =		I/G =		G =		I/G =		G =		I/G =		G =		I/G =		

Signal Junction Analysis

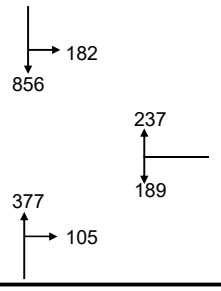
Junction: Junction Road / Carpenter Road — Job Number: J7433

Scenario: Future Condition (Without Proposed Development) — P. 11

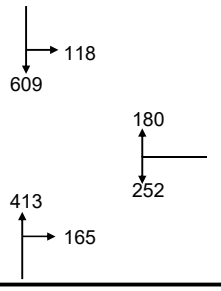
Design Year: 2033 — Designed By: — Checked By: — Date: 26 Oct 2026

Approach		Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak Turning %	AM Peak Sat. Flow (pcu/hr)	AM Peak Flow (pcu/hr)	AM Peak y value	AM Peak Critical y	PM Peak Turning %	PM Peak Sat. Flow (pcu/hr)	PM Peak Flow (pcu/hr)	PM Peak y value	PM Peak Critical y
Junction Road SB	LT+SA	A1	1	3.30	7.5		38	1808	482	0.267	0.267	35	1818	339	0.186	0.186
	SA	A2	1	3.30				2085	556	0.267			2085	388	0.186	
Junction Road NB	SA	B1	1,2	3.00				1915	377	0.197			1915	413	0.216	
	RT	B2	2	3.00	15.0		100	1868	105	0.056	0.056	100	1868	165	0.088	0.088
Carpenter Road WB	LT	C1	3	3.20	7.5		100	1613	189	0.117		100	1613	252	0.156	0.156
	RT	C2	3	3.20	20.0		100	1930	237	0.123	0.123	100	1930	180	0.093	
pedestrian phase		D(p)	4		min crossing time =		7	sec GM +		7	sec FGM =		14	sec		
		E(p)	4		min crossing time =		7	sec GM +		8	sec FGM =		15	sec		

AM Traffic Flow (pcu/hr)



PM Traffic Flow (pcu/hr)

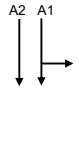
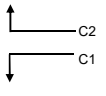
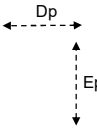


$S=1940+100(W-3.25)$ $S=2080+100(W-3.25)$

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

	AM Peak		PM Peak	
Group	1+2+3		1+2+3	
Sum y	0.446		0.431	
L (s)	39		39	
C (s)	125		120	
practical y	0.619		0.608	
R.C. (%)	39%		41%	

Note:

1	2	3	4	5
				
AM G = I/G = 6	AM G = I/G = 5	AM G = I/G = 13	AM G = 7 I/G = 11	AM G = I/G =
AM G = I/G =	AM G = I/G =	AM G = I/G =	AM G = I/G =	AM G = I/G =
PM G = I/G = 6	PM G = I/G = 5	PM G = I/G = 13	PM G = 7 I/G = 11	PM G = I/G =
PM G = I/G =	PM G = I/G =	PM G = I/G =	PM G = I/G =	PM G = I/G =

Signal Junction Analysis

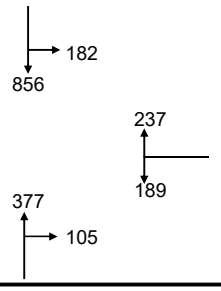
Junction: Junction Road / Carpenter Road Job Number: J7433

Scenario: Future Condition (With Proposed Development) P. 12

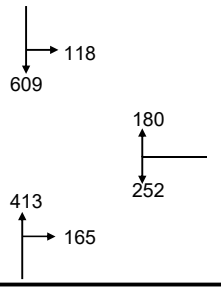
Design Year: 2033 Designed By: Checked By: Date: 26 Oct 2026

Approach		Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak Turning %	AM Peak Sat. Flow (pcu/hr)	AM Peak Flow (pcu/hr)	AM Peak y value	AM Peak Critical y	PM Peak Turning %	PM Peak Sat. Flow (pcu/hr)	PM Peak Flow (pcu/hr)	PM Peak y value	PM Peak Critical y
Junction Road SB	LT+SA	A1	1	3.30	7.5		38	1808	482	0.267	0.267	35	1818	339	0.186	0.186
	SA	A2	1	3.30				2085	556	0.267			2085	388	0.186	
Junction Road NB	SA	B1	1,2	3.00				1915	377	0.197			1915	413	0.216	
	RT	B2	2	3.00	15.0		100	1868	105	0.056	0.056	100	1868	165	0.088	0.088
Carpenter Road WB	LT	C1	3	3.20	7.5		100	1613	189	0.117		100	1613	252	0.156	0.156
	RT	C2	3	3.20	20.0		100	1930	237	0.123	0.123	100	1930	180	0.093	
pedestrian phase		D(p)	4		min crossing time =		7	sec GM +		7	sec FGM =		14	sec		
		E(p)	4		min crossing time =		7	sec GM +		8	sec FGM =		15	sec		

AM Traffic Flow (pcu/hr)



PM Traffic Flow (pcu/hr)

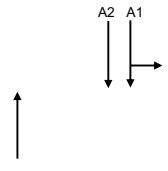
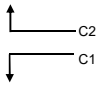
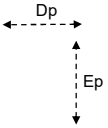


$S=1940+100(W-3.25)$ $S=2080+100(W-3.25)$

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

	AM Peak		PM Peak	
Group	1+2+3		1+2+3	
Sum y	0.446		0.431	
L (s)	39		39	
C (s)	125		120	
practical y	0.619		0.608	
R.C. (%)	39%		41%	

Note:

1	2	3	4	5
				
AM G = I/G = 6	AM G = I/G = 5	AM G = I/G = 13	AM G = 7 I/G = 11	AM G = I/G =
AM G = I/G =	AM G = I/G =	AM G = I/G =	AM G = I/G =	AM G = I/G =
PM G = I/G = 6	PM G = I/G = 5	PM G = I/G = 13	PM G = 7 I/G = 11	PM G = I/G =
PM G = I/G =	PM G = I/G =	PM G = I/G =	PM G = I/G =	PM G = I/G =

Signal Junction Analysis

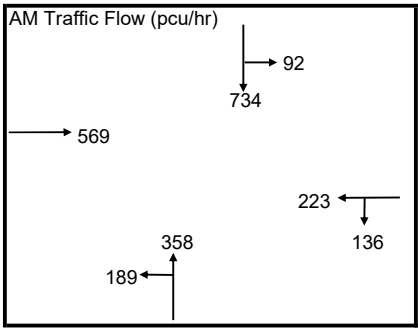
Junction: Junction Road / Nga Tsin Wai Road Job Number: J7433

Scenario: Existing Condition P. 13

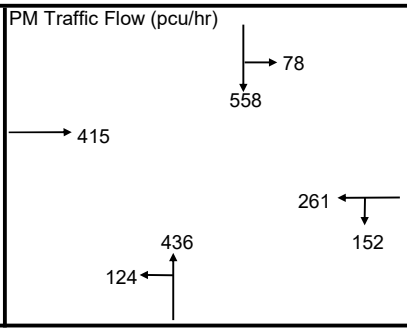
Design Year: 2025 Designed By: Checked By: Date: 26 Oct 2026

Approach		Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak Turning %	AM Peak Sat. Flow (pcu/hr)	AM Peak Flow (pcu/hr)	AM Peak y value	AM Peak Critical y	PM Peak Turning %	PM Peak Sat. Flow (pcu/hr)	PM Peak Flow (pcu/hr)	PM Peak y value	PM Peak Critical y
Nga Tsin Wai Road EB	SA	A1	1	3.00				1915	274	0.143			1915	200	0.104	
	SA	A2	1	3.00				2055	295	0.144	0.144		2055	215	0.105	
Nga Tsin Wai Road WE	LT+SA	B1	1	3.30	12.5		82	1771	165	0.093		80	1775	190	0.107	0.107
	SA	B2	1	3.30				2085	194	0.093			2085	223	0.107	
Junction Road SB	LT+SA	C1	3	3.40	7.5		24	1865	389	0.209		26	1858	299	0.161	
	SA	C2	3	3.40				2095	437	0.209			2095	337	0.161	
Junction Road NB	LT+SA	D1	3	4.00	7.5		35	1883	547	0.290	0.290	22	1930	560	0.290	0.290
pedestrian phase		E(p)	2		min crossing time =		5	sec GM +		11	sec FGM =		16	sec		
		F(p)	2		min crossing time =		5	sec GM +		11	sec FGM =		16	sec		
		G(p)	2		min crossing time =		5	sec GM +		11	sec FGM =		16	sec		
		H(p)	2		min crossing time =		5	sec GM +		11	sec FGM =		16	sec		

AM Traffic Flow (pcu/hr)



PM Traffic Flow (pcu/hr)

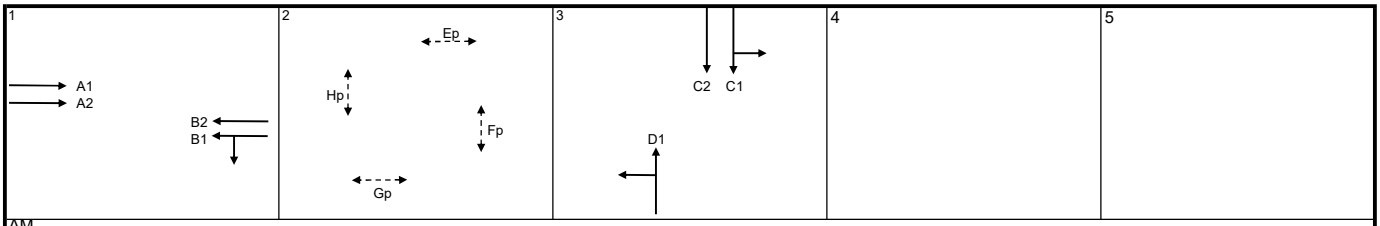


$S=1940+100(W-3.25)$ $S=2080+100(W-3.25)$

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

	AM Peak		PM Peak	
Group	1+3		1+3	
Sum y	0.434		0.397	
L (s)	31		31	
C (s)	125		120	
practical y	0.677		0.668	
R.C. (%)	56%		68%	

Note:



AM	G =		I/G =	8	G =	5	I/G =	14	G =		I/G =	6	G =		I/G =		G =		I/G =
	G =		I/G =		G =		I/G =		G =		I/G =		G =		I/G =		G =		I/G =
PM	G =		I/G =	8	G =	5	I/G =	14	G =		I/G =	6	G =		I/G =		G =		I/G =
	G =		I/G =		G =		I/G =		G =		I/G =		G =		I/G =		G =		I/G =

Signal Junction Analysis

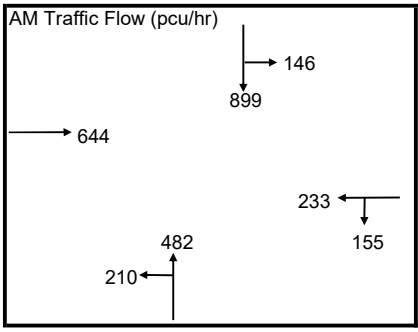
Junction: Junction Road / Nga Tsin Wai Road Job Number: J7433

Scenario: Future Condition (Without Proposed Development) P. 14

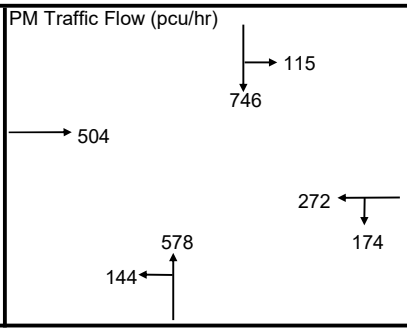
Design Year: 2033 Designed By: Checked By: Date: 26 Oct 2026

Approach		Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak Turning %	AM Peak Sat. Flow (pcu/hr)	AM Peak Flow (pcu/hr)	AM Peak y value	AM Peak Critical y	PM Peak Turning %	PM Peak Sat. Flow (pcu/hr)	PM Peak Flow (pcu/hr)	PM Peak y value	PM Peak Critical y
Nga Tsin Wai Road EB	SA	A1	1	3.00				1915	311	0.162	0.162		1915	243	0.127	
	SA	A2	1	3.00				2055	333	0.162			2055	261	0.127	0.127
Nga Tsin Wai Road WE	LT+SA	B1	1	3.30	12.5		87	1761	178	0.101		85	1765	204	0.116	
	SA	B2	1	3.30				2085	210	0.101			2085	242	0.116	
Junction Road SB	LT+SA	C1	3	3.40	7.5		30	1844	489	0.265		28	1851	404	0.218	
	SA	C2	3	3.40				2095	556	0.265			2095	457	0.218	
Junction Road NB	LT+SA	D1	3	4.00	7.5		30	1901	692	0.364	0.364	20	1938	722	0.373	0.373
pedestrian phase		E(p)	2		min crossing time =		5	sec GM +		11	sec FGM =		16	sec		
		F(p)	2		min crossing time =		5	sec GM +		11	sec FGM =		16	sec		
		G(p)	2		min crossing time =		5	sec GM +		11	sec FGM =		16	sec		
		H(p)	2		min crossing time =		5	sec GM +		11	sec FGM =		16	sec		

AM Traffic Flow (pcu/hr)



PM Traffic Flow (pcu/hr)

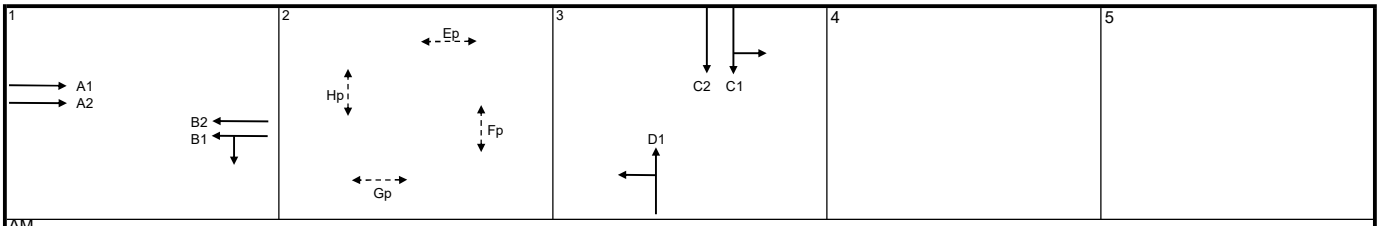


$S=1940+100(W-3.25)$ $S=2080+100(W-3.25)$

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

	AM Peak		PM Peak	
Group	1+3		1+3	
Sum y	0.526		0.500	
L (s)	31		31	
C (s)	125		120	
practical y	0.677		0.668	
R.C. (%)	29%		34%	

Note:



AM	G =		I/G =	8	G =	5	I/G =	14	G =		I/G =	6	G =		I/G =		G =		I/G =	
	G =		I/G =		G =		I/G =		G =		I/G =		G =		I/G =		G =		I/G =	
PM	G =		I/G =	8	G =	5	I/G =	14	G =		I/G =	6	G =		I/G =		G =		I/G =	
	G =		I/G =		G =		I/G =		G =		I/G =		G =		I/G =		G =		I/G =	

Signal Junction Analysis

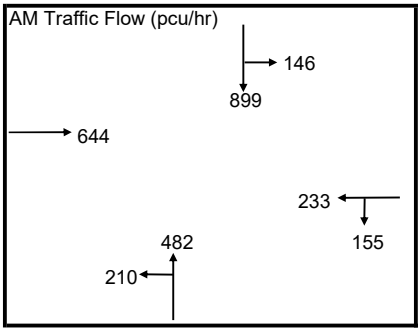
Junction: Junction Road / Nga Tsin Wai Road Job Number: J7433

Scenario: Future Condition (With Proposed Development) P. 15

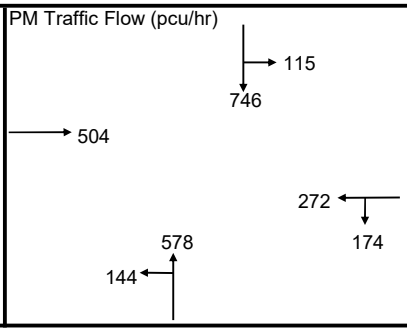
Design Year: 2033 Designed By: Checked By: Date: 26 Oct 2026

Approach		Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak Turning %	AM Peak Sat. Flow (pcu/hr)	AM Peak Flow (pcu/hr)	AM Peak y value	AM Peak Critical y	PM Peak Turning %	PM Peak Sat. Flow (pcu/hr)	PM Peak Flow (pcu/hr)	PM Peak y value	PM Peak Critical y
Nga Tsin Wai Road EB	SA	A1	1	3.00				1915	311	0.162	0.162		1915	243	0.127	
	SA	A2	1	3.00				2055	333	0.162			2055	261	0.127	0.127
Nga Tsin Wai Road WE	LT+SA	B1	1	3.30	12.5		87	1761	178	0.101		85	1765	204	0.116	
	SA	B2	1	3.30				2085	210	0.101			2085	242	0.116	
Junction Road SB	LT+SA	C1	3	3.40	7.5		30	1844	489	0.265		28	1851	404	0.218	
	SA	C2	3	3.40				2095	556	0.265			2095	457	0.218	
Junction Road NB	LT+SA	D1	3	4.00	7.5		30	1901	692	0.364	0.364	20	1938	722	0.373	0.373
pedestrian phase		E(p)	2		min crossing time =		5	sec GM +		11	sec FGM =		16	sec		
		F(p)	2		min crossing time =		5	sec GM +		11	sec FGM =		16	sec		
		G(p)	2		min crossing time =		5	sec GM +		11	sec FGM =		16	sec		
		H(p)	2		min crossing time =		5	sec GM +		11	sec FGM =		16	sec		

AM Traffic Flow (pcu/hr)



PM Traffic Flow (pcu/hr)

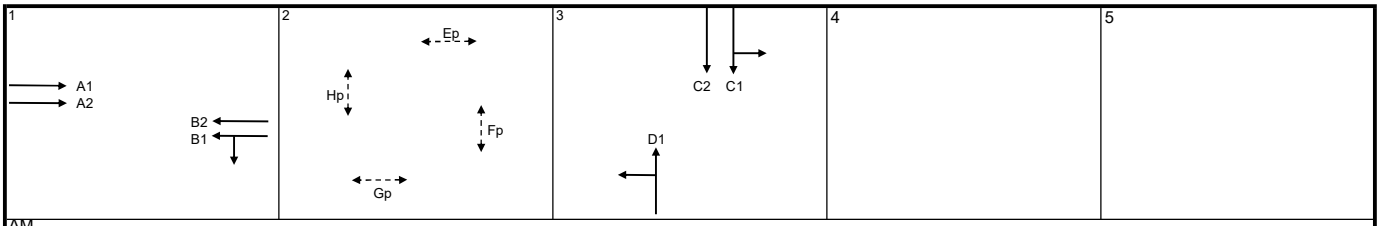


$S=1940+100(W-3.25)$ $S=2080+100(W-3.25)$

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

	AM Peak		PM Peak	
Group	1+3		1+3	
Sum y	0.526		0.500	
L (s)	31		31	
C (s)	125		120	
practical y	0.677		0.668	
R.C. (%)	29%		34%	

Note:



AM	G =		I/G =	8	G =	5	I/G =	14	G =		I/G =	6	G =		I/G =		G =		I/G =	
	G =		I/G =		G =		I/G =		G =		I/G =		G =		I/G =		G =		I/G =	
PM	G =		I/G =	8	G =	5	I/G =	14	G =		I/G =	6	G =		I/G =		G =		I/G =	
	G =		I/G =		G =		I/G =		G =		I/G =		G =		I/G =		G =		I/G =	

Signal Junction Analysis

Junction: Grampian Road / Nga Tsin Wai Road Job Number: J7433

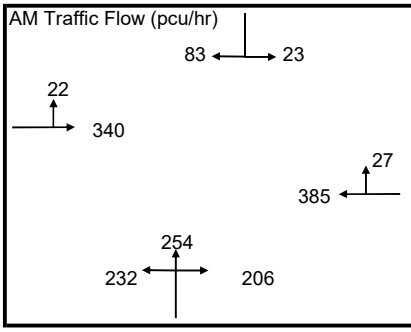
Scenario: Existing Condition P. 16

Design Year: 2025 Designed By: Checked By: Date: 26 Oct 2026

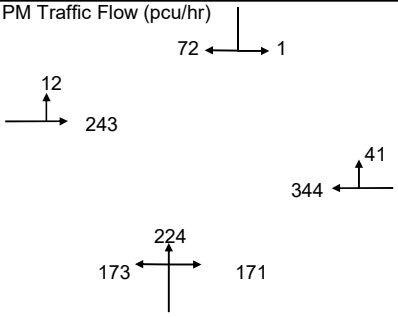
Approach		Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak Turning %	AM Peak Sat. Flow (pcu/hr)	AM Peak Flow (pcu/hr)	AM Peak y value	AM Peak Critical y	PM Peak Turning %	PM Peak Sat. Flow (pcu/hr)	PM Peak Flow (pcu/hr)	PM Peak y value	PM Peak Critical y
Nga Tsin Wai Road EB	LT+SA	A1	1	3.00	12.5		13	1886	173	0.092		10	1892	122	0.064	
	SA	A2	1	3.00				2055	189	0.092			2055	133	0.065	
Nga Tsin Wai Road WE	SA	B1	1	3.00				1915	200	0.104	0.104		1915	188	0.098	0.098
	SA+RT	B2	1	3.00	15.0		13	2029	212	0.104		21	2013	197	0.098	
Grampian Road SB	LT+RT	C1	3	5.00	20.0		100	1967	106	0.054	0.054	100	1967	73	0.037	0.037
Grampian Road NB	LT+SA	D1	4	3.00	7.5		100	1596	232	0.145	0.145	99	1598	174	0.109	0.109
	SA+RT	D2	4	3.00	12.5			2055	254	0.124			2055	223	0.109	
	RT	D3	4	3.00	7.5		100	1713	206	0.120		100	1713	171	0.100	

pedestrian phase	E(p)	2		min crossing time =	5	sec GM +	9	sec FGM =	14	sec	
	F(p)	2		min crossing time =	8	sec GM +	11	sec FGM =	19	sec	
	G(p)	2		min crossing time =	6	sec GM +	11	sec FGM =	17	sec	
	H(p)	2		min crossing time =	10	sec GM +	11	sec FGM =	21	sec	

AM Traffic Flow (pcu/hr)



PM Traffic Flow (pcu/hr)

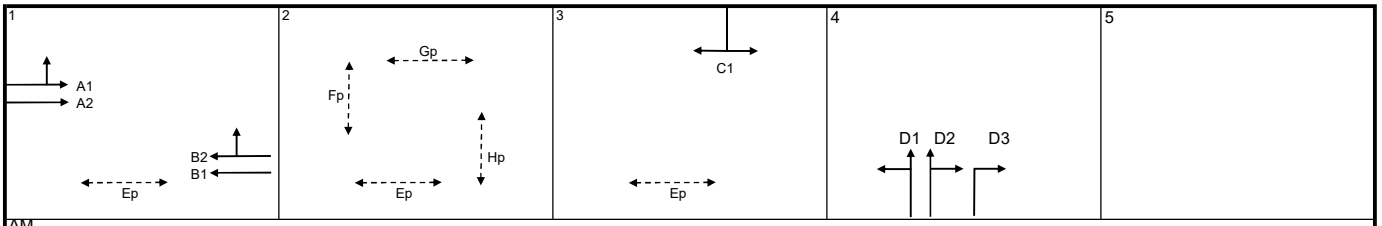


$S=1940+100(W-3.25)$ $S=2080+100(W-3.25)$

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

	AM Peak		PM Peak	
Group	1+3+4		1+3+4	
Sum y	0.304		0.244	
L (s)	37		37	
C (s)	125		120	
practical y	0.634		0.623	
R.C. (%)	109%		155%	

Note:



AM	G =	I/G =	5	G =	10	I/G =	14	G =	I/G =	5	G =	I/G =	6	G =	I/G =						
	G =	I/G =		G =		I/G =		G =	I/G =		G =	I/G =		G =	I/G =						
PM	G =	I/G =	5	G =	10	I/G =	14	G =	I/G =	5	G =	I/G =	6	G =	I/G =						
	G =	I/G =		G =		I/G =		G =	I/G =		G =	I/G =		G =	I/G =						

Signal Junction Analysis

Junction: Grampian Road / Nga Tsin Wai Road Job Number: J7433

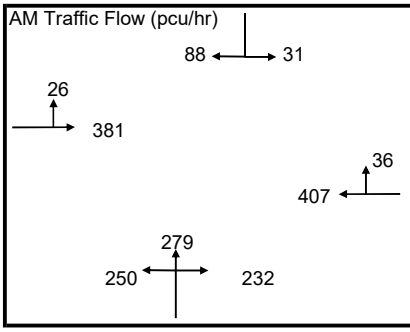
Scenario: Future Condition (Without Proposed Development) P. 17

Design Year: 2033 Designed By: Checked By: Date: 26 Oct 2026

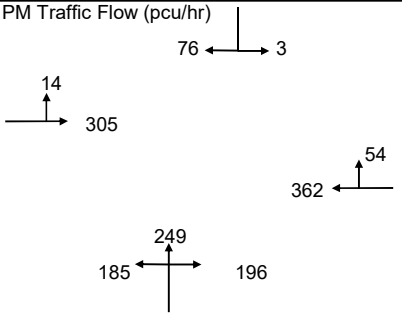
Approach		Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak Turning %	AM Peak Sat. Flow (pcu/hr)	AM Peak Flow (pcu/hr)	AM Peak y value	AM Peak Critical y	PM Peak Turning %	PM Peak Sat. Flow (pcu/hr)	PM Peak Flow (pcu/hr)	PM Peak y value	PM Peak Critical y
Nga Tsin Wai Road EB	LT+SA	A1	1	3.00	12.5		13	1886	195	0.103		9	1895	153	0.081	
	SA	A2	1	3.00				2055	212	0.103			2055	166	0.081	
Nga Tsin Wai Road WE	SA	B1	1	3.00				1915	215	0.112			1915	203	0.106	0.106
	SA+RT	B2	1	3.00	15.0		16	2023	228	0.113	0.113	25	2005	213	0.106	
Grampian Road SB	LT+RT	C1	3	5.00	20.0		100	1967	119	0.060	0.060	100	1967	79	0.040	0.040
Grampian Road NB	LT+SA	D1	4	3.00	7.5		96	1713	261	0.152		97	1604	190	0.118	0.118
	SA+RT	D2	4	3.00	12.5			1755	268	0.153	0.153		2055	244	0.119	
	RT	D3	4	3.00	7.5		100	1755	232	0.132		100	1713	196	0.114	

pedestrian phase	E(p)	2		min crossing time =	5	sec GM +	9	sec FGM =	14	sec
	F(p)	2		min crossing time =	8	sec GM +	11	sec FGM =	19	sec
	G(p)	2		min crossing time =	6	sec GM +	11	sec FGM =	17	sec
	H(p)	2		min crossing time =	10	sec GM +	11	sec FGM =	21	sec

AM Traffic Flow (pcu/hr)



PM Traffic Flow (pcu/hr)

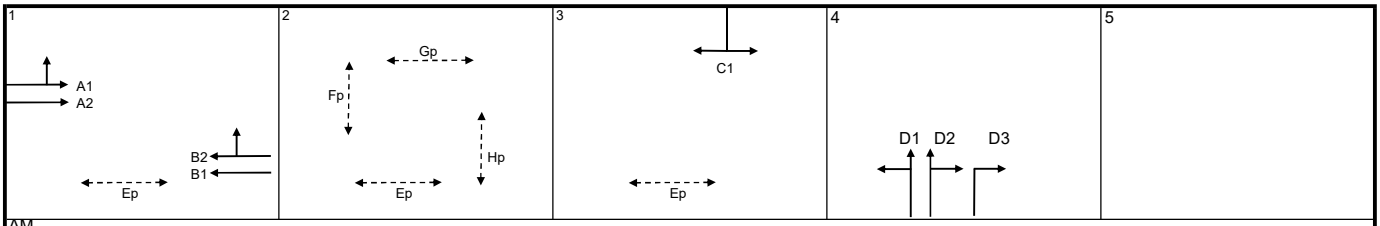


$S=1940+100(W-3.25)$ $S=2080+100(W-3.25)$

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

	AM Peak		PM Peak	
Group	1+3+4		1+3+4	
Sum y	0.326		0.265	
L (s)	37		37	
C (s)	120		120	
practical y	0.623		0.623	
R.C. (%)	91%		135%	

Note:



AM	G =		I/G =	5	G =		I/G =	10	G =		I/G =	14	G =		I/G =	5	G =		I/G =	6	G =		I/G =
	G =		I/G =		G =		I/G =		G =		I/G =		G =		I/G =		G =		I/G =		G =		I/G =
PM	G =		I/G =	5	G =		I/G =	10	G =		I/G =	14	G =		I/G =	5	G =		I/G =	6	G =		I/G =
	G =		I/G =		G =		I/G =		G =		I/G =		G =		I/G =		G =		I/G =		G =		I/G =

Signal Junction Analysis

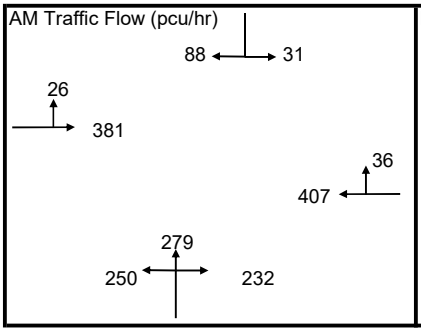
Junction: Grampian Road / Nga Tsin Wai Road Job Number: J7433

Scenario: Future Condition (With Proposed Development) P. 18

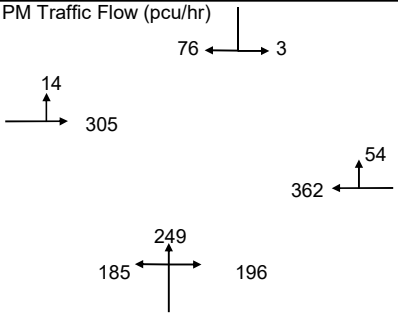
Design Year: 2033 Designed By: Checked By: Date: 26 Oct 2026

Approach		Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak Turning %	AM Peak Sat. Flow (pcu/hr)	AM Peak Flow (pcu/hr)	AM Peak y value	AM Peak Critical y	PM Peak Turning %	PM Peak Sat. Flow (pcu/hr)	PM Peak Flow (pcu/hr)	PM Peak y value	PM Peak Critical y
Nga Tsin Wai Road EB	LT+SA	A1	1	3.00	12.5		13	1886	195	0.103		9	1895	153	0.081	
	SA	A2	1	3.00				2055	212	0.103			2055	166	0.081	
Nga Tsin Wai Road WE	SA	B1	1	3.00				1915	215	0.112			1915	203	0.106	0.106
	SA+RT	B2	1	3.00	15.0		16	2023	228	0.113	0.113	25	2005	213	0.106	
Grampian Road SB	LT+RT	C1	3	5.00	20.0		100	1967	119	0.060	0.060	100	1967	79	0.040	0.040
Grampian Road NB	LT+SA	D1	4	3.00	7.5		96	1713	261	0.152		97	1604	190	0.118	0.118
	SA+RT	D2	4	3.00	12.5			1755	268	0.153	0.153		2055	244	0.119	
	RT	D3	4	3.00	7.5		100	1755	232	0.132		100	1713	196	0.114	
pedestrian phase		E(p)	2		min crossing time =		5	sec GM +	9	sec FGM =	14	sec				
		F(p)	2		min crossing time =		8	sec GM +	11	sec FGM =	19	sec				
		G(p)	2		min crossing time =		6	sec GM +	11	sec FGM =	17	sec				
		H(p)	2		min crossing time =		10	sec GM +	11	sec FGM =	21	sec				

AM Traffic Flow (pcu/hr)



PM Traffic Flow (pcu/hr)

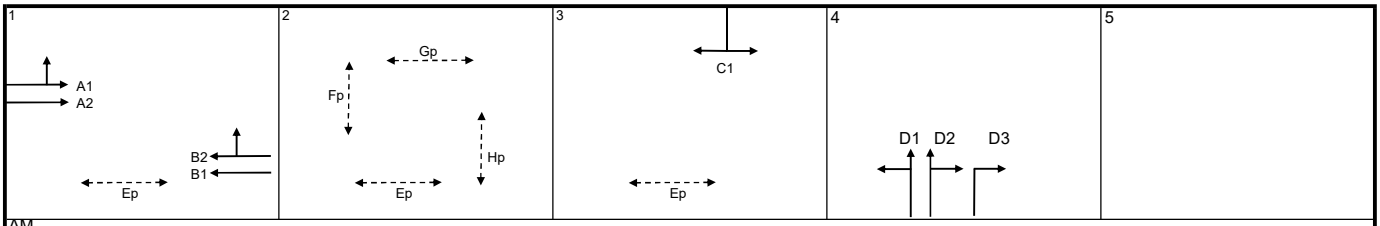


$S=1940+100(W-3.25)$ $S=2080+100(W-3.25)$

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

	AM Peak		PM Peak	
Group	1+3+4		1+3+4	
Sum y	0.326		0.265	
L (s)	37		37	
C (s)	120		120	
practical y	0.623		0.623	
R.C. (%)	91%		135%	

Note:



AM	G =		I/G =	5	G =		10	I/G =	14	G =		I/G =	5	G =		I/G =	6	G =		I/G =	
	G =		I/G =		G =			I/G =		G =		I/G =		G =		I/G =		G =		I/G =	
PM	G =		I/G =	5	G =		10	I/G =	14	G =		I/G =	5	G =		I/G =	6	G =		I/G =	
	G =		I/G =		G =			I/G =		G =		I/G =		G =		I/G =		G =		I/G =	

Signal Junction Analysis

Junction: Grampian Road / Boundary Street Job Number: J7433

Scenario: Existing Condition P. 19

Design Year: 2025 Designed By: Checked By: Date: 26 Oct 2026

Approach		Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak Turning %	AM Peak Sat. Flow (pcu/hr)	AM Peak Flow (pcu/hr)	AM Peak y value	AM Peak Critical y	PM Peak Turning %	PM Peak Sat. Flow (pcu/hr)	PM Peak Flow (pcu/hr)	PM Peak y value	PM Peak Critical y
Prince Edward Road	LT	A1	1	3.30	10.0		100	1691	482	0.285	0.285	100	1691	504	0.298	0.298
West EB	SA	A2	1,2	3.30				2085	248	0.119			2085	224	0.107	
	SA	A3	1,2	3.30				2085	248	0.119			2085	224	0.107	
	SA	A4	1,2	3.30				2085	249	0.119			2085	224	0.107	
pedestrian phase		B(p)	2		min crossing time =		9	sec GM +		9	sec FGM =		18	sec		

AM Traffic Flow (pcu/hr)

482

745

PM Traffic Flow (pcu/hr)

504

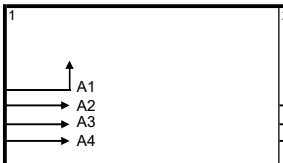
672

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

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

	AM Peak		PM Peak	
Group	1		1	
Sum y	0.285		0.298	
L (s)	27		27	
C (s)	120		115	
practical y	0.698		0.689	
R.C. (%)	145%		131%	

Note:



AM													
G =	I/G =	7	G =	9	I/G =	12	G =	I/G =	G =	I/G =	G =	I/G =	
G =	I/G =		G =		I/G =		G =	I/G =	G =	I/G =	G =	I/G =	
PM													
G =	I/G =	7	G =	9	I/G =	12	G =	I/G =	G =	I/G =	G =	I/G =	
G =	I/G =		G =		I/G =		G =	I/G =	G =	I/G =	G =	I/G =	

Signal Junction Analysis

Junction: Grampian Road / Boundary Street — Job Number: J7433

Scenario: Future Condition (Without Proposed Development) — P. 20

Design Year: 2033 — Designed By: — Checked By: — Date: 26 Oct 2026

Approach		Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak Turning %	AM Peak Sat. Flow (pcu/hr)	AM Peak Flow (pcu/hr)	AM Peak y value	AM Peak Critical y	PM Peak Turning %	PM Peak Sat. Flow (pcu/hr)	PM Peak Flow (pcu/hr)	PM Peak y value	PM Peak Critical y
Prince Edward Road	LT	A1	1	3.30	10.0		100	1691	535	0.316	0.316	100	1691	563	0.333	0.333
West EB	SA	A2	1,2	3.30				2085	262	0.126			2085	234	0.112	
	SA	A3	1,2	3.30				2085	262	0.126			2085	234	0.112	
	SA	A4	1,2	3.30				2085	262	0.126			2085	235	0.113	
pedestrian phase		B(p)	2		min crossing time =			9	sec GM +		9		sec FGM =		18	sec

AM Traffic Flow (pcu/hr)

535 → 786

PM Traffic Flow (pcu/hr)

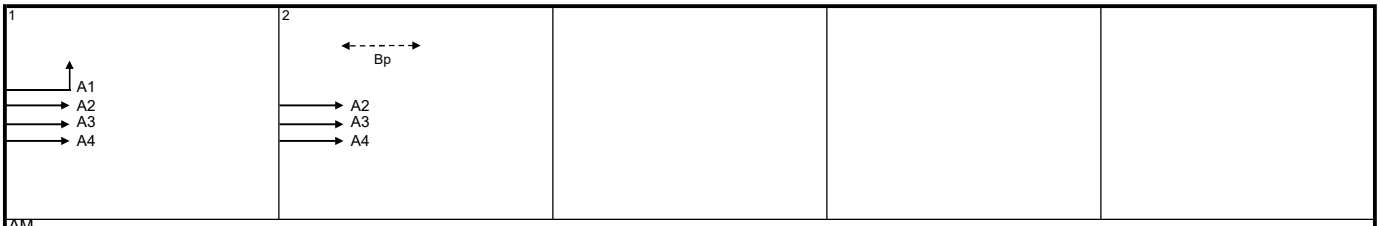
563 → 703

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

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

	AM Peak		PM Peak	
Group	1		1	
Sum y	0.316		0.333	
L (s)	27		27	
C (s)	120		115	
practical y	0.698		0.689	
R.C. (%)	120%		107%	

Note:



AM	G =	I/G = 7	G = 9	I/G = 12	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =
	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =
PM	G =	I/G = 7	G = 9	I/G = 12	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =
	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =

Signal Junction Analysis

Junction: Grampian Road / Boundary Street — Job Number: J7433

Scenario: Future Condition (With Proposed Development) — P. 21

Design Year: 2033 — Designed By: — Checked By: — Date: 26 Oct 2026

Approach		Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak Turning %	AM Peak Sat. Flow (pcu/hr)	AM Peak Flow (pcu/hr)	AM Peak y value	AM Peak Critical y	PM Peak Turning %	PM Peak Sat. Flow (pcu/hr)	PM Peak Flow (pcu/hr)	PM Peak y value	PM Peak Critical y
Prince Edward Road	LT	A1	1	3.30	10.0		100	1691	535	0.316	0.316	100	1691	563	0.333	0.333
West EB	SA	A2	1,2	3.30				2085	262	0.126			2085	234	0.112	
	SA	A3	1,2	3.30				2085	262	0.126			2085	234	0.112	
	SA	A4	1,2	3.30				2085	262	0.126			2085	235	0.113	
pedestrian phase		B(p)	2		min crossing time =			9	sec GM +		9		sec FGM =		18	sec

AM Traffic Flow (pcu/hr)

535 → 786

PM Traffic Flow (pcu/hr)

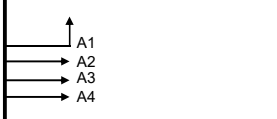
563 → 703

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

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

	AM Peak		PM Peak	
Group	1		1	
Sum y	0.316		0.333	
L (s)	27		27	
C (s)	120		115	
practical y	0.698		0.689	
R.C. (%)	120%		107%	

Note:



AM	G =	I/G = 7	G = 9	I/G = 12	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =
	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =
PM	G =	I/G = 7	G = 9	I/G = 12	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =
	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =	G =	I/G =

Signal Junction Analysis

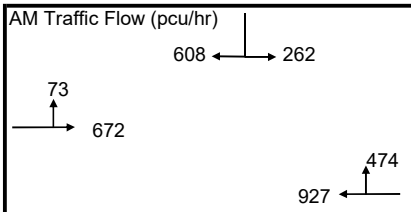
Junction: Junction Road / Prince Edward Road West / Boundary Street — Job Number: J7433

Scenario: Existing Condition — P. 22

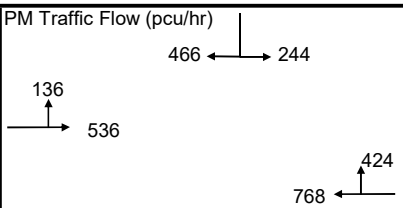
Design Year: 2025 — Designed By: — Checked By: — Date: 26 Oct 2026

Approach		Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak Turning %	AM Peak Sat. Flow (pcu/hr)	AM Peak Flow (pcu/hr)	AM Peak y value	AM Peak Critical y	PM Peak Turning %	PM Peak Sat. Flow (pcu/hr)	PM Peak Flow (pcu/hr)	PM Peak y value	PM Peak Critical y
Prince Edward Road	LT	A1	2	3.40	15.0		100	1777	73	0.041		100	1777	136	0.077	
West EB	SA	A2	1,2	3.40				2095	224	0.107	0.107		2095	179	0.085	0.085
	SA	A3	1,2	3.40				2095	224	0.107			2095	179	0.085	
	SA	A4	1,2	3.40				2095	224	0.107			2095	178	0.085	
Prince Edward Road	SA	B1	2,3	3.40				1955	447	0.229			1955	371	0.190	
West WB	SA	B2	2,3	3.40				2095	480	0.229			2095	397	0.189	
	RT	B3	3	3.40	25.0		100	1976	474	0.240	0.240	100	1976	424	0.215	0.215
Junction Road SB	LT+RT	C1	4	3.30	20.0		100	1809	417	0.231	0.231	100	1809	340	0.188	0.188
	RT	C2	4	3.30	25.0		100	1967	453	0.230		100	1967	370	0.188	
pedestrian phase		D(p)	3,4		min crossing time =		7	sec GM +		15	sec FGM =		22	sec		
		E(p)	4		min crossing time =		5	sec GM +		9	sec FGM =		14	sec		
		F(p)	1,4		min crossing time =		5	sec GM +		9	sec FGM =		14	sec		
		G(p)	1		min crossing time =		7	sec GM +		5	sec FGM =		12	sec		
		H(p)	1		min crossing time =		7	sec GM +		7	sec FGM =		14	sec		

AM Traffic Flow (pcu/hr)



PM Traffic Flow (pcu/hr)

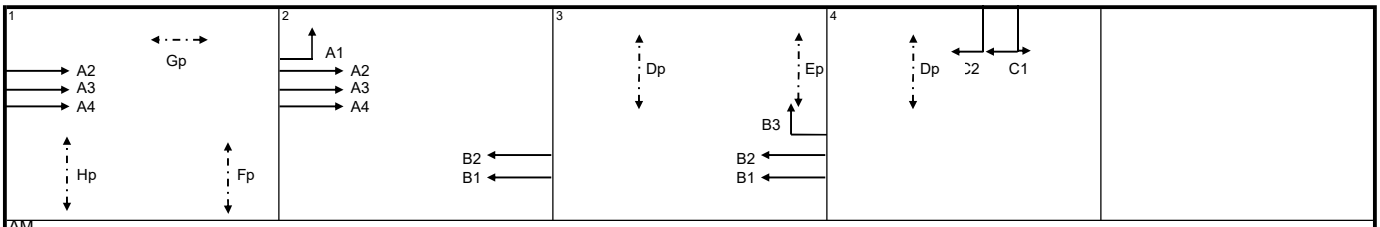


$S=1940+100(W-3.25)$ $S=2080+100(W-3.25)$

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

	AM Peak		PM Peak	
Group	1,2+3+4		1+3+4	
Sum y	0.577		0.488	
L (s)	13		13	
C (s)	120		115	
practical y	0.803		0.798	
R.C. (%)	39%		64%	

Note:



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

Signal Junction Analysis

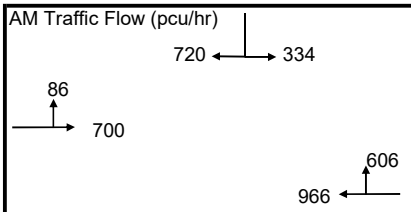
Junction: Junction Road / Prince Edward Road West / Boundary Street — Job Number: J7433

Scenario: Future Condition (Without Proposed Development) — P. 23

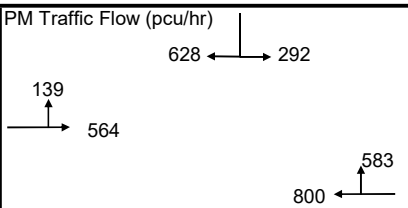
Design Year: 2033 — Designed By: — Checked By: — Date: 26 Oct 2026

Approach		Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak Turning %	AM Peak Sat. Flow (pcu/hr)	AM Peak Flow (pcu/hr)	AM Peak y value	AM Peak Critical y	PM Peak Turning %	PM Peak Sat. Flow (pcu/hr)	PM Peak Flow (pcu/hr)	PM Peak y value	PM Peak Critical y
Prince Edward Road	LT	A1	2	3.40	15.0		100	1777	86	0.048		100	1777	139	0.078	
West EB	SA	A2	1,2	3.40				2095	233	0.111			2095	188	0.090	0.090
	SA	A3	1,2	3.40				2095	233	0.111			2095	188	0.090	
	SA	A4	1,2	3.40				2095	234	0.112	0.112		2095	188	0.090	
Prince Edward Road	SA	B1	2,3	3.40				1955	466	0.238			1955	386	0.197	
West WB	SA	B2	2,3	3.40				2095	500	0.239			2095	414	0.198	
	RT	B3	3	3.40	25.0		100	1976	606	0.307	0.307	100	1976	583	0.295	0.295
Junction Road SB	LT+RT	C1	4	3.30	20.0		100	1809	505	0.279	0.279	100	1809	441	0.244	0.244
	RT	C2	4	3.30	25.0		100	1967	549	0.279		100	1967	479	0.244	
pedestrian phase		D(p)	3,4		min crossing time =		7	sec GM +		15	sec FGM =		22	sec		
		E(p)	4		min crossing time =		5	sec GM +		9	sec FGM =		14	sec		
		F(p)	1,4		min crossing time =		5	sec GM +		9	sec FGM =		14	sec		
		G(p)	1		min crossing time =		7	sec GM +		5	sec FGM =		12	sec		
		H(p)	1		min crossing time =		7	sec GM +		7	sec FGM =		14	sec		

AM Traffic Flow (pcu/hr)



PM Traffic Flow (pcu/hr)

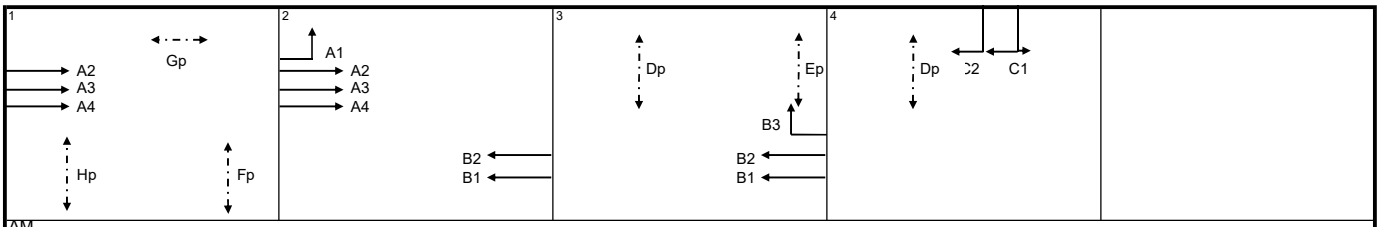


$S=1940+100(W-3.25)$ $S=2080+100(W-3.25)$

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

Note:

	AM Peak		PM Peak	
Group	1,2+3+4		1+3+4	
Sum y	0.698		0.629	
L (s)	13		13	
C (s)	120		115	
practical y	0.803		0.798	
R.C. (%)	15%		27%	



AM

G =	I/G =	5	G =	I/G =	G =	I/G =	5	G =	I/G =	6	G =	I/G =
G =	I/G =		G =	I/G =	G =	I/G =		G =	I/G =		G =	I/G =

PM

G =	I/G =	5	G =	I/G =	G =	I/G =	5	G =	I/G =	6	G =	I/G =
G =	I/G =		G =	I/G =	G =	I/G =		G =	I/G =		G =	I/G =

Signal Junction Analysis

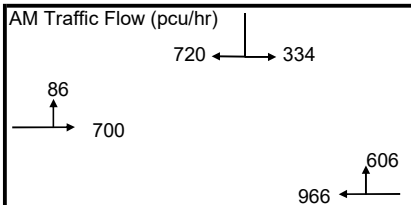
Junction: Junction Road / Prince Edward Road West / Boundary Street — Job Number: J7433

Scenario: Future Condition (With Proposed Development) — P. 24

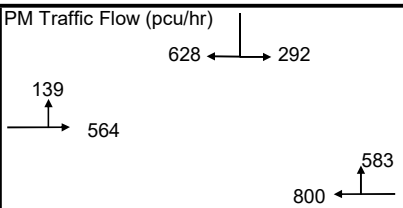
Design Year: 2033 — Designed By: — Checked By: — Date: 26 Oct 2026

Approach		Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak Turning %	AM Peak Sat. Flow (pcu/hr)	AM Peak Flow (pcu/hr)	AM Peak y value	AM Peak Critical y	PM Peak Turning %	PM Peak Sat. Flow (pcu/hr)	PM Peak Flow (pcu/hr)	PM Peak y value	PM Peak Critical y
Prince Edward Road	LT	A1	2	3.40	15.0		100	1777	86	0.048		100	1777	139	0.078	
West EB	SA	A2	1,2	3.40				2095	233	0.111			2095	188	0.090	0.090
	SA	A3	1,2	3.40				2095	233	0.111			2095	188	0.090	
	SA	A4	1,2	3.40				2095	234	0.112	0.112		2095	188	0.090	
Prince Edward Road	SA	B1	2,3	3.40				1955	466	0.238			1955	386	0.197	
West WB	SA	B2	2,3	3.40				2095	500	0.239			2095	414	0.198	
	RT	B3	3	3.40	25.0		100	1976	606	0.307	0.307	100	1976	583	0.295	0.295
Junction Road SB	LT+RT	C1	4	3.30	20.0		100	1809	505	0.279	0.279	100	1809	441	0.244	0.244
	RT	C2	4	3.30	25.0		100	1967	549	0.279		100	1967	479	0.244	
pedestrian phase		D(p)	3,4		min crossing time =		7	sec GM +		15	sec FGM =		22	sec		
		E(p)	4		min crossing time =		5	sec GM +		9	sec FGM =		14	sec		
		F(p)	1,4		min crossing time =		5	sec GM +		9	sec FGM =		14	sec		
		G(p)	1		min crossing time =		7	sec GM +		5	sec FGM =		12	sec		
		H(p)	1		min crossing time =		7	sec GM +		7	sec FGM =		14	sec		

AM Traffic Flow (pcu/hr)



PM Traffic Flow (pcu/hr)

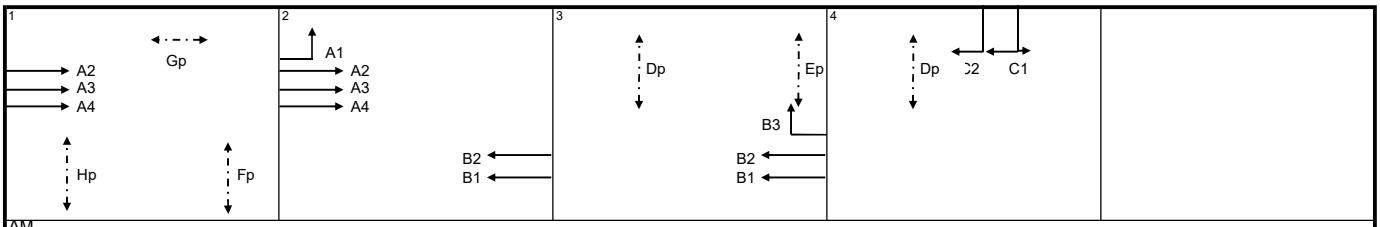


$S=1940+100(W-3.25)$ $S=2080+100(W-3.25)$

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

Note:

	AM Peak		PM Peak	
Group	1,2+3+4		1,2+3+4	
Sum y	0.698		0.629	
L (s)	13		13	
C (s)	120		115	
practical y	0.803		0.798	
R.C. (%)	15%		27%	



AM

G =	I/G =	5	G =	I/G =	G =	I/G =	5	G =	I/G =	6	G =	I/G =
G =	I/G =		G =	I/G =	G =	I/G =		G =	I/G =		G =	I/G =

PM

G =	I/G =	5	G =	I/G =	G =	I/G =	5	G =	I/G =	6	G =	I/G =
G =	I/G =		G =	I/G =	G =	I/G =		G =	I/G =		G =	I/G =

Signal Junction Analysis

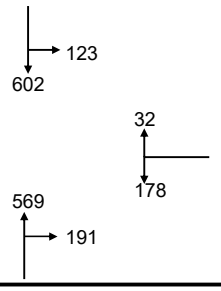
Junction: Junction Road / Tung Tau Tsuen Road Job Number: J7433

Scenario: Existing Condition P. 25

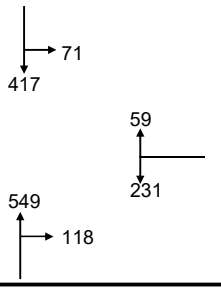
Design Year: 2025 Designed By: Checked By: Date: 26 Oct 2026

Approach		Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak Turning %	AM Peak Sat. Flow (pcu/hr)	AM Peak Flow (pcu/hr)	AM Peak y value	AM Peak Critical y	PM Peak Turning %	PM Peak Sat. Flow (pcu/hr)	PM Peak Flow (pcu/hr)	PM Peak y value	PM Peak Critical y
Junction Road SB	LT+SA	A1	1	3.20	15.0		36	1868	343	0.184		31	1877	232	0.124	
	SA	A2	1	3.20				2075	382	0.184			2075	256	0.123	
Junction Road NB	SA	B1	1,2	3.40				1955	569	0.291	0.291		1955	549	0.281	0.281
	RT	B2	2	3.40	20.0		100	1949	191	0.098		100	1949	118	0.061	
Tung Tau Tsuen Road	LT	C1	3	3.10	18.0		100	1777	178	0.100	0.100	100	1777	231	0.130	0.130
WB	RT	C2	3	3.40	20.0		100	1949	32	0.016		100	1949	59	0.030	
pedestrian phase		D(p)	4		min crossing time =		8	sec GM +		10		sec FGM =	18	sec		

AM Traffic Flow (pcu/hr)



PM Traffic Flow (pcu/hr)

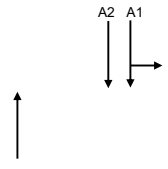
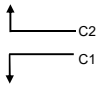
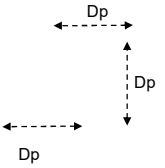


$S=1940+100(W-3.25)$ $S=2080+100(W-3.25)$

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

	AM Peak		PM Peak	
Group	1,2+3		1,2+3	
Sum y	0.391		0.411	
L (s)	36		36	
C (s)	125		120	
practical y	0.641		0.630	
R.C. (%)	64%		53%	

Note:

1	2	3	4	5
				

AM	G =	I/G =	G =	I/G =	6	G =	I/G =	11	G =	8	I/G =	13	G =	I/G =
	G =	I/G =	G =	I/G =		G =	I/G =		G =		I/G =		G =	I/G =
PM	G =	I/G =	G =	I/G =	6	G =	I/G =	11	G =	8	I/G =	13	G =	I/G =
	G =	I/G =	G =	I/G =		G =	I/G =		G =		I/G =		G =	I/G =

Signal Junction Analysis

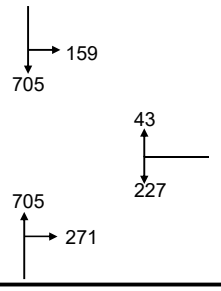
Junction: Junction Road / Tung Tau Tsuen Road — Job Number: J7433

Scenario: Future Condition (Without Proposed Development) — P. 26

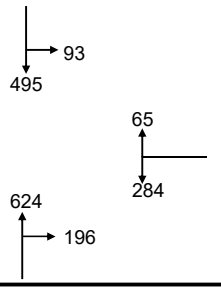
Design Year: 2033 — Designed By: — Checked By: — Date: 26 Oct 2026

Approach		Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak Turning %	AM Peak Sat. Flow (pcu/hr)	AM Peak Flow (pcu/hr)	AM Peak y value	AM Peak Critical y	PM Peak Turning %	PM Peak Sat. Flow (pcu/hr)	PM Peak Flow (pcu/hr)	PM Peak y value	PM Peak Critical y
Junction Road SB	LT+SA	A1	1	3.20	15.0		39	1862	409	0.220		33	1873	279	0.149	
	SA	A2	1	3.20				2075	455	0.219			2075	309	0.149	
Junction Road NB	SA	B1	1,2	3.40				1955	705	0.361	0.361		1955	624	0.319	0.319
	RT	B2	2	3.40	20.0		100	1949	271	0.139		100	1949	196	0.101	
Tung Tau Tsuen Road	LT	C1	3	3.10	18.0		100	1777	227	0.128	0.128	100	1777	284	0.160	0.160
WB	RT	C2	3	3.40	20.0		100	1949	43	0.022		100	1949	65	0.033	
pedestrian phase		D(p)	4		min crossing time =		8	sec GM +		10		sec FGM =	18	sec		

AM Traffic Flow (pcu/hr)



PM Traffic Flow (pcu/hr)

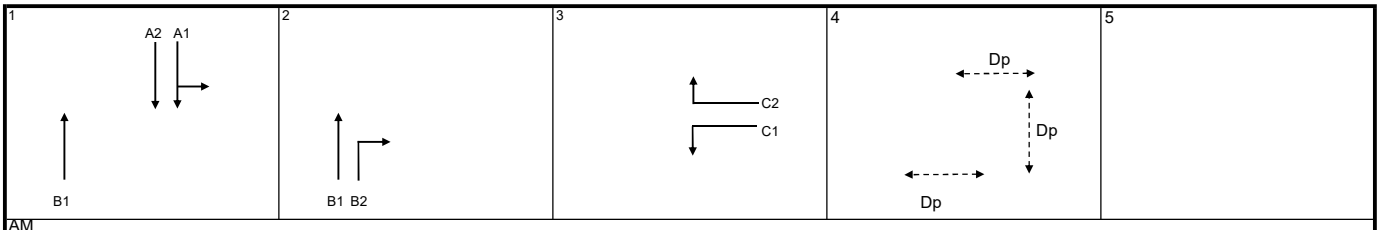


$S=1940+100(W-3.25)$ $S=2080+100(W-3.25)$

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

	AM Peak		PM Peak	
Group	1,2+3		1,2+3	
Sum y	0.488		0.479	
L (s)	36		36	
C (s)	125		120	
practical y	0.641		0.630	
R.C. (%)	31%		32%	

Note:



AM	G =	I/G =	G =	I/G =	6	G =	I/G =	11	G =	8	I/G =	13	G =	I/G =		
	G =	I/G =	G =	I/G =		G =	I/G =		G =		I/G =		G =	I/G =		
PM	G =	I/G =	G =	I/G =	6	G =	I/G =	11	G =	8	I/G =	13	G =	I/G =		
	G =	I/G =	G =	I/G =		G =	I/G =		G =		I/G =		G =	I/G =		

Signal Junction Analysis

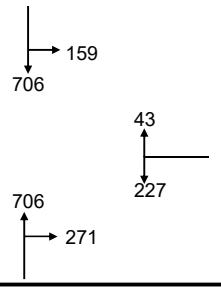
Junction: Junction Road / Tung Tau Tsuen Road Job Number: J7433

Scenario: Future Condition (With Proposed Development) P. 27

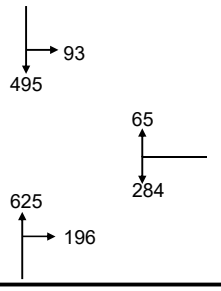
Design Year: 2033 Designed By: Checked By: Date: 26 Oct 2026

Approach		Phase	Stage	Width (m)	Radius (m)	% Up-hill Gradient	AM Peak Turning %	AM Peak Sat. Flow (pcu/hr)	AM Peak Flow (pcu/hr)	AM Peak y value	AM Peak Critical y	PM Peak Turning %	PM Peak Sat. Flow (pcu/hr)	PM Peak Flow (pcu/hr)	PM Peak y value	PM Peak Critical y
Junction Road SB	LT+SA	A1	1	3.20	15.0		39	1862	409	0.220		33	1873	279	0.149	
	SA	A2	1	3.20				2075	456	0.220			2075	309	0.149	
Junction Road NB	SA	B1	1,2	3.40				1955	706	0.361	0.361		1955	625	0.320	0.320
	RT	B2	2	3.40	20.0		100	1949	271	0.139		100	1949	196	0.101	
Tung Tau Tsuen Road	LT	C1	3	3.10	18.0		100	1777	227	0.128	0.128	100	1777	284	0.160	0.160
WB	RT	C2	3	3.40	20.0		100	1949	43	0.022		100	1949	65	0.033	
pedestrian phase		D(p)	4		min crossing time =		8	sec GM +		10		sec FGM =	18	sec		

AM Traffic Flow (pcu/hr)



PM Traffic Flow (pcu/hr)

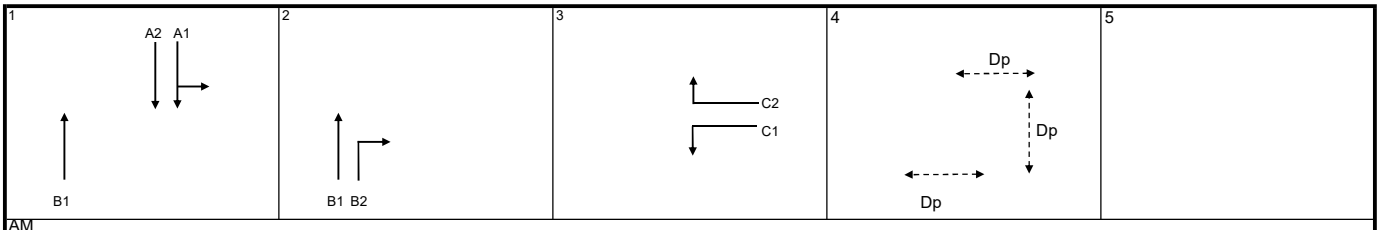


$S=1940+100(W-3.25)$ $S=2080+100(W-3.25)$

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

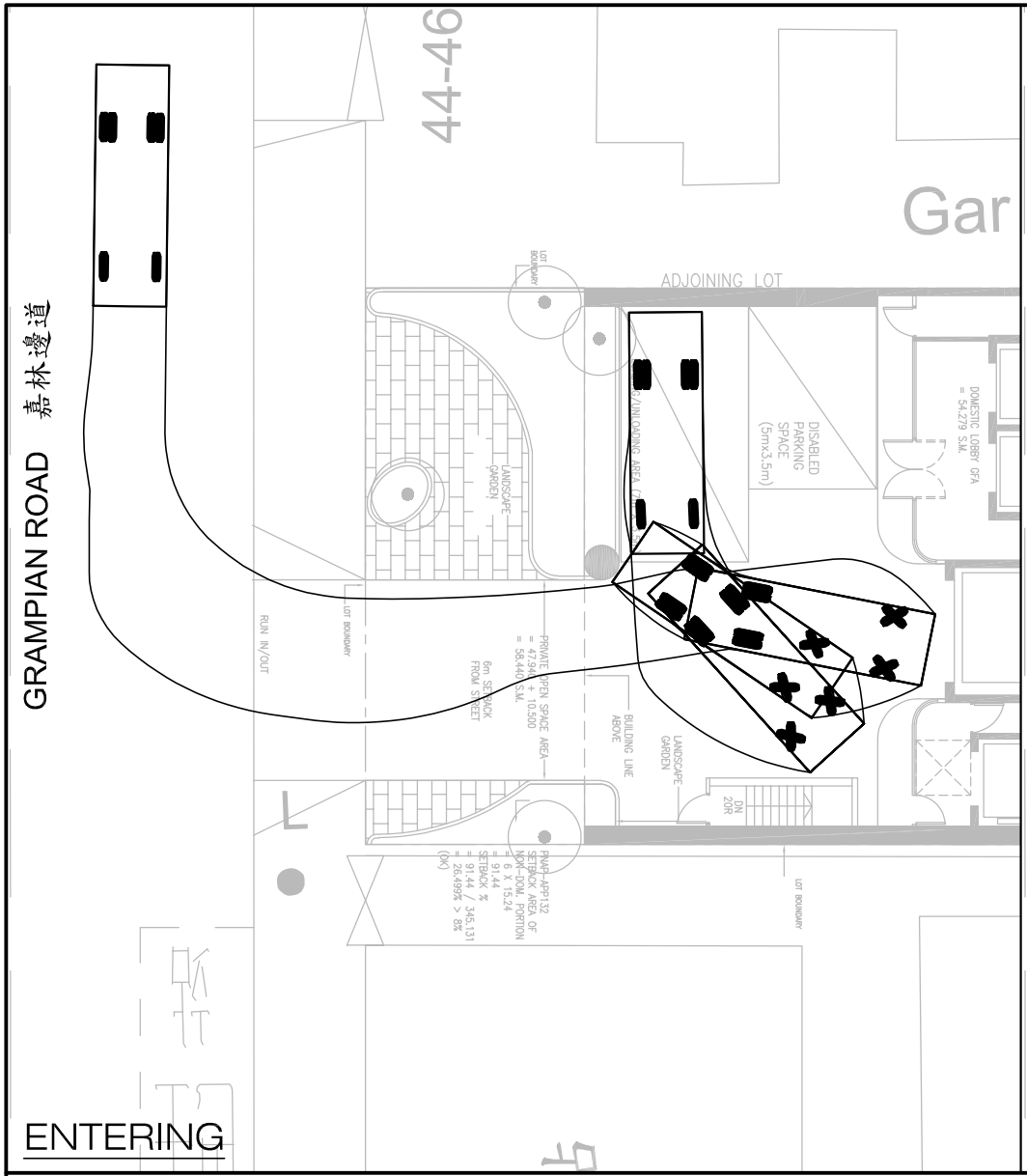
	AM Peak		PM Peak	
Group	1,2+3		1,2+3	
Sum y	0.489		0.480	
L (s)	36		36	
C (s)	125		120	
practical y	0.641		0.630	
R.C. (%)	31%		31%	

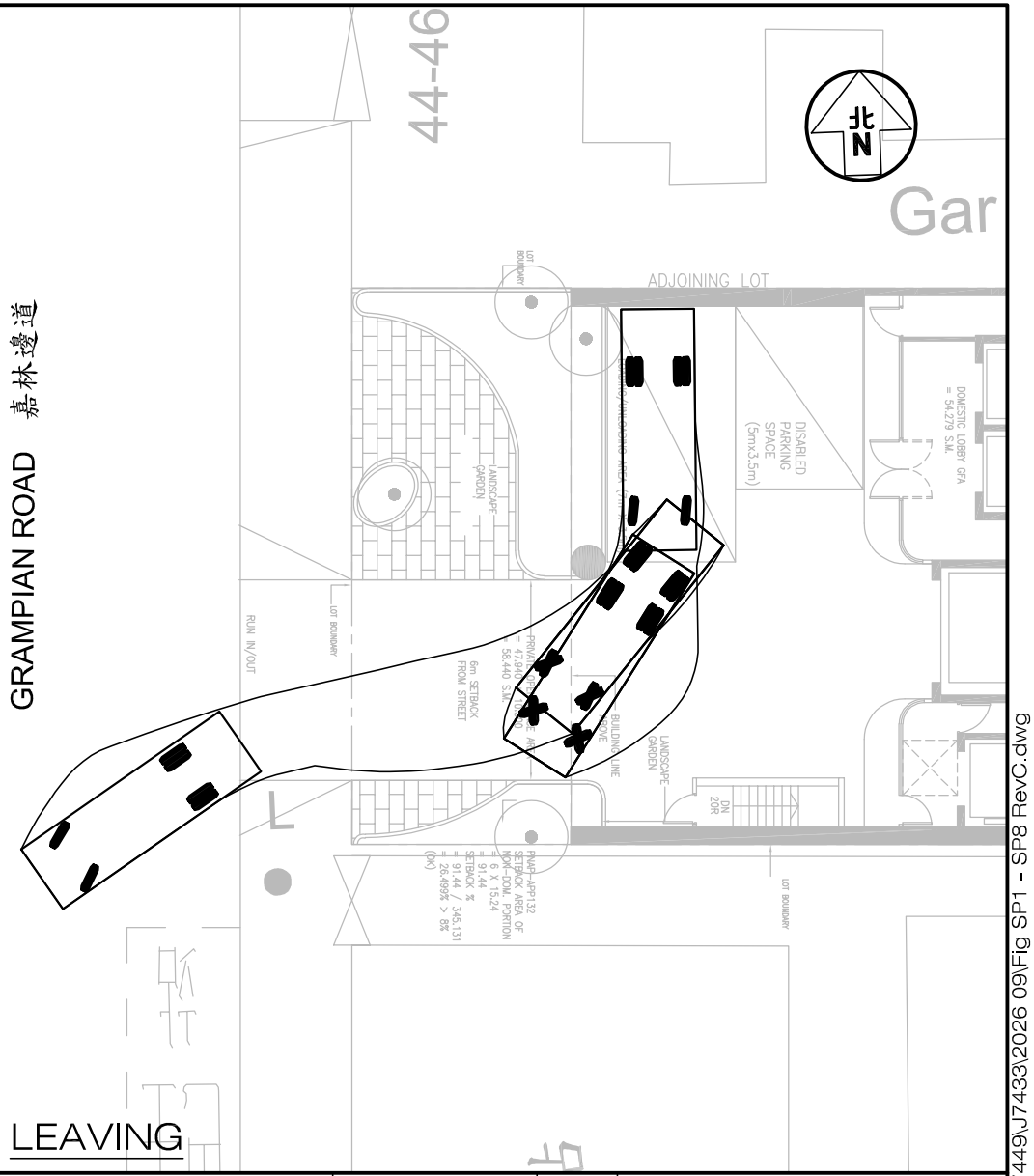
Note:



AM	G =	I/G =	G =	I/G =	6	G =	I/G =	11	G =	8	I/G =	13	G =	I/G =		
	G =	I/G =	G =	I/G =		G =	I/G =		G =		I/G =		G =	I/G =		
PM	G =	I/G =	G =	I/G =	6	G =	I/G =	11	G =	8	I/G =	13	G =	I/G =		
	G =	I/G =	G =	I/G =		G =	I/G =		G =		I/G =		G =	I/G =		

Appendix 2 –
Swept Path Analysis

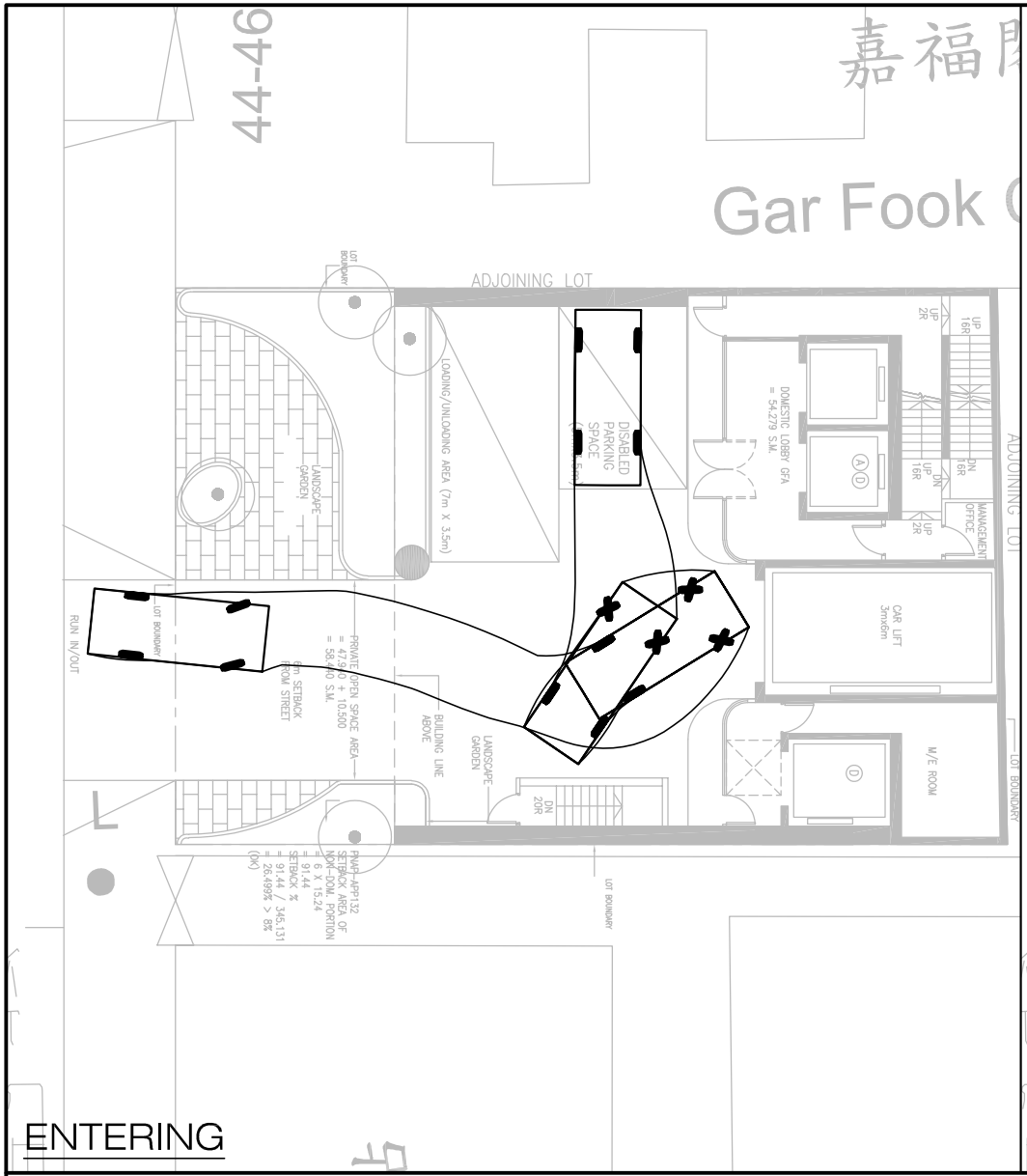


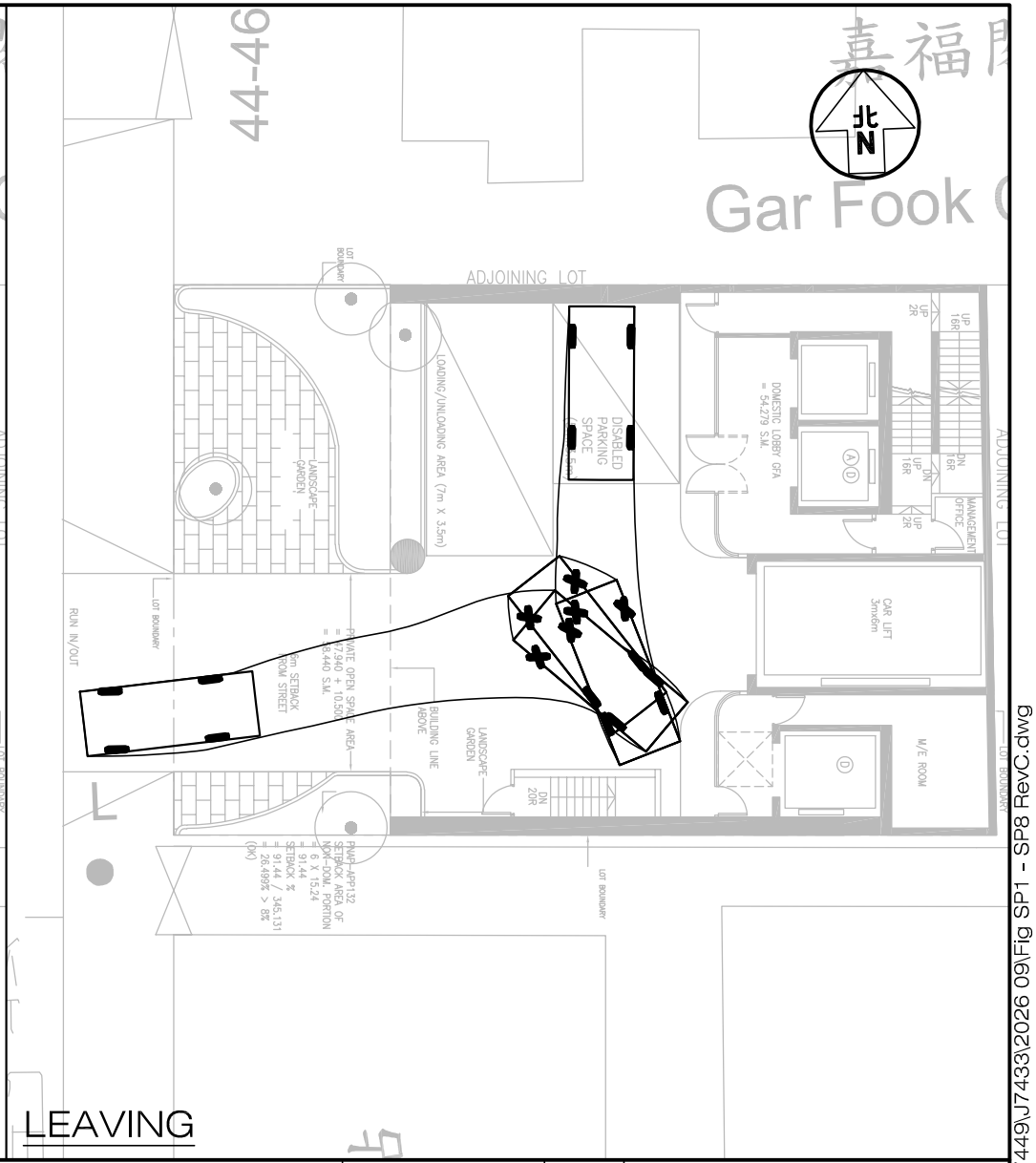


Project Title	PROPOSED MINOR RELAXATION FOR "RESIDENTIAL" USE AT 42 GRAMPIAN ROAD, KOWLOON CITY KOWLOON (NEW KOWLOON INLAND LOT NO. 3535)	J7433	Figure No. SP1 / Revision D
Figure Title	SWEPT PATH OF LGV ENTERING AND LEAVING THE LGV LOADING / UNLOADING BAY ON G/F		Designed by C Y Y / Drawn by N C M / Checked by K C
			Scale in A4 1 : 200 / Date 26 OCT 2026

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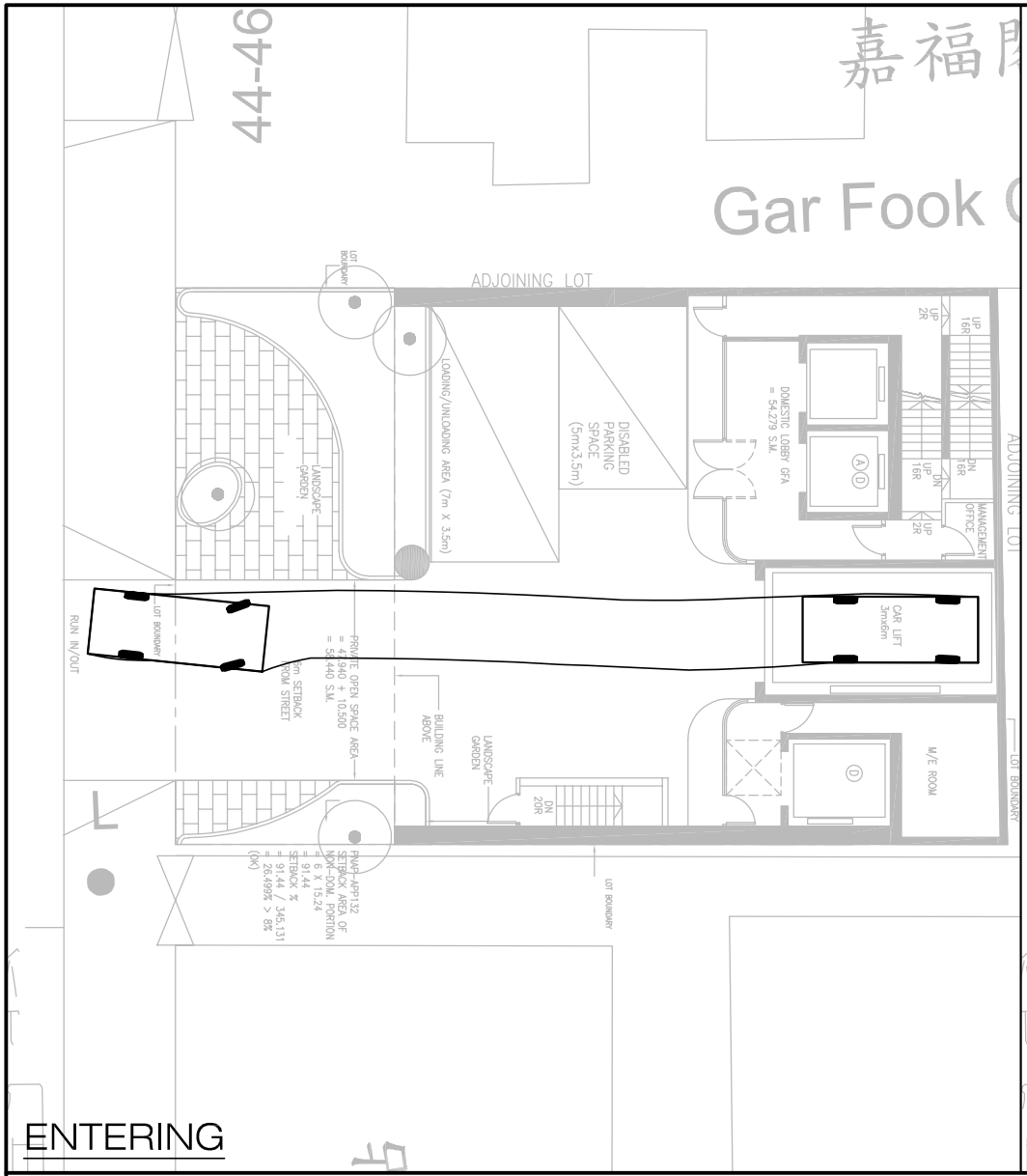


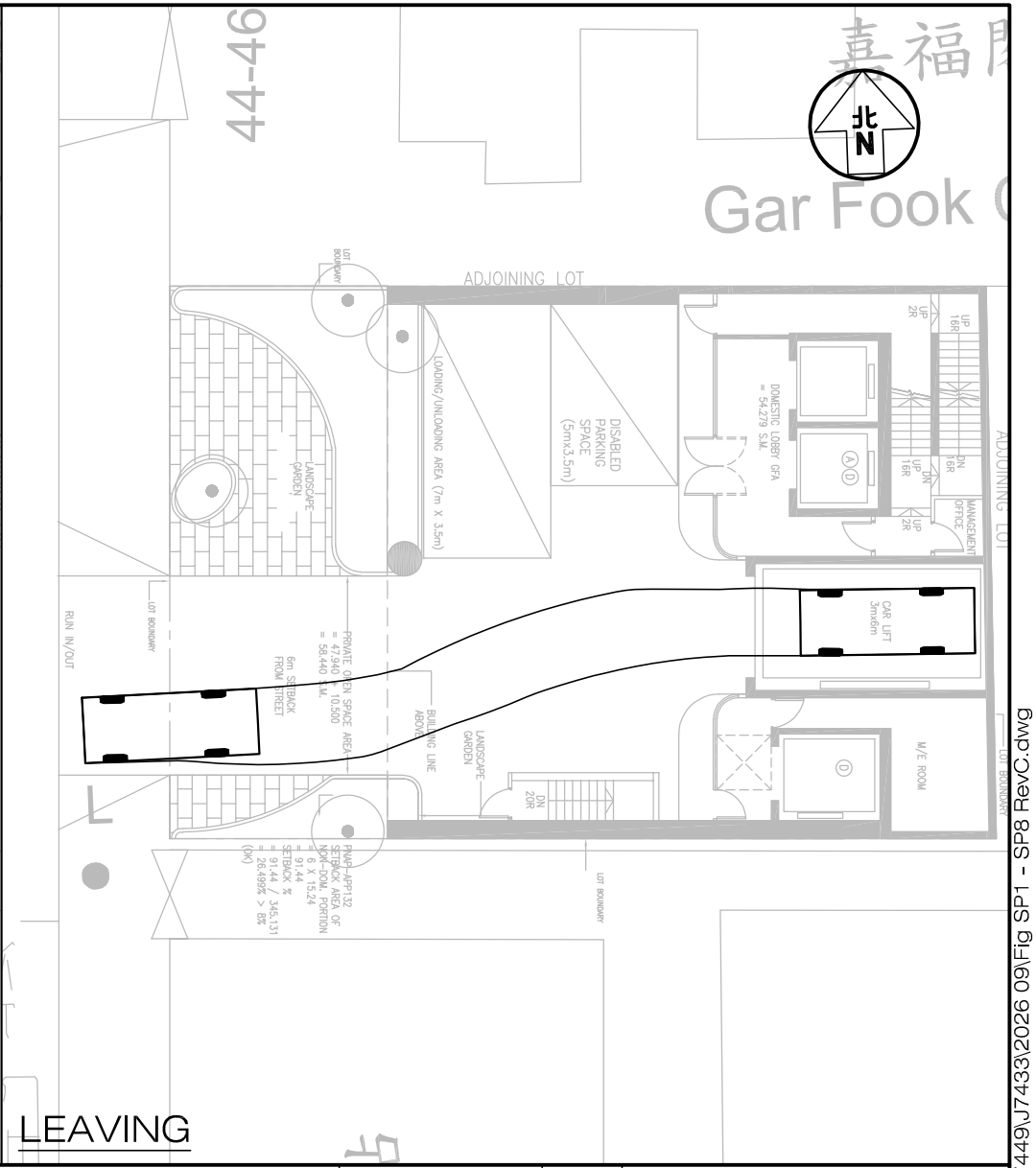


Project Title	PROPOSED MINOR RELAXATION FOR "RESIDENTIAL" USE AT 42 GRAMPIAN ROAD, KOWLOON CITY KOWLOON (NEW KOWLOON INLAND LOT NO. 3535)	J7433	Figure No. SP2 / Revision D
Figure Title	SWEPT PATH OF PRIVATE CAR ENTERING AND LEAVING THE ACCESSIBLE CAR PARKING SPACE ON G/F		Designed by C Y Y / Drawn by N C M / Checked by K C
			Scale in A4: 1 : 200 / Date: 26 OCT 2026

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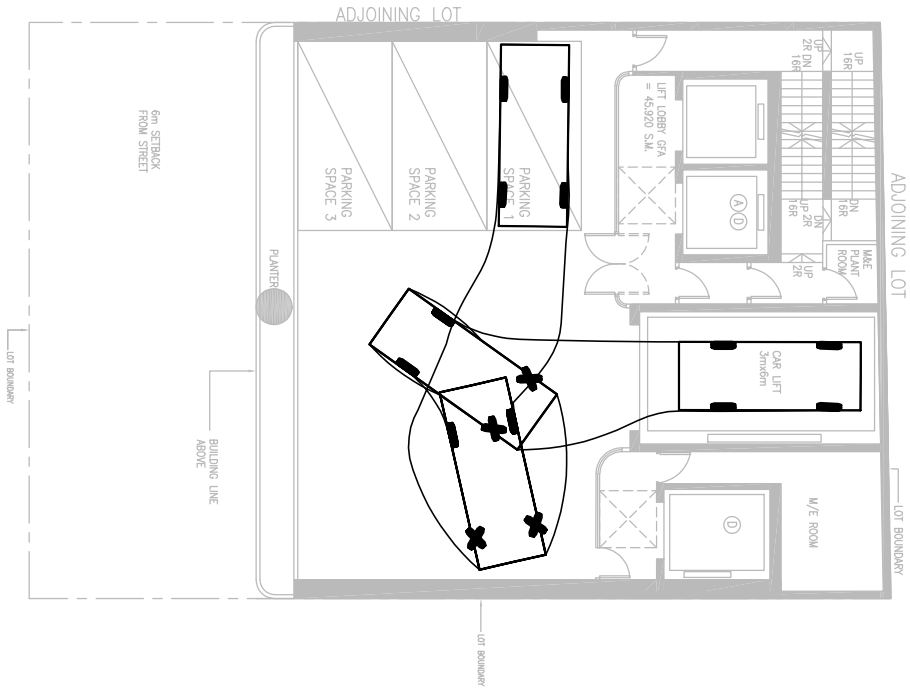




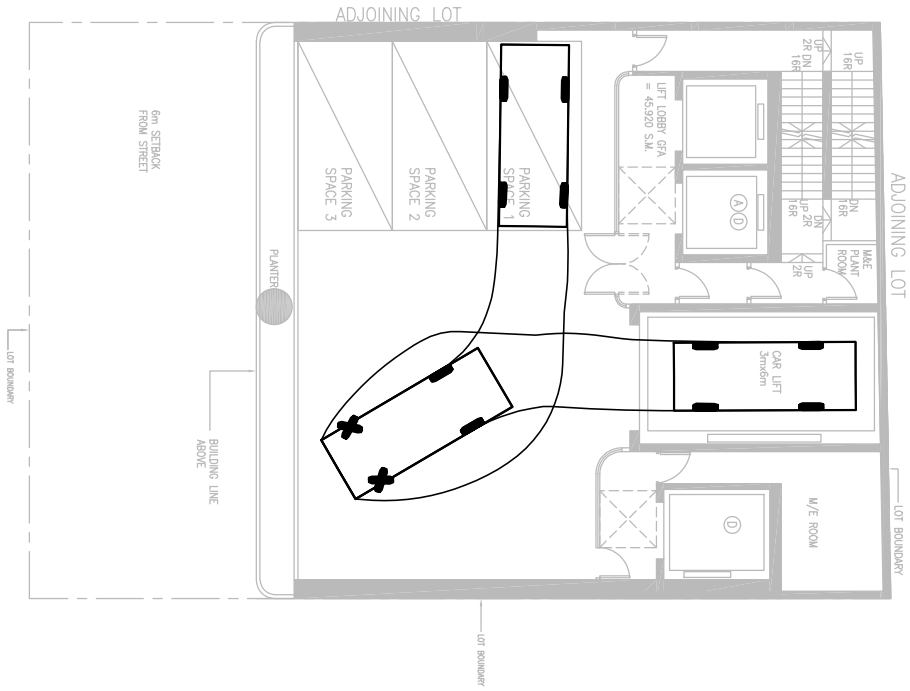
Project Title	PROPOSED MINOR RELAXATION FOR "RESIDENTIAL" USE AT 42 GRAMPIAN ROAD, KOWLOON CITY KOWLOON (NEW KOWLOON INLAND LOT NO. 3535)	J7433	Figure No. SP3 / Revision D
Figure Title	SWEPT PATH OF PRIVATE CAR ENTERING AND LEAVING THE CAR LIFT ON G/F		Designed by C Y Y / Drawn by N C M / Checked by K C
			Scale in A4: 1 : 200 / Date: 26 OCT 2026

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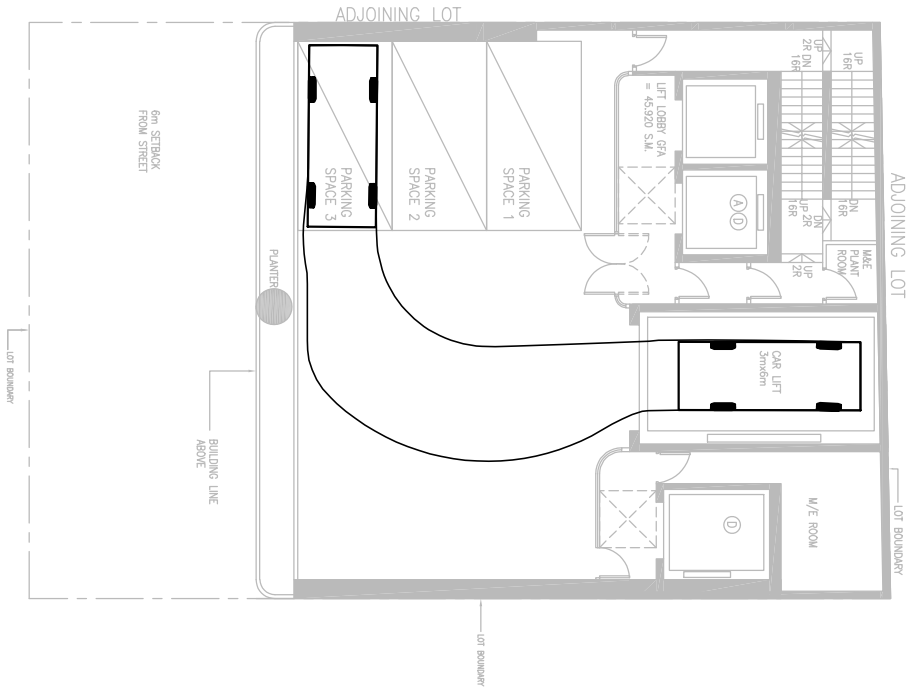


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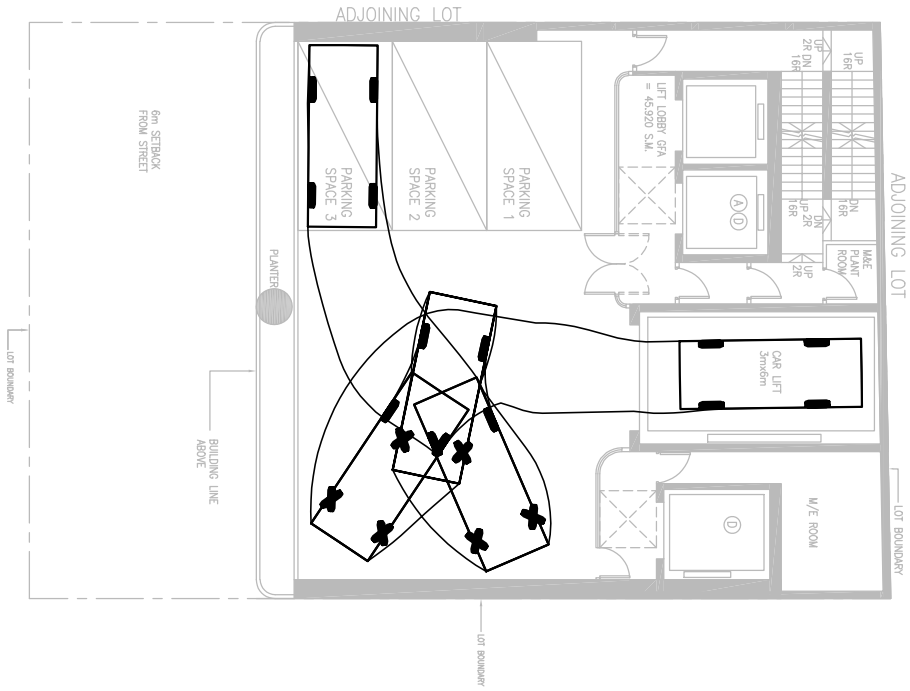
Project Title	PROPOSED MINOR RELAXATION FOR "RESIDENTIAL" USE AT 42 GRAMPIAN ROAD, KOWLOON CITY KOWLOON (NEW KOWLOON INLAND LOT NO. 3535)	J7433	Figure No. SP4 / Revision D
Figure Title	SWEPT PATH OF PRIVATE CAR ENTERING AND LEAVING THE CAR PARKING SPACE 1 ON 1/F		Designed by C Y Y / Drawn by N C M / Checked by K C
			Scale in A4 1 : 200 / Date 26 OCT 2026

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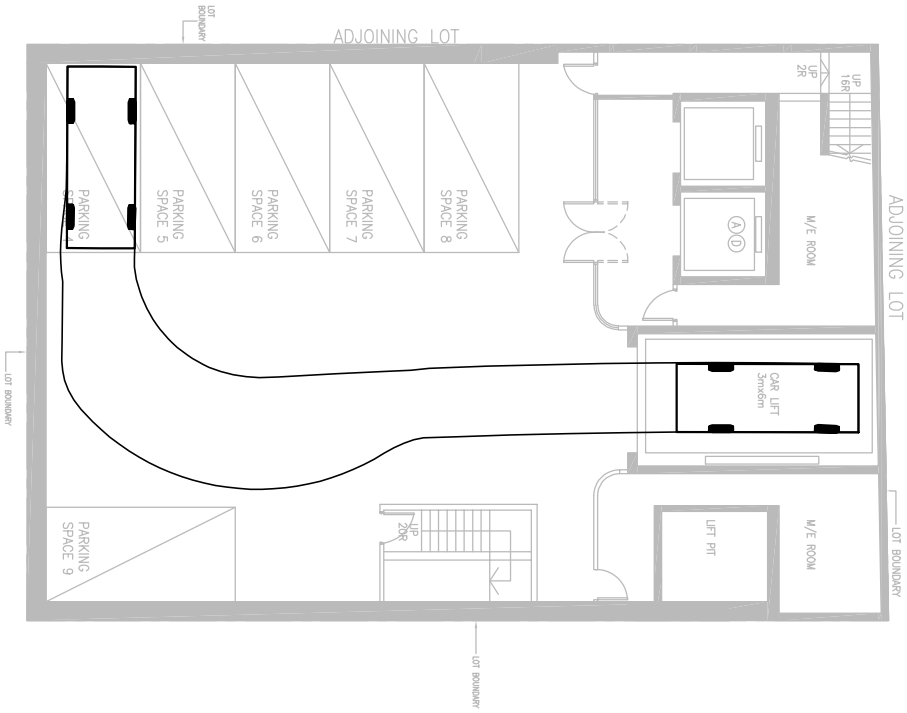


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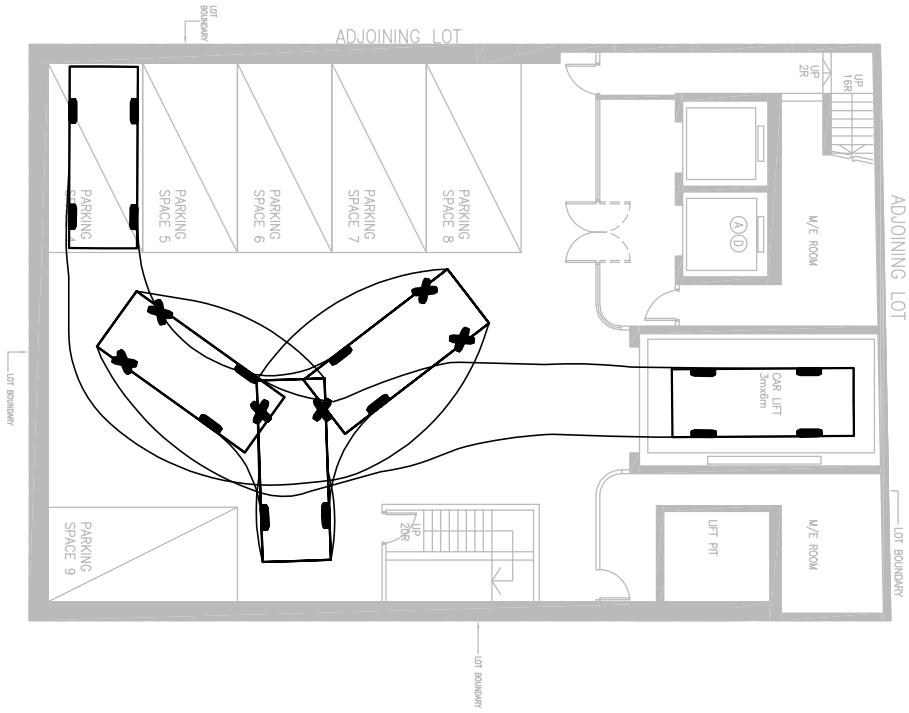
Project Title	PROPOSED MINOR RELAXATION FOR "RESIDENTIAL" USE AT 42 GRAMPIAN ROAD, KOWLOON CITY KOWLOON (NEW KOWLOON INLAND LOT NO. 3535)	J7433	Figure No. SP5 / Revision D
Figure Title	SWEPT PATH OF PRIVATE CAR ENTERING AND LEAVING THE CAR PARKING SPACE 3 ON 1/F		Designed by C Y Y / Drawn by N C M / Checked by K C
			Scale in A4 1 : 200 / Date 26 OCT 2026

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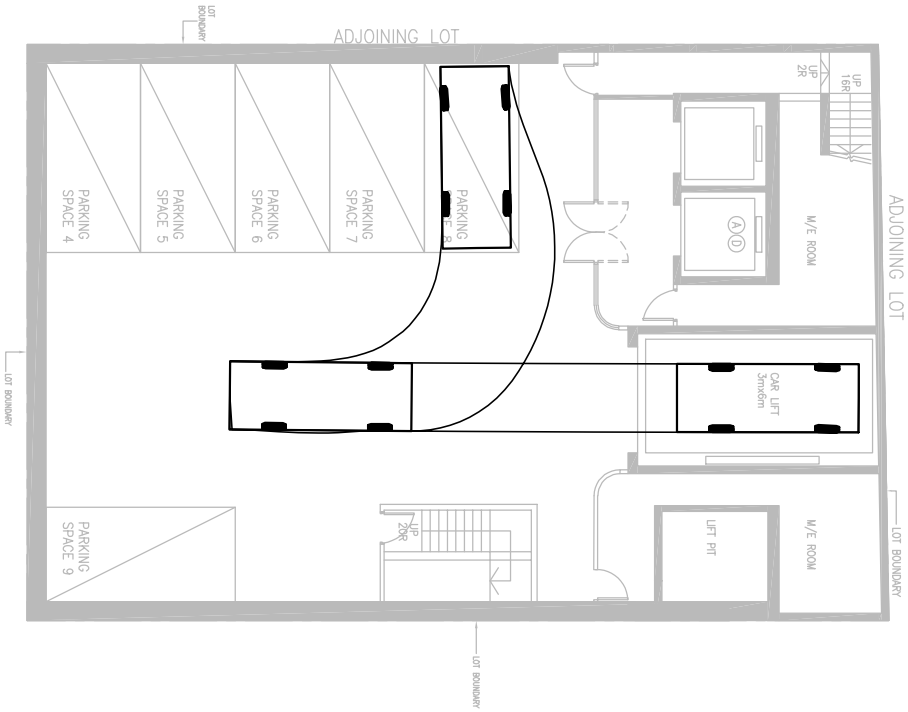


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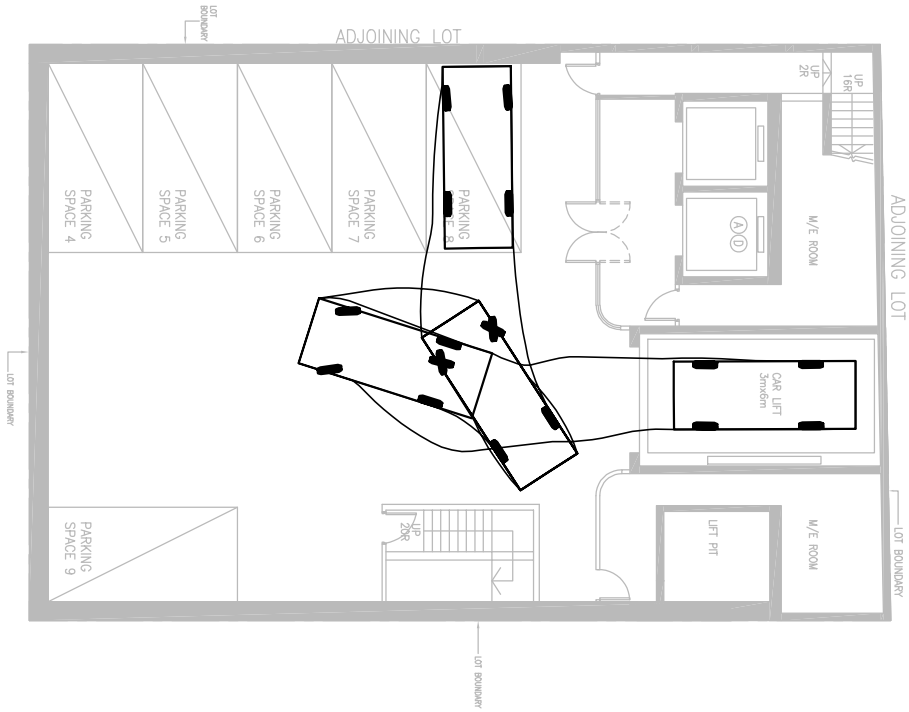
Project Title	PROPOSED MINOR RELAXATION FOR "RESIDENTIAL" USE AT 42 GRAMPIAN ROAD, KOWLOON CITY KOWLOON (NEW KOWLOON INLAND LOT NO. 3535)	J7433	Figure No. SP6 / Revision D
Figure Title	SWEPT PATH OF PRIVATE CAR ENTERING AND LEAVING THE CAR PARKING SPACE 4 ON B/F		Designed by C Y Y / Drawn by N C M / Checked by K C / Scale in A4 1 : 200 / Date 23 OCT 2026

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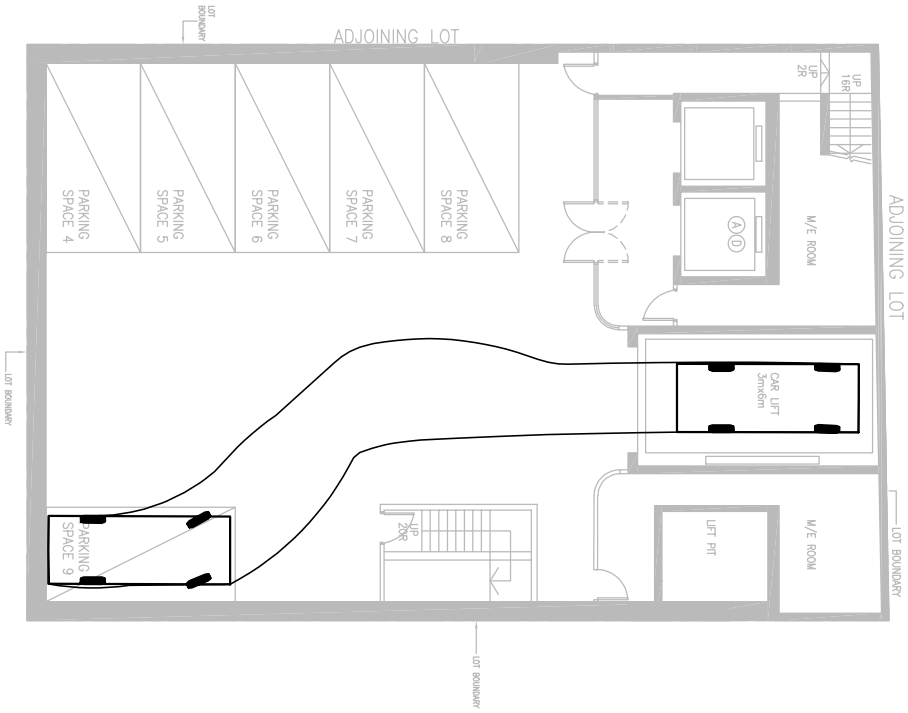


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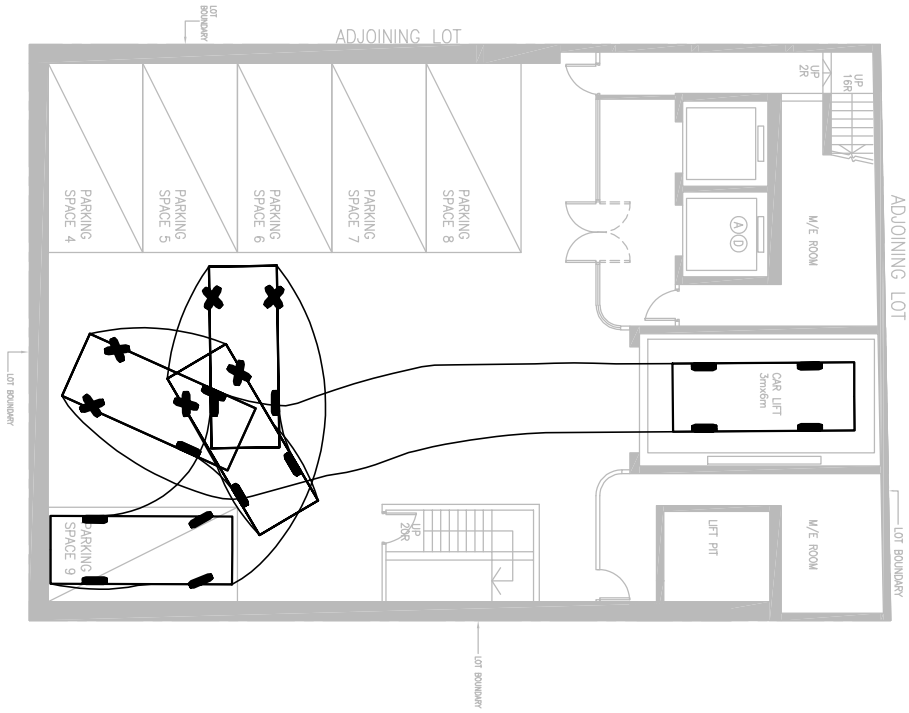
Project Title	PROPOSED MINOR RELAXATION FOR "RESIDENTIAL" USE AT 42 GRAMPIAN ROAD, KOWLOON CITY KOWLOON (NEW KOWLOON INLAND LOT NO. 3535)	J7433	Figure No. SP7 / Revision D
Figure Title	SWEPT PATH OF PRIVATE CAR ENTERING AND LEAVING THE CAR PARKING SPACE 8 ON B/F		Designed by C Y Y / Drawn by N C M / Checked by K C
			Scale in A4 1 : 200 / Date 23 OCT 2026

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ENTERING



LEAVING

Project Title	PROPOSED MINOR RELAXATION FOR "RESIDENTIAL" USE AT 42 GRAMPIAN ROAD, KOWLOON CITY KOWLOON (NEW KOWLOON INLAND LOT NO. 3535)	J7433	Figure No. SP8 / Revision A
Figure Title	SWEPT PATH OF PRIVATE CAR ENTERING AND LEAVING THE CAR PARKING SPACE 9 ON B/F		Designed by C Y Y / Drawn by N C M / Checked by K C / Scale in A4 1 : 200 / Date 23 OCT 2026

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Appendix 3 –
Vehicle Lift Analysis

Vehicle Lift Analysis

Job Title Proposed Minor Relaxation for "Residential" Use at 42 Grampian Road, Kowloon City Kowloon (New Kowloon Inland Lot No. 3535)

Ground floor to typical car park floor (m)	3.30
Average Speed (m/s)	0.75
Travel time (s)	4.40

Activity	**Time (s)**
Car lift travels from ground floor to typical car park floor	4
Lift door opens	5
Car exits lift in foward gear on typical car park floor	5
Car enters lift in reverse gear on typical car park floor	15
Door closes	5
Car lift travels from typical car park floor to ground floor	4
Lift door opens	5
Car exits lift in forward gear on ground floor	5
Car enters lift in reverse gear on ground floor	15
Door closes	5
Total	69

Number of lift servers, **k**	1
Cycle time ω (s)	69
Arrival rate λ (veh / hr)	2
Service rate μ of one lift server (veh / hr)	52

Number of Cars N	**Probability of Exact N Cars in the Lift System**	**Probability of N Cars or Less in the Lift System**	**Probability of More Than N Cars in the Lift System**
0	96.18%	96.18%	3.82%
1	**3.68%**	**99.85%**	**0.15%**
2	0.14%	99.99%	0.01%
3	0.01%	100.00%	0.00%
4	0.00%	100.00%	0.00%
5	0.00%	100.00%	0.00%
6	0.00%	100.00%	0.00%
7	0.00%	100.00%	0.00%

Conclusion

The probability of 1 car arriving when 1 car lift being occupied is 0.15%.

Formulae:		[A]	[B]	
Floor	Level (m)	Distance from G/F	No. of parking spaces	[A] * [B]
8/F		0		0
7/F		0		0
6/F		0		0
5/F		0		0
4/F		0		0
3/F		0		0
2/F		0		0
1/F	20.575	4	3	12
G/F	16.575	0	1	0
B1	13.075	3.5	6	21
B2		0.0		0
B3		0		0
B4		0		0
B5		0		0
B6		0		0
B7		0		0
B8		0		0
			total parking spaces	typical floor distance
			10	3.3

Note:
k is the number of lift servers.
λ is the arrival rate in vehicles per hour.
μ is the service rate of a lift server in vehicles per hour.

N	1/N!*(λ/μ)^	summation from N=0 to N=k-1
0	1	1
1	0	1
2	0	1
3	0	1
4	0	1
5	0	1
6	0	1
7	0	1
8	0	1
9	0	1
10	0	1

The assessment is based on the mutli-server queuing (M/M/N) theory, and the equations applied are listed below :

Probability of having exactly zero cars in the lift system:

$$P(0) = \frac{1}{\left[\sum_{N=0}^{k-1} \frac{1}{N!}\left(\frac{\lambda}{\mu}\right)^N\right] + \frac{1}{k!}\left(\frac{\lambda}{\mu}\right)^k \frac{k\mu}{k\mu - \lambda}}$$

Probability of having exactly N cars in the lift system:

For $N < k$:

$$P(N) = \frac{1}{N!}\left(\frac{\lambda}{\mu}\right)^N P(0)$$

For $N \geq k$:

$$P(N) = \frac{1}{k!\,k^{N-k}}\left(\frac{\lambda}{\mu}\right)^N P(0)$$

k - -number of lift servers
λ - -arrival rate
μ - -service rate