METRO PLANNING COMMITTEE
OF THE TOWN PLANNING BOARD

MPC Paper No. 2/21
For Consideration by
The Metro Planning Committee on 26.2.2021

PROPOSED AMENDMENTS TO THE APPROVED KWUN TONG (SOUTH) OUTLINE ZONING PLAN NO. S/K14S/22

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1. Introduction

This paper is to seek Members' agreement that:

(a) the proposed amendments to the approved Kwun Tong (South) Outline Zoning Plan (OZP) No. S/K14S/22 (**Attachment I**) as shown on the draft OZP No. S/K14S/22A (**Attachment II**) and its Notes (**Attachment III**) are suitable for exhibition for public inspection under section 5 of the Town Planning Ordinance (the Ordinance); and

(b) the revised Explanatory Statement (ES) of the OZP (**Attachment IV**) should be adopted as an expression of the planning intentions and objectives of the Town Planning Board (the Board) for various land use zonings of the OZP, and is suitable for exhibition together with the OZP and its Notes.

2. Status of the Current OZP

On 30.10.2018, the Chief Executive in Council (CE in C), under section 9(1)(a) of the Ordinance, approved the draft Kwun Tong (South) OZP, which was subsequently renumbered as S/K14S/22. On 4.6.2019, the CE in C referred the approved OZP to the Board for amendment under section 12(1)(b)(ii) of the Ordinance.

3. Background

3.1 Kowloon East is transforming into another core business district to support Hong Kong's long-term economic development. To expedite the transformation, the 2013 Policy Address (PA) announced development of two action areas in the Kwun Tong and Kowloon Bay Business Areas (KTBA and KBBA). It was further indicated in the 2016 and 2017 PA that the commercial/office floor area to be provided in the two action areas in Kowloon East will be about 560,000m^2. In pursuit of this policy initiative, the Energizing Kowloon East Office (EKEO), Development Bureau (DEVB) commissioned the Planning and Engineering Study on the Kwun Tong Action Area (KTAA) – Feasibility Study (the Study) for developing a robust, coherent and comprehensive development in KTAA (**Plan 1**) comprising commercial/office, government uses and public open space for this waterfront site. To take forward the Recommended Outline Development Plan (RODP) of the Study (**Plan 6a**), rezoning of the relevant portions of KTAA with stipulation of appropriate development restrictions is required.

3.2 Opportunity has been taken to revise the Notes to incorporate the latest revision of the Master Schedule of Notes to Statutory Plans (MSN).

4. The RODP for KTAA

4.1 KTAA mainly falls within the K14S Planning Scheme Area (the K14S Area) with a site area of about 2.8ha[1]. It is in the waterfront of KTBA and is bounded by the Hoi Yuen Road/Wai Yip Street roundabout in the northeast, Kei Yip Street and Kei Yip Lane in the northwest, two existing buildings (namely Lu Plaza and Hoi Bun Industrial Building) in the southeast, and the waterfront in the southwest (**Plans 1** and **4**). To better utilize this waterfront site, the Study proposes to re-organize, rationalize or relocate the existing uses within this cluster of government land for proposed commercial/office development with government, institution/ community (GIC) uses and public open spaces, and various pedestrian connections for enhancing the accessibility and vibrancy of the waterfront (**Plans 6a** and **6b**).

4.2 The affected facilities (**Plans 3** to **5c**) and the reprovisioning proposals recommended under the Study are as follows:

(a) Kwun Tong Ferry Pier Public Transport Interchange (PTI) and adjoining roads (currently zoned "Government, Institution or Community (1)" ("G/IC(1)") and shown as 'Road'): would form the main portion of the proposed commercial development with the existing open-air PTI to be reprovisioned under the podium deck of the proposed commercial development;

(b) Kwun Tong Ferry Pier Square cum Pet Garden (currently zoned "Open Space" ("O")): the main portion would be developed as part of the proposed commercial development while the remaining portion abutting the road junction would be retained as public open space. Adequate public open space would be re-provisioned at various locations within KTAA including areas facing the harbour and along the waterfront promenade;

(c) Ex-Kwun Tong Driving School (KTDS) (currently zoned "G/IC(1)"): KTDS was relocated to another site within Kwun Tong District in 2019. The eastern portion of the ex-KTDS site is proposed to be redeveloped as a drainage facility (comprising an underground storm water storage tank and pump house with ancillary aboveground structures) by the Drainage Services Department (DSD) and a public open space/pet garden with integrated design on top;

(d) Dangerous goods vehicle (DGV) queuing area of Kwun Tong Vehicular Ferry Pier underneath the elevated structures of the ex-KTDS (currently zoned "G/IC(1)"): on-site reprovisioning with a reconfigured queuing area in the western portion of the ex-KTDS site abutting Kei Yip Street;

(e) Storage area of the Food and Environmental Hygiene Department (FEHD) at Kei Yip Lane (currently zoned "G/IC(1)") : to be reprovisioned to a proposed

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[1] KTAA (with total land area of 4.2ha) also covers a planned waterfront promenade and three existing piers, namely Kwun Tong Vehicular Ferry Pier, Kwun Tong Public Pier and Kwun Tong Passenger Ferry Pier, that fall within the Kai Tak Planning Area (**Plan 1**).

annex block adjacent to FEHD's Refuse Collection Point cum Public Toilet at Kei Yip Lane which is zoned "G/IC(1)"; and

(f) Kwun Tong Ferry Concourse Cooked Food Market (CFM)[2] and strips of land to the southeast and west of the existing PTI (currently zoned "G/IC(1)") : would be developed for public open space.

4.3 In the course of the Study, EKEO has consulted the Kwun Tong District Council (KTDC) and the Task Force on Kai Tak Harbourfront Development (the Task Force) and has suitably incorporated their comments in the refinements to the RODP (see paragraphs 12.2 and 12.3 below for details). Based on the RODP, zoning amendments to the land area within KTAA and the roads in its vicinity are proposed which involve the proposed land use zonings as discussed in paragraph 5 below.

5. Proposed Amendments to the OZP

Amendment Item A – "Commercial (2)" ("C(2)") for Proposed Commercial Development (total area of 1.37ha)

5.1 A piece of land (1.37ha), currently zoned as "O" and "G/IC(1)" and shown as 'Road' on the OZP, is proposed to be rezoned to "C(2)" (**Item A** on **Plans 2** to **4**) with the intention primarily for office/retail and GIC uses and the existing PTI to be re-provisioned under the podium deck. A public vehicle park (PVP) should be provided as required by the Transport Department (TD) to address the local parking demand. Having regard to the waterfront location and the capacity of the local traffic network and based on the findings of the Traffic and Transport Impact Assessment (TTIA) of the Study, the proposed commercial development would be developed with a total gross floor area (GFA) of about 86,650m^2 (excluding GFA of about 2,700m^2 for social welfare facilities). A maximum building height (BH) of 100 metres above Principal Datum (mPD), as currently stipulated for other "Other Specified Uses" annotated "Business" ("OU(B)") and "C(1)" sites near the waterfront of KTBA, is adopted for the main portion of the proposed "C(2)" zone. A lower BH of 15mPD is proposed for the western portion that generally aligns with Hoi Yuen Road which would facilitate wind penetration from the waterfront to the major wind corridor in the district along Hoi Yuen Road (**Plans 2** to **4**).

5.2 To optimise the provision of public open space, a Public Open Space within Private Development (POSPD) of not less than 6,500m^2 would be provided within the proposed commercial development at locations facing the waterbody with sea view.

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[2] As announced in the 2018 PA, the Government is conducting a comprehensive review of the usage and development potential of the existing market sites with a view to formulating appropriate development plans for fulfilment of policy objectives of optimizing land uses, benefitting the public and promoting district development. The CFM is a 2-storey building which has been operating since the 1980s with an aim to resite on-street cooked food hawkers for food and environmental hygiene reasons and to meet the need of the workers in nearby industrial buildings at that time. Currently there are varieties of catering facilities within KTBA while catering facilities will also be provided within the proposed commercial development in KTAA. Given the abovementioned policy objective announced in the 2018 PA, the Study recommends to utilize the CFM site after demolition as a public open space for public enjoyment.

5.3 The key development parameters for the notional scheme of a proposed commercial/office development in the proposed "C(2)" zone assessed under the Study are summarised below:

Site Area	About 13,700m^2
Maximum GFA - Commercial / Office - PTI[b], [c]	86,650m^2[a] - 79,600m^2 - 7,050m^2
Maximum BH	100mPD (eastern portion) 15mPD (western portion)
Social Welfare Facilities[a], [c]	- One 60-place Day Care Centre for the Elderly - Two Office Bases of On-site Pre-school Rehabilitation Services - One School Social Work Office - One 80-place Integrated Vocational Rehabilitation Services Centre
Ancillary parking and loading/unloading (L/UL) Facilities [d] - Private Car (PC) Parking - Motorcycle Parking - L/UL for Light Goods Vehicle (GV) - L/UL for Heavy GV	 - 350 - 27 - 23 - 13
PVP [c] - PC Parking - GV Parking - Coach Parking	 - 130 - 63 - 10
Bicycle parking[c]	- 50
POSPD [c]	not less than 6,500m^2 (open to public 24 hours daily)
Development Programme	Tentative completion by 2030

Notes:

[a] Floor space for social welfare facilities of about 2,700m^2 (subject to detailed design as advised by the Social Welfare Department (SWD)) is exempted from maximum GFA calculation for the "C(2)" zone and excluded in the above.

[b] GFA of the PTI (subject to detailed design) should be accountable in GFA calculation.

[c] Requirements on provision of PTI, social welfare facilities, PVP, bicycle parking and POSPD would be specified in the land sale document of the proposed commercial development.

[d] Assumed for the notional scheme under the Study. Actual provision subject to the mix of uses and respective parking requirement under the prevailing Hong Kong Planning Standards and Guidelines (HKPSG) and as specified in the land sale document.

Amendment Items B1, B2 and B3 – Public Open Space Proposals (total area of 6,965m^2)

5.4 To facilitate the implementation of public open space proposals recommended in the RODP (**Plan 6a**), parcels of land currently zoned as "G/IC(1)" and shown as 'Road' on the OZP are proposed to be rezoned to "O" or its subzone (**Items B1** and **B2** on **Plans 2** to **4**). These include the CFM site and adjoining strip of land (annotated as RO2 on **Plan 6a**) as well as the road spaces at the southern sides of the Hoi Yuen Road/Wai Yip Street roundabout that would be freed up with the proposed junction modification as illustrated on **Plan 6d** (annotated as LO1 and part of LO2 on **Plan 6a**). Another waterfront area covering the eastern portion of ex-KTDS site (annotated as RO1 on **Plan 6a**) is proposed to be rezoned from "G/IC(1)" to "Other Specified Uses" annotated "Drainage Facility and At-grade Public Open Space" ("OU(DFAPOS)") zone to reflect the integrated design of a largely underground public utility installation with public open space atop (**Item B3** on **Plans 2** to **4**). To allow reprovisioning of an existing gas governor kiosk[3] as recommended under the Study, LO1 is proposed to be rezoned to "O(1)" with 'Public Utility Installation' as a Column 1 use (**Item B2** on **Plans 2** to **4**).

Amendment Item C – Road Improvement Works (total area of 1,933m^2)

5.5 To accommodate the traffic generated from the proposed commercial development and the reprovisioned PTI, a series of road improvements within KTAA and its adjoining roads are recommended in the Study[4] (**Plan 6d**). A new public road (Road L1) within the proposed commercial development running in parallel to Wai Yip Street is proposed to connect Road L2 and Kei Yip Lane. As such, two strips of land at both ends of Road L1 are proposed to be rezoned from "G/IC(1)" to areas shown as 'Road'. Besides, the existing Kei Yip Lane currently zoned "G/IC(1)" is proposed to be rezoned as an area shown as 'Road' area to reflect its as-built road status (**Item C** on **Plans 2** to **4**).

6. Technical Assessments

6.1 Various technical assessments were conducted under the Study. According to the findings of these assessments as highlighted below, the proposed uses in KTAA are technically feasible with no insurmountable problems.

[3] An existing small-scale gas governor kiosk (with a size of about 2.5m (L) x 1.5m (W)) located at the southern footpath of the eastern end of Kei Yip Lane would be affected by the proposed KTAA development. The Study recommends to relocate it to LO1 taken into account the alignment of existing gas main. The exact location would be formulated under the schematic design and control drawings for open spaces in KTAA by EKEO at detailed design stage with due regard to the planning intention of the public open space.

[4] The road improvement works, subject to detailed design under the Investigation, Design and Construction Study by the Civil Engineering and Development Department (CEDD), would be gazetted under the Roads (Works, Use and Compensation) Ordinance (Cap 370) and to be constructed by CEDD before completion of the proposed commercial development.

Land Use Compatibility, Development Intensity and Harbourfront Planning

6.2 Being at a prominent waterfront location in KTBA, the proposed commercial development with ample public open spaces would create synergy effect for the transformation of KTBA and bring vibrancy to the waterfront area. The development intensity for the commercial development recommended under the Study has taken into account the waterfront setting and the road capacities in the locality. The proposed maximum BH of 100mPD for the main portion of the proposed “C(2)” site is in line with the BH restriction (BHR) currently imposed for other waterfront sites in KTBA and would allow stepped BH profile descending from the inland area to the waterfront. Whereas the proposed BHR of 15mPD for the western portion of the proposed commercial development is similar to other sites zoned “G/IC(1)” in the vicinity and would be commensurate with the harbourfront setting. A lower BHR would also provide a transition from the dense hinterland area to the waterfront having regard to the Harbour Planning Guidelines and would facilitate air penetration along Hoi Yuen Road into inner area of KTBA.

Traffic and Transport Aspects

6.3 A TTIA (**Attachment Va**) was conducted under the Study to investigate the traffic impacts arising from the proposed development at KTAA[5] on the surrounding road network, to review the potential traffic implications, parking and L/UL provisions for the proposed commercial site, the vehicular access arrangement and to assess the pedestrian connectivity with KTAA and the waterfront. Noting that relevant junction improvement works would be implemented by CEDD as discussed in paragraph 6.4 below, the Commissioner for Transport (C for T) has no comment on the TTIA which confirmed the technical feasibility of the proposed development at KTAA from traffic perspective. Based on the TTIA, CEDD is conducting a review (the Traffic Review) under the ongoing Investigation, Design and Construction Study with updated traffic survey data and planning data.

Traffic Impact

6.4 According to the TTIA, with improvements proposed at three road junctions (**Plan 6e**) as detailed below, the nearby road junctions in the surrounding areas would be operating within capacity with the proposed development in KTAA at the peak hours in the design year of 2031. The TTIA recommended to convert the Hoi Yuen Road/Wai Yip Street roundabout into a signal-controlled junction with a new public road (i.e. Road L1) running parallel to Wai Yip Streetand other local road network reconfiguration/junction improvements (**Plan 6d**). This improvement measure is proposed to increase the traffic capacity of the junctions concerned and to serve the future development and the re-provisioned PTI via the proposed Road L1. It would also allow provision of at-grade pedestrian crossing and grade-separated pedestrian connection across Wai Yip Street (**Plan 6b**). In addition, the Wai Yip Street/Wai Fat Road junction would be improved, and the section of Lai Yip Street northbound between Kwun Tong Road and Hung To Road would be widened (**Plans 6f** to **6g)**.

6.5 As the additional traffic induced from the KTAA only accounts for minimal amount

[5] Based on the notional scheme with development parameters as set out in paragraph 5.3.

of the total traffic at the heavily trafficked Hoi Yuen Road/Kwun Tong Road/Hip Wo Street roundabout, no improvement scheme is recommended for this junction under the TTIA. The ongoing Traffic Review would look into the traffic implication of this junction amongst others and recommend improvement schemes, if necessary.

6.6 The PTI will continue to operate during the construction stage as a temporary PTI will be provided within KTAA to accommodate the public transport services before a permanent PTI is made available within the commercial development.

*Pedestrian Accessibility and Connections (**Plan 6b**)*

6.7 Multi-level pedestrian connections would be incorporated with a view to enhancing connectivity and accessibility to KTAA and further to the waterfront. The new at-grade pedestrian crossings across Hoi Yuen Road and Wai Yip Street supplemented by a proposed public footbridge across Wai Yip Street would better facilitate pedestrian movement along Hoi Yuen Road from the KTBA hinterland (including Kwun Tong MTR Station) to KTAA and further to the waterfront promenade. The existing footbridge connecting Manulife Financial Centre and Kwun Tong Passenger Ferry Pier across Wai Yip Street (**Plans 3** and **5a**) would be modified to connect directly to the podium deck of proposed commercial development. Vertical pedestrian facilities for barrier-free access within the proposed commercial development would be provided to enhance pedestrian connections to Kwun Tong Passenger Ferry Pier and the waterfront promenade[6].

6.8 An elevated walkway along Wai Yip Street connecting KBAA and KTAA is proposed under the Multi-modal Environmentally Friendly Linkage System for Kowloon East (**Plan 6c**). Possible connection to KTAA would be considered in detailed design for the proposed elevated walkway by CEDD.

Visual and Landscape Impacts

Visual Impact

6.9 To assess the visual and landscape impacts of the proposed development, a Landscape and Visual Impact Assessment (LVIA) is conducted under the Study (**Attachment Vb**). Key public view points (VPs) frequently visited by the public have been selected in long, medium and short ranges and photomontages have been prepared to illustrate the possible visual impacts. As illustrated in the photomontages, the proposed commercial development with proposed BH not exceeding 100mPD is likely to blend into the existing building groups with visual composition largely maintained. Thus, the proposed commercial development would not be visually excessive and would have slightly adverse/negligible visual impact from medium- and long-range VPs (**Plans 6h** and **6i**). Whereas from the short-range VP, the proposed commercial development would partially obstruct the sky view and openness; and thus would have slightly adverse visual impact (**Plan 6j**). With mitigation measures such as provision of green deck with amenity planting, at-grade open space and streetscape improvement as compared to the existing context, visual impact of the proposed commercial development would be partly mitigated. The Chief Town Planner/Urban Design and Landscape, PlanD (CTP/UD&L, PlanD) has

[6] The provision of pedestrian connections will be vetted under the relevant clauses of the lease conditions.

no adverse comment on the proposed rezoning from urban design and visual impact aspects.

Landscape Aspect and Provision of Open Spaces

6.10 According to the Tree Survey Report conducted under the Study (**Attachment Vc**), there are 238 nos. of trees identified within the KTAA project area as well as the central island of the Hoi Yuen Road/Wai Yip Street roundabout. No registered Old and Valuable Tree is found and all trees are common species and most are observed to be in fair to poor form, health and structural condition with medium to low amenity value. As most of the 238 nos. of trees would be affected by the proposed KTAA development, the Study proposes 40 nos. of trees to be retained, 35 nos. that are identified with medium amenity value and have a very good chance of recovering to its normal form be transplanted, and the remaining 163 nos. be fell. According to the tree compensation proposal, subject to detailed design, a total number of 287 nos. of Heavy Standard trees would be compensated (with a compensatory tree planting ratio of 1:1.76) in the proposed commercial development and its POSPD[7] as well as the proposed public open spaces/adjacent roadside amenity areas. CTP/UD&L, PlanD has no adverse comment on the proposed rezoning amendments from tree preservation and landscape perspectives.

6.11 While the area of the existing Kwun Tong Ferry Square cum Pet Garden site would be reduced upon rezoning, with the POSPD at the proposed commercial development[8] and the additional public open spaces at RO2 along the promenade and LO1 (**Plans 6a and 6b**), there will be a net increase of about 7,082m^2 in provision of public open space in the K14S Area (i.e. from about 4,883m^2 to about 11,965m^2) with overall improvement in terms of design and function aspects. In addition, a public open space at RO1 with an area of 3,325m^2 (not counted towards the said provision of 11,965m^2) would be designed in an integrated manner atop the underground storm water storage facility in the "OU(DFAPOS)" zone.

Air Ventilation Aspect

6.12 An Air Ventilation Assessment (AVA) by Computational Fluid Dynamics modelling has been conducted in November 2019 under the Study (**Attachment Vd**) which indicated that the KTAA project area rely on easterly (E), east-north easterly (ENE), and east-south easterly (ESE) winds to maintain air ventilation performance under annual condition. In summer condition, the prevailing winds are mainly coming from the south-westerly (SW), south-south-westerly (SSW) and west-south-westerly (WSW) directions. The OZP-compliant scheme and the notional scheme with proposed development intensity are assessed. With incorporation of good design measures (including provision of at-grade open spaces, at-grade permeable elements in the main podium, elevated green deck, building headroom clearance along the drainage reserve area (**Plan 6a**), a lower maximum BH of 15mPD on the western portion that generally aligns with Hoi Yuen Road), the proposed development would

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[7] The tree compensatory proposal will be vetted in the submission of the Landscape Master Plan for compliance with the lease conditions.

[8] Provision of a minimum of 6,500m^2 POSPD at ground level and/or deck level, and a minimum greening ratio of 30% of the site area (higher than that required for site of less than 2ha under the Sustainable Building Design Guidelines) would be specified in the lease.

maintain an overall comparable wind performance to that of the OZP-compliant scheme under both annual and summer conditions. CTP/UD&L, PlanD has no adverse comment on the proposed zoning amendments from air ventilation perspective.

Other Technical Aspects

6.13 Other technical assessments, namely Environmental Assessment including a Quantitative Risk Assessment (QRA) and a Land Contamination Assessment, Sustainability Assessment, Utility Impact Assessment, Water Supply Impact Assessment, Sewerage Impact Assessment, Drainage Impact Assessment and Geotechnical Assessment are conducted under the Study. It was concluded that the proposed development would not result in any adverse impacts on infrastructural capacities in the area. Concerned government departments including the Water Supplies Department, the Environmental Protection Department, DSD, CEDD, and the Geotechnical Engineering Office of the CEDD have no adverse comment on the technical assessments and the proposed rezoning.

7. Provision of Open Space and Major GIC Facilities

7.1 The planned population of the K14S Area is estimated to be about 318,400 persons. Based on the requirements in the HKPSG and the planned population, and taking into account the proposed rezoning (**Attachment VI)**, the planned provision of local open spaces and various community facilities in the K14S Area is generally sufficient except that there will be shortfall in district open space (-0.67ha), Child Care Centre (CCC) (-795 places), Community Care Services Facilities (including Day Care Centre for the Elderly (DE)) (-805 places), Residential Care Homes for the Elderly (RCHE) (-1,221 beds)[9] and one sports ground/sports complex.

7.2 District open space is intended to serve the district population, despite there will be a slight shortfall (-0.67ha) in the K14S Area, there will be a surplus of about +26ha in the Kwun Tong District. As discussed in paragraph 6.11 above, upon the proposed rezoning amendment, there will be a net increase in open spaces in K14S of about 7,082m^2, and an additional 3,325m^2 of public open space co-located on top of the underground storm water storage facility. In addition, there is existing and planned open space at Kwun Tong Promenade of about 3.9ha[10] that would serve the population.

7.3 As the proposed commercial development is not in close proximity to residential areas, SWD advises that provision of CCC might not be easily accessible to the target users

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[9] The population-based planning standards for elderly services and facilities have been incorporated into the HKPSG since December 2018, and such requirements are long-term goals and the actual provision would be subject to the consideration of SWD in the planning and development process as appropriate.

[10] Kwun Tong Promenade falls within the Kai Tak Planning Area and thus has not been taken into account in the open space provision **Attachment VI**, yet they would serve the recreational needs of the population.

and that RCHE within a business area is considered not appropriate. Instead, SWD advised a number of other welfare facilities as indicated in paragraph 5.3 above to be provided in the proposed commercial development. For the shortfall of one sports ground/sports complex with a minimum site requirement of 3ha in size, opportunity for such provision in the Kwun Tong District will be considered by the Leisure and Cultural Services Department when suitable site can be identified.

8. Proposed Amendments to Matters shown on the Plan (Attachment II)

The proposed amendments to the approved Kwun Tong (South) OZP No. S/K14S/22 are summarized below:

(a) Amendment Item A (about 1.37 ha) (**Plan 2**)
Rezoning the site to the south of the Hoi Yuen Road/Wai Yip Street junction from "G/IC(1)", "O" and areas shown as 'Road' to "C(2)" with stipulation of maximum GFA of 86,650m^2 and BHRs of 100mPD (for the eastern portion) and 15mPD (for the western portion).

(b) Amendment Item B1 (about 2,480m^2) (**Plan 2**)
Rezoning of parcels of land to the south and southwest of the proposed "C(2)" zone and south of the Hoi Yuen Road/Wai Yip Street junction from "G/IC(1)" and areas shown as 'Road' to "O".

(c) Amendment Item B2 (about 1,160m^2) (**Plan 2**)
Rezoning of a parcel of land to the west of the Hoi Yuen Road/Wai Yip Street junction from "G/IC(1)" and an area shown as 'Road' to "O(1)".

(d) Amendment Item B3 (about 3,325m^2) (**Plan 2**)
Rezoning of a parcel of land to the northwest of the proposed "C(2)" zone from "G/IC(1)" to "OU(DFAPOS)" with stipulation of BHR of 1 storey.

(e) Amendment Item C (about 1,933m^2) (**Plan 2**)
Rezoning of Kei Yip Lane and two strips of land from "G/IC(1)" to areas shown as 'Road'.

9. Proposed Amendments to the Notes of the OZP (Attachment III)

Amendment Items A to C

9.1 In relation to **Item A1**, the Notes for the "C(1)" zone is revised to "C" with incorporation of planning intention as well as remarks for the "C(2)" zone to include the GFA and BH restrictions. The requirements to provide GIC facilities and PTI at "C(2)" zone, as required by the Government, will be added. To facilitate the provision of required GIC facilities, a new clause under the Remarks for disregarding the floor space of GIC facilities, as required by the Government, in the maximum GFA calculation for the "C(2)" zone will be incorporated.

9.2 In relation to **Item B2**, 'Public Utility Installation (on land designated "O(1)" only)' will be added to Column 1 and the corresponding Column 2 use will be amended to 'Public Utility Installation (not elsewhere specified)' for the "O" zone. A planning intention of the "O(1)" zone will be added to state that provision of minor public utility installations is always permitted.

9.3 In relation to **Item B3**, the Notes and the Remarks for "OU" zone will be revised to reflect the planning intention and the BHR for the "OU(DFAPOS)" sub-zone.

Technical Amendments

9.4 In accordance with the latest amendments to the MSN in relation to the subsuming of 'Market' use under 'Shop and Services' use as endorsed by the Board on 28.12.2018, the following amendments to the Notes will be made:

(a) deletion of 'Market' from Column 1 use in the "C" zone;

(b) deletion of 'Market' from Column 2 use in the "Residential (Group B)" zone; and

(c) revising 'Shop and Services' to 'Shop and Services (not elsewhere specified)' in Column 2 of the "Residential (Group A)" and "G/IC" zones.

9.5 The proposed amendments to the Notes of the OZP (with additions in ***bold and italics*** and deletions in '~~crossed out~~') are at **Attachment III** for Members' consideration.

10. Revision to the ES of the OZP (Attachment IV)

The ES of the OZP has been revised to take into account the proposed amendments as mentioned in the above paragraphs. Opportunity has also been taken to update the general information for various land use zones to reflect the latest status and planning circumstances of the OZP. The proposed amendments to the ES of the OZP (with additions in ***bold and italics*** and deletions in '~~crossed out~~') are at **Attachment IV** for Members' consideration.

11. Plan Number

Upon exhibition for public inspection, the OZP will be renumbered as S/K14S/23.

12. Consultation

Departmental Consultation

12.1 The proposed amendments have been circulated to the following relevant bureaux/departments (B/Ds) and they have no objection to/no adverse comment on the proposed amendments:

(a) EKEO, DEVB;
(b) C for T;

(c) Director of Environmental Protection;
(d) Project Manager (East), CEDD;
(e) Chief Building Surveyor/Kowloon, Buildings Department;
(f) Chief Engineer/Development(2), Water Supplies Department;
(g) Chief Engineer/Mainland South, DSD;
(h) Chief Highway Engineer/Kowloon, Highways Department;
(i) Chief Project Manager/Project Management Branch 3, Architectural Services Department;
(j) Commissioner of Police;
(k) Director of Social Welfare;
(l) Director of Food and Environmental Hygiene;
(m) Director of Leisure and Cultural Services;
(n) District Lands Officer/Kowloon East, Lands Department;
(o) Director of Agriculture, Fisheries and Conservation;
(p) Director of Electrical and Mechanical Services;
(q) Director of Fire Services;
(r) District Officer (Kwun Tong), Home Affairs Department;
(s) Government Property Administrator;
(t) Head of the Geotechnical Engineering Office, CEDD and
(u) CTP/UD&L, PlanD.

Consultations with KTDC and Task Force

12.2 EKEO has consulted the Kwun Tong Development and Renewal Task Force of KTDC on 2.4.2019 and 24.9.2019, and the Task Force on 15.5.2019 on the RODP. Concerns of the Members of KTDC were mainly on the need to have sufficient provision of parking spaces, the effectiveness of the proposed modification to the Hoi Yuen Road/Wai Yip Street junction from a roundabout to a signal-controlled junction, possible visual and air ventilation aspects of the proposed commercial development, and other district traffic issues such as the possibility of erection of elevated walkway along Hoi Yuen Road to facilitate pedestrian movement between KTAA and Kwun Tong MTR Station and status of the Environmentally Friendly Linkage System. Members of the Task Force raised concern about the possible visual impact of the notional development scheme, pedestrian connectivity from the inland area to the promenade and the vertical pedestrian connections between the podium deck and the at-grade open spaces, the possibility to relocate the DGV queuing area and swap the location of the PTI with LO2 for better integration of the open spaces, to improve the vibrancy of the waterfront for providing more retail activities, and to provide more GIC facilities in the development. The minutes of the KTDC and Task Force meetings are attached at **Attachment VIIa** to **VIIc**.

12.3 Regarding the concerns on traffic aspects, the proposed modification to the Hoi Yuen Road/Wai Yip Street junction would improve the traffic capacity as mentioned in paragraph 6.4 above and a PVP as required by the TD would be provided within the site to address the parking demand in the area. The size of the PTI has been optimized with new passenger waiting area, and its proposed location has taken into account the circulation requirement associated with the proposed road improvements. The LVIA and AVA conducted under the Study have demonstrated that the proposed commercial development with ample at-grade and podium deck open spaces would be acceptable from visual and air ventilation aspects. As indicated in **Plan 6b**, the pedestrian accessibility to the waterfront area would generally be improved as compared to the existing context. As for the DGV queuing area, there is an operational need to transport the dangerous goods across the harbour by ferry thus it has to be retained in-situ; yet the size of the queuing area has been optimised and the QRA was conducted to ascertain its technical feasibility. To facilitate the provision of GIC facilities, a clause to exempt the floor space of such facilities as required by the Government in GFA calculation is incorporated in the "C(2)" zone.

Public Consultation (After Exhibition of OZP)

12.4 If the proposed amendments are agreed by the Committee, the draft OZP (to be renumbered to S/K14S/23 upon exhibition) and its Notes will be exhibited under section 5 of the Ordinance for public inspection. Members of the public can submit representations on the OZP to the Board during the two-month statutory public inspection period.

13. Decision Sought

Members are invited to:

(a) agree to the proposed amendments to the approved Kwun Tong (South) OZP and that the draft Kwun Tong (South) OZP No. S/K14S/22A at **Attachment II** (to be renumbered to S/K14S/23 upon exhibition) and its Notes at **Attachment III** are suitable for exhibition under section 5 of the Ordinance; and

(b) adopt the revised ES at **Attachment IV** for the draft Kwun Tong (South) OZP No. S/K14S/23 as an expression of the planning intentions and objectives of the Board for various land use zonings of the OZP and agree that the revised ES is suitable for publication together with the OZP.

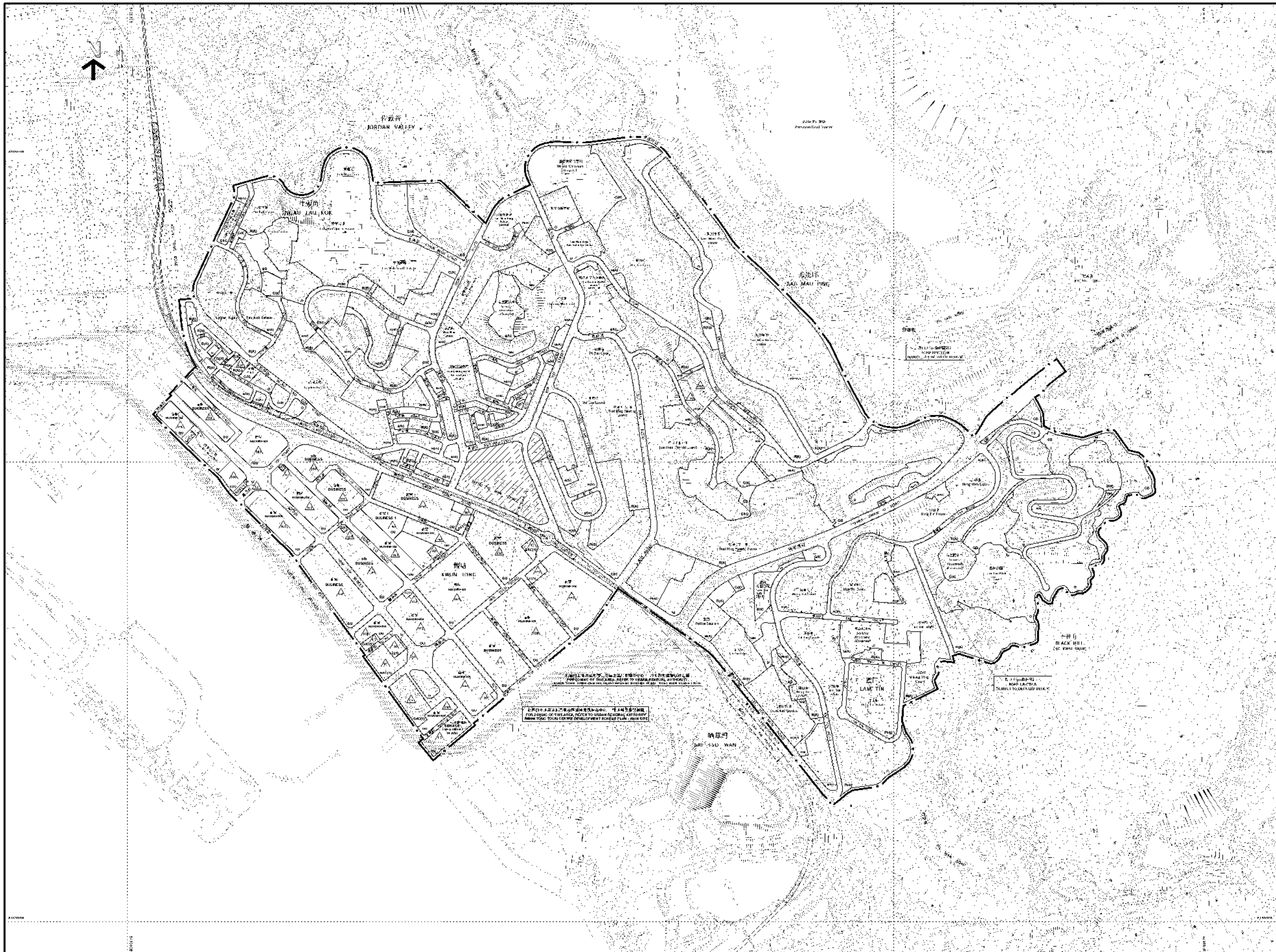
14. Attachments

Attachment I	Approved Kwun Tong (South) Outline Zoning Plan (OZP) No. S/K14S/22 (reduced size)
Attachment II	Draft Kwun Tong (South) OZP No. S/K14S/22A
Attachment III	Revised Notes of the Draft Kwun Tong (South) OZP No. S/K14S/22A
Attachment IV	Revised Explanatory Statement of the Draft Kwun Tong (South) OZP No. S/K14S/22A
Attachment Va	Traffic and Transport Impact Assessment
Attachment Vb	Landscape and Visual Impact Assessment
Attachment Vc	Tree Survey Report
Attachment Vd	Air Ventilation Assessment
Attachment VI	Provision of Major Community Facilities and Open Space in the K14S Planning Scheme Area
Attachment VIIa	Extract of Minutes of the Kwun Tong Development and Renewal Task Force of Kwun Tong District Council Meeting held on 2.4.2019
Attachment VIIb	Extract of Meeting Minutes of the Kwun Tong Development and Renewal Task Force of Kwun Tong District Council Meeting held

	on 24.9.2019
Attachment VIIc	Extract of Minutes of the Task Force on Kai Tak Harbourfront Development Meeting held on 15.5.2019
Plans 1 and **2**	Location Plans
Plan 3	Site Plan
Plan 4	Aerial Photo
Plans 5a to **5c**	Site Photos
Plan 6a	Recommended Outline Development Plan for Kwun Tong Action Area
Plan 6b	Pedestrian Accessibility Plan
Plan 6c	Proposed Elevated Walkway under the Multi-modal Environmentally Friendly Linkage System between KTBA and KTAA
Plan 6d	Proposed Junction Improvement and Local Road Network and Reprovisioning of Public Transport Interchange
Plan 6e	Proposed Junction Improvements – Location Plan
Plans 6f to **6g**	Proposed Junction Improvements
Plans 6h to **6j**	Photomontages

PLANNING DEPARTMENT
February 2021

Attachment I of
MPC Paper No. 2/21



圖例
NOTATION

ZONES		地帶
COMMERCIAL	C	商業
RESIDENTIAL (GROUP A)	R(A)	住宅（甲類）
RESIDENTIAL (GROUP B)	R(B)	住宅（乙類）
GOVERNMENT, INSTITUTION OR COMMUNITY	G/IC	政府、機構或社區
OPEN SPACE	O	休憩用地
OTHER SPECIFIED USES	OU	其他指定用途
GREEN BELT	GB	綠化地帶

COMMUNICATIONS		交通
RAILWAY AND STATION		鐵路及車站
RAILWAY AND STATION (UNDERGROUND)		鐵路及車站（地下）
RAILWAY AND STATION (ELEVATED)		鐵路及車站（高架）
MAJOR ROAD AND JUNCTION		主要道路及路口
ELEVATED ROAD		高架道路

MISCELLANEOUS		其他
BOUNDARY OF PLANNING SCHEME		規劃範圍界線
URBAN RENEWAL AUTHORITY DEVELOPMENT SCHEME PLAN AREA		市區重建局發展計劃圖範圍
BUILDING HEIGHT CONTROL ZONE BOUNDARY		建築物高度管制區界線
MAXIMUM BUILDING HEIGHT (IN METRES ABOVE PRINCIPAL DATUM)		最高建築物高度（在主水平基準上若干米）
PETROL FILLING STATION	P F S	加油站

土地用途及面積一覽表
SCHEDULE OF USES AND AREAS

USES	大約面積及百分率 APPROXIMATE AREA & % 公頃 HECTARES	% 百分率	用途
COMMERCIAL	1.21	0.31	商業
RESIDENTIAL (GROUP A)	[illegible]	[illegible]	住宅（甲類）
RESIDENTIAL (GROUP B)	14.46	3.73	住宅（乙類）
GOVERNMENT, INSTITUTION OR COMMUNITY	[illegible]	[illegible]	政府、機構或社區
OPEN SPACE	41.43	10.69	休憩用地
OTHER SPECIFIED USES	46.82	[illegible]	其他指定用途
GREEN BELT	[illegible]	[illegible]	綠化地帶
NULLAH	0.05	0.02	明渠
MAJOR ROAD ETC.	[illegible]	[illegible]	主要道路等
URBAN RENEWAL AUTHORITY DEVELOPMENT SCHEME PLAN AREA	5.06	1.31	市區重建局發展計劃圖範圍
TOTAL PLANNING SCHEME AREA	387.40	100.00	規劃範圍總面積

夾附的《註釋》屬這份圖則的一部分
THE ATTACHED NOTES ALSO FORM PART OF THIS PLAN

行政長官會同行政會議於2018年10月30日根據城市規劃條例第9（1）（a）條核准的圖則
APPROVED BY THE CHIEF EXECUTIVE IN COUNCIL UNDER SECTION 9(1)(a) OF THE TOWN PLANNING ORDINANCE ON 30 OCTOBER 2018

Signed Ms Wendy LEUNG 梁慧儀女士 簽署
CLERK TO THE EXECUTIVE COUNCIL 行政會議秘書

香港城市規劃委員會依據城市規劃條例擬備的觀塘南部（九龍規劃區第14區部分）分區計劃大綱圖
TOWN PLANNING ORDINANCE, HONG KONG TOWN PLANNING BOARD
KOWLOON PLANNING AREA No. 14 (PART) - KWUN TONG (SOUTH) - OUTLINE ZONING PLAN

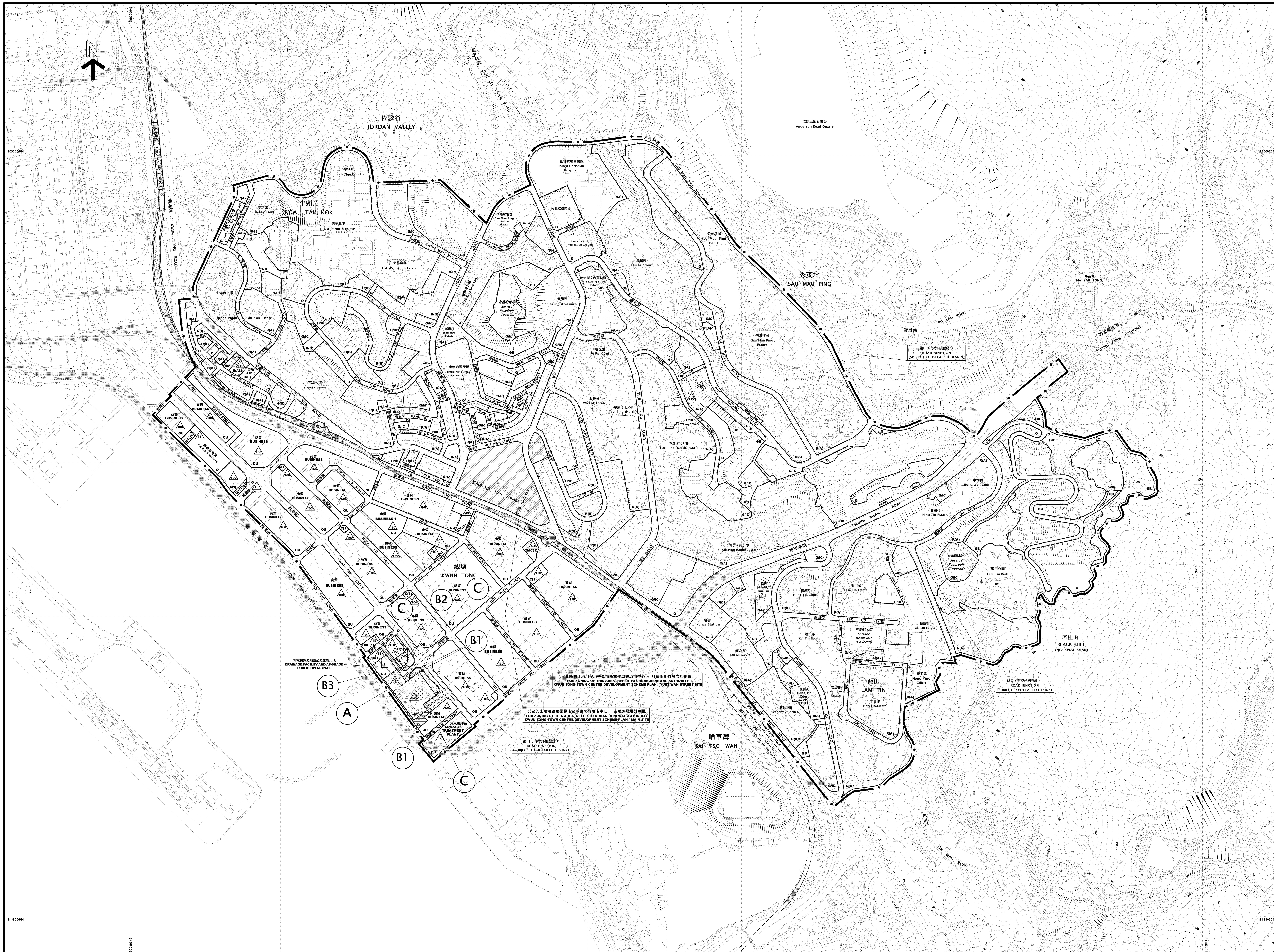
METRES 100 0 100 200 300 400 500 米 METRES

規劃署遵照城市規劃委員會指示擬備
PREPARED BY THE PLANNING DEPARTMENT UNDER THE DIRECTION OF THE TOWN PLANNING BOARD

圖則編號
PLAN No. S/K14S/22

本摘要圖於2021年2月5日擬備
EXTRACT PLAN PREPARED ON 5.2.2021

參考編號 REFERENCE No. M/K14S/20/49



Attachment II of
MPC Paper No. 2/21

圖例
NOTATION

ZONES 地帶

COMMERCIAL	C	商業
RESIDENTIAL (GROUP A)	R(A)	住宅（甲類）
RESIDENTIAL (GROUP B)	R(B)	住宅（乙類）
GOVERNMENT, INSTITUTION OR COMMUNITY	G/IC	政府、機構或社區
OPEN SPACE	O	休憩用地
OTHER SPECIFIED USES	OU	其他指定用途
GREEN BELT	GB	綠化地帶

COMMUNICATIONS 交通

RAILWAY AND STATION	車站 STATION	鐵路及車站
RAILWAY AND STATION (UNDERGROUND)	車站 STATION	鐵路及車站（地下）
RAILWAY AND STATION (ELEVATED)	車站 STATION	鐵路及車站（高架）
MAJOR ROAD AND JUNCTION		主要道路及路口
ELEVATED ROAD		高架道路

MISCELLANEOUS 其他

BOUNDARY OF PLANNING SCHEME		規劃範圍界線
URBAN RENEWAL AUTHORITY DEVELOPMENT SCHEME PLAN AREA		市區重建局發展計劃圖範圍
BUILDING HEIGHT CONTROL ZONE BOUNDARY		建築物高度管制區界線
MAXIMUM BUILDING HEIGHT (IN METRES ABOVE PRINCIPAL DATUM)	100	最高建築物高度（在主水平基準上若干米）
MAXIMUM BUILDING HEIGHT (IN NUMBER OF STOREYS)	1	最高建築物高度（樓層數目）
PETROL FILLING STATION	P F S	加油站

土地用途及面積一覽表
SCHEDULE OF USES AND AREAS

USES	大約面積及百分率 APPROXIMATE AREA & %		用途
	公頃 HECTARES	% 百分率	
COMMERCIAL	2.58	0.67	商業
RESIDENTIAL (GROUP A)	137.73	35.55	住宅（甲類）
RESIDENTIAL (GROUP B)	14.46	3.73	住宅（乙類）
GOVERNMENT, INSTITUTION OR COMMUNITY	43.32	11.18	政府、機構或社區
OPEN SPACE	41.49	10.71	休憩用地
OTHER SPECIFIED USES	47.16	12.17	其他指定用途
GREEN BELT	28.50	7.36	綠化地帶
NULLAH	0.09	0.02	明渠
MAJOR ROAD ETC.	67.01	17.30	主要道路等
URBAN RENEWAL AUTHORITY DEVELOPMENT SCHEME PLAN AREA	5.06	1.31	市區重建局發展計劃圖範圍
TOTAL PLANNING SCHEME AREA	387.40	100.00	規劃範圍總面積

夾附的《註釋》屬這份圖則的一部分，
現經修訂並按照城市規劃條例第5條展示。
THE ATTACHED NOTES ALSO FORM PART OF THIS PLAN AND HAVE BEEN AMENDED FOR EXHIBITION UNDER SECTION 5 OF THE TOWN PLANNING ORDINANCE

核准圖編號 S/K14S/22 的修訂
AMENDMENTS TO APPROVED PLAN No. S/K14S/22

AMENDMENTS EXHIBITED UNDER SECTION 5 OF THE TOWN PLANNING ORDINANCE		按照城市規劃條例第5條展示的修訂
AMENDMENT ITEM A		修訂項目A項
AMENDMENT ITEM B1		修訂項目B1項
AMENDMENT ITEM B2		修訂項目B2項
AMENDMENT ITEM B3		修訂項目B3項
AMENDMENT ITEM C		修訂項目C項

（參看附表）
(SEE ATTACHED SCHEDULE)

香港城市規劃委員會依據城市規劃條例擬備的觀塘南部（九龍規劃區第14區部分）分區計劃大綱圖
TOWN PLANNING ORDINANCE, HONG KONG TOWN PLANNING BOARD
KOWLOON PLANNING AREA No. 14 (PART) - KWUN TONG (SOUTH) - OUTLINE ZONING PLAN

SCALE 1:5000 比例尺

METRES 100 0 200 400 600 800 METRES

規劃署遵照城市規劃委員會指示擬備
PREPARED BY THE PLANNING DEPARTMENT UNDER THE DIRECTION OF THE TOWN PLANNING BOARD

圖則編號 PLAN No. S/K14S/22A

KOWLOON PLANNING AREA NO. 14 (PART)

~~APPROVED~~ *DRAFT* KWUN TONG (SOUTH) OUTLINE ZONING PLAN NO. S/K14S/22*A*

(Being ~~an Approved~~ ***a Draft*** Plan for the Purposes of the Town Planning Ordinance)

NOTES

(N.B. These form part of the Plan)

(1) These Notes show the uses or developments on land falling within the boundaries of the Plan which are always permitted and which may be permitted by the Town Planning Board, with or without conditions, on application. Where permission from the Town Planning Board for a use or development is required, the application for such permission should be made in a prescribed form. The application shall be addressed to the Secretary of the Town Planning Board, from whom the prescribed application form may be obtained.

(2) Any use or development which is always permitted or may be permitted in accordance with these Notes must also conform to any other relevant legislation, the conditions of the Government lease concerned, and any other Government requirements, as may be applicable.

(3) (a) No action is required to make the existing use of any land or building conform to this Plan until there is a material change of use or the building is redeveloped.

(b) Any material change of use or any other development (except minor alteration and/or modification to the development of the land or building in respect of the existing use which is always permitted) or redevelopment must be always permitted in terms of the Plan or, if permission is required, in accordance with the permission granted by the Town Planning Board.

(c) For the purposes of subparagraph (a) above, "existing use of any land or building" means -

(i) before the publication in the Gazette of the notice of the first statutory plan covering the land or building (hereafter referred as 'the first plan'),

- a use in existence before the publication of the first plan which has continued since it came into existence; or
- a use or a change of use approved under the Buildings Ordinance which relates to an existing building; and

(ii) after the publication of the first plan,

- a use permitted under a plan which was effected during the effective period of that plan and has continued since it was effected; or

- a use or a change of use approved under the Buildings Ordinance which relates to an existing building and permitted under a plan prevailing at the time when the use or change of use was approved.

(4) Except as otherwise specified by the Town Planning Board, when a use or material change of use is effected or a development or redevelopment is undertaken, as always permitted in terms of the Plan or in accordance with a permission granted by the Town Planning Board, all permissions granted by the Town Planning Board in respect of the site of the use or material change of use or development or redevelopment shall lapse.

(5) Road junctions, alignments of roads and railway tracks, and boundaries between zones may be subject to minor adjustments as detailed planning proceeds.

(6) Temporary uses (expected to be 5 years or less) of any land or buildings are always permitted as long as they comply with any other relevant legislation, the conditions of the Government lease concerned, and any other Government requirements, and there is no need for these to conform to the zoned use or these Notes. For temporary uses expected to be over 5 years, the uses must conform to the zoned use or these Notes.

(7) The following uses or developments are always permitted on land falling within the boundaries of the Plan except where the uses or developments are specified in Column 2 of the Notes of individual zones:

(a) provision, maintenance or repair of plant nursery, amenity planting, open space, rain shelter, refreshment kiosk, road, bus/public light bus stop or lay-by, cycle track, Mass Transit Railway station entrance, Mass Transit Railway structure below ground level, taxi rank, nullah, public utility pipeline, electricity mast, lamp pole, telephone booth, telecommunications radio base station, automatic teller machine and shrine;

(b) geotechnical works, local public works, road works, sewerage works, drainage works, environmental improvement works, marine related facilities, waterworks (excluding works on service reservoir) and such other public works co-ordinated or implemented by Government; and

(c) maintenance or repair of watercourse and grave.

(8) In any area shown as ‘Road’, all uses or developments except those specified in paragraph (7) above and those specified below require permission from the Town Planning Board:

toll plaza, on-street vehicle park and railway track.

(9) Unless otherwise specified, all building, engineering and other operations incidental to and all uses directly related and ancillary to the permitted uses and developments within the same zone are always permitted and no separate permission is required.

(10) In these Notes, “existing building” means a building, including a structure, which is physically existing and is in compliance with any relevant legislation and the conditions of the Government lease concerned.

KOWLOON PLANNING AREA NO. 14 (PART)

~~APPROVED~~ *DRAFT* KWUN TONG (SOUTH)
OUTLINE ZONING PLAN NO. S/K14S/22*A*

Schedule of Uses

COMMERCIAL ~~(1)~~

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board
Ambulance Depot Commercial Bathhouse/Massage Establishment Eating Place Educational Institution Exhibition or Convention Hall Government Use (not elsewhere specified) Information Technology and Telecommunications Industries Institutional Use (not elsewhere specified) Library ~~Market~~ Off-course Betting Centre Office Place of Entertainment Place of Recreation, Sports or Culture Private Club Public Clinic Public Convenience Public Transport Terminus or Station Public Utility Installation Public Vehicle Park (excluding container vehicle) Radar, Telecommunications Electronic Microwave Repeater, Television and/or Radio Transmitter Installation Recyclable Collection Centre Religious Institution Research, Design and Development Centre School Shop and Services Social Welfare Facility (excluding those involving residential care) Training Centre Utility Installation for Private Project	Broadcasting, Television and/or Film Studio Cargo Handling and Forwarding Facility Government Refuse Collection Point Hospital Hotel Mass Transit Railway Vent Shaft and/or Other Structure above Ground Level other than Entrances Petrol Filling Station Wholesale Trade

(Please see next page)

COMMERCIAL ~~(1)~~ (Cont'd)

Planning Intention

This zone is intended primarily for commercial developments, which may include ***uses such as office,*** shop, service***s***, place of entertainment and eating place ~~serving the needs of local workers.~~***, functioning as territorial business/financial centre(s) and regional or district commercial/ shopping centre(s). These areas are usually major employment nodes***.

Remarks

(1) ***On land designated "Commercial (1)",*** ~~N~~***n***o new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of a maximum plot ratio of 12.0, and the maximum building heights, in terms of metres above Principal Datum ***(mPD)***, as stipulated on the Plan, or the plot ratio and height of the existing building, whichever is the greater.

(2) On land designated "Commercial (2)", no new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of a maximum gross floor area of 86,650m², and the maximum building height in terms of mPD as stipulated on the Plan, or the gross floor area and height of the existing building, whichever is the greater. A public transport interchange and Government, Institution or Community (GIC) facilities, as required by the Government, shall be provided.

(~~2~~***3***) In determining the ***relevant*** maximum plot ratio***/gross floor area*** for the purposes of paragraph***s*** (1) ***and (2)*** above, any floor space that is constructed or intended for use solely as car park, loading/unloading bay, plant room and caretaker's office, provided such uses and facilities are ancillary and directly related to the development or redevelopment, may be disregarded. ***Any floor space that is constructed or intended for use solely as GIC facilities, as required by the Government, on land designated "Commercial (2)", may also be disregarded.***

(~~3~~***4***) Where the permitted plot ratio as defined in Building (Planning) Regulations is permitted to be exceeded in circumstances as set out in Regulation 22(1) or (2) of the said Regulations, the plot ratio***/gross floor area*** for the building on land to which paragraph***s*** (1) ***and (2) above*** applies may be increased by the additional plot ratio by which the permitted plot ratio is permitted to be exceeded under and in accordance with the said Regulation 22(1) or (2), notwithstanding that the relevant maximum plot ratio***/gross floor area*** specified in paragraph***s*** (1) ***and (2)*** above may thereby be exceeded.

(~~4~~***5***) Based on the individual merits of a development or redevelopment proposal, minor relaxation of the plot ratio***/gross floor area/***building height restrictions stated in paragraph***s*** (1) ***and (2)*** above may be considered by the Town Planning Board on application under section 16 of the Town Planning Ordinance.

RESIDENTIAL (GROUP A)

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board
Ambulance Depot Flat Government Refuse Collection Point (on land designated "Residential (Group A)3" only) Government Use (not elsewhere specified) House Library Market Place of Recreation, Sports or Culture Public Clinic Public Transport Terminus or Station (excluding open-air terminus or station) Residential Institution School (in free-standing purpose-designed building only) Social Welfare Facility Utility Installation for Private Project	Commercial Bathhouse/Massage Establishment Eating Place Educational Institution Exhibition or Convention Hall Government Refuse Collection Point (not elsewhere specified) Hospital Hotel Institutional Use (not elsewhere specified) Mass Transit Railway Vent Shaft and/or Other Structure above Ground Level other than Entrances Office Petrol Filling Station Place of Entertainment Private Club Public Convenience Public Transport Terminus or Station (not elsewhere specified) Public Utility Installation Public Vehicle Park (excluding container vehicle) Religious Institution School (not elsewhere specified) Shop and Services ***(not elsewhere specified)*** Training Centre

(Please see next page)

RESIDENTIAL (GROUP A) (Cont'd)

In addition, the following uses are always permitted (a) on the lowest three floors of a building, taken to include basements; or (b) in the purpose-designed non-residential portion of an existing building, both excluding floors containing wholly or mainly car parking, loading/unloading bays and/or plant room :

Eating Place
Educational Institution
Institutional Use (not elsewhere specified)
Off-course Betting Centre
Office
Place of Entertainment
Private Club
Public Convenience
Recyclable Collection Centre
School
Shop and Services
Training Centre

Planning Intention

This zone is intended primarily for high-density residential developments. Commercial uses are always permitted on the lowest three floors of a building or in the purpose-designed non-residential portion of an existing building.

Remarks

(1) On land designated "Residential (Group A)" and "Residential (Group A)3", no new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in the plot ratio for the building upon development and/or redevelopment in excess of 7.5 for a domestic building or 9.0 for a building that is partly domestic and partly non-domestic, or the plot ratio of the existing building, whichever is the greater. Except where the plot ratio is permitted to be exceeded under paragraphs (9) and/or (10) hereof, under no circumstances shall the plot ratio for the domestic part of any building, to which this paragraph applies, exceed 7.5.

(2) On land designated "Residential (Group A)" and "Residential (Group A)3", for a non-domestic building to be erected on the site, the maximum plot ratio shall not exceed 9.0 except where the plot ratio is permitted to be exceeded under paragraphs (9) and/or (10) hereof.

(Please see next page)

RESIDENTIAL (GROUP A) (Cont'd)

Remarks (Cont'd)

(3) On land designated "Residential (Group A)1", no new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of a maximum domestic gross floor area of 134,352m^2.

(4) On land designated "Residential (Group A)2", no new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of the maximum domestic and non-domestic plot ratio of 4.5 and 1.5 respectively, and the maximum building height of 150 metres above Principal Datum (mPD), or the plot ratio and height of the existing building, whichever is the greater.

(5) For the purpose of paragraphs (1) and (4), on land designated "Residential (Group A)", "Residential (Group A)2" and "Residential (Group A)3", no addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of the relevant maximum domestic and/or non-domestic plot ratio(s), or the domestic and/or non-domestic plot ratio(s) of the existing building, whichever is the greater, subject to, as applicable-

(a) the plot ratio(s) of the existing building shall apply only if any addition, alteration and/or modification to or redevelopment of an existing building is for the same type of building as the existing building, i.e. domestic, non-domestic, or partly domestic and partly non-domestic building; or

(b) the maximum domestic and/or non-domestic plot ratio(s) stated in paragraphs (1) and (4) above shall apply if any addition, alteration and/or modification to or redevelopment of an existing building is not for the same type of building as the existing building, i.e. domestic, non-domestic, or partly domestic and partly non-domestic building.

(6) On land designated "Residential (Group A)" abutting both Hiu Ming Street and Hiu Kwong Street and land designated "Residential (Group A)3", no new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of the maximum building height, in terms of mPD, as stipulated on the Plan, or the height of the existing building, whichever is the greater.

(7) In determining the relevant maximum plot ratio for the purposes of paragraphs (1), (2) and (4) above, area of any part of the site that is occupied or intended to be occupied by free-standing purpose-designed buildings (including both developed on ground and on podium level) solely for accommodating ~~Government, institution or community~~ ***GIC*** facilities including school(s) as may be required by Government shall be deducted in calculating the relevant site area.

(Please see next page)

RESIDENTIAL (GROUP A) (Cont'd)

Remarks (Cont'd)

(8) In determining the relevant maximum plot ratio/gross floor area for the purposes of paragraphs (1) to (4) above, any floor space that is constructed or intended for use solely as car park, loading/unloading bay, plant room and caretaker's office, or caretaker's quarters and recreational facilities for the use and benefit of all the owners or occupiers of the domestic building or domestic part of the building, provided such uses and facilities are ancillary and directly related to the development or redevelopment, may be disregarded.

(9) Where the permitted plot ratio as defined in Building (Planning) Regulations is permitted to be exceeded in circumstances as set out in Regulation 22(1) or (2) of the said Regulations, the plot ratio/gross floor area for the building on land to which paragraphs (1), (2), (3) or (4) above applies may be increased by the additional plot ratio by which the permitted plot ratio is permitted to be exceeded under and in accordance with the said Regulation 22(1) or (2), notwithstanding that the relevant maximum plot ratio/gross floor area specified in paragraphs (1) to (4) above may thereby be exceeded.

(10) Based on the individual merits of a development or redevelopment proposal, minor relaxation of the plot ratio/gross floor area/building height restrictions stated in paragraphs (1) to (4) and (6) above may be considered by the Town Planning Board on application under section 16 of the Town Planning Ordinance.

RESIDENTIAL (GROUP B)

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board
Flat Government Use (Police Reporting Centre, Post Office only) House Library Residential Institution School (in free-standing purpose-designed building only) Utility Installation for Private Project	Ambulance Depot Eating Place Educational Institution Government Refuse Collection Point Government Use (not elsewhere specified) Hospital Hotel Institutional Use (not elsewhere specified) ~~Market~~ Mass Transit Railway Vent Shaft and/or Other Structure above Ground Level other than Entrances Off-course Betting Centre Office Petrol Filling Station Place of Entertainment Place of Recreation, Sports or Culture Private Club Public Clinic Public Convenience Public Transport Terminus or Station Public Utility Installation Public Vehicle Park (excluding container vehicle) Recyclable Collection Centre Religious Institution School (not elsewhere specified) Shop and Services Social Welfare Facility Training Centre

Planning Intention

This zone is intended primarily for medium-density residential developments where commercial uses serving the residential neighbourhood may be permitted on application to the Town Planning Board.

(Please see next page)

RESIDENTIAL (GROUP B) (Cont'd)

Remarks

(1) No new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of a maximum plot ratio of 5.0, or the plot ratio of the existing building, whichever is the greater.

(2) In determining the maximum plot ratio for the purposes of paragraph (1), any floor space that is constructed or intended for use solely as car park, loading/unloading bay, plant room and caretakers' office or caretakers' quarters and recreational facilities for the use and benefit of all the owners or occupiers of the domestic building or domestic part of the building, provided such uses and facilities are ancillary and directly related to the development or redevelopment, may be disregarded.

(3) Based on the individual merits of a development or redevelopment proposal, minor relaxation of the plot ratio restriction stated in paragraph (1) above may be considered by the Town Planning Board on application under section 16 of the Town Planning Ordinance.

GOVERNMENT, INSTITUTION OR COMMUNITY

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board
Ambulance Depot Animal Quarantine Centre (in Government building only) Broadcasting, Television and/or Film Studio Cable Car Route and Terminal Building Eating Place (Canteen, Cooked Food Centre only) Educational Institution Exhibition or Convention Hall Field Study/Education/Visitor Centre Government Refuse Collection Point Government Use (not elsewhere specified) Hospital Institutional Use (not elsewhere specified) Library Market Place of Recreation, Sports or Culture Public Clinic Public Convenience Public Transport Terminus or Station Public Utility Installation Public Vehicle Park (excluding container vehicle) Recyclable Collection Centre Religious Institution Research, Design and Development Centre School Service Reservoir Social Welfare Facility Training Centre Wholesale Trade	Animal Boarding Establishment Animal Quarantine Centre (not elsewhere specified) Columbarium Correctional Institution Crematorium Driving School Eating Place (not elsewhere specified) Flat Funeral Facility Helicopter Landing Pad Helicopter Fuelling Station Holiday Camp Hotel House Mass Transit Railway Vent Shaft and/or Other Structure above Ground Level other than Entrances Off-course Betting Centre Office Petrol Filling Station Place of Entertainment Private Club Radar, Telecommunications Electronic Microwave Repeater, Television and/or Radio Transmitter Installation Refuse Disposal Installation (Refuse Transfer Station only) Residential Institution Sewage Treatment/Screening Plant Shop and Services ***(not elsewhere specified)*** Utility Installation for Private Project Zoo

Planning Intention

This zone is intended primarily for the provision of Government, institution or community facilities serving the needs of the local residents and/or a wider district, region or the territory. It is also intended to provide land for uses directly related to or in support of the work of the Government, organizations providing social services to meet community needs, and other institutional establishments.

(Please see next page)

GOVERNMENT, INSTITUTION OR COMMUNITY (Cont'd)

Remarks

(1) On land designated "Government, Institution or Community (1)", no new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of the maximum building heights, in terms of metres above Principal Datum, as stipulated on the Plan, or the height of the existing building, whichever is the greater.

(2) Based on the individual merits of a development or redevelopment proposal, minor relaxation of the building height restrictions stated in paragraph (1) above may be considered by the Town Planning Board on application under section 16 of the Town Planning Ordinance.

OPEN SPACE

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board
Aviary Barbecue Spot Field Study/Education/Visitor Centre Park and Garden Pavilion Pedestrian Area Picnic Area Playground/Playing Field Promenade Public Convenience ***Public Utility Installation (on land designated "Open Space (1)" only)*** Sitting Out Area Zoo	Cable Car Route and Terminal Building Eating Place Government Refuse Collection Point Government Use (not elsewhere specified) Holiday Camp Mass Transit Railway Vent Shaft and/or Other Structure above Ground Level other than Entrances Place of Entertainment Place of Recreation, Sports or Culture Private Club Public Transport Terminus or Station Public Utility Installation ***(not elsewhere specified)*** Public Vehicle Park (excluding container vehicle) Religious Institution Service Reservoir Shop and Services Tent Camping Ground Utility Installation for Private Project

Planning Intention

This zone is intended primarily for the provision of outdoor open-air public space for active and/or passive recreational uses serving the needs of local residents as well as the general public. ***For land designated "Open Space (1)", provision of minor public utility installations is always permitted.***

OTHER SPECIFIED USES

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board

For "Business" only

Schedule I: for open-air development or
for building other than industrial or industrial-office building[@]

Column 1	Column 2
Ambulance Depot Commercial Bathhouse/Massage Establishment Eating Place Educational Institution Exhibition or Convention Hall Government Use (Police Reporting Centre, Post Office only) Information Technology and Telecommunications Industries Institutional Use (not elsewhere specified) Library Non-polluting Industrial Use (excluding industrial undertakings involving the use/storage of Dangerous Goods[△]) Off-course Betting Centre Office Place of Entertainment Place of Recreation, Sports or Culture Private Club Public Clinic Public Convenience Public Transport Terminus or Station Public Utility Installation Public Vehicle Park (excluding container vehicle) Radar, Telecommunications Electronic Microwave Repeater, Television and/or Radio Transmitter Installation Recyclable Collection Centre Religious Institution Research, Design and Development Centre School (excluding free-standing purpose-designed building and kindergarten) Shop and Services Training Centre Utility Installation for Private Project	Broadcasting, Television and/or Film Studio Bus Depot (on land designated "OU (Business 1)" only) Cargo Handling and Forwarding Facility Government Refuse Collection Point Government Use (not elsewhere specified) Hotel Mass Transit Railway Vent Shaft and/or Other Structure above Ground Level other than Entrances Non-polluting Industrial Use (not elsewhere specified) Petrol Filling Station School (not elsewhere specified) Social Welfare Facility (excluding those involving residential care) Warehouse (excluding Dangerous Goods Godown) Wholesale Trade

(Please see next page)

OTHER SPECIFIED USES (Cont'd)

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board

For "Business" only (Cont'd)

Schedule II: for industrial or industrial-office building @

Column 1	Column 2
Ambulance Depot Art Studio (excluding those involving direct provision of services or goods) Cargo Handling and Forwarding Facility (not elsewhere specified) Eating Place (Canteen only) Government Refuse Collection Point Government Use (not elsewhere specified) Information Technology and Telecommunications Industries Non-polluting Industrial Use (excluding industrial undertakings involving the use/storage of Dangerous Goods△) Office (excluding those involving direct provision of customer services or goods) Public Convenience Public Transport Terminus or Station Public Utility Installation Public Vehicle Park (excluding container vehicle) Radar, Telecommunications Electronic Microwave Repeater, Television and/or Radio Transmitter Installation Recyclable Collection Centre Research, Design and Development Centre Shop and Services (Motor-vehicle Showroom on ground floor, Service Trades only) Utility Installation for Private Project Warehouse (excluding Dangerous Goods Godown)	Broadcasting, Television and/or Film Studio Bus Depot (on land designated "OU (Business 1)" only) Cargo Handling and Forwarding Facility (Container Freight Station, free-standing purpose-designed Logistics Centre only) Industrial Use (not elsewhere specified) Mass Transit Railway Vent Shaft and/or Other Structure above Ground Level other than Entrances Off-course Betting Centre Office (not elsewhere specified) Petrol Filling Station Place of Recreation, Sports or Culture (not elsewhere specified) Private Club Shop and Services (not elsewhere specified) (ground floor only except Ancillary Showroom# which may be permitted on any floor) Vehicle Repair Workshop Wholesale Trade
In addition, for building without industrial undertakings involving offensive trades or the use/storage of Dangerous Goods△, the following use is always permitted :	
Office	

(Please see next page)

OTHER SPECIFIED USES (Cont'd)

For "Business" only (Cont'd)

In addition, the following uses are always permitted in the purpose-designed non-industrial portion on the lower floors (except basements and floors containing wholly or mainly car parking, loading/unloading bays and/or plant room) of an existing building, provided that the uses are separated from the industrial uses located above by a buffer floor or floors and no industrial uses are located within the non-industrial portion:	In addition, the following uses may be permitted with or without conditions on application to the Town Planning Board in the purpose-designed non-industrial portion on the lower floors (except basements and floors containing wholly or mainly car parking, loading/unloading bays and/or plant room) of an existing building, provided that the use is separated from the industrial uses located above by a buffer floor or floors and no industrial uses are located within the non-industrial portion:
Commercial Bathhouse/Massage Establishment Eating Place Educational Institution Exhibition or Convention Hall Institutional Use (not elsewhere specified) Library Off-course Betting Centre Office Place of Entertainment Place of Recreation, Sports or Culture Private Club Public Clinic Religious Institution School (excluding kindergarten) Shop and Services Training Centre	Social Welfare Facility (excluding those involving residential care)

@ An industrial or industrial-office building means a building which is constructed for or intended to be used by industrial or industrial-office purpose respectively as approved by the Building Authority.

△ Dangerous Goods refer to substances classified as Dangerous Goods and requiring a licence for their use/storage under the Dangerous Goods Ordinance (Cap. 295).

Ancillary Showroom requiring planning permission refers to showroom use of greater than 20% of the total usable floor area of an industrial firm in the same premises or building.

(Please see next page)

OTHER SPECIFIED USES (Cont'd)

For "Business" only (Cont'd)

Planning Intention

This zone is intended primarily for general business uses. A mix of information technology and telecommunications industries, non-polluting industrial, office and other commercial uses are always permitted in new "business" buildings. Less fire hazard-prone office use that would not involve direct provision of customer services or goods to the general public is always permitted in existing industrial or industrial-office buildings.

Remarks

(1) No new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of a maximum plot ratio of 12.0, and the maximum building heights, in terms of metres above Principal Datum, as stipulated on the Plan, or the plot ratio and height of the existing building, whichever is the greater.

(2) In determining the maximum plot ratio for the purposes of paragraph (1) above, any floor space that is constructed or intended for use solely as car park, loading/unloading bay, plant room and caretaker's office, provided such uses and facilities are ancillary and directly related to the development or redevelopment, may be disregarded.

(3) Where the permitted plot ratio as defined in Building (Planning) Regulations is permitted to be exceeded in circumstances as set out in Regulation 22(1) or (2) of the said Regulations, the plot ratio for the building on land to which paragraph (1) applies may be increased by the additional plot ratio by which the permitted plot ratio is permitted to be exceeded under and in accordance with the said Regulation 22(1) or (2), notwithstanding that the relevant maximum plot ratio specified in paragraph (1) above may thereby be exceeded.

(4) Based on the individual merits of a development or redevelopment proposal, minor relaxation of the plot ratio/building height restrictions stated in paragraph (1) above may be considered by the Town Planning Board on application under section 16 of the Town Planning Ordinance.

(Please see next page)

OTHER SPECIFIED USES (Cont'd)

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board

For "Petrol Filling Station" only

Petrol Filling Station	Government Use Utility Installation not Ancillary to the Specified Use

Planning Intention

This zone is intended primarily for the provision of petrol filling stations serving the needs of local residents as well as the general public.

(Please see next page)

OTHER SPECIFIED USES (Cont'd)

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board

For "Sewage Treatment Plant" only

Sewage Treatment/Screening Plant	Government Use (not elsewhere specified) Utility Installation not Ancillary to the Specified Use

Planning Intention

This zone is intended primarily for the provision of sewage treatment/screening plant serving the needs of the general public.

Remarks

(1) No new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of the maximum building height, in terms of metres above Principal Datum, as stipulated on the Plan, or the height of the existing building, whichever is the greater.

(2) Based on the individual merits of a development or redevelopment proposal, minor relaxation of the building height restrictions stated in paragraph (1) above may be considered by the Town Planning Board on application under section 16 of the Town Planning Ordinance.

(Please see next page)

OTHER SPECIFIED USES ***(Cont'd)***

Column 1 ***Uses always permitted***	***Column 2*** ***Uses that may be permitted with or without conditions on application to the Town Planning Board***
For "Drainage Facility and At-grade Public Open Space" only	
Field Study/Education/Visitor Centre *Park and Garden* *Pavilion* *Pedestrian Area* *Picnic Area* *Playground/Playing Field* *Promenade* *Public Convenience* *Public Utility Installation (Drainage Facility only)* *Sitting Out Area*	*Eating Place* *Government Refuse Collection Point* *Government Use (not elsewhere specified)* *Place of Entertainment* *Place of Recreation, Sports or Culture* *Public Transport Terminus or Station* *Public Utility Installation (not elsewhere specified)* *Public Vehicle Park (excluding container vehicle)* *Shop and Services* *Tent Camping Ground* *Utility Installation for Private Project*

Planning Intention

This zone is intended primarily for the provision of drainage facility with underground storm water storage tank and ancillary aboveground structures as well as at-grade public open space.

Remarks

(1) ***No new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of the maximum building height, in terms of number of storeys, as stipulated on the Plan, or the height of the existing building, whichever is the greater.***

(2) ***In determining the relevant maximum building height in terms of number of storeys for the purposes of paragraph (1) above, any basement floor(s) may be disregarded.***

(3) ***Based on the individual merits of a development or redevelopment proposal, minor relaxation of the building height restriction stated in paragraph (1) above may be considered by the Town Planning Board on application under section 16 of the Town Planning Ordinance.***

GREEN BELT

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board
Agricultural Use Barbecue Spot Government Use (Police Reporting Centre only) Nature Reserve Nature Trail On-Farm Domestic Structure Picnic Area Public Convenience Tent Camping Ground Wild Animals Protection Area	Animal Boarding Establishment Broadcasting, Television and/or Film Studio Cable Car Route and Terminal Building Columbarium (within a Religious Institution or extension of existing Columbarium only) Crematorium (within a Religious Institution or extension of existing Crematorium only) Field Study/Education/Visitor Centre Flat Government Refuse Collection Point Government Use (not elsewhere specified) Helicopter Landing Pad Holiday Camp House Mass Transit Railway Vent Shaft and/or Other Structure above Ground Level other than Entrances Petrol Filling Station Place of Recreation, Sports or Culture Public Transport Terminus or Station Public Utility Installation Public Vehicle Park (excluding container vehicle) Radar, Telecommunications Electronic Microwave Repeater, Television and/or Radio Transmitter Installation Religious Institution Residential Institution School Service Reservoir Social Welfare Facility Utility Installation for Private Project Zoo

Planning Intention

The planning intention of this zone is primarily for the conservation of the existing natural environment amid the built-up areas/at the urban fringe, to safeguard it from encroachment by urban type development, and to provide additional outlets for passive recreational activities. There is a general presumption against development within this zone.

KOWLOON PLANNING AREA NO. 14 (PART)

~~APPROVED~~ *DRAFT* KWUN TONG (SOUTH) OUTLINE ZONING PLAN NO. S/K14S/22*A*

EXPLANATORY STATEMENT

KOWLOON PLANNING AREA NO. 14 (PART)

~~APPROVED~~ *DRAFT* KWUN TONG (SOUTH)
OUTLINE ZONING PLAN NO. S/K14S/22*A*

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KOWLOON PLANNING AREA NO. 14 (PART)

~~APPROVED~~ *DRAFT* KWUN TONG (SOUTH) OUTLINE ZONING PLAN NO. S/K14S/22*A*

(Being ~~an Approved~~ ***a Draft*** Plan for the Purposes of the Town Planning Ordinance)

EXPLANATORY STATEMENT

Note: For the purposes of the Town Planning Ordinance, this statement shall not be deemed to constitute a part of the Plan.

1. INTRODUCTION

This explanatory statement is intended to assist an understanding of the ~~approved~~ ***draft*** Kwun Tong (South) Outline Zoning Plan (OZP) No. S/K14S/22***A***. It reflects the planning intention and objectives of the Town Planning Board (the Board) for the various land use zonings of the Plan.

2. AUTHORITY FOR THE PLAN AND PROCEDURES

2.1 On 9 January 1959, the draft Ngau Tau Kok Village - Proposed Layout Plan No. LK 15/24/2, being the first statutory plan covering the western part of the Kwun Tong area, was gazetted under section 5 of the Town Planning Ordinance (the Ordinance). On 9 June 1959, the then Governor-in-Council (G in C) under the then section 8(1) of the Ordinance, approved the draft Layout Plan. In January 1964, the approved Layout Plan was referred back to the Board for amendment. On 25 September 1964, the Ngau Tau Kok Village Layout Plan No. LK 14/17, which replaced the Plan No. LK 15/24/2, was gazetted under section 5 of the Ordinance, and was subsequently approved by the then G in C on 9 March 1965 under the then section 8(1) of the Ordinance.

2.2 On 9 May 1984, the Board was directed under section 3 of the Ordinance to prepare a draft statutory plan for the Kwun Tong and Lam Tin areas. On 26 August 1986, the approved Ngau Tau Kok Village Layout Plan was referred back to the Board for amendment under section 12(1)(b)(ii) of the Ordinance. On 11 December 1987, the draft Kwun Tong OZP No. S/K14/1 was exhibited for public inspection under section 5 of the Ordinance. The OZP was subsequently amended twice and exhibited for public inspection under section 6(7) and 7 of the Ordinance. On 1 May 1990, the then G in C agreed to refer the OZP No. S/K14/4 to the Board for further consideration and amendment under section 9(1)(c) of the Ordinance.

2.3 Under the power delegated by the then Governor, the then Secretary for Planning, Environment and Lands, directed the Board on 3 February 1993, under section 3(1)(a) of the Ordinance, to prepare a separate draft OZP for the Anderson Road Quarries and the adjoining area to tie in with the rehabilitation scheme of Anderson Road Quarries. In this connection, the land north of Sau

Mau Ping Road was excised from the draft Kwun Tong OZP and the OZP was re-named as the draft Kwun Tong (South) OZP. On 21 May 1993, the draft Kwun Tong (South) OZP No. S/K14S/1 was exhibited for public inspection under section 5 of the Ordinance. The OZP was subsequently amended four times and exhibited for public inspection under section 7 of the Ordinance.

2.4 On 14 September 1999, the Chief Executive in Council (CE in C), under section 9(1)(a) of the Ordinance, approved the draft Kwun Tong (South) OZP, which was subsequently renumbered as S/K14S/6. On 19 September 2000, the CE in C referred the approved OZP No. S/K14S/6 to the Board for amendment under section 12(1)(b)(ii) of the Ordinance. The OZP was subsequently amended once and exhibited for public inspection under section 5 of the Ordinance.

2.5 On 10 July 2001, the CE in C, under section 9(1)(a) of the Ordinance, approved the draft Kwun Tong (South) OZP, which was subsequently renumbered as S/K14S/8. On 25 September 2001, the CE in C referred the approved OZP No. S/K14S/8 to the Board for amendment under section 12(1)(b)(ii) of the Ordinance. The OZP was subsequently amended once and exhibited for public inspection under section 5 of the Ordinance.

2.6 On 16 March 2004, the CE in C, under section 9(1)(a) of the Ordinance, approved the draft Kwun Tong (South) OZP, which was subsequently renumbered as S/K14S/10. On 5 October 2004, the CE in C referred the approved OZP No. S/K14S/10 to the Board for amendment under section 12(1)(b)(ii) of the Ordinance. The OZP was subsequently amended three times and exhibited for public inspection under section 5 or 7 of the Ordinance.

2.7 On 27 March 2007, the CE in C, under section 9(1)(a) of the Ordinance, approved the draft Kwun Tong (South) OZP, which was subsequently renumbered as S/K14S/14. On 5 June 2007, the CE in C referred the approved OZP No. S/K14S/14 to the Board for amendment under section 12(1)(b)(ii) of the Ordinance.

2.8 On 5 October 2007, the draft Kwun Tong (South) OZP No. S/K14S/15, mainly indicating two areas of the Plan replaced by the draft Urban Renewal Authority (URA) Kwun Tong Town Centre (KTTC) – Main Site Development Scheme Plan (DSP) No. S/K14S/URA1/1 and the draft URA KTTC – Yuet Wah Street Site DSP No. S/K14S/URA2/1, was exhibited for public inspection under section 5 of the Ordinance.

2.9 On 15 July 2008, the CE in C, under section 9(1)(a) of the Ordinance, approved the draft Kwun Tong (South) OZP, which was subsequently renumbered as S/K14S/16. On 7 February 2012, the CE in C referred the approved OZP No. S/K14S/16 to the Board for amendment under section 12(1)(b)(ii) of the Ordinance. The OZP was subsequently amended once and exhibited for public inspection under section 5 of the Ordinance.

2.10 On 4 June 2013, the CE in C, under section 9(1)(a) of the Ordinance, approved the draft Kwun Tong (South) OZP, which was subsequently renumbered as S/K14S/18. On 1 April 2014, the CE in C referred the approved OZP No. S/K14S/18 to the Board for amendment under section 12(1)(b)(ii) of the

Ordinance. The OZP was subsequently amended once and exhibited for public inspection under section 5 of the Ordinance.

2.11 On 21 July 2015, the CE in C, under section 9(1)(a) of the Ordinance, approved the draft Kwun Tong (South) OZP, which was subsequently renumbered as S/K14S/20. On 18 October 2016, the CE in C referred the approved Kwun Tong (South) OZP No. S/K14S/20 to the Board for amendment under section 12(1)(b)(ii) of the Ordinance. ~~The reference back of the OZP was notified in the Gazette on 28 October 2016 under section 12(2) of the Ordinance.~~ ***The OZP was subsequently amended once and exhibited for public inspection under section 5 of the Ordinance.***

~~2.12 On 3 November 2017, the draft Kwun Tong (South) OZP No. S/K14S/21, incorporating amendments mainly to include the rezoning of a site at Ting On Street from "Government, Institution or Community" ("G/IC") to "Residential (Group A)3" ("R(A)3") and inclusion of 'Art Studio (excluding those involving direct provision of services or goods)' as a Column 1 use in Schedule II for industrial or industrial-office (I-O) building of the "Other Specified Uses" annotated "Business" ("OU(B)") zone was exhibited for public inspection under section 5 of the Ordinance. During the two-month exhibition period, a total of 103 valid representations were received. On 26 January 2018, the representations were published for three weeks for public comment and a total of 5 comments were received. After giving consideration to the representations and comments, the Board on 27 July 2018 noted the supportive representations, and decided not to uphold the remaining representations and that no amendment should be made to the draft OZP to meet the representations.~~

2.1~~3~~***2*** On 30 October 2018, the CE in C, under section 9(1)(a) of the Ordinance, approved the draft Kwun Tong (South) OZP, which was subsequently renumbered as S/K14S/22. ~~On 9 November 2018, the approved Kwun Tong (South) OZP No. S/K14S/22 (the Plan) was exhibited for public inspection under section 9(5) of the Ordinance.~~ ***On 4 June 2019, the CE in C referred the approved Kwun Tong (South) OZP No. S/K14S/22 to the Board for amendment under section 12(1)(b)(ii) of the Ordinance. The reference back of the OZP was notified in the Gazette on 14 June 2019 under section 12(2) of the Ordinance.***

2.13 On __________ 2021, the draft Kwun Tong (South) OZP No. S/K14S/23 (the Plan), incorporating amendments mainly to include the rezoning of a waterfront area at the Kwun Tong Business Area (KTBA) from "Government, Institution or Community (1)" ("G/IC(1)"), "Open Space" ("O") and areas shown as 'Road' to "Commercial (2)" ("C(2)"), "O" and "O(1)", "Other Specified Uses" annotated "Drainage Facility and At-grade Public Open Space" and areas shown as 'Road' was exhibited for public inspection under section 5 of the Ordinance.

3. OBJECT OF THE PLAN

3.1 The object of the Plan is to indicate the broad land use zonings and major transport network so that development and redevelopment of land within the Planning Scheme Area (the Area) can be put under statutory planning control.

3.2 The Plan is to illustrate the broad principles of development and to provide guidance for more detailed planning within the Area. It is a small-scale plan and the transport alignments and boundaries between the land use zones may be subject to minor adjustments as detailed planning proceeds.

3.3 Since the Plan is to show broad land use zonings, there would be situations in which small strips of land not intended for building development purposes and carry no development right under the lease, such as the areas restricted for garden, slope maintenance and access road purposes, are included in the residential zones. The general principle is that such areas should not be taken into account in plot ratio calculation. Development within residential zones should be restricted to building lots carrying development right in order to maintain the character and amenity of the Kwun Tong (South) area and not to overload the road network in this area.

4. NOTES OF THE PLAN

4.1 Attached to the Plan is a set of Notes which shows the types of uses or developments which are always permitted within the Area and in particular zones and which may be permitted by the Board, with or without conditions, on application. The provision for application for planning permission under section 16 of the Ordinance allows greater flexibility in land use planning and control of development to meet changing needs.

4.2 For the guidance of the general public, a set of definitions that explains some of the terms used in the Notes may be obtained from the Technical Services Division of the Planning Department and can be downloaded from the Board's website at http://www.info.gov.hk/tpb.

5. THE PLANNING SCHEME AREA

5.1 The Area is located in East Kowloon within the Kwun Tong District. It is bounded by Hoi Bun Road, Shun Yip Street and Ngau Tau Kok Road to the west; Chun Wah Road and Sau Mau Ping Road to the north; and Lei Yue Mun Road and King Yip Street to the south. The eastern boundary largely follows the district administrative boundary for the Kwun Tong District. The boundary of the Area is shown in a heavy broken line on the Plan and includes the two areas designated as "URA KTTC DSP Area". It covers about 387 hectares of land.

5.2 The Area can be separated into two portions in terms of land use. The portion to the south-west of Kwun Tong Road, which was formed by reclamation in the 1950s, is the ~~Kwun Tong Business Area (~~KTBA~~)~~, which is one of the major employment centres in the main urban area. The area is under transformation to meet the changing needs of the non-polluting industrial and business sectors. The portion to the northeast of Kwun Tong Road and Lei Yue Mun Road is predominantly occupied by residential developments, particularly public housing estates.

6. POPULATION

Based on the 201~~1~~***6*** Population ~~Census~~ ***By-census***, the population of the Area was estimated by the Planning Department as about ~~307,900~~***302,100*** persons. It is estimated that the planned population of the Area would be about ~~318,700~~***318,400*** persons.

7. BUILDING HEIGHT RESTRICTIONS IN KWUN TONG BUSINESS AREA

7.1 As revealed from the public consultations undertaken under the Study of Urban Design Guidelines for Hong Kong (2003), the community was in general support of the initiative to instigate height control in the statutory plans to protect views to the ridgelines from popular vantage points. In taking this forward, proposals for building height restriction for the Kwun Tong and Kowloon Bay Business Areas were prepared and put forward for public consultation between May and July 2004. The proposals were generally supported by the community as a means to preserve the views to the ridgelines and to enhance the urban environment.

7.2 In main, the building height restrictions are to preserve the views to the Kowloon Ridgelines from the vantage points recommended in the Urban Design Guidelines Study, taking into account the local area context and the need to maintain visually compatible building masses in the wider setting. There are four height bands – 100 metres above Principal Datum (mPD), 130mPD, 160mPD and 200mPD imposed for the commercial, business and industrial developments in KTBA, for preserving views to the ridgelines and reinforcing discernible district centre character at the main activity node of the Mass Transit Railway (MTR) Kwun Tong Station and KTTC. These height bands help achieve a stepped height profile for visual permeability, reduce the solidness of KTBA and maintain a more intertwined relationship with the Victoria Harbour edge. Sharp contrast and significant visual barrier to adjacent major residential development such as Laguna City is also avoided.

7.3 Building height restrictions for Government, institution or community (GIC) and utility sites in KTBA in height bands of 15mPD and 40mPD are also incorporated to provide visual relief to the high density environment of KTBA.

7.4 A minor relaxation clause in respect of the building height restrictions is incorporated into the Notes of the Plan in order to provide incentive for development/redevelopments with design merits/planning gains. Each application for minor relaxation of building height restriction under section 16 of the Ordinance will be considered on its own merits and the relevant criteria for consideration of such relaxation are as follows:

(a) amalgamating smaller sites for achieving better urban design and local area improvements;

(b) accommodating the bonus plot ratio granted under the Buildings Ordinance in relation to surrender/dedication of land/area for use as public passage/street widening;

(c) providing better streetscape/good quality street level public urban space;

(d) providing separation between buildings to enhance air ventilation and visual permeability;

(e) accommodating building design to address specific site constraints in achieving the permissible plot ratio under the Plan; and

(f) other factors such as the need for tree preservation, innovative building design and planning merits that would bring about improvements to townscape and amenity of the locality, provided that no adverse landscape and visual impacts would be resulted from the innovative building design.

7.5 However, for existing buildings where the building height has already exceeded the maximum building height restrictions in terms of mPD and/or number of storeys as stipulated on the Plan, there is a general presumption against such application for minor relaxation unless under exceptional circumstances.

7.6 Building height restrictions have also been incorporated for some development sites outside KTBA. The criteria as mentioned in paragraphs 7.4 and 7.5 above are also relevant for consideration of application for minor relaxation of the building height restrictions for these sites.

8. LAND USE ZONINGS

8.1 "Commercial ~~(1)~~" ("C~~(1)~~") - Total Area ~~1.21~~ ***2.58*** ha

8.1.1 ***This zone is intended primarily for commercial developments, which may include uses such as office, shop, services, place of entertainment and eating place, functioning as territorial business/financial centre(s) and regional or district commercial/ shopping centre(s). These areas are usually major employment nodes.***

8.1.~~1~~***2*** ~~The "C(1)" zone is intended primarily for commercial developments, which may include shop, services, place of entertainment and eating place serving the needs of local workers.~~ There are a total of seven sites under "C(1)" zoning. They are located in KTBA to the south of Kwun Tong Road. These commercial sites, which are either located near road junctions or major transport interchanges, have been developed to provide commercial facilities for the workers. Multi-storey car parks are incorporated in some of the developments.

8.1.3 A maximum plot ratio of 12.0 is imposed on these ~~commercial sites so as not to aggravate the existing traffic problems in the Area.~~ ***"C(1)" zones. Developments and redevelopments in the "C(1)" sites are subject to maximum building heights of 100mPD or 130mPD as stipulated on the Plan.***

~~8.1.4 Developments and redevelopments in the "C(1)" sites are subject to maximum building heights of 100mPD or 130mPD as stipulated on the Plan.~~

***8.1.4 A waterfront site at the KTBA is zoned "C(2)", which is proposed for a mixed commercial development with office, shop, services and/or eating place uses. A maximum gross floor area of 86,650m²* is stipulated for achieving an optimal development intensity having regard to the local road capacities and its waterfront setting. An at-grade public transport interchange (PTI) in the podium with gross floor area of not less than 7,050m², social welfare facilities as required by the Government, and a minimum total provision of 6,500m² public open space in private development (POSPD) at ground level and deck level at locations facing the waterbody with sea view shall be provided. In determining the maximum gross floor area of the development/redevelopment in the "C(2)" zone, any floor space that is constructed or intended for use solely as GIC facilities, as required by the Government, may be disregarded. A maximum building height of 100mPD is imposed for main portion of the site for blending in with the stepped building height profile descending from the inland area towards the waterfront. A stepped-down height profile towards the waterfront should also be adopted for the buildings on this site. Having regard to the air ventilation assessment conducted under the Planning and Engineering Study on Kwun Tong Action Area which identified Hoi Yuen Road as a major air corridor and in order to allow wind penetration to the inland area, a maximum building height of 15mPD is imposed for the western portion of this site that generally aligns with Hoi Yuen Road.**

8.1.5 In the "C(2)" zone, a stepped-down viewing deck facing the waterfront should be incorporated at the deck level of the POSPD, with the lowest level sufficiently below the soffit level of Kwun Tong Bypass to provide sea view. A set of landscaped staircases cascading down from the deck level to the adjoining public open space in the "Other Specified Uses" annotated "Drainage Facility and At-grade Public Open Space" zone and the waterfront promenade should be provided. Connections with barrier free accesses between at-grade and elevated levels as well as between private and public developments in the vicinity should be provided for enhancing connectivity and accessibility.

8.1.~~3~~***6*** In the circumstances set out in Regulation 22 of the Building (Planning) Regulations, the above specified maximum plot ratio***/gross floor area*** may be increased by what is permitted to be exceeded under Regulation 22. This is to maintain flexibility for unique circumstances such as dedication of part of a site for road widening or public uses.

8.1.~~5~~***7*** To provide design/architectural flexibility, minor relaxation of the plot ratio/***gross floor area***/building height restrictions may be considered by the Board on application under section 16 of the Ordinance. The criteria given in paragraphs 7.4 and 7.5 above would be relevant for the assessment of minor relaxation of building height restriction.

However, for any existing building with plot ratio/***gross floor area*** already exceeding the restriction as stipulated in the Notes, there is a general presumption against such application for minor relaxation of the plot ratio/***gross floor area*** restriction***s*** unless under exceptional circumstances. Each application will be considered on its own merits.

8.2 "<u>Residential (Group A)" ("R(A)")</u> - Total Area 137.73 ha

8.2.1 This zone is intended primarily for high-density residential developments. Commercial uses are always permitted on the lowest three floors of a building or in the purpose-designed non-residential portion of an existing building.

8.2.2 Existing public rental housing (PRH) estates in the Area include Lok Wah (North and South) Estate, Upper Ngau Tau Kok Estate, Sau Mau Ping Estate, Sau Mau Ping South Estate, Wo Lok Estate, Wan Hon Estate, Tsui Ping (North and South) Estate, Kai Tin Estate, Ping Tin Estate, On Tin Estate, Hing Tin Estate, Lam Tin Estate and Tak Tin Estate. Existing Home Ownership Scheme developments include Lok Nga Court, Lei On Court, On Kay Court, Chun Wah Court, Cheung Wo Court, Hong Tin Court, Hong Yat Court, Hiu Lai Court, Po Pui Court, Hong Wah Court and Hong Ying Court. Existing public housing developments under the Hong Kong Housing Society ***(HKHS)*** include Lotus Tower and Kwun Tong Garden Estate Phase II.

8.2.3 A site along Sau Ming Road, which is zoned "R(A)2", is ~~being~~ developed for PRH cum community hall development. To prevent massive and out-of-context development, the site is subject to a maximum building height of 150mPD as stated in the Notes, a maximum domestic plot ratio of 4.5 and a maximum non-domestic plot ratio of 1.5. Various GIC facilities including a community hall, a small public library and a study area would be provided within the development. A site abutting both Hiu Ming Street and Hiu Kwong Street is reserved for PRH development and is subject to maximum building heights of 80mPD (for the upper platform and its adjoining slope) and 150mPD (for the lower platform) as shown on the Plan. A site abutting both Ting On Street and Ngau Tau Kok Road, which is zoned "R(A)3", is proposed for public housing development ***under HKHS*** and is subject to a maximum building height of 110mPD as shown on the Plan. To increase building permeability and allow more wind penetration, two setbacks shall be provided along Ting On Street and Ngau Tau Kok Road and a stepped terrace architectural design shall be adopted for minimizing the podium structure at the "R(A)3" site. In order to minimize any adverse air ventilation impact on the surrounding low to medium-rise developments, a quantitative air ventilation assessment is required at the detailed design stage to explore more opportunity on scheme improvement.

8.2.4 A wide range of GIC facilities such as primary schools, community halls, children and youth centres, elderly centres, local open space, indoor games halls, markets and shopping centres are provided within these estates to serve the residents. Some of the community facilities are free-standing within the housing estates. They are as follows:

<u>Name of Estate</u>	<u>No. of Free-standing Facilities</u>
Lok Wah Estate	2 primary schools and 1 community centre
Tsui Ping Estate	1 primary school
Lam Tin Estate	1 municipal services building
Ping Tin Estate	2 primary schools
Sau Mau Ping Estate	4 primary schools
Upper Ngau Tau Kok Estate	1 primary school

These school and GIC facilities, existing or planned, are zoned “R(A)” on the OZP so as to allow for flexibility in the comprehensive planning and development of these large residential sites.

8.2.5 Existing private residential developments include those to the north/west of KTTC, as well as those at On Wah Street, Ting On Street, Hiu Kwong Street and Kai Tin Road.

8.2.6 In the consideration of the overall transport, environmental and infrastructural constraints as well as the adequacy in the provision of community facilities envisioned in the Kowloon Density Study Review, completed in early 2002, developments or redevelopments within this zone are subject to specific control on plot ratios except otherwise specified in the Notes, i.e. a maximum plot ratio of 7.5 for a domestic building and a maximum plot ratio of 9.0 for a partly domestic and partly non-domestic building. In calculating the gross floor areas for these developments/redevelopments, the sites for free-standing purpose-designed buildings that are used solely for accommodating school or other GIC facilities, including those located on ground and on building podium, are not to be taken as parts of the site.

8.2.7 The northern part of Sceneway Garden which is a comprehensive private residential development above the ~~public transport interchange~~ ***PTI*** is within the “R(A)1” zone. The southern part of the development is built on top of the MTR Lam Tin Station on the other side of Lei Yue Mun Road which falls within the Cha Kwo Ling, Yau Tong, Lei Yue Mun OZP, that is outside the Plan area. A landscaped deck is built over the road linking the two parts of the development together. To ensure that the intensity of this private development is under statutory planning control, a maximum domestic gross floor area is imposed under the Notes of the Plan.

8.2.8 In the circumstances set out in Regulation 22 of the Building (Planning) Regulations, the above specified maximum plot ratios or gross floor areas may be increased by what is permitted to be exceeded under Regulation 22. This is to maintain flexibility for unique circumstances such as dedication of part of a site for road widening or public uses.

8.2.9 To provide design/architectural flexibility, minor relaxation of the plot ratio/gross floor area/building height restrictions may be considered by the Board on application under section 16 of the Ordinance. The criteria given in paragraphs 7.4 and 7.5 above would be relevant for the assessment of minor relaxation of building height restriction. However, for any existing building with plot ratio/gross floor area already exceeding the restrictions as stipulated in the Notes, there is a general presumption against such application for minor relaxation of the plot ratio/gross floor area restrictions unless under exceptional circumstances. Each application will be considered on its own merits.

8.3 "Residential (Group B)" ("R(B)") - Total Area 14.46 ha

8.3.1 This zone is intended primarily for medium-density residential developments where commercial uses serving the residential neighbourhood may be permitted on application to the Board. The private residential developments along Kung Lok Road, Hong Lee Road, Yuet Wah Street, Tin Heung Street and upper sections of Hong Ning Road and Hip Wo Street fall within this zone.

8.3.2 Developments within this zone are subject to a maximum plot ratio of 5.0 in order to restrain traffic growth which will otherwise overload the existing and planned road network.

8.3.3 To provide design/architectural flexibility, minor relaxation of the plot ratio restriction may be considered by the Board on application under section 16 of the Ordinance. However, for any existing building with plot ratio already exceeding the restriction as stipulated in the Notes, there is a general presumption against such application for minor relaxation of the plot ratio restriction unless under exceptional circumstances. Each application will be considered on its own merits.

8.4 "Government, Institution or Community" ("G/IC") - Total Area ***43.32*** ~~44.93~~ ha

8.4.1 This zone is intended primarily for the provision of GIC facilities serving the needs of the local residents and/or a wider district, region or the territory. It is also intended to provide land for uses directly related to or in support of the work of the Government, organizations providing social services to meet community needs, and other institutional establishments.

8.4.2 Major existing GIC facilities include United Christian Hospital at Sau Nga Road, Ngau Tau Kok Jockey Club Clinic at Ting On Street, Lam Tin Polyclinic at Kai Tin Road, Ngau Tau Kok Government Offices at On Wah Street, Hong Kong Public Records Building at Tsui Ping Road, various social welfare facilities at Kung Lok Road, Kwun Tong Road, Fuk Tong Road and Fuk Ning Road, two vocational training centres at Wan Hon Street and Tsui Ping Road, two Municipal Services Buildings at Ngau Tau Kok Road and Shui Wo Street, two divisional police stations at Hong Ning Road and Lei Yue Mun Road, two sub-divisional fire stations at Hoi Yuen Road and Kai Tin Road, a Disciplined Services Quarters at Wo Hong Path, a market complex at

Yee On Street, a sports centre at Hiu Kwong Street, a swimming pool complex at Tsui Ping Road, service reservoirs, pumping stations, electricity substations, telephone exchanges, community centres, churches, a higher educational facility and a number of primary and secondary schools.

8.4.3 Developments and redevelopments in the "G/IC(1)" sites in KTBA to the south of Kwun Tong Road are subject to ~~a~~ maximum building height***s*** of 15mPD or 40mPD as stipulated on the Plan.

8.4.4 To provide design/architectural flexibility, minor relaxation of the building height restriction may be considered by the Board on application under section 16 of the Ordinance pursuant to the criteria given in paragraphs 7.4 and 7.5 above. Each application will be considered on its own merits.

8.5 "Open Space" ("O") - Total Area ***41.49*** ~~41.43~~ ha

8.5.1 This zone is intended primarily for the provision of outdoor open-air public space for active and/or passive recreational uses serving the needs of local residents as well as the general public.

8.5.2 Major existing open spaces in the Area include Kwun Tong Recreation Ground, Hong Ning Road Recreation Ground, Sau Ming Road Park, Hoi Bun Road Park, Lam Tin Park, Hong Ning Road Park, the playgrounds at On Tak Road, Kung Lok Road, Yuet Wah Street, Sau Nga Road, Hiu Ming Street, Tsun Yip Street, and a number of rest gardens/sitting-out areas at various locations. Additional sites have been reserved at Kai Tin Road and Tseung Kwan O Road.

8.5.3 Two sites to the west and south of the Hoi Yuen Road/Wai Yip Street junction are reserved for local open spaces, including one site zoned "O(1)" where provision of minor public utility installations (PUI) is always permitted. The PUI to be provided at the "O(1)" zone is a gas governor kiosk, and its design should have due regard to the planning intention of the public open space.

8.5.~~3~~***4*** ~~Soccer pitches and play areas~~ ***Local open spaces providing sitting-out areas, children's playground and/or recreational facilities*** are also provided on top of the decked service reservoirs and ~~local open spaces are provided~~ within public housing ***developments,*** ~~estates and~~ comprehensive ***residential*** ~~private housing~~ ***developments, and/or some private residential and commercial/residential developments.***

8.6 "Other Specified Uses" ("OU") - Total Area ~~46.82~~ ***47.16*** ha

8.6.1 This zoning covers land allocated for specific uses which include Business, Petrol Filling Station***,*** ~~and~~ Sewage Treatment Plant ***and Drainage Facility and At-grade Public Open Space***.

8.6.2 About 45.57 ha of land is zoned "OU" annotated "Business" ("OU(B)"). This zone is intended primarily for general business uses.

A mix of information technology and telecommunications industries, non-polluting industrial, office and other commercial uses are always permitted in new “business” buildings. Less fire hazard-prone office use that would not involve direct provision of customer services or goods to the general public is always permitted in existing industrial and I-O buildings. As it is not possible to phase out existing polluting and hazardous industrial uses all at once on land zoned “OU(B)”, it is necessary to ensure compatibility of the uses within the same industrial or I-O building and in KTBA until the whole area is transformed to cater for the new non-polluting business uses. The setting back of buildings to cater for the future increase in traffic demand may also be required. The setback requirements are stipulated in ***the*** departmental outline development plan~~s~~ and enforced through lease modification process where appropriate.

8.6.3 A site at How Ming Street to the northwest of Tsun Yip Street Playground is zoned “OU(B)1”. It is also for general employment uses with the same planning intention as stated in paragraph 8.6.2. However, in order to make provision for redevelopment of the vacated bus depot if necessary, ‘Bus Depot’ use is included in Column 2 of the “OU(B)1” zone to allow the Board to scrutinise any submitted proposals to its satisfaction.

8.6.4 Developments and redevelopments in the “OU(B)” and “OU(B)1” sites are subject to a maximum plot ratio of 12.0. Reference should be made to the relevant Town Planning Board Guidelines. In the circumstances set out in Regulation 22 of the Building (Planning) Regulations, the above specified maximum plot ratio may be increased by what is permitted to be exceeded under Regulation 22. This is to maintain flexibility for unique circumstances such as dedication of part of a site for road widening or public uses.

8.6.5 The sewage treatment plant at Wing Yip Street zoned “OU” annotated “Sewage Treatment Plant” is intended primarily for the provision of sewage treatment/screening plant serving the needs of the general public.

8.6.6 ***A waterfront site to the southwest of the Hoi Yuen Road/Wai Yip Street junction zoned “OU” annotated “Drainage Facility and At-grade Public Open Space” is reserved for drainage facility, with underground storm water storage tank and ancillary aboveground structures, and with provision of at-grade public open space. Development and redevelopment therein is subject to a maximum building height of 1 storey. The drainage facility should be designed to respect the harbourfront setting and integrate with the at-grade public open space for public enjoyment.***

8.6.~~6~~***7*** Developments and redevelopments in the “OU(B)” and “OU(B)1” sites are subject to maximum building heights ranging from 100mPD to 200mPD as stipulated on the Plan. Development and redevelopment in the “OU” annotated “Sewage Treatment Plant” site is subject to a maximum building height of 15mPD.

8.6.~~7~~***8*** To provide design/architectural flexibility, minor relaxation of the plot ratio/building height restrictions may be considered by the Board on application under section 16 of the Ordinance. The criteria given in paragraphs 7.4 and 7.5 above would be relevant for the assessment of minor relaxation of building height restriction. However, for any existing building with plot ratio already exceeding the restriction as stipulated in the Notes, there is a general presumption against such application for minor relaxation of the plot ratio restriction unless under exceptional circumstances. Each application will be considered on its own merits.

8.6.~~8~~***9*** The petrol filling stations at Kwun Tong Road and Hiu Kwong Street zoned "OU" annotated "Petrol Filling Station" are intended primarily for the provision of petrol filling stations serving the needs of local residents as well as the general public.

8.7 "Green Belt" ("GB") - Total Area 28.50 ha

8.7.1 The planning intention of this zone is primarily for the conservation of the existing natural environment amid the built-up areas/at the urban fringe, to safeguard it from encroachment by urban type development, and to provide additional outlets for passive recreational activities. There is a general presumption against development within this zone. Development within this zone will be carefully controlled and development proposals will be assessed on individual merits taking into account the relevant Town Planning Board Guidelines.

8.7.2 It includes the closed Ma Yau Tong West and Ma Yau Tong Central landfill sites. Restoration works for recreational after-use are currently in progress. Part of Lam Tin Park and hillslopes at various locations are also within this zone.

9. COMMUNICATIONS

9.1 Roads

9.1.1 The primary distributors in the Area include Kwun Tong By-pass and Tseung Kwan O Road. Kwun Tong By-pass along the southwestern boundary of the Area links Eastern Harbour Crossing in the southeast and Tseung Kwan O Tunnel via Tseung Kwan O Road in the northeast. This By-pass also forms part of the road network connecting the Eastern Harbour Crossing to the approaches of the Tate's Cairn Tunnel portal at Diamond Hill. Tseung Kwan O Road links Tseung Kwan O New Town via Tseung Kwan O Tunnel, which forms the principal access from the main urban areas to the New Town.

9.1.2 Major district distributors in the Area include Kwun Tong Road, Lei Yue Mun Road and Wai Yip Street. These distributors, running in a northwest and southeast direction, connect the Area, in particular KTBA, with Central and West Kowloon. The business area is also served by local distributors including Hung To Road, Lai Yip Street, Tsun Yip Street and Hoi Yuen Road.

9.1.3 Sau Mau Ping Road, Tsui Ping Road, Hip Wo Street and Hong Ning Road are the major local distributors in the north-eastern part of the Area. The main function of these roads is to serve the residents of the public and private housing developments in the Area. Sau Mau Ping Road at the northern edge of the Area together with Shun Lee Tsuen Road and Po Lam Road also provide external linkages to Central and West Kowloon to the west, and Sai Kung and Tseung Kwan O to the east.

9.2 Mass Transit Railway

The existing MTR Kwun Tong Line runs along Kwun Tong Road and Lei Yue Mun Road on elevated tracks. It connects Tseung Kwan O Line with interchange at MTR Yau Tong Station for harbour crossing. There are two stations in the Area, namely, MTR Ngau Tau Kok Station and MTR Kwun Tong Station.

9.3 Public Transport

Apart from the MTR, the Area is also well served by various modes of public transport including bus and public light bus. A number of bus termini are conveniently located to serve the residential, commercial, business and industrial developments in the Area.

10. URBAN RENEWAL AUTHORITY DEVELOPMENT SCHEME PLAN AREAS

10.1 Two areas have been designated as "URA DSP Areas". The land use zonings of the areas are depicted on the relevant URA DSPs and they will be implemented by the URA.

10.2 The DSP for KTTC – Main Site covers an area of about 4.63 ha. The site is intended for comprehensive development/redevelopment of the area for residential, Government and/or commercial uses with the provision of open space and other community and supporting facilities. The DSP for KTTC – Yuet Wah Street Site covers an area of about 0.43 ha. The site is developed as a high-density residential development with Kwun Tong Community Health Centre in the podium serving the wider district.

10.3 On 15 July 2008, the CE in C, under section 9(1)(a) of the Ordinance, approved the draft URA KTTC – Main Site DSP and draft URA KTTC – Yuet Wah Street Site DSP which were subsequently renumbered as S/K14S/URA1/2 and S/K14S/URA2/2 respectively. On 12 September 2008, the approved URA KTTC – Main Site DSP No. S/K14S/URA1/2 and approved URA KTTC – Yuet Wah Street Site DSP No. S/K14S/URA2/2 were exhibited for public inspection under section 9(5) of the Ordinance.

11. UTILITY SERVICES

11.1 The Area is well served with piped water supply, drainage and sewerage systems. Electricity, gas and telephone services are also available. No difficulty is envisaged in meeting the future requirements. Improvement works to the existing drainage and sewerage systems may be required for the possible change of stormwater flow due to topographic changes arising from development.

11.2 The project of “East Kowloon Sewerage Improvement and Pollution Control” undertaken by the Drainage Services Department to improve the existing sewerage system and abate the pollution problem in East Kowloon has been completed.

12. IMPLEMENTATION

12.1 Although existing uses non-conforming to the statutory zoning are tolerated, any material change of use and any other development/redevelopment must be always permitted in terms of the Plan or, if permission is required, in accordance with the permission granted by the Board. The Board has published a set of guidelines for the interpretation of existing use in the urban and new town areas. Any person who intends to claim an “existing use right” should refer to the guidelines and will need to provide sufficient evidence to support his claim. The enforcement of the zonings mainly rests with the Buildings Department, the Lands Department and the various licensing authorities.

12.2 The Plan provides a broad land use framework within which more detailed non-statutory plans for the Area are prepared by the Planning Department. These detailed plans are used as the basis for public works planning and site reservation within the Government. Disposal of sites is undertaken by the Lands Department. Public works projects are co-ordinated by the Civil Engineering and Development Department in conjunction with the client departments and the works departments, such as the Highways Department and the Architectural Services Department. In the course of implementation of the Plan, the Kwun Tong District Council would also be consulted as appropriate.

12.3 Planning applications to the Board will be assessed on individual merits. In general, the Board, in considering the planning applications will take into account all relevant planning considerations which may include departmental outline development plans and guidelines published by the Board. The outline development plans are available for public inspection at the Planning Department. Guidelines published by the Board are available from the Board’s website, the Secretariat of the Board and the Technical Services Division of the Planning Department. Application forms and Guidance Notes for planning applications can be downloaded from the Board’s website and are available from the Secretariat of the Board and the Technical Services Division and relevant District Planning Office of the Planning Department.

Applications should be supported by such materials as the Board thinks appropriate to enable it to consider the applications.

TOWN PLANNING BOARD
~~**NOVEMBER 2018**~~
____________ *2021*

Attachment Va of
MPC Paper No. 2/21

Kowloon East
九龍東

Agreement No. CE 61/2015 (TP)
Planning and Engineering Study on

Kwun Tong Action Area

Feasibility Study

TR2 - Traffic and Transport Impact Assessment
(Final-R1)
June 2020

AECOM

發展局起動九龍東辦事處
Energizing Kowloon East Office
Development Bureau

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Kowloon East Office
九龍東辦事處

Development Bureau
Government Secretariat
Energizing Kowloon East Office

Agreement No. CE 61/2015 (TP)

Planning and Engineering Study on Kwun Tong Action Area – Feasibility Study

TR2 – Traffic and Transport Impact Assessment (Final-R1)

24 June 2020

Prepared:	Since Lau	(24 June 2020)
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AECOM Asia Company Ltd.

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ACRONYMS & ABBREVIATIONS

"ACI"	means Arts and Cultural/Institutional Uses
"AECOM"	means AECOM Asia Co. Ltd.
"AOI"	means Area of Influence
"ATC"	means Annual Traffic Census
"CBD"	means Core Business District
"CEDD"	means Civil Engineering and Development Department
"CFM"	means Cooked Food Market
"Competition"	means Kai Tak Fantasy (KTF) – International Ideas Competition on Urban Planning and Design
"DIA"	means Drainage Impact Assessment
"DFC"	means Design Flow to Capacity
"DGV"	means Dangerous Goods Vehicular
"DSD"	means Drainage Services Department
"EFLS"	means Environmentally Friendly Linkage System
"EKDMP Review Study"	means Review Study for the previous Drainage Master Plan Study in East Kowloon
"EKEO"	means Energizing Kowloon East Office
"ETWB"	means Environment, Transport and Works Bureau
"GMB"	means Green Mini-bus
"HKPSG"	means Hong Kong Planning Standards and Guidelines
"KE"	means Kowloon East
"KBAA"	means Kowloon Bay Action Area
"KTAA"	means Kwun Tong Action Area
"KTBA"	means Kwun Tong Business Area
"KTDA"	means Kai Tak Development Area
"KTDS"	means Kwun Tong Driving School
"KTF"	means Kai Tak Fantasy
"KTRT"	means Kai Tak Runway Tip
"KTTS"	means Kwun Tong Typhoon Shelter
"KTVFP"	means Kwun Tong Vehicular Ferry Pier
"LATM"	means Local Area Traffic Model
"L/UL"	means Loading / Unloading

"PELPS"	means Preliminary Engineering Layout Plans
"PODP"	means Preliminary Outline Development Plan
"PTI"	means Public Transport Interchange
"RCP"	means Refuse Collection Point
"SDM"	means Stormwater Drainage Manual
"STM"	means Strategic Transport Model
"TPDM"	means Transport Planning and Design Manual
"TPEDM"	means Territorial Population and Employment Data Matrix
"the Study"	means the Planning and Engineering study on Kwun Tong Action Area - Feasibility Study
"T&TIA"	means Traffic and Transport Impact Assessment
"TR"	means Technical Report
"WP2"	means Working Paper on Broad Cost Assessment, Preliminary Outline Development Plan (PODP), Preliminary Master Urban Design Plan and Master Landscape Plan

1 STUDY BACKGROUND AND OBJECTIVES

1.1 Background

1.1.1 In the 2013 Policy Address, the Chief Executive announced the proposal of setting up a recreational landmark – "Kai Tak Fantasy" (KTF) on the site of the former runway tip in Kai Tak Development Area (KTDA), Kwun Tong Action Area (KTAA) and the Water body between the Kai Tak Runway Tip (KTRT) and KTAA which was identified of having excellent potential to be developed into a destination that will be attractive to both local residents and visitors. In order to encourage creative design ideas and visions for the development of this prominent site, the "Kai Tak Fantasy – International Ideas Competition on Urban Planning and Design" (the Competition) was launched by the Energizing Kowloon East Office (EKEO) in November 2013 and results of the Competition was announced in November 2014.

1.1.2 To further develop the KTF, EKEO has initiated this study: ***Agreement No. CE 61/2015 (TP) – Planning and Engineering Study on Kwun Tong Action Area – Feasibility Study*** (herein referred as "the Study") and another study "Agreement No. CE 73/2014 (TP) – Planning and Urban Design Review for Developments at Kai Tak Runway Tip – Feasibility Study" commenced in December 2015. Both studies will make reference to the winning scheme of the Competition, together with the good ideas and elements of other shortlisted entries.

1.1.3 AECOM Asia Co Ltd (AECOM) has been commissioned by EKEO to undertake the Study. The Agreement commenced on 22 March 2016 and is anticipated to be completed in 2019.

1.2 Study Objectives

1.2.1 Kwun Tong Action Area (KTAA) is planned for comprehensive mixed-use development that are complementary to the tourism and entertainment uses at the KTRT, create synergy effect for the transformation of Kowloon East (KE) into another Core Business District (CBD), enhance the incubator role for creativity, arts and culture uses as well as celebrate the industrial culture of KE.

1.2.2 The overall objective of the Study is to take into due consideration the findings and recommendations of the previous and on-going planning and engineering studies carried out for Kwun Tong Business Area (KTBA) and the ideas of the winning design and the shortlisted entries of the Competition to rationalise the existing and required government uses and to derive a robust, flexible and practical development scheme for KTAA with due regards to planning, urban design, air ventilation, visual consideration, while ensuring that the scheme would be acceptable in environmental, traffic and transport, engineering, business viability terms as well as to provide recommendations on phasing and implementation mechanisms.

1.2.3 The future development of KTAA will hold significance to the area, as KTAA is envisioned to form the creative industry hub of KTF, complementing the tourism/entertainment development at KTRT and the water body of Kwun Tong Typhoon Shelter (KTTS). Looking at a wider context, the future development of KTAA, together with Kowloon Bay Action Area (KBAA) will be two focal core areas of KE as future premier business/commercial areas showcasing the branding and identity of the CBD2.

1.3 Purpose of Technical Report

1.3.1 This Traffic and Transport Impact Assessment (T&TIA) report has been reviewed to incorporate the latest planning and highways network assumptions with the aim to identify and address potential traffic and transport implications due to the Proposed KTAA Development on the nearby road network. Also, it will recommend necessary traffic improvement measures and public transport provision/facilities, and car parking and servicing requirements.

1.3.2 The main objectives of this report are summarised below:

- to present development parameters of the Proposed KTAA Development;
- to recommend car parking and servicing provision;
- to present existing and future road network in the vicinity;
- to recommend vehicular access arrangement by taking into account the future external road network;
- to review the pedestrian connectivity and the public transport services in vicinity of KTAA.
- to provide traffic forecast by taking into account the latest planning and road/railway network assumptions;
- to assess traffic impact due to the Proposed KTAA Development on nearby road network; and
- to recommend practicable traffic improvement schemes to mitigate any impact as necessary.

1.4 Structure of Technical Report

1.4.1 This TTIA contains the following sections in addition to this introductory section:

a) Section 1: Introduction, which outlines the background of the Study and sets out the scope, objectives and structure of this working paper.

b) Section 2: Proposed Development, which introduces the proposed development including development schedule, car parking provision and loading/unloading (L/UL) bay provision.

c) Section 3: Existing Road Network, which describes the existing road network, reviews the existing traffic condition and presents the existing traffic flows.

d) Section 4: Planned/Committed Road Network, which discusses the planned/committed road network, including the committed schemes proposed by the "Agreement No. CE57/2013 (TT) Pedestrian Environment Improvement Scheme For Transformation of Kwun Tong Business Area – Feasibility Study" (KTBA Study).

e) Section 5: Pedestrian Connectivity, which describes pedestrian connectivity (e.g. footpath and footbridges) in the vicinity of KTAA development.

f) Section 6: Traffic Forecast, which summaries the methodology of traffic forecasting and presents the design flows with KTAA development.

g) Section 7: Proposed Junction Layout with Public Transport Interchange and Internal Road at KTAA, which presents the proposed junction improvement schemes, layout of Public Transport Interchange (PTI) and internal road layout at KTAA and describes the operation of the proposed road network.

h) Section 8: Traffic Impact Assessment, which presents the findings of the assessment of the existing junctions and proposed improvement junction layouts in year 2017 and in design year 2031.

i) Section 9: DGV Routing and Queuing Spaces, which describes DGV routing under the proposed road network and presents layout of the proposed queuing spaces.

j) Section 10: Public Transport Review, which reviews public transport provision in the existing Public Transport Interchange (PTI) next to Kwun Tong Ferry Pier.

k) Section 11: Summary and Conclusion, which summarises the findings of this TTIA and presents the conclusions regarding the traffic issues.

2 PROPOSED DEVELOPMENT

2.1 General Description

2.1.1 The Study Area of KTAA is shown in **Figure 2.1**. It covers an overall area of approximately 4.2 ha. The existing facilities in KTAA includes Kwun Tong Ferry Pier Square and Pet Garden at Wai Yip Street, Kei Yip Street Public Toilet and Refuse Collection Point (RCP), Kwun Tong Ferry Pier Public Transport Interchange (PTI), Cooked Food Market (CFM), and temporary Kwun Tong Driving School (KTDS). Ferry pier facilities include Kwun Tong Public Pier, Kwun Tong Ferry Pier and Kwun Tong Vehicular Ferry Pier (KTVFP).

2.1.2 The preferred development option of KTAA was presented in the working paper on Broad Cost Assessment, Preliminary Outline Development Plan (PODP), Preliminary Master Urban Design Plan and Master Landscape Plan (WP2) (Final) circulated on 28 March 2018. Under the preferred option, two building towers are proposed in the commercial site with an elevated landscape deck and at-grade PTI. In addition, three basement floors are proposed to accommodate ancillary transport facilities and public parking facilities.

2.1.3 Besides the proposed commercial development, some existing government facilities will be re-provided in the Study Area. The Refuse Collection Point (RCP) is proposed to remain in-situ at the preferred option. A new three-storey structure is proposed at RCP's open area for temporary use as storage area and potential space for other uses after the cessation of the temporary use. The existing CFM is proposed to be converted for Arts and Cultural/Institutional (ACI) uses. The dangerous goods vehicular (DGV) queuing area is proposed to be optimized and rearranged along Kei Yip Street upon the relocation of KTDS. The existing pier facilities will be retained and the operation of piers would be maintained. The tentative earliest date for population intake is 2028.

2.1.4 Taking into account the comments received from relevant Government Bureaux and Department (B/Ds) and major findings from the technical assessments, Recommended Outline Development Plan (RODP) was formulated, which was presented in the working paper on RODP, Recommended Master Urban Design Plan and Master Landscape Plan (Draft-R2) (WP5 (Draft - R2)) circulated on 22 October 2018. Subsequent to the submission of WP5 (Draft – R2) and Steering Committee Meeting No. 2 on 29 October 2018, the RODP was further revised and presented in the paper for discussion in Committee on Planning and Land Development (CPLD) on 4 March 2019.

2.1.5 After obtaining CPLD members' agreement on the revised RODP (RODP – Revision 1), consultation with Kwun Tong Development and Renewal Task Force of Kwun Tong District Council, Land and Development Advisory Committee, Task Force on Kai Tak Harbourfront Development of Harbourfront Commission, and Housing and Infrastructure Committee of Kowloon City District Council on the RODP – Revision 1 were carried out from April to September 2019.

2.1.6 The RODP – Revision 1 was further amended taking account of the public comments received during consultation. As compared with the preferred development option presented in TR2 Traffic and Transport Impact Assessment (Draft – R4) (TR2 TTIA (Draft – R4)), the following arrangement for the updated RODP (RODP – Revision 2), which was also submitted to CPLD as Matter Arising on 25 July 2019 and presented in WP5 – RODP, Recommended Master Urban Design Plan and Master Landscape Plan (Final) (WP5 (Final)), remains unchanged:

Commercial Development

- Two building towers in the commercial site with an elevated landscape deck and at-grade PTI; and
- Three basement floors are proposed to accommodate ancillary transport facilities and public parking facilities.

Government Facilities

- The RCP is proposed to remain in-situ;
- A new three-storey structure is proposed at RCP's open area for temporary use as storage area and potential space for other uses after the cessation of the temporary use;
- The DGV queuing area is proposed to be optimized and rearranged along Kei Yip Street upon the relocation of KTDS; and
- The existing pier facilities will be retained and the operation of piers would be maintained.

2.1.7 The major revisions to the preferred development option involve the conversion of the existing CFM to regional open space, refinement of the site area for DGV Queuing Area, reservation of GFA for "Government, Institution or Community" ("G/IC") uses within the "Commercial" ("C") site, refinement of the alignment of the proposed footbridges and minor revision to the junction layout.

2.1.8 After obtaining CPLD members' endorsement on the RODP – Revision 2, further liaison with relevant B/Ds has been carried out to address the comments from the CPLD. Minor amendments are made taking into account the latest arrangement as agreed with relevant B/Ds and the recommendations from the technical amendments. The latest RODP is shown in **Figure 2.1** and the development parameters are summarised in **Table 2.1**. Taking into consideration the anticipated intake by phases and the worst case scenario, year 2031 is taken as the assessment year in the technical assessment.

Table 2.1 Proposed Development Parameters

Proposed/ Existing Land Use Zoning	"C"	"G" (DGV Queuing Area)	"G" (RCP & Storage Area)	"OU(Pier) 1" (KTPFP) (in situ)	"OU (Vehicular Ferry Pier)" (KTVFP) (in situ)	"OU(Pier)" (KTPP) (in situ)	"O"
Site Area (approx. m²)	***13,700***	***1,880***	***690***	***2,600***	***4,000***	***740***	***15,180 RO: 11,880 LO: 3,300***
Max. Building Height (mPD)	100	15	15	15	15	15	-
Plot Ratio (approx.)	6.52#	0.05	1.53	No change	No change	No change	-
GFA Distribution (approx. m²)							
- Office	62,600	-	-	-	-	-	-
- Retail / F&B	17,000	-	-	-	-	-	-
- Arts and Cultural/Institutional	-	-	-	1,700	-	-	-
- GIC	2,700	90	780* + 275	-	-	-	-
- PTI	7,050	-	-	-	-	-	-
- Pier	-	-	-	2,390*	845*	-	-
Total GFA (m²)	**89,350**	**90**	**1,055**	**4,090**	**845**	**-**	**-**

Figure 2.1: Study Area of Kwun Tong Action Area

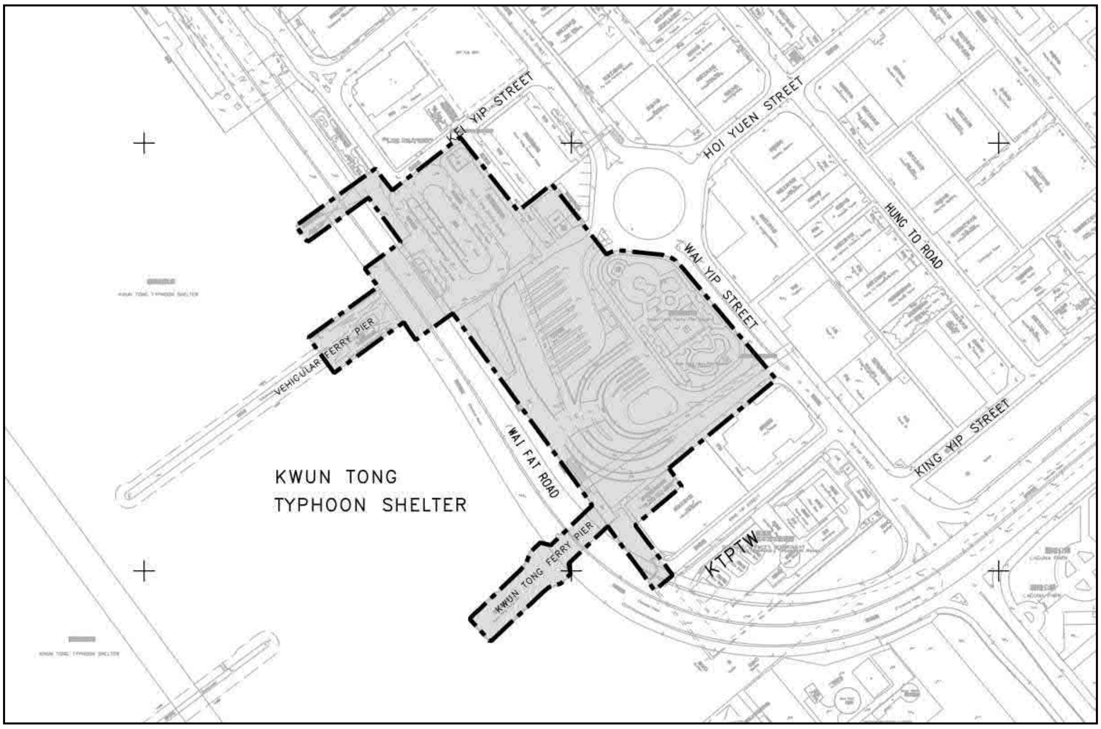
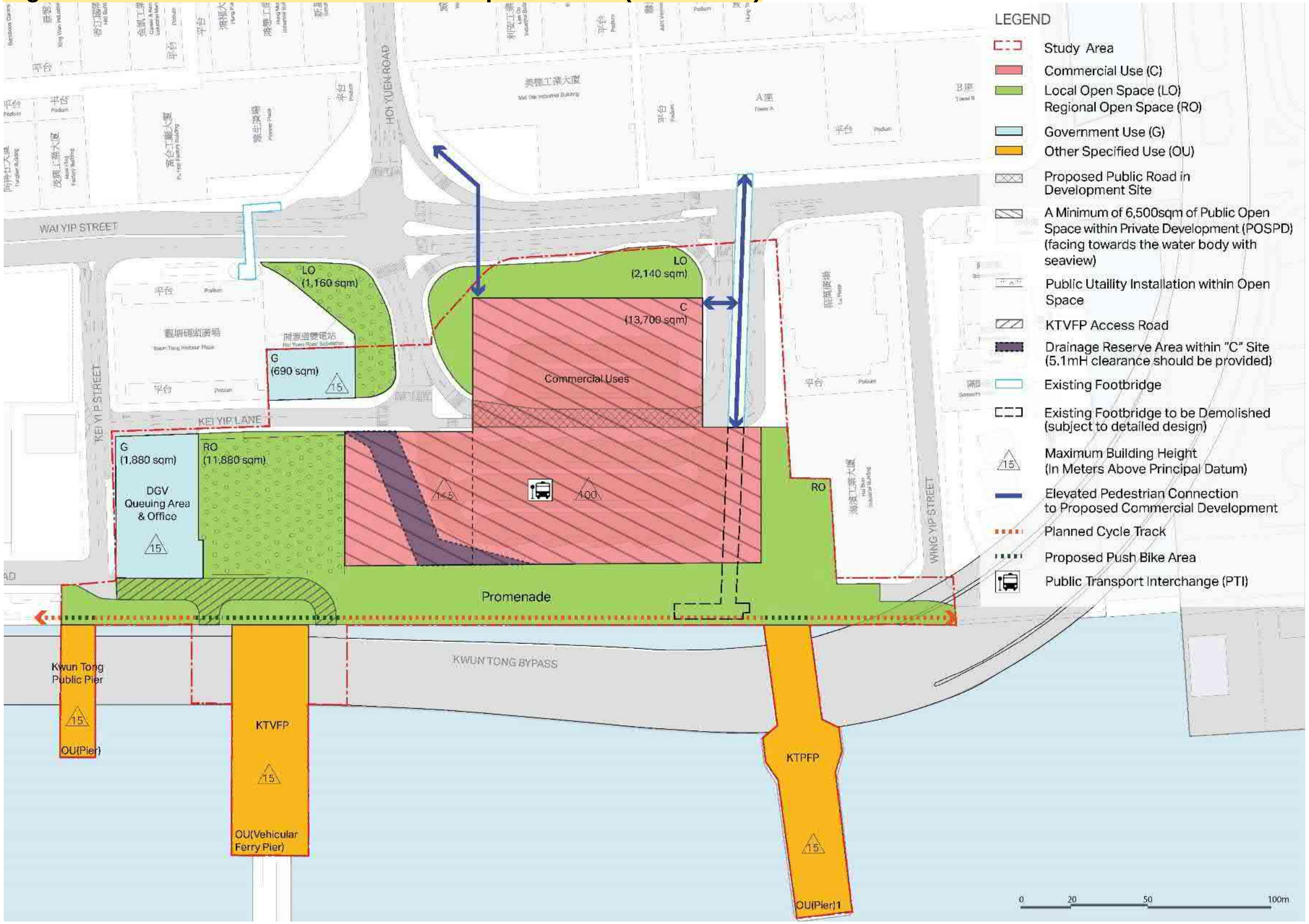


Figure 2.2: Recommended Outline Development Plan (Revision 4)



2.2 Proposed Car Parking and L/UL Facilities Provision

2.2.1 The Preliminary Outline Development Plan (PODP) for the KTAA under Working Paper No. 2 (WP2) has been submitted on 9 March 2017 in accordance with the requirements as set out under Clauses 6.27 to 6.35 of the Study Brief to formulate development scheme options taking into account land use compatibility, transport and infrastructure capacities and connectivity to the surroundings. The PODP was submitted for endorsement by the Committee on Planning and Land Development (CPLD) on 20 June 2017. The Transport and Housing Bureau (THB) and the Transport Department (TD) provided comments on the CPLD Paper in June 2017 regarding the proposed parking provision and advised that they had no comment on the adoption of "shared-use" approach to increase parking provision. Subsequently, a meeting with THB and TD to discuss the parking provision in KTAA was held on 27 June 2017 and the parking provision requirements were agreed as follows:

Table 2.2 Proposed Car Parking and L/UL Facilities Provision in TR2 TTIA (Draft – R4)

<table>
<tr><th rowspan="2">Type of Provision</th><th colspan="4">Requirement#</th></tr>
<tr><th>Use</th><th>Provision Standard</th><th colspan="2">Quantity</th></tr>
<tr><td rowspan="3">Private Vehicle (PV) Parking</td><td>Office + Cultural & Creative Industries (CCI)</td><td>Lower End + 20% to Middle Range of HKPSG Requirement</td><td>279 – 314*</td><td rowspan="2">359 - 394</td></tr>
<tr><td>Retail + Food Stalls</td><td>Upper End of HKPSG Requirement</td><td>80*</td></tr>
<tr><td>Public</td><td></td><td colspan="2">130**</td></tr>
<tr><td>Goods Vehicles (GV) L/UL Bays</td><td>Office + Retail (ancillary)</td><td>Lower End of HKPSG Requirement</td><td colspan="2">36*</td></tr>
<tr><td>GV Parking</td><td>Public</td><td>65</td><td colspan="2">65***</td></tr>
<tr><td>Coach Parking</td><td>Public</td><td>10</td><td colspan="2">10
(including 2M/HGV L/UL bays with 12m of length shared with coach parking)</td></tr>
</table>

Note:

* The ancillary parking provision was calculated based on the development parameters under the PODP which further revised subject to the final development parameters will be.

** The number of the public PV parking spaces would be subject to the preliminary layouts of the basement carpark. It was agreed that all the parking facilities should be accommodated in three basement floors.

*** EKEO secured an in-principle agreement from LandsD to permit the use of part of the ancillary GV L/UL spaces as nighttime parking spaces for public use. The number of public GV parking spaces could be reduced accordingly subject to TD's advice on the proportion of the GV L/UL spaces to be retained for L/UL at nighttime.

\# The number of required parking spaces may be slightly adjusted in the process of formulating the layout of basement carpark.

2.2.2 The percentage of the GV L/UL bays to be shared for public GVs parking at night time was endorsed as 75% under the CPLD Paper No. 33/19(MA) dated 25 July 2019. As such, the number of public GV parking spaces is 63. The quantity of parking spaces for other vehicle types are also adjusted based on the latest scheme of RODP- Revision 2 presented in WP5 (Final), with the provision standard remaining unchanged. The parking provision requirements as endorsed in the CPLD meetings are shown in **Table 2.3**.

Table 2.3 Car Parking and L/UL Facilities Provision Endorsed by CPLD Meetings

<table>
<tr><th rowspan="2">Type of Provision</th><th colspan="4">Requirement</th></tr>
<tr><th>Use</th><th>Provision Standard</th><th colspan="2">Quantity</th></tr>
<tr><td rowspan="3">Private Vehicle (PV) Parking</td><td>Office*</td><td>Lower End + 20% to Middle Range of HKPSG Requirement</td><td>270 – 303**</td><td rowspan="2">350 - 383</td></tr>
<tr><td>Retail + Food Stalls</td><td>Upper End of HKPSG Requirement</td><td>80*</td></tr>
<tr><td>Public</td><td></td><td colspan="2">130***</td></tr>
<tr><td>Goods Vehicles (GV) L/UL Bays</td><td>Office + Retail (ancillary)</td><td>Lower End of HKPSG Requirement</td><td colspan="2">36**
(23LGV; 13 M/HGV)</td></tr>
<tr><td>GV Parking</td><td>Public</td><td>65</td><td colspan="2">63# (41LGV; 22M/HGV)</td></tr>
<tr><td>Coach Parking</td><td>Public</td><td>10</td><td colspan="2">10</td></tr>
<tr><td>Motorcycle Parking</td><td></td><td>5% of total provision of private vehicles</td><td colspan="2">27</td></tr>
<tr><td>Cycle Parking</td><td></td><td>50</td><td colspan="2">50@</td></tr>
</table>

Note:

* 2700 m^2 of office space is reserved for "G/IC" use

** The ancillary parking provision was calculated based on the development parameters under the RODP – Revision 2 which will be further revised subject to the final development parameters.

*** Public parking space as requested by TD.

\# 75% of GV L/UL spaces to be shared with overnight GV parking.

@ The provision is to support the cycle track along the waterfront of KTAA to form part of the future cycle track network in the Kai Tak Development Area.

3 EXISTING ROAD NETWORK

3.1 Existing Road Network

3.1.1 The extent of Area of Influence (AOI) for this TTIA and the locations of key junctions for this study are presented in **TIA/FIGURE 3.1**.

3.1.2 The AOI for this TTIA is bounded by Lai Yip Street to the north-west, Kwun Tong Road to the north-east, Wai Fat Road to the south-east and Hoi Bun Road to the south-west.

3.1.3 The future developments at the KTAA within the AOI will induce traffic impact on the road network in particular for several major road links, including Hoi Bun Road, Wai Yip Street, Kei Yip Street and Hoi Yuen Road.

3.1.4 Hoi Bun Road is an east-west road link along Kwun Tong Promenade, serving various Industrial and Commercial developments alongside. Hoi Bun Road is classified as Local Distributor Road with 10m single-2 carriageway configuration. Currently, the kerbsides of Hoi Bun Road are frequently utilized by vehicles.

3.1.5 Wai Yip Street is an east-west major road link connecting Kwun Tong Road, Kai Fuk Road and Kwun Tong Bypass in KTBA. Wai Yip Street is classified as District Distributor Road with dual-3 carriageway configuration. Kerbside loading/unloading activities were observed along both sides of Wai Yip Street which reduced the lane capacity of both bounds.

3.1.6 Kei Yip Street is a 2-lane local distributor running south-westbound between Wai Yip Street and Hoi Bun Road. There is a general loading/unloading bay on the carriageway along the south-eastern kerb of Kei Yip Street adjacent to Kwun Tong Harbour Plaza. Hence this section of Kei Yip Street will be reduced to 2 lanes between Wai Yip Street and Kei Yip Lane.

3.1.7 Hoi Yuen Road is a 3-lane district distributor running south-westbound between Kwun Tong Road and Wai Yip Street. Due to heavy traffic flows and kerbside activities along How Ming Street, traffic queue is observed on Hoi Yuen Road tailing back to the roundabout with Kwun Tong Road and Hip Wo Street.

3.1.8 26 key junctions were selected in the study area for TTIA Study which may probably be affected by the induced traffic due to the KTAA. These 26 critical junctions are summarized below:

- J1 - Junction of Lai Yip Street/Kwun Tong Road
- J2 - Junction of Lai Yip Street/Hung To Road
- J3 - Junction of Lai Yip Street/Wai Yip Street
- J4 - Junction of Lai Yip Street/Hoi Bun Road
- J5 - Junction of How Ming Street/Chong Yip Street
- J6 - Junction of How Ming Street/Hung To Road
- J7 - Junction of How Ming Street/Wai Yip Street
- J8 - Junction of How Ming Street/Hoi Bun Road
- J9 - Junction of Tsun Yip Street/Hung To Road
- J10 - Junction of Tsun Yip Street/Wai Yip Street
- J11 - Junction of Hoi Yuen Road/Kwun Tong Road/Hip Wo Street
- J12 - Junction of Hoi Yuen Road/Shing Yip Street/How Ming Street

- J13 - Junction of Hoi Yuen Road/Hung To Road
- J14 - Junction of Hoi Yuen Road/Wai Yip Street
- J15 - Junction of King Yip Street/Shing Yip Street
- J16 - Junction of King Yip Street/Hung To Road
- J17 - Junction of Wai Fat Road/Lei Yue Mun Road/Tseung Kwan O Road
- J18 - Junction of Wai Fat Road/Shing Yip Street
- J19 - Junction of Wai Fat Road/Wai Yip Street
- J20 - Junction of Kwun Tong Road/Tsui Ping Road
- J21 - Junction of How Ming Street/Tsun Yip Street
- J22 - Junction of Lei Yue Mun Road/Cha Kwo Ling Road
- J23 – Junction of Kei Yip Street/Kei Yip Lane
- J24 – Junction of Hoi Yuen Road/Kei Yip Lane/Road L1
- J25 – Junction of Road L1/Road L2
- J26 - Junction of Wai Yip Street/Road L2

3.1.9 J1 to J23 and J26 are existing junctions. The junction layouts of existing junctions are presented in **Appendix A**. The junction assessment results of these existing junctions and the proposed new signalized junction (i.e. J24 and J25) will be presented in **Section 8** in this TTIA report.

3.2 Existing Traffic Flows

3.2.1 The traffic surveys for these key junctions was carried out in September 2016 (partially) and May 2017 (full surveys in AOI). The 2017 observed flows within the AOI of this TTIA are presented in **TIA/FIGURE 3.2**.

3.2.2 The results of the junction capacity analysis for J1 to J23 and J26 based on the 2017 observed flows are summarized in **Table 3.1**.

Table 3.1 Junction Performance Based On 2017 Observed Flows

Junction No.	Junction Name	Junction Type	RC^ or DFC*	
			2017 AM Peak	2017 PM Peak
J1	Lai Yip Street/Kwun Tong Road	Signalized	61%	50%
J2	Lai Yip Street/Hung To Road	Signalized	>100%	>100%
J3	Lai Yip Street/Wai Yip Street	Signalized	33%	81%
J4	Lai Yip Street/Hoi Bun Road	Signalized	69%	58%
J5	How Ming Street/Chong Yip Street	Signalized	>100%	>100%
J6	How Ming Street/Hung To Road	Signalized	>100%	>100%
J7	How Ming Street/Wai Yip Street	Signalized	5%	30%
J8	Tsun Yip Street/Hung To Road	Priority	0.17	0.36

Junction No.	Junction Name	Junction Type	RC^ or DFC*	
			2017 AM Peak	2017 PM Peak
J9	Tsun Yip Street/Hung To Road	Priority	>100%	>100%
J10	Tsun Yip Street/Wai Yip Street	Signalized	57%	99%
J11	Hoi Yuen Road/Kwun Tong Road/Hip Wo Street	Roundabout	0.81	0.96
J12	Hoi Yuen Road/Shing Yip Street/How Ming Street	Signalized	63%	37%
J13	Wai Yip Street/Hoi Yuen Road/Hung To Road	Signalized	>100%	75%
J14	Hoi Yuen Road/Wai Yip Street	Roundabout	***1.17***	0.80
J15	King Yip Street/Shing Yip Street	Signalized	>100%	59%
J16	King Yip Street/Hung To Road	Priority	0.39	0.62
J17	Wai Fat Road/Lei Yue Mun Road/Tseung Kwan O Road	Signalized	36%	43%
J18	Wai Fat Road/Shing Yip Street	Signalized	19%	24%
J19	Wai Fat Road/Wai Yip Street	Signalized	10%	***-19%***
J20	Kwun Tong Road/Tsui Ping Road	Signalized	36%	23%
J21	How Ming Street/Tsun Yip Street	Signalized	46%	32%
J22	Lei Yue Mun Road/Cha Kwo Ling Road	Signalized	37%	49%
J23	Kei Yip Street/Kei Yip Lane	Priority	0.06	0.08
J26	Wai Yip Street/Road L2	Signalized	50%	50%

Note:
^ RC is reserved capacity in % for signal-controlled junction.
* Figures in decimal represent "Design Flow to Capacity" (DFC) ratio for priority junctions or roundabouts.

3.2.3 As shown in **Table 3.1**, all the existing junctions were operated with ample capacity during AM and PM peak hour based on 2017 Observed Flows except J14 and J19.

3.2.4 The traffic congestion at J14 is one of the major traffic issues in Kwun Tong area particularly the traffic queue along Hoi Yuen Road south-westbound at J14. The traffic queue along Hoi Yuen Road may be due to the heavy circulating flows at the roundabout and the traffic queue tailing back from the junction at J19. Moreover, the traffic queue related to the heavy pick-up/drop-off activities of the bus stops along Hoi Yuen Road and the moving-in/out activities at the run-in/out along both sides of Hoi Yuen Road. The traffic queue along Hoi Yuen Road causes gridlock problem to adjacent roads including How Ming Street, Hing Yip Street, and Shing Yip Street.

3.2.5 As recommended under the Pedestrian Environment Improvement Study in KTBA (Agreement no. CE 57/2012(TT) Pedestrian Environment Improvement scheme for transformation of Kwun Tong Business Area – Feasibility Study) and the Technical Note for TTIA Study, traffic improvement measures are highly recommended, especially for the Hoi Yuen Road Roundabout. Hence, an improvement scheme is proposed for J14 in this Study and be introduced in the later section.

3.2.6 For J19, the junction performance has negative RC during PM peak may be due to the heavy left turn flows from Wai Yip Street EB to Wai Fat Road NB heading to Tseung Kwan O and Eastern Harbour Crossing. The junction improvement scheme will be discussed in the later section.

4 PLANNED / COMMITTED ROAD NETWORK

4.1 Planned / Committed Road Network

4.1.1 Some of the existing roads, junctions, pedestrian crossings in the proposed AOI of TTIA will be up-graded, enhanced and realigned based on the proposals in other studies. They included:

Enhancement of Pedestrian Crossings:
- J5 - Junction of How Ming Street/Chong Yip Street
- J8 - Junction of How Ming Street/Hoi Bun Road
- J12 - Junction of Hoi Yuen Road/Shing Yip Street/How Ming Street
- J15 - Junction of King Yip Street/Shing Yip Street

Rationalization of kerbside activities:
- Along How Ming Street near J8 - Junction of How Ming Street/Hoi Bun Road
- Along Tsun Yip Street near J10 - Junction of Tsun Yip Street/Wai Yip Street
- Along Kei Yip Street
- Along Shing Yip Street

Junction Layout Improvements:
- J3 - Junction of Lai Yip Street/Wai Yip Street
- J14 - Junction of Hoi Yuen Road/Wai Yip Street
- J18 - Junction of Wai Fat Road/Shing Yip Street
- J19 - Junction of Wai Fat Road/Wai Yip Street

4.1.2 Some of the above up-grading, enhancements and improvement schemes are presented in **Appendix B** and have been taken into account in the TTIA of this Study.

4.1.3 The planned and committed road network also included Route 6 – Tseung Kwan O – Lam Tin Tunnel, Trunk Road T2, Central Kowloon Route, reversal of How Ming Street (section between Wai Yip Street and Hoi Bun Road) traffic direction, closure of Cheung Yip Street, and the future Environmentally Friendly Linkage System (EFLS).

5 PEDESTRIAN CONNECTIVITY

5.1 Existing Pedestrian Facilities

5.1.1 The major road corridor of Wai Yip Street bisects the future KTAA development and the other developments in KTBA on the northern side of Wai Yip Street. In order not to affect the road base vehicular traffic on Wai Yip Street, the grade separated walkway is a good pedestrian connection between the future KTAA and the KTBA on the northern side of Wai Yip Street. The existing footbridge across Wai Yip Street near the roundabout with Hoi Yuen Road as shown in **Figure 5.1** and the footbridge across Wai Yip Street connecting between Manulife Financial Centre and Kwun Tong Ferry Pier as shown in **Figure 5.2** are two examples of the pedestrian connections which could be considered to be maintained.

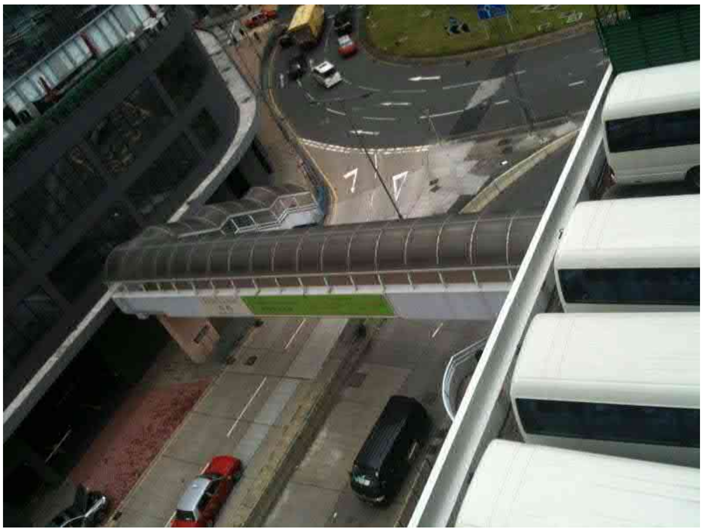


Figure 5.1 Existing Footbridge Across Wai Yip Street near Roundabout with Hoi Yuen Road

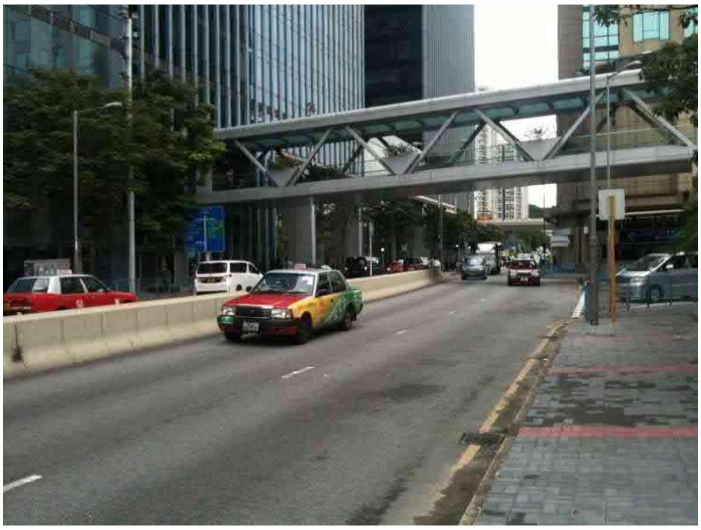


Figure 5.2 Existing Footbridge Across Wai Yip Street Connecting Maunlife Financial Centre and Kwun Tong Ferry Pier

5.1.2 Generally, LOS C is desirable for most design at streets with dominant 'living' pedestrian activities. A short description of the LOS conditions is presented in **Table 5.1**.

Table 5.1 LOS for Walkway

LOS	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 their 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 stream. Where reverse direction or crossing movement exist, minor conflicts will occur, and speed and volume will be somewhat lower.
D	33 - 49	Freedom to select individual walking speeds and bypass other pedestrians is restricted. Where crossing or reverse-flow movements exist, the probability of conflicts is high and its avoidance requires changes of speeds and position. The LOS provides reasonable fluid flow; however considerable friction and interactions between pedestrians are likely to occur.
E	49 - 75	Virtually, all pedestrians would have their normal walking speeds restricted. At the lower range of this LOS, forward movement is possible only by shuffling. Space is insufficient to pass over slower pedestrians. Cross- and reverse-movement are possible only with extreme difficulties. Design volumes approach the limit of walking capacity with resulting stoppages and interruptions to flow.
F	> 75	Walking speeds are severely restricted. Forward progress is made only by shuffling. There are frequent and unavoidable conflicts with other pedestrians. Cross- and reverse-movements are virtually impossible. Flow is sporadic and unstable. Space is more characteristics of queued pedestrians than of moving pedestrian streams.

5.1.3 Based on surveyed results in other study in this area, the observed (in 2014) pedestrian flows in vicinity of KTAA is shown in **Figure 5.3**. The Level of Service (LOS) of the footpath based on the surveyed pedestrian flows is shown in **Table 5.2**.

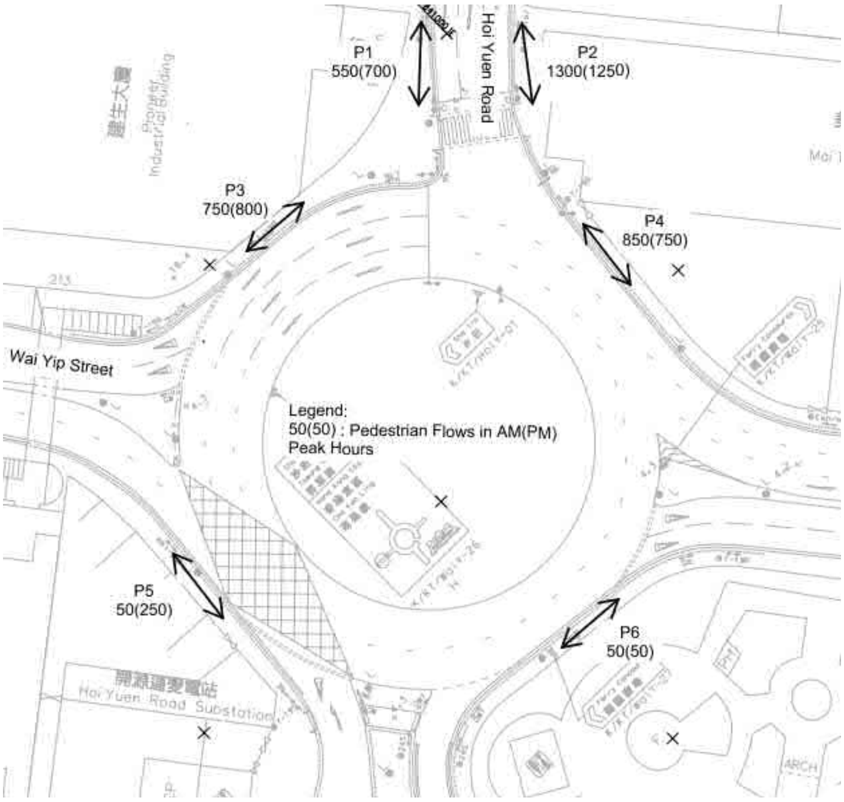


Figure 5.3 Surveyed Pedestrian Flows

Table 5.2 LOS of Existing Footpath

Footpath	Actual Width (m)	Effective Width (m)	Peak Hour Flow (Ped/hr) (2-way)		Peak Hour Flow Rate (Ped/min/m) (2-way)		LOS	
			AM	PM	AM	PM	AM	PM
P1	3.7	2.7	550	700	3.9	5.0	A	A
P2	4.0	3.0	1,300	1,250	8.6	8.3	A	A
P3	2.9	1.9	750	800	6.8	7.3	A	A
P4	3.5	2.5	850	750	9.1	8.0	A	A
P5	3.2	2.2	50	250	0.3	2.2	A	A
P6	3.2	2.5	50	(50)	0.2	0.3	A	A

Note:
^ Effective width is the portion of a walkway that can be used effectively by pedestrians. By assuming 0.5m for dead width on both sides of footpath, the effective width = actual width - 0.5mx2.

5.1.4 As shown in **Table 5.2**, the LOS of all footpaths along Hoi Yuen Road and at the junction with Wai Yip Street are A and hence it means that walking speeds are freely selected, and conflicts between pedestrians are unlikely.

5.2 Pedestrian Flows Related To KTAA

5.2.1 Based on the pedestrian trip rates (as shown in **Table 5.3**) adopted in Agreement No. CE49/2012 (TT) Kowloon Bay Business Area Pedestrian Environment Improvement – Feasibility Study, the pedestrian trip end of KTAA is shown in **Table 5.4**.

Table 5.3 Pedestrian Trip Rates

Development Type	Survey Locations	AM Peak		PM Peak	
		Generation	Attraction	Generation	Attraction
Office (person/100m^2 GFA)	Manhattan Place and Billion Centre	0.058	3.111	2.080	0.148
Retail/Commercial (person/100m^2 GFA)	Mega Box and KITEC*	0.154	0.638	1.387	0.855

Note: KITEC is Kowloon Bay International Trade and Exhibition Centre.

Table 5.4 Pedestrian Trip End of KTAA

Development Type	GFA	AM Peak		PM Peak	
		Generation	Attraction	Generation	Attraction
Office (person/100m^2 GFA)	69,300	40	2156	1441	103
Retail/Commercial (person/100m^2 GFA)	16,000	25	102	222	137
	Total	65	2258	1663	240

5.2.2 From **Table 5.4**, the trip end related to Office development of KTAA dominated the trip end results because the GFA of office in KTAA is much higher than that of Retail/Commercial development. Even if the peak period of the Retail/Commercial will not appear at AM and PM peak, the trip end related to Office development was adopted for the following pedestrian assessment.

5.2.3 In order to estimate the modal split of the pedestrian flows related to KTAA, survey was conducted at Mega Box. The reason for using Mega Box as a benchmark is because of the following similarities with KTAA:

- Located in Kowloon East;
- A mixed-use development with office and retail;

- Outside 500m catchment area of the closest MTR station; and
- Well served by franchised buses and other public transport mode.

5.2.4 The modal split of the pedestrian flows related to KTAA, as shown in **Table 5.5,** is based on i) the surveyed results conducted at Mega Box for the KTRT Study; ii) improved walkability along the session of Hoi Yuen Road between Kwun Tong MTR station and KTAA under the proposed scheme of KTBA Study, and; iii) close proximity to ferry piers.

Table 5.5 Modal Split of Pedestrian Related To KTAA

Mode Of Transport	Modal Split	Pedestrian Route
MTR	**30%**	**To/from Kwun Tong MTR Station**
Franchised Bus	**38%**	**To/from the future PTI**
Taxi	**4%**	**To/from the taxi layby within KTAA**
Private Car	**10%**	**To/from KTAA's Carpark**
Ferry	**10%**	**To/from Kwun Tong Ferry Pier and planned water taxi services**
Mini-Bus/Residents' Service	**6%**	**To/from the future PTI**
Walking	**2%**	**To/from Hoi Yuen Road***
Total	**100%**	**-**

Note: * The walking trips are assumed "to/from Hoi Yuen Road" which is a conservative scenario for the following assessment.

5.2.5 After taking into account of the modal split and the predicted pedestrian route as shown in **Table 5.5**, the pedestrian related to "MTR" and "Walking" (in total 32%) will be adopted to assess the LOS of the footpath as shown in **Figure 5.3**.

5.3 Future Pedestrian Facilities

5.3.1 There are well-planned pedestrian enhancement schemes at KTBA based on the recommendations from EKEO's Feasibility Study – Agreement No. CE 57/2013 (TT) – Pedestrian Environment Improvement Scheme for Transformation of KTBA. It is proposed that main roads between Kwun Tong Road and Kwun Tong promenade should be utilized to strengthen the north-south connectivity.

5.3.2 Short term pedestrian environment improvement schemes including the enhancement of existing pedestrian crossings, introducing new pedestrian crossing facilities at the New Kwun Tong Ferry Pier Public Transport Interchange and demolishing some unnecessary railings to alleviate congestions during peak hours. Maximizing the use of back alleys as an integral part of the pedestrian network is proposed to increase the carrying capacity of pedestrian walkways, which include back alleys in the vicinity of Kwun Tong Road, Shing Yip Street, Hing Yip Street, Hoi Yuen Road, Hung To Road, Tsun Yip Street Playground, How Ming Street and Hoi Bun Road. Pedestrian directional signage facilities along major pedestrian routes to/from the Kwun Tong waterfront/ Kwun Tong Ferry Pier Public Transport Interchange and MTR stations will also be added and updated to facilitate pedestrians to arrive at their respective destination efficiently without detouring.

5.3.3 In the long run, upgrading works along major north-south corridors, including Hoi Yuen Road and Tsun Yip Street, and east-west corridors, including Wai Yip Street and Hoi Bun Road, are proposed to rationalise the pedestrian and traffic environment between Kwun Tong Road and the waterfront, with an aim to attract people to the waterfront through providing a walkable environment.

5.3.4 The proposed at-grade pedestrian facilities are presented in **TIA/Figure 5.1**. As mentioned in Para. 5.2.4, only 32% of the KTAA's pedestrian trips will use the at-grade pedestrian facilities as shown in **Figure 5.4**.

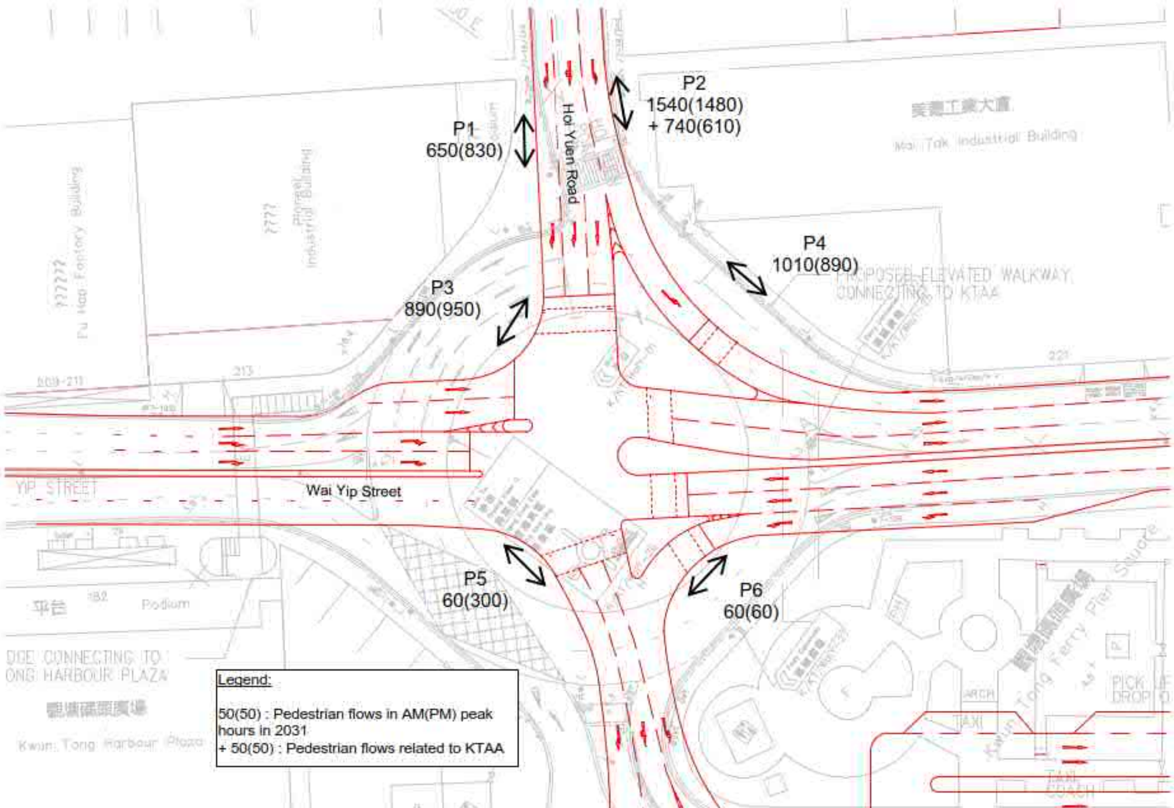


Figure 5.4 Pedestrian Flows in 2031 with KTAA

5.3.5 The pedestrian flows in **Figure 5.4** was factored up by a growth rate of 1% (an assumed figure for conservative) p.a. onto the surveyed pedestrian flows as shown in **Figure 5.3** to reflect the background growth. The additional pedestrian flows of 740(610) (in AM(PM) peak respectively) are the resultant of the 32% (MTR and walking trip as mentioned in Para. 5.2.4 and 5.3.4) of the two-way pedestrian flows as shown in **Table 5.4**. The LOS of the future footpath in vicinity is shown in **Table 5.6**.

Table 5.6 LOS of Future Footpath in 2031

Footpath	Actual Width (m)	Effective Width^ (m)	Peak Hour Flow (Ped/hr) (2-way)		Peak Hour Flow Rate (Ped/min/m) (2-way)		LOS	
			AM	PM	AM	PM	AM	PM
P1	4.4*	3.4	650	830	3.2	4.1	A	A
P2	4.6*	3.6	2,280	2,090	10.6	9.7	A	A
P3	4.0#	3.0	890	950	4.9	5.3	A	A
P4	3.5	2.5	1,010	890	6.7	5.9	A	A
P5	4.0#	3.0	60	300	0.3	1.7	A	A
P6	4.0#	3.0	60	60	0.3	0.3	A	A

Note:
^ Effective width is the portion of a walkway that can be used effectively by pedestrians. By assuming 0.5m for dead width on both sides of footpath, the effective width = actual width - 0.5mx2.
* Width of footpath is increased due to footpath widening proposed by KTBA Study.
# Width of footpath is assumed to be 4.0m and it will be further reviewed based of the RODP.

5.3.6 As shown in **Table 5.6**, all the footpath in vicinity of KTAA has a LOS of A and hence, it means that walking speeds are freely selected, and conflicts between pedestrians are unlikely. The elevated footbridge connecting to KTAA across J14 – the junction of Hoi Yuen Road/ Wai Yip Street as shown in **TIA/Figure 5.1** was proposed under KTBA Study.

6 TRAFFIC FORECAST

6.1 Overview of Modelling Approach

6.1.1 The main purpose of establishing a transport demand model for the Project is to estimate the traffic activities within the AOI and to determine the demand and requirement of the transport infrastructure/facilities. Thus, it is important to establish a transport demand model which incorporates the agreed planning data and assumptions including the demographic & land use data, socio-economic characteristics, highway infrastructure and railway network assumptions, etc.

6.1.2 To produce robust traffic forecasts that would be responsive to dynamic changes in future land use and infrastructure development, a two-tier modelling approach is proposed for the Project. The two-tier model structure will comprise a strategic transport model (STM) in the upper tier and a local area traffic model (LATM) in the lower tier. The upper tier strategic transport model follows a 4-stage multi-modal modeling process to produce vehicular cordoned matrices for input into the lower tier local area traffic model.

6.2 Base Year Model Development

6.2.1 In all, the highway-based local area traffic model was developed on SATURN platform which is equipped with detailed junction simulation capability. This allows traffic behavior at junctions including junction delays, traffic queues and platoon effects to be taken into account in a combined traffic simulation and assignment process.

6.2.2 The base year strategic transport model will be validated to observed vehicular flows across the major Annual Traffic Census (ATC) screenlines for the morning and afternoon peak periods as well as daily. The ATC count data provides breakdowns of total vehicle flows by direction, by hour and by vehicle classification.

6.2.3 The base year vehicular cordoned matrices are extracted from strategic transport model for input to local area traffic model. The local area traffic model serves as the prime basis for facilitating traffic forecasts and assessments to be carried out under this Project. Hence, the base year (2017) local area traffic model has to be rigorously validated against a vast amount of observed traffic data comprising junction flows in the two distinctive morning and evening peak hours. 23 junctions are identified where the base year modelled flows will be compared against with observed flows to ensure that junction flows are satisfactorily replicated by the LATM. For junction validation, the entry and exit flows on each key junction arm will be compared. The validation summary is presented in **Table 6.1**. The list of validated junctions and details are provided in **Appendix C**.

Table 6.1 Key Link and Junction Flows Validation Summary

Validation Criteria	Target Values	Percentage of Key Link and Key Junction In/Out Flows	
		AM Peak	PM Peak
		Total (PV + GV + PT)	Total (PV + GV + PT)
% of links with GEH 5 or less	85%	97%	87%
% of links with GEH 10 or less	100%	100%	100%

6.2.4 The above results show that entry/exit traffic flows at key junctions are satisfactorily validated to the validation criteria for GEH 5 and 10 for both AM and PM peak hours. As demonstrated in the above tables, key junction flows synthesized by the base year (2017) LATM compared well with the observed flows.

6.2.5 To conclude, the validation results illustrate that the LATM satisfactorily replicate the existing (2017) traffic flow pattern and have high degree of agreement between the modelled flows and observed traffic count data within the AOI of the Project. The accuracy obtained for the base year 2017 model results demonstrate that the LATM is robust and provide reliable platform for carrying out traffic projection. These models in turn will provide sound basis for the development of design year traffic models to facilitate traffic forecasting for traffic and environmental impact assessment purposes.

6.3 Design Years Model Development

6.3.1 2014-based Territorial Population and Employment Data Matrix (TPEDM) is adopted as input planning data to establish the future year traffic model for the design year 2031. The planned highway infrastructure – Route 6, which comprise of Central Kowloon Route, Trunk Road T2, Tseung Kwan O – Lam Tin Tunnel and Cross Bay Link, are incorporated in the traffic model. In addition, agreed local junction improvements within the AOI are also included. Traffic assignments will then be undertaken to produce local area traffic forecasts for the design year. The reference traffic flows in 2031 without KTAA development are presented in **TIA/FIGURE 6.1C**.

6.4 Development Traffic of KTAA

6.4.1 The latest development schedule of KTAA is summarized in **Table 2.1**. Trip rates for office and commercial/retail facilities from Transport Planning and Design Manual (TPDM) are summarized in **Table 6.2**.

Table 6.2 Trip Rates for Office and Commercial/Retail Facilities

Development	Source	AM Peak (pcu/hr/100m^2 GFA)		PM Peak (pcu/hr/100m^2 GFA)	
		Generation	Attraction	Generation	Attraction
Office	TPDM (Mean value) (1)	0.1703	0.2452	0.1573	0.1175
Commercial/ Retail	TPDM (Mean value) (1)	0.2296	0.2434	0.3100	0.3563

Note:
(1) Mean Value has been chosen as the commercial/retail/office facilities are located far from Kwun Tong MTR Station (>500m walkway distance).

6.4.2 Based on the development schedule and the proposed trip rates as indicated in **Table 6.2**, peak hour traffic generation/attraction trips of KTAA have been estimated as summarized in **Table 6.3.**

Table 6.3 Traffic Generation/Attraction of the Proposed Development at KTAA

Development Component	AM Peak (pcu/hr)		PM Peak (pcu/hr)	
	Generation	Attraction	Generation	Attraction
Office	111	160	103	77
Retail/F&B	33	36	45	52
Arts, Cultural/Institutional Uses (Studios or exhibition/event area) (use Office's trip rates as assumption)	7	10	6	5
Total	**151**	**206**	**154**	**134**

6.4.3 With the amount of development traffic of KTAA as shown in **Table 6.3** and the traffic forecast as mentioned above, the 2031 AM and PM peak hour traffic forecast flows have been predicted and presented in **TIA/FIGURE 6.2D**.

7 PROPOSED JUNCTION LAYOUT WITH PUBLIC TRANSPORT INTERCHANGE AND INTERNAL ROAD AT KTAA

7.1 Proposed Junction Layout and Internal Road at KTAA

7.1.1 According to the proposed junction layout at J14 - Hoi Yuen Road/Wai Yip Street by KTBA Study, this junction will be modified from the existing roundabout to a signal-controlled junction with 4 arms as shown in **TIA/FIGURE 5.1**, and it has been updated in order to take into account of the U-turn flows on both bounds of Wai Yip Street.

7.1.2 The following design concepts of this proposed junction layout have been considered.

- Simplify the junction layout by adopting a cross junction configuration;
- Besides the 2 U-turn flows, all turning movements at this junction could be maintained;
- Create a through road (Road L1) parallel to Wai Yip Street through the site of KTAA in order to relief the traffic demand on Wai Yip Street; and
- Introduce pedestrian crossings at this junction.

7.1.3 Based on the above design concepts and the preliminary design of KTAA, future PTI and other considerations, the modification of the junction layout has been re-designed and is shown in **TIA/FIGURE 5.1**.

7.1.4 The main features of this junction layout and traffic arrangement at KTAA are summarized below:

- The cross junction with signal control is proposed;
- U-turn flows from Wai Yip Street Eastbound will be diverted to use i) Wai Yip Street Eastbound → Hoi Yuen Road Extension South bound → Kei Yip Lane Westbound → Kei Yip Street North bound and back to Wai Yip Street Westbound;
- U turn flows from Wai Yip Street Westbound would have two options: i) Wai Yip Street Westbound → Hoi Yuen Road Extension South bound →Road L1 Eastbound → Road L2 North bound and back to Wai Yip Street Eastbound, or ii) Wai Yip Street Westbound → Road L2 South bound → Road L2 North bound and back to Wai Yip Street Eastbound;
- The u-turn routings are shown in **Figure TIA/546** in Appendix F.
- Pedestrian crossings and an elevated walkway are provided which facilitate the pedestrians going from Kwun Tong MTR Station to KTAA along the south-eastern footpath of Hoi Yuen Road.
- Kei Yip Lane will be a one-way north-westbound road between Kei Yip Street and Hoi Yuen Road Extension.
- 3 new junctions will be proposed, including i) a signal controlled junction of Wai Yip Street/Road L2 (J26), ii) a signal controlled junction of Road L2/Road L1 (J25), and iii) a signal controlled junction of Hoi Yuen Road extension/Kei Yip Lane (J24).
- The ingress/egress routing of development traffic is shown in **TIA/FIGURE 7.1B**.

7.2 Public Transport Interchange

7.2.1 According to Appendix F – Accommodation, Technical and Operational Requirements of the Proposed Facilities, mentioned in the Study Brief of this Study, the requirements of the proposed PTI are:

- *A new PTI should consist of 12 bus bays (3.5m-wide between curbs with a minimum length of 40m each), 2 mini-bus bays (3m wide between curbs with a minimum length of 30m each) and 2 taxi stands (3m wide between curbs with minimum lengths of 15m and 45m for cross-harbor taxis and urban taxis respectively). The passenger platforms should be at least 3m wide. In case the PTI is semi-covered or fully covered, the minimum headroom for the PTI should be 6m.*

7.2.2 The proposed PTI layout is presented in **TIA/FIGURE 5.1** and the transport facilities of the PTI are summarized in **Table 7.1**.

Table 7.1 Proposed Transport Facilities of the PTI

<table>
<tr><th>Transport Facilities</th><th>Requirement of Study Brief</th><th>Proposed Provision</th><th>Satisfy or not</th></tr>
<tr><td>Bus Bays</td><td>12 bays (as advised by EKEO, the requirement is reduced to 8 bays)</td><td>2 bays for dropping off passengers, 7 bays for picking up passengers and 20 bus bays for parking/stacking</td><td rowspan="2">Yes
Total no. of bays = 29 bus + 1 GMB / 25 bus + 7 GMB (4 bus bays equal to 6 GMB bays)</td></tr>
<tr><td>Mini-bus bays</td><td>2 bays</td><td>1 bay</td></tr>
<tr><td>Taxi Stands</td><td>i) Cross-harbour Taxi : min. 15m in length
ii) Urban Taxi : min 45m in length</td><td>2 separated taxi stand with min length of 15m and 45m respectively</td><td>Yes</td></tr>
<tr><td>General Pick-up/drop-off bay</td><td>No requirement</td><td>A bay with min 20m in length is proposed</td><td>-</td></tr>
<tr><td>Coach pick-up/drop-off bay</td><td>No requirement</td><td>A double width bay with min 45m in length is proposed</td><td>-</td></tr>
</table>

7.2.3 As presented in **Table 7.1**, all the requirements as mentioned in the Study Brief for the proposed PTI are satisfied.

7.2.4 The results of swept path analysis were shown in **Appendix D** and showed that the maneuvering space was sufficient for 12.8m bus within the proposed PTI.

7.3 Residents' Services

7.3.1 There are 3 existing routes of residents' service as shown in **Table 7.2** which are using Kwun Tong Ferry Pier as their destination at AM peak and origin at PM peak. The location of existing stop at Kwun Tong Ferry Pier is shown in **Appendix E**.

Table 7.2 Existing Residents' Service at Kwun Tong Ferry Pier

Route No.	Destination/Origin	No. of Service	
		AM Peak	PM Peak
NR725	Tsui Ning Garden/Kwun Tong Ferry Pier	6	6
NR748	Tai Hing Garden/Kwun Tong	5	2
NR753	Tuen Mun Siu Hong Court/Kwun Tong Ferry Pier	1	1

Source: From TD's web site in May 2018

7.3.2 A double width 45m(L) coach pick-up/drop-off bay is proposed in the future PTI. It is agreed with TD that the stops of Residents' Service would be re-provided at the proposed coach pick-up/drop-off bay.

8 TRAFFIC IMPACT ASSESSMENT

8.1 Junction Performance without KTAA

8.1.1 The forecasted traffic flows in year 2031 without KTAA at J1 to J26 are presented in **TIA/FIGURE 6.1C**.

8.1.2 The results of the junction capacity analysis for these junctions based on 2031 Reference Traffic Flows (without KTAA) are summarised in **Table 8.1**.

Table 8.1 Junction Performance Based On 2031 Reference Traffic Flows (without KTAA Development)

Junction No.	Junction Name	Junction Type	RC^ or DFC* 2031 w/o KTAA AM Peak	PM Peak
J1	Lai Yip Street/Kwun Tong Road	Signalized	***18%***	***2%***
J2	Lai Yip Street/Hung To Road	Signalized	50%	46%
J3	Lai Yip Street/Wai Yip Street	Signalized	12%	28%
J4	Lai Yip Street/Hoi Bun Road	Signalized	26%	23%
J5	How Ming Street/Chong Yip Street	Signalized	>100%	74%
J6	How Ming Street/Hung To Road	Signalized	56%	77%
J7	How Ming Street/Wai Yip Street	Signalized	15%	26%
J8	Tsun Yip Street/Hung To Road	Priority	0.76	0.78
J9	Tsun Yip Street/Hung To Road	Priority	50%	78%
J10	Tsun Yip Street/Wai Yip Street	Signalized	45%	63%
J11	Hoi Yuen Road/Kwun Tong Road/Hip Wo Street	Roundabout	***1.20***	***1.15***
J12	Hoi Yuen Road/Shing Yip Street/How Ming Street	Signalized	19%	12%
J13	Hoi Yuen Road/Hung To Road	Signalized	48%	28%
J14	Hoi Yuen Road/Wai Yip Street	Signalized	19%	30%
J15	King Yip Street/Shing Yip Street	Signalized	84%	64%
J16	King Yip Street/Hung To Road	Priority	0.52	0.76
J17	Wai Fat Road/Lei Yue Mun Road/Tseung Kwan O Road	Signalized	20%	31%
J18	Wai Fat Road/Shing Yip Street	Signalized	29%	65%

Junction No.	Junction Name	Junction Type	RC^ or DFC* 2031 w/o KTAA	
			AM Peak	PM Peak
J19	Wai Fat Road/Wai Yip Street	Signalized	***-16%***	***-24%***
J20	Kwun Tong Road/Tsui Ping Road	Signalized	23%	18%
J21	How Ming Street/Tsun Yip Street	Signalized	14%	11%
J22	Lei Yue Mun Road/Cha Kwo Ling Road	Signalized	13%	31%
J23	Kei Yip Street/Kei Yip Lane	Priority	0.81	0.57
J24	Hoi Yuen Road/Kei Yip Lane/Road L1	Signalized	>100%	>100%
J25	Road L1/Road L2	Signalized	72%	43%
J26	Wai Yip Street/Road L2	Signalized	20%	17%

Note:
^ RC is reserved capacity in % for signal-controlled junction.
* Figures in decimal represent "Design Flow to Capacity" (DFC) ratio for priority junctions or roundabouts.

8.1.3 As indicated in **Table 8.1**, all the assessed junctions are expected to operate within their capacities in the assessment years of 2031 without KTAA except J1, J11 and J19.

8.2 Junction Performance with KTAA

8.2.1 The forecasted traffic flows in year 2031 with KTAA at J1 to J26 are presented in **TIA/FIGURE 6.2D**.

8.2.2 The results of the junction capacity analysis for these junctions based on 2031 Design Traffic Flows (with KTAA) are summarised in **Tables 8.2**.

Table 8.2 Junction Performance Based On 2031 Design Traffic Flows (with KTAA Development)

Junction No.	Junction Name	Junction Type	RC^ or DFC* 2031 with KTAA	
			AM Peak	PM Peak
J1	Lai Yip Street/Kwun Tong Road	Signalized	***18%***	***2%***
J2	Lai Yip Street/Hung To Road	Signalized	50%	46%
J3	Lai Yip Street/Wai Yip Street	Signalized	10%	24%
J4	Lai Yip Street/Hoi Bun Road	Signalized	26%	23%

Junction No.	Junction Name	Junction Type	RC^ or DFC*	
			2031 with KTAA	
			AM Peak	PM Peak
J5	How Ming Street/Chong Yip Street	Signalized	>100%	74%
J6	How Ming Street/Hung To Road	Signalized	56%	77%
J7	How Ming Street/Wai Yip Street	Signalized	15%	25%
J8	Tsun Yip Street/Hung To Road	Priority	0.76	0.78
J9	Tsun Yip Street/Hung To Road	Priority	50%	76%
J10	Tsun Yip Street/Wai Yip Street	Signalized	39%	56%
J11	Hoi Yuen Road/Kwun Tong Road/Hip Wo Street	Roundabout	***1.21***	***1.15***
J12	Hoi Yuen Road/Shing Yip Street/How Ming Street	Signalized	18%	11%
J13	Hoi Yuen Road/Hung To Road	Signalized	47%	27%
J14	Hoi Yuen Road/Wai Yip Street	Signalized	11%	25%
J15	King Yip Street/Shing Yip Street	Signalized	84%	64%
J16	King Yip Street/Hung To Road	Priority	0.52	0.76
J17	Wai Fat Road/Lei Yue Mun Road/Tseung Kwan O Road	Signalized	20%	31%
J18	Wai Fat Road/Shing Yip Street	Signalized	28%	64%
J19	Wai Fat Road/Wai Yip Street	Signalized	***-18%***	***-25%***
J20	Kwun Tong Road/Tsui Ping Road	Signalized	23%	17%
J21	How Ming Street/Tsun Yip Street	Signalized	13%	11%
J22	Lei Yue Mun Road/Cha Kwo Ling Road	Signalized	13%	30%
J23	Kei Yip Street/Kei Yip Lane	Priority	0.83	0.57
J24	Hoi Yuen Road/Kei Yip Lane/Road L1	Signalized	55%	100%
J25	Road L1/Road L2	Signalized	44%	23%
J26	Wai Yip Street/Road L2	Signalized	13%	12%

Note:
^ RC is reserved capacity in % for signal-controlled junction.
* Figures in decimal represent "Design Flow to Capacity" (DFC) ratio for priority junctions or roundabouts.

8.2.3 As indicated in **Table 8.2**, all the assessed junctions are expected to operate within their capacities in the assessment years of 2031 under the Proposed Development scenario at KTAA except J1, J11 and J19.

8.2.4 J11 - junction of Hoi Yuen Road/Kwun Tong Road will operate over its capacity in year 2031 even without KTAA development traffic. With KTAA, it is estimated that an additional 20pcus/hr (AM peak) and 15 pcus/hr (PM peak) would pass through the roundabout in year 2031. The additional traffic from KTAA only accounts for less than 0.5% of the total traffic flows at the roundabout which means the impact of KTAA on this junction, if any, is insignificant. Therefore, junction improvement scheme was not proposed for J11.

8.2.5 For J1 and J19, junction improvement schemes have been proposed and details are described in Section 8.3.

8.3 Junction Improvement Schemes

J1 – Junction of Kwun Tong Road/Lai Yip Street

8.3.1 By year 2031, traffic on Lai Yip Street is expected to increase significantly. Based on the assessment results, it is recommended to widen Lai Yip Street NB between Kwun Tong Road and Hung To Road to three traffic lanes that consists of one left turn lane and two straight ahead lanes. To implement the proposed widening, the existing kerbline along both sides of Lai Yip Street will need to be slightly setback. The proposed improvement scheme is shown in **Appendix F (Drawing No. TIA/543).**

8.3.2 With this junction improvement scheme, the junction J1 would operate with ample capacity in 2031 with KTAA. Please refer to **Table 8.3**.

J19 – Junction of Wai Fat Road/Wai Yip Street

8.3.3 As recommended in KTBA, this junction will be modified as shown in **Appendix F (Drawing No. TIA/538)**. A free flow lane at Wai Yip Street EB turning left to Wai Fat Road NB heading to Tseung Kwan O and the Eastern Harbour Crossing will be provided. In addition to the free flow lane, it is recommended to modify the lane configuration of both Wai Yip Street EB and WB.

8.3.4 However, with this interim junction improvement scheme, this junction will still operate over its capacity (RC = -9%(-11%) at AM(PM) peak hour in 2031 respectively). As there is not sufficient space to provide more traffic lanes with the restriction of the piers/columns of Kwun Tong Bypass, reduction of traffic flows to enter this junction in order to improve the junction performance was considered. Hence, the two right turn movements, i.e. Wai Yip Street EB to Kwun Tong Bypass, and Wai Yip Street WB to Wai Fat Road NB, are proposed to be banned. A new U-turn facility will be provided at Wai Fat Road NB to Wai Fat Road SB underneath Kwun Tong Bypass immediately south of the proposed pedestrian crossings. After banning the two right turn movements, the Method of Control (MOC) of this junction will be adjusted from 4 stages to 3 stages. It will improve this junction significantly even if there are additional flows superimposed onto other movements due to the diverted U-turn flows. The proposed new u-turn facility and detour routings are shown in **Appendix F (Drawing No. TIA/544).**

8.3.5 With the medium-term improvement scheme, the junction J19 would operate with ample capacity in 2031 with KTAA. Please refer to **Table 8.3**.

Table 8.3 Junction Performance with Improvement Schemes in 2031 (with KTAA Development)

Junction No.	Junction Name	Junction Type	RC^ or DFC*	
			2031 with KTAA	
			AM Peak	PM Peak
J1	Kwun Tong Road/Lai Yip Street	Signalized	18%	10%
J19	Wai Fat Road/Wai Yip Street	Signalized	10%	10%

Note:
^ RC is reserved capacity in % for signal-controlled junction.
* Figures in decimal represent “Design Flow to Capacity” (DFC) ratio for priority junctions or roundabouts.

9 DANGEROUS GOODS VEHICLE ROUTING AND QUEUING SPACES

9.1 DGV Routing and Queuing Spaces

9.1.1 The existing government facilities such as the KTVFP and DGV queuing area should be retained. The DGV routing would be changed according to the proposed road network.

9.1.2 The existing entrance of DGV queuing area is located next to the access of Kwun Tong Driving School at Kei Yip Street. DGVs from the east, west and north travel from Wai Yip Street North-Westbound, Hoi Yuen Road and Wai Yip Street South-Eastbound respectively make use of J14 – Wai Yip Street/Hoi Yuen Road to access Wai Yip Street North-Westbound and turn into Kei Yip Street to access DGV queuing area.

9.1.3 Based on the latest communication with TD, the recommended routings to DGV queuing area (DGVQA) are as follows:

i) Hoi Yuen Rd > Wai Yip Street North-Westbound > Kei Yip Street > DGVQA
ii) Wai Yip Street South-Eastbound >Tsun Yip Street > Hung To Road > Hoi Yuen Road > Wai Yip Street North-Westbound > Kei Yip Street > DGVQA
iii) Wai Yip Street North-Westbound > Kei Yip Street > DGVQA

9.1.4 According to the Study Brief, it mentioned that: “The existing queuing area for 10 dangerous goods vehicles of 11m to 16m long and transportation of LPG road tankers and cylinder wagons waiting to board the ferry pier should be retained”. The proposed DGV queuing area would have 18 nos. of queuing spaces with maximum capacity of 20 nos. queuing spaces shown in **TIA/FIGURE 7.1B**, which satisfy the requirement as mentioned in the Study Brief.

10 PUBLIC TRANSPORT REVIEW

10.1 Existing Public Transport Interchange

10.1.1 The existing Public Transport Interchange (PTI) at Kwun Tong Ferry Pier will be re-provided after the development of KTAA is completed. Based on the latest information as of July 2018, the following franchised bus routes and Green Mini-bus (GMB) routes used the captioned PTI as summarized in **Table 10.1** and shown in **Figure 10.1**.

(a) Bus Terminus

(b) Green Mini-bus Stop

Figure 10.1 Existing Public Transport Interchange for (a) Bus and (b) Green Mini-bus

Table 10.1 Existing Public Transport Services at Kwun Tong Ferry Pier PTI

Public Transport Service	Route No.	From	To	Ingress Route via	Egress Route via	Remarks
Bus (12 nos. of bays in which 3 bays with double width)	11D	Kwun Tong Ferry Pier PTI	Lok Fu	Hoi Yuen Road	Wai Yip Street south-east bound & King Yip Street	
	23		Shun Lee			Circular
	40P		Shek Wai Kok			Special Trips
	69C		Tin Yan Estate Bus Terminus			
	74D		Kau Lung Hang			
	74X		Tai Po Central			
	80		Mei Lam Bus Terminus			
	80X		Chun Shek Bus Terminus			
	83X		Shui Chuen O Bus Terminus			
	93A		Po Lam			
	268C		Long Ping Station			
	269C		Tin Shui Wai Town Centre Bus Terminus			
	258X		Po Tin	Wai Yip Street south-east bound		Special Trips
	259X		Lung Mun Oasis			Special Trips
	74B[1]	Tai Po Centre	Kwun Tong Ferry Pier PTI	Wai Yip Street south-east bound	N/A	Special Trips
Bus (One-way route)	74C	Kau Lung Hang	Kwun Tong Ferry Pier PTI	Hoi Yuen Road	N/A	Special Trips
	74E	Tai Mei Tuk Bus Terminus				Special Trips
	80P	Hin Keng Bus Terminus				Special Trips
	83A	Shui Chuen O Bus Terminus				Special Trips
	268A	Long Ping Estate Bus Terminus				Special Trips
	80A	Mei Lam Bus Terminus		Wai Yip Street south-east bound		Special Trips

<table>
<tr><th>Public Transport Service</th><th>Route No.</th><th>From</th><th>To</th><th>Ingress Route via</th><th>Egress Route via</th><th>Remarks</th></tr>
<tr><td rowspan="6"></td><td>268P</td><td>Ma Wang Road (Shan Shui House)</td><td rowspan="3"></td><td rowspan="3"></td><td rowspan="3"></td><td>Special Trips</td></tr>
<tr><td>269S</td><td>Tin Shui Wai Town Centre Bus Terminus</td><td>Special Trips</td></tr>
<tr><td>X89D</td><td>Wu Kai Sha Station</td><td>Special Trips</td></tr>
<tr><td>74P</td><td rowspan="3">Kwun Tong Ferry Pier PTI</td><td>Tai Po Centre</td><td rowspan="3">N/A</td><td rowspan="3">Wai Yip Street south-east bound & King Yip Street</td><td>Special Trips</td></tr>
<tr><td>268 P</td><td>Long Ping Station</td><td>Special Trips</td></tr>
<tr><td>274X</td><td>Tai Po Centre</td><td>Special Trips</td></tr>
<tr><td rowspan="2">Bus (Bypassing route)</td><td>40[2]</td><td>Laguna City</td><td>Tsuen Wan (Belvedere Garden)</td><td>Wai Yip Street north-west bound</td><td rowspan="2">Wai Yip Street south-east bound & King Yip Street</td><td></td></tr>
<tr><td>T277[3]</td><td>Sheung Shui Bus Terminus</td><td>Lam Tin Station</td><td>Wai Yip Street south-east bound</td><td>Special Trips</td></tr>
<tr><td rowspan="2">GMB (2 nos. of bays)</td><td>22A</td><td>Kwun Tong Ferry Pier</td><td>Lok Wah Estate</td><td rowspan="2">Hoi Yuen Road</td><td>Hoi Bun Road</td><td></td></tr>
<tr><td>103</td><td>Kwun Tong Ferry Pier</td><td>Clear Water Bay Second Beach</td><td>Wai Yip Street south-east bound & King Yip Street</td><td></td></tr>
<tr><td>Red Mini Bus (2 nos. of bays)</td><td colspan="6">No service has been observed.</td></tr>
<tr><td colspan="7">2 taxi stand – one for urban taxi and one for crossing harbour taxi</td></tr>
</table>

Note:

[1] Bus route no. 74B is a two-way route, but only the incoming route from Tai Po Centre to Kwun Tong Ferry Pier PTI travels within KTAA study area. For the return trip, it travels from Kowloon Bay to Tai Po Centre that has no impact on the roads network in the proximity of KTAA.

[2] Bus route no. 40 enters Kwun Tong Ferry Pier PTI when travelling from Laguna City to Tsuen Wan with ingress route via Wai Yip Street north-west bound and egress route via Wai Yip Street south-east bound and King Yip Street. For the return trip, it bypasses Kwun Tong Ferry Pier PTI via Wai Yip Street north-west bound and Hoi Yuen Road.

[3] Bus route no. T277 enters Kwun Tong Ferry Pier PTI when travelling from Sheung Shui Bus Terminus to Lam Tin Station with ingress route via Wai Yip Street south-east bound and egress route via Wai Yip Street south-east bound and King Yip Street. For the return trip, it enters Kwun Tong Ferry Pier PTI with ingress route via Wai Fat road and Wai Yip Street north-west bound and egress route via Wai Yip Street north-west bound.

10.1.2 As shown in **Table 10.1**, more than half of all the buses (17 nos. of route) and GMB (2 nos. of route) are heading to Kwun Tong Ferry Pier PTI via Hoi Yuen Road and it was one of the issues to create heavy traffic volume on Hoi Yuen Road. Moreover, 19 nos. of bus route and 1 GMB route used Wai Yip Street south-east bound and King Yip Street for the egress route and it was one of the issues to create heavy traffic volume on Wai Yip Street south-east bound approaching to the junction with Wai Fat Road.

10.2 Routing of Public Transport and Development Traffic

10.2.1 The proposed routings of bus, green mini-bus (GMB), taxis and development traffic to/from the proposed PTI are presented in **TIA/FIGURE 7.1B**.

10.2.2 The future public transport services using the Kwun Tong Ferry Pier PTI may have additional impact on the junctions at Wai Yip Street and Hoi Yuen Road. To relieve the pressure on the road network, future bus routes should be considered to divert to use Wai Yip Street westbound or relocated to other bus stops in vicinity of Kwun Tong Area.

11 SUMMARY AND CONCLUSION

11.1 Summary

11.1.1 The development schedule of KTAA comprises about 65,300m^2 GFA for office (2,700m^2 GFA is reserved for G/IC use if required), 17,000m^2 GFA for retail/F&B, and 1,700m^2 GFA for ACI use. A new PTI will be provided within the “C” site of KTAA.

11.1.2 There would be sufficient car parking spaces and L/LU bays for the demand within KTAA and the public.

11.1.3 The observed traffic flows in 2017 are shown in **TIA/FIGURE 3.2** and the junction assessment results show that almost all the junctions operate with ample capacity except J14 - Wai Yip Street/Hoi Yuen Road and J19 – Wai Fat Road/Wai Yip Street.

11.1.4 There would be up-grading, enhancements and improvement schemes of pedestrian crossing, kerbside activities and junction layouts. The planned and committed road network also included Route 6 – Tseung Kwan O – Lam Tin Tunnel, Trunk Road T2, Central Kowloon Route and the possible Environmentally Friendly Linkage System (EFLS) under separate study by CEDD. They were reviewed and taken into account into this TTIA.

11.1.5 In order not to affect the road based vehicular traffic on Wai Yip Street, grade separated walkway is a good pedestrian connection between the future KTAA and the KTBA on the northern side of Wai Yip Street. The existing footbridge across Wai Yip Street near the roundabout with Hoi Yuen Road and the footbridge across Wai Yip Street connecting between Manulife Financial Centre and Kwun Tong Ferry Pier are good pedestrian connections between the future KTAA and the KTBA on the northern side of Wai Yip Street.

11.1.6 Proposed improvement scheme of pedestrian walkway between KTAA and Kwun Tong MTR Station along Hoi Yuen Road will mitigate the existing crowd situation on the footpaths along both sides of Hoi Yuen Road.

11.1.7 The forecasted 2031 traffic flows with KTAA for this TTIA are shown in **TIA/FIGURE 6.2D**.

11.1.8 Based on the design concepts of the cross signal-controlled junction proposed by the KTBA Study and the preliminary design of KTAA, future PTI and other considerations, the modification of the junction layout at J14 – Wai Yip Street/Hoi Yuen Road has been re-designed and is shown in **TIA/FIGURE 5.1**.

11.1.9 The junction improvement scheme at J14 – Wai Yip Street/Hoi Yuen Road is proposed to adopt a signal-controlled junction based on the following reasons:

iv) delay will be reduced to link J14 with other adjacent junctions.
v) using a signal-controlled junction will reduce the land take and hence to maximize the land use potential for KTAA; and
vi) at-grade pedestrian crossings at J14 could be provided.

11.1.10 Most of the junctions are predicted to be operating within the design capacity in 2031. For junctions which are operating beyond the capacity, improvement schemes are proposed to resolve the problem. Hence, no junction capacity problem is envisaged with the proposed development at KTAA.

11.1.11 DGV queuing area would have 18 nos. of queuing spaces with a maximum capacity of 20 nos. queuing spaces to satisfy the operating requirements.

11.1.12 The future public transport services using the Kwun Tong Ferry Pier PTI may have additional impacts on the junctions at Wai Yip Street and Hoi Yuen Road. To relieve the pressure on the road network, future bus routes should be considered for diversion, using Wai Yip Street westbound or relocating to other bus stops in the vicinity of Kwun Tong Area.

11.2 Conclusion

11.2.1 Traffic and transport impacts arising from the proposed KTAA developments are manageable. The proposed junction layout at J14 – Wai Yip Street/Hoi Yuen Road with the proposed PTI and the internal roads and junctions are considered feasible from traffic and transport engineering and management perspectives.

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DRAWINGS

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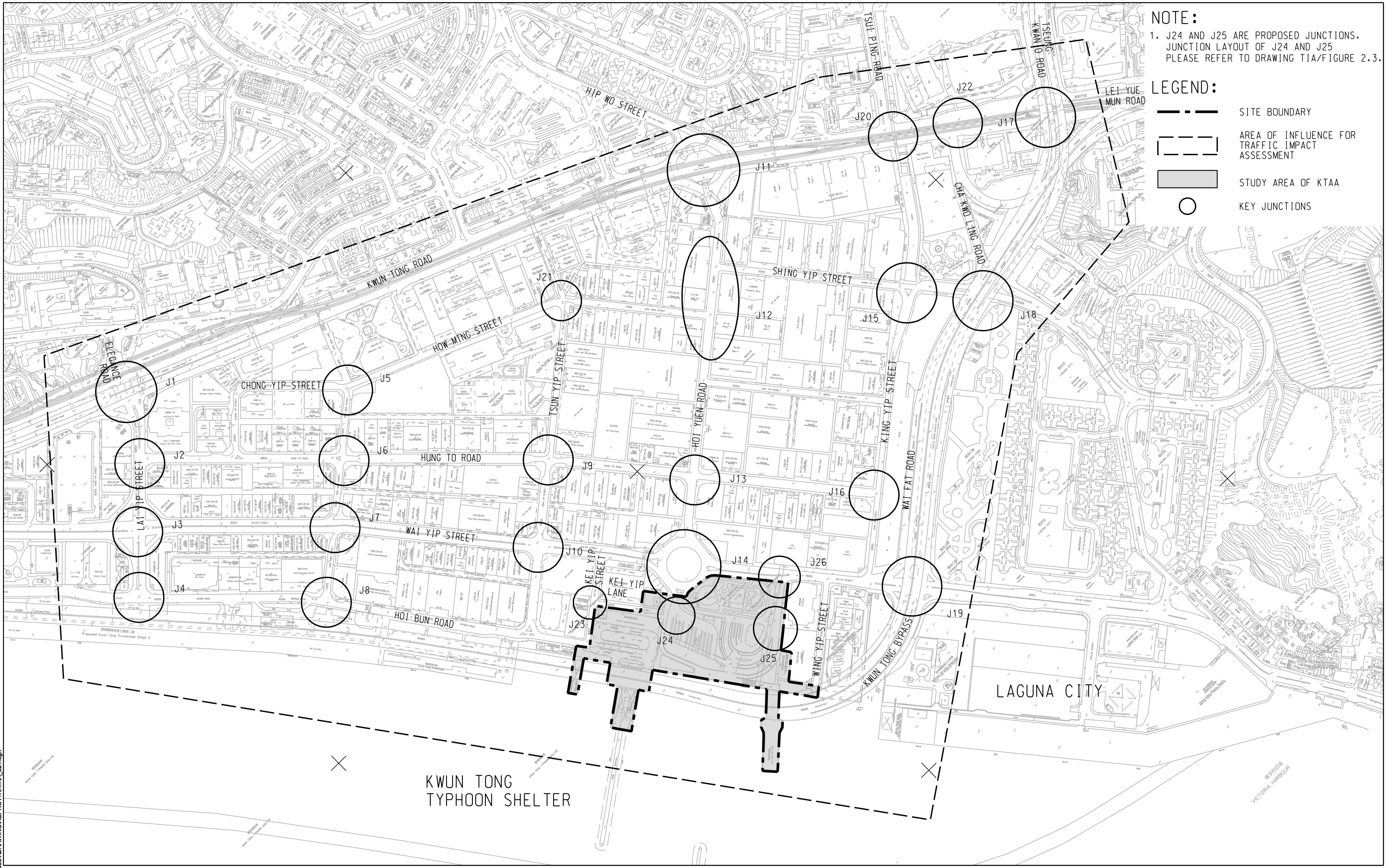

Project:

Agreement No. CE 61/2015 (TP)
Planning and Engineering Study on
Kwun Tong Action Area - Feasibility Study

Title:

LOCATIONS OF KEY JUNCTION IN STUDY AREA

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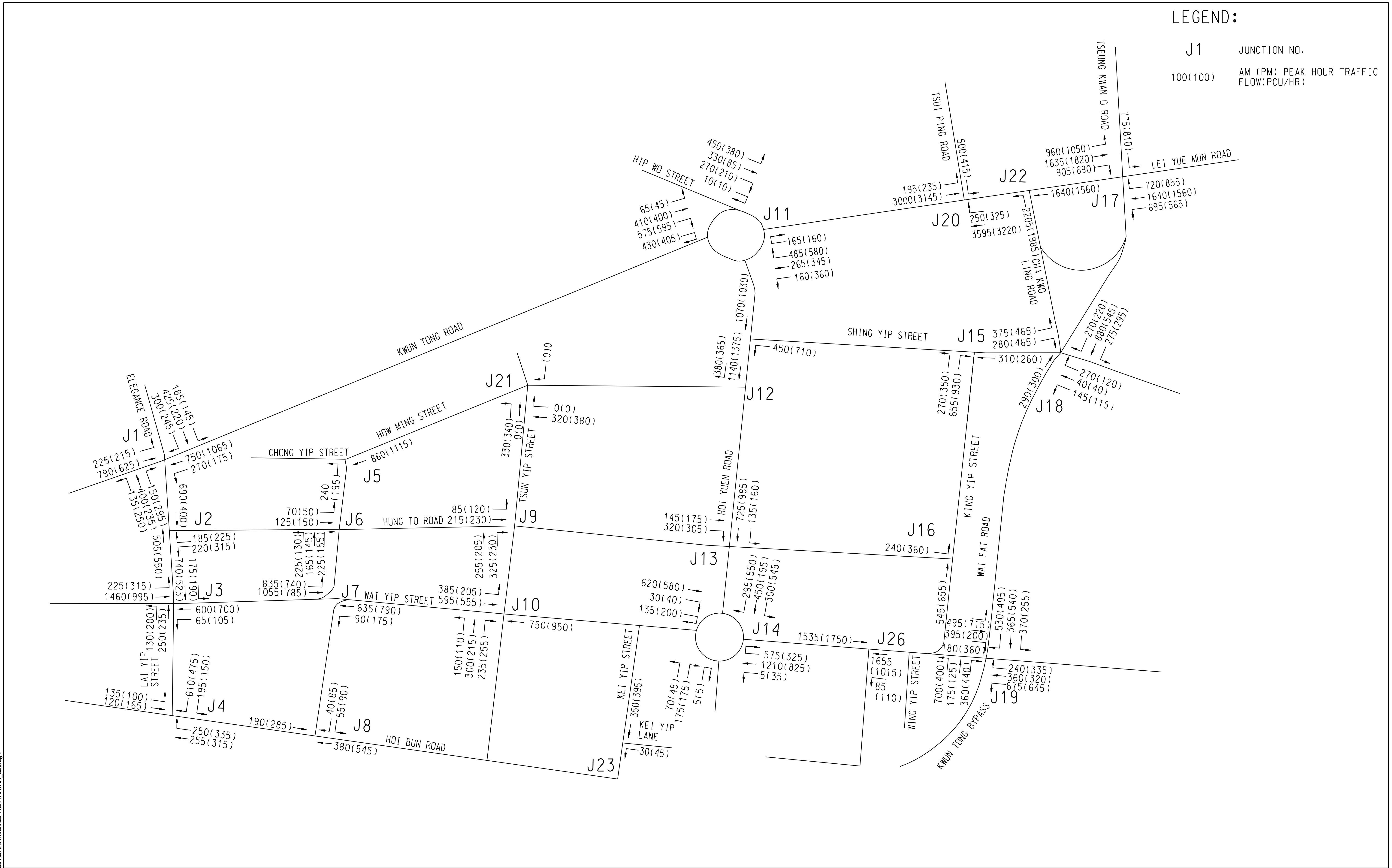

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Agreement No. CE 61/2015 (TP)
Planning and Engineering Study on
Kwun Tong Action Area - Feasibility Study

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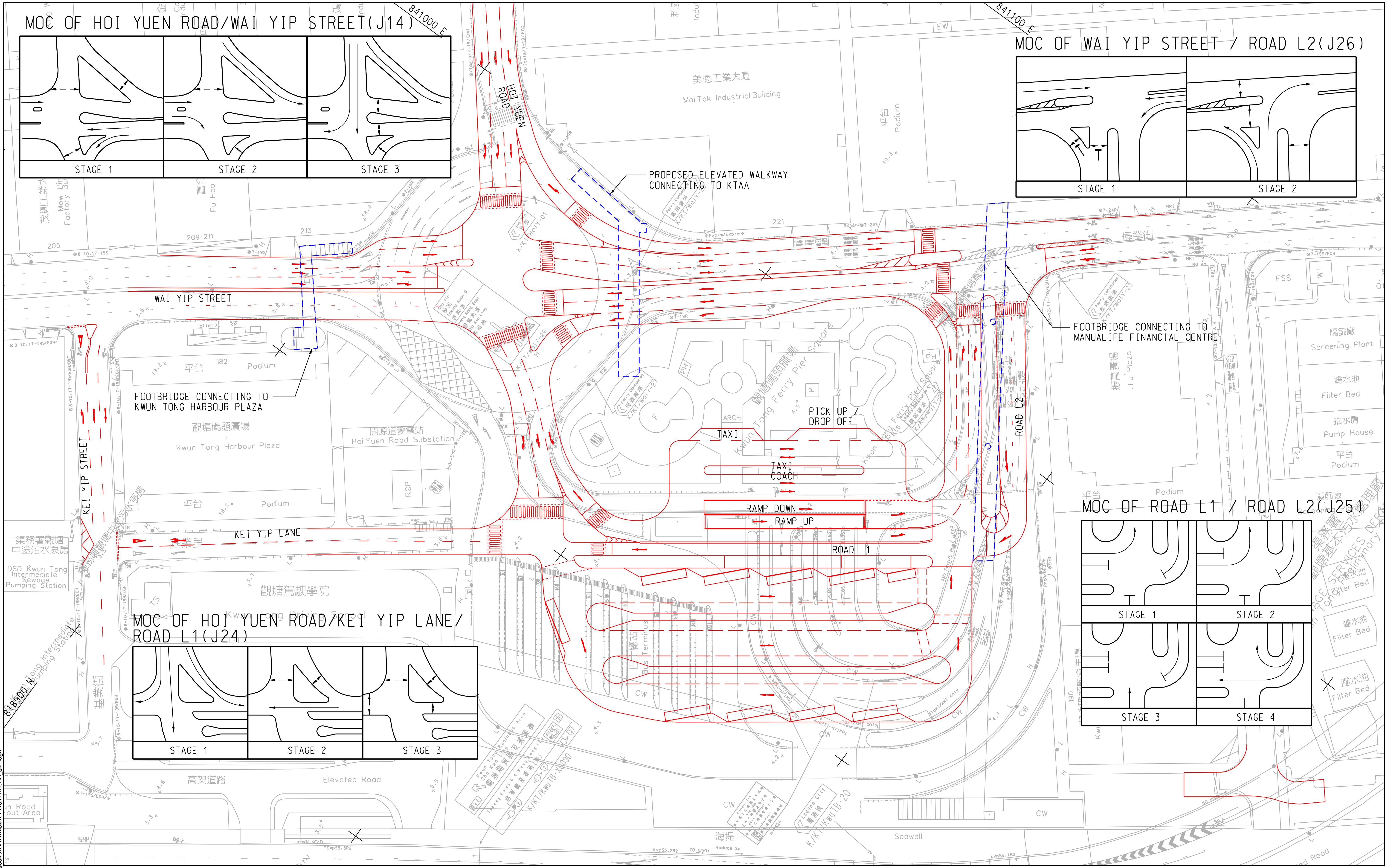

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Planning and Engineering Study on
Kwun Tong Action Area - Feasibility Study

Title:
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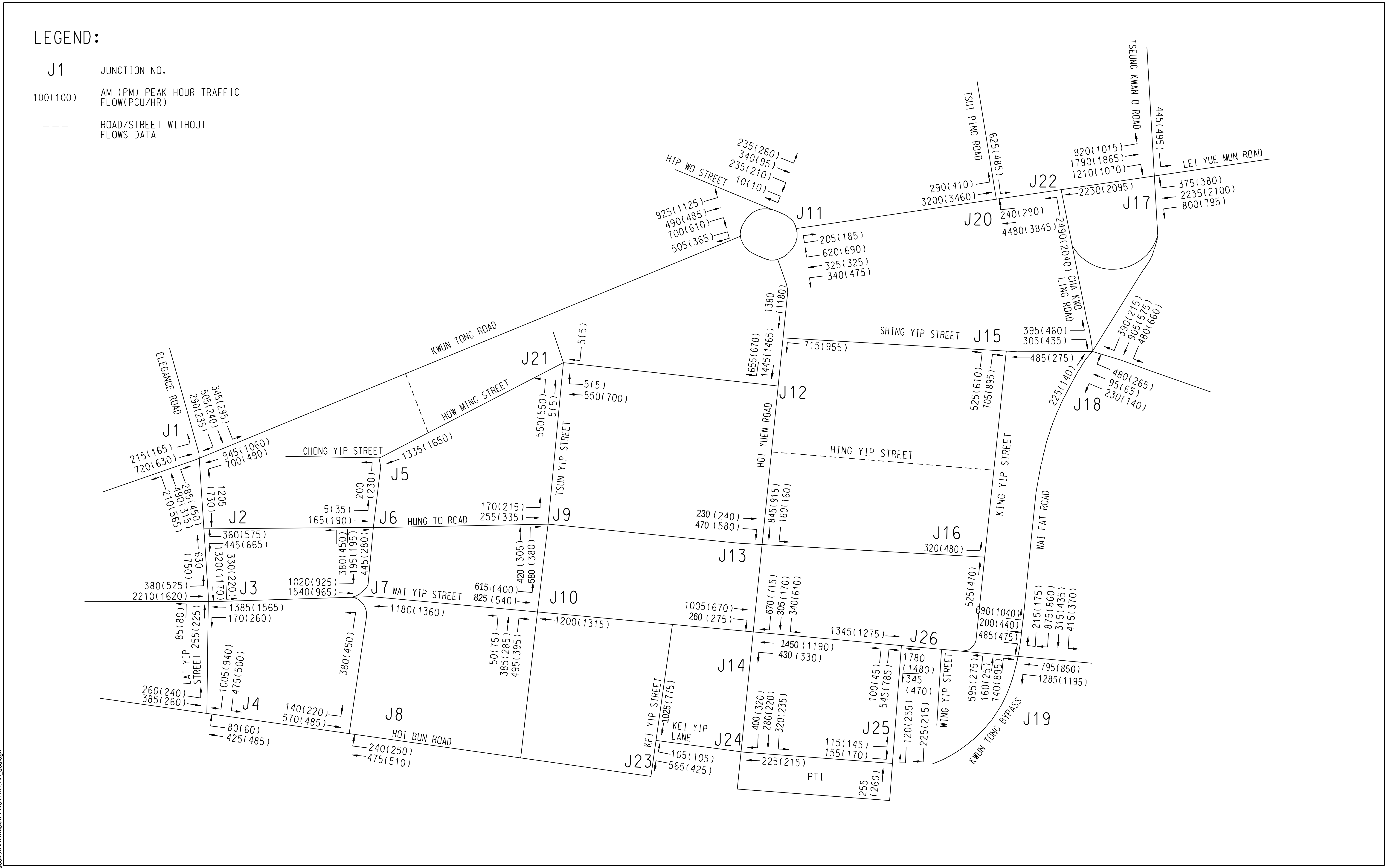

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LEGEND:

J1 JUNCTION NO.

100(100) AM (PM) PEAK HOUR TRAFFIC FLOW(PCU/HR)

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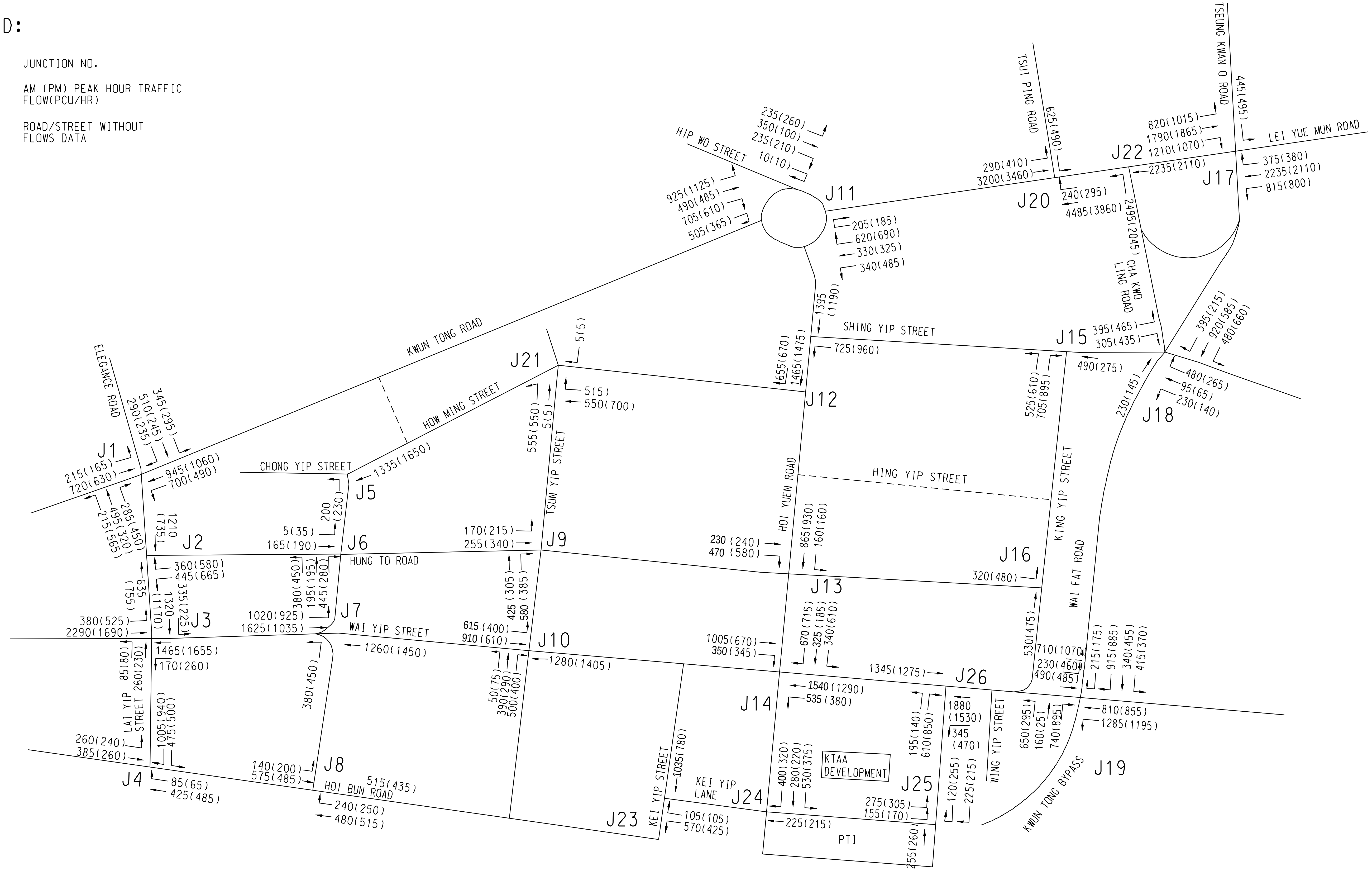

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Planning and Engineering Study on
Kwun Tong Action Area - Feasibility Study

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2031 DESIGN TRAFFIC FLOWS

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Date: Jun 2020

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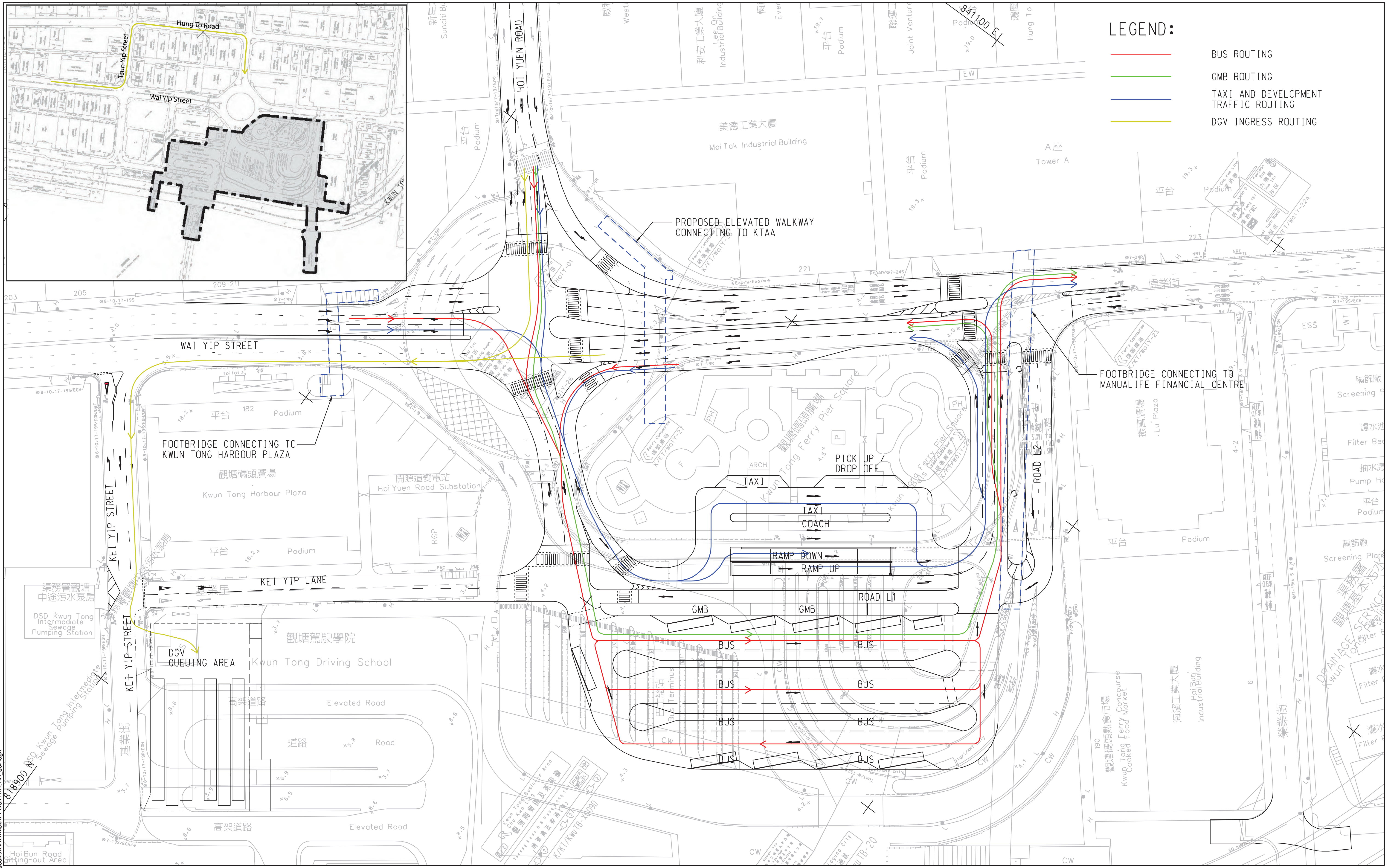

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Kwun Tong Action Area - Feasibility Study

Title:
PROPOSED PUBLIC TRANSPORT,
DEVELOPMENT TRAFFIC AND DGV ROUTINGS

Drawing No:
TIA/FIGURE 7.1B
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APPENDICES

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APPENDIX A

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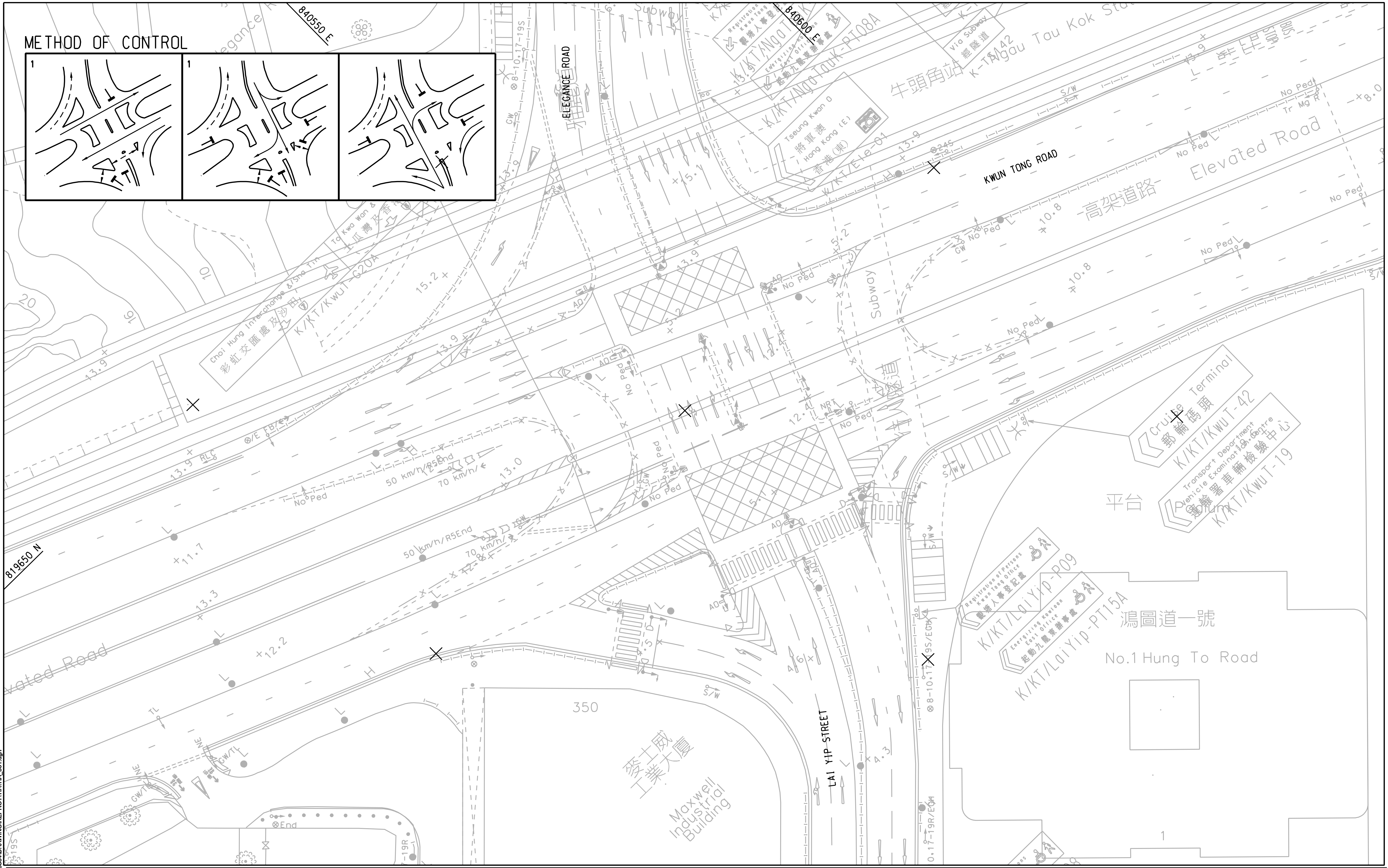
Appendix A - Existing Junction Layouts



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Planning and Engineering Study on
Kwun Tong Action Area - Feasibility Study

Title:
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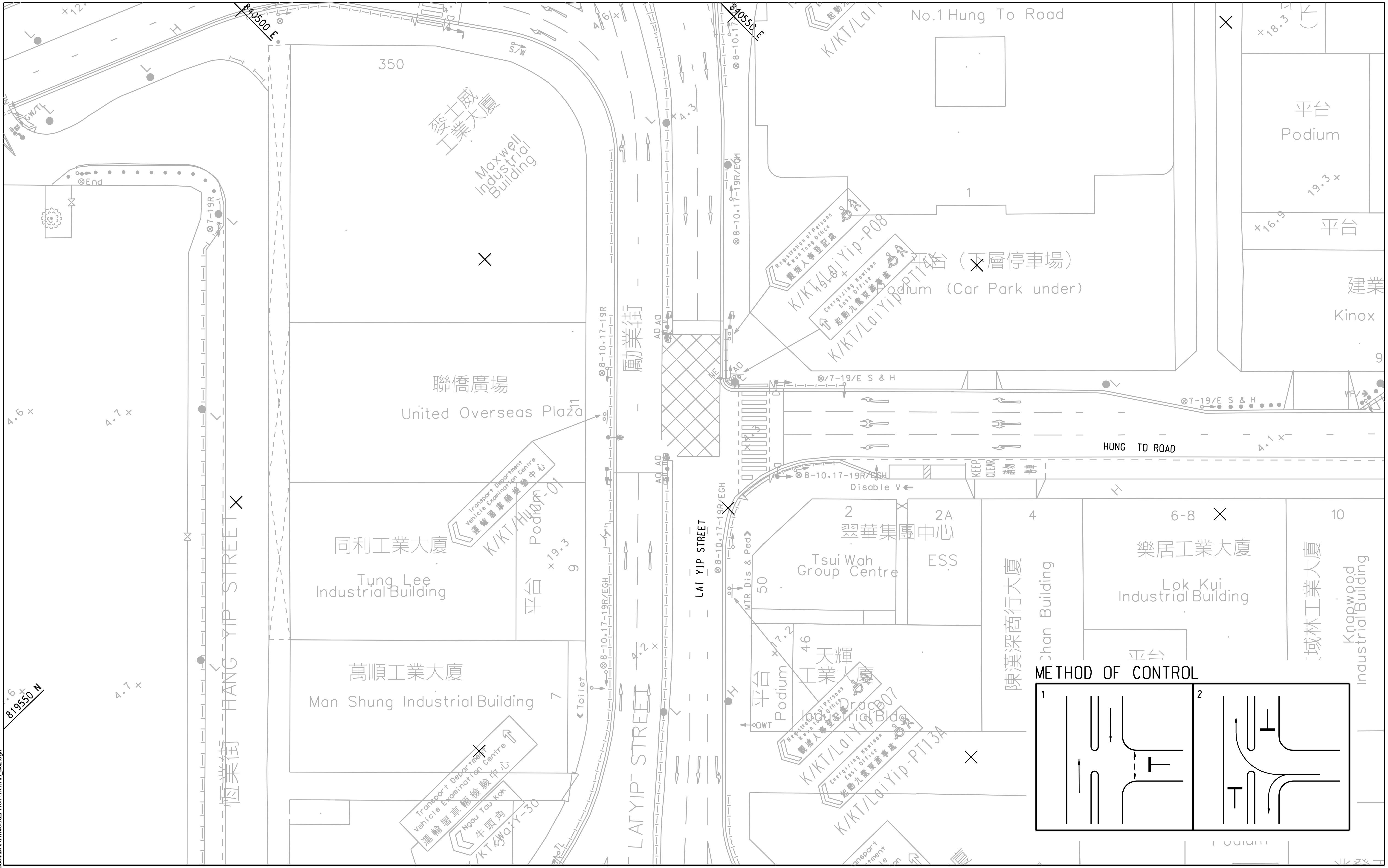

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Planning and Engineering Study on
Kwun Tong Action Area - Feasibility Study

Title:

LAYOUT OF LAI YIP STREET / HUNG TO ROAD (J2)

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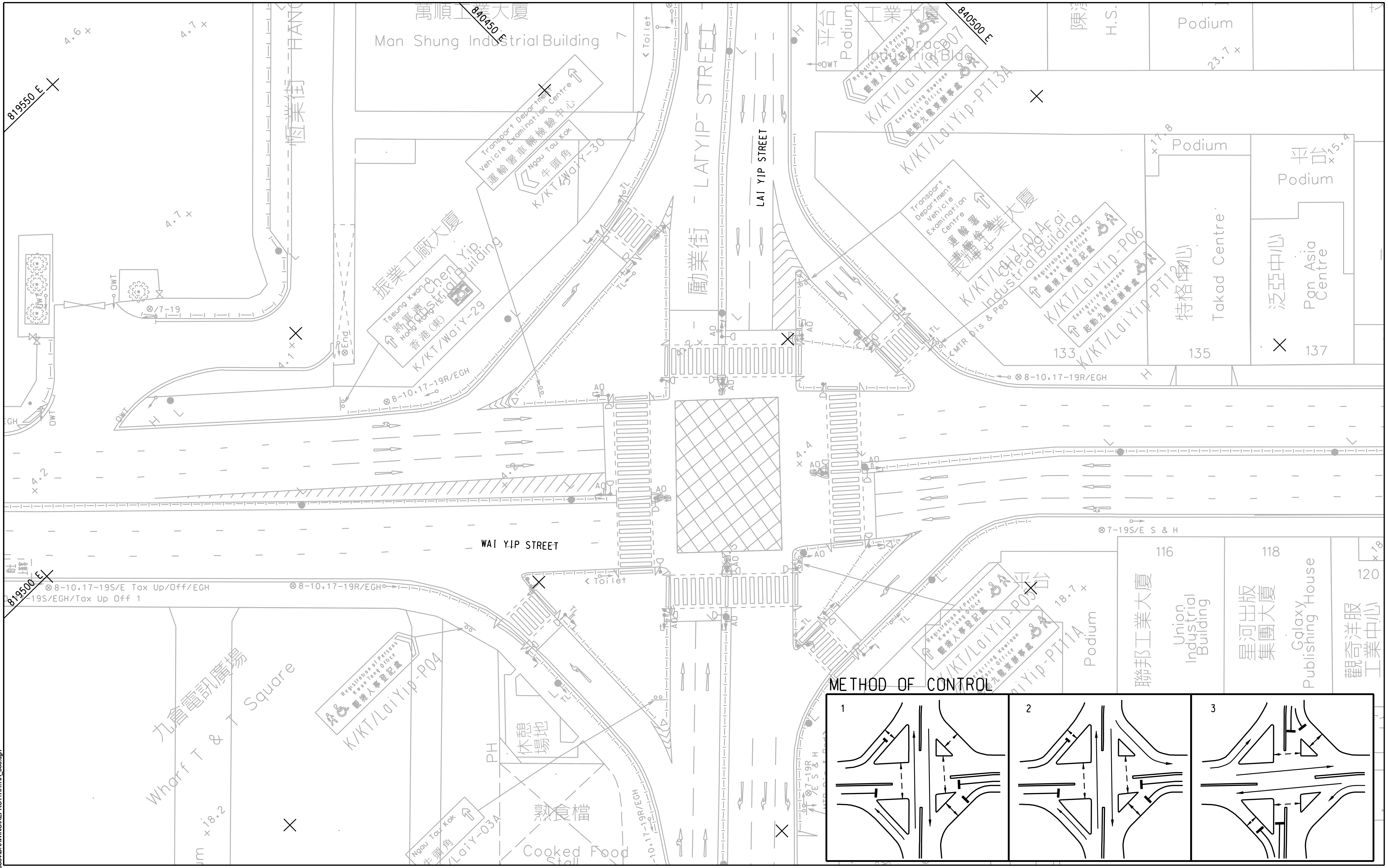

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Planning and Engineering Study on
Kwun Tong Action Area - Feasibility Study

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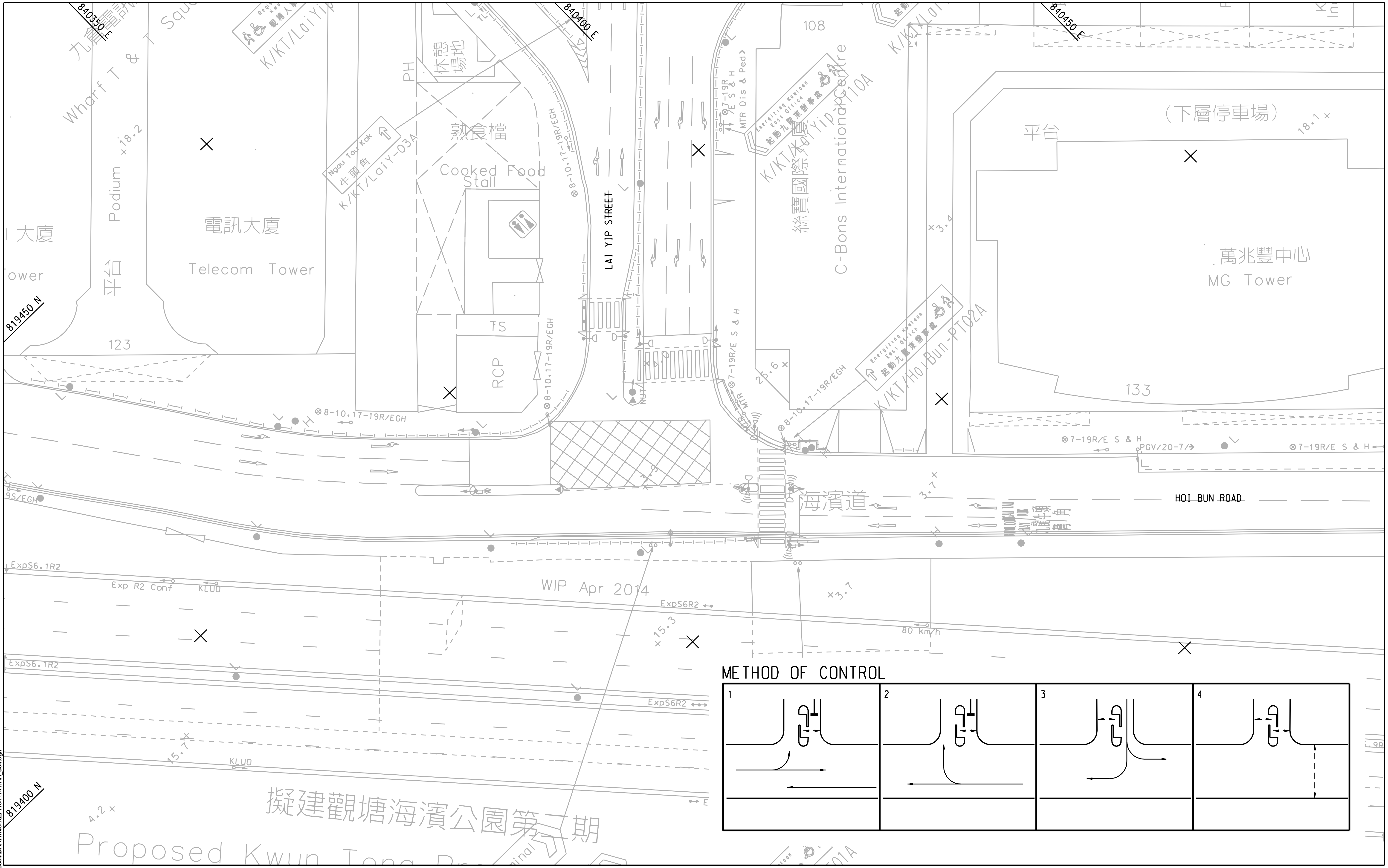

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Planning and Engineering Study on
Kwun Tong Action Area - Feasibility Study

Title:
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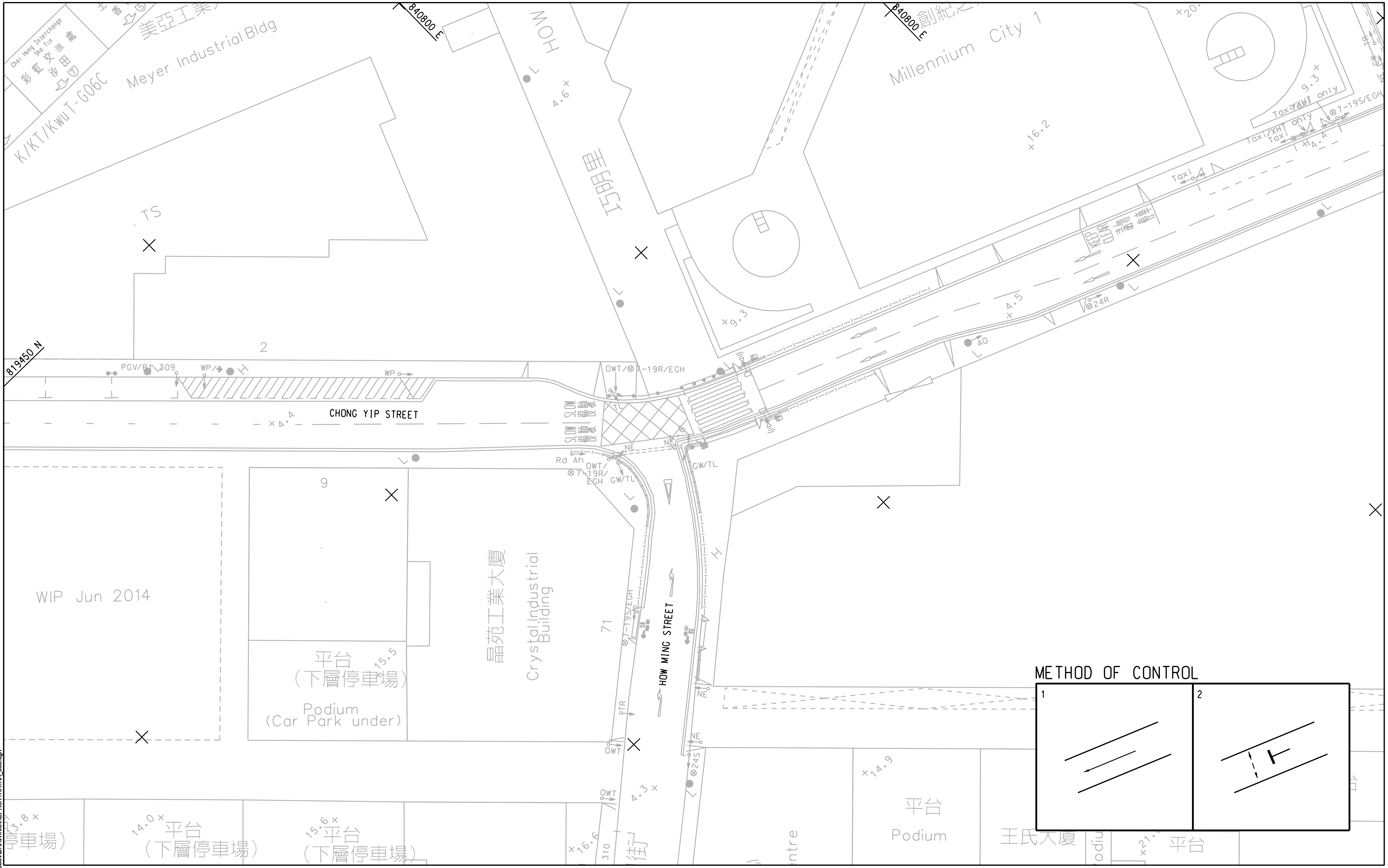

Project:
Agreement No. CE 61/2015 (TP)
Planning and Engineering Study on
Kwun Tong Action Area - Feasibility Study

Title:
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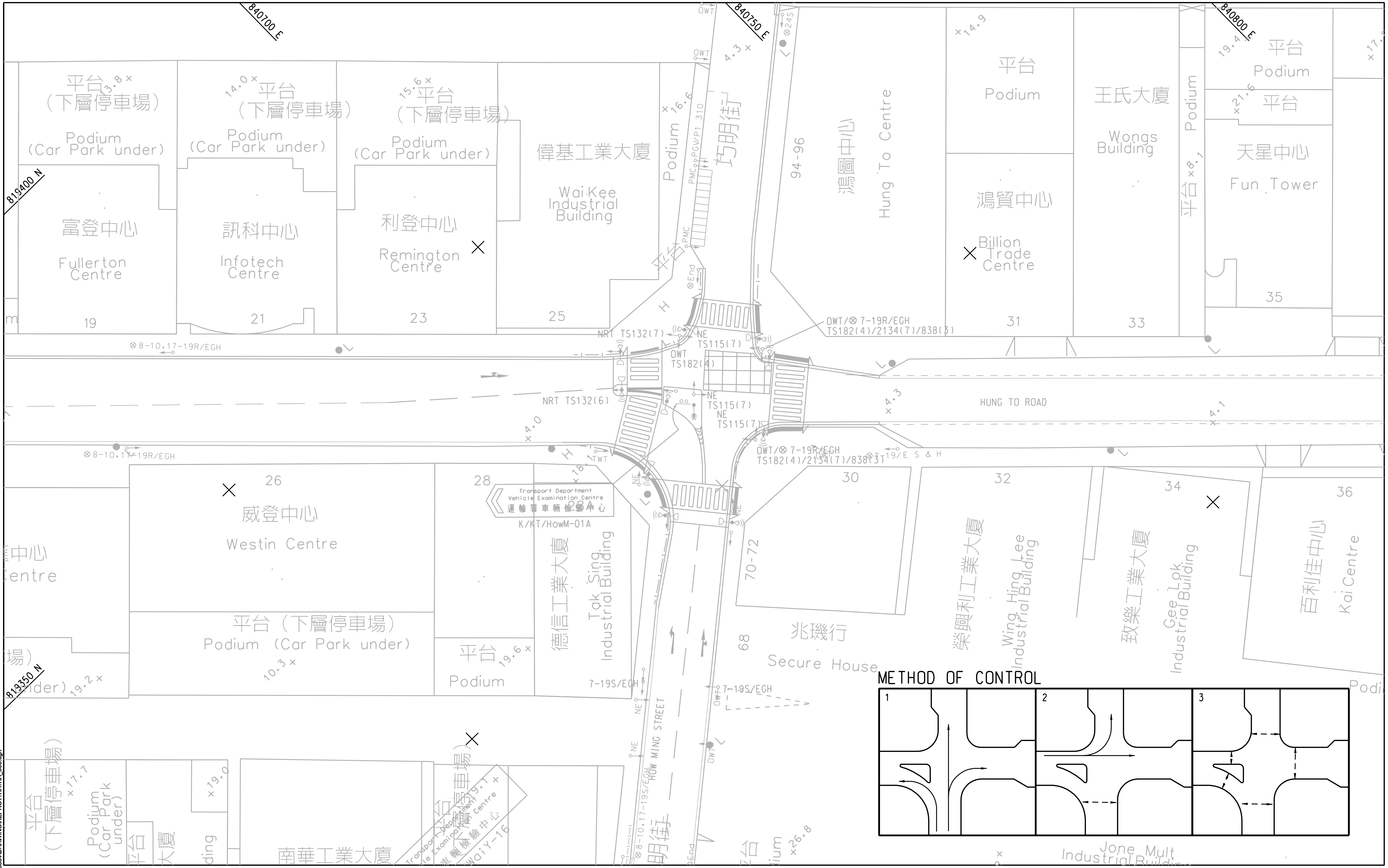

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Planning and Engineering Study on
Kwun Tong Action Area - Feasibility Study

Title:
LAYOUT OF HOW MING STREET / HUNG TO ROAD (J6)

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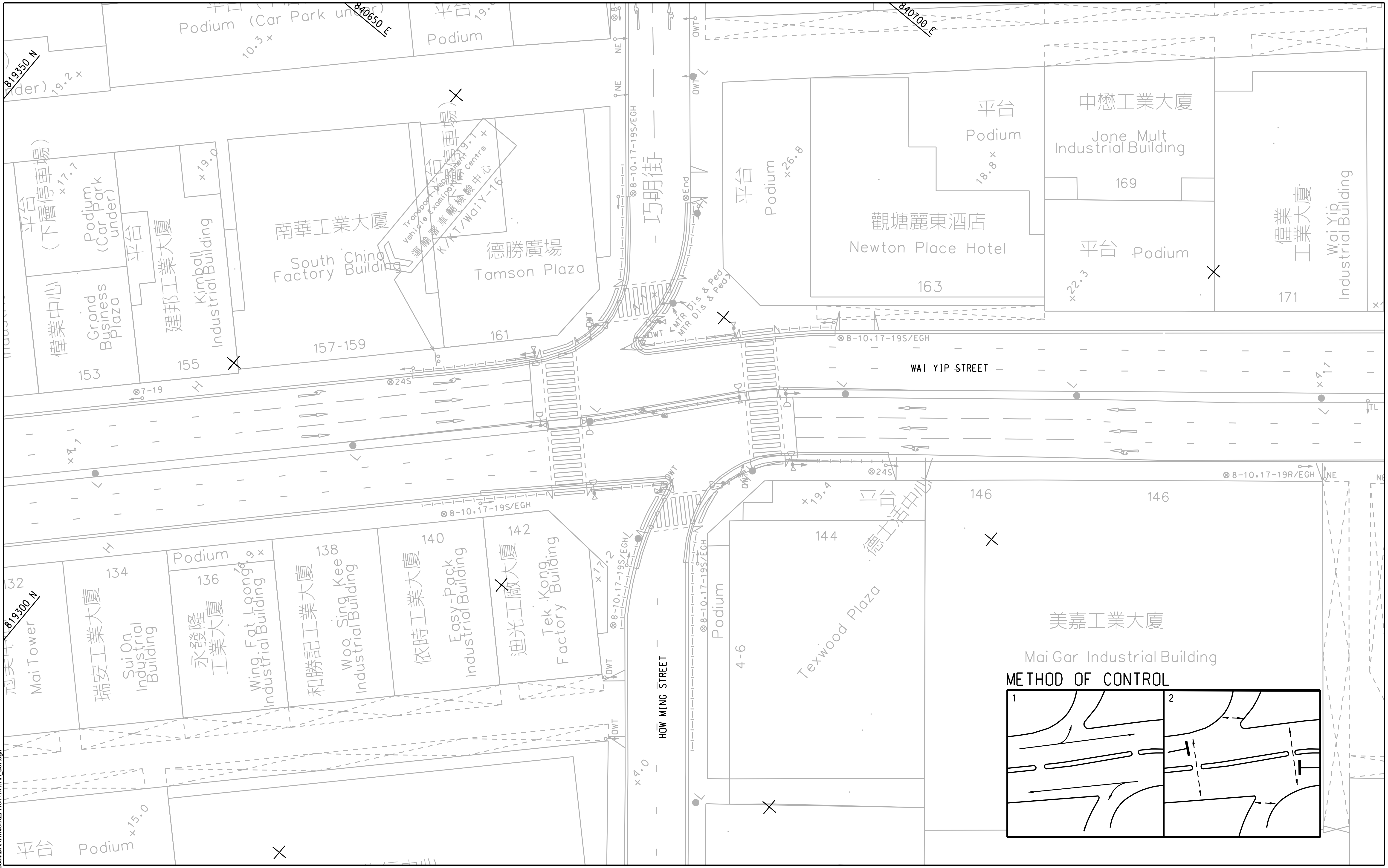

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Planning and Engineering Study on
Kwun Tong Action Area - Feasibility Study

Title:
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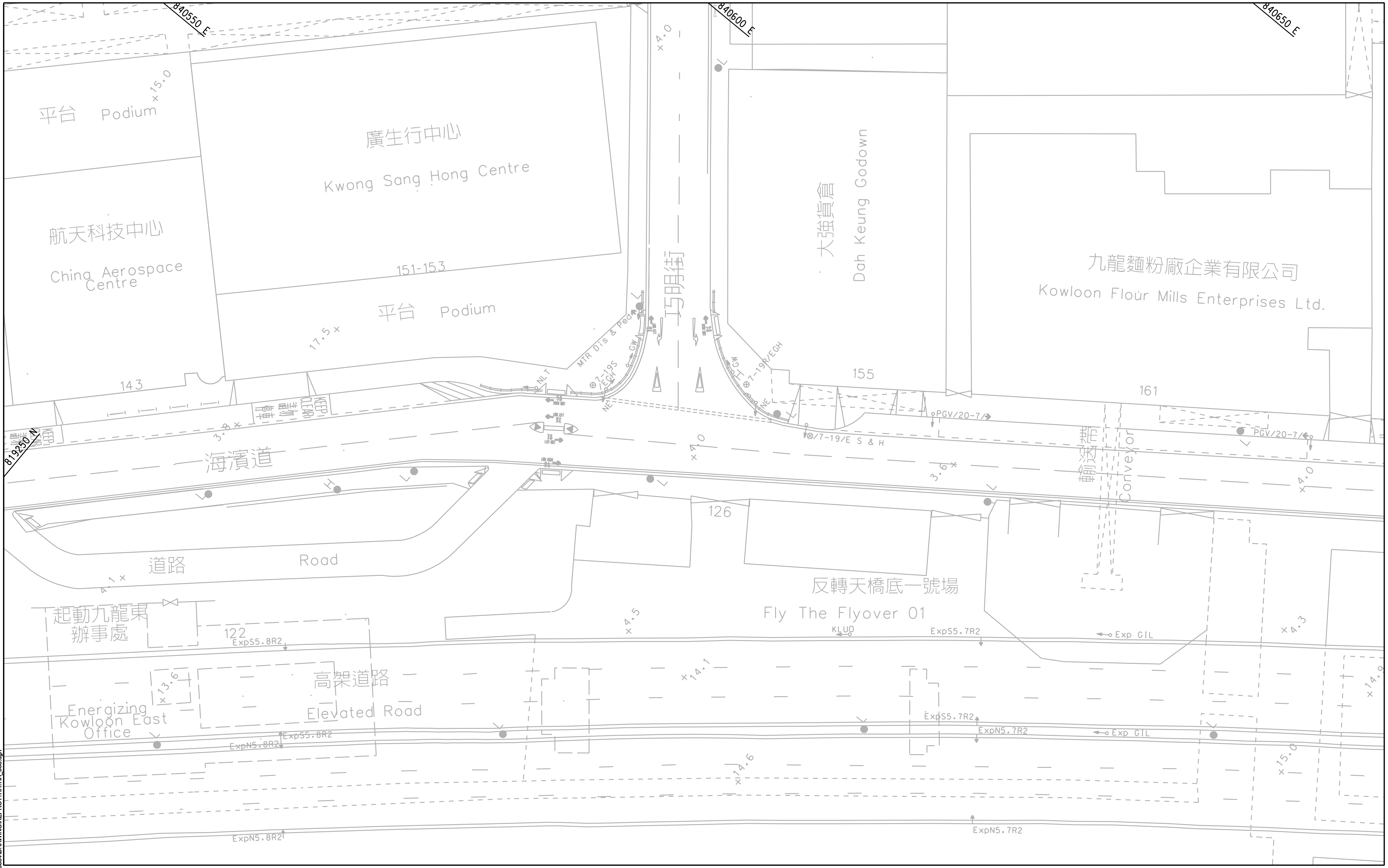

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Planning and Engineering Study on
Kwun Tong Action Area - Feasibility Study

Title:
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Drawing No: TIA/508
Date: AUG 2018
Scale: 1 : 500

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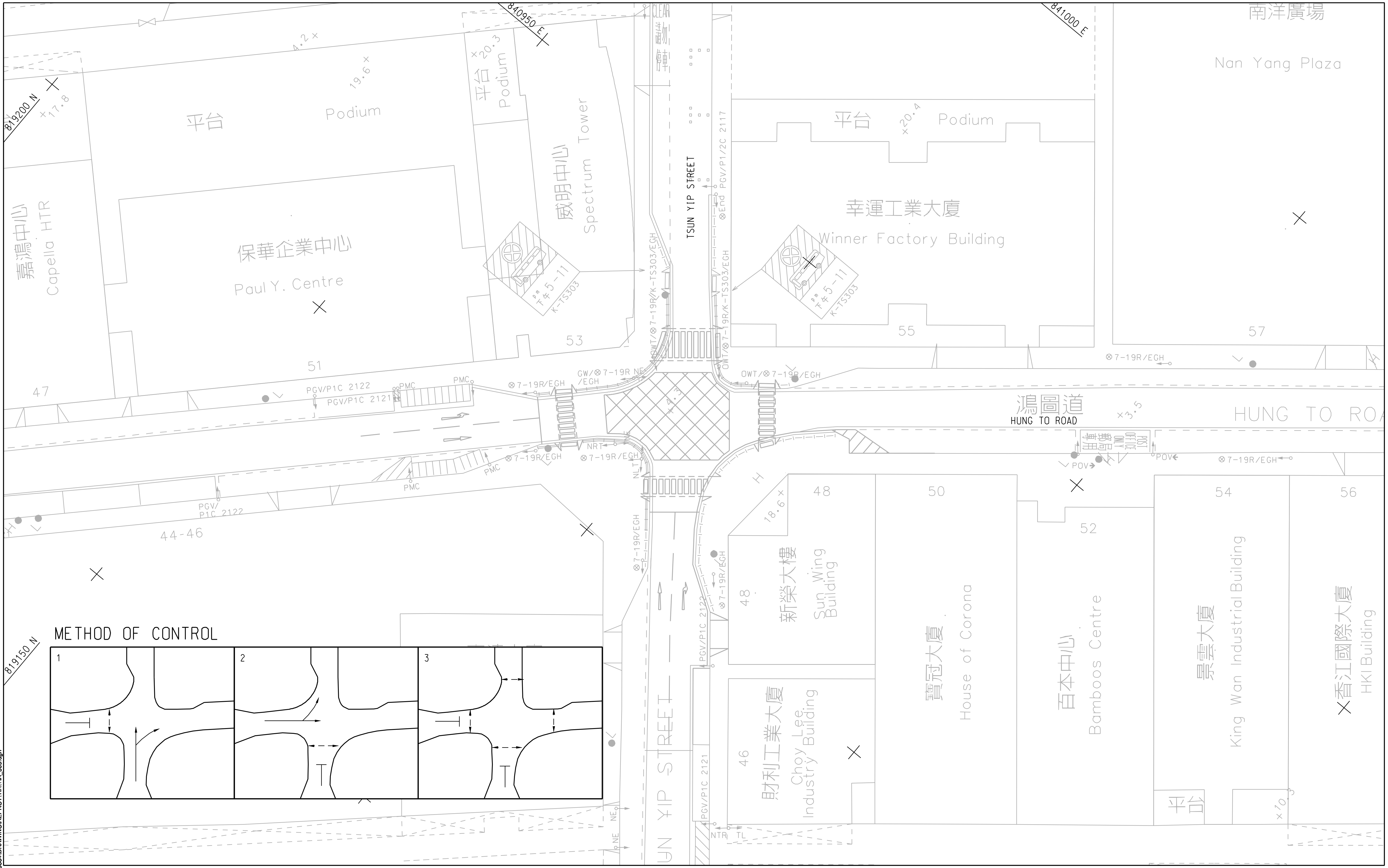

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Planning and Engineering Study on
Kwun Tong Action Area - Feasibility Study

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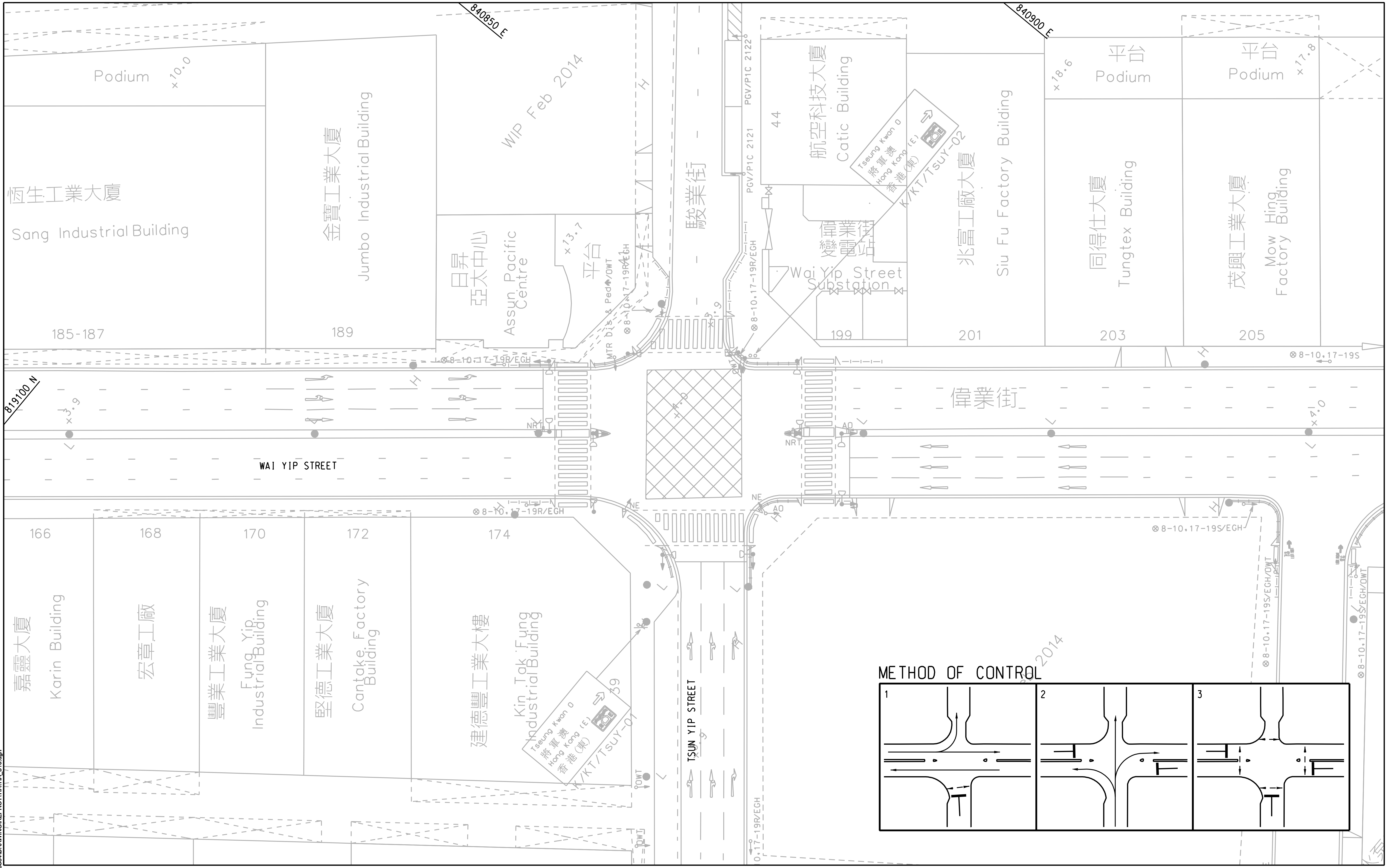

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Planning and Engineering Study on
Kwun Tong Action Area - Feasibility Study

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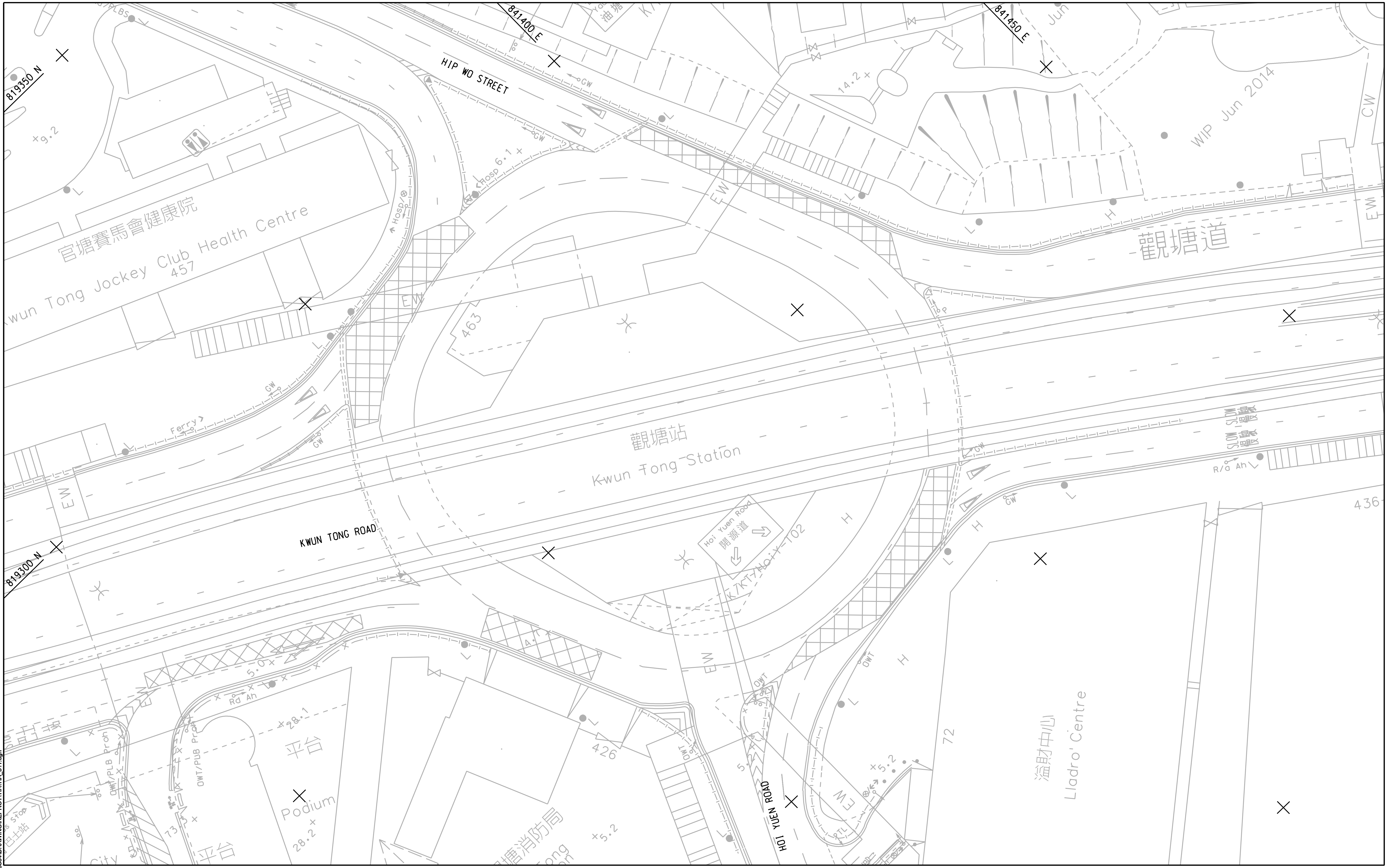

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Planning and Engineering Study on
Kwun Tong Action Area - Feasibility Study

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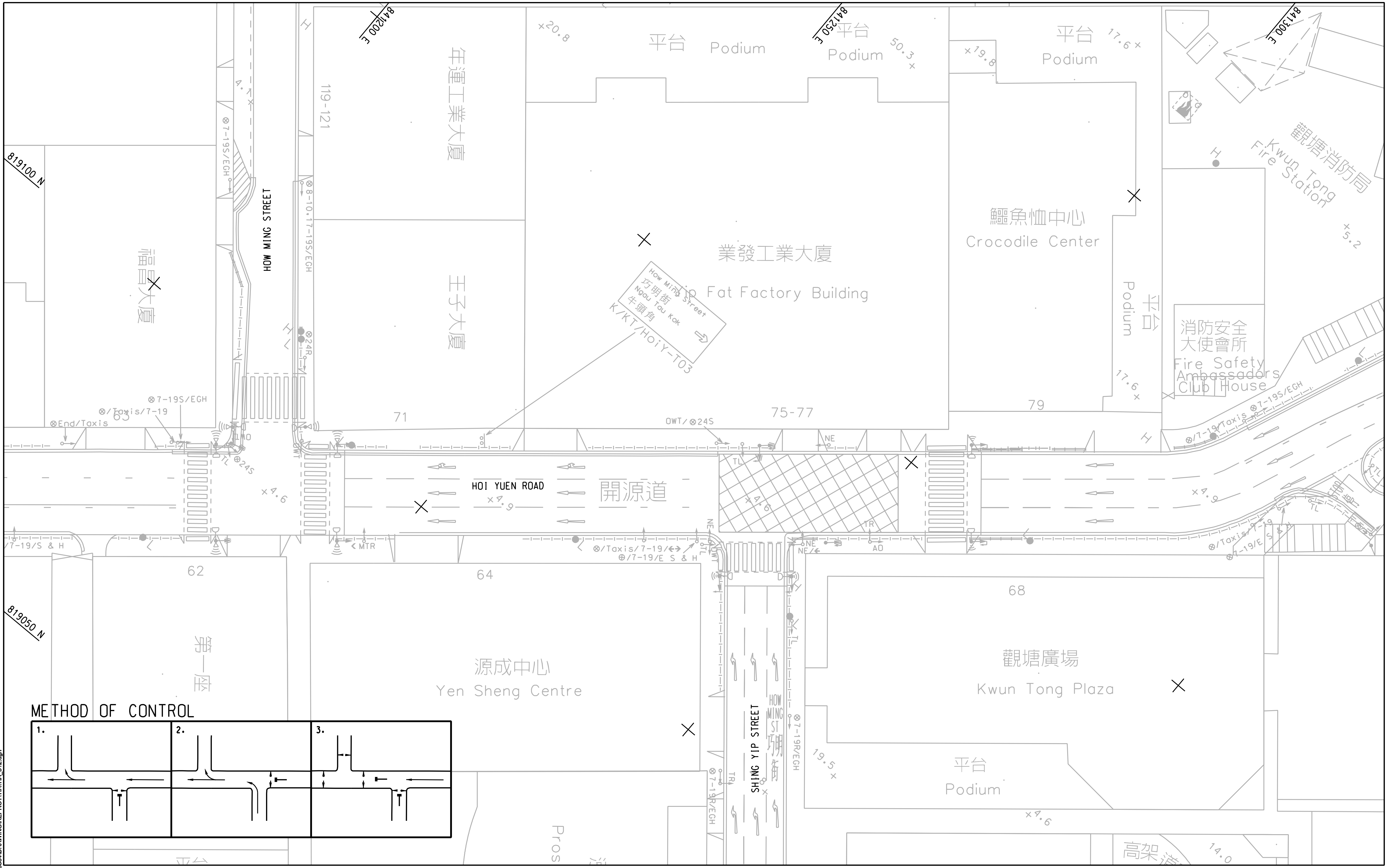

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Planning and Engineering Study on
Kwun Tong Action Area - Feasibility Study

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(J12)

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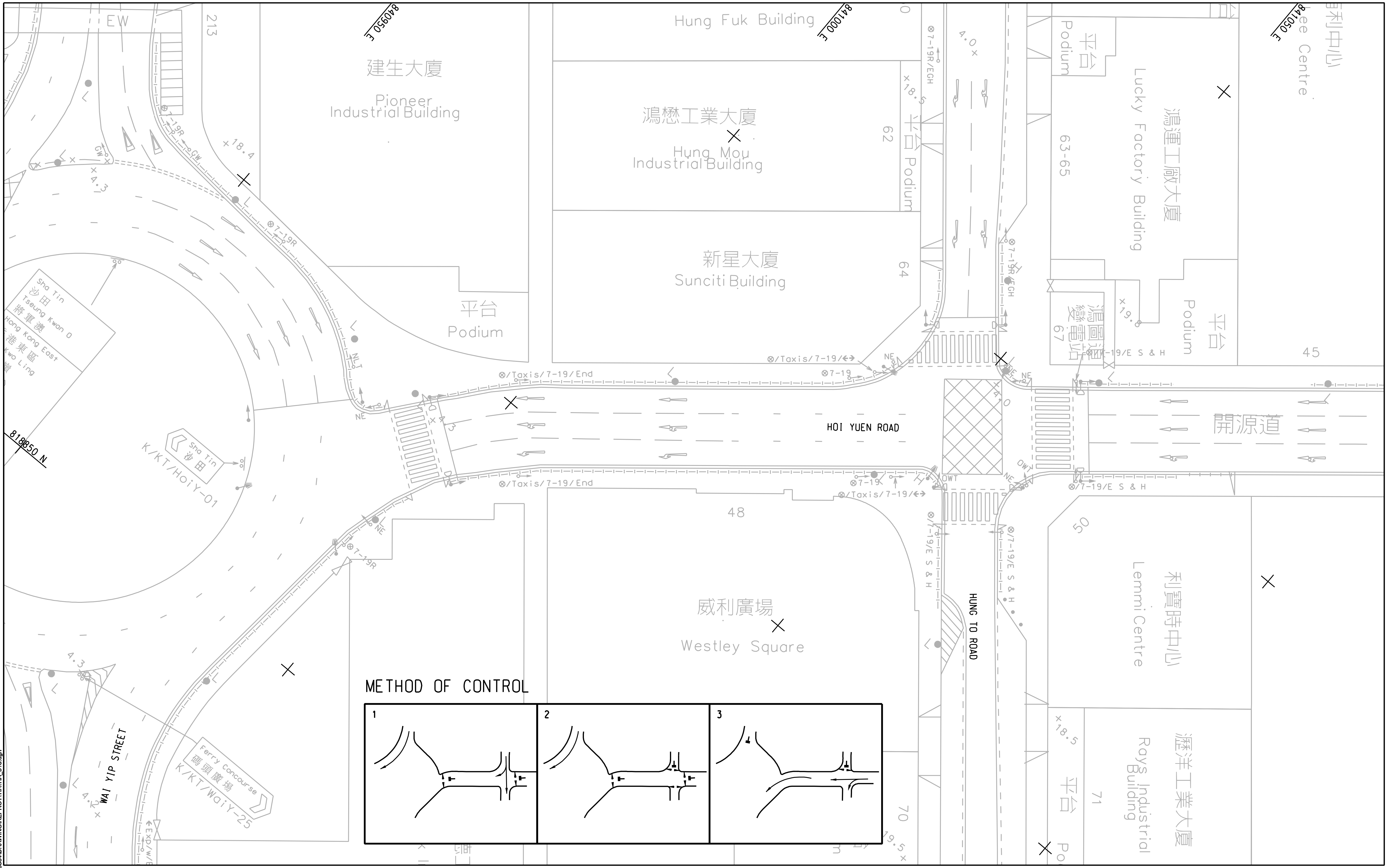

Project:
Agreement No. CE 61/2015 (TP)
Planning and Engineering Study on
Kwun Tong Action Area - Feasibility Study

Title:
LAYOUT OF HOI YUEN ROAD / HUNG TO ROAD (J13)

Drawing No: TIA/513
Date: AUG 2018
Scale: 1 : 500

AECOM

Plot File by: CHENFJ 8/27/2018
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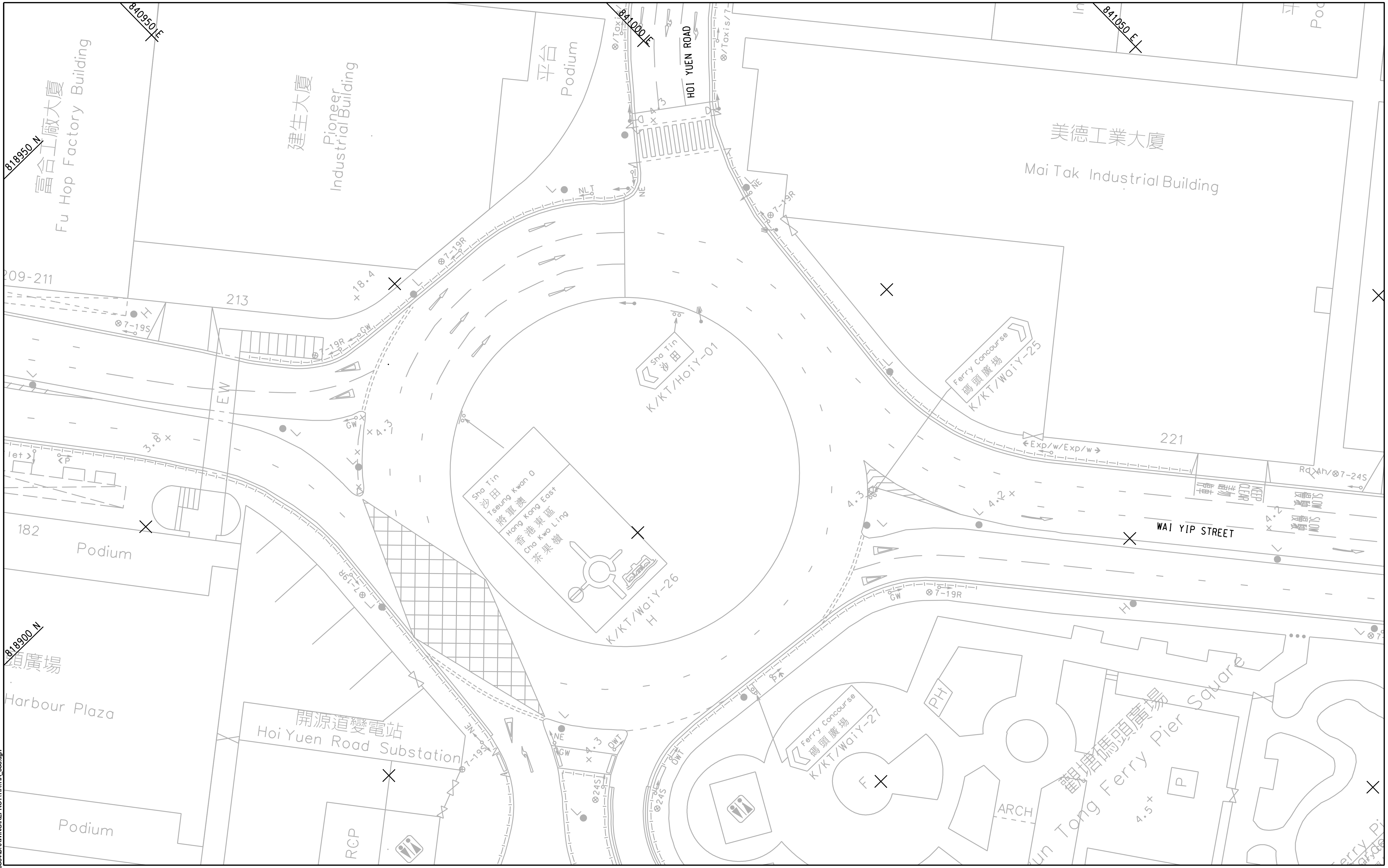

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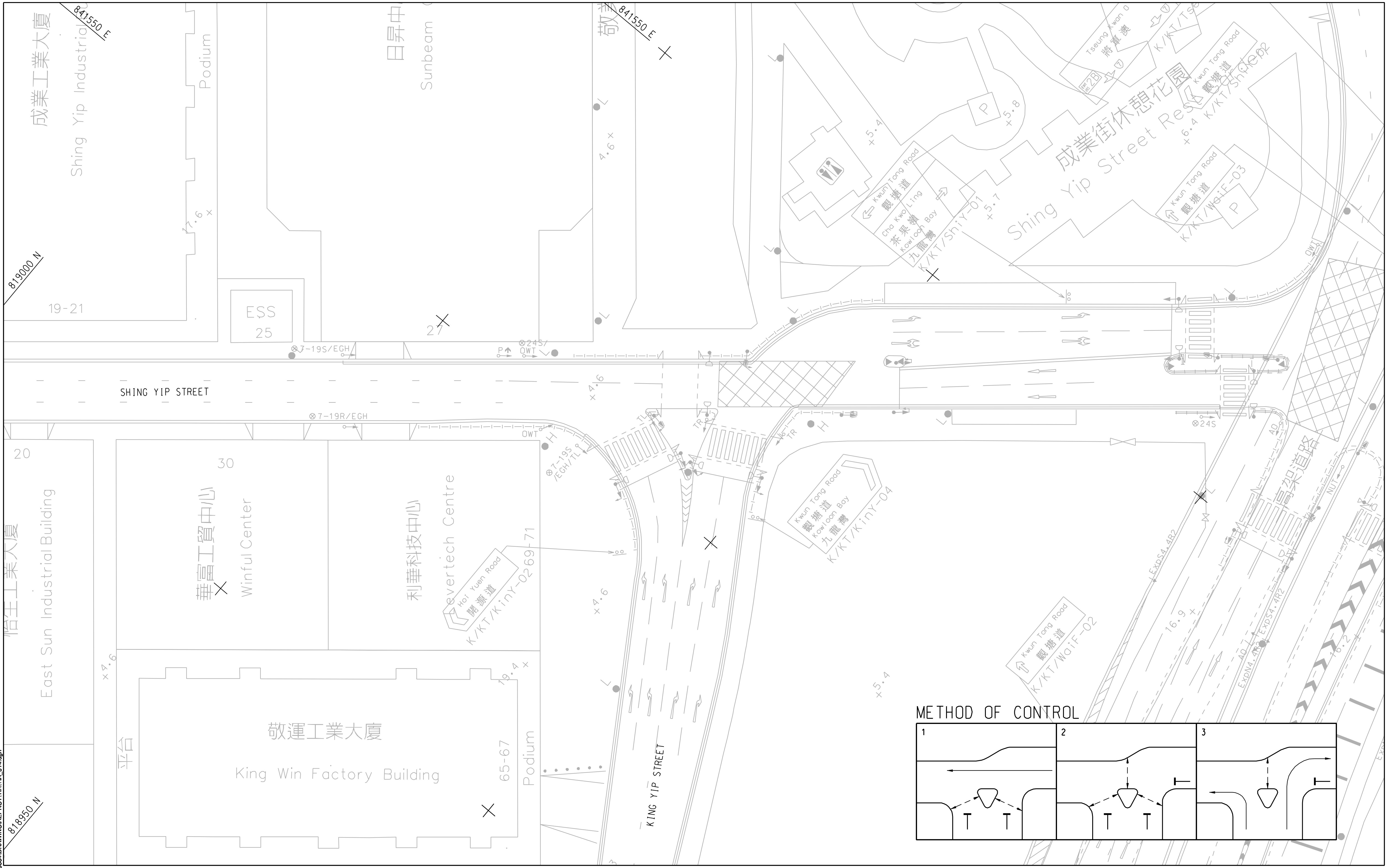
Project:
Agreement No. CE 61/2015 (TP)
Planning and Engineering Study on
Kwun Tong Action Area - Feasibility Study

Title:
LAYOUT OF HOI YUEN ROAD / WAI YIP STREET (J14)

Drawing No: TIA/533
Date: AUG 2018
Scale: 1 : 500

AECOM



Project:

Agreement No. CE 61/2015 (TP)
Planning and Engineering Study on
Kwun Tong Action Area - Feasibility Study

Title:

LAYOUT OF KING YIP STREET / SHING YIP STREET (J15)

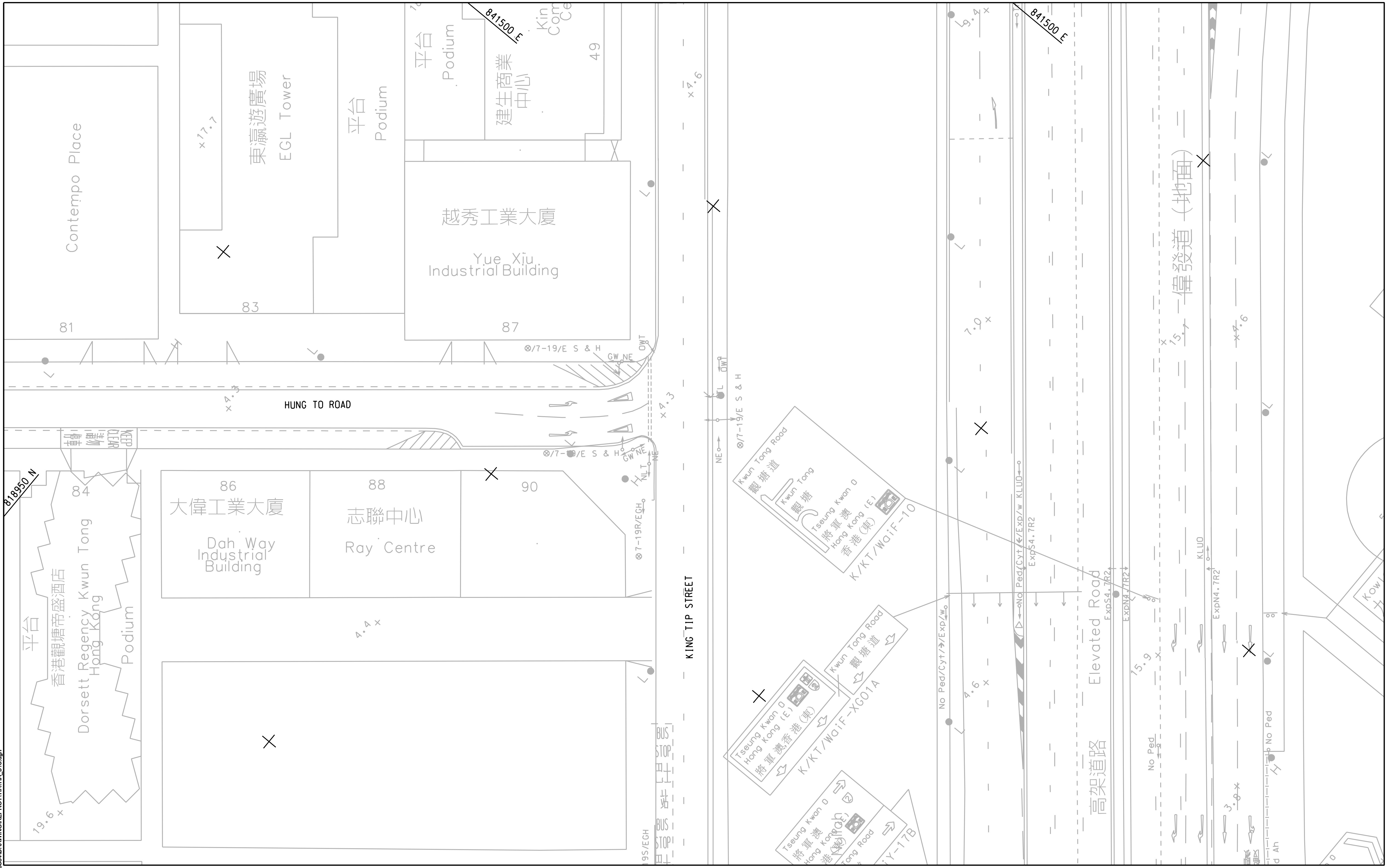
N

Drawing No: TIA/514A

Date: AUG 2018

Scale: 1 : 500

AECOM



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Project:
Agreement No. CE 61/2015 (TP)
Planning and Engineering Study on
Kwun Tong Action Area - Feasibility Study

Title:
LAYOUT OF KING YIP STREET / HUNG TO ROAD (J16)

N

Drawing No: TIA/515
Date: AUG 2018
Scale: 1 : 500

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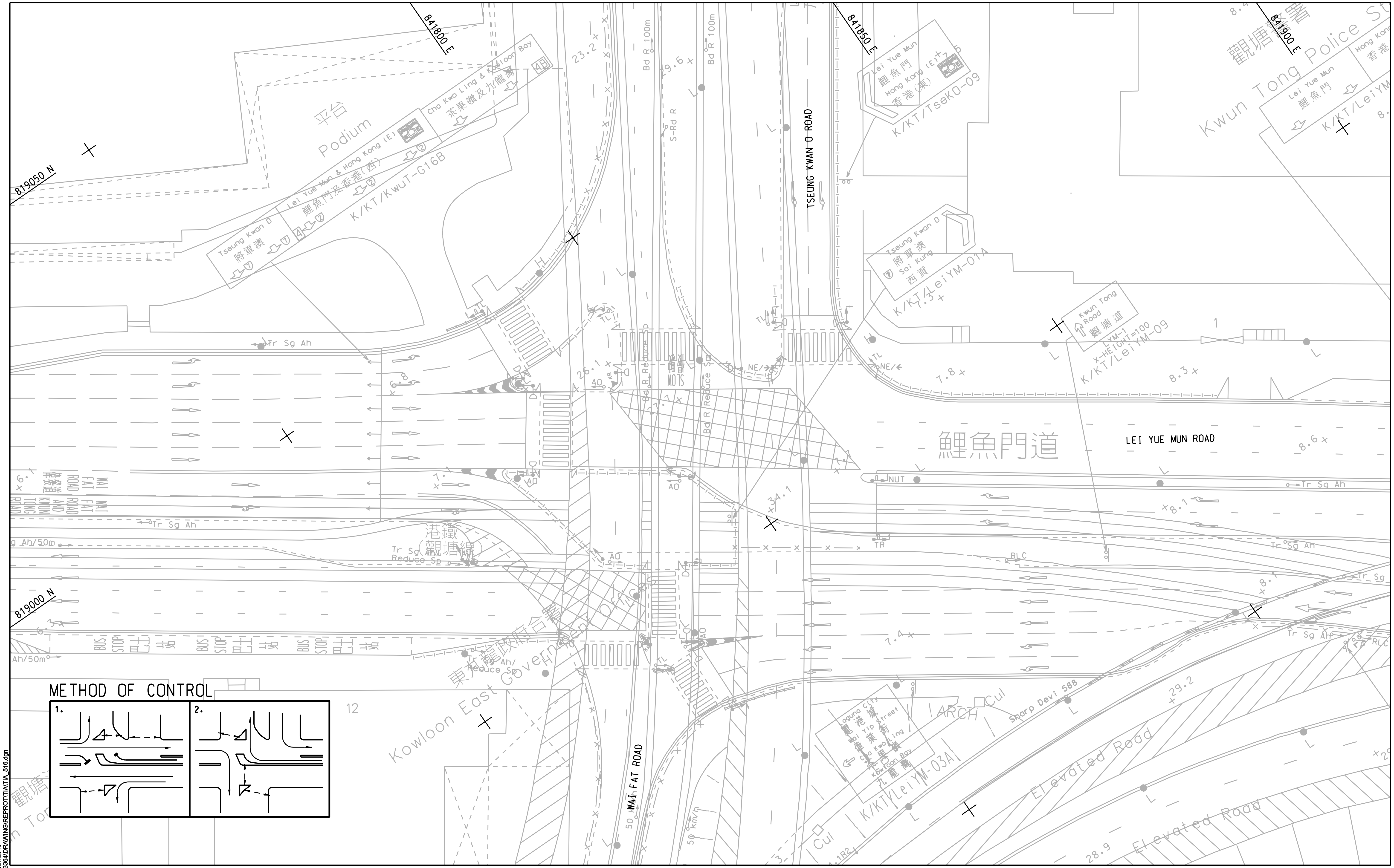

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Project:
Agreement No. CE 61/2015 (TP)
Planning and Engineering Study on
Kwun Tong Action Area - Feasibility Study

Title:
LAYOUT OF WAI FAT ROAD / LEI YUE MUN ROAD / TSEUNG KWAN O ROAD (J17)

N

Drawing No: TIA/516
Date: AUG 2018
Scale: 1:500

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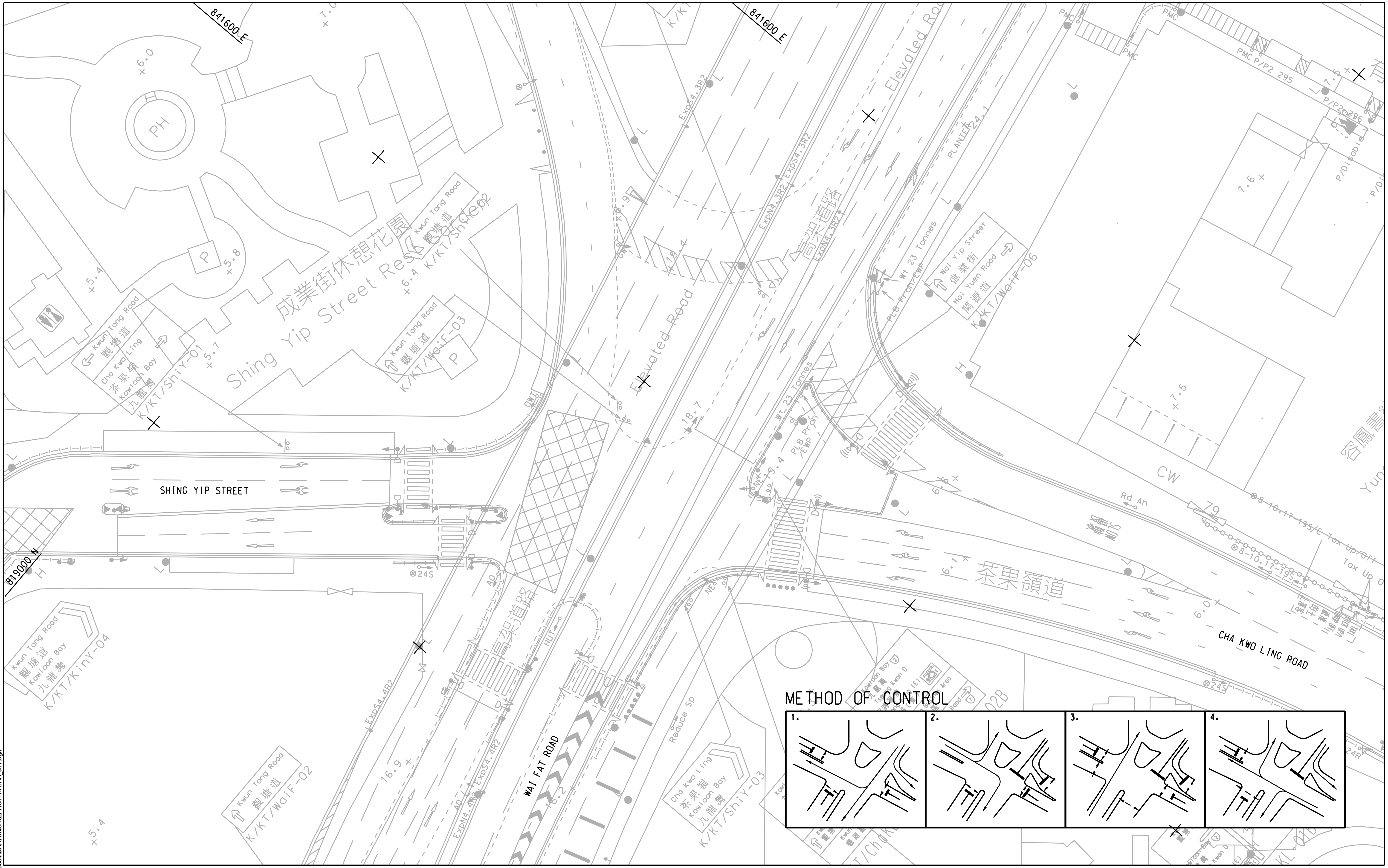

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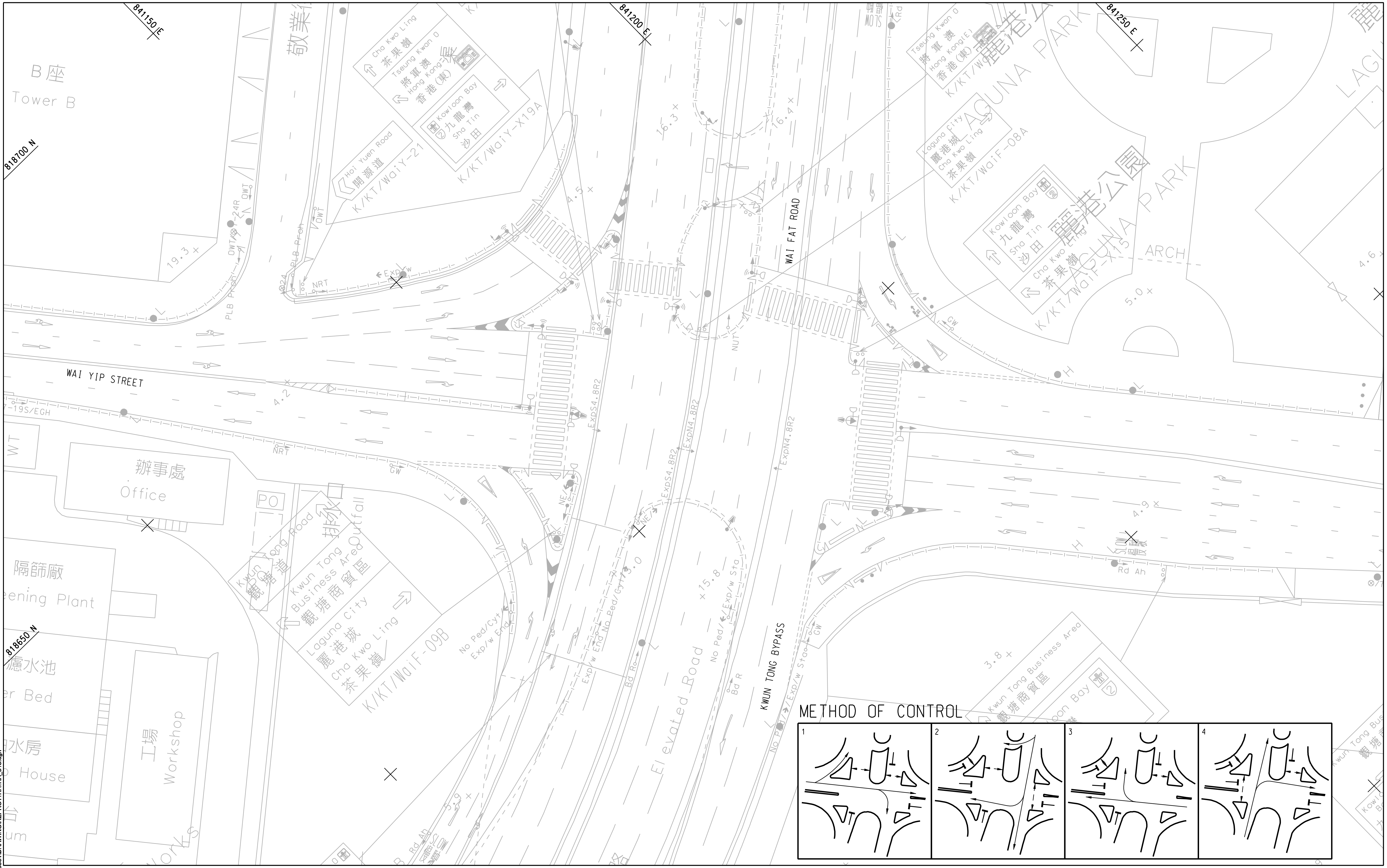
Project:
Agreement No. CE 61/2015 (TP)
Planning and Engineering Study on
Kwun Tong Action Area - Feasibility Study

Title:
LAYOUT OF WAI FAT ROAD / SHING YIP STREET (J18)

N

Drawing No:
TIA/517
Date: AUG 2018
Scale: 1:500

AECOM



Project:
Agreement No. CE 61/2015 (TP)
Planning and Engineering Study on
Kwun Tong Action Area - Feasibility Study

Title:
LAYOUT OF WAI FAT ROAD / WAI YIP STREET (J19)

N

Drawing No: TIA/518
Date: AUG 2018
Scale: 1:500

AECOM

Plot File by: LIUH9 2018/9/13
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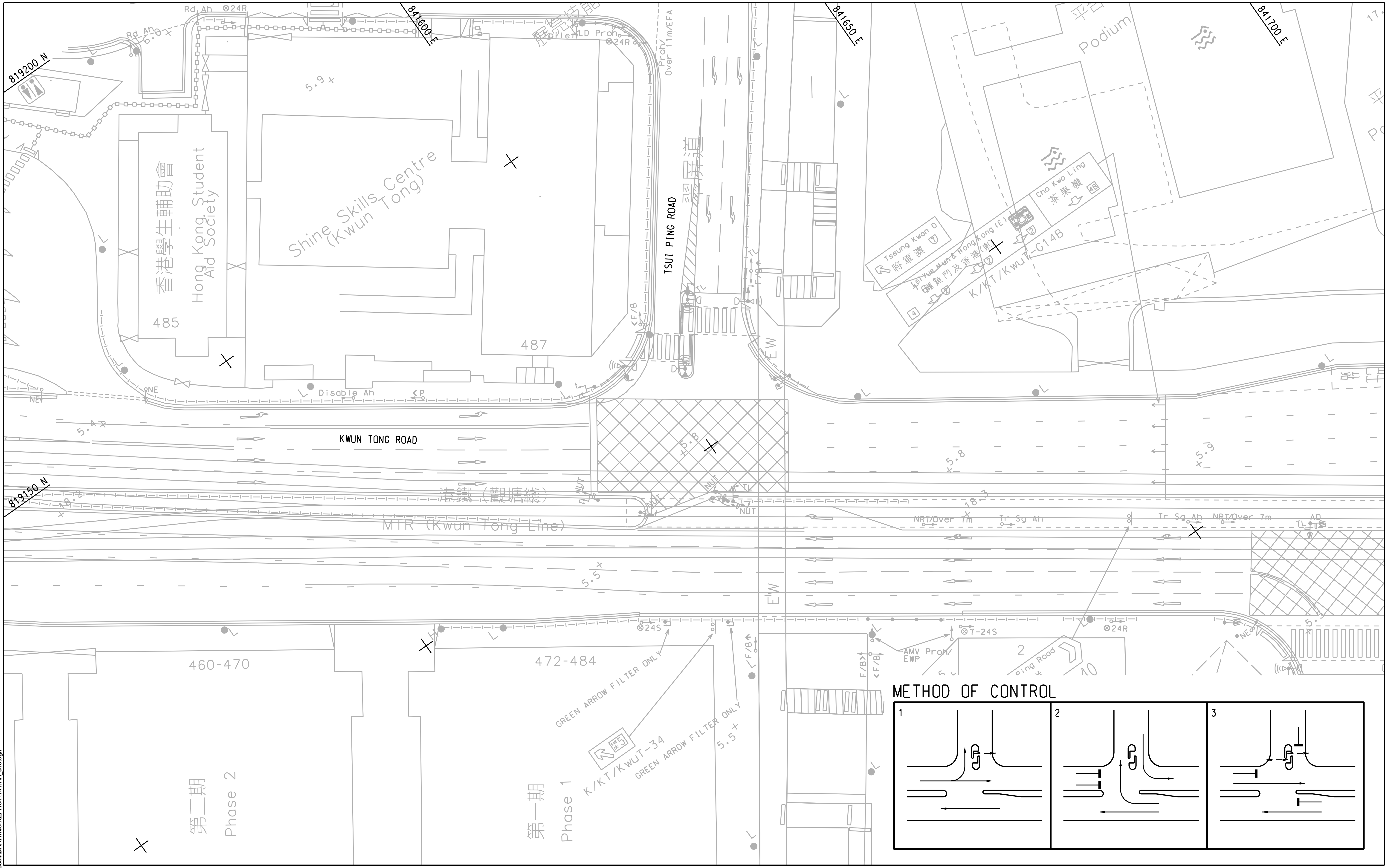
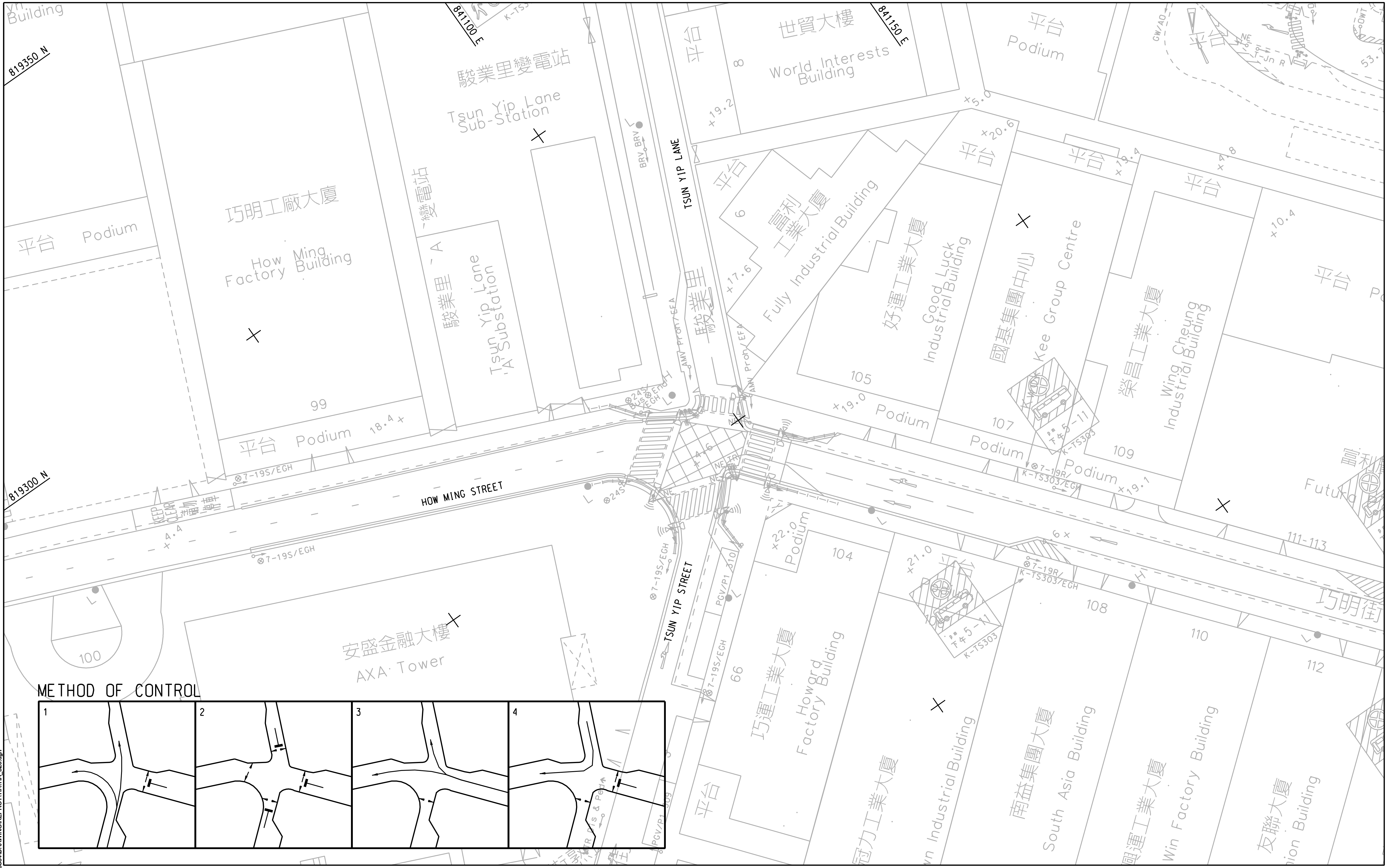


Project: Agreement No. CE 61/2015 (TP) Planning and Engineering Study on Kwun Tong Action Area - Feasibility Study	**Title:** LAYOUT OF KWUN TONG ROAD / TSUI PING ROAD (J20)	Drawing No: TIA/519 Date: AUG 2018 Scale: 1 : 500	AECOM



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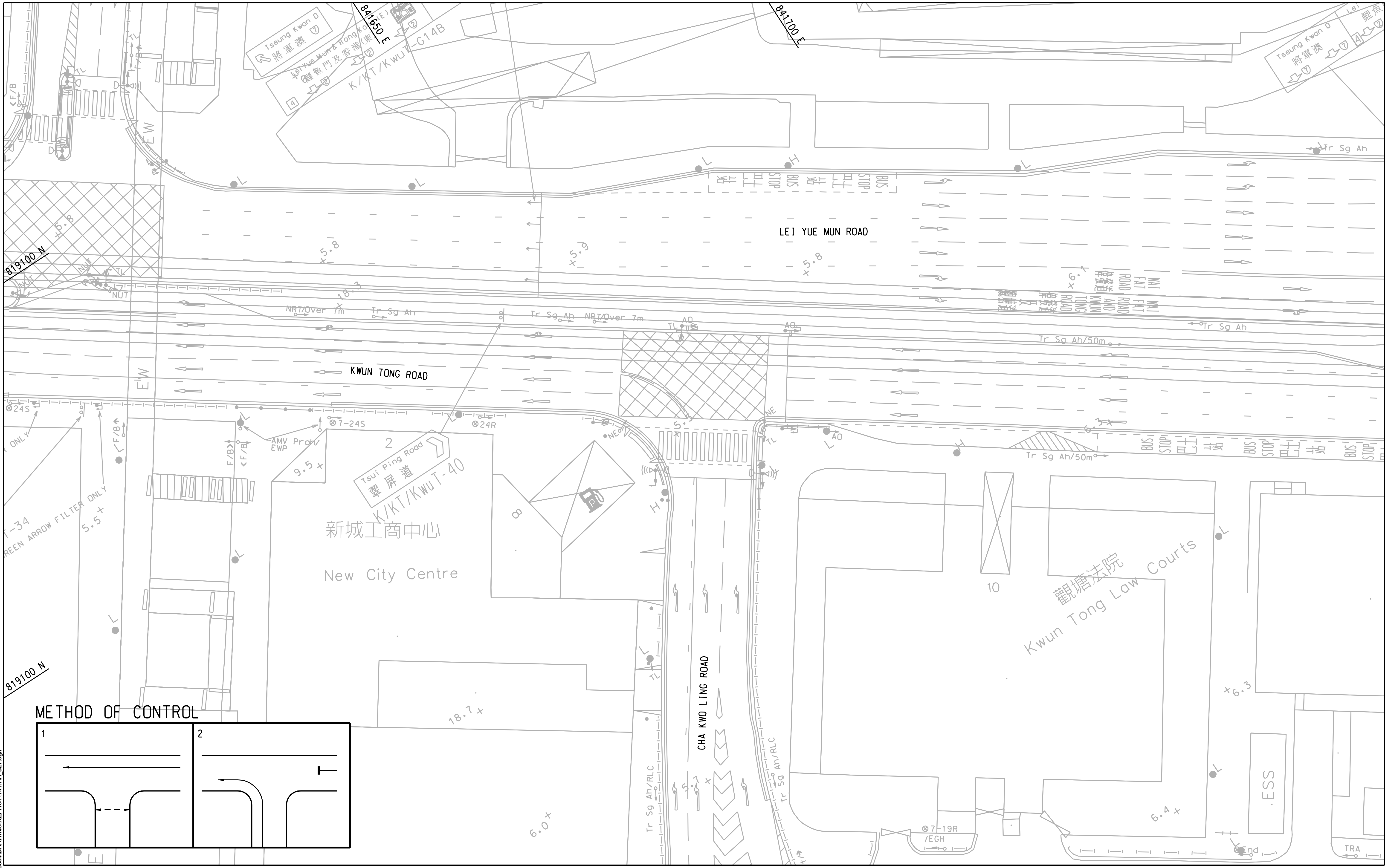
Project:
Agreement No. CE 61/2015 (TP)
Planning and Engineering Study on Kwun Tong Action Area - Feasibility Study

Title:
LAYOUT OF HOW MING STREET / TSUN YIP STREET (J21)

Drawing No: TIA/520
Date: AUG 2018
Scale: 1 : 500

AECOM



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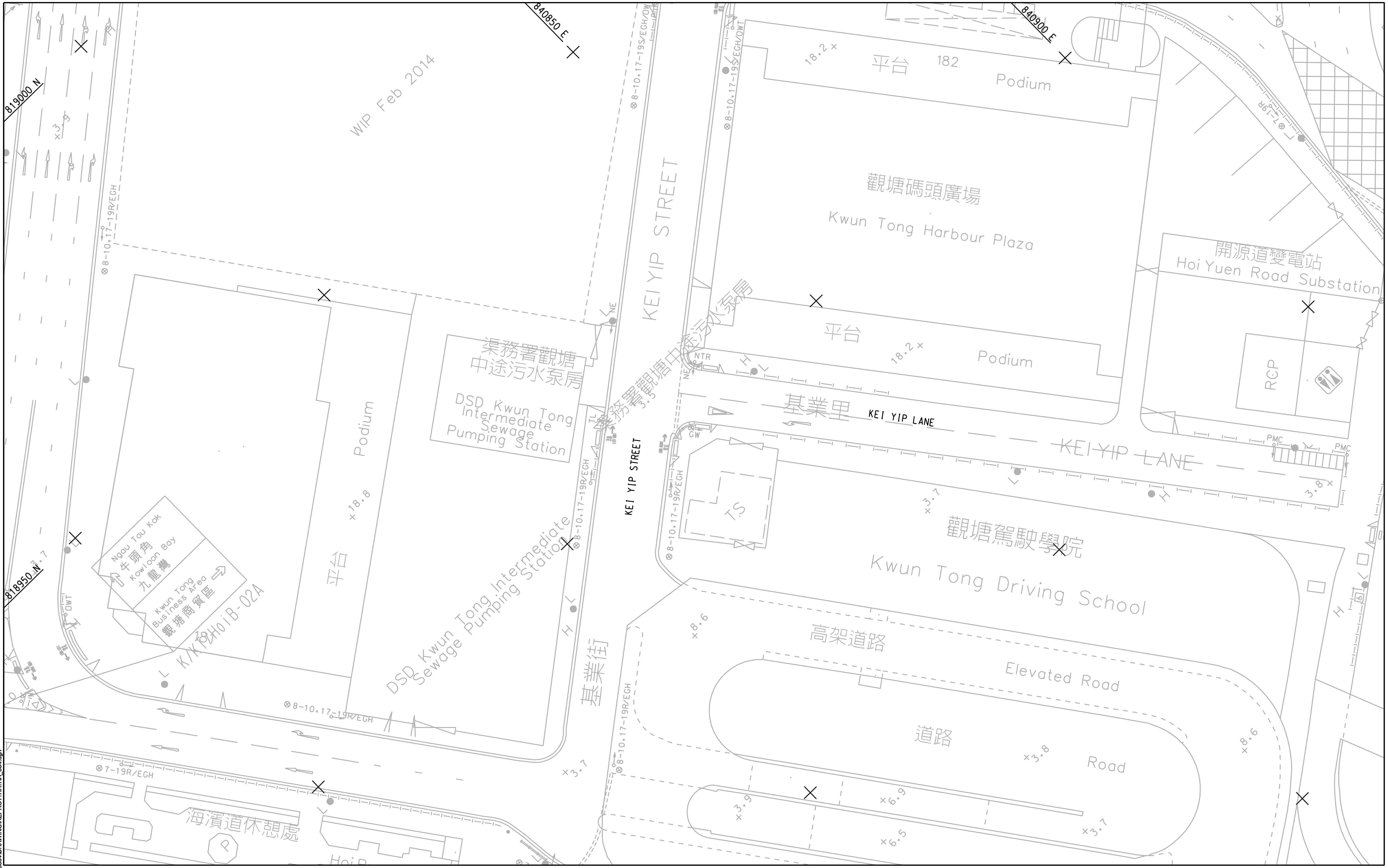
Project:
Agreement No. CE 61/2015 (TP)
Planning and Engineering Study on
Kwun Tong Action Area - Feasibility Study

Title:
LAYOUT OF LEI YUE MUN ROAD / CHA KWO LING ROAD (J22)

N

Drawing No: TIA/527
Date: AUG 2018
Scale: 1 : 500

AECOM



Project:
Agreement No. CE 61/2015 (TP)
Planning and Engineering Study on
Kwun Tong Action Area - Feasibility Study

Title:
LAYOUT OF KEI YIP STREET / KEI YIP LANE (J23)

Drawing No: TIA/534
Date: AUG 2018
Scale: 1 : 500

AECOM

Plot File by: CHENFJ 8/27/2018
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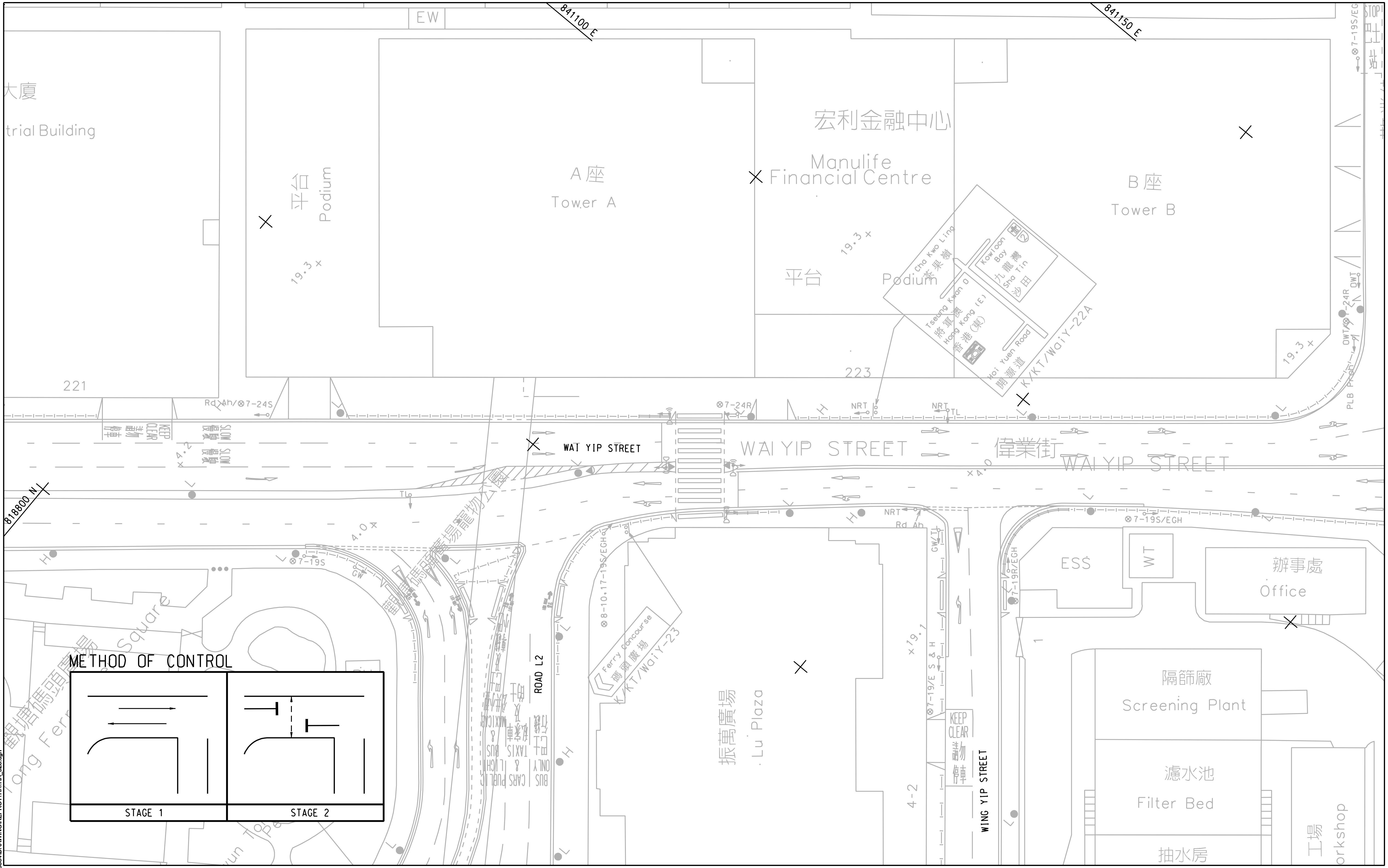

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Project:
Agreement No. CE 61/2015 (TP)
Planning and Engineering Study on
Kwun Tong Action Area - Feasibility Study

Title:
LAYOUT OF WAI YIP STREET / ROAD L2 (J26)

Drawing No: TIA/528
Date: AUG 2018
Scale: 1 : 500

AECOM

APPENDIX B

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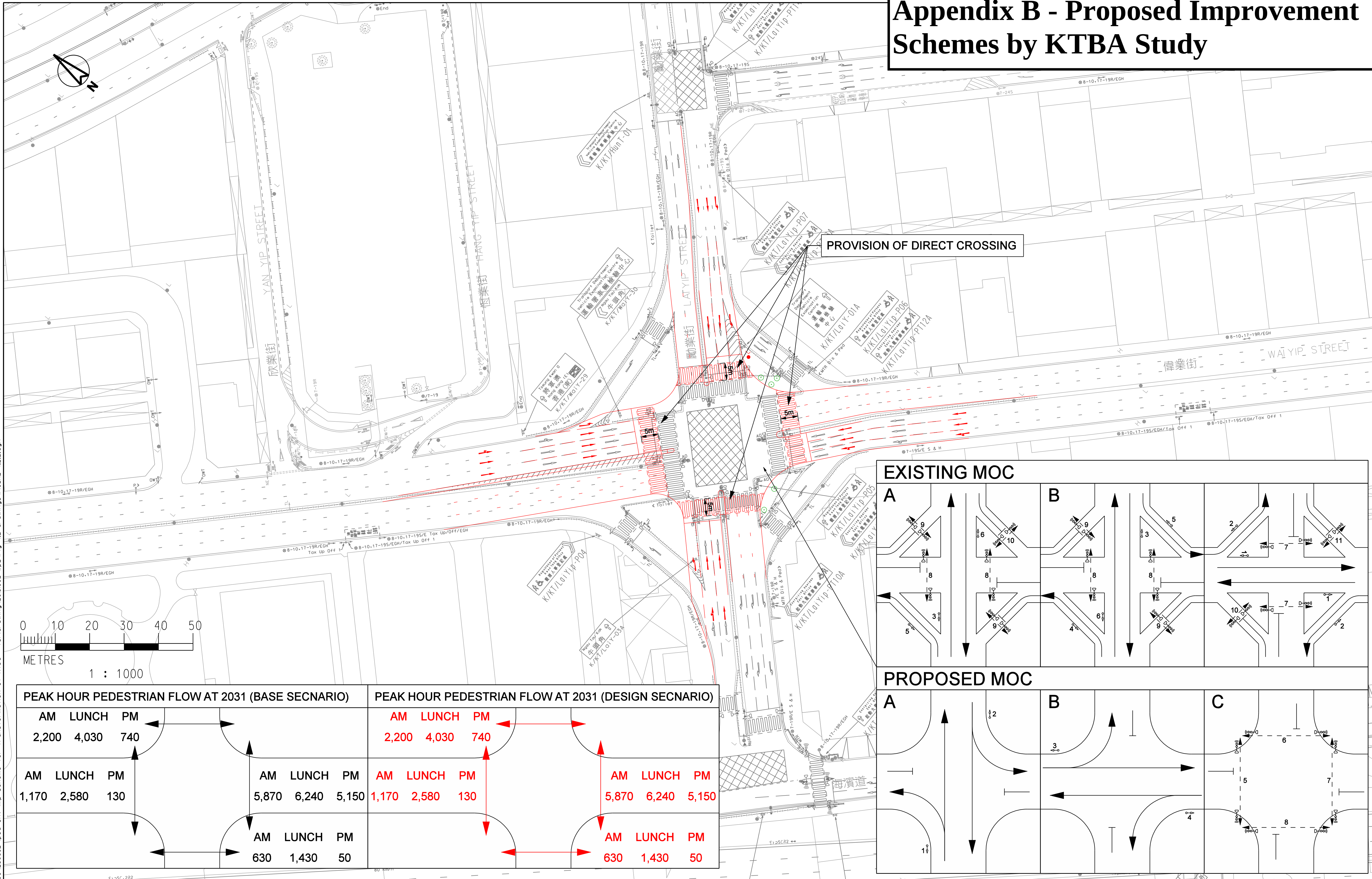
Appendix B - Proposed Improvement Schemes by KTBA Study

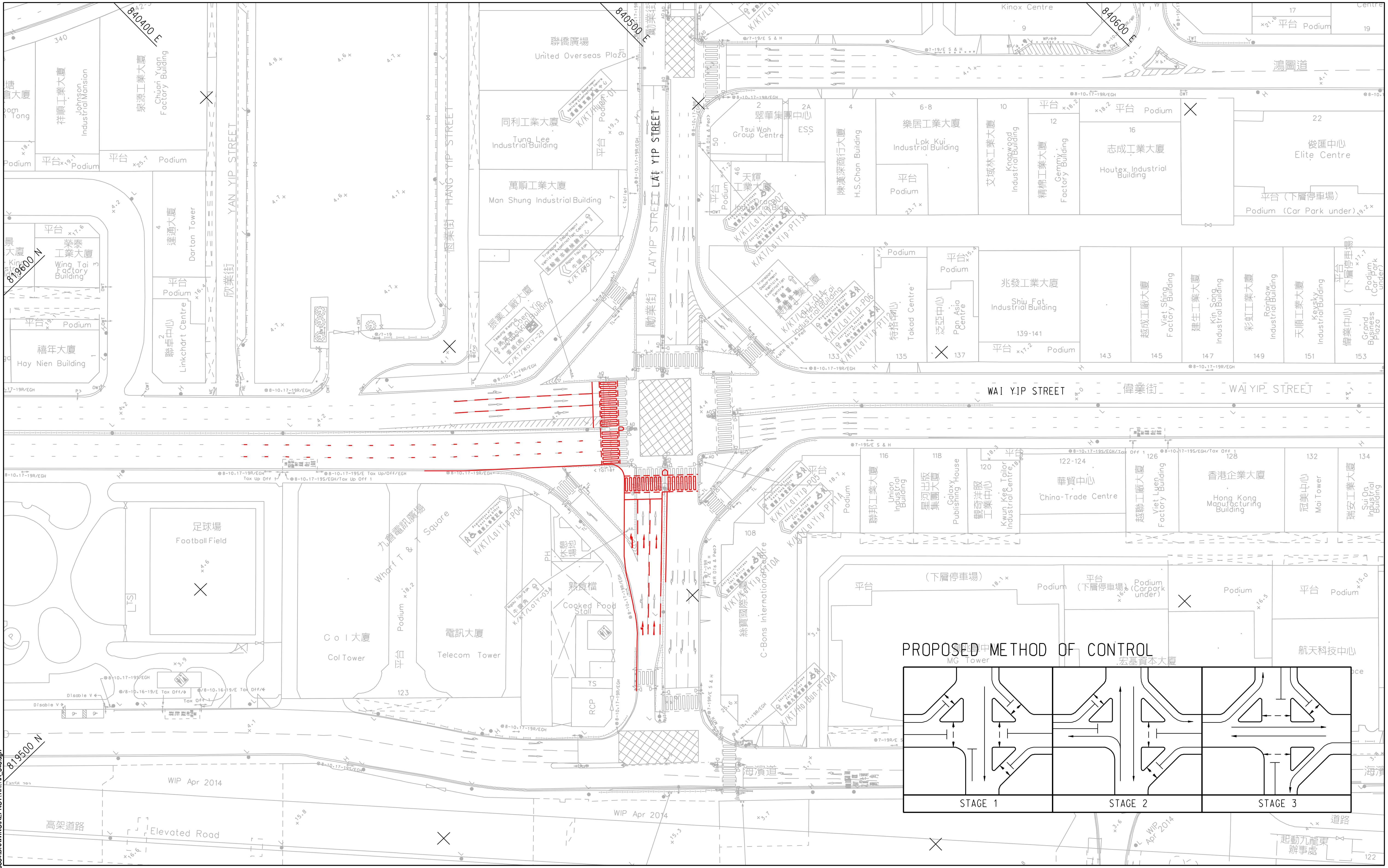


Job Title

AGREEMENT NO. CE 57/2013 (TT) PEDESTRIAN ENVIRONMENT IMPROVEMENT SCHEME FOR TRANSFORMATION OF KWUN TONG BUSINESS AREA - FEASIBILITY STUDY

FIGURE 4.2.2

Date: MAY 15	Scale: 1:1000	Drawing Title: M1.2 REALIGNMENT OF PEDESTRIAN CROSSING - LAI YIP STREET / WAI YIP STREET	ARUP
Drawn: CHPH	Job No. 236692		



Project:
Agreement No. CE 61/2015 (TP)
Planning and Engineering Study on
Kwun Tong Action Area - Feasibility Study

Title:
IMPROVEMENT SCHEME OF LAI YIP
STREET / WAI YIP STREET (J3) BY HyD NTK STUDY

N

Drawing No:
TIA/545
Date: JUL 2019
Scale: 1 : 1000

AECOM

Plot File by: LIUH9 01/08/2019
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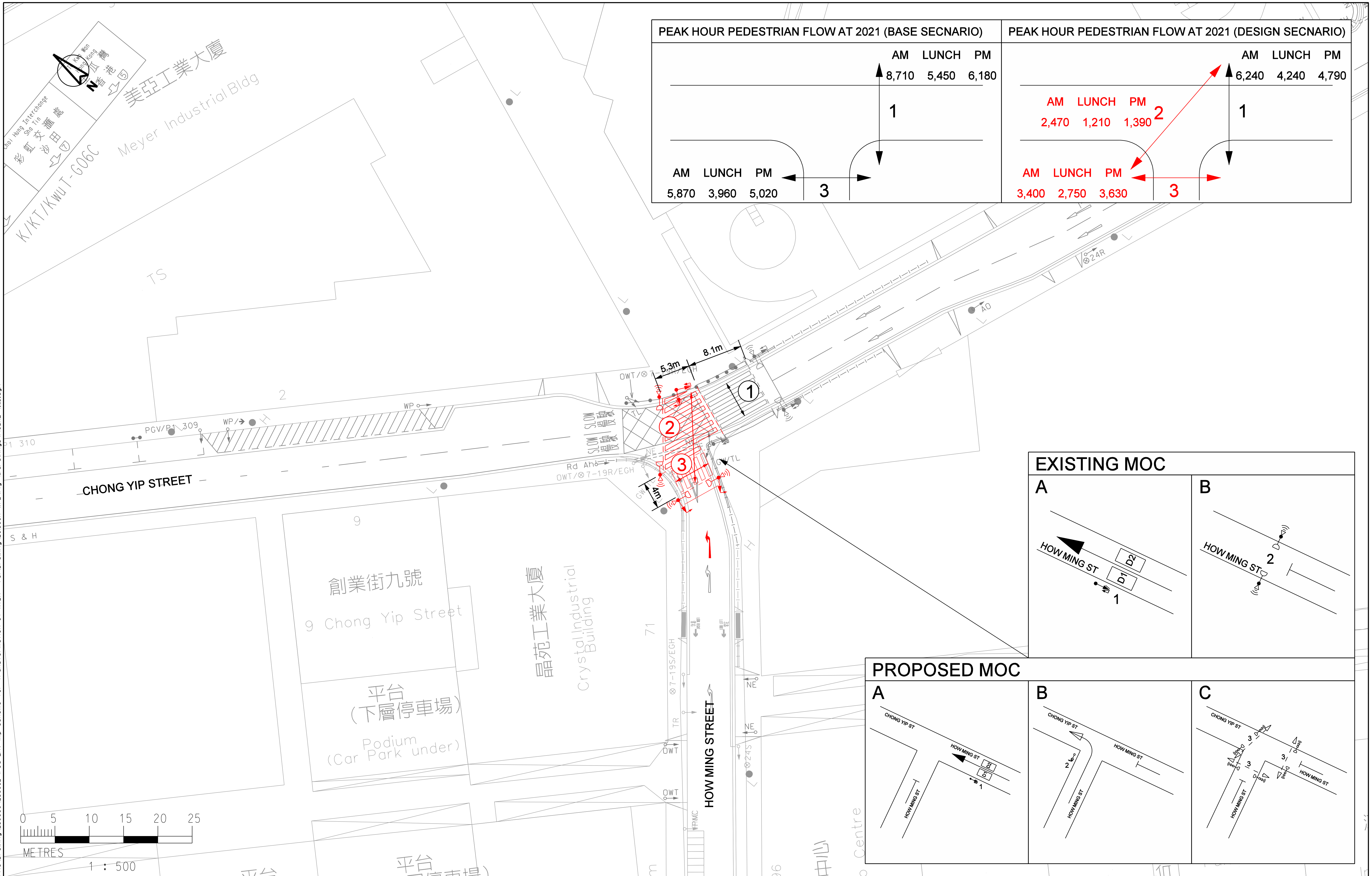

Job Title

AGREEMENT NO. CE 57/2013 (TT) PEDESTRIAN ENVIRONMENT IMPROVEMENT SCHEME FOR TRANSFORMATION OF KWUN TONG BUSINESS AREA - FEASIBILITY STUDY

FIGURE 4.1.5

Date	Scale	Drawing Title
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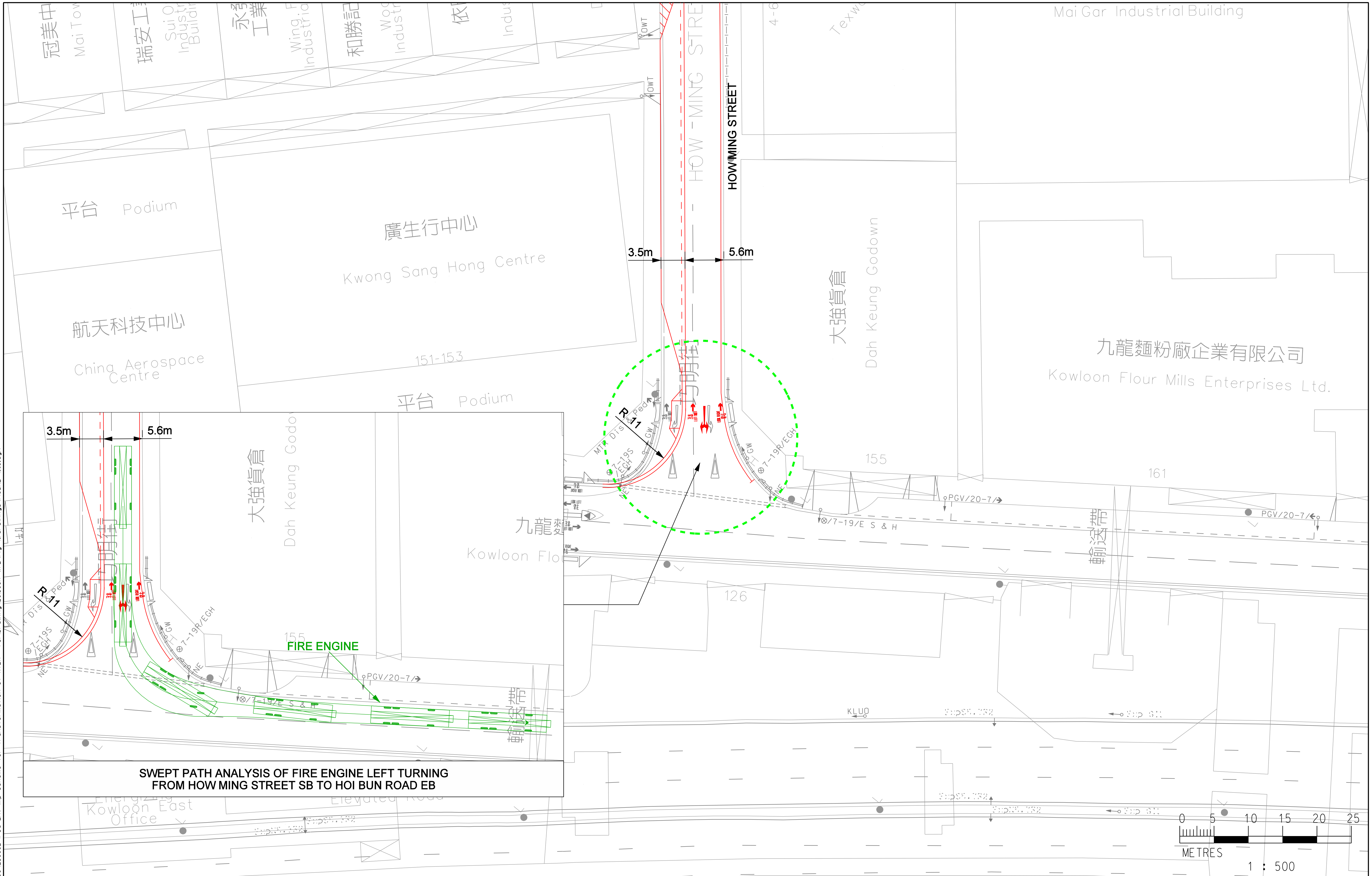
Drawn: CHPH	Job No.: 236692	

ARUP



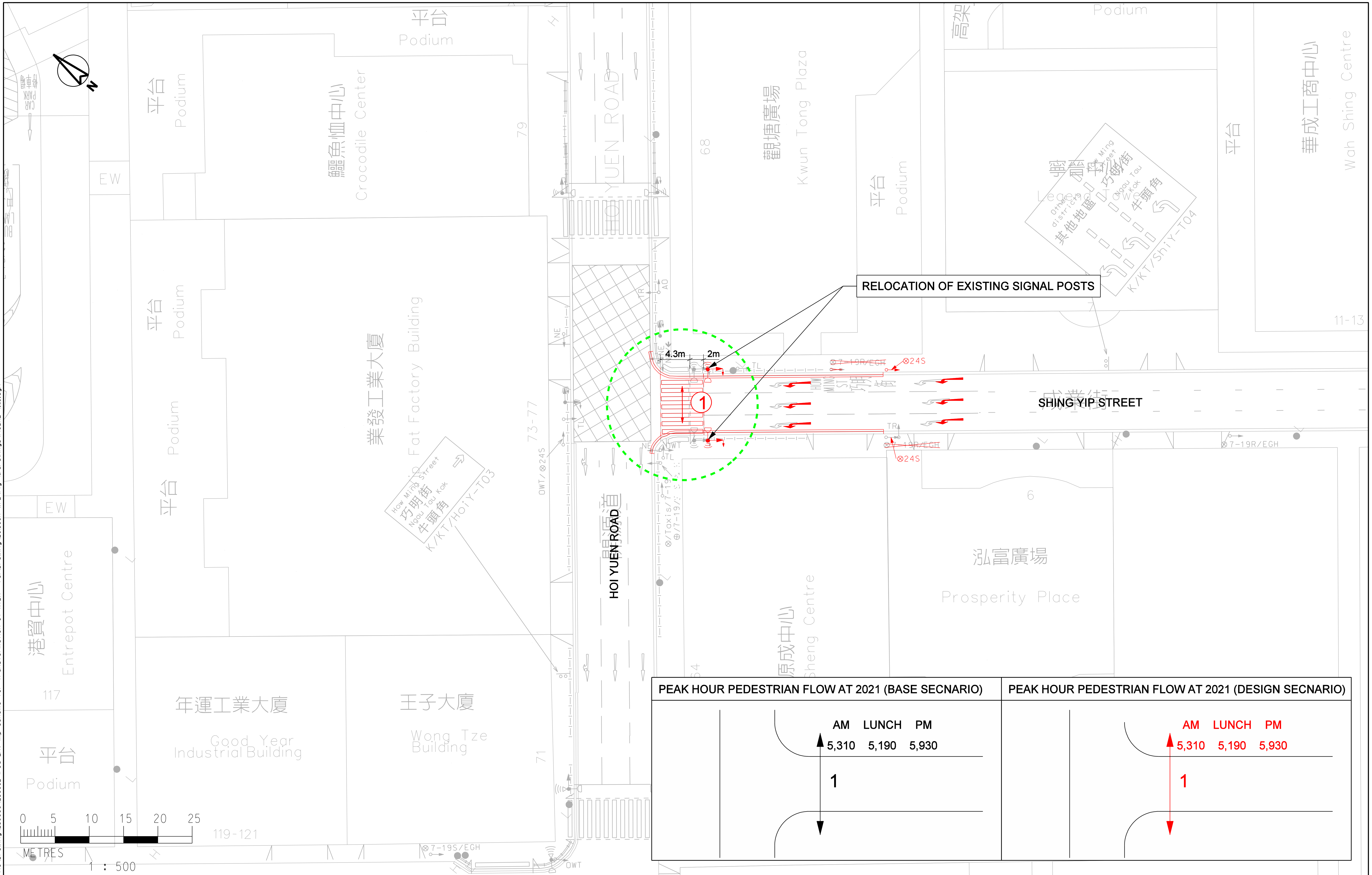
Job Title

AGREEMENT NO. CE 57/2013 (TT) PEDESTRIAN ENVIRONMENT IMPROVEMENT SCHEME FOR TRANSFORMATION OF KWUN TONG BUSINESS AREA - FEASIBILITY STUDY

FIGURE 4.1.6

Date	Scale	Drawing Title
NOV 14	1:500	S1.6 ENHANCEMENT OF PEDESTRIAN CROSSING - HOW MING STREET / HOI BUN ROAD
Drawn	Job No.	
KHC	236692	

ARUP



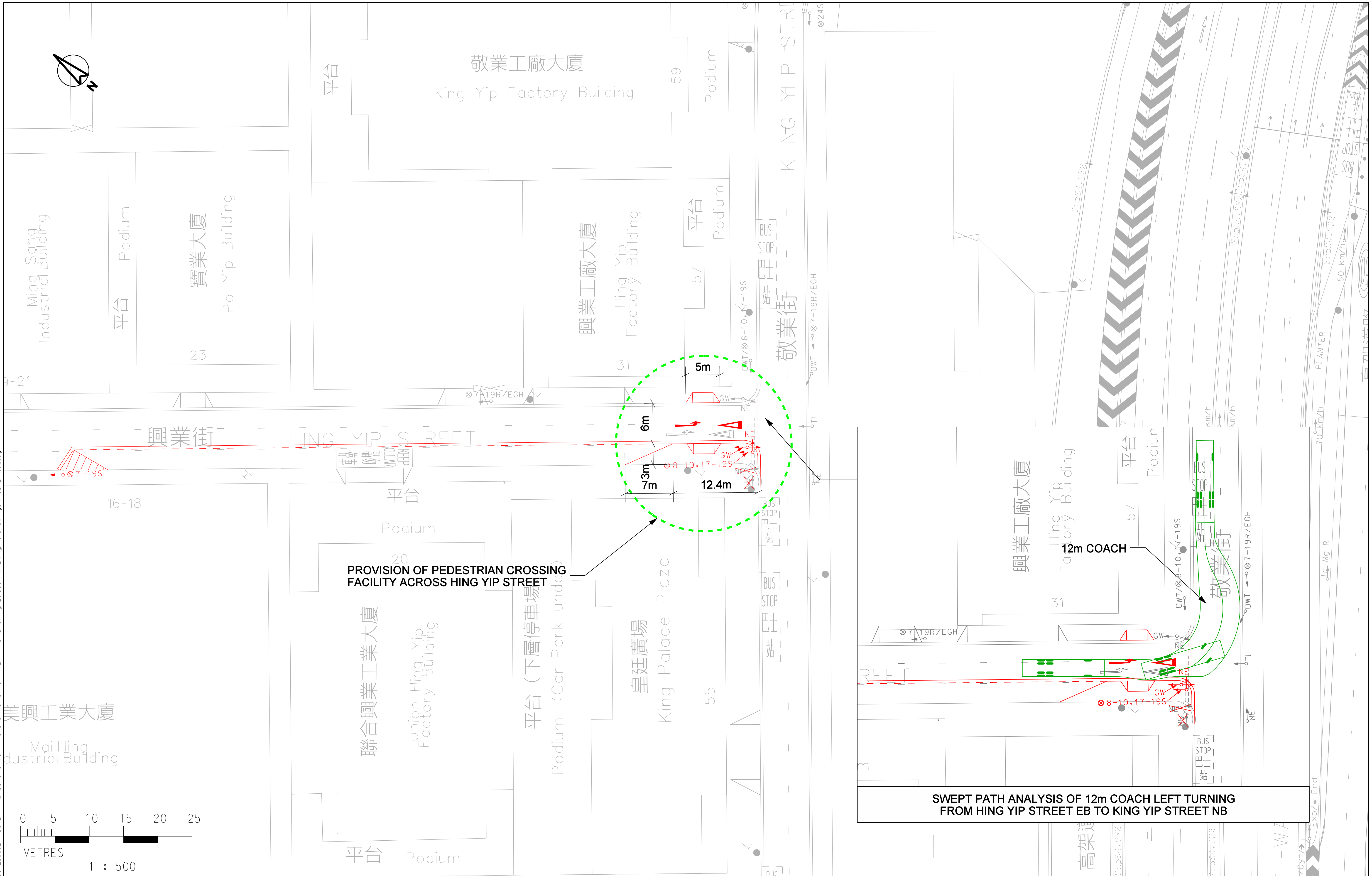
Job Title

AGREEMENT NO. CE 57/2013 (TT) PEDESTRIAN ENVIRONMENT IMPROVEMENT SCHEME FOR TRANSFORMATION OF KWUN TONG BUSINESS AREA - FEASIBILITY STUDY

FIGURE 4.1.8

Date	Scale	Drawing Title
SEP 15	1:500	S1.8 ENHANCEMENT OF PEDESTRIAN CROSSING - HOI YUEN ROAD / SHING YIP STREET
Drawn: KHC	Job No.: 236692	

ARUP



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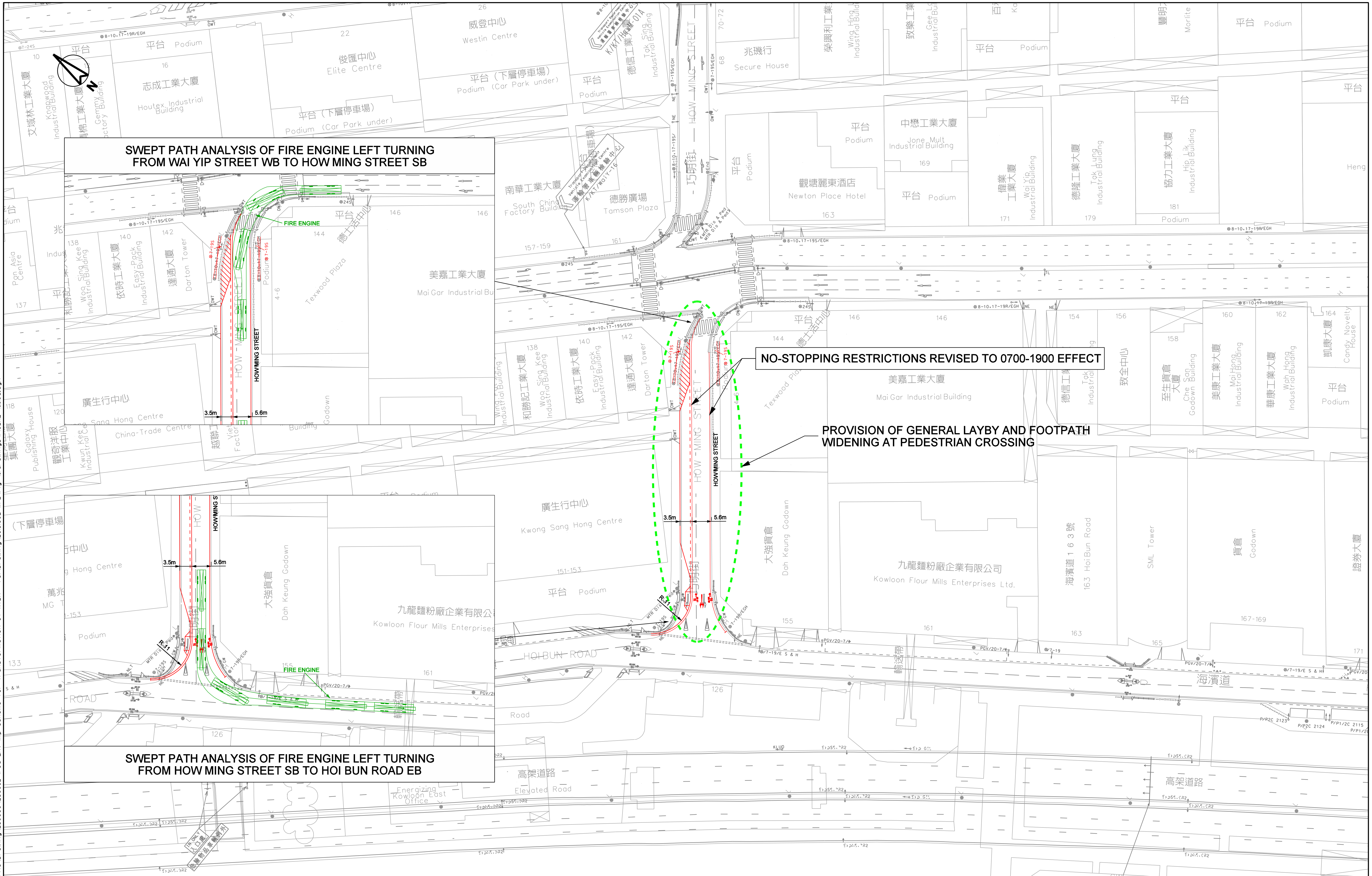
FILENAME: M:\Drawing\230000\236692 iPed Env Imp Scheme for Transformation of KTBA - FS\Drawing\20150917 WP2\Fig 4.1\drawings\FIGURE 4.1.10.dgn

Job Title		
AGREEMENT NO. CE 57/2013 (TT) PEDESTRIAN ENVIRONMENT IMPROVEMENT SCHEME FOR TRANSFORMATION OF KWUN TONG BUSINESS AREA - FEASIBILITY STUDY		FIGURE 4.1.10
Date: NOV 14	Scale: 1:500	Drawing Title: S1.10 ENHANCEMENT OF PEDESTRIAN CROSSING - HING YIP STREET / KING YIP STREET
Drawn: KHC	Job No.: 236692	ARUP



Job Title

AGREEMENT NO. CE 57/2013 (TT) PEDESTRIAN ENVIRONMENT IMPROVEMENT SCHEME FOR TRANSFORMATION OF KWUN TONG BUSINESS AREA - FEASIBILITY STUDY

FIGURE 4.1.16A

Date	Scale	Drawing Title
MAY 15	1:1000	S2.5A RATIONALIZATION OF KERB SIDE ACTIVITIES - HOW MING STREET / HOI BUN ROAD
Drawn: CHPH	Job No.: 236692	

ARUP

PRINTED BY: wing-tung.lee 18/2015 11:51:11 AM
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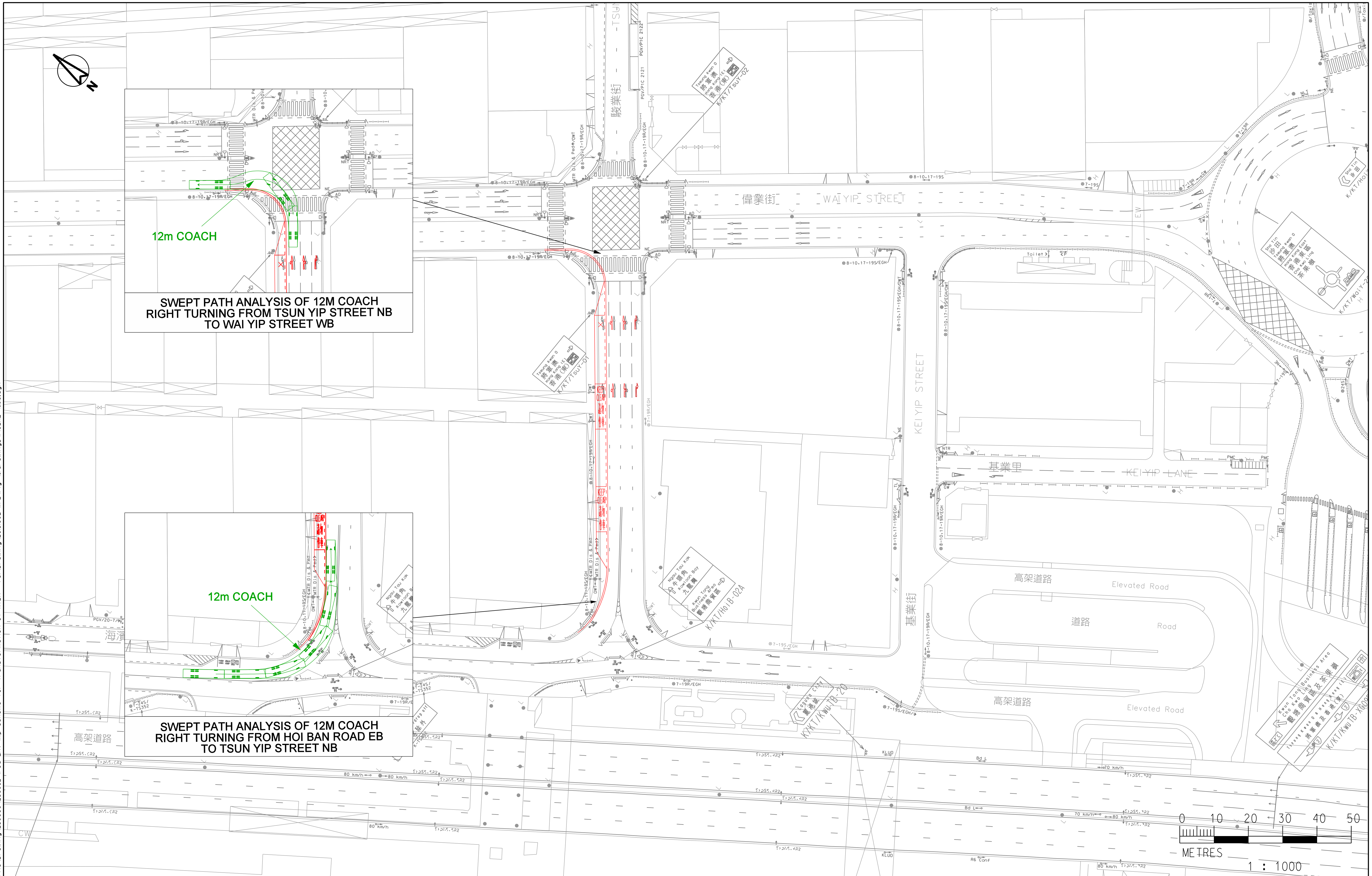


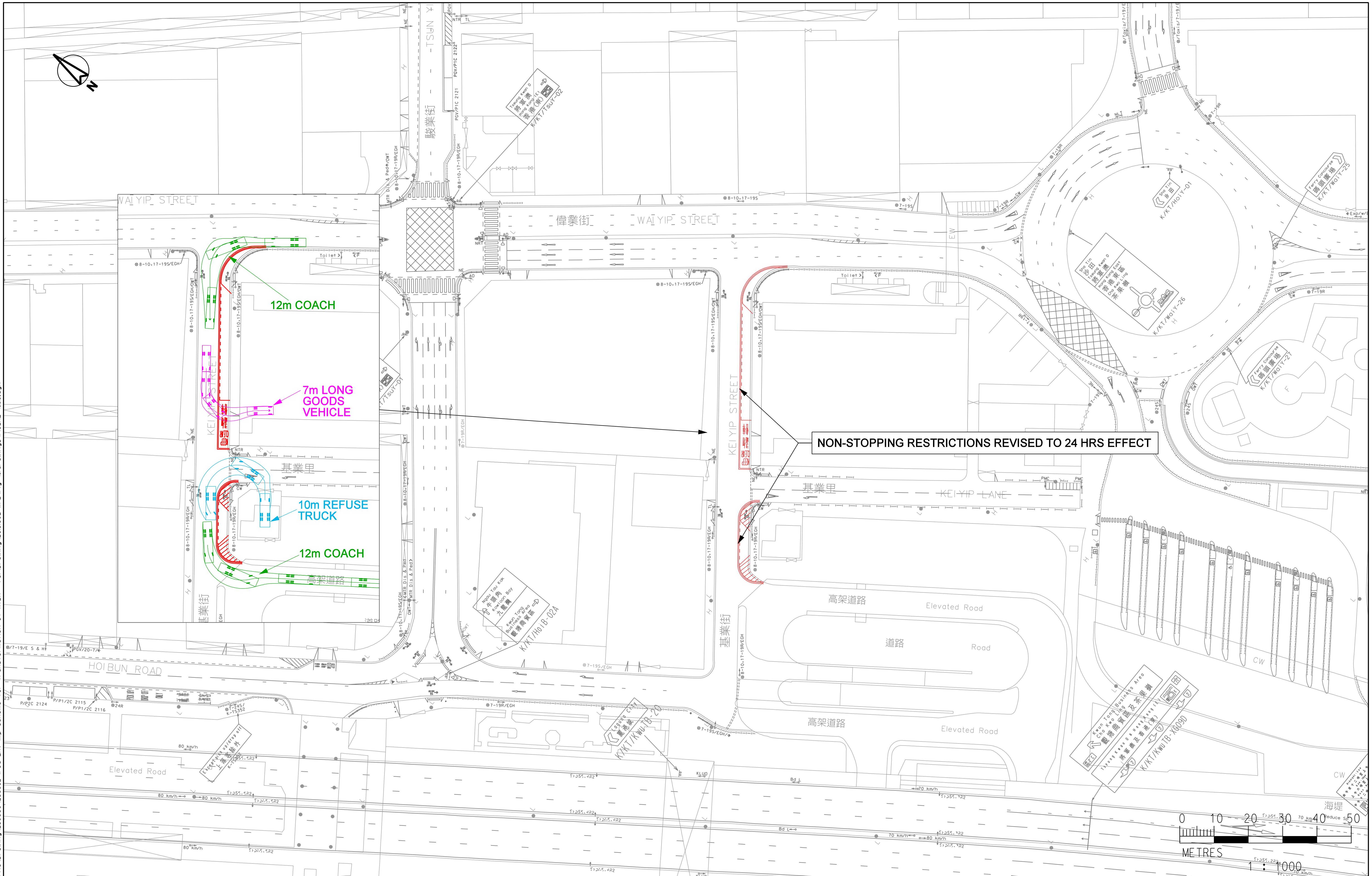
Job Title

AGREEMENT NO. CE 57/2013 (TT) PEDESTRIAN ENVIRONMENT IMPROVEMENT SCHEME FOR TRANSFORMATION OF KWUN TONG BUSINESS AREA - FEASIBILITY STUDY

FIGURE 4.1.18

Date	Scale	Drawing Title
MAY 15	1:1000	S2.7 RATIONALIZATION OF KERB SIDE ACTIVITIES - TSUN YIP STREET / WAI YIP STREET
Drawn	Job No.	
CHPH	236692	

ARUP



Job Title

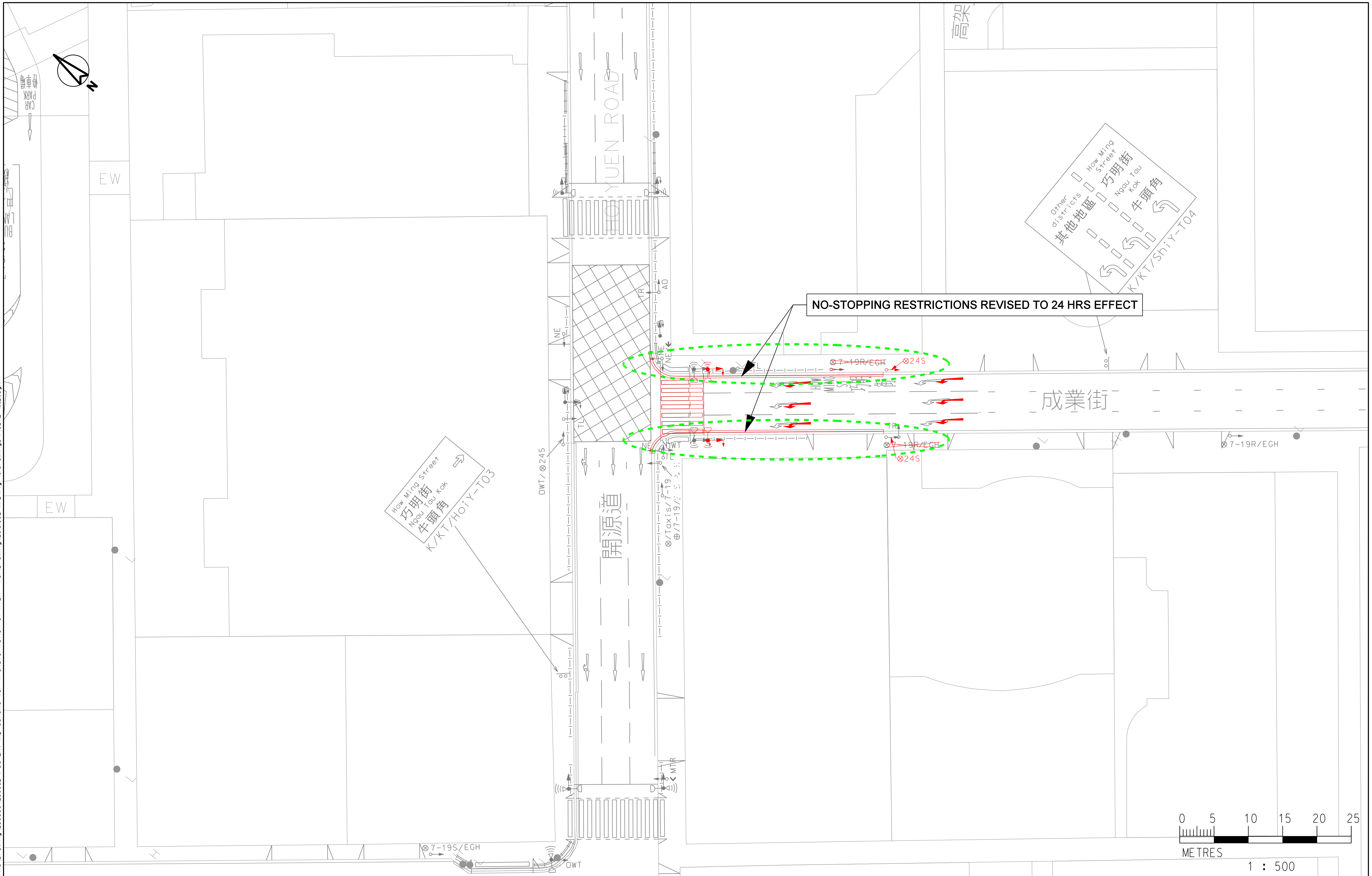
AGREEMENT NO. CE 57/2013 (TT) PEDESTRIAN ENVIRONMENT IMPROVEMENT SCHEME FOR TRANSFORMATION OF KWUN TONG BUSINESS AREA - FEASIBILITY STUDY

FIGURE 4.1.19

Date	Scale	Drawing Title
MAY 15	1:1000	S2.8 RATIONALIZATION OF KERB SIDE ACTIVITIES - KEI YIP STREET
Drawn	Job No.	
CHPH	236692	

ARUP

FILENAME: \\hkghts69\Traffic\Drawing\230000\236692 (Ped Env Imp Scheme for Transformation of KTBA - FS)\Drawing\20150002 WP2\Fig 4\drawings\FIGURE 4.1.19.dgn



Job Title

AGREEMENT NO. CE 57/2013 (TT) PEDESTRIAN ENVIRONMENT IMPROVEMENT SCHEME FOR TRANSFORMATION OF KWUN TONG BUSINESS AREA - FEASIBILITY STUDY

FIGURE 4.1.21

Date	Scale	Drawing Title
MAY 15	1:500	S2.10 RATIONALIZATION OF KERB SIDE ACTIVITIES - SHING YIP STREET (STAGE 1)
Drawn: CHPH	Job No. 236692	

ARUP

PRINTED BY: wing-tung.lai 10/8/2015 11:17:01 AM
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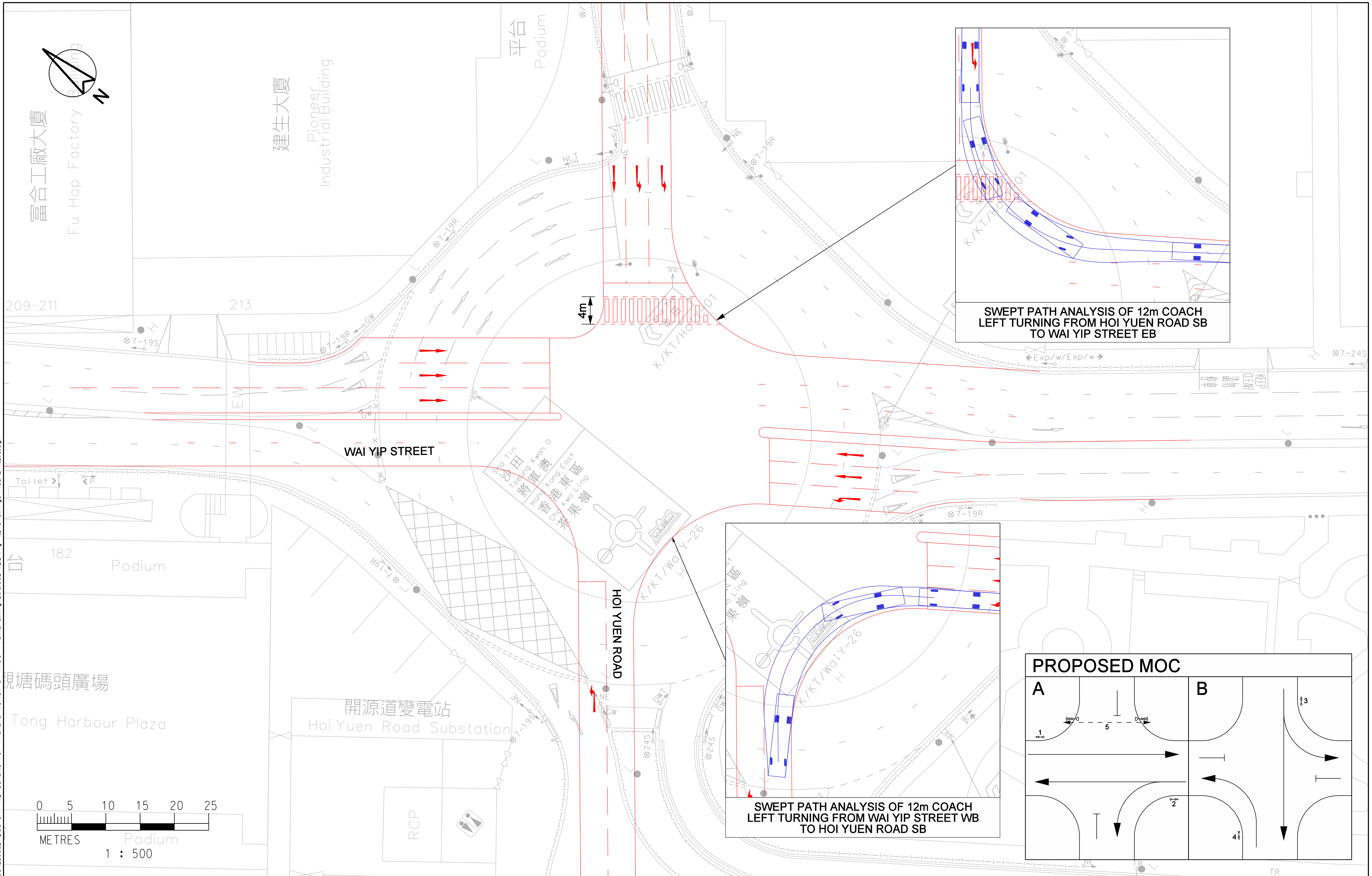


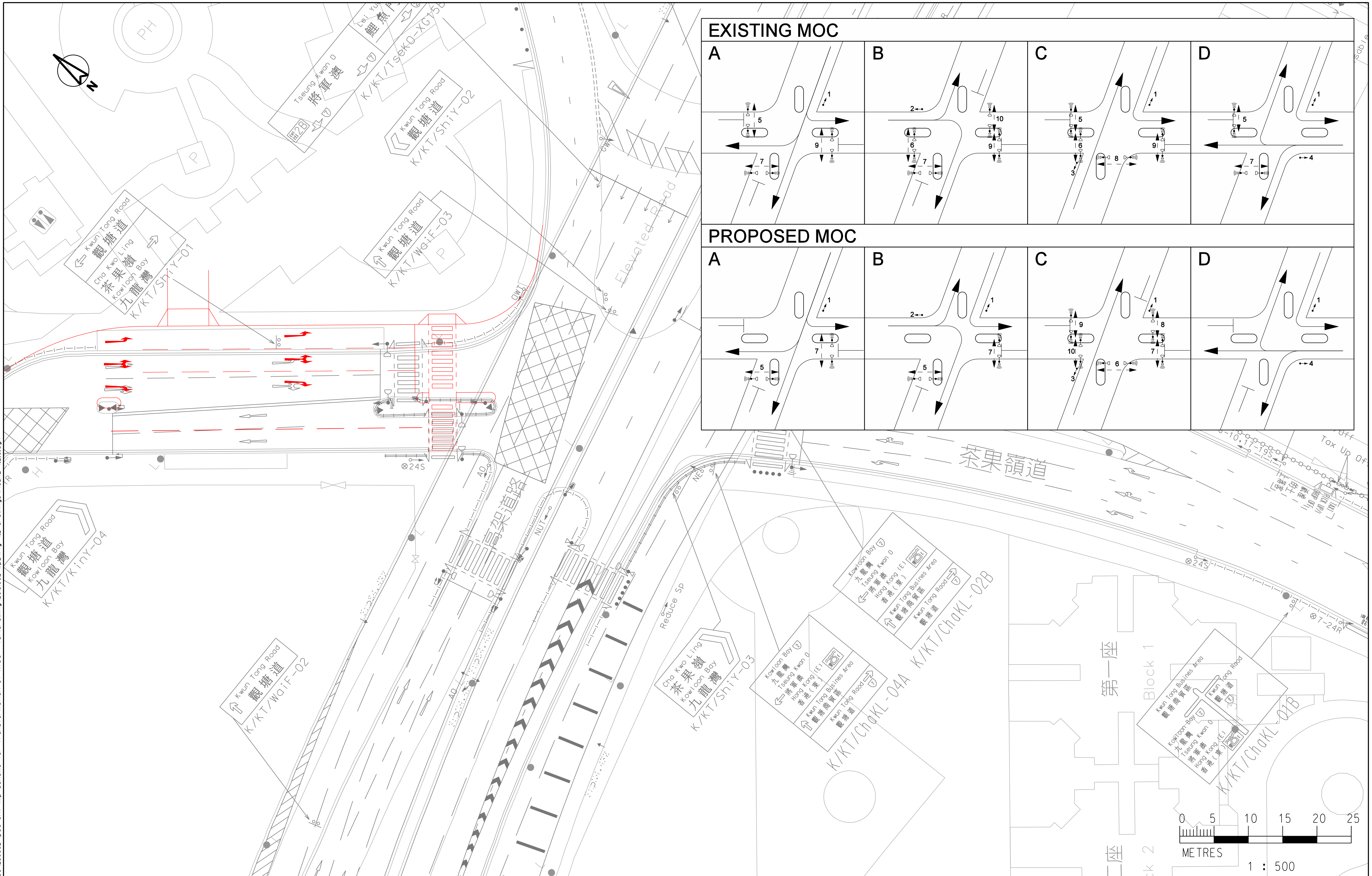
Job Title

AGREEMENT NO. CE 57/2013 (TT) PEDESTRIAN ENVIRONMENT IMPROVEMENT SCHEME FOR TRANSFORMATION OF KWUN TONG BUSINESS AREA - FEASIBILITY STUDY

FIGURE 4.2.13

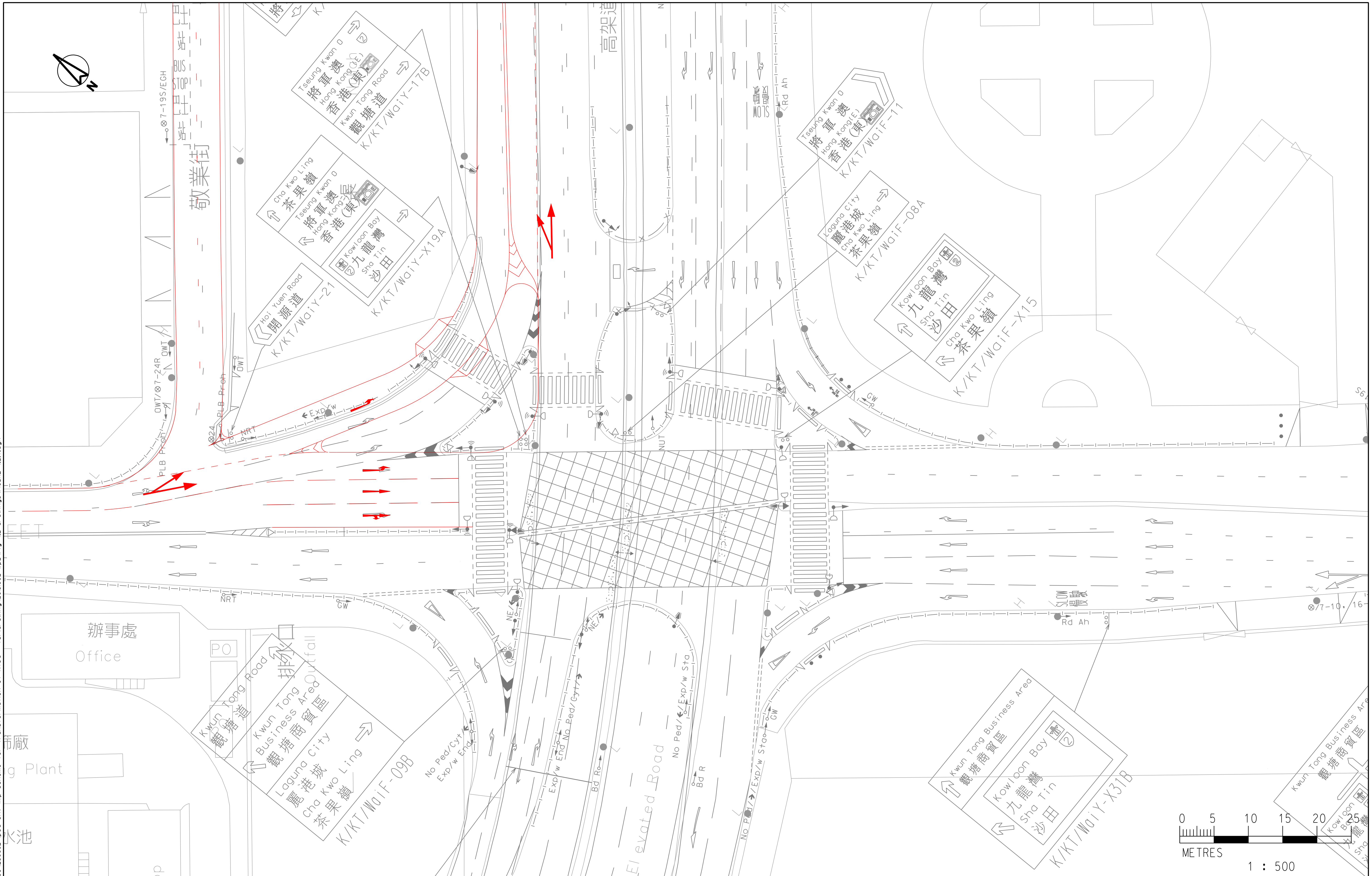
Date	Scale	Drawing Title
JUN 15	1:500	M2.5 - SIGNALISATION OF ROAD JUNCTION - HOI YUEN ROAD / WAI YIP STREET
Drawn: KHC	Job No.: 236692	

ARUP



PRINTED BY: wing-tung.lai 06/2015 8:22:04 PM
FILENAME: m:\drawing\230000\236692 (ped env imp scheme for transformation of ktba - fs)\drawing\2015002 wp2\Fig 4.2 drawings\FIGURE 4.2.6.dgn

Job Title	AGREEMENT NO. CE 57/2013 (TT) PEDESTRIAN ENVIRONMENT IMPROVEMENT SCHEME FOR TRANSFORMATION OF KWUN TONG BUSINESS AREA - FEASIBILITY STUDY	FIGURE 4.2.6
Date: MAY 15 / Scale: 1:500	Drawing Title: M2.1 REARRANGEMENT OF JUNCTION LAYOUT - SHING YIP STREET / WAI FAT ROAD	ARUP
Drawn: CHPH / Job No.: 236692		



Job Title

AGREEMENT NO. CE 57/2013 (TT) PEDESTRIAN ENVIRONMENT IMPROVEMENT SCHEME FOR TRANSFORMATION OF KWUN TONG BUSINESS AREA - FEASIBILITY STUDY

FIGURE 4.2.7

Date	Scale	Drawing Title
MAY 15	1:500	M2.2 REARRANGEMENT OF JUNCTION LAYOUT - WAI YIP STREET / WAI FAT ROAD
Drawn	Job No.	
CHPH	236692	

ARUP

PRINTED BY: wing-tung.lai 30/06/2015 8:13:38 PM
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APPENDIX C

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Appendix C1 – Local Area Traffic Model Validation Result

PV		AM				PM			
		OBS	MOD	MOD/OBS	GEH	OBS	MOD	MOD/OBS	GEH
*** J1 - Kwun Tong Road/ Lai Yip Street/ Elegance Road**									
* Kwun Tong Road	SEB	368	361	1.0	0	317	333	1.1	1
* Lai Yip Street	NEB	429	416	1.0	1	450	503	1.1	2
* Kwun Tong Road	NWB	511	502	1.0	0	669	738	1.1	3
* Elegance Road	SWB	473	531	1.1	3	296	272	0.9	1
ENTRY ARM - TOTAL		**1781**	**1810**	**1.0**	**1**	**1732**	**1846**	**1.1**	**3**
* Kwun Tong Road	NWB	521	542	1.0	1	678	697	1.0	1
* Lai Yip Street	SWB	475	487	1.0	1	225	217	1.0	1
* Kwun Tong Road	SEB	334	327	1.0	0	553	659	1.2	4
* Elegance Road	NEB	451	454	1.0	0	276	272	1.0	0
EXIT ARM - TOTAL		**1781**	**1810**	**1.0**	**1**	**1732**	**1845**	**1.1**	**3**
*** J2 - Lai Yip Street / Hung To Road**									
* Lai Yip Street	NEB	346	306	0.9	2	323	345	1.1	1
* Lai Yip Street	SWB	475	487	1.0	1	225	217	1.0	1
* Hung To Road	NWB	202	264	1.3	4	319	369	1.2	3
ENTRY ARM - TOTAL		**1023**	**1057**	**1.0**	**1**	**867**	**931**	**1.1**	**2**
* Lai Yip Street	SWB	594	641	1.1	2	417	427	1.0	0
* Lai Yip Street	NEB	429	416	1.0	1	450	503	1.1	2
EXIT ARM - TOTAL		**1023**	**1057**	**1.0**	**1**	**867**	**930**	**1.1**	**2**
*** J3 - Wai Yip Street/ Lai Yip Street**									
* Wai Yip Street	SEB	1116	1191	1.1	2	674	781	1.2	4
* Lai Yip Street	NEB	247	246	1.0	0	298	278	0.9	1
* Wai Yip Street	NWB	285	303	1.1	1	464	486	1.0	1
* Lai Yip Street	SWB	594	641	1.1	2	417	427	1.0	0
ENTRY ARM - TOTAL		**2242**	**2381**	**1.1**	**3**	**1853**	**1972**	**1.1**	**3**
* Wai Yip Street	NWB	308	368	1.2	3	534	550	1.0	1
* Lai Yip Street	SWB	544	552	1.0	0	395	373	0.9	1
* Wai Yip Street	SEB	1044	1154	1.1	3	601	704	1.2	4
* Lai Yip Street	NEB	346	306	0.9	2	323	345	1.1	1
EXIT ARM - TOTAL		**2242**	**2380**	**1.1**	**3**	**1853**	**1972**	**1.1**	**3**
*** J4 - Hoi Bun Road/ Lai Yip Street**									
* Hoi Bun Road	SEB	170	166	1.0	0	169	145	0.9	2
* Hoi Bun Road	NWB	302	248	0.8	3	408	384	0.9	1
* Lai Yip Street	SWB	544	552	1.0	0	395	373	0.9	1
ENTRY ARM - TOTAL		**1016**	**966**	**1.0**	**2**	**972**	**902**	**0.9**	**2**
* Hoi Bun Road	NWB	596	541	0.9	2	492	470	1.0	1
* Hoi Bun Road	NWB	173	180	1.0	1	182	155	0.9	2
* Lai Yip Street	NEB	247	246	1.0	0	298	278	0.9	1
EXIT ARM - TOTAL		**1016**	**967**	**1.0**	**2**	**972**	**903**	**0.9**	**2**
*** J5 - How Ming Street/ Chong Yip Street**									
* How Ming Street	NEB	163	148	0.9	1	110	128	1.2	2
* How Ming Street	NWB	557	585	1.1	1	720	762	1.1	2

PV		AM				PM			
		OBS	MOD	MOD/OBS	GEH	OBS	MOD	MOD/OBS	GEH
ENTRY ARM - TOTAL		**720**	**733**	**1.0**	**0**	**830**	**890**	**1.1**	**2**
* Chong Yip Street	NWB	720	733	1.0	0	830	890	1.1	2
EXIT ARM - TOTAL		**720**	**733**	**1.0**	**0**	**830**	**890**	**1.1**	**2**
*** J6 - Hung To Road/ How Ming Street**									
* Hung To Road	SEB	86	117	1.4	3	115	95	0.8	2
* How Ming Street	NEB	430	445	1.0	1	228	306	1.3	5
ENTRY ARM - TOTAL		**516**	**562**	**1.1**	**2**	**343**	**401**	**1.2**	**3**
* Hung To Road	NWB	131	139	1.1	1	63	96	1.5	4
* Hung To Road	SEB	222	275	1.2	3	170	176	1.0	0
* How Ming Street	NEB	163	148	0.9	1	110	128	1.2	2
EXIT ARM - TOTAL		**516**	**562**	**1.1**	**2**	**343**	**400**	**1.2**	**3**
*** J7 - Wai Yip Street/ How Ming Street**									
* Wai Yip Street	SEB	1183	1172	1.0	0	833	753	0.9	3
* Wai Yip Street	NWB	364	382	1.0	1	568	571	1.0	0
ENTRY ARM - TOTAL		**1547**	**1554**	**1.0**	**0**	**1401**	**1324**	**0.9**	**2**
* Wai Yip Street	NWB	316	333	1.1	1	491	514	1.0	1
* How Ming Street	SWB	48	49	1.0	0	77	57	0.7	2
* Wai Yip Street	SEB	669	727	1.1	2	441	447	1.0	0
* How Ming Street	NEB	514	445	0.9	3	392	306	0.8	5
EXIT ARM - TOTAL		**1547**	**1554**	**1.0**	**0**	**1401**	**1324**	**0.9**	**2**
*** J8 - Hoi Bun Road/ How Ming Street**									
* Hoi Bun Road	SEB	112	112	1.0	0	181	143	0.8	3
* Hoi Bun Road	NWB	232	237	1.0	0	298	297	1.0	0
* How Ming Street	SWB	48	49	1.0	0	77	57	0.7	2
ENTRY ARM - TOTAL		**392**	**398**	**1.0**	**0**	**556**	**497**	**0.9**	**3**
* Hoi Bun Road	NWB	257	262	1.0	0	347	343	1.0	0
* Hoi Bun Road	SEB	135	136	1.0	0	209	155	0.7	4
EXIT ARM - TOTAL		**392**	**398**	**1.0**	**0**	**556**	**498**	**0.9**	**3**
*** J9 - Hung To Road / Tsun Yip Street**									
* Hung To Road	SEB	160	180	1.1	2	202	207	1.0	0
* Tsun Yip Street	NEB	392	431	1.1	2	234	229	1.0	0
ENTRY ARM - TOTAL		**552**	**611**	**1.1**	**2**	**436**	**436**	**1.0**	**0**
* Hung To Road	SEB	343	388	1.1	2	257	257	1.0	0
* Tsun Yip Street	NEB	209	223	1.1	1	179	178	1.0	0
EXIT ARM - TOTAL		**552**	**611**	**1.1**	**2**	**436**	**435**	**1.0**	**0**
*** J10 - Wai Yip Street/ Tsun Yip Street**									
* Wai Yip Street	SEB	620	696	1.1	3	428	436	1.0	0
* Tsun Yip Street	NEB	300	283	0.9	1	301	281	0.9	1
* Wai Yip Street	NWB	370	389	1.1	1	514	517	1.0	0
ENTRY ARM - TOTAL		**1290**	**1368**	**1.1**	**2**	**1243**	**1234**	**1.0**	**0**
* Wai Yip Street	NWB	401	421	1.0	1	564	568	1.0	0
* Wai Yip Street	SEB	454	516	1.1	3	490	438	0.9	2
* Tsun Yip Street	NEB	435	431	1.0	0	189	229	1.2	3
EXIT ARM - TOTAL		**1290**	**1368**	**1.1**	**2**	**1243**	**1235**	**1.0**	**0**

PV		AM				PM			
		OBS	MOD	MOD/OBS	GEH	OBS	MOD	MOD/OBS	GEH
*** J11 - Kwun Tong Road/ Hip Wo Street/ Hoi Yuen Road**									
* Kwun Tong Road	EB	570	602	1.1	1	526	455	0.9	3
* Kwun Tong Road	WB	455	463	1.0	0	598	570	1.0	1
* Hip Wo Street	SB	610	623	1.0	1	389	402	1.0	1
ENTRY ARM - TOTAL		**1635**	**1688**	**1.0**	**1**	**1513**	**1427**	**0.9**	**2**
* Kwun Tong Road	WB	574	601	1.0	1	530	415	0.8	5
* Hoi Yuen Road	SB	566	601	1.1	1	515	532	1.0	1
* Kwun Tong Road	EB	343	318	0.9	1	290	282	1.0	0
* Hip Wo Street	NB	170	168	1.0	0	215	198	0.9	1
EXIT ARM - TOTAL		**1653**	**1688**	**1.0**	**1**	**1550**	**1427**	**0.9**	**3**
*** J12 - Hoi Yuen Road / How Ming Street / Shing Yip Street**									
* Hoi Yuen Road	SWB	566	601	1.1	1	515	532	1.0	1
* Shing Yip Street	NWB	246	251	1.0	0	404	455	1.1	2
ENTRY ARM - TOTAL		**812**	**852**	**1.0**	**1**	**919**	**987**	**1.1**	**2**
* Hoi Yuen Road	SWB	583	610	1.0	1	721	758	1.1	1
* How Ming Street	NWB	229	242	1.1	1	198	230	1.2	2
EXIT ARM - TOTAL		**812**	**852**	**1.0**	**1**	**919**	**988**	**1.1**	**2**
*** J13 - Hoi Yuen Road/ Hung To Road**									
* Hung To Road	SEB	264	271	1.0	0	238	358	1.5	7
* Hoi Yuen Road	SWB	340	358	1.1	1	608	488	0.8	5
ENTRY ARM - TOTAL		**604**	**629**	**1.0**	**1**	**846**	**846**	**1.0**	**0**
* Hung To Road	SEB	167	172	1.0	0	161	160	1.0	0
* Hoi Yuen Road	SWB	437	457	1.0	1	685	686	1.0	0
EXIT ARM - TOTAL		**604**	**629**	**1.0**	**1**	**846**	**846**	**1.0**	**0**
*** J14 - Hoi Yuen Road/ Wai Yip Street**									
* Public Tranposrt Interchange Access	NEB	0	0	1.0	0	45	0	0.0	9
* Wai Yip Street	NWB	1156	1087	0.9	2	679	642	0.9	1
* Hoi Yuen Road	SWB	437	457	1.0	1	685	686	1.0	0
* Wai Yip Street	SEB	459	516	1.1	3	492	415	0.8	4
ENTRY ARM - TOTAL		**2052**	**2060**	**1.0**	**0**	**1901**	**1743**	**0.9**	**4**
* Public Tranposrt Interchange Access	SWB	148	93	0.6	5	68	14	0.2	8
* Wai Yip Street	SEB	979	1018	1.0	1	971	881	0.9	3
* Wai Yip Street	NWB	925	948	1.0	1	862	846	1.0	1
EXIT ARM - TOTAL		**2052**	**2059**	**1.0**	**0**	**1901**	**1741**	**0.9**	**4**
*** J15 - King Yip Street/ Shing Yip Street**									
* King Yip Street	NEB	455	594	1.3	6	671	677	1.0	0
* Shing Yip Street	NWB	210	218	1.0	1	147	149	1.0	0
ENTRY ARM - TOTAL		**665**	**812**	**1.2**	**5**	**818**	**826**	**1.0**	**0**
* Shing Yip Street	SEB	304	281	0.9	1	466	359	0.8	5
* Shing Yip Street	NWB	361	531	1.5	8	352	466	1.3	6
EXIT ARM - TOTAL		**665**	**812**	**1.2**	**5**	**818**	**825**	**1.0**	**0**
*** J16 - King Yip Street/ Hung To Street**									

PV		AM				PM			
		OBS	MOD	MOD/OBS	GEH	OBS	MOD	MOD/OBS	GEH
* King Yip Street	NEB	321	330	1.0	0	295	174	0.6	8
* Hung To Road	SEB	130	133	1.0	0	190	187	1.0	0
ENTRY ARM - TOTAL		**451**	**463**	**1.0**	**1**	**485**	**361**	**0.7**	**6**
* King Yip Street	NEB	451	463	1.0	1	485	361	0.7	6
EXIT ARM - TOTAL		**451**	**463**	**1.0**	**1**	**485**	**361**	**0.7**	**6**
*** J17 - Lei Yue Mun Road/ Tseung Kwan O Road**									
* Lei Yue Mun Road	EB	1620	1698	1.0	2	1822	1855	1.0	1
* Lei Yue Mun Road	WB	1935	1936	1.0	0	1620	1678	1.0	1
* Tseung Kwan O Road	SB	560	576	1.0	1	535	549	1.0	1
ENTRY ARM - TOTAL		**4115**	**4210**	**1.0**	**1**	**3977**	**4082**	**1.0**	**2**
* Lei Yue Mun Road	WB	938	957	1.0	1	737	777	1.1	1
* Wai Fat Road	SB	998	994	1.0	0	738	747	1.0	0
* Lei Yue Mun Road	EB	1340	1377	1.0	1	1507	1531	1.0	1
* Tseung Kwan O Road	NB	839	882	1.1	1	995	1027	1.0	1
EXIT ARM - TOTAL		**4115**	**4210**	**1.0**	**1**	**3977**	**4082**	**1.0**	**2**
*** J18 - Cha Kwo Ling Road/ Wai Fat Road**									
* Wai Fat Road	EB	170	96	0.6	6	172	153	0.9	1
* Cha Kwo Ling Road	NB	308	285	0.9	1	199	216	1.1	1
* Wai Fat Road	WB	998	962	1.0	1	738	718	1.0	1
* Shing Yip Street	SEB	304	281	0.9	1	466	359	0.8	5
ENTRY ARM - TOTAL		**1780**	**1624**	**0.9**	**4**	**1575**	**1446**	**0.9**	**3**
* Wai Fat Road	WB	831	696	0.8	5	743	662	0.9	3
* Cha Kwo Ling Road	SB	184	223	1.2	3	211	205	1.0	0
* Cha Kwo Ling Road	NEB	555	488	0.9	3	474	430	0.9	2
* Shing Yip Street	NWB	210	218	1.0	1	147	149	1.0	0
EXIT ARM - TOTAL		**1780**	**1625**	**0.9**	**4**	**1575**	**1446**	**0.9**	**3**
*** J19 - Wai Yip Street/ Wai Fat Road**									
* Wai Fat Road	NEB	853	802	0.9	2	541	491	0.9	2
* Wai Yip Street	NWB	469	457	1.0	1	620	642	1.0	1
* Wai Fat Road	SWB	844	953	1.1	4	804	647	0.8	6
* Wai Yip Street	SEB	575	584	1.0	0	827	912	1.1	3
ENTRY ARM - TOTAL		**2741**	**2796**	**1.0**	**1**	**2792**	**2692**	**1.0**	**2**
* Wai Fat Road	SWB	487	442	0.9	2	813	690	0.8	4
* Wai Yip Street	SEB	606	563	0.9	2	480	629	1.3	6
* Wai Fat Road	NEB	575	636	1.1	2	843	786	0.9	2
* Wai Yip Street	NWB	1073	1154	1.1	2	656	587	0.9	3
EXIT ARM - TOTAL		**2741**	**2795**	**1.0**	**1**	**2792**	**2692**	**1.0**	**2**
*** J20 - Kwun Tong Road/ Tsui Ping Road**									
* Kwun Tong Road	EB	1380	1453	1.1	2	1646	1718	1.0	2
* Kwun Tong Road	WB	2029	2054	1.0	1	1654	1682	1.0	1
* Tsui Ping Road	SB	329	341	1.0	1	271	260	1.0	1
ENTRY ARM - TOTAL		**3738**	**3848**	**1.0**	**2**	**3571**	**3660**	**1.0**	**1**
* Kwun Tong Road	WB	1816	1849	1.0	1	1423	1474	1.0	1

PV		AM				PM			
		OBS	MOD	MOD/OBS	GEH	OBS	MOD	MOD/OBS	GEH
* Kwun Tong Road	EB	1620	1698	1.0	2	1822	1855	1.0	1
* Tsui Ping Road	NB	302	302	1.0	0	326	331	1.0	0
EXIT ARM - TOTAL		**3738**	**3849**	**1.0**	**2**	**3571**	**3660**	**1.0**	**1**
*** J21 - How Ming Street / Tsun Yip Street**									
* How Ming Street	WB	188	197	1.0	1	211	242	1.1	2
* Tsun Yip Street	NB	189	192	1.0	0	194	204	1.1	1
ENTRY ARM - TOTAL		**377**	**389**	**1.0**	**1**	**405**	**446**	**1.1**	**2**
* How Ming Street	WB	377	389	1.0	1	405	446	1.1	2
EXIT ARM - TOTAL		**377**	**389**	**1.0**	**1**	**405**	**446**	**1.1**	**2**
*** J22 - Cha Kwo Ling Road / Lei Yue Mun Road**									
* Cha Kwo Ling Road	WB	938	957	1.0	1	737	777	1.1	1
* Lei Yue Mun Road	NB	1091	1097	1.0	0	917	905	1.0	0
ENTRY ARM - TOTAL		**2029**	**2054**	**1.0**	**1**	**1654**	**1682**	**1.0**	**1**
* Lei Yue Mun Road	WB	2029	2054	1.0	1	1654	1682	1.0	1
EXIT ARM - TOTAL		**2029**	**2054**	**1.0**	**1**	**1654**	**1682**	**1.0**	**1**
*** J26 - Wai Yip Street / Public Transport Interchange**									
* Wai Yip Street	WB	1130	1045	0.9	3	633	501	0.8	6
* Public Tranposrt Interchange Access	NB	60	60	1.0	0	90	78	0.9	1
ENTRY ARM - TOTAL		**1190**	**1105**	**0.9**	**3**	**723**	**579**	**0.8**	**6**
* Wai Yip Street	WB	2310	2158	0.9	3	1347	1197	0.9	4
* Public Tranposrt Interchange Access	SB	34	34	1.0	0	44	23	0.5	4
EXIT ARM - TOTAL		**2344**	**2192**	**0.9**	**3**	**1391**	**1220**	**0.9**	**5**

Junction Flows Validation Summary

Validation Criteria	Target Values	Percentage of Key Junction In/Out Flows	
		AM Peak	PM Peak
		PV	PV
% within GEH 5	85%	98%	93%
% within GEH 10	100%	100%	100%

Appendix C2 – Local Area Traffic Model Validation Result

GV		AM				PM			
		OBS	MOD	MOD/OBS	GEH	OBS	MOD	MOD/OBS	GEH
*** J1 - Kwun Tong Road/ Lai Yip Street/ Elegance Road**									
* Kwun Tong Road	SEB	190	168	0.9	2	161	117	0.7	4
* Lai Yip Street	NEB	209	214	1.0	0	267	328	1.2	4
* Kwun Tong Road	NWB	202	258	1.3	4	301	373	1.2	4
* Elegance Road	SWB	256	173	0.7	6	159	157	1.0	0
ENTRY ARM - TOTAL		**857**	**813**	**0.9**	**2**	**888**	**975**	**1.1**	**3**
* Kwun Tong Road	NWB	435	391	0.9	2	401	430	1.1	1
* Lai Yip Street	SWB	163	159	1.0	0	130	127	1.0	0
* Kwun Tong Road	SEB	112	115	1.0	0	208	323	1.6	7
* Elegance Road	NEB	147	148	1.0	0	149	95	0.6	5
EXIT ARM - TOTAL		**857**	**813**	**0.9**	**2**	**888**	**975**	**1.1**	**3**
*** J2 - Lai Yip Street / Hung To Road**									
* Lai Yip Street	NEB	108	111	1.0	0	171	191	1.1	1
* Lai Yip Street	SWB	163	159	1.0	0	130	127	1.0	0
* Hung To Road	NWB	197	213	1.1	1	217	265	1.2	3
ENTRY ARM - TOTAL		**468**	**483**	**1.0**	**1**	**518**	**583**	**1.1**	**3**
* Lai Yip Street	SWB	259	269	1.0	1	251	255	1.0	0
* Lai Yip Street	NEB	209	214	1.0	0	267	328	1.2	4
EXIT ARM - TOTAL		**468**	**483**	**1.0**	**1**	**518**	**583**	**1.1**	**3**
*** J3 - Wai Yip Street/ Lai Yip Street**									
* Wai Yip Street	SEB	536	598	1.1	3	570	601	1.1	1
* Lai Yip Street	NEB	117	119	1.0	0	120	118	1.0	0
* Wai Yip Street	NWB	300	307	1.0	0	327	345	1.1	1
* Lai Yip Street	SWB	259	269	1.0	1	251	255	1.0	0
ENTRY ARM - TOTAL		**1212**	**1293**	**1.1**	**2**	**1268**	**1319**	**1.0**	**1**
* Wai Yip Street	NWB	345	353	1.0	0	361	373	1.0	1
* Lai Yip Street	SWB	206	215	1.0	1	197	201	1.0	0
* Wai Yip Street	SEB	553	615	1.1	3	539	555	1.0	1
* Lai Yip Street	NEB	108	111	1.0	0	171	191	1.1	1
EXIT ARM - TOTAL		**1212**	**1294**	**1.1**	**2**	**1268**	**1320**	**1.0**	**1**
*** J4 - Hoi Bun Road/ Lai Yip Street**									
* Hoi Bun Road	SEB	82	70	0.9	1	89	91	1.0	0
* Hoi Bun Road	NWB	182	185	1.0	0	229	232	1.0	0
* Lai Yip Street	SWB	206	215	1.0	1	197	201	1.0	0
ENTRY ARM - TOTAL		**470**	**470**	**1.0**	**0**	**515**	**524**	**1.0**	**0**
* Hoi Bun Road	NWB	212	219	1.0	0	264	275	1.0	1
* Hoi Bun Road	NWB	141	131	0.9	1	131	131	1.0	0
* Lai Yip Street	NEB	117	119	1.0	0	120	118	1.0	0
EXIT ARM - TOTAL		**470**	**469**	**1.0**	**0**	**515**	**524**	**1.0**	**0**
*** J5 - How Ming Street/ Chong Yip Street**									
* How Ming Street	NEB	75	56	0.7	2	76	56	0.7	2
* How Ming Street	NWB	304	314	1.0	1	395	456	1.2	3

GV		AM				PM			
		OBS	MOD	MOD/OBS	GEH	OBS	MOD	MOD/OBS	GEH
ENTRY ARM - TOTAL		**379**	**370**	**1.0**	**0**	**471**	**512**	**1.1**	**2**
* Chong Yip Street	NWB	379	370	1.0	0	471	512	1.1	2
EXIT ARM - TOTAL		**379**	**370**	**1.0**	**0**	**471**	**512**	**1.1**	**2**
*** J6 - Hung To Road/ How Ming Street**									
* Hung To Road	SEB	111	67	0.6	5	86	64	0.7	3
* How Ming Street	NEB	186	238	1.3	4	196	233	1.2	3
ENTRY ARM - TOTAL		**297**	**305**	**1.0**	**0**	**282**	**297**	**1.1**	**1**
* Hung To Road	NWB	92	113	1.2	2	67	101	1.5	4
* Hung To Road	SEB	130	137	1.1	1	139	141	1.0	0
* How Ming Street	NEB	75	56	0.7	2	76	56	0.7	2
EXIT ARM - TOTAL		**297**	**306**	**1.0**	**1**	**282**	**298**	**1.1**	**1**
*** J7 - Wai Yip Street/ How Ming Street**									
* Wai Yip Street	SEB	675	635	0.9	2	659	551	0.8	4
* Wai Yip Street	NWB	284	322	1.1	2	381	402	1.1	1
ENTRY ARM - TOTAL		**959**	**957**	**1.0**	**0**	**1040**	**953**	**0.9**	**3**
* Wai Yip Street	NWB	240	277	1.2	2	284	315	1.1	2
* How Ming Street	SWB	44	45	1.0	0	97	87	0.9	1
* Wai Yip Street	SEB	365	396	1.1	2	323	317	1.0	0
* How Ming Street	NEB	310	238	0.8	4	336	233	0.7	6
EXIT ARM - TOTAL		**959**	**956**	**1.0**	**0**	**1040**	**952**	**0.9**	**3**
*** J8 - Hoi Bun Road/ How Ming Street**									
* Hoi Bun Road	SEB	80	68	0.9	1	102	89	0.9	1
* Hoi Bun Road	NWB	137	141	1.0	0	234	218	0.9	1
* How Ming Street	SWB	44	45	1.0	0	97	87	0.9	1
ENTRY ARM - TOTAL		**261**	**254**	**1.0**	**0**	**433**	**394**	**0.9**	**2**
* Hoi Bun Road	NWB	150	155	1.0	0	270	251	0.9	1
* Hoi Bun Road	SEB	111	99	0.9	1	163	143	0.9	2
EXIT ARM - TOTAL		**261**	**254**	**1.0**	**0**	**433**	**394**	**0.9**	**2**
*** J9 - Hung To Road / Tsun Yip Street**									
* Hung To Road	SEB	135	140	1.0	0	147	147	1.0	0
* Tsun Yip Street	NEB	184	255	1.4	5	199	231	1.2	2
ENTRY ARM - TOTAL		**319**	**395**	**1.2**	**4**	**346**	**378**	**1.1**	**2**
* Hung To Road	SEB	194	245	1.3	3	203	230	1.1	2
* Tsun Yip Street	NEB	125	149	1.2	2	143	147	1.0	0
EXIT ARM - TOTAL		**319**	**394**	**1.2**	**4**	**346**	**377**	**1.1**	**2**
*** J10 - Wai Yip Street/ Tsun Yip Street**									
* Wai Yip Street	SEB	314	343	1.1	2	291	295	1.0	0
* Tsun Yip Street	NEB	380	281	0.7	5	273	236	0.9	2
* Wai Yip Street	NWB	313	322	1.0	1	411	376	0.9	2
ENTRY ARM - TOTAL		**1007**	**946**	**0.9**	**2**	**975**	**907**	**0.9**	**2**
* Wai Yip Street	NWB	429	340	0.8	5	471	412	0.9	3
* Wai Yip Street	SEB	326	352	1.1	1	274	265	1.0	1
* Tsun Yip Street	NEB	252	255	1.0	0	230	231	1.0	0
EXIT ARM - TOTAL		**1007**	**947**	**0.9**	**2**	**975**	**908**	**0.9**	**2**

GV		AM				PM			
		OBS	**MOD**	**MOD/OBS**	**GEH**	**OBS**	**MOD**	**MOD/OBS**	**GEH**
*** J11 - Kwun Tong Road/ Hip Wo Street/ Hoi Yuen Road**									
* Kwun Tong Road	EB	167	180	1.1	1	319	313	1.0	0
* Kwun Tong Road	WB	229	246	1.1	1	299	258	0.9	2
* Hip Wo Street	SB	253	262	1.0	1	111	115	1.0	0
ENTRY ARM - TOTAL		**649**	**688**	**1.1**	**2**	**729**	**686**	**0.9**	**2**
* Kwun Tong Road	WB	199	209	1.1	1	163	168	1.0	0
* Hoi Yuen Road	SB	228	239	1.0	1	341	350	1.0	0
* Kwun Tong Road	EB	132	138	1.0	1	116	120	1.0	0
* Hip Wo Street	NB	87	102	1.2	2	77	48	0.6	4
EXIT ARM - TOTAL		**646**	**688**	**1.1**	**2**	**697**	**686**	**1.0**	**0**
*** J12 - Hoi Yuen Road / How Ming Street / Shing Yip Street**									
* Hoi Yuen Road	SWB	228	239	1.0	1	341	350	1.0	0
* Shing Yip Street	NWB	206	218	1.1	1	305	371	1.2	4
ENTRY ARM - TOTAL		**434**	**457**	**1.1**	**1**	**646**	**721**	**1.1**	**3**
* Hoi Yuen Road	SWB	282	294	1.0	1	479	495	1.0	1
* How Ming Street	NWB	152	163	1.1	1	167	226	1.4	4
EXIT ARM - TOTAL		**434**	**457**	**1.1**	**1**	**646**	**721**	**1.1**	**3**
*** J13 - Hoi Yuen Road/ Hung To Road**									
* Hung To Road	SEB	203	240	1.2	2	243	210	0.9	2
* Hoi Yuen Road	SWB	248	201	0.8	3	366	337	0.9	2
ENTRY ARM - TOTAL		**451**	**441**	**1.0**	**0**	**609**	**547**	**0.9**	**3**
* Hung To Road	SEB	113	113	1.0	0	172	133	0.8	3
* Hoi Yuen Road	SWB	338	328	1.0	1	437	414	0.9	1
EXIT ARM - TOTAL		**451**	**441**	**1.0**	**0**	**609**	**547**	**0.9**	**3**
*** J14 - Hoi Yuen Road/ Wai Yip Street**									
* Public Tranposrt Interchange Access	NEB	0	0	1.0	0	20	0	0.0	6
* Wai Yip Street	NWB	594	578	1.0	1	479	497	1.0	1
* Hoi Yuen Road	SWB	338	328	1.0	1	437	414	0.9	1
* Wai Yip Street	SEB	305	318	1.0	1	301	291	1.0	1
ENTRY ARM - TOTAL		**1237**	**1224**	**1.0**	**0**	**1237**	**1202**	**1.0**	**1**
* Public Tranposrt Interchange Access	SWB	62	31	0.5	5	19	8	0.4	3
* Wai Yip Street	SEB	478	492	1.0	1	502	518	1.0	1
* Wai Yip Street	NWB	697	701	1.0	0	716	676	0.9	2
EXIT ARM - TOTAL		**1237**	**1224**	**1.0**	**0**	**1237**	**1202**	**1.0**	**1**
*** J15 - King Yip Street/ Shing Yip Street**									
* King Yip Street	NEB	334	341	1.0	0	387	407	1.1	1
* Shing Yip Street	NWB	100	106	1.1	1	114	64	0.6	5
ENTRY ARM - TOTAL		**434**	**447**	**1.0**	**1**	**501**	**471**	**0.9**	**1**
* Shing Yip Street	SEB	215	217	1.0	0	242	177	0.7	4
* Shing Yip Street	NWB	219	229	1.0	1	259	294	1.1	2
EXIT ARM - TOTAL		**434**	**446**	**1.0**	**1**	**501**	**471**	**0.9**	**1**
*** J16 - King Yip Street/ Hung To Street**									

GV		AM				PM			
		OBS	MOD	MOD/OBS	GEH	OBS	MOD	MOD/OBS	GEH
* King Yip Street	NEB	92	76	0.8	2	142	110	0.8	3
* Hung To Road	SEB	109	109	1.0	0	170	170	1.0	0
ENTRY ARM - TOTAL		**201**	**185**	**0.9**	**1**	**312**	**280**	**0.9**	**2**
* King Yip Street	NEB	201	185	0.9	1	312	280	0.9	2
EXIT ARM - TOTAL		**201**	**185**	**0.9**	**1**	**312**	**280**	**0.9**	**2**
*** J17 - Lei Yue Mun Road/ Tseung Kwan O Road**									
* Lei Yue Mun Road	EB	949	1014	1.1	2	999	1069	1.1	2
* Lei Yue Mun Road	WB	514	562	1.1	2	700	709	1.0	0
* Tseung Kwan O Road	SB	101	104	1.0	0	137	138	1.0	0
ENTRY ARM - TOTAL		**1564**	**1680**	**1.1**	**3**	**1836**	**1916**	**1.0**	**2**
* Lei Yue Mun Road	WB	236	251	1.1	1	335	345	1.0	1
* Wai Fat Road	SB	425	422	1.0	0	393	406	1.0	1
* Lei Yue Mun Road	EB	494	554	1.1	3	580	608	1.0	1
* Tseung Kwan O Road	NB	409	453	1.1	2	528	557	1.1	1
EXIT ARM - TOTAL		**1564**	**1680**	**1.1**	**3**	**1836**	**1916**	**1.0**	**2**
*** J18 - Cha Kwo Ling Road/ Wai Fat Road**									
* Wai Fat Road	EB	97	66	0.7	3	114	99	0.9	1
* Cha Kwo Ling Road	NB	112	110	1.0	0	51	54	1.1	0
* Wai Fat Road	WB	425	370	0.9	3	393	351	0.9	2
* Shing Yip Street	SEB	215	217	1.0	0	242	177	0.7	4
ENTRY ARM - TOTAL		**849**	**763**	**0.9**	**3**	**800**	**681**	**0.9**	**4**
* Wai Fat Road	WB	386	269	0.7	6	354	315	0.9	2
* Cha Kwo Ling Road	SB	56	60	1.1	1	28	55	2.0	4
* Cha Kwo Ling Road	NEB	307	328	1.1	1	304	247	0.8	3
* Shing Yip Street	NWB	100	106	1.1	1	114	64	0.6	5
EXIT ARM - TOTAL		**849**	**763**	**0.9**	**3**	**800**	**681**	**0.9**	**4**
*** J19 - Wai Yip Street/ Wai Fat Road**									
* Wai Fat Road	NEB	330	239	0.7	5	378	332	0.9	2
* Wai Yip Street	NWB	719	755	1.1	1	607	603	1.0	0
* Wai Fat Road	SWB	453	474	1.0	1	548	431	0.8	5
* Wai Yip Street	SEB	414	528	1.3	5	430	579	1.3	7
ENTRY ARM - TOTAL		**1916**	**1996**	**1.0**	**2**	**1963**	**1945**	**1.0**	**0**
* Wai Fat Road	SWB	604	584	1.0	1	670	522	0.8	6
* Wai Yip Street	SEB	402	311	0.8	5	371	384	1.0	1
* Wai Fat Road	NEB	427	553	1.3	6	400	520	1.3	6
* Wai Yip Street	NWB	483	548	1.1	3	522	519	1.0	0
EXIT ARM - TOTAL		**1916**	**1996**	**1.0**	**2**	**1963**	**1945**	**1.0**	**0**
*** J20 - Kwun Tong Road/ Tsui Ping Road**									
* Kwun Tong Road	EB	859	904	1.1	2	945	993	1.1	2
* Kwun Tong Road	WB	882	919	1.0	1	891	861	1.0	1
* Tsui Ping Road	SB	114	141	1.2	2	96	129	1.3	3
ENTRY ARM - TOTAL		**1855**	**1964**	**1.1**	**2**	**1932**	**1983**	**1.0**	**1**
* Kwun Tong Road	WB	846	881	1.0	1	807	786	1.0	1

GV		AM				PM			
		OBS	MOD	MOD/OBS	GEH	OBS	MOD	MOD/OBS	GEH
* Kwun Tong Road	EB	949	1014	1.1	2	999	1069	1.1	2
* Tsui Ping Road	NB	60	68	1.1	1	126	128	1.0	0
EXIT ARM - TOTAL		**1855**	**1963**	**1.1**	**2**	**1932**	**1983**	**1.0**	**1**
*** J21 - How Ming Street / Tsun Yip Street**									
* How Ming Street	WB	128	136	1.1	1	168	225	1.3	4
* Tsun Yip Street	NB	137	137	1.0	0	146	150	1.0	0
ENTRY ARM - TOTAL		**265**	**273**	**1.0**	**0**	**314**	**375**	**1.2**	**3**
* How Ming Street	WB	265	273	1.0	0	314	375	1.2	3
EXIT ARM - TOTAL		**265**	**273**	**1.0**	**0**	**314**	**375**	**1.2**	**3**
*** J22 - Cha Kwo Ling Road / Lei Yue Mun Road**									
* Cha Kwo Ling Road	WB	236	251	1.1	1	335	345	1.0	1
* Lei Yue Mun Road	NB	646	669	1.0	1	556	517	0.9	2
ENTRY ARM - TOTAL		**882**	**920**	**1.0**	**1**	**891**	**862**	**1.0**	**1**
* Lei Yue Mun Road	WB	882	919	1.0	1	891	861	1.0	1
EXIT ARM - TOTAL		**882**	**919**	**1.0**	**1**	**891**	**861**	**1.0**	**1**
*** J26 - Wai Yip Street / Public Transport Interchange**									
* Wai Yip Street	WB	578	472	0.8	5	449	407	0.9	2
* Public Tranposrt Interchange Access	NB	57	57	1.0	0	65	65	1.0	0
ENTRY ARM - TOTAL		**635**	**529**	**0.8**	**4**	**514**	**472**	**0.9**	**2**
* Wai Yip Street	WB	1136	1104	1.0	1	958	952	1.0	0
* Public Tranposrt Interchange Access	SB	41	2	0.0	8	35	17	0.5	4
EXIT ARM - TOTAL		**1177**	**1106**	**0.9**	**2**	**993**	**969**	**1.0**	**1**

Junction Flows Validation Summary

Validation Criteria	Target Values	Percentage of Key Junction In/Out Flows	
		AM Peak	PM Peak
		PV	PV
% within GEH 5	85%	97%	95%
% within GEH 10	100%	100%	100%

Appendix C3 – Local Area Traffic Model Validation Result

PV + GV + PT		AM				PM			
		OBS	MOD	MOD/OBS	GEH	OBS	MOD	MOD/OBS	GEH
*** J1 - Kwun Tong Road/ Lai Yip Street/ Elegance Road**									
* Kwun Tong Road	SEB	1266	1170	0.9	3	986	988	1.0	0
* Lai Yip Street	NEB	690	692	1.0	0	776	893	1.2	4
* Kwun Tong Road	NWB	1185	1252	1.1	2	1571	1719	1.1	4
* Elegance Road	SWB	907	898	1.0	0	613	577	0.9	1
ENTRY ARM - TOTAL		**4048**	**4012**	**1.0**	**1**	**3946**	**4177**	**1.1**	**4**
* Kwun Tong Road	NWB	1436	1427	1.0	0	1707	1718	1.0	0
* Lai Yip Street	SWB	691	679	1.0	0	399	373	0.9	1
* Kwun Tong Road	SEB	1292	1284	1.0	0	1390	1699	1.2	8
* Elegance Road	NEB	629	622	1.0	0	450	388	0.9	3
EXIT ARM - TOTAL		**4048**	**4012**	**1.0**	**1**	**3946**	**4178**	**1.1**	**4**
*** J2 - Lai Yip Street / Hung To Road**									
* Lai Yip Street	NEB	506	474	0.9	1	551	593	1.1	2
* Lai Yip Street	SWB	691	679	1.0	0	399	373	0.9	1
* Hung To Road	NWB	404	482	1.2	4	538	649	1.2	5
ENTRY ARM - TOTAL		**1601**	**1635**	**1.0**	**1**	**1488**	**1615**	**1.1**	**3**
* Lai Yip Street	SWB	911	943	1.0	1	712	721	1.0	0
* Lai Yip Street	NEB	690	692	1.0	0	776	893	1.2	4
EXIT ARM - TOTAL		**1601**	**1635**	**1.0**	**1**	**1488**	**1614**	**1.1**	**3**
*** J3 - Wai Yip Street/ Lai Yip Street**									
* Wai Yip Street	SEB	1716	1863	1.1	3	1311	1432	1.1	3
* Lai Yip Street	NEB	384	378	1.0	0	435	404	0.9	2
* Wai Yip Street	NWB	666	680	1.0	1	804	867	1.1	2
* Lai Yip Street	SWB	911	943	1.0	1	712	721	1.0	0
ENTRY ARM - TOTAL		**3677**	**3864**	**1.1**	**3**	**3262**	**3424**	**1.0**	**3**
* Wai Yip Street	NWB	733	791	1.1	2	901	953	1.1	2
* Lai Yip Street	SWB	803	800	1.0	0	628	620	1.0	0
* Wai Yip Street	SEB	1635	1799	1.1	4	1182	1259	1.1	2
* Lai Yip Street	NEB	506	474	0.9	1	551	593	1.1	2
EXIT ARM - TOTAL		**3677**	**3864**	**1.1**	**3**	**3262**	**3425**	**1.0**	**3**
*** J4 - Hoi Bun Road/ Lai Yip Street**									
* Hoi Bun Road	SEB	257	249	1.0	1	266	244	0.9	1
* Hoi Bun Road	NWB	501	433	0.9	3	649	617	1.0	1
* Lai Yip Street	SWB	803	800	1.0	0	628	620	1.0	0
ENTRY ARM - TOTAL		**1561**	**1482**	**0.9**	**2**	**1543**	**1481**	**1.0**	**2**
* Hoi Bun Road	NWB	863	793	0.9	2	792	791	1.0	0
* Hoi Bun Road	NWB	314	311	1.0	0	316	285	0.9	2
* Lai Yip Street	NEB	384	378	1.0	0	435	404	0.9	2
EXIT ARM - TOTAL		**1561**	**1482**	**0.9**	**2**	**1543**	**1480**	**1.0**	**2**
*** J5 - How Ming Street/ Chong Yip Street**									
* How Ming Street	NEB	238	204	0.9	2	193	184	1.0	1
* How Ming Street	NWB	861	933	1.1	2	1115	1250	1.1	4

PV + GV + PT		AM				PM			
		OBS	MOD	MOD/OBS	GEH	OBS	MOD	MOD/OBS	GEH
ENTRY ARM - TOTAL		**1099**	**1137**	**1.0**	**1**	**1308**	**1434**	**1.1**	**3**
* Chong Yip Street	NWB	1099	1137	1.0	1	1308	1434	1.1	3
EXIT ARM - TOTAL		**1099**	**1137**	**1.0**	**1**	**1308**	**1434**	**1.1**	**3**
*** J6 - Hung To Road/ How Ming Street**									
* Hung To Road	SEB	197	185	0.9	1	201	159	0.8	3
* How Ming Street	NEB	616	691	1.1	3	431	539	1.3	5
ENTRY ARM - TOTAL		**813**	**876**	**1.1**	**2**	**632**	**698**	**1.1**	**3**
* Hung To Road	NWB	223	252	1.1	2	130	197	1.5	5
* Hung To Road	SEB	352	420	1.2	3	309	317	1.0	0
* How Ming Street	NEB	238	204	0.9	2	193	184	1.0	1
EXIT ARM - TOTAL		**813**	**876**	**1.1**	**2**	**632**	**698**	**1.1**	**3**
*** J7 - Wai Yip Street/ How Ming Street**									
* Wai Yip Street	SEB	1893	1837	1.0	1	1528	1303	0.9	6
* Wai Yip Street	NWB	727	774	1.1	2	963	1009	1.0	1
ENTRY ARM - TOTAL		**2620**	**2611**	**1.0**	**0**	**2491**	**2312**	**0.9**	**4**
* Wai Yip Street	NWB	635	680	1.1	2	789	865	1.1	3
* How Ming Street	SWB	92	94	1.0	0	174	144	0.8	2
* Wai Yip Street	SEB	1056	1146	1.1	3	786	764	1.0	1
* How Ming Street	NEB	837	691	0.8	5	742	539	0.7	8
EXIT ARM - TOTAL		**2620**	**2611**	**1.0**	**0**	**2491**	**2312**	**0.9**	**4**
*** J8 - Hoi Bun Road/ How Ming Street**									
* Hoi Bun Road	SEB	192	180	0.9	1	285	232	0.8	3
* Hoi Bun Road	NWB	380	378	1.0	0	543	515	0.9	1
* How Ming Street	SWB	92	94	1.0	0	174	144	0.8	2
ENTRY ARM - TOTAL		**664**	**652**	**1.0**	**0**	**1002**	**891**	**0.9**	**4**
* Hoi Bun Road	NWB	418	417	1.0	0	628	594	0.9	1
* Hoi Bun Road	SEB	246	235	1.0	1	374	298	0.8	4
EXIT ARM - TOTAL		**664**	**652**	**1.0**	**0**	**1002**	**892**	**0.9**	**4**
*** J9 - Hung To Road / Tsun Yip Street**									
* Hung To Road	SEB	299	319	1.1	1	353	354	1.0	0
* Tsun Yip Street	NEB	583	690	1.2	4	436	474	1.1	2
ENTRY ARM - TOTAL		**882**	**1009**	**1.1**	**4**	**789**	**828**	**1.0**	**1**
* Hung To Road	SEB	541	634	1.2	4	462	487	1.1	1
* Tsun Yip Street	NEB	341	376	1.1	2	327	340	1.0	1
EXIT ARM - TOTAL		**882**	**1010**	**1.1**	**4**	**789**	**827**	**1.0**	**1**
*** J10 - Wai Yip Street/ Tsun Yip Street**									
* Wai Yip Street	SEB	982	1061	1.1	2	759	731	1.0	1
* Tsun Yip Street	NEB	690	569	0.8	5	582	532	0.9	2
* Wai Yip Street	NWB	751	781	1.0	1	952	929	1.0	1
ENTRY ARM - TOTAL		**2423**	**2411**	**1.0**	**0**	**2293**	**2192**	**1.0**	**2**
* Wai Yip Street	NWB	903	831	0.9	2	1062	1016	1.0	1
* Wai Yip Street	SEB	833	889	1.1	2	812	703	0.9	4
* Tsun Yip Street	NEB	687	690	1.0	0	419	474	1.1	3
EXIT ARM - TOTAL		**2423**	**2410**	**1.0**	**0**	**2293**	**2193**	**1.0**	**2**

PV + GV + PT		AM				PM			
		OBS	MOD	MOD/OBS	GEH	OBS	MOD	MOD/OBS	GEH
*** J11 - Kwun Tong Road/ Hip Wo Street/ Hoi Yuen Road**									
* Kwun Tong Road	EB	1478	1370	0.9	3	1446	1281	0.9	4
* Kwun Tong Road	WB	1076	1238	1.2	5	1438	1492	1.0	1
* Hip Wo Street	SB	1061	1154	1.1	3	685	743	1.1	2
ENTRY ARM - TOTAL		**3615**	**3762**	**1.0**	**2**	**3569**	**3516**	**1.0**	**1**
* Kwun Tong Road	WB	967	1044	1.1	2	974	840	0.9	4
* Hoi Yuen Road	SB	1068	1076	1.0	0	1029	1058	1.0	1
* Kwun Tong Road	EB	1026	1010	1.0	1	947	927	1.0	1
* Hip Wo Street	NB	560	633	1.1	3	635	690	1.1	2
EXIT ARM - TOTAL		**3621**	**3763**	**1.0**	**2**	**3585**	**3515**	**1.0**	**1**
*** J12 - Hoi Yuen Road / How Ming Street / Shing Yip Street**									
* Hoi Yuen Road	SWB	1068	1076	1.0	0	1029	1058	1.0	1
* Shing Yip Street	NWB	452	499	1.1	2	709	845	1.2	5
ENTRY ARM - TOTAL		**1520**	**1575**	**1.0**	**1**	**1738**	**1903**	**1.1**	**4**
* Hoi Yuen Road	SWB	1139	1140	1.0	0	1373	1429	1.0	1
* How Ming Street	NWB	381	435	1.1	3	365	474	1.3	5
EXIT ARM - TOTAL		**1520**	**1575**	**1.0**	**1**	**1738**	**1903**	**1.1**	**4**
*** J13 - Hoi Yuen Road/ Hung To Road**									
* Hung To Road	SEB	467	511	1.1	2	481	574	1.2	4
* Hoi Yuen Road	SWB	859	795	0.9	2	1145	1001	0.9	4
ENTRY ARM - TOTAL		**1326**	**1306**	**1.0**	**1**	**1626**	**1575**	**1.0**	**1**
* Hung To Road	SEB	280	285	1.0	0	333	294	0.9	2
* Hoi Yuen Road	SWB	1046	1020	1.0	1	1293	1282	1.0	0
EXIT ARM - TOTAL		**1326**	**1305**	**1.0**	**1**	**1626**	**1576**	**1.0**	**1**
*** J14 - Hoi Yuen Road/ Wai Yip Street**									
* Public Tranposrt Interchange Access	NEB	243	195	0.8	3	219	193	0.9	2
* Wai Yip Street	NWB	1792	1723	1.0	2	1187	1206	1.0	1
* Hoi Yuen Road	SWB	1046	1020	1.0	1	1293	1282	1.0	0
* Wai Yip Street	SEB	787	834	1.1	2	823	739	0.9	3
ENTRY ARM - TOTAL		**3868**	**3772**	**1.0**	**2**	**3522**	**3420**	**1.0**	**2**
* Public Tranposrt Interchange Access	SWB	489	350	0.7	7	273	186	0.7	6
* Wai Yip Street	SEB	1667	1698	1.0	1	1629	1661	1.0	1
* Wai Yip Street	NWB	1712	1723	1.0	0	1620	1573	1.0	1
EXIT ARM - TOTAL		**3868**	**3771**	**1.0**	**2**	**3522**	**3420**	**1.0**	**2**
*** J15 - King Yip Street/ Shing Yip Street**									
* King Yip Street	NEB	925	1069	1.2	5	1278	1285	1.0	0
* Shing Yip Street	NWB	310	354	1.1	2	261	231	0.9	2
ENTRY ARM - TOTAL		**1235**	**1423**	**1.2**	**5**	**1539**	**1516**	**1.0**	**1**
* Shing Yip Street	SEB	655	632	1.0	1	928	738	0.8	7
* Shing Yip Street	NWB	580	790	1.4	8	611	778	1.3	6
EXIT ARM - TOTAL		**1235**	**1422**	**1.2**	**5**	**1539**	**1516**	**1.0**	**1**
*** J16 - King Yip Street/ Hung To Street**									

PV + GV + PT		AM				PM			
		OBS	MOD	MOD/OBS	GEH	OBS	MOD	MOD/OBS	GEH
* King Yip Street	NEB	544	540	1.0	0	654	486	0.7	7
* Hung To Road	SEB	239	243	1.0	0	360	357	1.0	0
ENTRY ARM - TOTAL		**783**	**783**	**1.0**	**0**	**1014**	**843**	**0.8**	**6**
* King Yip Street	NEB	783	782	1.0	0	1014	843	0.8	6
EXIT ARM - TOTAL		**783**	**782**	**1.0**	**0**	**1014**	**843**	**0.8**	**6**
*** J17 - Lei Yue Mun Road/ Tseung Kwan O Road**									
* Lei Yue Mun Road	EB	3501	3633	1.0	2	3562	3861	1.1	5
* Lei Yue Mun Road	WB	3053	3113	1.0	1	2976	3166	1.1	3
* Tseung Kwan O Road	SB	773	779	1.0	0	810	767	0.9	2
ENTRY ARM - TOTAL		**7327**	**7525**	**1.0**	**2**	**7348**	**7794**	**1.1**	**5**
* Lei Yue Mun Road	WB	1639	1676	1.0	1	1558	1752	1.1	5
* Wai Fat Road	SB	1601	1566	1.0	1	1255	1324	1.1	2
* Lei Yue Mun Road	EB	2410	2557	1.1	3	2630	2708	1.0	2
* Tseung Kwan O Road	NB	1677	1725	1.0	1	1905	2010	1.1	2
EXIT ARM - TOTAL		**7327**	**7524**	**1.0**	**2**	**7348**	**7794**	**1.1**	**5**
*** J18 - Cha Kwo Ling Road/ Wai Fat Road**									
* Wai Fat Road	EB	289	185	0.6	7	299	274	0.9	1
* Cha Kwo Ling Road	NB	457	450	1.0	0	276	327	1.2	3
* Wai Fat Road	WB	1601	1483	0.9	3	1255	1241	1.0	0
* Shing Yip Street	SEB	655	632	1.0	1	928	738	0.8	7
ENTRY ARM - TOTAL		**3002**	**2750**	**0.9**	**5**	**2758**	**2580**	**0.9**	**3**
* Wai Fat Road	WB	1306	993	0.8	9	1124	1022	0.9	3
* Cha Kwo Ling Road	SB	276	341	1.2	4	295	323	1.1	2
* Cha Kwo Ling Road	NEB	1110	1062	1.0	1	1078	1005	0.9	2
* Shing Yip Street	NWB	310	354	1.1	2	261	231	0.9	2
EXIT ARM - TOTAL		**3002**	**2750**	**0.9**	**5**	**2758**	**2581**	**0.9**	**3**
*** J19 - Wai Yip Street/ Wai Fat Road**									
* Wai Fat Road	NEB	1236	1083	0.9	4	967	865	0.9	3
* Wai Yip Street	NWB	1276	1321	1.0	1	1302	1334	1.0	1
* Wai Fat Road	SWB	1413	1456	1.0	1	1410	1122	0.8	8
* Wai Yip Street	SEB	1070	1166	1.1	3	1273	1552	1.2	7
ENTRY ARM - TOTAL		**4995**	**5026**	**1.0**	**0**	**4952**	**4873**	**1.0**	**1**
* Wai Fat Road	SWB	1222	1080	0.9	4	1545	1260	0.8	8
* Wai Yip Street	SEB	1127	958	0.9	5	892	1109	1.2	7
* Wai Fat Road	NEB	1060	1232	1.2	5	1299	1343	1.0	1
* Wai Yip Street	NWB	1586	1756	1.1	4	1216	1160	1.0	2
EXIT ARM - TOTAL		**4995**	**5026**	**1.0**	**0**	**4952**	**4872**	**1.0**	**1**
*** J20 - Kwun Tong Road/ Tsui Ping Road**									
* Kwun Tong Road	EB	3197	3340	1.0	3	3382	3728	1.1	6
* Kwun Tong Road	WB	3842	3914	1.0	1	3541	3714	1.0	3
* Tsui Ping Road	SB	501	542	1.1	2	415	460	1.1	2
ENTRY ARM - TOTAL		**7540**	**7796**	**1.0**	**3**	**7338**	**7902**	**1.1**	**6**
* Kwun Tong Road	WB	3593	3659	1.0	1	3218	3419	1.1	3

PV + GV + PT		AM				PM			
		OBS	MOD	MOD/OBS	GEH	OBS	MOD	MOD/OBS	GEH
* Kwun Tong Road	EB	3501	3633	1.0	2	3562	3861	1.1	5
* Tsui Ping Road	NB	446	504	1.1	3	558	621	1.1	3
EXIT ARM - TOTAL		**7540**	**7796**	**1.0**	**3**	**7338**	**7901**	**1.1**	**6**
*** J21 - How Ming Street / Tsun Yip Street**									
* How Ming Street	WB	318	363	1.1	2	379	485	1.3	5
* Tsun Yip Street	NB	328	333	1.0	0	342	368	1.1	1
ENTRY ARM - TOTAL		**646**	**696**	**1.1**	**2**	**721**	**853**	**1.2**	**5**
* How Ming Street	WB	646	696	1.1	2	721	853	1.2	5
EXIT ARM - TOTAL		**646**	**696**	**1.1**	**2**	**721**	**853**	**1.2**	**5**
*** J22 - Cha Kwo Ling Road / Lei Yue Mun Road**									
* Cha Kwo Ling Road	WB	1639	1676	1.0	1	1558	1752	1.1	5
* Lei Yue Mun Road	NB	2203	2239	1.0	1	1983	1962	1.0	0
ENTRY ARM - TOTAL		**3842**	**3915**	**1.0**	**1**	**3541**	**3714**	**1.0**	**3**
* Lei Yue Mun Road	WB	3842	3914	1.0	1	3541	3714	1.0	3
EXIT ARM - TOTAL		**3842**	**3914**	**1.0**	**1**	**3541**	**3714**	**1.0**	**3**
*** J26 - Wai Yip Street / Public Transport Interchange**									
* Wai Yip Street	WB	1742	1551	0.9	5	1127	944	0.8	6
* Public Tranposrt Interchange Access	NB	135	130	1.0	0	172	169	1.0	0
ENTRY ARM - TOTAL		**1877**	**1681**	**0.9**	**5**	**1299**	**1113**	**0.9**	**5**
* Wai Yip Street	WB	3530	3357	1.0	3	2370	2266	1.0	2
* Public Tranposrt Interchange Access	SB	85	47	0.6	5	112	53	0.5	6
EXIT ARM - TOTAL		**3615**	**3404**	**0.9**	**4**	**2482**	**2319**	**0.9**	**3**

Junction Flows Validation Summary

Validation Criteria	Target Values	Percentage of Key Junction In/Out Flows	
		AM Peak	PM Peak
		Total (PV + GV + PT)	Total (PV + GV + PT)
% within GEH 5	85%	97%	87%
% within GEH 10	100%	100%	100%

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APPENDIX D

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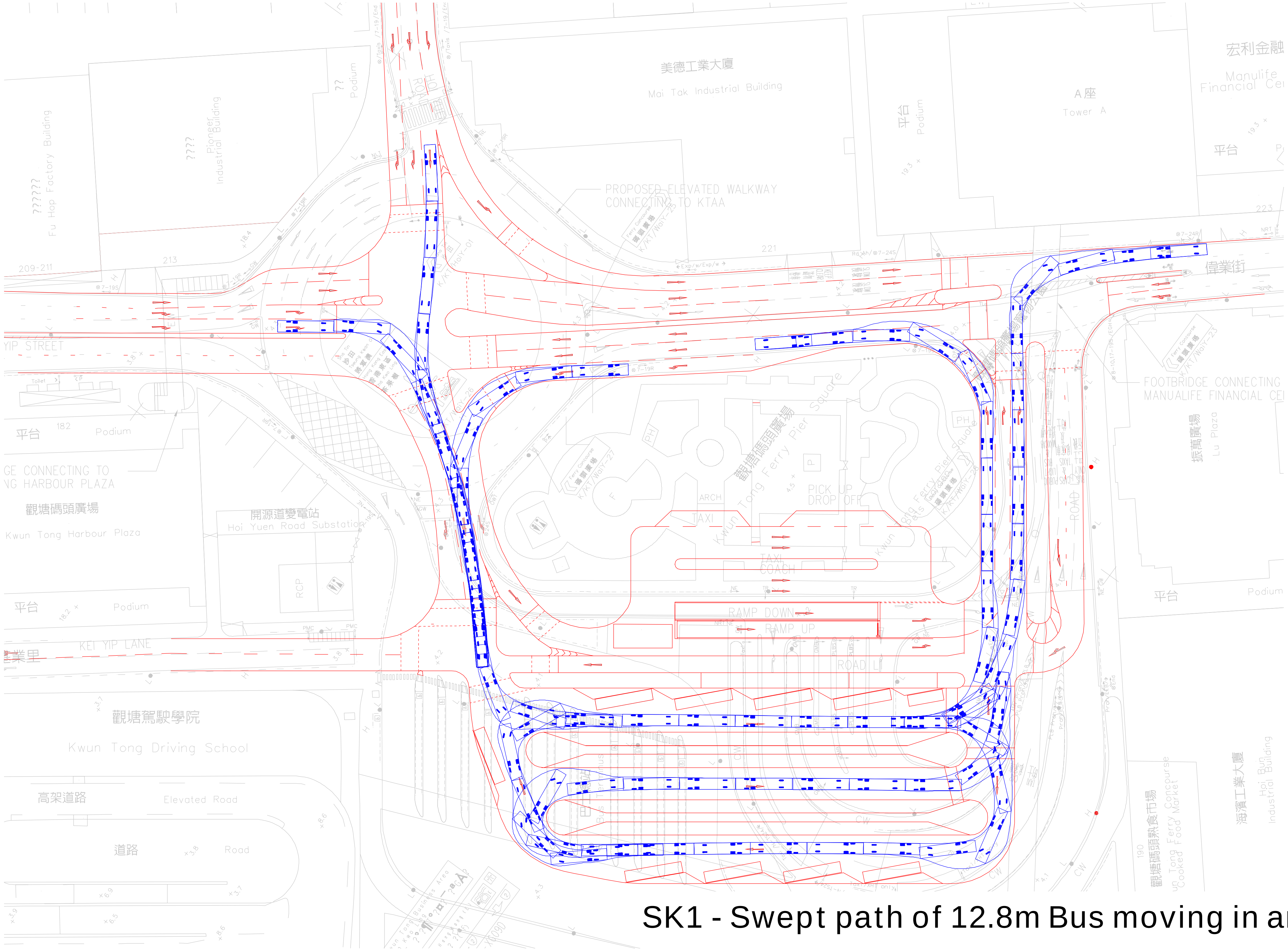
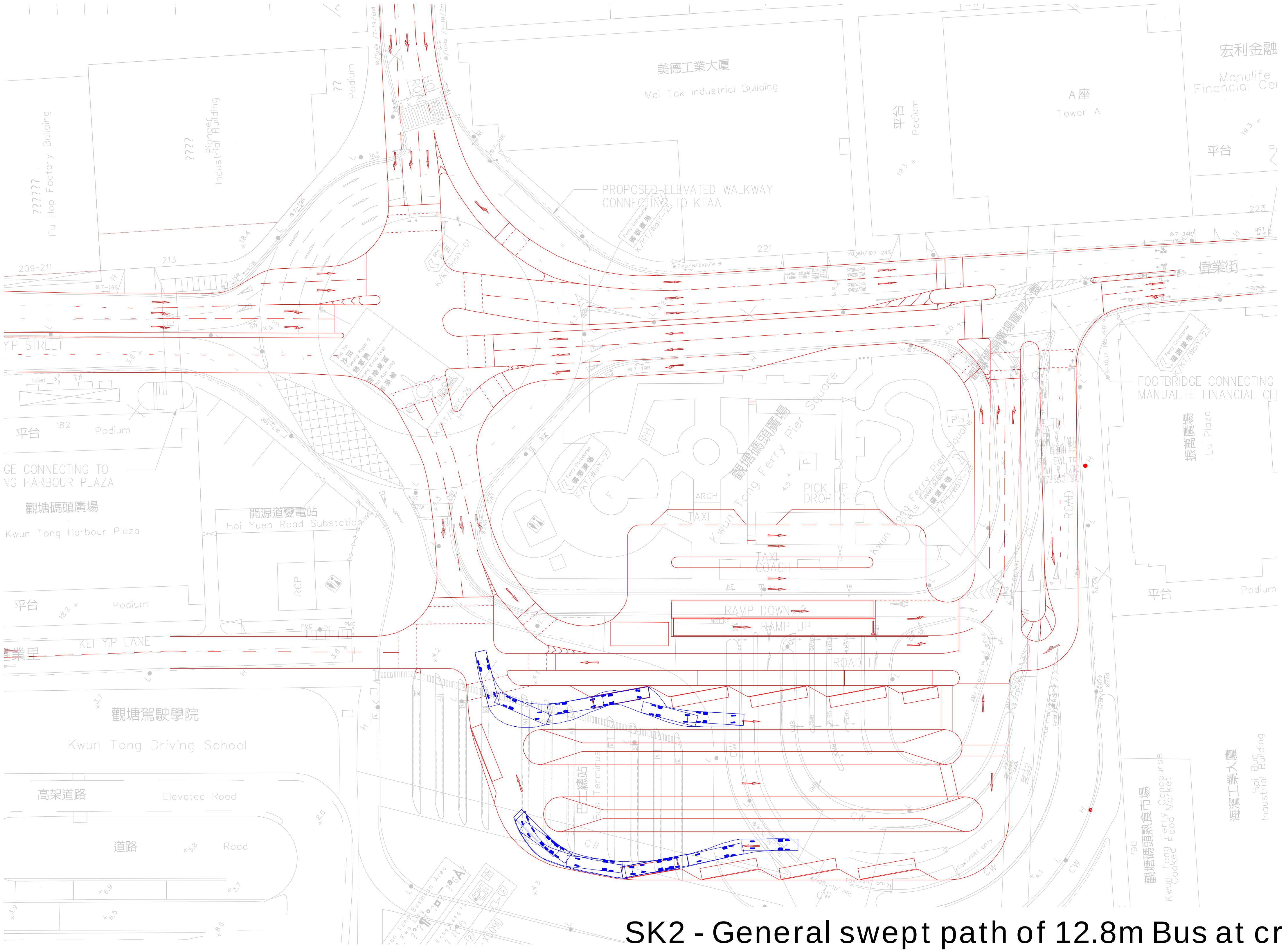
Appendix D - Swept Path Analysis



SK1 - Swept path of 12.8m Bus moving in and out the PTI

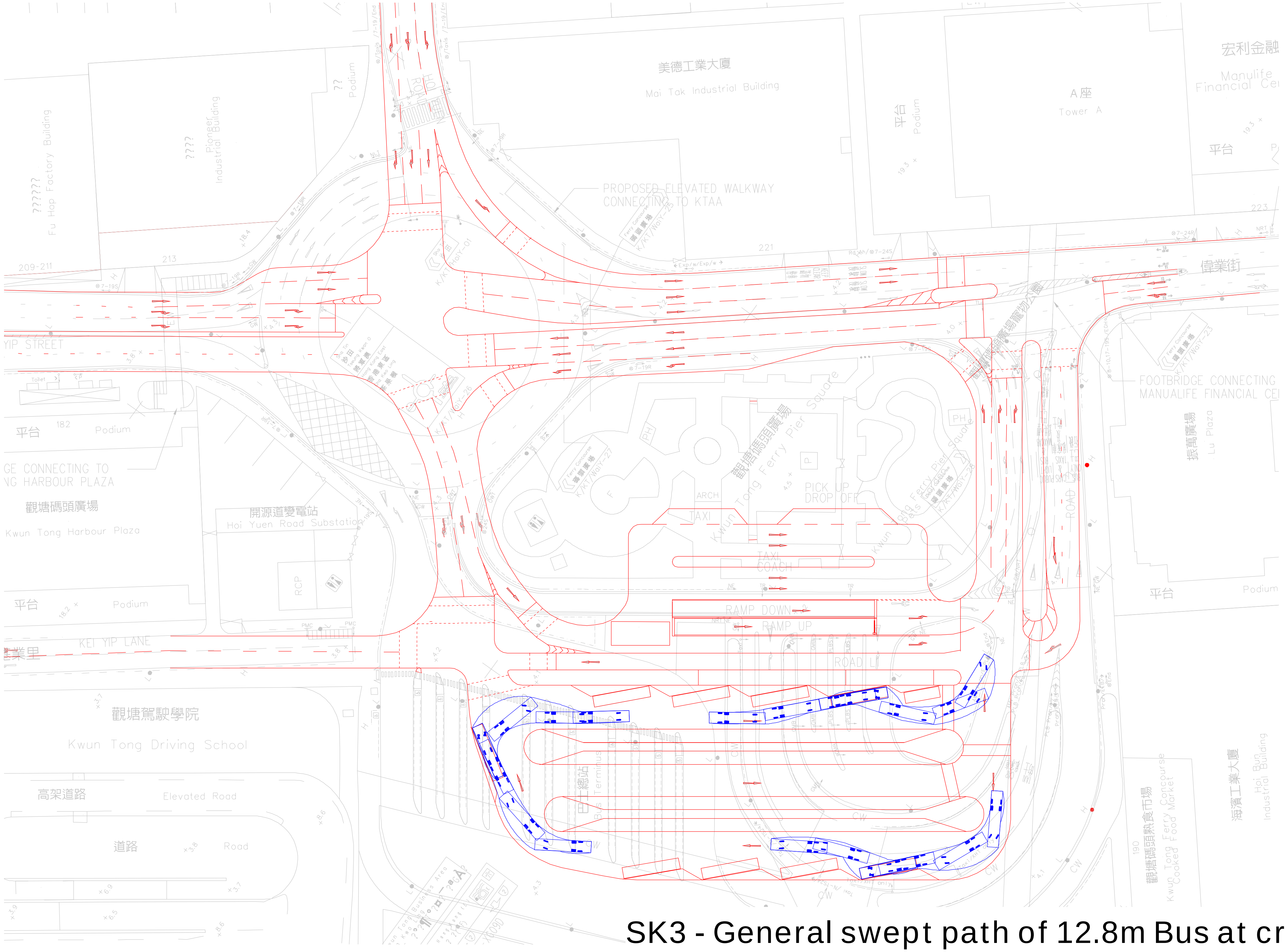
A3 1:1000



SK2 - General swept path of 12.8m Bus at critical bus bays

(Sheet 1 of 2)

A3 1:1000



SK3 - General swept path of 12.8m Bus at critical bus bays

(Sheet 2 of 2)

A3 1:1000

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APPENDIX E

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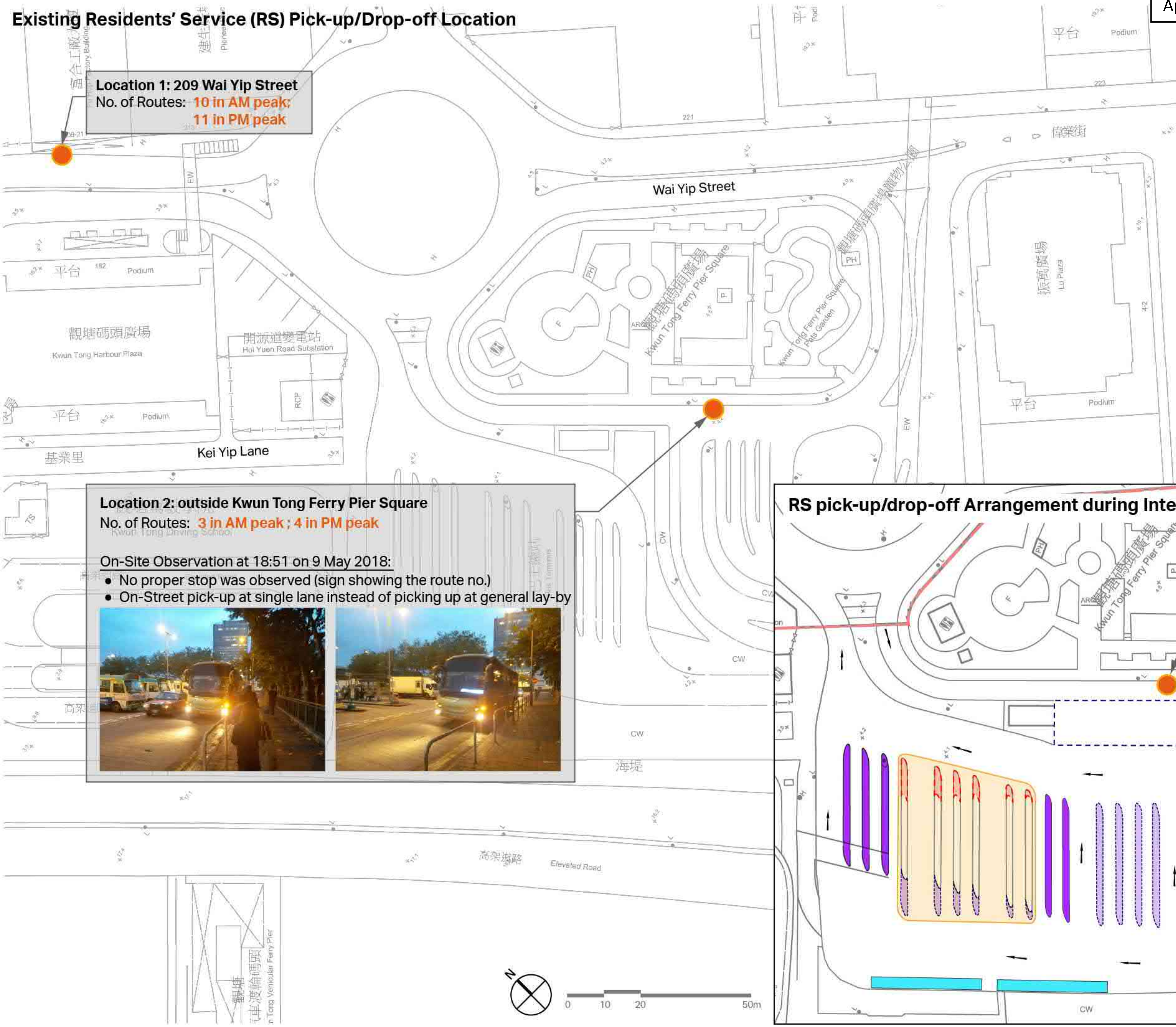
Existing Residents' Service (RS) Pick-up/Drop-off Location



Location 1: 209 Wai Yip Street
No. of Routes: 10 in AM peak; 11 in PM peak

Location 2: outside Kwun Tong Ferry Pier Square
No. of Routes: 3 in AM peak ; 4 in PM peak

On-Site Observation at 18:51 on 9 May 2018:
- No proper stop was observed (sign showing the route no.)
- On-Street pick-up at single lane instead of picking up at general lay-by

LEGEND

- Existing RS pick-up/drop-off location

Interim PTI
- Existing Bus Bay
- Temporary Bus Bay
- Temporary GMB Bay
- Taxi Bay
- General Lay-by
- Proposed Works Area
- Proposed Temporary Divider/Kerb

RS pick-up/drop-off Arrangement during Interim Treatment

Existing RS pick-up/drop-off is proposed to be maintained during various phases of interim PTI until the construction of internal road.

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APPENDIX F

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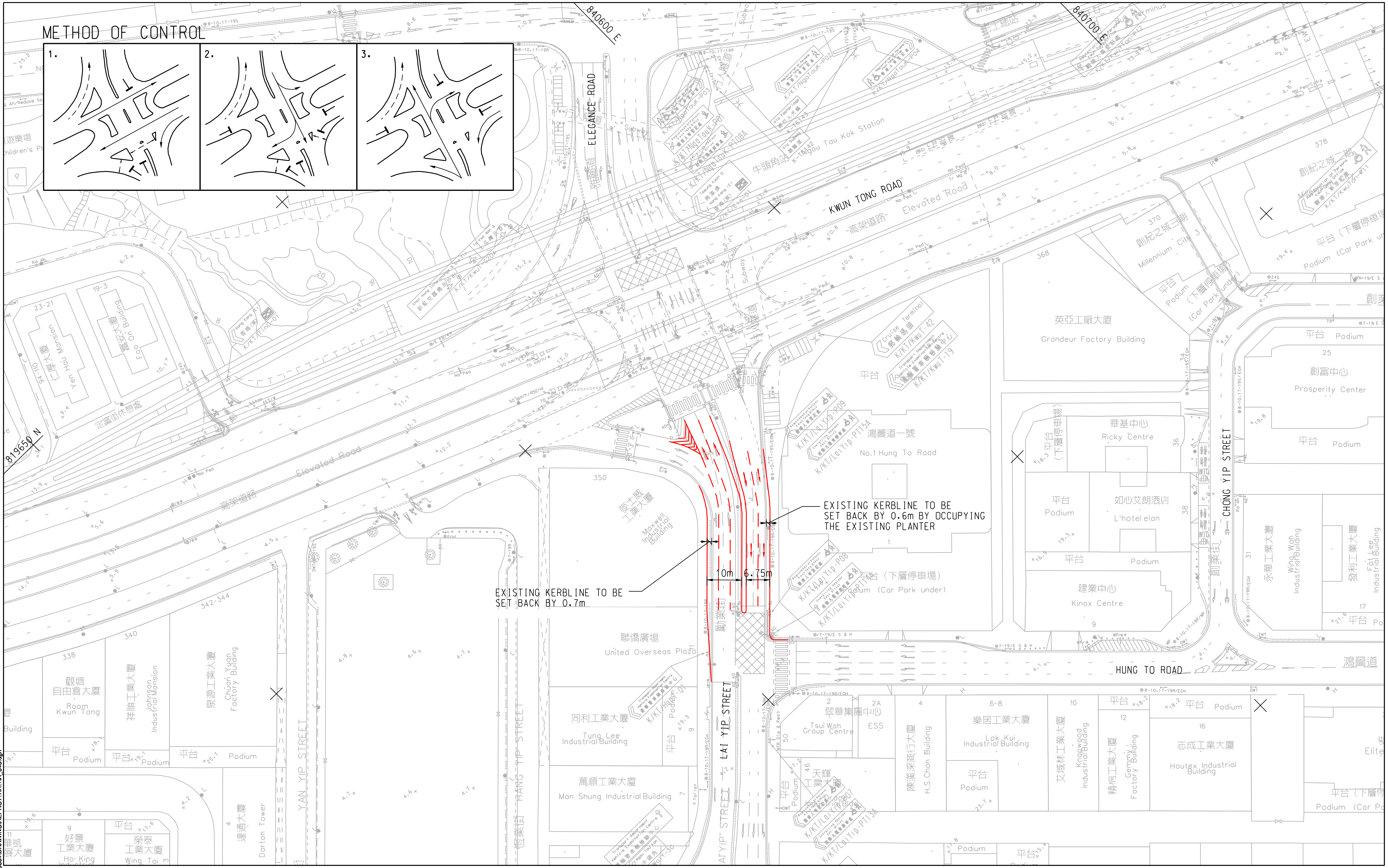
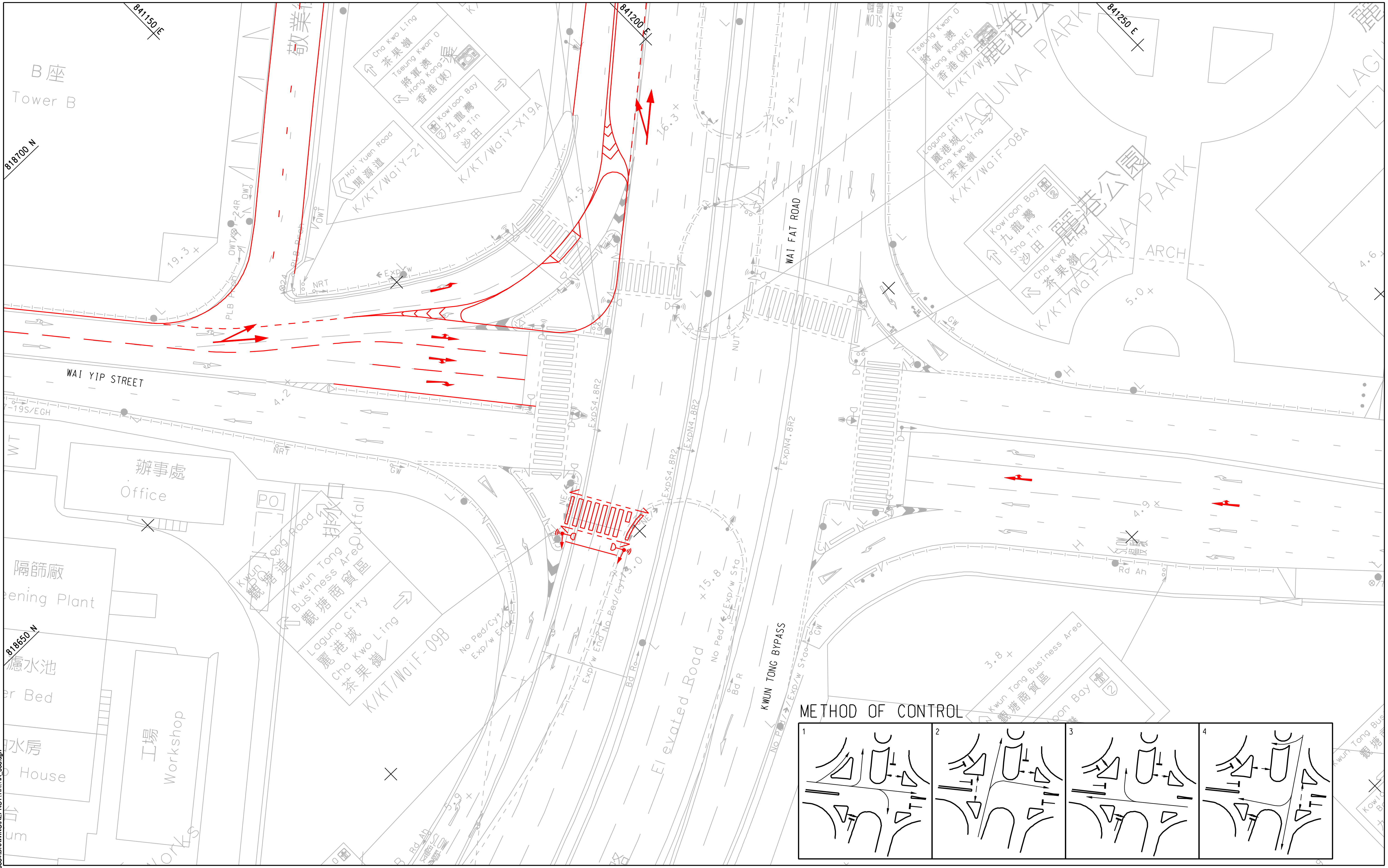


Project:
Agreement No. CE 61/2015 (TP)
Planning and Engineering Study on
Kwun Tong Action Area - Feasibility Study

Title:
IMPROVEMENT SCHEME OF LAI YIP STREET / KWUN TONG ROAD (J1)

Drawing No: TIA/543
Date: AUG 2018
Scale: 1 : 1000

AECOM



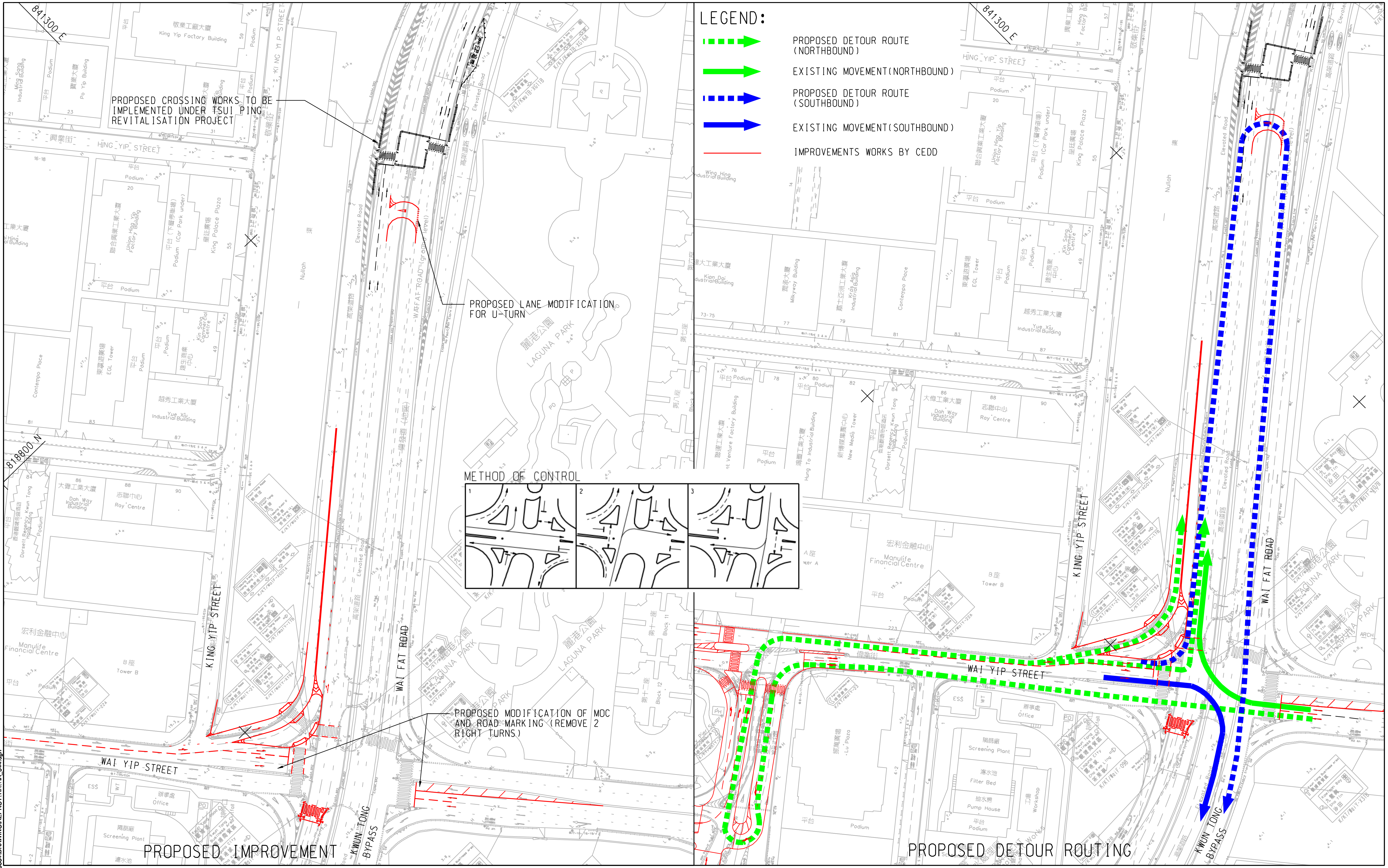
Project:
Agreement No. CE 61/2015 (TP)
Planning and Engineering Study on
Kwun Tong Action Area - Feasibility Study

Title:
IMPROVEMENT SCHEME OF WAI FAT ROAD / WAI YIP STREET (J19) - INTERIM PROPOSAL

N

Drawing No:
TIA/538
Date: AUG 2018
Scale: 1:500

AECOM



Project:
Agreement No. CE 61/2015 (TP)
Planning and Engineering Study on
Kwun Tong Action Area - Feasibility Study

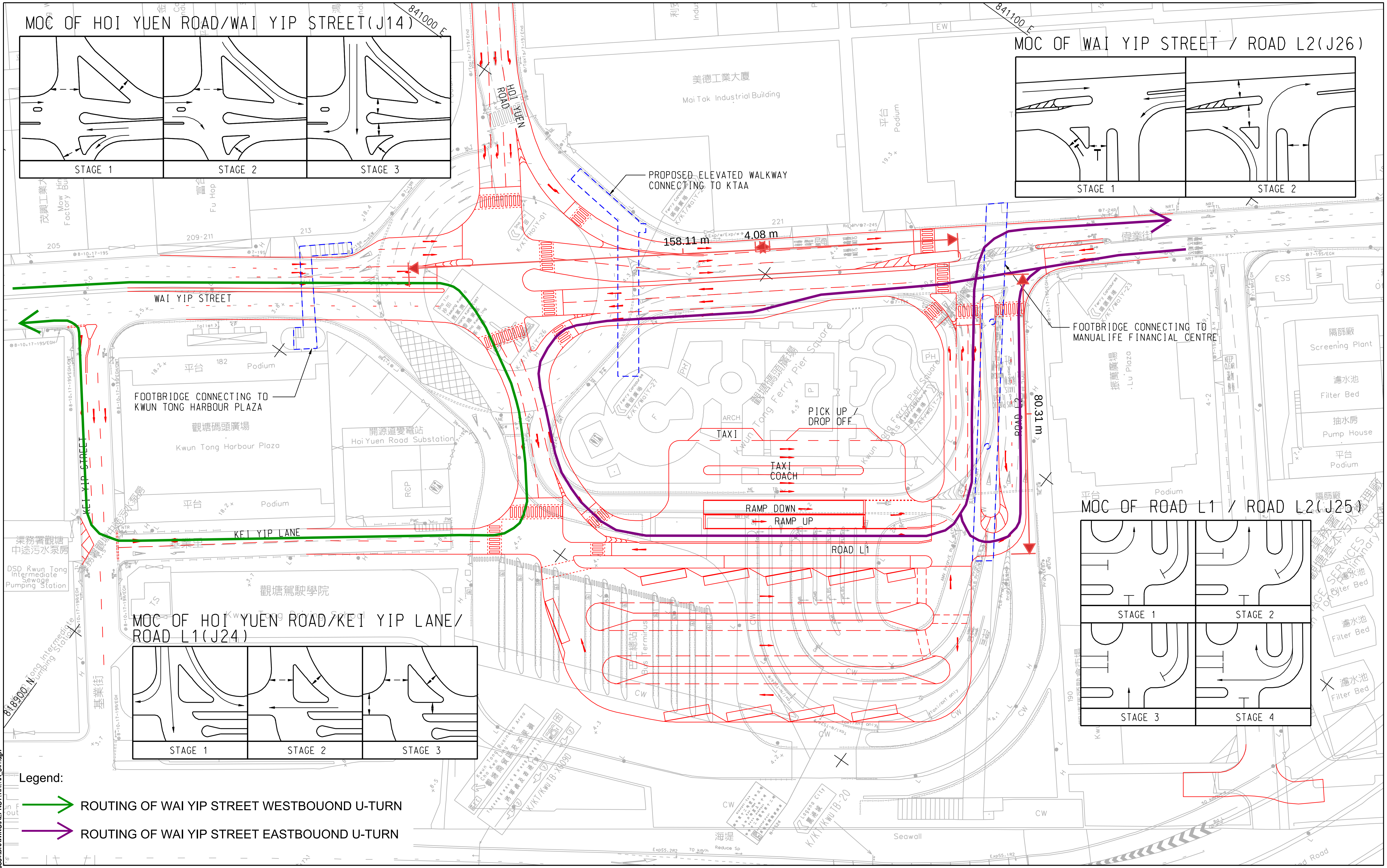
Title:
IMPROVEMENT SCHEME OF WAI FAT ROAD / WAI YIP STREET (J19) - MEDIUM TERM PROPOSAL

N

Drawing No: TIA/544
Date: MAY 2019
Scale: 1:1500

AECOM

Plot File by: LIUH9 06/06/2019
PATH P:\PROJECTS\60493364\DRAWING\REPORT\TIA\TIA_544.dgn



Legend:

ROUTING OF WAI YIP STREET WESTBOUOND U-TURN

ROUTING OF WAI YIP STREET EASTBOUOND U-TURN

Project:
Agreement No. CE 61/2015 (TP)
Planning and Engineering Study on
Kwun Tong Action Area - Feasibility Study

Title:
PROPOSED U-TURN ROUTINGS OF WAI YIP STREET / HOI YUEN ROAD (J14)

Drawing No: TIA/546
Date: JAN 2019
Scale: 1 : 1000

AECOM

APPENDIX G

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APPENDIX H

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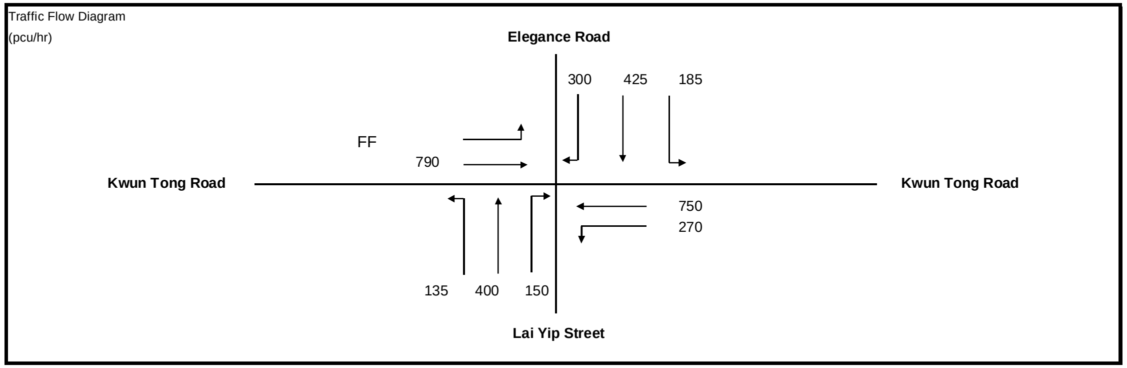
Appendix G - Junction Calculation Sheets

JUNCTION CAPACITY CALCULATION

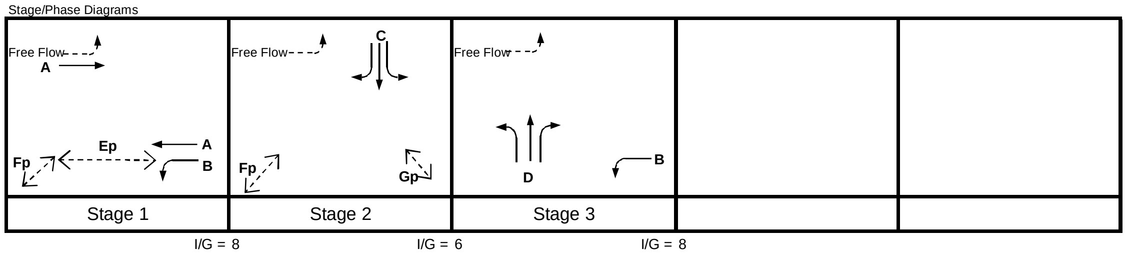
AECOM

Junction J1 - Kwun Tong Road / Lai Yip Street	2017 AM Observed Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19



J1

No. of stages per cycle	N =	3	
Cycle time	C =	118	sec
Sum(y)	Y =	0.469	
Lost time	L =	19	sec
Total Flow	=	3,412	pcu
Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y) =$	63	sec
Min. Cycle Time C_m	$= L/(1-Y) =$	36	sec
Y_{ult}	$= 0.9-0.0075 \times L =$	0.758	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y \times 100\% =$	61.4	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y) =$	40	sec
Y_{max}	$= 1-L/C =$	0.839	



Critical Case : A,C,D

R.C.(C) $= (0.9 \times Y_{max}-Y)/Y \times 100\% =$ 61%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
→	A	1	3.220	2				0		0		4154		790		790			4154	0.190	0.190
←	A	1	3.125	2				0		0		4135		750		750			4135	0.181	
	B	1,3	3.220	1	10			1		0	-253	1937	270			270	100%		1464	0.184	
	C	2	3.180	1	10			1		0		1933	185			185	100%		1681	0.110	
↓	C	2	3.180	1				0		0		2073		315		315			2073	0.152	0.152
	C	2	3.180	1		25	0	0		0		2073		110	193	303		64%	1997	0.152	
Flared Length															107						
	D	3	3.500	1	10			1		0		1965	5	244		249	2%		1959	0.127	0.127
Flared Length													137								
	D	3	3.500	1		15	0	0		0		2105		103	150	253		59%	1987	0.127	
Flared Length														53							
Pedestrian Crossing				GM		FGM															
	Ep	1	min.	7	+	9	=	16	sec												
	Fp	1,2	min.	7	+	6	=	13	sec												
	Gp	2	min.	5	+	6	=	11	sec												

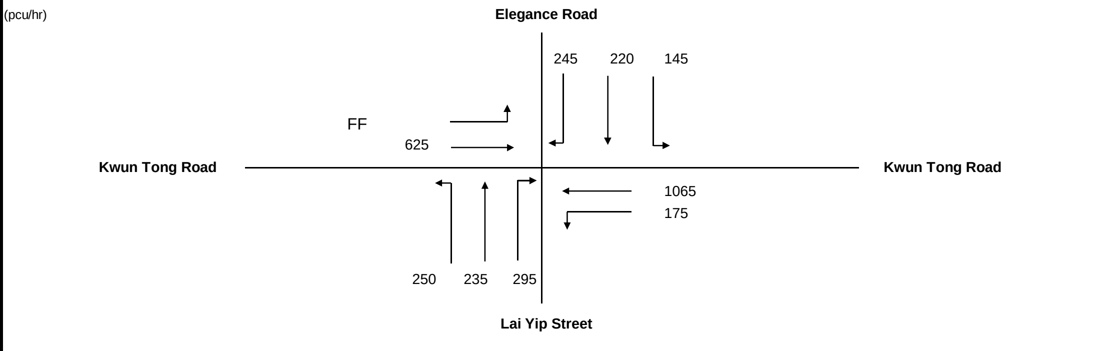
*Remark: Flows of Phase C (right-turning movement) and Phase D (left-turning and straight-ahead movements) are deducted by flows capacity of the flared lane.
As left-turn lane for Phase B is not a full lane, capacity of this lane is deducted.

JUNCTION CAPACITY CALCULATION

AECOM

Junction J1 - Kwun Tong Road / Lai Yip Street	2017 PM Observed Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

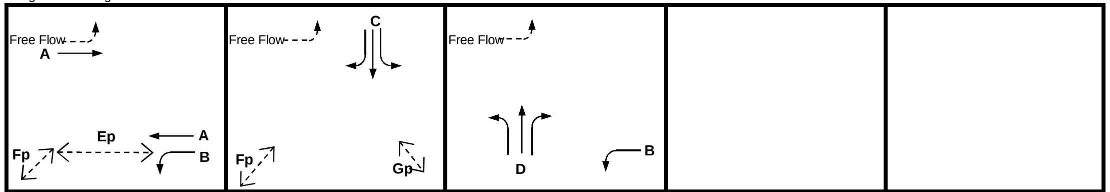
Traffic Flow Diagram
(pcu/hr)



J1

No. of stages per cycle	N =	3	
Cycle time	C =	118	sec
Sum(y)	Y =	0.502	
Lost time	L =	19	sec
Total Flow	=	3,255	pcu
Optimum Cycle C_o	= (1.5×L+5)/(1-Y) =	67	sec
Min. Cycle Time C_m	= L/(1-Y) =	38	sec
Y_{ult}	= 0.9-0.0075×L =	0.758	
R.C.$_{ult}$	= (Y_{ult}-Y)/Yx100% =	50.8	%
Practical Cycle Time C_p	= 0.9×L/(0.9-Y) =	43	sec
Y_{max}	= 1-L/C =	0.839	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G = 8 I/G = 6 I/G = 8

Critical Case : A,C,D

R.C.(C) = (0.9xY_{max}-Y)/Yx100% = 50%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.220	2				0		0		4154		625		625			4154	0.150	
	A	1	3.125	2				0		0		4135		1065		1065			4135	0.258	0.258
	B	1,3	3.220	1	10			1		0	-253	1937	175			175	100%		1464	0.120	
	C	2	3.180	1	10			1		0		1933	145			145	100%		1681	0.086	
	C	2	3.180	1				0		0		2073		183		183			2073	0.088	
	C	2	3.180	1		25	0	0		0		2073		37	138	175		79%	1979	0.088	0.088
Flared Length															107						
	D	3	3.500	1	10			1		0		1965	113	177		290	39%		1857	0.156	0.156
Flared Length													137								
	D	3	3.500	1		15	0	0		0		2105		5	295	300		98%	1916	0.156	
Flared Length														53							
Pedestrian Crossing				GM		FGM															
	Ep	1	min.	7	+	9	=	16	sec												
	Fp	1,2	min.	7	+	6	=	13	sec												
	Gp	2	min.	5	+	6	=	11	sec												

*Remark: Flows of Phase C (right-turning movement) and Phase D (left-turning and straight-ahead movements) are deducted by flows capacity of the flared lane.
As left-turn lane for Phase B is not a full lane, capacity of this lane is deducted.

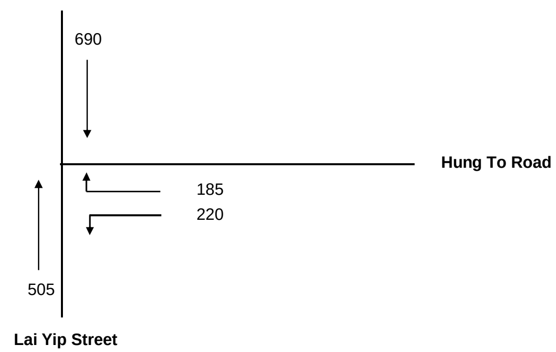
JUNCTION CAPACITY CALCULATION

AECOM

Junction J2 - Hung To Road / Lai Yip Street	2017 AM Observed Traffic Flows	DESIGN: 0	CHECK: 0	JOB NO: 60493364	DATE: Jun 19

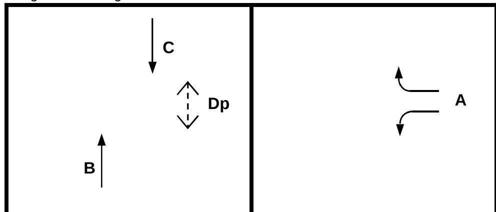
J2

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	2	
Cycle time	C =	118	sec
Sum(y)	Y =	0.292	
Lost time	L =	11	sec
Total Flow	=	1,600	pcu
Optimum Cycle C_o = $(1.5\times L+5)/(1-Y)$	=	30	sec
Min. Cycle Time C_m = $L/(1-Y)$	=	16	sec
Y_{ult} = $0.9-0.0075\times L$	=	0.818	
$R.C._{ult}$ = $(Y_{ult}-Y)/Y\times100\%$	=	180.4	%
Practical Cycle Time C_p = $0.9\times L/(0.9-Y)$	=	16	sec
Y_{max} = $1-L/C$	=	0.907	

Stage/Phase Diagrams



Stage 1	Stage 2			
I/G = 7	I/G = 6			

Critical Case : C,A

R.C.(C) = $(0.9xY_{max}-Y)/Yx100\%$ = 180%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	2	3.180	1		15	0	0		0		2073			185	185		100%	1885	0.098	
	A	2	3.180	1	10			0		0		2073	220			220	100%		1803	0.122	0.122
	B	1	3.500	2				1		0		4070		505		505			4070	0.124	
	C	1	3.500	2				1		0		4070		690		690			4070	0.170	0.170
Pedestrian Crossing				GM		FGM															
	Dp	1	min.	7	+	16	=	23	sec												

*Remark: Due to kerbside activities, there are only 2 lanes for Hung To Road westbound traffic.

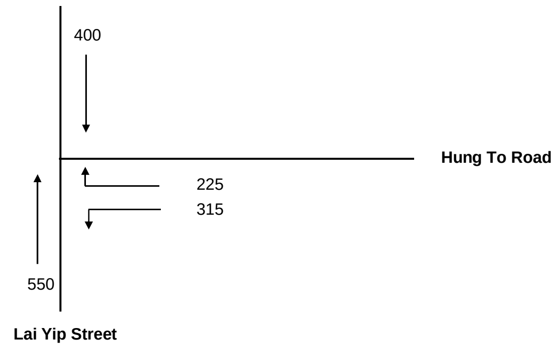
JUNCTION CAPACITY CALCULATION

AECOM

Junction J2 - Hung To Road / Lai Yip Street	2017 PM Observed Traffic Flows	DESIGN: 0	CHECK: 0	JOB NO: 60493364	DATE: Jun 19

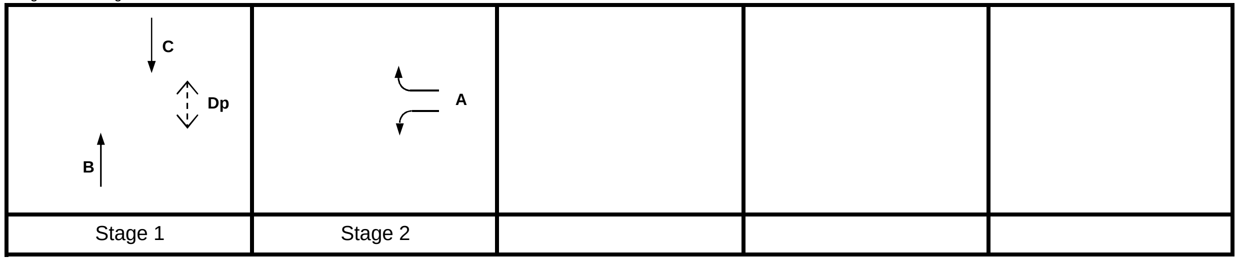
J2

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	2	
Cycle time		C =	108	sec
Sum(y)		Y =	0.310	
Lost time		L =	11	sec
Total Flow		=	1,490	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y)$	=	31	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	16	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.818	
R.C.$_{ult}$	$= (Y_{ult}-Y)/Y\times 100\%$	=	163.8	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	17	sec
Y_{max}	$= 1-L/C$	=	0.898	

Stage/Phase Diagrams



I/G = 6 I/G = 7

Critical Case : B,A

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\%$ = 161%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
	A	2	3.180	1		15	0	0		0		2073			225	225		100%	1885	0.119	
	A	2	3.180	1	10			0		0		2073	315			315	100%		1803	0.175	0.175
	B	1	3.500	2				1		0		4070		550		550			4070	0.135	0.135
	C	1	3.500	2				1		0		4070		400		400			4070	0.098	
Pedestrian Crossing				GM		FGM															
	Dp	1	min.	7	+	16	=	23	sec												

*Remark: Due to kerbside activities, there are only 2 lanes for Hung To Road westbound traffic.

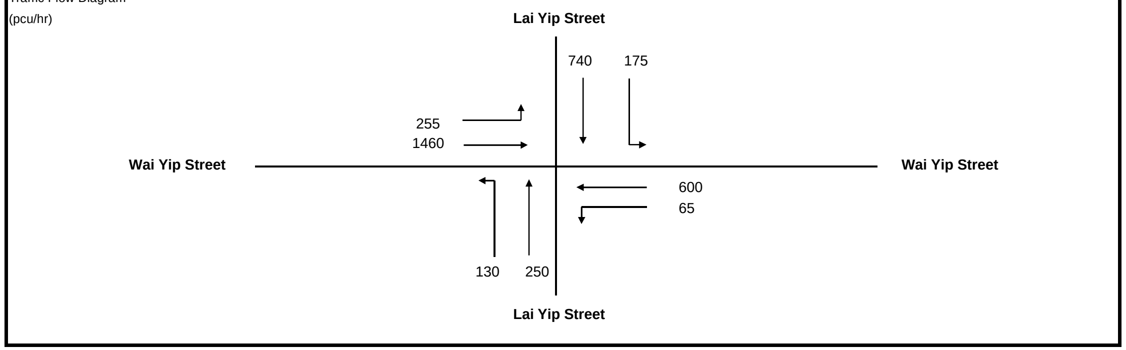
JUNCTION CAPACITY CALCULATION

AECOM

Junction J3 - Wai Yip Street / Lai Yip Street	2017 AM Observed Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jul 19

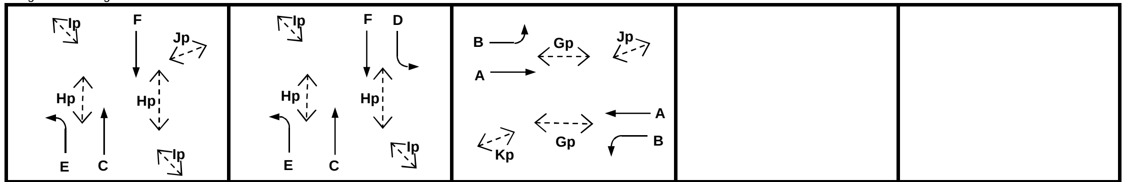
J3

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	3	
Cycle time		C =	118	sec
Sum(y)		Y =	0.563	
Lost time		L =	20	sec
Total Flow		=	3,675	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y)$	=	80	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	46	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.750	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times100\%$	=	33.3	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	53	sec
Y_{max}	$= 1-L/C$	=	0.831	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		
I/G =	I/G = 13	I/G = 9		

Critical Case : F,A

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 33%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	B	3	3.500	1	10			1		0		1965	255	465		720	35%		1866	0.386	
	A	3	3.500	1				0		0		2105		812		812			2105	0.386	0.386
Flared Lane														183							
	B	3	3.200	1	15			1		0		1935	65	209		274	24%		1890	0.145	
	A	3	3.200	1				0		0		2075		300		300			2075	0.145	
Flared Lane														91							
	E	1,2	3.500	1	20			1		0		1965	130	0		130	100%		1828	0.071	
	C	1,2	3.500	1				0		0		2105		125		125			2105	0.059	
Flared Lane														125							
	D	2	3.375	1	15			1		0		1952.5	113			113	100%		1775	0.064	
Flared Lane													62								
	F	1,2	3.375	2				0		0		4185		740		740			4185	0.177	0.177
Pedestrian Crossing				GM		FGM															
	Gp	3	min.	7	+	8	=	15	sec												
	Hp	1,2	min.	7	+	11	=	18	sec												
	Ip	1,2	min.	5	+	10	=	15	sec												
	Jp	1,3	min.	5	+	7	=	12	sec												
	Kp	3	min.	5	+	7	=	12	sec												

*Remark: Flows of Phase A & C (straight-ahead movements) and D (left-turning movement) are deducted by flows capacity of the flared lane.
Due to kerbside activity on Wai Yip Street, no. of lane of Wai Yip Street (EB & WB) are reduced by 1.

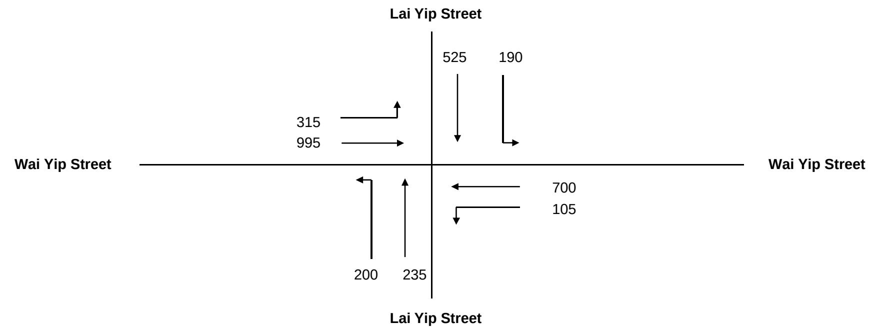
JUNCTION CAPACITY CALCULATION

AECOM

Junction J3 - Wai Yip Street / Lai Yip Street	2017 PM Observed Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jul 19

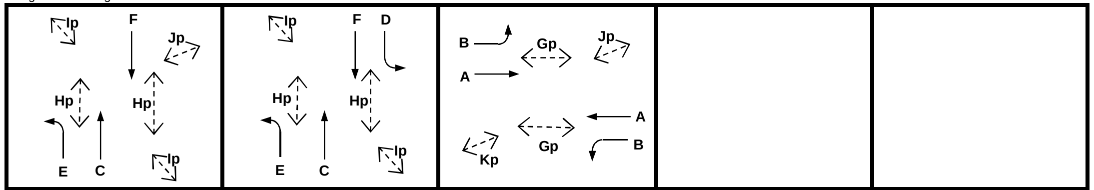
J3

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	3	
Cycle time	C =	118	sec
Sum(y)	Y =	0.414	
Lost time	L =	20	sec
Total Flow	=	3,265	pcu
Optimum Cycle C_o = $(1.5\times L+5)/(1-Y)$	=	60	sec
Min. Cycle Time C_m = $L/(1-Y)$	=	34	sec
Y_{ult} = $0.9-0.0075\times L$	=	0.750	
$R.C._{ult}$ = $(Y_{ult}-Y)/Y\text{x}100\%$	=	81.2	%
Practical Cycle Time C_p = $0.9\times L/(0.9-Y)$	=	37	sec
Y_{max} = 1-L/C	=	0.831	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		
I/G =	I/G = 13	I/G = 9		

Critical Case : F,A

R.C.(C) = $(0.9\text{x}Y_{max}\text{-}Y)/Y\text{x}100\%$ = 81%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	B	3	3.500	1	10			1		0		1965	315	205		520	61%		1801	0.289	
	A	3	3.500	1				0		0		2105		607		607			2105	0.289	0.289
Flared Lane														183							
	B	3	3.200	1	15			1		0		1935	105	234		339	31%		1877	0.181	
	A	3	3.200	1				0		0		2075		375		375			2075	0.181	
Flared Lane														91							
	E	1,2	3.500	1	20			1		0		1965	200	0		200	100%		1828	0.109	
	C	1,2	3.500	1				0		0		2105		110		110			2105	0.052	
Flared Lane														125							
	D	2	3.375	1	15			1		0		1952.5	128			128	100%		1775	0.072	
Flared Lane													62								
	F	1,2	3.375	2				0		0		4185		525		525			4185	0.125	0.125
Pedestrian Crossing				GM		FGM															
	Gp	3	min.	7	+	8	=	15	sec												
	Hp	1,2	min.	7	+	11	=	18	sec												
	Ip	1,2	min.	5	+	10	=	15	sec												
	Jp	1,3	min.	5	+	7	=	12	sec												
	Kp	3	min.	5	+	7	=	12	sec												

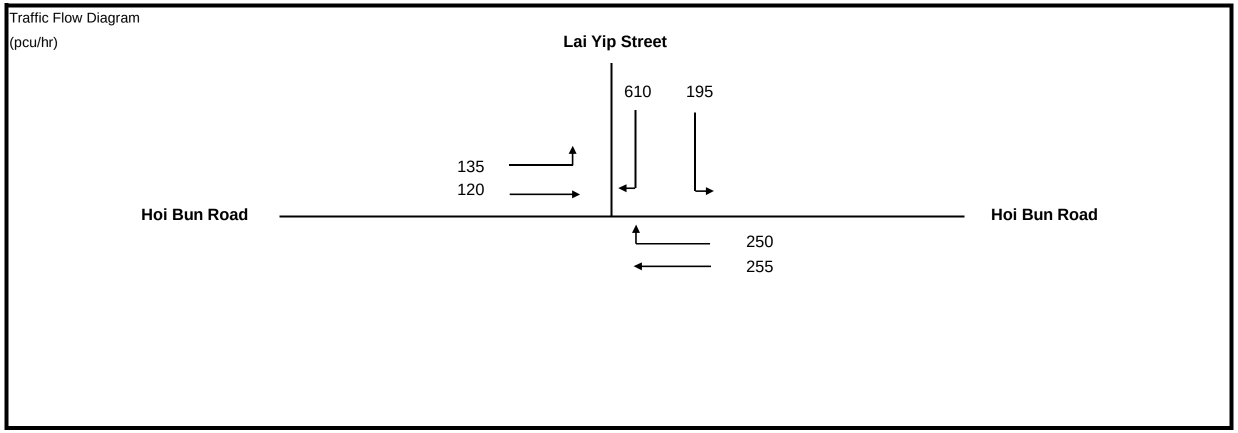
*Remark: Flows of Phase A & C (straight-ahead movements) and D (left-turning movement) are deducted by flows capacity of the flared lane.

Due to kerbside activity on Wai Yip Street, no. of lane of Wai Yip Street (EB & WB) are reduced by 1.

JUNCTION CAPACITY CALCULATION

AECOM

Junction J4 - Hoi Bun Road / Lai Yip Street	2017 AM Observed Traffic Flows	DESIGN: SL	CHECK: SL	JOB NO: 60493364	DATE: Jul 19

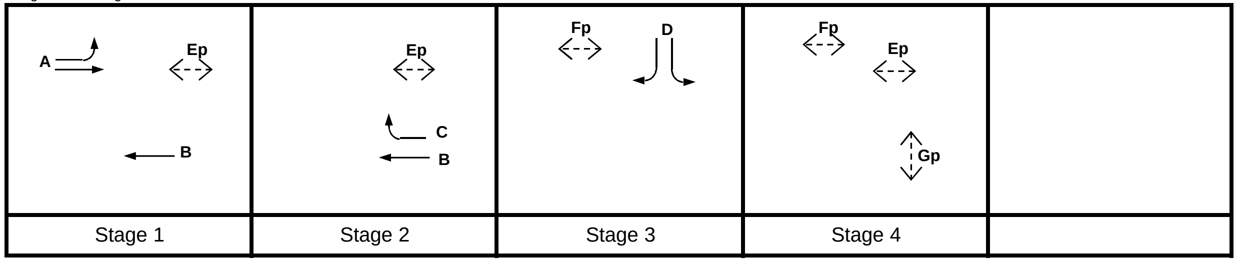


J4

No. of stages per cycle	N =	4	
Cycle time	C =	118	sec
Sum(y)	Y =	0.375	
Lost time	L =	35	sec
Total Flow	=	1,565	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	92	sec
Min. Cycle Time C_m	$= L/(1-Y) =$	56	sec
Y_{ult}	$= 0.9-0.0075\times L =$	0.638	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times100\% =$	70.1	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y) =$	60	sec
Y_{max}	$= 1-L/C =$	0.703	

Stage/Phase Diagrams



I/G = 8 I/G = 5 I/G = 8 G = 7 I/G = 10

Critical Case : A,C,D,Gp

R.C.(C) $= (0.9\text{x}Y_{max}-Y)/Y\text{x}100\% =$ 69%

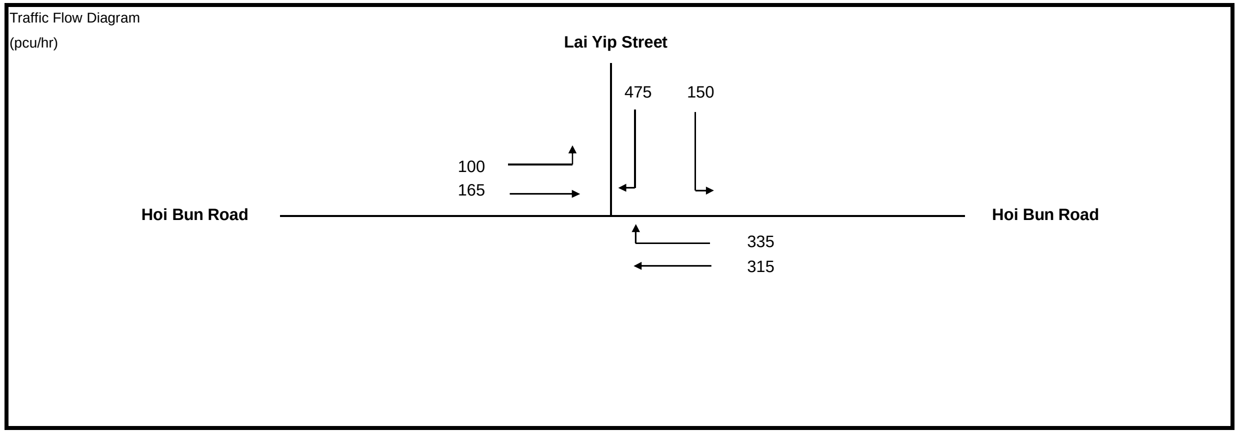
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m)		OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr)			TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%)		REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
					LEFT	RIGHT							LEFT	STRAIGHT AHEAD	RIGHT		LEFT	RIGHT			
	A	1	3.250	1	10			1		0		1940	135			135	100%		1687	0.080	0.080
	A	1	3.250	1				0		0		2080		120		120			2080	0.058	
	B	1,2	3.000	1				1		0		1915		255		255			1915	0.133	
	C	2	3.000	1		15	0	0		0		2055			250	250		100%	1868	0.134	0.134
	D	3	3.300	1	12.5			1		0		1945	195			195	100%		1737	0.112	
	D	3	3.300	2		15	0	0		0		4170			610	610		100%	3791	0.161	0.161
Pedestrian Crossing				GM		FGM															
	Ep	1,2,4	min.	12	+	9	=	21	sec												
	Fp	3,4	min.	7	+	6	=	13	sec												
	Gp	4	min.	7	+	7	=	14	sec												*

JUNCTION CAPACITY CALCULATION

AECOM

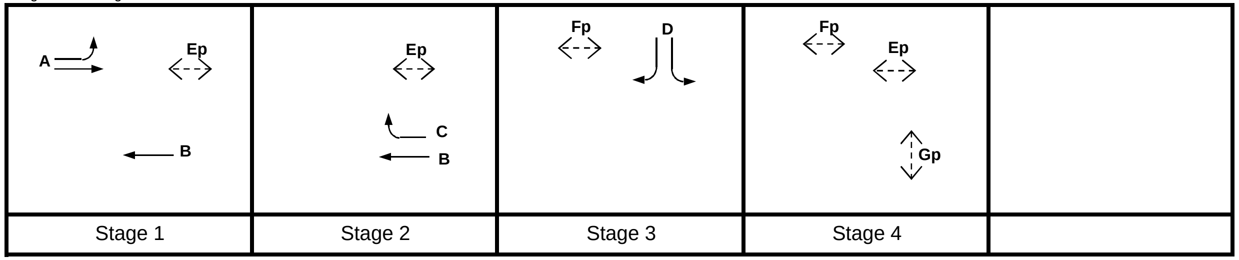
Junction J4 - Hoi Bun Road / Lai Yip Street	2017 PM Observed Traffic Flows	DESIGN: SL	CHECK: SL	JOB NO: 60493364	DATE: Jul 19

J4



No. of stages per cycle		N =	4	
Cycle time		C =	108	sec
Sum(y)		Y =	0.384	
Lost time		L =	35	sec
Total Flow		=	1,540	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y)$	=	93	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	57	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.638	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times 100\%$	=	66.0	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	61	sec
Y_{max}	$= 1-L/C$	=	0.676	

Stage/Phase Diagrams



I/G = 8 I/G = 5 I/G = 8 G = 7 I/G = 10

Critical Case : A,C,D,Gp

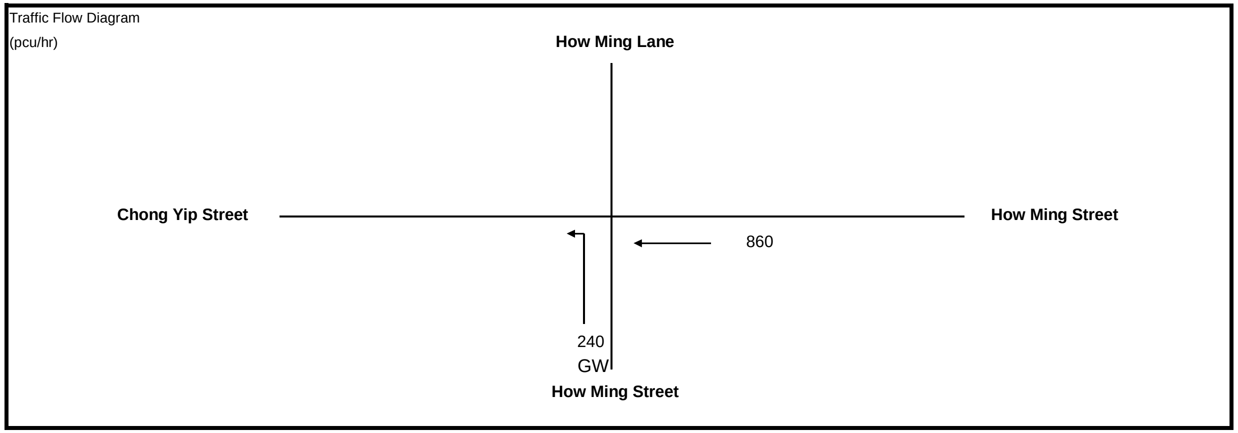
R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 58%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.250	1	10			1		0		1940	100			100	100%		1687	0.059	
	A	1	3.250	1				0		0		2080		165		165			2080	0.079	0.079
	B	1,2	3.000	1				1		0		1915		315		315			1915	0.164	
	C	2	3.000	1		15	0	0		0		2055			335	335		100%	1868	0.179	0.179
	D	3	3.300	1	12.5			1		0		1945	150			150	100%		1737	0.086	
	D	3	3.300	2		15	0	0		0		4170			475	475		100%	3791	0.125	0.125
Pedestrian Crossing				GM		FGM															
	Ep	1,2,4	min.	12	+	9	=	21	sec												
	Fp	3,4	min.	7	+	6	=	13	sec												
	Gp	4	min.	7	+	7	=	14	sec												*

JUNCTION CAPACITY CALCULATION

AECOM

Junction J5 - How Ming Street / Chong Yip Street	2017 AM Observed Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jan 19

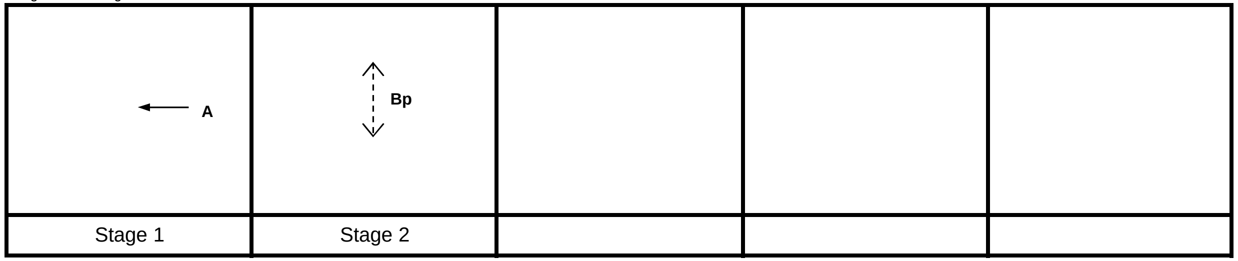


J5

No. of stages per cycle	N =	2	
Cycle time	C =	90	sec
Sum(y)	Y =	0.210	
Lost time	L =	20	sec
Total Flow	=	860	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	44	sec
Min. Cycle Time C_m	$= L/(1-Y) =$	25	sec
Y_{ult}	$= 0.9-0.0075\times L =$	0.750	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times 100\% =$	257.6	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y) =$	26	sec
Y_{max}	$= 1-L/C =$	0.778	

Stage/Phase Diagrams



I/G = 6 G = 5 I/G = 10

Critical Case : A,Bp

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 234%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
←	A	1	3.650	2				1		0		4100		860		860			4100	0.210	0.210
Pedestrian Crossing				GM		FGM															
	Bp	2	min.	5	+	7	=	12	sec												*

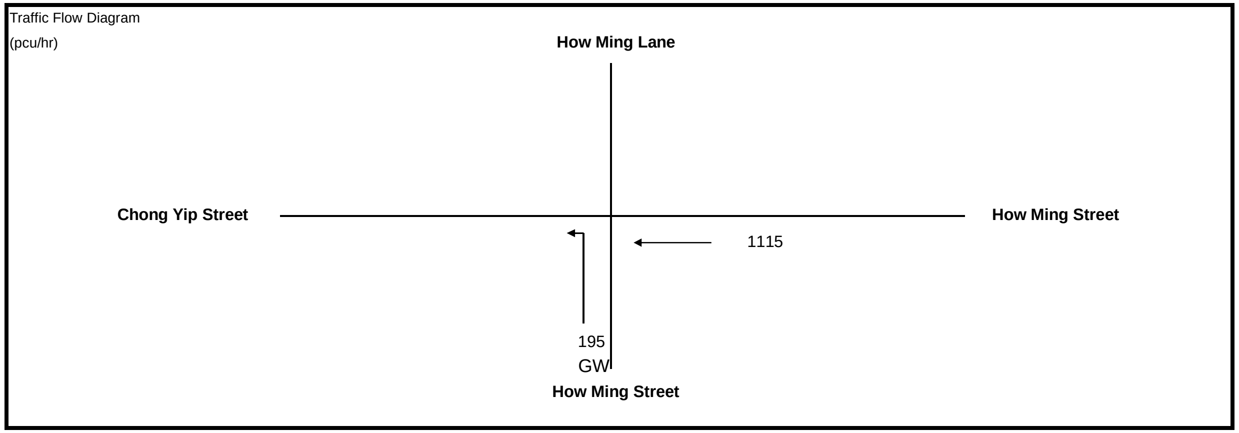
JUNCTION CAPACITY CALCULATION

AECOM

Junction J5 - How Ming Street / Chong Yip Street	2017 PM Observed Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jan 19

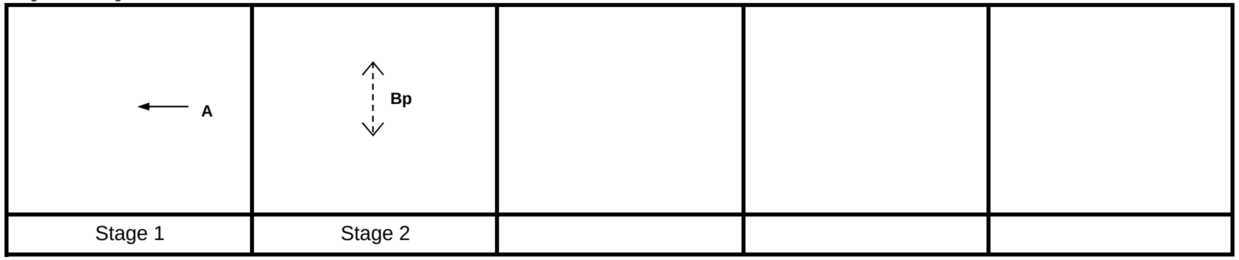
J5

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	2	
Cycle time		C =	90	sec
Sum(y)		Y =	0.272	
Lost time		L =	20	sec
Total Flow		=	1,115	pcu
Optimum Cycle C_o	= (1.5×L+5)/(1-Y)	=	48	sec
Min. Cycle Time C_m	= L/(1-Y)	=	27	sec
Y_{ult}	= 0.9-0.0075×L	=	0.750	
R.C.$_{ult}$	= (Y_{ult}-Y)/Yx100%	=	175.8	%
Practical Cycle Time C_p	= 0.9×L/(0.9-Y)	=	29	sec
Y_{max}	= 1-L/C	=	0.778	

Stage/Phase Diagrams



I/G = 6 G = 5 I/G = 10

Critical Case : A,Bp

R.C.(C) = (0.9xY_{max}-Y)/Yx100% = 157%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m)		OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr)			TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%)		REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
					LEFT	RIGHT							LEFT	STRAIGHT AHEAD	RIGHT		LEFT	RIGHT			
←	A	1	3.650	2				1		0		4100		1115		1115			4100	0.272	0.272
Pedestrian Crossing				GM		FGM															
	Bp	2	min.	5	+	7	=	12	sec												*

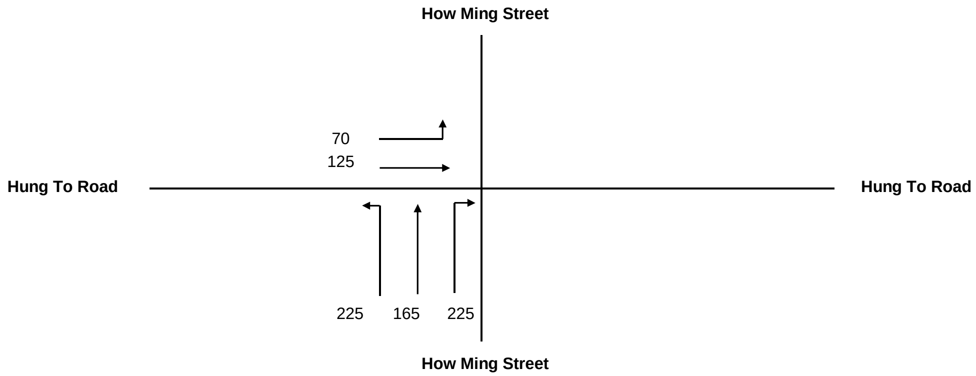
JUNCTION CAPACITY CALCULATION

AECOM

Junction J6 - Hung To Road / How Ming Street	2017 AM Observed Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

J6

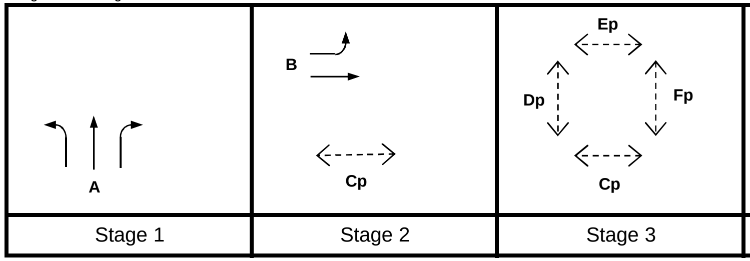
Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	3	
Cycle time	C =	118	sec
Sum(y)	Y =	0.312	
Lost time	L =	29	sec
Total Flow	=	810	pcu

Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y) =$		71	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	42	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.683	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y \times 100\%$	=	118.6	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	44	sec
Y_{max}	= 1-L/C	=	0.754	

Stage/Phase Diagrams



I/G = 6 I/G = 5 G = 10 I/G = 10

Critical Case : A,B,Dp

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 117%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	4.000	1	10			1		0		2015	225			225	100%		1752	0.128	
	A	1	4.000	1		10	0	1		0		2015		165	225	390		58%	1855	0.210	0.210
	B	2	4.000	1	10			1		0		2015	70	125		195	36%		1912	0.102	0.102
Pedestrian Crossing				GM		FGM															
	Cp	2,3	min.	7	+	10	=	17	sec												
	Dp	3	min.	10	+	8	=	18	sec												*
	Ep	3	min.	6	+	9	=	15	sec												
	Fp	3	min.	6	+	9	=	15	sec												

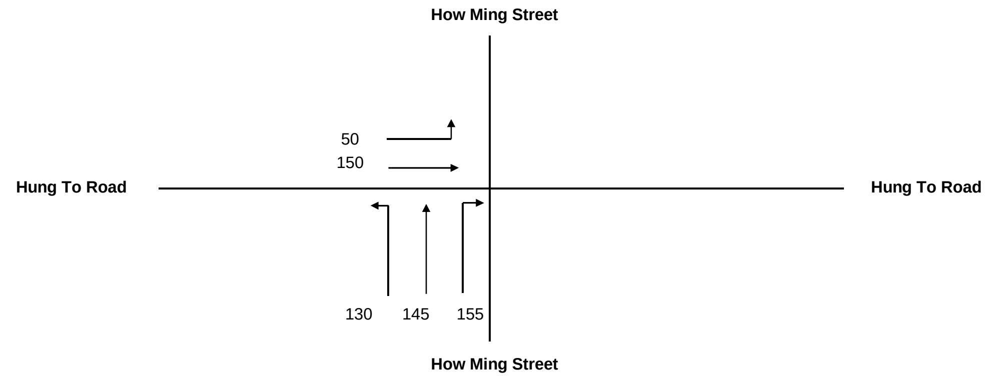
JUNCTION CAPACITY CALCULATION

AECOM

Junction J6 - Hung To Road / How Ming Street	2017 PM Observed Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

J6

Traffic Flow Diagram
(pcu/hr)

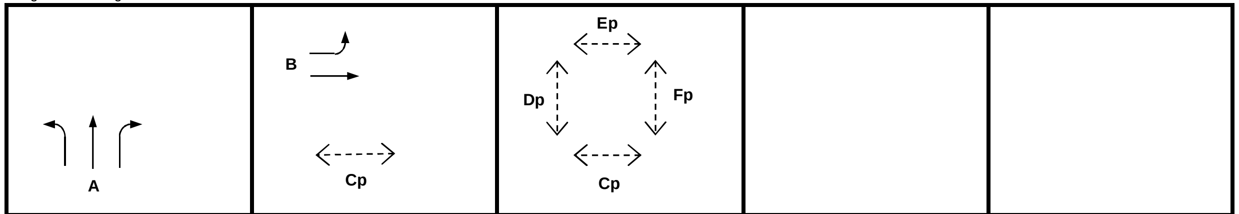


No. of stages per cycle		N =	3	
Cycle time		C =	108	sec
Sum(y)		Y =	0.263	
Lost time		L =	29	sec
Total Flow		=	630	pcu
Optimum Cycle C_o	= (1.5×L+5)/(1-Y) =		66	sec
Min. Cycle Time C_m	= L/(1-Y)	=	39	sec
Y_{ult}	= 0.9-0.0075×L	=	0.683	
$R.C._{ult}$	= $(Y_{ult}$-Y)/Yx100%	=	159.1	%
Practical Cycle Time C_p	= 0.9×L/(0.9-Y)	=	41	sec
Y_{max}	= 1-L/C	=	0.731	

Critical Case : A,B,Dp

R.C.(C) = $(0.9xY_{max}$-Y)/Yx100% = 150%

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G = 6 I/G = 5 G = 10 I/G = 10

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	4.000	1	10			1		0		2015	130			130	100%		1752	0.074	
	A	1	4.000	1		10	0	1		0		2015		145	155	300		52%	1870	0.160	0.160
	B	2	4.000	1	10			1		0		2015	50	150		200	25%		1942	0.103	0.103
Pedestrian Crossing				GM		FGM															
	Cp	2,3	min.	7	+	10	=	17	sec												
	Dp	3	min.	10	+	8	=	18	sec												*
	Ep	3	min.	6	+	9	=	15	sec												
	Fp	3	min.	6	+	9	=	15	sec												

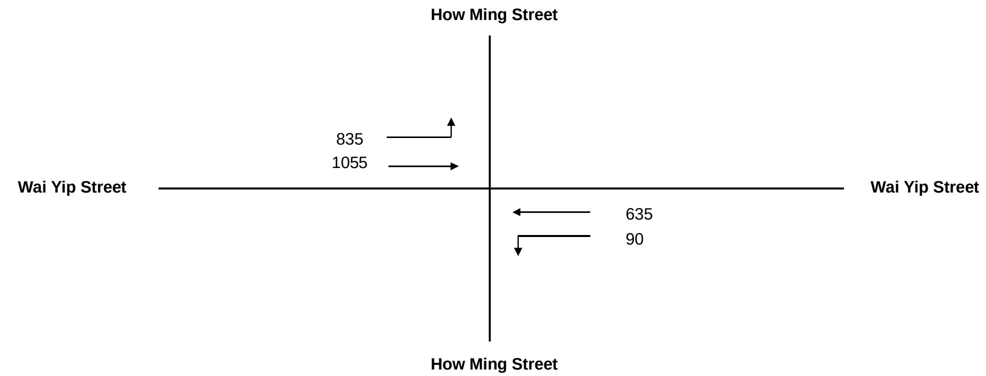
JUNCTION CAPACITY CALCULATION

AECOM

Junction J7 - Wai Yip Street / How Ming Street	2017 AM Observed Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: -	DATE: Jun 19

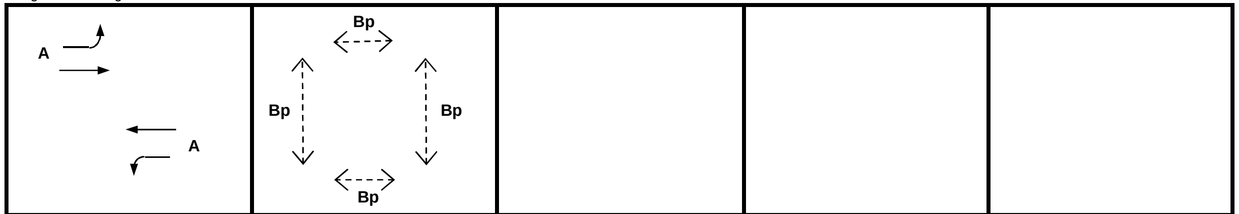
J7

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	2	
Cycle time		C =	118	sec
Sum(y)		Y =	0.637	
Lost time		L =	30	sec
Total Flow		=	2,615	pcu
Optimum Cycle C_o	= (1.5×L+5)/(1-Y) =		138	sec
Min. Cycle Time C_m	= L/(1-Y)	=	83	sec
Y_{ult}	= 0.9-0.0075×L	=	0.675	
$R.C._{ult}$	= $(Y_{ult}$-Y)/Yx100%	=	6.0	%
Practical Cycle Time C_p	= 0.9×L/(0.9-Y)	=	103	sec
Y_{max}	= 1-L/C	=	0.746	

Stage/Phase Diagrams



Stage 1	Stage 2			

I/G = 8 G = 8 I/G = 15

Critical Case : A,Bp

R.C.(C) = $(0.9xY_{max}$-Y)/Yx100% = 5%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.000	1	15			1		0		1915	835	301		1136	74%		1784	0.637	0.637
	A	1	3.000	1				0		0	-871	2055		754		754			1184	0.637	
	A	1	3.000	1	20			1		0		1915	90	367		457	20%		1887	0.242	
	A	1	3.000	1				0		0	-947	2055		268		268			1108	0.242	
Pedestrian Crossing				GM		FGM															
	Bp	2	min.	8	+	11	=	19	sec												*

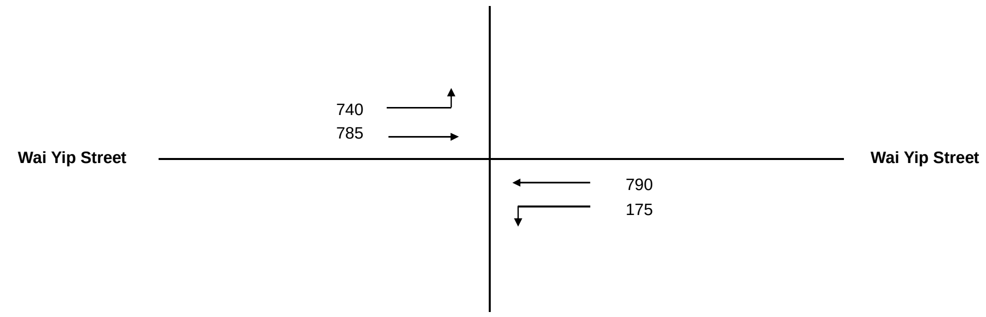
*Remark: Due to kerside activities, capacity of one of the lanes is deducted by half.

JUNCTION CAPACITY CALCULATION

AECOM

Junction J7 - Wai Yip Street / How Ming Street	2017 PM Observed Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: -	DATE: Jul 19

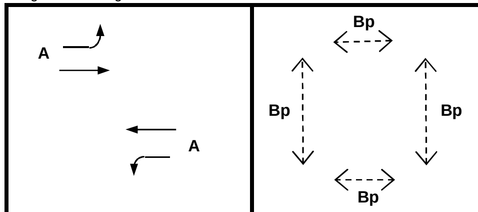
Traffic Flow Diagram
(pcu/hr)



J7

No. of stages per cycle	N =	2	
Cycle time	C =	118	sec
Sum(y)	Y =	0.516	
Lost time	L =	30	sec
Total Flow	=	2,490	pcu
Optimum Cycle C_o = $(1.5\times L+5)/(1-Y)$	=	103	sec
Min. Cycle Time C_m = $L/(1-Y)$	=	62	sec
Y_{ult} = $0.9-0.0075\times L$	=	0.675	
$R.C._{ult}$ = $(Y_{ult}-Y)/Y\times100\%$	=	30.8	%
Practical Cycle Time C_p = $0.9\times L/(0.9-Y)$	=	70	sec
Y_{max} = $1-L/C$	=	0.746	

Stage/Phase Diagrams



Stage 1	Stage 2			

I/G = 8 G = 8 I/G = 15

Critical Case : A,Bp

R.C.(C) = $(0.9xY_{max}-Y)/Yx100\%$ = 30%

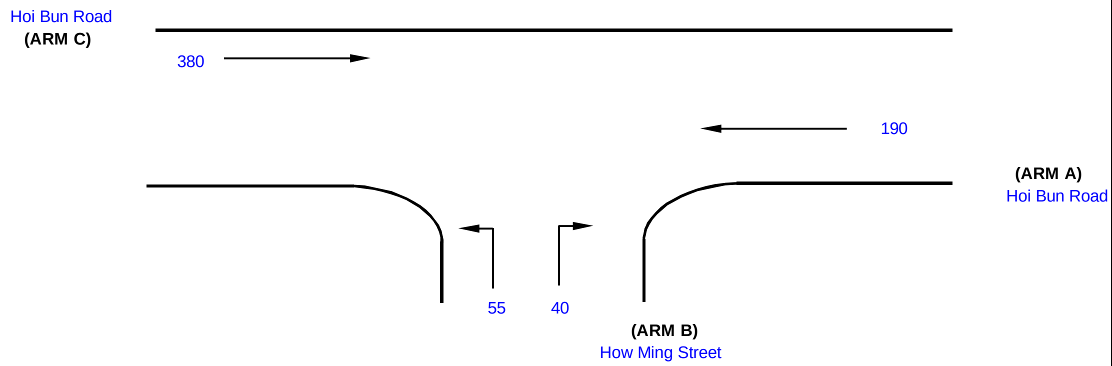
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.000	1	15			1		0		1915	740	174		914	81%		1772	0.516	0.516
	A	1	3.000	1				0		0	-871	2055		611		611			1184	0.516	
	A	1	3.000	1	20			1		0		1915	175	431		606	29%		1874	0.324	
	A	1	3.000	1				0		0	-947	2055		359		359			1108	0.324	
Pedestrian Crossing				GM		FGM															
	Bp	2	min.	8	+	11	=	19	sec												*

*Remark: Due to kerside activities, capacity of one of the lanes is deducted by half.

PRIORITY JUNCTION CAPACITY CALCULATION

AECOM

Junction J8 - Hoi Bun Road / How Ming Street	2017 AM Observed Traffic Flows	Designed By : SL	Checked By : DW	Job No. : 60493364	Date : Oct 19



J8

NOTES : (GEOMETRIC INPUT DATA)

W	= Major Road Width (6.4 - 20.0)
W cr	= Central Reserve width (1.2 - 9.0, kerbed central reserve only)
W b-a	= Lane width available to vehicle waiting in stream b-a (2.05 - 4.70)
W b-c	= Lane width available to vehicle waiting in stream b-c (2.05 - 4.70)
W c-b	= Lane width available to vehicle waiting in stream c-b (2.05 - 4.70)
Vl b-a	= Visibility to the left for vehicles waiting in stream b-a (22.0 - 250.0)
Vr b-a	= Visibility to the right for vehicles waiting in stream b-a (17.0 - 250.0)
Vr b-c	= Visibilitu to the right for vehicles waiting in stream b-c (17.0 - 250.0)
Vr c-b	= Visibility to the right for vehicles waiting in stream c-b (17.0 - 250.0)
D	= Stream-specific B-A
E	= Stream-specific B-C
F	= Stream-specific C-B
Y	= (1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)				*MAJOR ROAD (ARM C)*				*MINOR ROAD (ARM B)*			
W	=	5.75	(metres)	W c-b	=		(metres)	W b-a	=	3.15	(metres)
W cr	=	0.85	(metres)	Vr c-b	=		(metres)	W b-c	=	3.65	(metres)
q a-b	=	0	(pcu/hr)	q c-a	=	380	(pcu/hr)	Vl b-a	=	74	(metres)
q a-c	=	190	(pcu/hr)	q c-b	=	0	(pcu/hr)	Vr b-a	=	62	(metres)
								Vr b-c	=	97	(metres)
								q b-a	=	40	(pcu/hr)
								q b-c	=	55	(pcu/hr)

GEOMETRIC FACTORS :

D	=	0.862065
E	=	0.979300
F	=	0.585955
Y	=	0.801625

THE CAPACITY OF MOVEMENT :

Q b-a	=	443
Q b-c	=	675
Q c-b	=	404
Q b-ac	=	553

CRITICAL DFC = 0.17

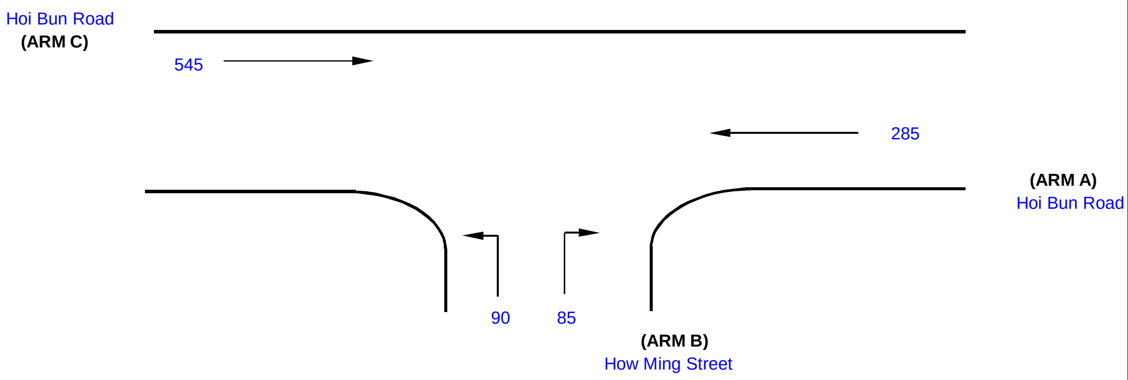
COMPARISION OF DESIGN FLOW TO CAPACITY :

DFC b-a	=	0.09
DFC b-c	=	0.08
DFC c-b	=	0.00
DFC b-ac	=	0.17

PRIORITY JUNCTION CAPACITY CALCULATION

AECOM

Junction J8 - Hoi Bun Road / How Ming Street	2017 PM Observed Traffic Flows	Designed By : SL	Checked By : DW	Job No. : 60493364	Date : Oct 19



J8

NOTES : (GEOMETRIC INPUT DATA)

W	= Major Road Width (6.4 - 20.0)
W cr	= Central Reserve width (1.2 - 9.0, kerbed central reserve only)
W b-a	= Lane width available to vehicle waiting in stream b-a (2.05 - 4.70)
W b-c	= Lane width available to vehicle waiting in stream b-c (2.05 - 4.70)
W c-b	= Lane width available to vehicle waiting in stream c-b (2.05 - 4.70)
Vl b-a	= Visibility to the left for vehicles waiting in stream b-a (22.0 - 250.0)
Vr b-a	= Visibility to the right for vehicles waiting in stream b-a (17.0 - 250.0)
Vr b-c	= Visibilitu to the right for vehicles waiting in stream b-c (17.0 - 250.0)
Vr c-b	= Visibility to the right for vehicles waiting in stream c-b (17.0 - 250.0)
D	= Stream-specific B-A
E	= Stream-specific B-C
F	= Stream-specific C-B
Y	= (1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)				*MAJOR ROAD (ARM C)*				*MINOR ROAD (ARM B)*			
W	=	5.75	(metres)	W c-b	=		(metres)	W b-a	=	3.15	(metres)
W cr	=	0.85	(metres)	Vr c-b	=		(metres)	W b-c	=	3.65	(metres)
q a-b	=	0	(pcu/hr)	q c-a	=	545	(pcu/hr)	Vl b-a	=	74	(metres)
q a-c	=	285	(pcu/hr)	q c-b	=	0	(pcu/hr)	Vr b-a	=	62	(metres)
								Vr b-c	=	97	(metres)
								q b-a	=	85	(pcu/hr)
								q b-c	=	90	(pcu/hr)

GEOMETRIC FACTORS :

D	=	0.862065
E	=	0.979300
F	=	0.585955
Y	=	0.801625

`

THE CAPACITY OF MOVEMENT :

Q b-a	=	393
Q b-c	=	648
Q c-b	=	388
Q b-ac	=	493

CRITICAL DFC = 0.36

COMPARISION OF DESIGN FLOW TO CAPACITY :

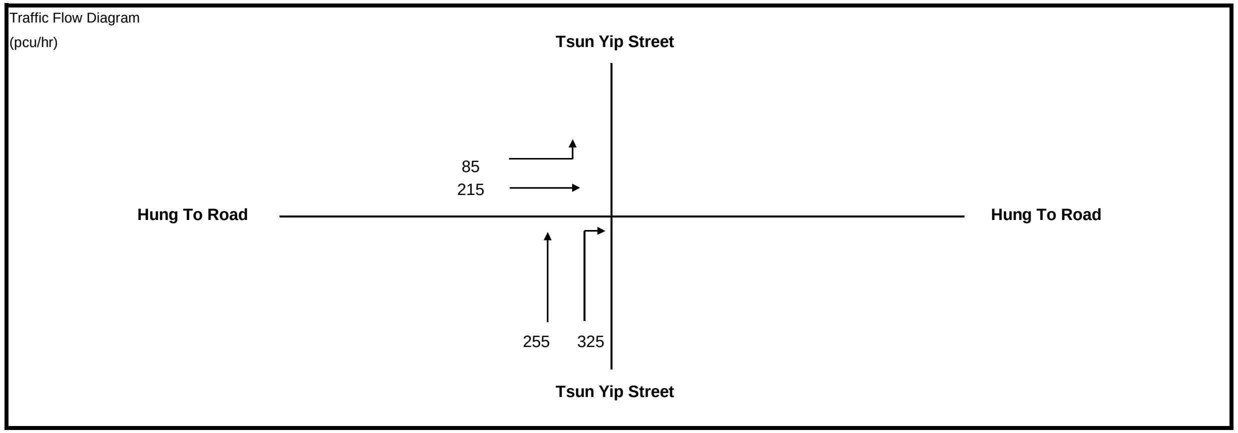
DFC b-a	=	0.22
DFC b-c	=	0.14
DFC c-b	=	0.00
DFC b-ac	=	0.36

JUNCTION CAPACITY CALCULATION

AECOM

Junction J9 - Hung To Road / Tsun Yip Street	2017 AM Observed Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

Traffic Flow Diagram
(pcu/hr)

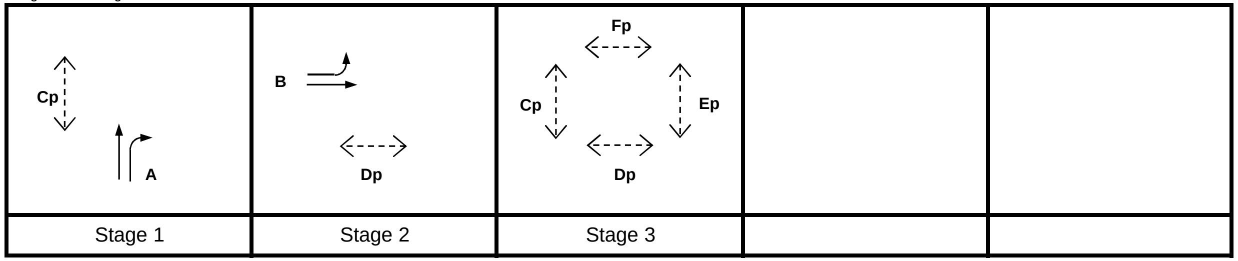


J9

No. of stages per cycle	N =	3	
Cycle time	C =	118	sec
Sum(y)	Y =	0.296	
Lost time	L =	27	sec
Total Flow	=	880	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$		65	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	38	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.698	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\text{x}100\%$	=	135.7	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	40	sec
Y_{max}	$= 1-L/C$	=	0.771	

Stage/Phase Diagrams



I/G = 5 I/G = 8 G = 7 I/G = 9

Critical Case : A,B,Ep

R.C.(C) $= (0.9\text{x}Y_{max}-Y)/Y\text{x}100\% =$ 135%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	B	2	3.300	1	11			1		0		1945	85			85	100%		1712	0.050	
	B	2	3.300	1				1		0		1945		215		215			1945	0.111	0.111
	A	1	3.400	1				1		0		1955		255		255			1955	0.130	
	A	1	3.400	1		13	0	1		0		1955			325	325		100%	1753	0.185	0.185
Pedestrian Crossing				GM		FGM															
	Cp	1,3	min.	6	+	6	=	12	sec												
	Dp	2,3	min.	9	+	9	=	18	sec												
	Ep	3	min.	7	+	7	=	14	sec												*
	Fp	3	min.	7	+	7	=	14	sec												

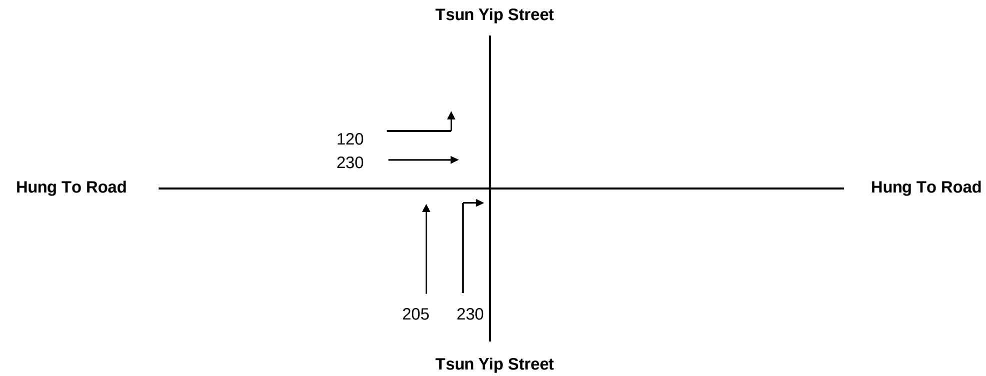
JUNCTION CAPACITY CALCULATION

AECOM

Junction J9 - Hung To Road / Tsun Yip Street	2017 PM Observed Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

J9

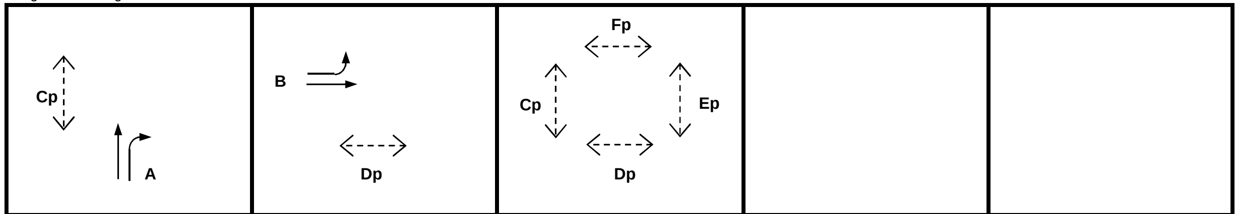
Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	3	
Cycle time	C =	118	sec
Sum(y)	Y =	0.249	
Lost time	L =	27	sec
Total Flow	=	785	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y)$ =		61	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	36	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.698	
R.C.$_{ult}$	$= (Y_{ult}-Y)/Y\times 100\%$	=	179.6	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	37	sec
Y_{max}	= 1-L/C	=	0.771	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G = 5 I/G = 8 G = 7 I/G = 9

Critical Case : A,B,Ep

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\%$ = 178%

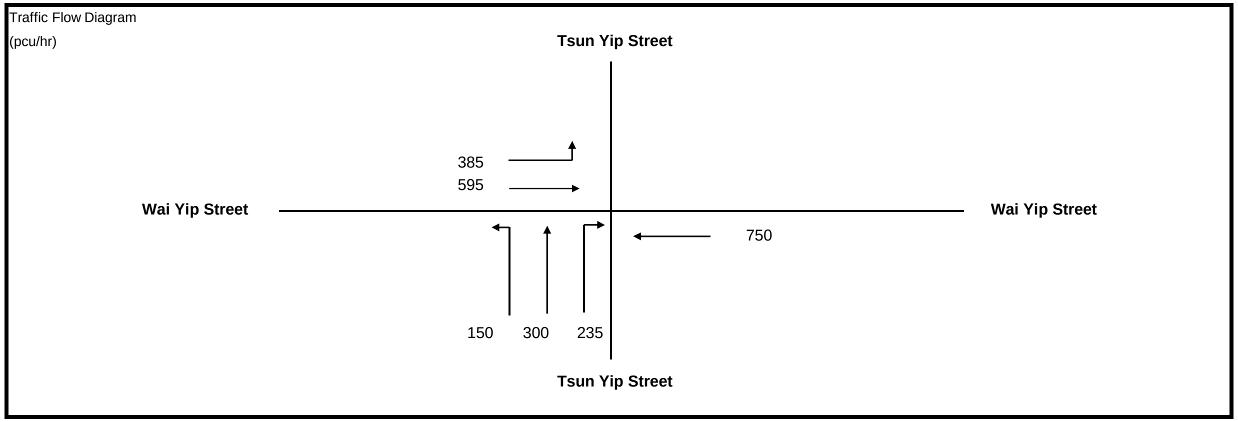
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m)		OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr)			TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%)		REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
					LEFT	RIGHT							LEFT	STRAIGHT AHEAD	RIGHT		LEFT	RIGHT			
	B	2	3.300	1	11			1		0		1945	120			120	100%		1712	0.070	
	B	2	3.300	1				1		0		1945		230		230			1945	0.118	0.118
	A	1	3.400	1				1		0		1955		205		205			1955	0.105	
	A	1	3.400	1		13	0	1		0		1955			230	230		100%	1753	0.131	0.131
Pedestrian Crossing				GM		FGM															
	Cp	1,3	min.	6	+	6	=	12	sec												
	Dp	2,3	min.	9	+	9	=	18	sec												
	Ep	3	min.	7	+	7	=	14	sec												*
	Fp	3	min.	7	+	7	=	14	sec												

JUNCTION CAPACITY CALCULATION

AECOM

Junction J10 - Wai Yip Street / Tsun Yip Street	2017 AM Observed Traffic Flows	DESIGN: SL	CHECK: SL	JOB NO: 60493364	DATE: Jul 19

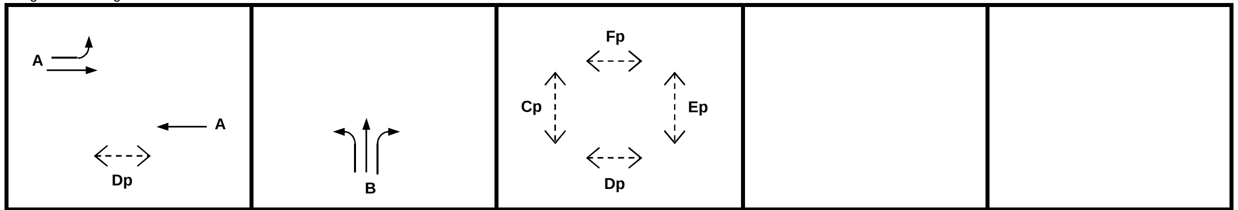
Traffic Flow Diagram
(pcu/hr)



J10

No. of stages per cycle	N =	3	
Cycle time	C =	118	sec
Sum(y)	Y =	0.383	
Lost time	L =	39	sec
Total Flow	=	15,970	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	103	sec
Min. Cycle Time C_m	$= L/(1-Y) =$	63	sec
Y_{ult}	$= 0.9-0.0075\times L =$	0.608	
R.C.$_{ult}$	$= (Y_{ult}-Y)/Y\text{x}100\% =$	58.6	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y) =$	68	sec
Y_{max}	$= 1-L/C =$	0.669	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G = 7 I/G = 8 G = 12 I/G = 14

Critical Case : A,B,Fp

R.C.(C) $= (0.9\text{x}Y_{max}-Y)/Y\text{x}100\% =$ 57%

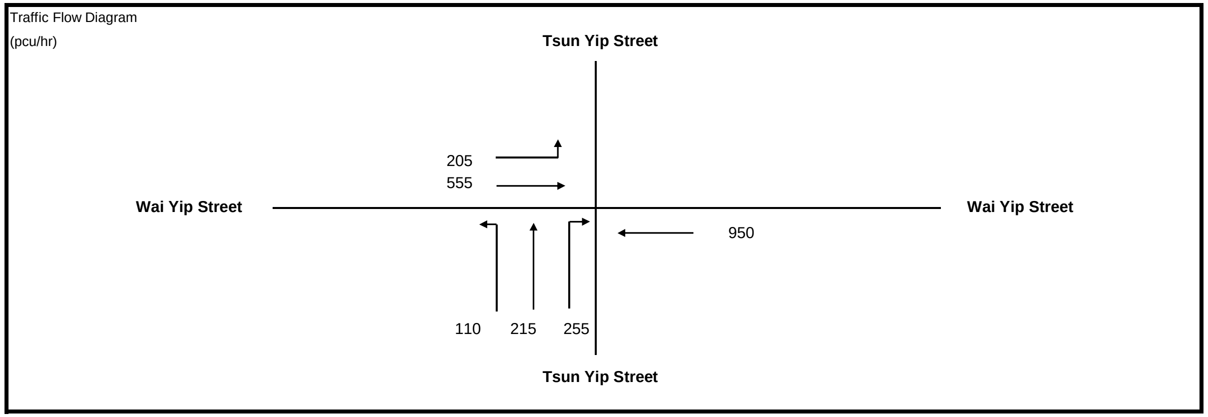
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.000	1	10			1		0		1915	385	58		443	87%		1694	0.261	0.261
	A	1	3.000	1				0		0		2055		537		537			2055	0.261	
	A	1	3.000	3				1		0		6025		750		750			6025	0.124	
	B	2	3.300	1	12.5			1		0		1945	150	68		218	69%		1797	0.122	
	B	2	3.300	1		18	0			0		2085		232	20	252		8%	2071	0.122	
	B	2	3.300	1		15	0	1		0		1945			215	215		100%	1768	0.122	0.122
Pedestrian Crossing				GM		FGM															
	Cp	3	min.	9	+	8	=	17	sec												
	Dp	1,3	min.	14	+	14	=	28	sec												
	Ep	3	min.	9	+	8	=	17	sec												
	Fp	3	min.	12	+	12	=	24	sec												*

Remarks: 1 lane of Wai Yip Street (EB) is deducted due to kerbside activities.

JUNCTION CAPACITY CALCULATION

AECOM

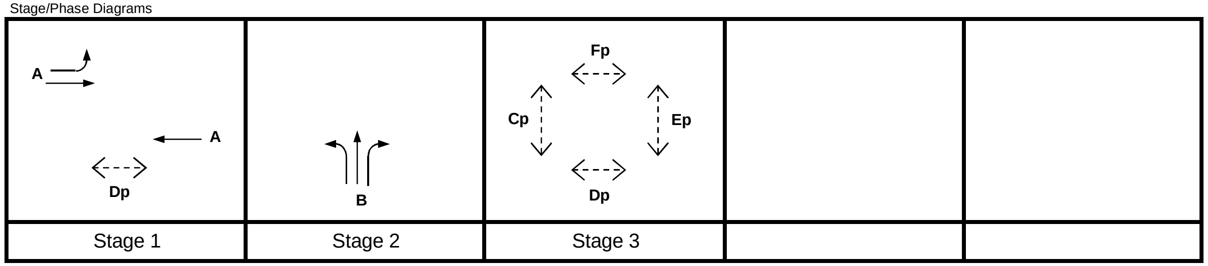
Junction J10 - Wai Yip Street / Tsun Yip Street	2017 PM Observed Traffic Flows	DESIGN: SL	CHECK: SL	JOB NO: 60493364	DATE: Jul 19



J10

No. of stages per cycle	N =	3	
Cycle time	C =	118	sec
Sum(y)	Y =	0.303	
Lost time	L =	39	sec
Total Flow	=	15,970	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	91	sec
Min. Cycle Time C_m	$= L/(1-Y) =$	56	sec
Y_{ult}	$= 0.9-0.0075\times L =$	0.608	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times 100\% =$	100.8	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y) =$	59	sec
Y_{max}	$= 1-L/C =$	0.669	

Stage/Phase Diagrams



I/G = 7 I/G = 8 G = 12 I/G = 14

Critical Case : A,B,Fp

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 99%

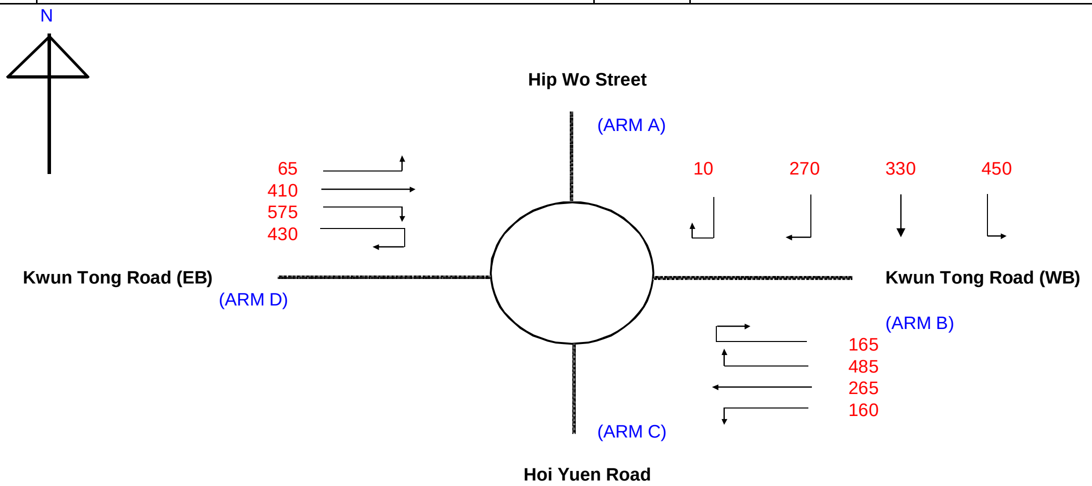
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.000	1	10			1		0		1915	205	146		351	58%		1761	0.199	
	A	1	3.000	1				0		0		2055		409		409			2055	0.199	0.199
	A	1	3.000	3				1		0		6025		950		950			6025	0.158	
	B	2	3.300	1	12.5			1		0		1945	110	78		188	59%		1817	0.103	
	B	2	3.300	1		18	0			0		2085		137	72	209		35%	2027	0.103	0.103
	B	2	3.300	1		15	0	1		0		1945			183	183		100%	1768	0.103	
Pedestrian Crossing				GM		FGM															
	Cp	3	min.	9	+	8	=	17	sec												
	Dp	1,3	min.	14	+	14	=	28	sec												
	Ep	3	min.	9	+	8	=	17	sec												
	Fp	3	min.	12	+	12	=	24	sec												*

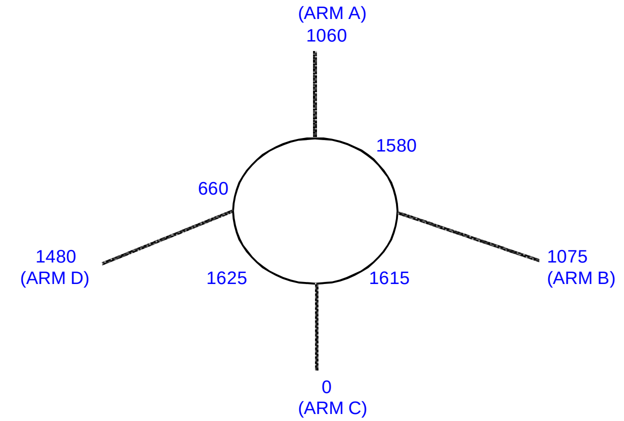
Remarks: 1 lane of Wai Yip Street (EB) is deducted due to kerbside activities.

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J11 Kwung Tong Road / Hip Wo Street	Scenario	20170 AM Observed Traffic Flows	Project No.	Prepared By	Checked By	Date
				60493364	SL	DW	25/Sep/19





ARM	A	B	C	D
INPUT PARAMETERS:				
V = Approach half width (m)	7.00	7.00	8.00	8.00
E = Entry width (m)	8.00	7.30	9.00	9.00
L = Effective length of flare (m)	10.00	15.00	20.00	20.00
R = Entry radius (m)	100.00	45.00	40.00	40.00
D = Inscribed circle diameter (m)	83.00	86.00	83.00	86.00
A = Entry angle (degree)	30.00	40.00	25.00	25.00
Q = Entry flow (pcu/h)	1060	1075	0	1480
Qc= Circulating flow across entry (pcu/h)	1580	1615	1625	660
OUTPUT PARAMETERS:				
S = Sharpness of flare = 1.6(E-V)/L	0.16	0.03	0.08	0.08
K = 1-0.00347(A-30)-0.978(1/R-0.05)	1.04	0.99	1.04	1.04
X2= V + ((E-V)/(1+2S))	7.76	7.28	8.86	8.86
M = EXP((D-60)/10)	9.97	13.46	9.97	13.46
F = 303*X2	2351	2206	2685	2685
Td= 1+(0.5/(1+M))	1.05	1.03	1.05	1.03
Fc= 0.21*Td(1+0.2*X2)	0.56	0.53	0.61	0.60
Qe= K(F-Fc*Qc)	1523	1334	1767	2383
DFC = Design flow/Capacity = Q/Qe	0.70	0.81	0.00	0.62

TOTAL ENTRY FLOWS = 3615 PCU

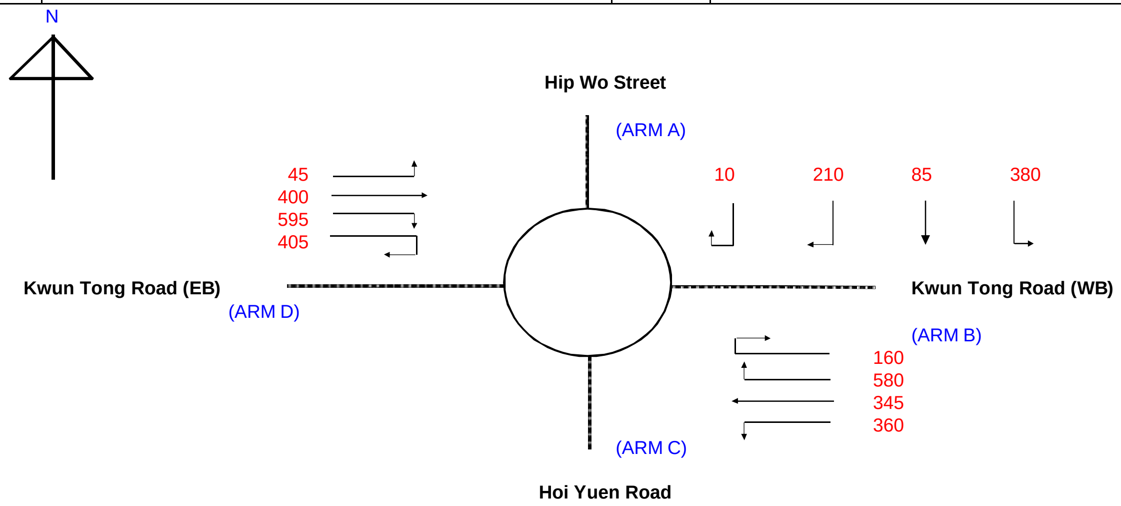
CRITICAL DFC = 0.81

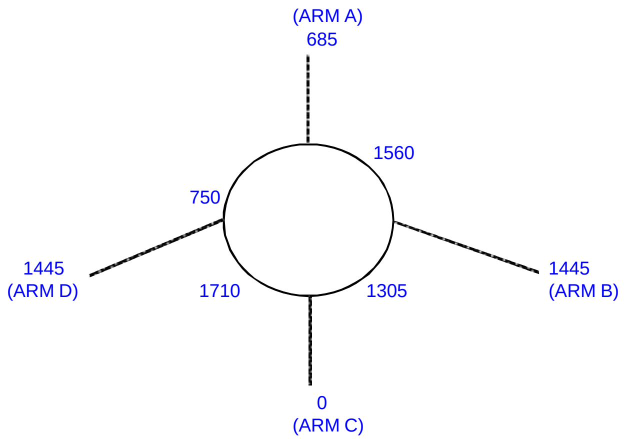
Filename : C:\old d drive data\Since\60493364 KTTA\20190703 Junction Calculation\[J11RA

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J11 Kwung Tong Road / Hip Wo Street	Scenario	2017 PM Observed Traffic Flows	Project No.	Prepared By	Checked By	Date
				60493364	SL	DW	25/Sep/19





ARM	A	B	C	D
INPUT PARAMETERS:				
V = Approach half width (m)	7.00	7.00	8.00	8.00
E = Entry width (m)	8.00	7.30	9.00	9.00
L = Effective length of flare (m)	10.00	15.00	20.00	20.00
R = Entry radius (m)	100.00	45.00	40.00	40.00
D = Inscribed circle diameter (m)	83.00	86.00	83.00	86.00
A = Entry angle (degree)	30.00	40.00	25.00	25.00
Q = Entry flow (pcu/h)	685	1445	0	1445
Qc= Circulating flow across entry (pcu/h)	1560	1305	1710	750
OUTPUT PARAMETERS:				
S = Sharpness of flare = 1.6(E-V)/L	0.16	0.03	0.08	0.08
K = 1-0.00347(A-30)-0.978(1/R-0.05)	1.04	0.99	1.04	1.04
X2= V + ((E-V)/(1+2S))	7.76	7.28	8.86	8.86
M = EXP((D-60)/10)	9.97	13.46	9.97	13.46
F = 303*X2	2351	2206	2685	2685
Td= 1+(0.5/(1+M))	1.05	1.03	1.05	1.03
Fc= 0.21*Td(1+0.2*X2)	0.56	0.53	0.61	0.60
Qe= K(F-Fc*Qc)	1534	1499	1713	2327
DFC = Design flow/Capacity = Q/Qe	0.45	0.96	0.00	0.62

TOTAL ENTRY FLOWS = 3575 PCU

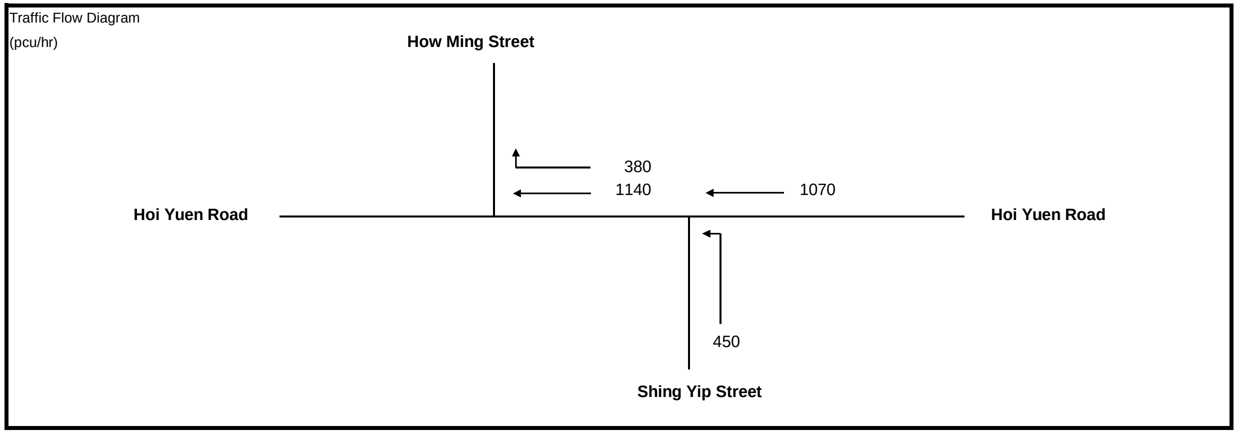
CRITICAL DFC = 0.96

JUNCTION CAPACITY CALCULATION

AECOM

Junction J12 - Hoi Yuen Road / How Ming Street / Shing Yip Street	2017 AM Observed Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

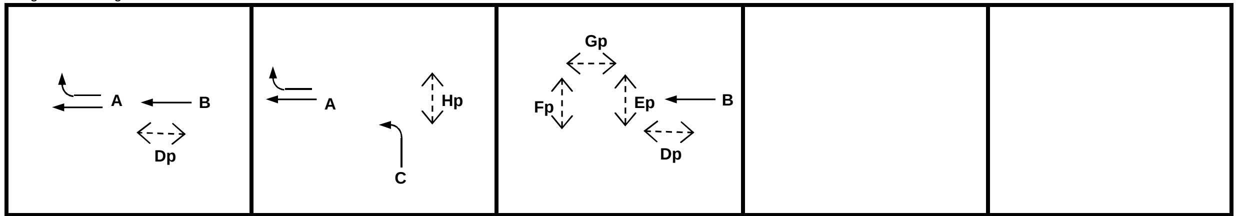
Traffic Flow Diagram
(pcu/hr)



J12

No. of stages per cycle	N =	3	
Cycle time	C =	100	sec
Sum(y)	Y =	0.391	
Lost time	L =	29	sec
Total Flow	=	3,040	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	80	sec
Min. Cycle Time C_m	$= L/(1-Y)$ =	48	sec
Y_{ult}	$= 0.9-0.0075\times L$ =	0.683	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times100\%$ =	74.4	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$ =	51	sec
Y_{max}	= 1-L/C =	0.710	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G = I/G = 6 G = 8 I/G = 16

Critical Case : A,Ep

R.C.(C) = $(0.9xY_{max}-Y)/Yx100\%$ = 63%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1,2	4.000	1				1		0		2015		789		789			2015	0.391	0.391
	A	1,2	4.000	1		10	0	1		0		2015		352	380	732		52%	1869	0.391	
	B	1,3	4.000	2				1		0		4170		1070		1070			4170	0.257	
	C	2	3.000	3	8			1		0		6025	450			450	100%		5074	0.089	
Pedestrian Crossing				GM		FGM															
	Dp	1,3	min.	8	+	9	=	17	sec												
	Ep	3	min.	8	+	13	=	21	sec												*
	Fp	3	min.	8	+	11	=	19	sec												
	Gp	3	min.	8	+	8	=	16	sec												
	Hp	2	min.	8	+	10	=	18	sec												

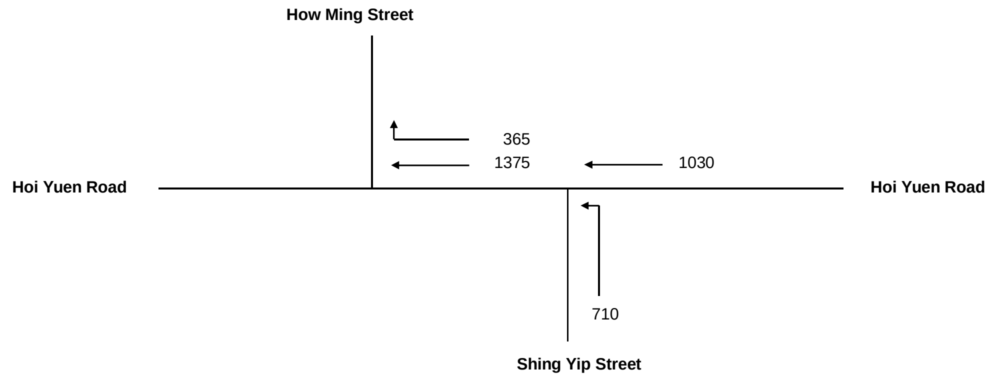
*Remark: Due to kerbside activities, there are only 2 lanes for Hoi Yuen Road westbound traffic.

JUNCTION CAPACITY CALCULATION

AECOM

Junction J12 - Hoi Yuen Road / How Ming Street / Shing Yip Street	2017 PM Observed Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

Traffic Flow Diagram
(pcu/hr)

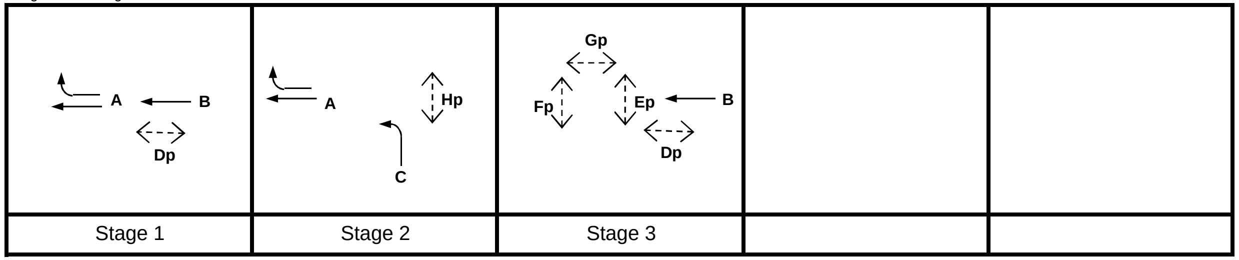


J12

No. of stages per cycle	N =	3	
Cycle time	C =	90	sec
Sum(y)	Y =	0.445	
Lost time	L =	29	sec
Total Flow	=	3,480	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y)$ =		87	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	52	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.683	
R.C.$_{ult}$	$= (Y_{ult}-Y)/Y\times100\%$	=	53.3	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	57	sec
Y_{max}	= 1-L/C	=	0.678	

Stage/Phase Diagrams



I/G = I/G = 6 G = 8 I/G = 16

Critical Case : A,Ep

R.C.(C) = $(0.9\times Y_{max}-Y)/Y\times100\%$ = 37%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1,2	4.000	1				1		0		2015		897		897			2015	0.445	
	A	1,2	4.000	1		10	0	1		0		2015		478	365	843		43%	1892	0.445	0.445
	B	1,3	4.000	2				1		0		4170		1030		1030			4170	0.247	
	C	2	3.000	3	8			1		0		6025	710			710	100%		5074	0.140	
Pedestrian Crossing				GM		FGM															
	Dp	1,3	min.	8	+	9	=	17	sec												
	Ep	3	min.	8	+	13	=	21	sec												*
	Fp	3	min.	8	+	11	=	19	sec												
	Gp	3	min.	8	+	8	=	16	sec												
	Hp	2	min.	8	+	10	=	18	sec												

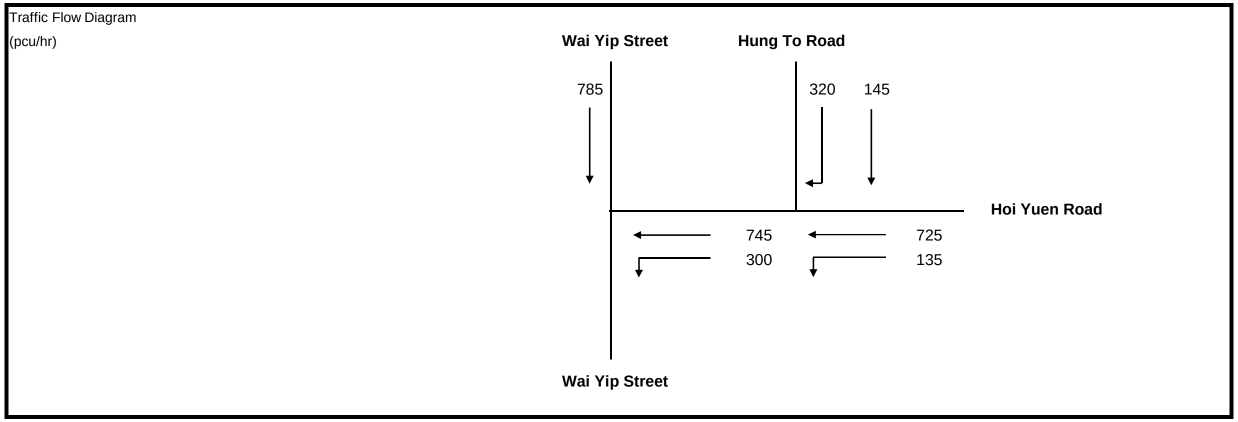
*Remark: Due to kerbside activities, there are only 2 lanes for Hoi Yuen Road westbound traffic.

JUNCTION CAPACITY CALCULATION

AECOM

Junction J13 - Wai Yip Street / Hoi Yuen Road / Hung To Road	2017 AM Observed Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

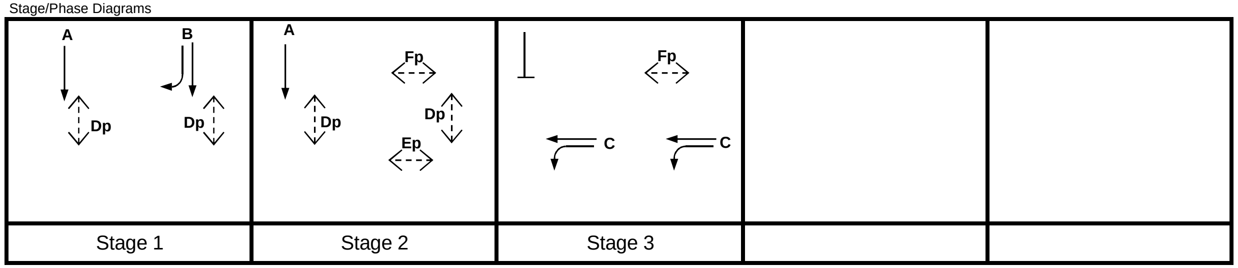
Traffic Flow Diagram
(pcu/hr)



J13

No. of stages per cycle	N =	3	
Cycle time	C =	100	sec
Sum(y)	Y =	0.310	
Lost time	L =	29	sec
Total Flow	=	3,155	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	70	sec
Min. Cycle Time C_m	$= L/(1-Y) =$	42	sec
Y_{ult}	$= 0.9-0.0075\times L =$	0.683	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\text{x}100\% =$	120.1	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y) =$	44	sec
Y_{max}	$= 1-L/C =$	0.710	

Stage/Phase Diagrams



I/G = 8 G = 5 I/G = 12 I/G = 6

Critical Case : B,Ep,C

R.C.(C) $= (0.9\text{x}Y_{max}\text{-}Y)/Y\text{x}100\% =$ 106%

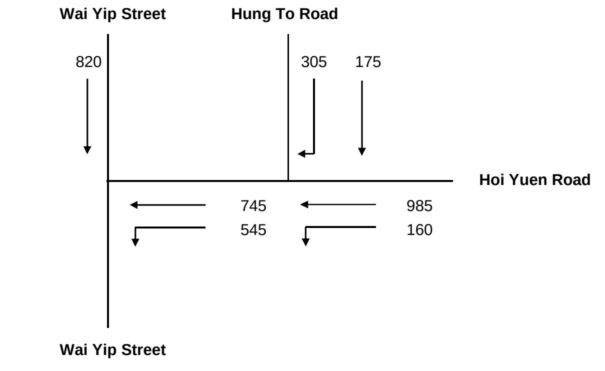
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1,2	4.000	3				1		0		6325		785		785			6325	0.124	
	B	1	3.500	1		12	0	1		0		1965		145	93	238		39%	1873	0.127	0.127
	B	1	3.500	1		15	0	1		0		1965			227	227		100%	1786	0.127	
	C	3	3.500	1	8			1		0		1965	135	128		263	51%		1792	0.147	
	C	3	3.500	2				1		0		4070		597		597			4070	0.147	
	C	3	3.500	1	30			1		0		1965	300			300	100%		1871	0.160	
	C	3	3.500	1	32					0		2105	0	385		385	0%		2105	0.183	0.183
	C	3	3.500	1				1		0		1965		360		360			1965	0.183	
Pedestrian Crossing				GM		FGM															
	Dp	1,2	min.	5	+	12	=	17	sec												
	Ep	2	min.	5	+	9	=	14	sec												*
	Fp	2,3	min.	5	+	11	=	16	sec												

JUNCTION CAPACITY CALCULATION

AECOM

Junction J13 - Wai Yip Street / Hoi Yuen Road / Hung To Road	2017 PM Observed Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

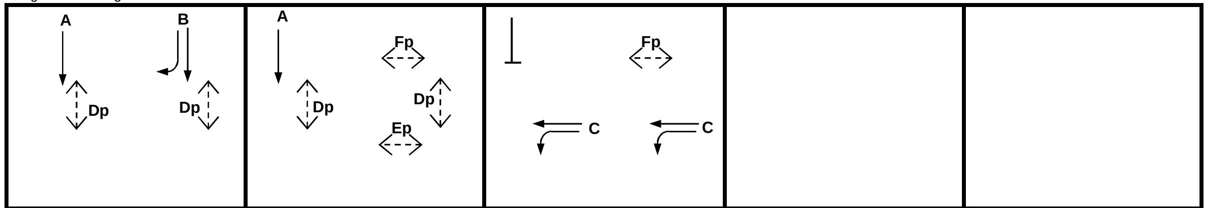
Traffic Flow Diagram
(pcu/hr)



J13

No. of stages per cycle	N =	3	
Cycle time	C =	90	sec
Sum(y)	Y =	0.349	
Lost time	L =	29	sec
Total Flow	=	3,735	pcu
Optimum Cycle C_o = $(1.5\times L+5)/(1-Y)$	=	74	sec
Min. Cycle Time C_m = $L/(1-Y)$	=	45	sec
Y_{ult} = $0.9-0.0075\times L$	=	0.683	
$R.C._{ult}$ = $(Y_{ult}-Y)/Y\text{x}100\%$	=	95.8	%
Practical Cycle Time C_p = $0.9\times L/(0.9-Y)$	=	47	sec
Y_{max} = $1-L/C$	=	0.678	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G = 8 G = 5 I/G = 12 I/G = 6

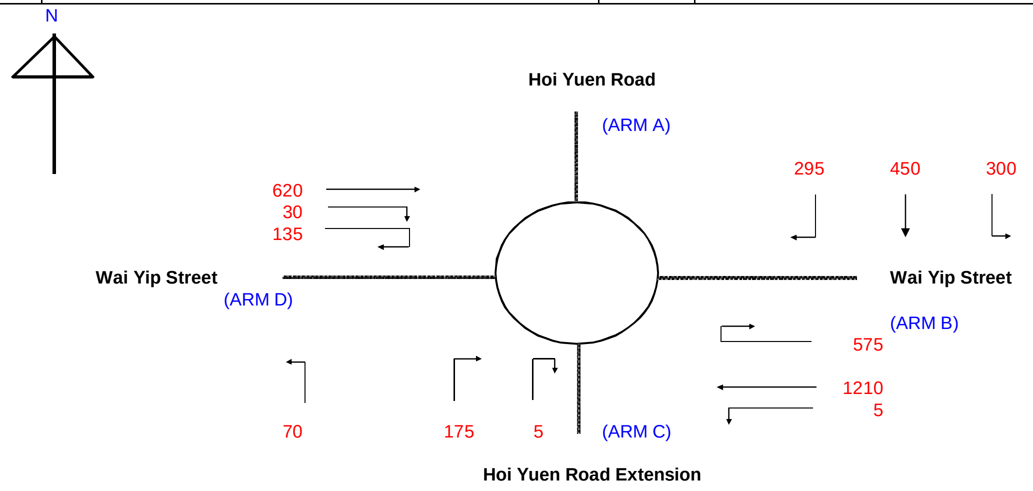
Critical Case : B,Ep,C

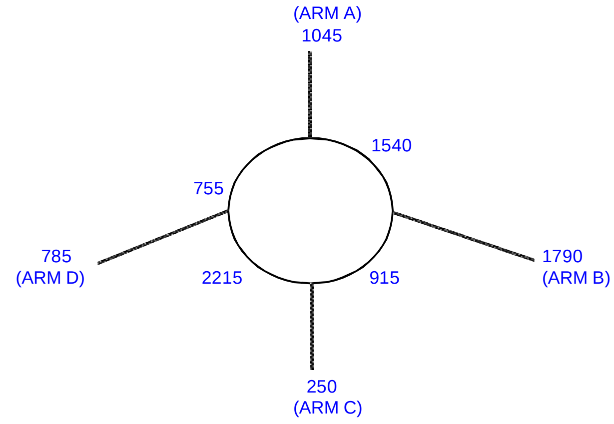
R.C.(C) = $(0.9\text{x}Y_{max}-Y)/Y\text{x}100\%$ = 75%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1,2	4.000	3				1		0		6325		820		820			6325	0.130	
	B	1	3.500	1		12	0	1		0		1965		175	72	247		29%	1896	0.130	0.130
	B	1	3.500	1		15	0	1		0		1965			233	233		100%	1786	0.130	
	C	3	3.500	1	8			1		0		1965	160	193		353	45%		1811	0.195	
	C	3	3.500	2				1		0		4070		792		792			4070	0.195	
	C	3	3.500	1	30			1		0		1965	408			408	100%		1871	0.218	0.218
	C	3	3.500	1	32					0		2105	137	316		453	30%		2076	0.218	
	C	3	3.500	1				1		0		1965		429		429			1965	0.218	
Pedestrian Crossing				GM		FGM															
	Dp	1,2	min.	5	+	12	=	17	sec												
	Ep	2	min.	5	+	9	=	14	sec												*
	Fp	2,3	min.	5	+	11	=	16	sec												

ROUNDABOUT CAPACITY CALCULATION

Junction	J14 Hoi Yuen Road / Wai Yip Street	Scenario	2017 AM Observed Traffic Flows	Project No.	Prepared By	Checked By	Date
				60493364	SL	DW	27/Jun/19





ARM	A	B	C	D
INPUT PARAMETERS:				
V = Approach half width (m)	11.60	7.30	6.50	8.90
E = Entry width (m)	11.60	7.60	8.30	8.10
L = Effective length of flare (m)	1.00	6.00	13.00	1.00
R = Entry radius (m)	30.00	45.00	25.00	15.00
D = Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A = Entry angle (degree)	60.00	55.00	40.00	40.00
Q = Entry flow (pcu/h)	1045	1790	250	785
Qc= Circulating flow across entry (pcu/h)	1540	915	2215	755
OUTPUT PARAMETERS:				
S = Sharpness of flare = 1.6(E-V)/L	0.00	0.08	0.22	-1.28
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.91	0.94	0.98	0.95
X2= V + ((E-V)/(1+2S))	11.60	7.56	7.75	9.41
M = EXP((D-60)/10)	0.37	0.37	0.37	0.37
F = 303*X2	3515	2290	2347	2852
Td= 1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc= 0.21*Td(1+0.2*X2)	0.95	0.72	0.73	0.83
Qe= K(F-Fc*Qc)	1869	1534	710	2114
DFC = Design flow/Capacity = Q/Qe	0.56	1.17	0.35	0.37

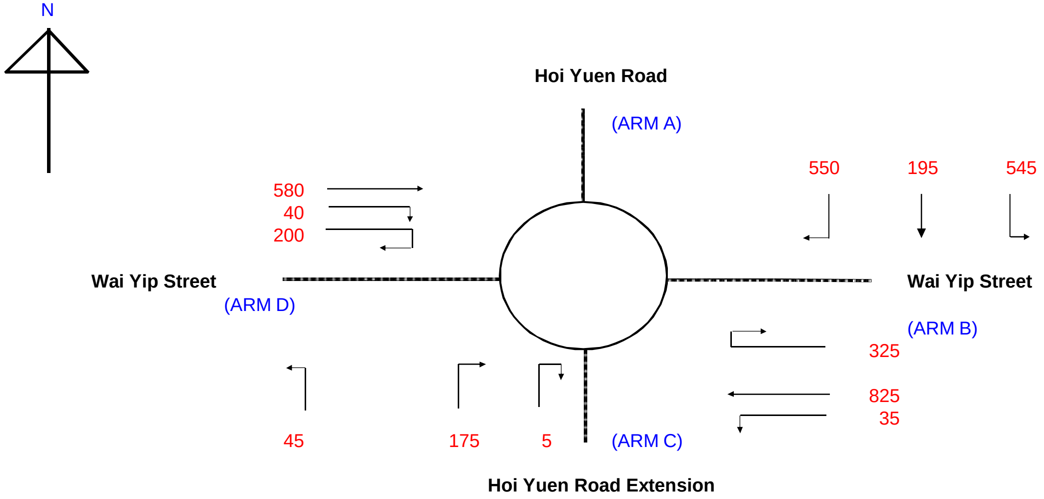
TOTAL ENTRY FLOWS = 3870 PCU

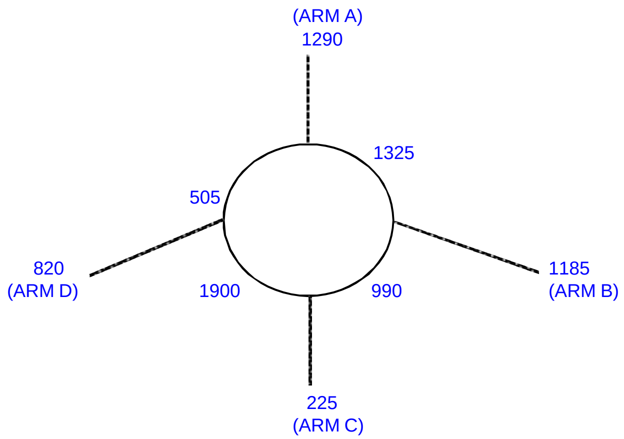
CRITICAL DFC = 1.17

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J14 Hoi Yuen Road / Wai Yip Street	Scenario	2017 PM Observed Traffic Flows	Project No.	Prepared By	Checked By	Date
				60493364	SL	DW	27/Jun/19





ARM	A	B	C	D
INPUT PARAMETERS:				
V = Approach half width (m)	11.60	7.30	6.50	8.90
E = Entry width (m)	11.60	7.60	8.30	8.10
L = Effective length of flare (m)	1.00	6.00	13.00	1.00
R = Entry radius (m)	30.00	45.00	25.00	15.00
D = Inscribed circle diameter (m)	50.00	50.00	50.00	50.00
A = Entry angle (degree)	60.00	55.00	40.00	40.00
Q = Entry flow (pcu/h)	1290	1185	225	820
Qc= Circulating flow across entry (pcu/h)	1325	990	1900	505
OUTPUT PARAMETERS:				
S = Sharpness of flare = 1.6(E-V)/L	0.00	0.08	0.22	-1.28
K = 1-0.00347(A-30)-0.978(1/R-0.05)	0.91	0.94	0.98	0.95
X2= V + ((E-V)/(1+2S))	11.60	7.56	7.75	9.41
M = EXP((D-60)/10)	0.37	0.37	0.37	0.37
F = 303*X2	3515	2290	2347	2852
Td= 1+(0.5/(1+M))	1.37	1.37	1.37	1.37
Fc= 0.21*Td(1+0.2*X2)	0.95	0.72	0.73	0.83
Qe= K(F-Fc*Qc)	2055	1483	934	2310
DFC = Design flow/Capacity = Q/Qe	0.63	0.80	0.24	0.35

TOTAL ENTRY FLOWS = 3520 PCU

CRITICAL DFC = 0.80

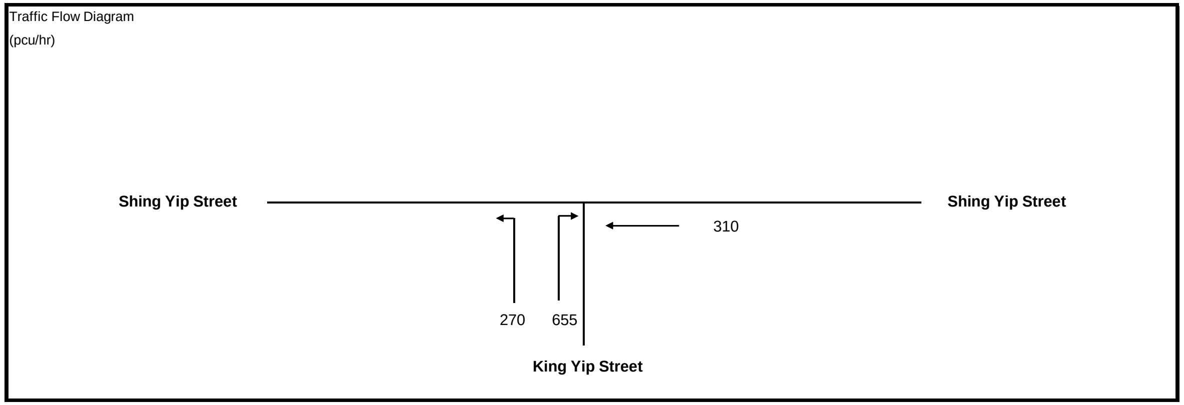
Filename : D:\Users\lausys\Desktop\TIA\[J14RA - Wai Yip St & Hoi Yuen Rd.xlsx]2017PM

JUNCTION CAPACITY CALCULATION

AECOM

Junction J15 - Shing Yip Street / King Yip Street	2017 AM Observed Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jul 19

Traffic Flow Diagram
(pcu/hr)

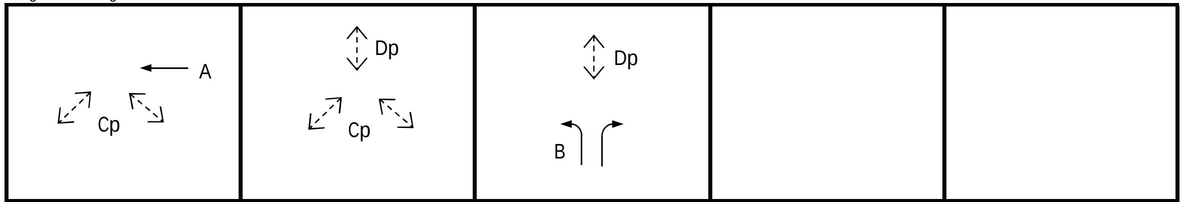


J15

No. of stages per cycle	N =	3	
Cycle time	C =	140	sec
Sum(y)	Y =	0.347	
Lost time	L =	20	sec
Total Flow	=	1,235	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	54	sec
Min. Cycle Time C_m	$= L/(1-Y)$ =	31	sec
Y_{ult}	$= 0.9-0.0075\times L$ =	0.750	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times100\%$ =	116.0	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$ =	33	sec
Y_{max}	= 1-L/C =	0.857	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G = 5 I/G = 12 I/G = 5

Critical Case : A,IG(AtoB),B

R.C.(C) $= (0.9\text{x}Y_{max}\text{-}Y)/Y\text{x}100\%$ = 122%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
←	A	1	3.000	2				1		0		3970		310		310			3970	0.078	0.078
↰	B	3	3.500	1	15			1		0		1965	107			107	100%		1786	0.060	
Flared Lane													163								
↱	B	3	3.500	1		20	0	1		0		1965			492	492		100%	1828	0.269	0.269
Flared Lane															163						
Pedestrian Crossing				GM		FGM															
	Cp	1,2	min.	10	+	12	=	22	sec												
	C1p	1	min.	10	+		=	10	sec												
	C2p	2	min.		+	12	=	12	sec												
	Dp	2,3	min.	7	+	8	=	15	sec												
	D1p	2	min.	7	+		=	7	sec												
	D2p	3	min.		+	8	=	8	sec												
	IG(AtoB)	2	min.		+	12	=	12	sec												*

*Remark: Flows of Phase B are deducted by flows capacity of the flared lane.

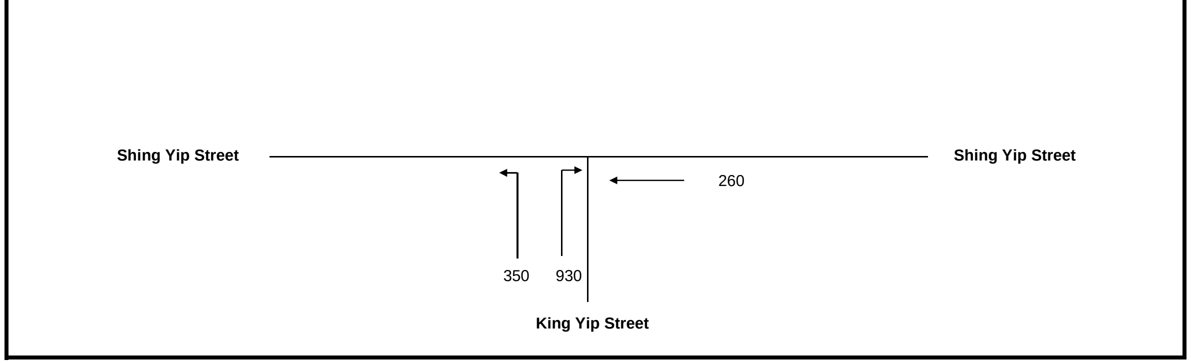
*Remark: As this calculation sheet cannot analyse pedestrian crossing whith 2 phases, so Cp and Dp are sub-divided for analysis.

JUNCTION CAPACITY CALCULATION

AECOM

Junction J15 - Shing Yip Street / King Yip Street	2017 PM Observed Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jul 19

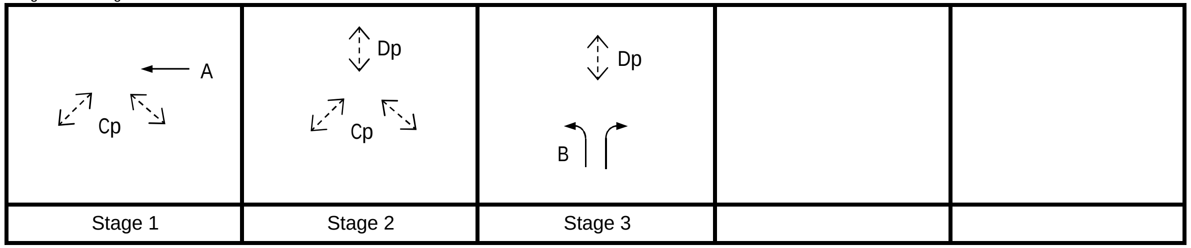
Traffic Flow Diagram
(pcu/hr)



J15

No. of stages per cycle	N =	3	
Cycle time	C =	140	sec
Sum(y)	Y =	0.485	
Lost time	L =	20	sec
Total Flow	=	1,540	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	68	sec
Min. Cycle Time C_m	$= L/(1-Y) =$	39	sec
Y_{ult}	$= 0.9-0.0075\times L =$	0.750	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times100\% =$	54.6	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y) =$	43	sec
Y_{max}	$= 1-L/C =$	0.857	

Stage/Phase Diagrams



I/G = 5 I/G = 12 I/G = 5

Critical Case : A,IG(AtoB),B

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 59%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
←	A	1	3.000	2				1		0		3970		260		260			3970	0.065	0.065
↰	B	3	3.500	1	15			1		0		1965	187			187	100%		1786	0.105	
Flared Lane													163								
↱	B	3	3.500	1		20	0	1		0		1965			767	767		100%	1828	0.420	0.420
Flared Lane															163						
Pedestrian Crossing				GM		FGM															
	Cp	1,2	min.	10	+	12	=	22	sec												
	C1p	1	min.	10	+		=	10	sec												
	C2p	2	min.		+	12	=	12	sec												
	Dp	2,3	min.	7	+	8	=	15	sec												
	D1p	2	min.	7	+		=	7	sec												
	D2p	3	min.		+	8	=	8	sec												
	IG(AtoE	2	min.		+	12	=	12	sec												*

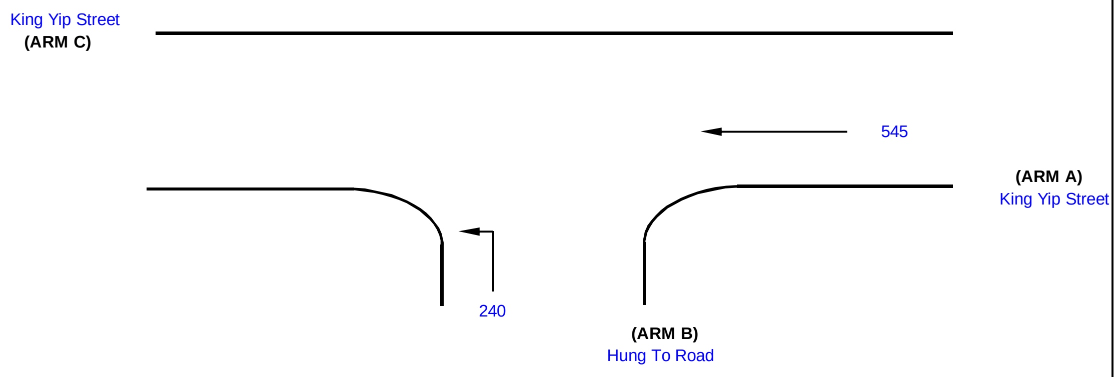
*Remark: Flows of Phase B are deducted by flows capacity of the flared lane.

*Remark: As this calculation sheet cannot analyse pedestrian crossing whith 2 phases, so Cp and Dp are sub-divided for analysis.

PRIORITY JUNCTION CAPACITY CALCULATION

AECOM

Junction J16 - Hung To Road / King Yip Street	2017 AM Observed Traffic Flows	Designed By : SL	Checked By : DW	Job No. : 60493364	Date : Oct 19



J16

NOTES : (GEOMETRIC INPUT DATA)

W	= Major Road Width (6.4 - 20.0)
W cr	= Central Reserve width (1.2 - 9.0, kerbed central reserve only)
W b-a	= Lane width available to vehicle waiting in stream b-a (2.05 - 4.70)
W b-c	= Lane width available to vehicle waiting in stream b-c (2.05 - 4.70)
W c-b	= Lane width available to vehicle waiting in stream c-b (2.05 - 4.70)
Vl b-a	= Visibility to the left for vehicles waiting in stream b-a (22.0 - 250.0)
Vr b-a	= Visibility to the right for vehicles waiting in stream b-a (17.0 - 250.0)
Vr b-c	= Visibilitu to the right for vehicles waiting in stream b-c (17.0 - 250.0)
Vr c-b	= Visibility to the right for vehicles waiting in stream c-b (17.0 - 250.0)
D	= Stream-specific B-A
E	= Stream-specific B-C
F	= Stream-specific C-B
Y	= (1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)			*MAJOR ROAD (ARM C)*			*MINOR ROAD (ARM B)*		
W	=	8 (metres)	W c-b	=	(metres)	W b-a	=	(metres)
W cr	=	0 (metres)	Vr c-b	=	(metres)	W b-c	=	4.07 (metres)
q a-b	=	0 (pcu/hr)	q c-a	=	0 (pcu/hr)	Vl b-a	=	(metres)
q a-c	=	545 (pcu/hr)	q c-b	=	0 (pcu/hr)	Vr b-a	=	(metres)
						Vr b-c	=	100 (metres)
						q b-a	=	0 (pcu/hr)
						q b-c	=	240 (pcu/hr)

GEOMETRIC FACTORS :

D	=	0.533219
E	=	1.020769
F	=	0.585955
Y	=	0.724000

THE CAPACITY OF MOVEMENT :

Q b-a	=	258
Q b-c	=	614
Q c-b	=	352
Q b-ac	=	614

CRITICAL DFC = 0.39

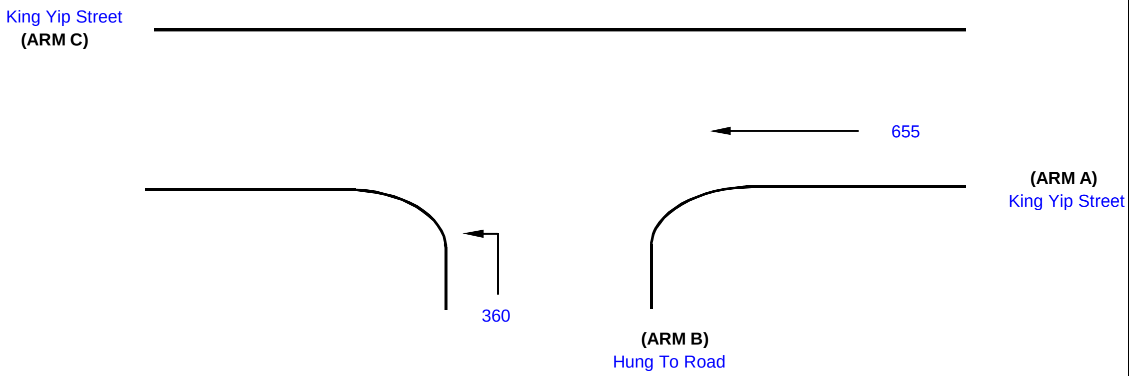
COMPARISION OF DESIGN FLOW TO CAPACITY :

DFC b-a	=	0.00
DFC b-c	=	0.39
DFC c-b	=	0.00
DFC b-ac	=	0.39

PRIORITY JUNCTION CAPACITY CALCULATION

AECOM

Junction J16 - Hung To Road / King Yip Street	2017 PM Observed Traffic Flows	Designed By : SL	Checked By : DW	Job No. : 60493364	Date : Oct 19



J16

NOTES : (GEOMETRIC INPUT DATA)

W	= Major Road Width (6.4 - 20.0)
W cr	= Central Reserve width (1.2 - 9.0, kerbed central reserve only)
W b-a	= Lane width available to vehicle waiting in stream b-a (2.05 - 4.70)
W b-c	= Lane width available to vehicle waiting in stream b-c (2.05 - 4.70)
W c-b	= Lane width available to vehicle waiting in stream c-b (2.05 - 4.70)
Vl b-a	= Visibility to the left for vehicles waiting in stream b-a (22.0 - 250.0)
Vr b-a	= Visibility to the right for vehicles waiting in stream b-a (17.0 - 250.0)
Vr b-c	= Visibilitu to the right for vehicles waiting in stream b-c (17.0 - 250.0)
Vr c-b	= Visibility to the right for vehicles waiting in stream c-b (17.0 - 250.0)
D	= Stream-specific B-A
E	= Stream-specific B-C
F	= Stream-specific C-B
Y	= (1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)			*MAJOR ROAD (ARM C)*			*MINOR ROAD (ARM B)*		
W	=	8 (metres)	W c-b	=	(metres)	W b-a	=	(metres)
W cr	=	0 (metres)	Vr c-b	=	(metres)	W b-c	=	4.07 (metres)
q a-b	=	0 (pcu/hr)	q c-a	=	0 (pcu/hr)	Vl b-a	=	(metres)
q a-c	=	655 (pcu/hr)	q c-b	=	0 (pcu/hr)	Vr b-a	=	(metres)
						Vr b-c	=	100 (metres)
						q b-a	=	0 (pcu/hr)
						q b-c	=	360 (pcu/hr)

GEOMETRIC FACTORS :

D	=	0.533219
E	=	1.020769
F	=	0.585955
Y	=	0.724000

THE CAPACITY OF MOVEMENT :

Q b-a	=	242
Q b-c	=	584
Q c-b	=	335
Q b-ac	=	584

CRITICAL DFC = 0.62

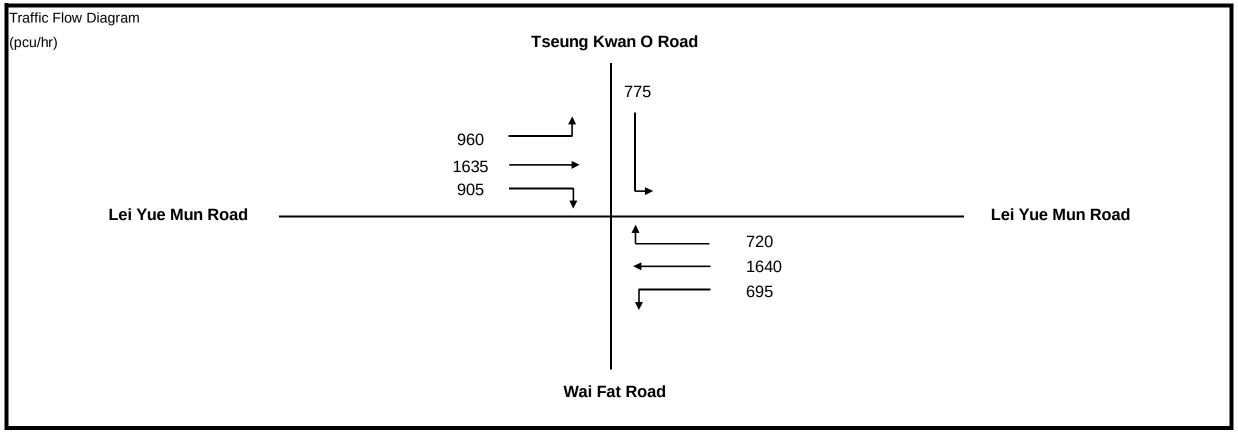
COMPARISION OF DESIGN FLOW TO CAPACITY :

DFC b-a	=	0.00
DFC b-c	=	0.62
DFC c-b	=	0.00
DFC b-ac	=	0.62

JUNCTION CAPACITY CALCULATION

AECOM

Junction J17 - Lei Yue Mun Road / Tseung Kwan O Road / Wai Fat Road	2017 AM Observed Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

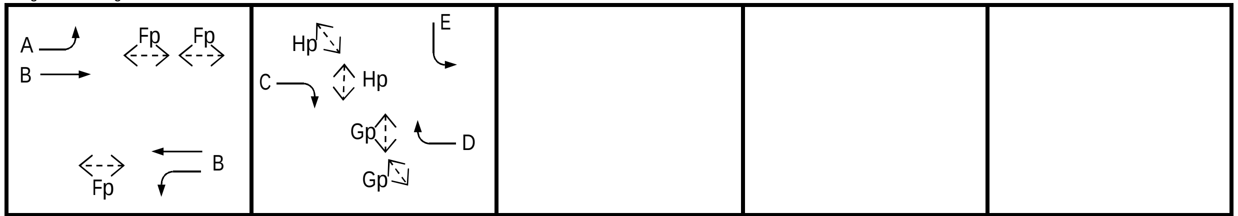


J17

No. of stages per cycle	N =	2	
Cycle time	C =	130	sec
Sum(y)	Y =	0.586	
Lost time	L =	15	sec
Total Flow	=	7,330	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$		66	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	36	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.788	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\text{x}100\%$	=	34.4	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	43	sec
Y_{max}	= 1-L/C	=	0.885	

Stage/Phase Diagrams



Stage 1	Stage 2			

I/G = 8 I/G = 9

Critical Case : B,C

R.C.(C) $= (0.9\text{x}Y_{max}\text{-}Y)/Y\text{x}100\% =$ 36%

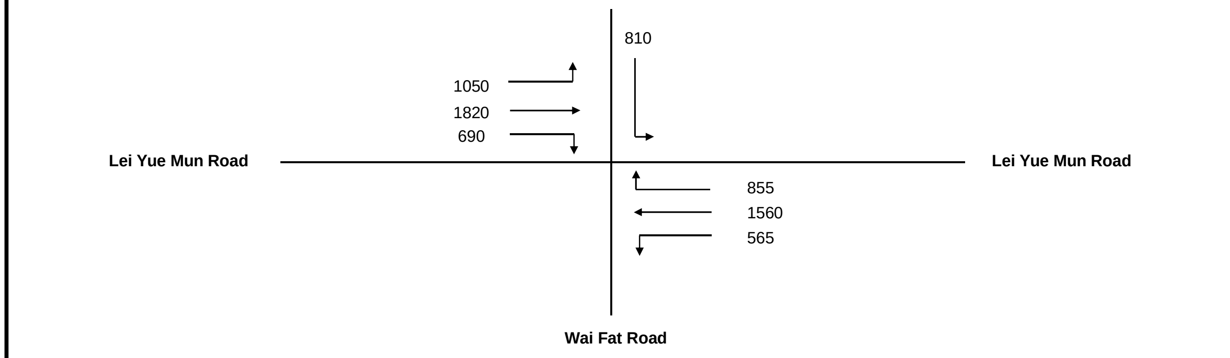
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.500	2	25			1		0		4070	960			960	100%		3840	0.250	
	B	1	3.500	3				0		0		6315		1635		1635			5305	0.308	
	C	2	3.600	2		20	0	0		0		4230			905	905		100%	3305	0.274	0.274
	B	1	3.200	2	20			1		0		4010	695			695	100%		3133	0.222	
	B	1	3.300	3				0		0		6255		1640		1640			5254	0.312	0.312
	D	2	3.500	2		32	0	0		0		4210			720	720		100%	4021	0.179	
	E	2	3.650	2	15			1		0		4100	775			775	100%		3727	0.208	
Pedestrian Crossing				GM		FGM															
	Fp	1	min.	8	+	13	=	21	sec												
	Gp	2	min.	20	+	13	=	33	sec												
	Hp	2	min.	9	+	13	=	22	sec												

JUNCTION CAPACITY CALCULATION

AECOM

Junction J17 - Lei Yue Mun Road / Tseung Kwan O Road / Wai Fat Road	2017 PM Observed Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

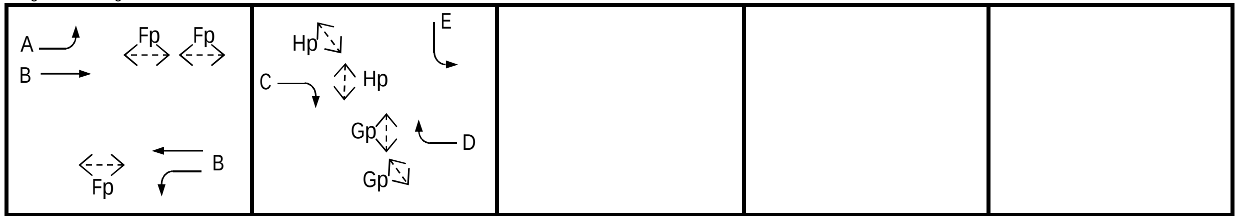
Traffic Flow Diagram
(pcu/hr)



J17

No. of stages per cycle		N =	2	
Cycle time		C =	130	sec
Sum(y)		Y =	0.556	
Lost time		L =	15	sec
Total Flow		=	7,350	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y)$	=	62	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	34	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.788	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times 100\%$	=	41.7	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	39	sec
Y_{max}	$= 1-L/C$	=	0.885	

Stage/Phase Diagrams



Stage 1	Stage 2			
I/G = 8	I/G = 9			

Critical Case : B,D

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 43%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.500	2	25			1		0		4070	1050			1050	100%		3840	0.273	
	B	1	3.500	3				0		0		6315		1820		1820			5305	0.343	0.343
	C	2	3.600	2		20	0	0		0		4230			690	690		100%	3305	0.209	
	B	1	3.200	2	20			1		0		4010	565			565	100%		3133	0.180	
	B	1	3.300	3				0		0		6255		1560		1560			5254	0.297	
	D	2	3.500	2		32	0	0		0		4210			855	855		100%	4021	0.213	0.213
	E	2	3.650	2	15			1		0		4100	810			810	100%		3727	0.217	
Pedestrian Crossing				GM		FGM															
	Fp	1	min.	8	+	13	=	21	sec												
	Gp	2	min.	20	+	13	=	33	sec												
	Hp	2	min.	9	+	13	=	22	sec												

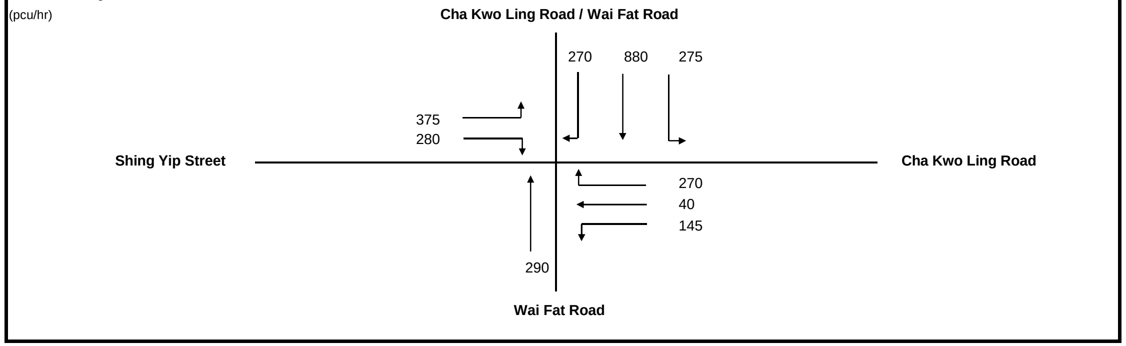
JUNCTION CAPACITY CALCULATION

AECOM

Junction J18 - Cha Kwo Ling Road / Wai Fat Road / Shing Yip Street	2017 AM Observed Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jan 19

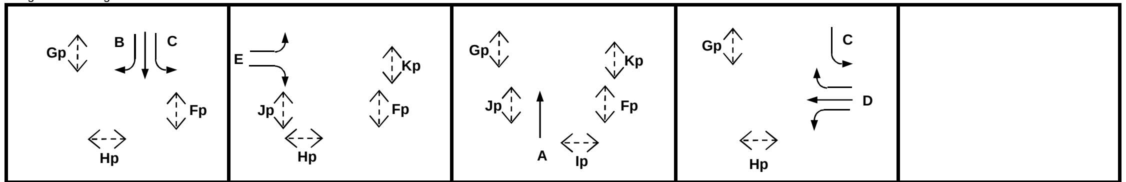
J18

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	4	
Cycle time	C =	140	sec
Sum(y)	Y =	0.531	
Lost time	L =	42	sec
Total Flow	=	2,825	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	145	sec
Min. Cycle Time C_m	$= L/(1-Y) =$	90	sec
Y_{ult}	$= 0.9-0.0075\times L =$	0.585	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times100\% =$	10.1	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y) =$	103	sec
Y_{max}	$= 1-L/C =$	0.700	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3	Stage 4	

I/G = 5 I/G = 15 G = 7 I/G = 11 I/G = 7

Critical Case : B,E,Ip,D

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 19%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	3	3.650	2				1		0		4100		290		290			4100	0.071	
	C	1	3.400	1	15			1		0		1955	275	227		502	55%		1854	0.271	
	B	1	3.400	1				0		0		2095		568		568			2095	0.271	0.271
Flared Lane														85							
	B	1	3.400	1		25	0	0		0		2095			270	270		100%	1976	0.137	
	D	4	3.400	1	10			1		0		1955	145			145	100%		1700	0.085	0.085
	D	4	3.400	1		22	0	0		0		2095		40	117	157		75%	1994	0.079	
	D	4	3.300	1		20	0	0		0		2085			153	153		100%	1940	0.079	
	E	2	3.650	1	13			1		0		1980	311			311	100%		1775	0.175	0.175
	E	2	3.650	1	15	20	0	0		0		2120	64		280	344	19%	81%	1964	0.175	

Pedestrian Crossing			GM		FGM				
Fp	1,2,3	min.	5	+	12	=	17	sec	
Gp	1,3,4	min.	5	+	9	=	14	sec	
Hp	1,2,4	min.	5	+	9	=	14	sec	
Ip	3	min.	7	+	9	=	16	sec	*
Jp	2,3	min.	5	+	6	=	11	sec	
Kp	2,3	min.	5	+	12	=	17	sec	

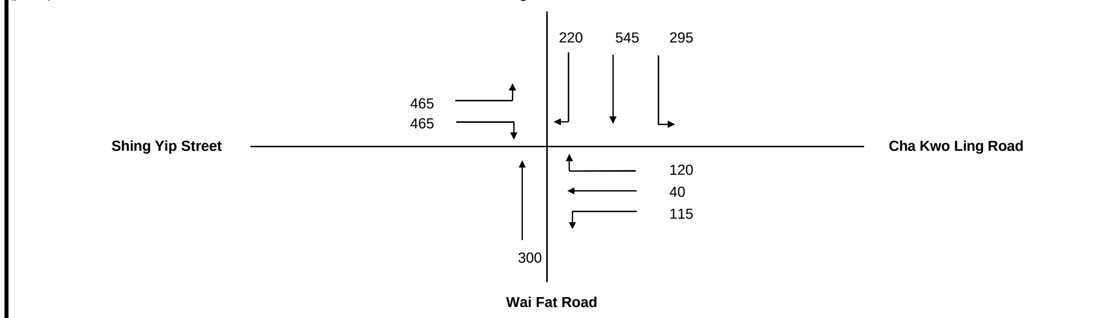
*Remark: Flows of southbound (straight-ahead movement) is deducted by flows capacity of the flared lane.

JUNCTION CAPACITY CALCULATION

AECOM

Junction J18 - Cha Kwo Ling Road / Wai Fat Road / Shing Yip Street	2017 PM Observed Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

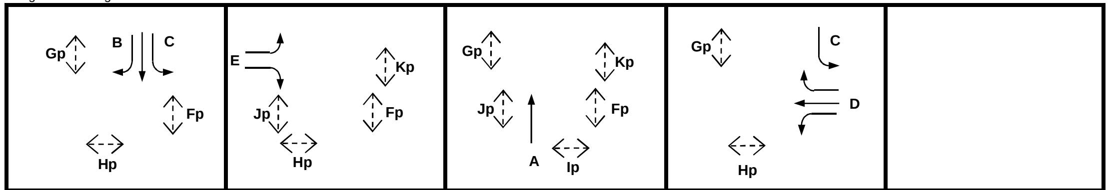
Traffic Flow Diagram
(pcu/hr)



J18

No. of stages per cycle	N =	4	
Cycle time	C =	140	sec
Sum(y)	Y =	0.510	
Lost time	L =	42	sec
Total Flow	=	2,565	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	139	sec
Min. Cycle Time C_m	$= L/(1-Y)$ =	86	sec
Y_{ult}	$= 0.9-0.0075\times L$ =	0.585	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times100\%$ =	14.8	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$ =	97	sec
Y_{max}	= 1-L/C =	0.700	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3	Stage 4	

I/G = 5 I/G = 15 G = 7 I/G = 11 I/G = 7

Critical Case : B,E,Ip,D

R.C.(C) $= (0.9xY_{max}\text{-}Y)/Yx100\%$ = 24%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	3	3.650	2				1		0		4100		300		300			4100	0.073	
	C	1	3.400	1	15			1		0		1955	295	54		349	84%		1803	0.194	
	B	1	3.400	1				0		0		2095		406		406			2095	0.194	0.194
Flared Lane														85							
	B	1	3.400	1		25	0	0		0		2095			220	220		100%	1976	0.111	
	D	4	3.400	1	10			1		0		1955	115			115	100%		1700	0.068	0.068
	D	4	3.400	1		22	0	0		0		2095		40	42	82		51%	2025	0.040	
	D	4	3.300	1		20	0	0		0		2085			78	78		100%	1940	0.040	
	E	2	3.650	1	13			1		0		1980	441			441	100%		1775	0.248	0.248
	E	2	3.650	1	15	20	0	0		0		2120	24		465	489	5%	95%	1970	0.248	
Pedestrian Crossing				GM		FGM															
	Fp	1,2,3	min.	5	+	12	=	17	sec												
	Gp	1,3,4	min.	5	+	9	=	14	sec												
	Hp	1,2,4	min.	5	+	9	=	14	sec												
	Ip	3	min.	7	+	9	=	16	sec												*
	Jp	2,3	min.	5	+	6	=	11	sec												
	Kp	2,3	min.	5	+	12	=	17	sec												

*Remark: Flows of southbound (straight-ahead movement) is deducted by flows capacity of the flared lane.

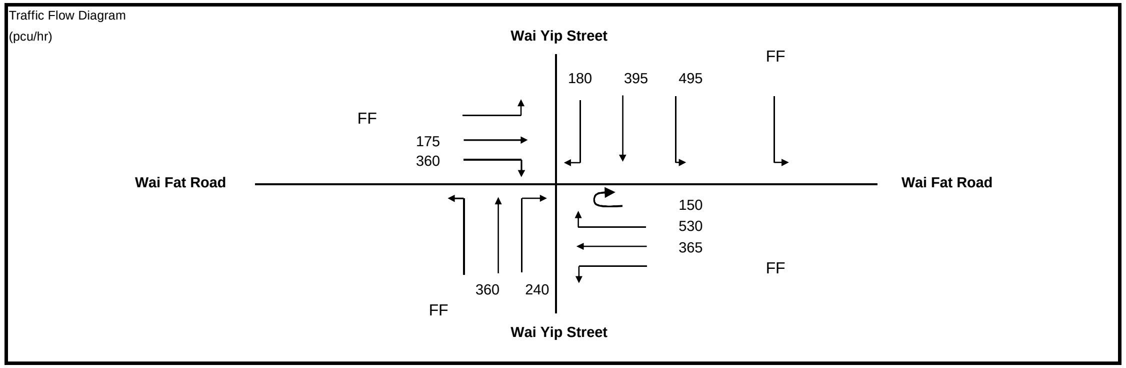
JUNCTION CAPACITY CALCULATION

AECOM

Junction J19 - Wai Yip Street / Wai Fat Road	2017 AM Observed Traffic Flows (free flow to Wai Fat Road)	DESIGN: DW	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

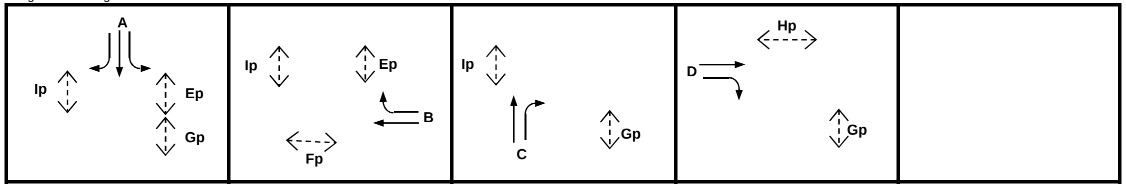
J19

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	4	
Cycle time		C =	140	sec
Sum(y)		Y =	0.675	
Lost time		L =	24	sec
Total Flow		=	3,250	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y)$	=	126	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	74	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.720	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\text{x}100\%$	=	6.6	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	96	sec
Y_{max}	$= 1-L/C$	=	0.829	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3	Stage 4	

I/G = 8 I/G = 6 I/G = 8 I/G = 6

Critical Case : A,B,C,D

R.C.(C) $= (0.9\text{x}Y_{max}-Y)/Y\text{x}100\% =$ 10%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	D	4	3.850	1		27	0	0		0		2140		175	98	273		36%	2098	0.130	0.130
	D	4	3.850	1		25	0	0		0		2140			262	262		100%	2019	0.130	
	C	3	3.500	1		20	0	0		0		2105			240	240		100%	1958	0.123	0.123
	C	3	3.500	2				0		0		4210		360		360			4210	0.086	
	B	2	3.500	2		20	0	0		0		4210			642	642		100%	3916	0.164	0.164
Flared Lane															38						
	B	2	3.500	1				0		0		2105		293		293			2105	0.139	
Flared Lane														72							
	A	1	3.500	1	15			0		0		2105	495			495	100%		1914	0.259	0.259
	A	1	3.500	1		25	0	0		0		2105		275	180	455		40%	2056	0.221	
Flared Lane														120							
Pedestrian Crossing				GM		FGM															
	Ep	1,2	min.	5	+	7	=	12	sec												
	Fp	2	min.	11	+	10	=	21	sec												
	Gp	1,3,4	min.	7	+	14	=	21	sec												
	Hp	4	min.	10	+	9	=	19	sec												
	Ip	1,2,3	min.	5	+	7	=	12	sec												

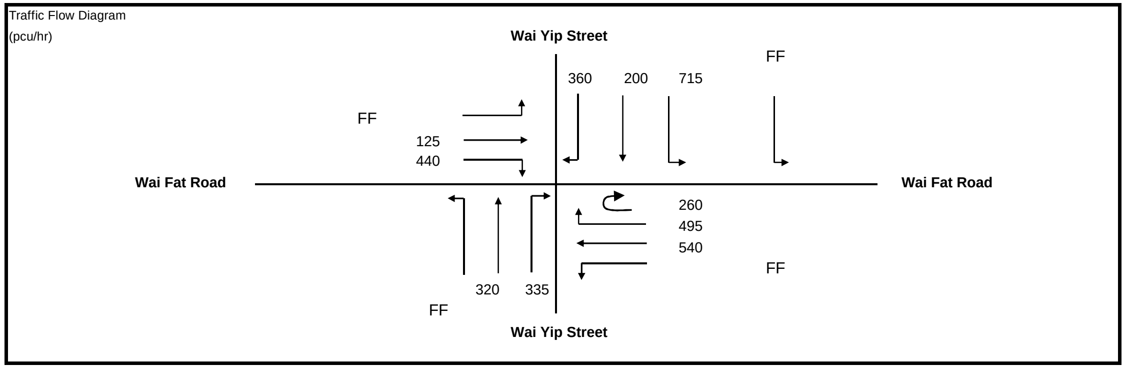
*Remark: Flows of Phase A & B are deducted by capcity flows of flared lane.

JUNCTION CAPACITY CALCULATION

AECOM

Junction J19 - Wai Yip Street / Wai Fat Road	2017 PM Observed Traffic Flows (free flow to Wai Fat Road)	DESIGN: DW	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

Traffic Flow Diagram
(pcu/hr)

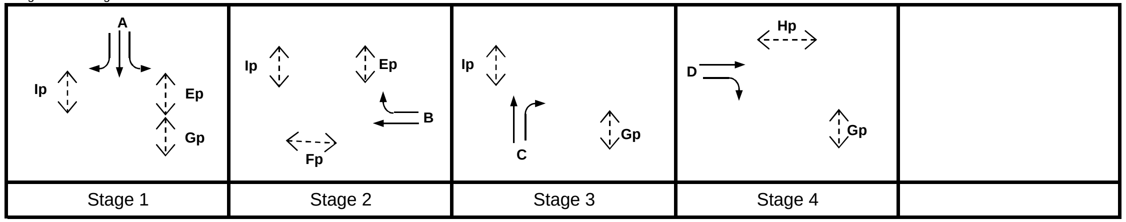


J19

No. of stages per cycle	N =	4	
Cycle time	C =	140	sec
Sum(y)	Y =	0.767	
Lost time	L =	43	sec
Total Flow	=	3,790	pcu

Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y) =$	298	sec
Min. Cycle Time C_m	$= L/(1-Y) =$	185	sec
Y_{ult}	$= 0.9-0.0075 \times L =$	0.578	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y \times 100\% =$	-24.7	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y) =$	291	sec
Y_{max}	$= 1-L/C =$	0.693	

Stage/Phase Diagrams



I/G = 8   I/G = 6   I/G = 10   G = 10   I/G = 12

Critical Case : A,B,C,Hp

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ -19%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	D	4	3.850	1		27	0	0		0		2140		125	161	286		56%	2075	0.138	
	D	4	3.850	1		25	0	0		0		2140			279	279		100%	2019	0.138	
	C	3	3.500	1		20	0	0		0		2105			335	335		100%	1958	0.171	0.171
	C	3	3.500	2				0		0		4210		320		320			4210	0.076	
	B	2	3.500	2		20	0	0		0		4210			717	717		100%	3916	0.183	
Flared Lane															38						
	B	2	3.500	1				0		0		2105		468		468			2105	0.222	0.222
Flared Lane														72							
	A	1	3.500	1	15			0		0		2105	715			715	100%		1914	0.374	0.374
	A	1	3.500	1		25	0	0		0		2105		80	360	440		82%	2006	0.219	
Flared Lane														120							
Pedestrian Crossing				GM		FGM															
	Ep	1,2	min.	5	+	7	=	12	sec												
	Fp	2	min.	11	+	10	=	21	sec												
	Gp	1,3,4	min.	7	+	14	=	21	sec												
	Hp	4	min.	10	+	9	=	19	sec												*
	Ip	1,2,3	min.	5	+	7	=	12	sec												

*Remark: Flows of Phase A & B are deducted by capcity flows of flared lane.

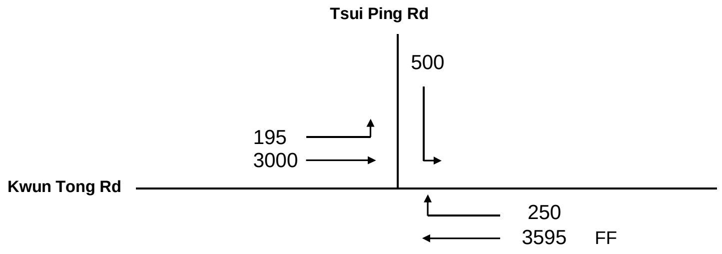
JUNCTION CAPACITY CALCULATION

AECOM

Junction J20 - Kwun Tong Rd / Tsui Ping Rd	2017 AM Observed Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

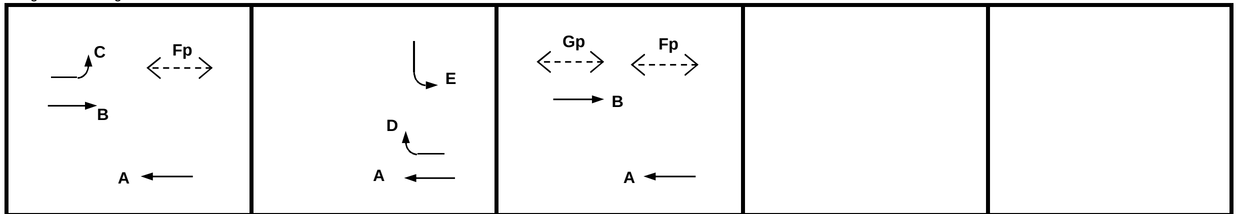
J20

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	3	
Cycle time		C =	130	sec
Sum(y)		Y =	0.612	
Lost time		L =	10	sec
Total Flow		=	3,945	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y)$	=	51	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	26	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.825	
R.C.$_{ult}$	$= (Y_{ult}-Y)/Y\times100\%$	=	34.9	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	31	sec
Y_{max}	$= 1-L/C$	=	0.923	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G = 5 I/G = I/G = 7

Critical Case : B,D

R.C.(C) $= (0.9\text{x}Y_{max}-Y)/Y\text{x}100\% =$ 36%

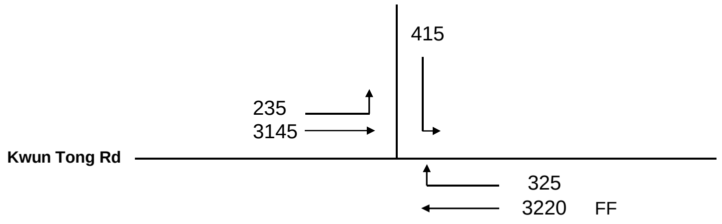
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	B	1,3	3.300	3				0		0		6255		3000		3000			6255	0.480	0.480
	C	1	3.300	1	15			1		0		1945	195			195	100%		1768	0.110	
	E	2	3.300	2	15			1		0		4030	500			500	100%		3664	0.136	
	D	2	3.300	1		15	0	0		0		2085			250	250		100%	1895	0.132	0.132
Pedestrian Crossing				GM		FGM															
	Fp	1,3	min.	8	+	10	=	18	sec												
	Gp	3	min.	6	+	8	=	14	sec												

JUNCTION CAPACITY CALCULATION

AECOM

Junction J20 - Kwun Tong Rd / Tsui Ping Rd	2017 PM Observed Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

Traffic Flow Diagram
(pcu/hr)

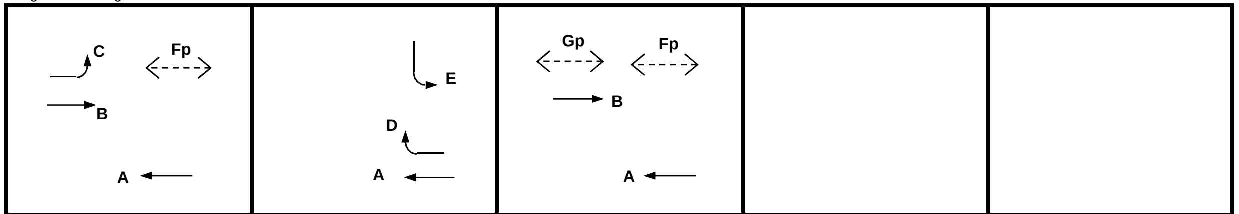


J20

No. of stages per cycle	N =	3	
Cycle time	C =	130	sec
Sum(y)	Y =	0.674	
Lost time	L =	10	sec
Total Flow	=	4,120	pcu

Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y) =$	61	sec
Min. Cycle Time C_m	$= L/(1-Y)$ =	31	sec
Y_{ult}	$= 0.9-0.0075 \times L$ =	0.825	
R.C.$_{ult}$	$= (Y_{ult}-Y)/Y \times 100\%$ =	22.4	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$ =	40	sec
Y_{max}	= 1-L/C =	0.923	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		
I/G = 5	I/G =	I/G = 7		

Critical Case : B,D

R.C.(C) $= (0.9 \times Y_{max}-Y)/Y \times 100\%$ = 23%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	B	1,3	3.300	3				0		0		6255		3145		3145			6255	0.503	0.503
	C	1	3.300	1	15			1		0		1945	235			235	100%		1768	0.133	
	E	2	3.300	2	15			1		0		4030	415			415	100%		3664	0.113	
	D	2	3.300	1		15	0	0		0		2085			325	325		100%	1895	0.171	0.171
Pedestrian Crossing				GM		FGM															
	Fp	1,3	min.	8	+	10	=	18	sec												
	Gp	3	min.	6	+	8	=	14	sec												

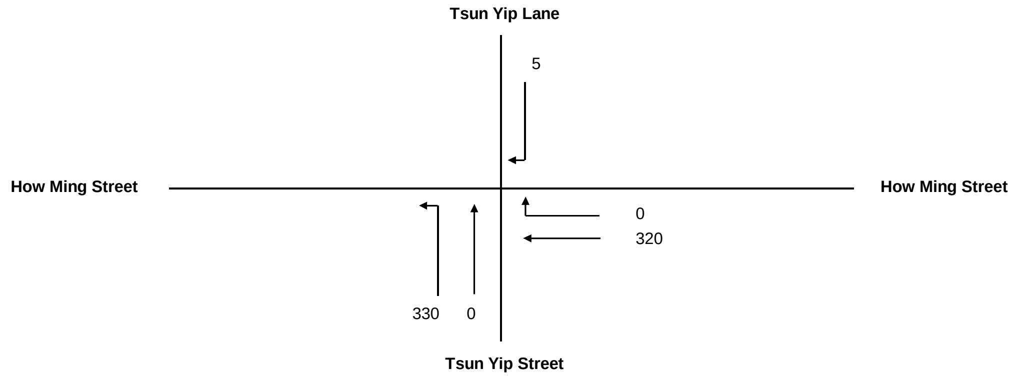
JUNCTION CAPACITY CALCULATION

AECOM

Junction J21 - How Ming Street / Tsun Yip Street / Tsun Yip Lane	2017 AM Observed Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

J21

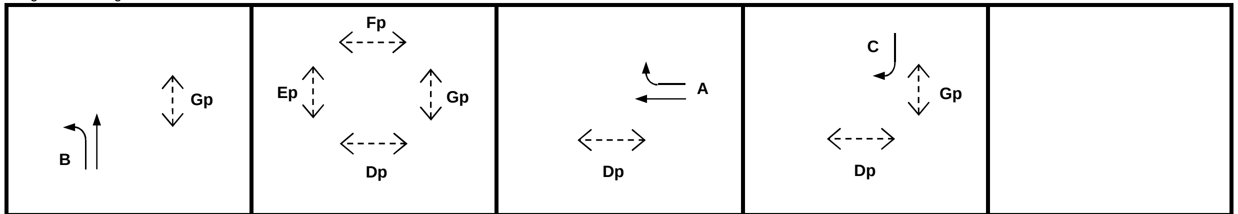
Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	4	
Cycle time	C =	100	sec
Sum(y)	Y =	0.345	
Lost time	L =	44	sec
Total Flow	=	655	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$		108	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	67	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.570	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times 100\%$	=	65.3	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	71	sec
Y_{max}	= 1-L/C	=	0.560	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3	Stage 4	

I/G = 7 G = 7 I/G = 12 I/G = 5 G = 5 I/G = 10

Critical Case : B,Ep,A,C

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 46%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m)		OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr)			TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%)		REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
					LEFT	RIGHT							LEFT	STRAIGHT AHEAD	RIGHT		LEFT	RIGHT			
	A	3	3.000	1		25	0	1		0		1915		320	0	320		0%	1915	0.167	0.167
	B	1	3.800	1	20			1		0		1995	330	0		330	100%		1856	0.178	0.178
	C	4	3.000	1		25	0	1		0		1915			5	5		100%	1807	0.003	
Pedestrian Crossing				GM		FGM															
	Dp	2,3,4	min.	8	+	8	=	16	sec												
	Ep	2	min.	7	+	10	=	17	sec												*
	Fp	2	min.	6	+	6	=	12	sec												
	Gp	1,2,4	min.	6	+	6	=	12	sec												

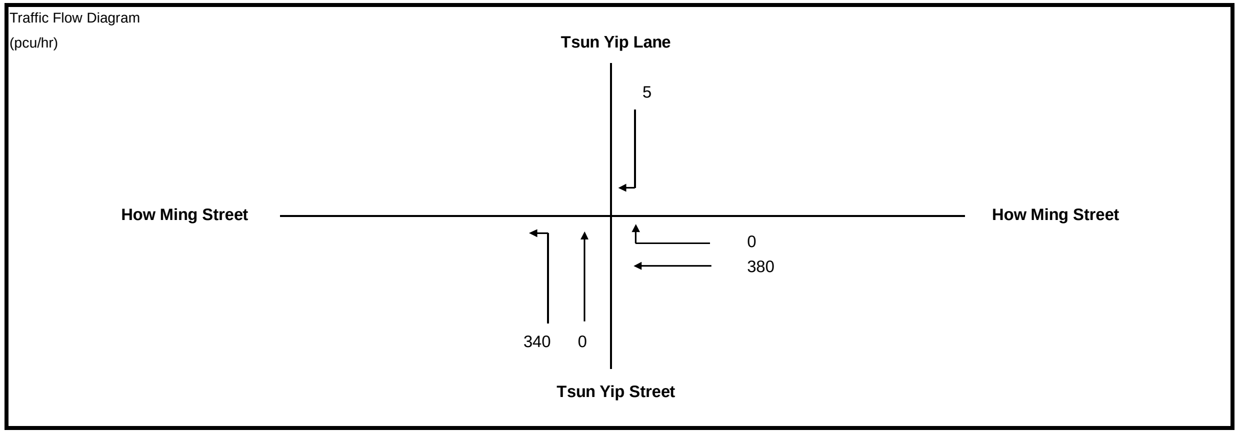
*Remark: Due to kerside activities, no. of lane of How Ming Street is redued by 1.

JUNCTION CAPACITY CALCULATION

AECOM

Junction J21 - How Ming Street / Tsun Yip Street / Tsun Yip Lane	2017 PM Observed Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jul 19

Traffic Flow Diagram
(pcu/hr)

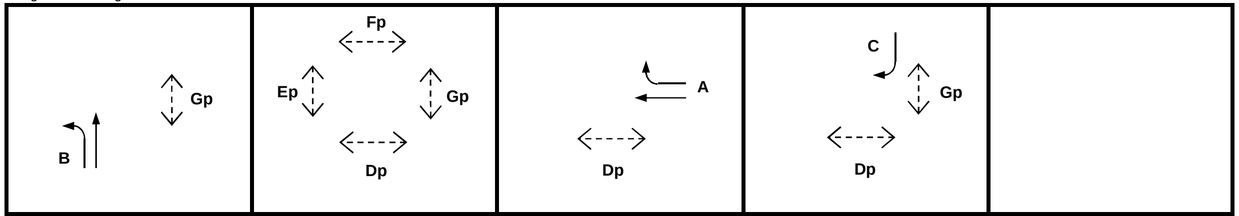


J21

No. of stages per cycle	N =	4	
Cycle time	C =	100	sec
Sum(y)	Y =	0.382	
Lost time	L =	44	sec
Total Flow	=	725	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	115	sec
Min. Cycle Time C_m	$= L/(1-Y)$ =	71	sec
Y_{ult}	$= 0.9-0.0075\times L$ =	0.570	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times100\%$ =	49.4	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$ =	76	sec
Y_{max}	= 1-L/C =	0.560	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3	Stage 4	

I/G = 7 G = 7 I/G = 12 I/G = 5 G = 5 I/G = 10

Critical Case : B,Ep,A,C

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 32%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	3	3.000	1		25	0	1		0		1915		380	0	380		0%	1915	0.198	0.198
	B	1	3.800	1	20			1		0		1995	340	0		340	100%		1856	0.183	0.183
	C	4	3.000	1		25	0	1		0		1915			5	5		100%	1807	0.003	
Pedestrian Crossing				GM		FGM															
	Dp	2,3,4	min.	8	+	8	=	16	sec												
	Ep	2	min.	7	+	10	=	17	sec												*
	Fp	2	min.	6	+	6	=	12	sec												
	Gp	1,2,4	min.	6	+	6	=	12	sec												

*Remark: Due to kerside activities, no. of lane of How Ming Street is redued by 1.

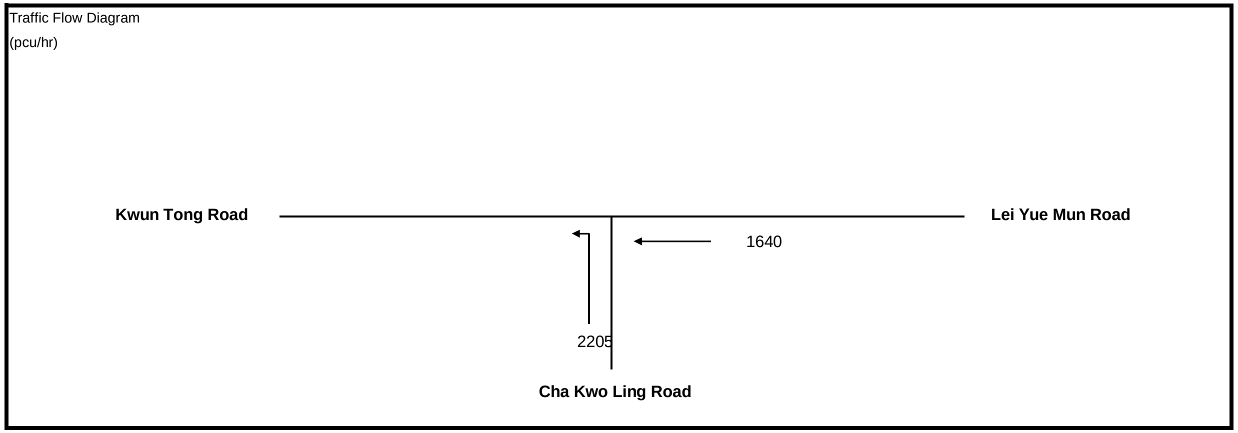
JUNCTION CAPACITY CALCULATION

AECOM

Junction J22 - Lei Yue Mun Road / Cha Kwo Ling Road	2017 AM Observed Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

J22

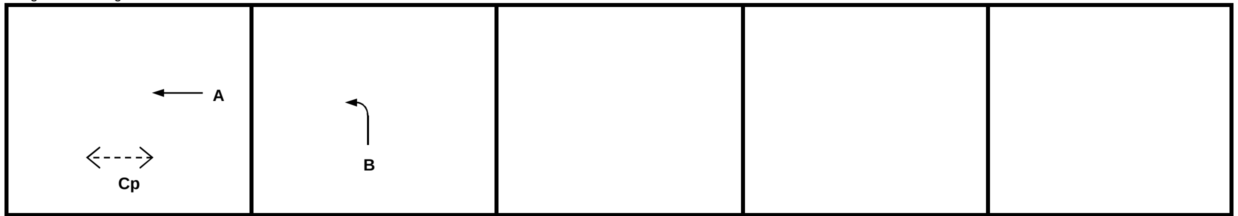
Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	2	
Cycle time	C =	130	sec
Sum(y)	Y =	0.586	
Lost time	L =	14	sec
Total Flow	=	14,405	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$		63	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	34	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.795	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\text{x}100\%$	=	35.6	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	40	sec
Y_{max}	= 1-L/C	=	0.892	

Stage/Phase Diagrams



Stage 1	Stage 2			

I/G = 6 I/G = 10

Critical Case : A,B

R.C.(C) $= (0.9\text{x}Y_{max}\text{-}Y)/Y\text{x}100\% =$ 37%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
←	A	1	3.000	4				1		0		8080		1640		1640			8080	0.203	0.203
↰	B	2	4.000	3	15			1		0		6325	2205			2205	100%		5750	0.383	0.383
Pedestrian Crossing				GM		FGM															
	Cp	1	min.	7	+	15	=	22	sec												

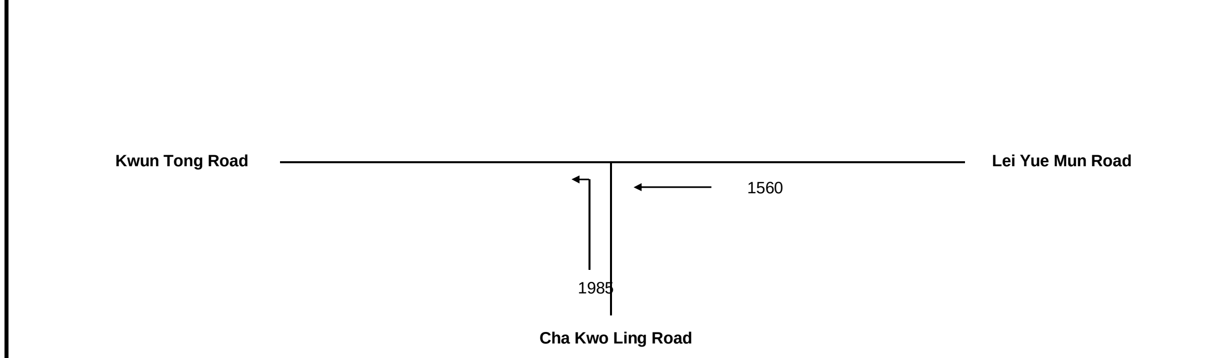
JUNCTION CAPACITY CALCULATION

AECOM

Junction J22 - Lei Yue Mun Road / Cha Kwo Ling Road	2017 PM Observed Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

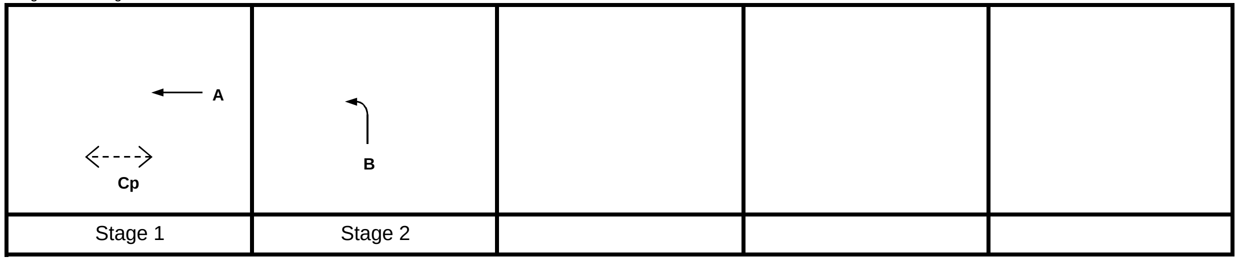
J22

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	2	
Cycle time	C =	130	sec
Sum(y)	Y =	0.538	
Lost time	L =	14	sec
Total Flow	=	14,405	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	56	sec
Min. Cycle Time C_m	$= L/(1-Y) =$	30	sec
Y_{ult}	$= 0.9-0.0075\times L =$	0.795	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times100\% =$	47.7	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y) =$	35	sec
Y_{max}	$= 1-L/C =$	0.892	

Stage/Phase Diagrams



I/G = 6   I/G = 10

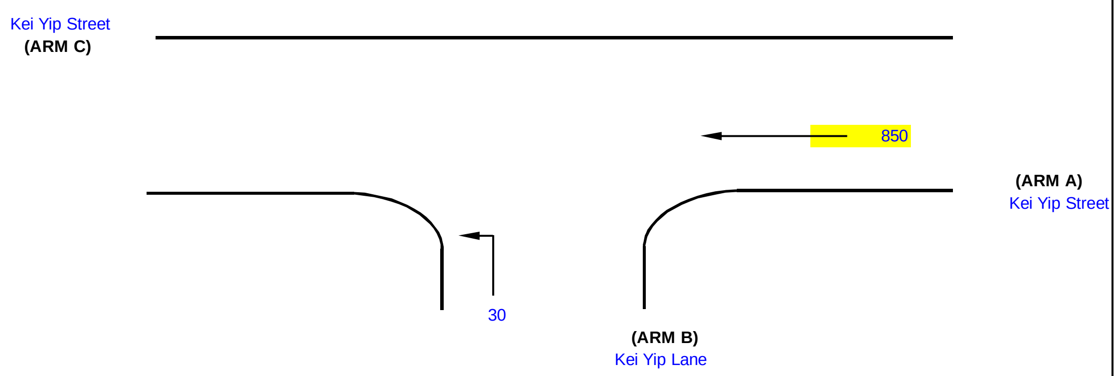
Critical Case : A,B

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 49%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
←	A	1	3.000	4				1		0		8080		1560		1560			8080	0.193	0.193
↰	B	2	4.000	3	15			1		0		6325	1985			1985	100%		5750	0.345	0.345
Pedestrian Crossing				GM		FGM															
	Cp	1	min.	7	+	15	=	22	sec												

PRIORITY JUNCTION CAPACITY CALCULATION

Junction J23 - Kei Yip Street / Kei Yip Lane	2017 AM Observed Traffic Flows	Designed By : SL	Checked By : DW	Job No. : 60493364	Date : Oct 19



J23

NOTES : (GEOMETRIC INPUT DATA)

W	= Major Road Width (6.4 - 20.0)
W cr	= Central Reserve width (1.2 - 9.0, kerbed central reserve only)
W b-a	= Lane width available to vehicle waiting in stream b-a (2.05 - 4.70)
W b-c	= Lane width available to vehicle waiting in stream b-c (2.05 - 4.70)
W c-b	= Lane width available to vehicle waiting in stream c-b (2.05 - 4.70)
Vl b-a	= Visibility to the left for vehicles waiting in stream b-a (22.0 - 250.0)
Vr b-a	= Visibility to the right for vehicles waiting in stream b-a (17.0 - 250.0)
Vr b-c	= Visibilitu to the right for vehicles waiting in stream b-c (17.0 - 250.0)
Vr c-b	= Visibility to the right for vehicles waiting in stream c-b (17.0 - 250.0)
D	= Stream-specific B-A
E	= Stream-specific B-C
F	= Stream-specific C-B
Y	= (1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)				*MAJOR ROAD (ARM C)*				*MINOR ROAD (ARM B)*			
W	=	9.9	(metres)	W c-b	=		(metres)	W b-a	=		(metres)
W cr	=	0	(metres)	Vr c-b	=		(metres)	W b-c	=	4	(metres)
q a-b	=	0	(pcu/hr)	q c-a	=	0	(pcu/hr)	Vl b-a	=	250	(metres)
q a-c	=	850	(pcu/hr)	q c-b	=	0	(pcu/hr)	Vr b-a	=	70	(metres)
								Vr b-c	=	70	(metres)
								q b-a	=	0	(pcu/hr)
								q b-c	=	30	(pcu/hr)

GEOMETRIC FACTORS :

D	=	0.664980
E	=	0.986420
F	=	0.585955
Y	=	0.658450

THE CAPACITY OF MOVEMENT :

Q b-a	=	281
Q b-c	=	534
Q c-b	=	317
Q b-ac	=	534

CRITICAL DFC = 0.06

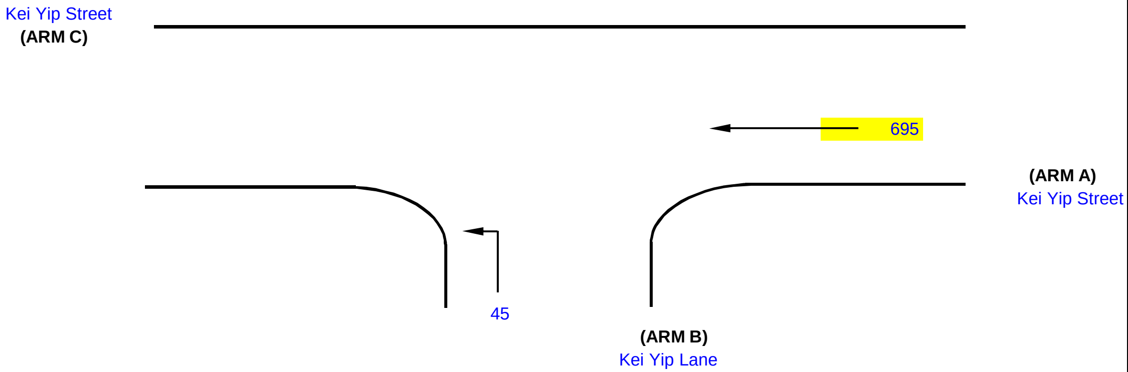
COMPARISION OF DESIGN FLOW TO CAPACITY :

DFC b-a	=	0.00
DFC b-c	=	0.06
DFC c-b	=	0.00
DFC b-ac	=	0.06

PRIORITY JUNCTION CAPACITY CALCULATION

AECOM

Junction J23 - Kei Yip Street / Kei Yip Lane	2017 PM Observed Traffic Flows	Designed By : SL	Checked By : DW	Job No. : 60493364	Date : Oct 19



J23

NOTES : (GEOMETRIC INPUT DATA)

W	= Major Road Width (6.4 - 20.0)
W cr	= Central Reserve width (1.2 - 9.0, kerbed central reserve only)
W b-a	= Lane width available to vehicle waiting in stream b-a (2.05 - 4.70)
W b-c	= Lane width available to vehicle waiting in stream b-c (2.05 - 4.70)
W c-b	= Lane width available to vehicle waiting in stream c-b (2.05 - 4.70)
Vl b-a	= Visibility to the left for vehicles waiting in stream b-a (22.0 - 250.0)
Vr b-a	= Visibility to the right for vehicles waiting in stream b-a (17.0 - 250.0)
Vr b-c	= Visibilitu to the right for vehicles waiting in stream b-c (17.0 - 250.0)
Vr c-b	= Visibility to the right for vehicles waiting in stream c-b (17.0 - 250.0)
D	= Stream-specific B-A
E	= Stream-specific B-C
F	= Stream-specific C-B
Y	= (1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)

W	=	9.9	(metres)
W cr	=	0	(metres)
q a-b	=	0	(pcu/hr)
q a-c	=	695	(pcu/hr)

MAJOR ROAD (ARM C)

W c-b	=		(metres)
Vr c-b	=		(metres)
q c-a	=	0	(pcu/hr)
q c-b	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W b-a	=		(metres)
W b-c	=	4	(metres)
Vl b-a	=	250	(metres)
Vr b-a	=	70	(metres)
Vr b-c	=	70	(metres)
q b-a	=	0	(pcu/hr)
q b-c	=	45	(pcu/hr)

GEOMETRIC FACTORS :

D	=	0.664980
E	=	0.986420
F	=	0.585955
Y	=	0.658450

`

THE CAPACITY OF MOVEMENT :

Q b-a	=	306
Q b-c	=	571
Q c-b	=	339
Q b-ac	=	571

CRITICAL DFC = 0.08

COMPARISION OF DESIGN FLOW TO CAPACITY :

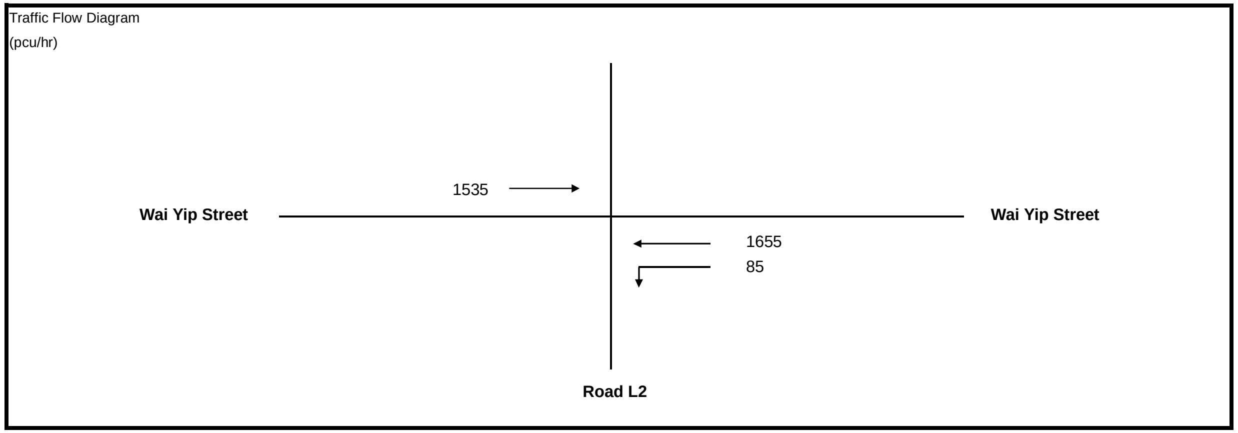
DFC b-a	=	0.00
DFC b-c	=	0.08
DFC c-b	=	0.00
DFC b-ac	=	0.08

JUNCTION CAPACITY CALCULATION

AECOM

Junction J26 - Wai Yip Street / Road L2	2017 AM Observed Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

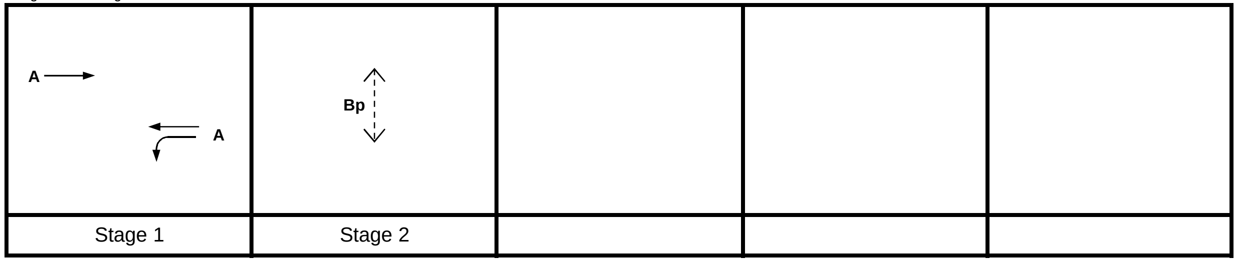
Traffic Flow Diagram
(pcu/hr)



J26

No. of stages per cycle	N =	2	
Cycle time	C =	75	sec
Sum(y)	Y =	0.440	
Lost time	L =	20	sec
Total Flow	=	3,275	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	63	sec
Min. Cycle Time C_m	$= L/(1-Y)$ =	36	sec
Y_{ult}	$= 0.9-0.0075\times L$ =	0.750	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times 100\%$ =	70.3	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$ =	39	sec
Y_{max}	= 1-L/C =	0.733	

Stage/Phase Diagrams



I/G = 5 G = 7 I/G = 9

Critical Case : A,Bp

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 50%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
→	A	1	3.000	2				1		0		3970		1535		1535			3970	0.387	
←↓	A	1	3.000	1	15			1		0		1915	85	750		835	10%		1896	0.440	0.440
←	A	1	3.000	1				0		0		2055		905		905			2055	0.440	
Pedestrian Crossing				GM		FGM															
	Bp	2	min.	7	+	6	=	13	sec												*

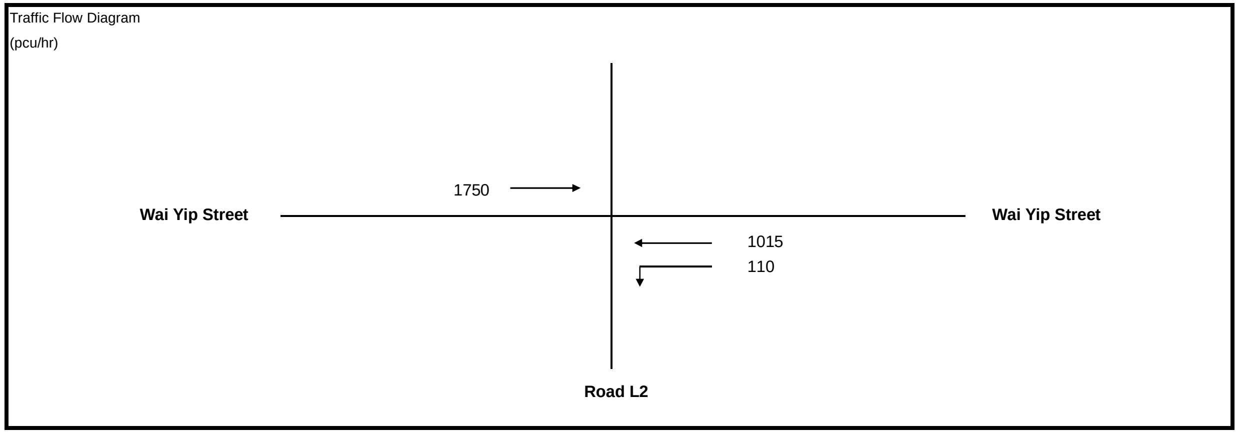
JUNCTION CAPACITY CALCULATION

AECOM

Junction J26 - Wai Yip Street / Road L2	2017 PM Observed Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

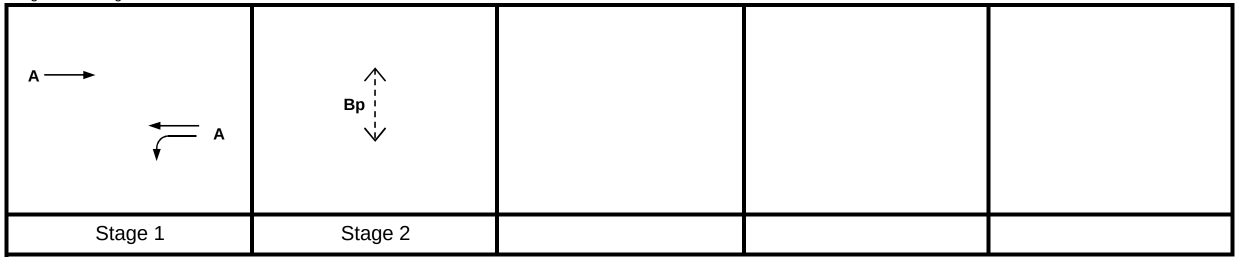
J26

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	2	
Cycle time		C =	75	sec
Sum(y)		Y =	0.441	
Lost time		L =	20	sec
Total Flow		=	2,875	pcu
Optimum Cycle C_o	= (1.5×L+5)/(1-Y)	=	63	sec
Min. Cycle Time C_m	= L/(1-Y)	=	36	sec
Y_{ult}	= 0.9-0.0075×L	=	0.750	
$R.C._{ult}$	= (Y_{ult}-Y)/Yx100%	=	70.1	%
Practical Cycle Time C_p	= 0.9×L/(0.9-Y)	=	39	sec
Y_{max}	= 1-L/C	=	0.733	

Stage/Phase Diagrams



I/G = 5 G = 7 I/G = 9

Critical Case : A,Bp

R.C.(C) = (0.9xY_{max}-Y)/Yx100% = 50%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
→	A	1	3.000	2				1		0		3970		1750		1750			3970	0.441	0.441
← ↙	A	1	3.000	1	15			1		0		1915	110	427		537	20%		1877	0.286	
←	A	1	3.000	1				0		0		2055		588		588			2055	0.286	
Pedestrian Crossing				GM		FGM															
	Bp	2	min.	7	+	6	=	13	sec												*

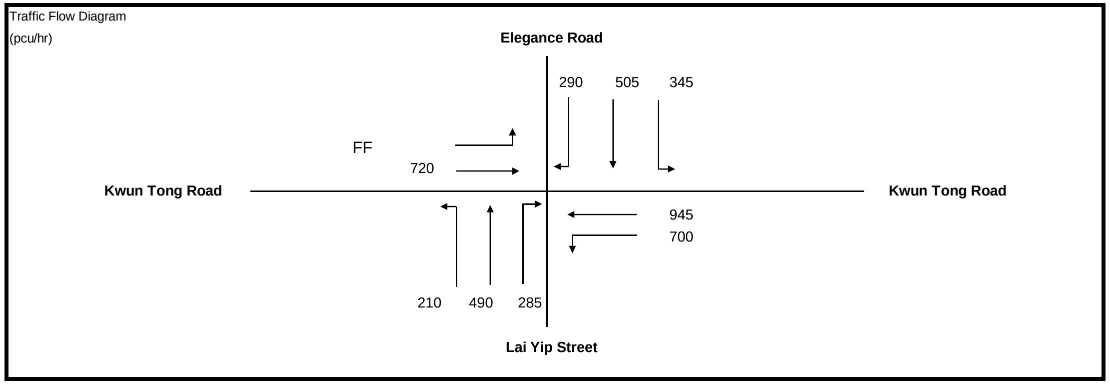
JUNCTION CAPACITY CALCULATION

AECOM

Junction J1 - Kwun Tong Road / Lai Yip Street	2031 AM Reference Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

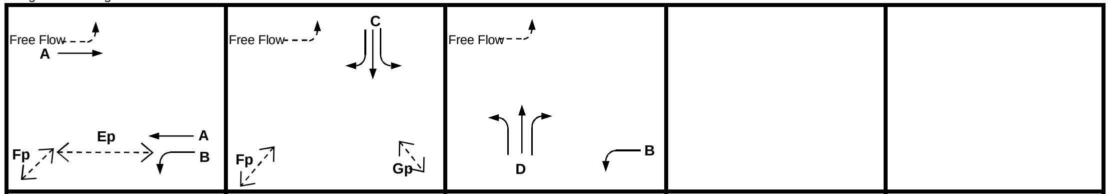
J1

Traffic Flow Diagram (pcu/hr)



No. of stages per cycle	N =	3	
Cycle time	C =	118	sec
Sum(y)	Y =	0.639	
Lost time	L =	19	sec
Total Flow	=	4,490	pcu
Optimum Cycle C_o	= (1.5×L+5)/(1-Y) =	93	sec
Min. Cycle Time C_m	= L/(1-Y) =	53	sec
Y_{ult}	= 0.9-0.0075×L =	0.758	
$R.C._{ult}$	= (Y_{ult}-Y)/Yx100% =	18.6	%
Practical Cycle Time C_p	= 0.9×L/(0.9-Y) =	65	sec
Y_{max}	= 1-L/C =	0.839	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G = 8 I/G = 6 I/G = 8

Critical Case : A,C,D

R.C.(C) = (0.9xY_{max}-Y)/Yx100% = 18%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.220	2				0		0		4154		720		720			4154	0.173	
	A	1	3.125	2				0		0		4135		945		945			4135	0.229	0.229
	B	1,3	3.220	1	10			1		0	-253	1937	700			700	100%		1464	0.478	
	C	2	3.180	1	10			1		0		1933	345			345	100%		1681	0.205	0.205
	C	2	3.180	1				0		0		2073		349		349			2073	0.169	
	C	2	3.180	1		25	0	0		0		2073		156	183	339		54%	2008	0.169	
Flared Length															107						
	D	3	3.500	1	10			1		0		1965	73	319		392	19%		1912	0.205	0.205
Flared Length													137								
	D	3	3.500	1		15	0	0		0		2105		118	285	403		71%	1966	0.205	
Flared Length														53							

Pedestrian Crossing	Stage		GM		FGM			
Ep	1	min.	7	+	9	=	16	sec
Fp	1,2	min.	7	+	6	=	13	sec
Gp	2	min.	5	+	6	=	11	sec

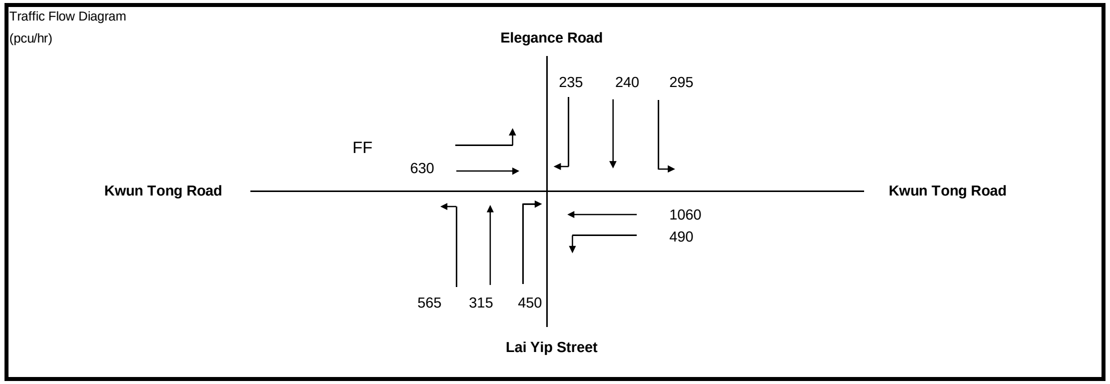
*Remark: Flows of Phase C (right-turning movement) and Phase D (left-turning and straight-ahead movements) are deducted by flows capacity of the flared lane.
As left-turn lane for Phase B is not a full lane, capacity of this lane is deducted.

JUNCTION CAPACITY CALCULATION

AECOM

Junction J1 - Kwun Tong Road / Lai Yip Street	2031 PM Reference Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

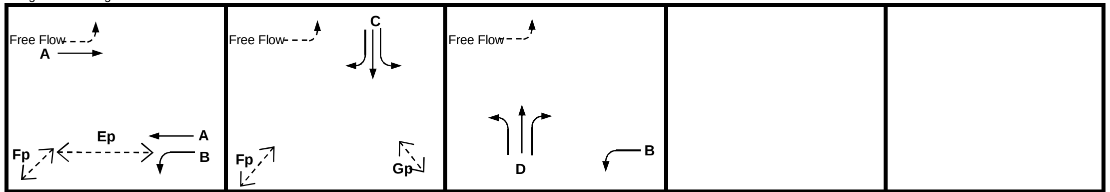
Traffic Flow Diagram
(pcu/hr)



J1

No. of stages per cycle	N =	3	
Cycle time	C =	118	sec
Sum(y)	Y =	0.739	
Lost time	L =	19	sec
Total Flow	=	4,280	pcu
Optimum Cycle C_o = $(1.5\times L+5)/(1-Y)$	=	128	sec
Min. Cycle Time C_m = $L/(1-Y)$	=	73	sec
Y_{ult} = $0.9-0.0075\times L$	=	0.758	
R.C.$_{ult}$ = $(Y_{ult}-Y)/Y\times100\%$	=	2.5	%
Practical Cycle Time C_p = $0.9\times L/(0.9-Y)$	=	106	sec
Y_{max} = $1-L/C$	=	0.839	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		
I/G = 8	I/G = 6	I/G = 8		

Critical Case : A,C,D

R.C.(C) = $(0.9\times Y_{max}-Y)/Y\times100\%$ = 2%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
→	A	1	3.220	2				0		0		4154		630		630			4154	0.152	
←	A	1	3.125	2				0		0		4135		1060		1060			4135	0.256	0.256
	B	1,3	3.220	1	10			1		0	-253	1937	490			490	100%		1464	0.335	
	C	2	3.180	1	10			1		0		1933	295			295	100%		1681	0.176	0.176
	C	2	3.180	1				0		0		2073		188		188			2073	0.091	
	C	2	3.180	1		25	0	0		0		2073		52	128	180		71%	1988	0.091	
Flared Length															107						
	D	3	3.500	1	10			1		0		1965	428	111		539	79%		1756	0.307	0.307
Flared Length													137								
	D	3	3.500	1		15	0	0		0		2105		151	450	601		75%	1958	0.307	
Flared Length														53							
Pedestrian Crossing				GM		FGM															
	Ep	1	min.	7	+	9	=	16	sec												
	Fp	1,2	min.	7	+	6	=	13	sec												
	Gp	2	min.	5	+	6	=	11	sec												

*Remark: Flows of Phase C (right-turning movement) and Phase D (left-turning and straight-ahead movements) are deducted by flows capacity of the flared lane.
As left-turn lane for Phase B is not a full lane, capacity of this lane is deducted.

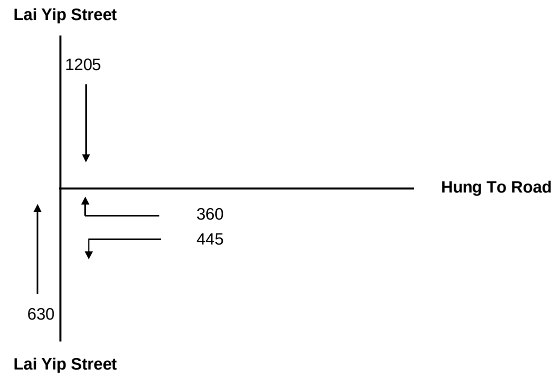
JUNCTION CAPACITY CALCULATION

AECOM

Junction J2 - Hung To Road / Lai Yip Street	2031 AM Reference Traffic Flows	DESIGN: 0	CHECK: 0	JOB NO: 60493364	DATE: Jun 19

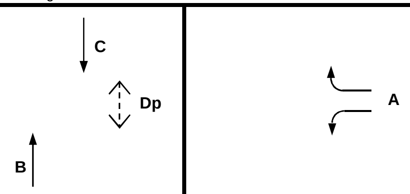
J2

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	2	
Cycle time	C =	118	sec
Sum(y)	Y =	0.543	
Lost time	L =	11	sec
Total Flow	=	2,640	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	47	sec
Min. Cycle Time C_m	$= L/(1-Y) =$	24	sec
Y_{ult}	$= 0.9-0.0075\times L =$	0.818	
R.C.$_{ult}$	$= (Y_{ult}-Y)/Y\text{x}100\% =$	50.6	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y) =$	28	sec
Y_{max}	$= 1-L/C =$	0.907	

Stage/Phase Diagrams



Stage 1	Stage 2			
I/G = 7	I/G = 6			

Critical Case : C,A

R.C.(C) $= (0.9\text{x}Y_{max}-Y)/Y\text{x}100\% =$ 50%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
	A	2	3.180	1		15	0	0		0		2073			360	360		100%	1885	0.191	
	A	2	3.180	1	10			0		0		2073	445			445	100%		1803	0.247	0.247
	B	1	3.500	2				1		0		4070		630		630			4070	0.155	
	C	1	3.500	2				1		0		4070		1205		1205			4070	0.296	0.296
Pedestrian Crossing				GM		FGM															
	Dp	1	min.	7	+	16	=	23	sec												

*Remark: Due to kerbside activities, there are only 2 lanes for Hung To Road westbound traffic.

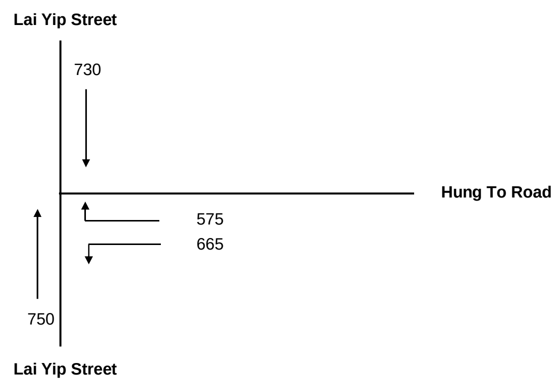
JUNCTION CAPACITY CALCULATION

AECOM

Junction J2 - Hung To Road / Lai Yip Street	2031 PM Reference Traffic Flows	DESIGN: 0	CHECK: 0	JOB NO: 60493364	DATE: Jun 19

J2

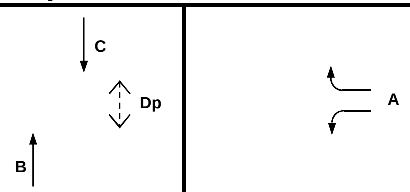
Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	2	
Cycle time	C =	108	sec
Sum(y)	Y =	0.553	
Lost time	L =	11	sec
Total Flow	=	2,720	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$		48	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	25	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.818	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times 100\%$	=	47.8	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	29	sec
Y_{max}	$= 1-L/C$	=	0.898	

Stage/Phase Diagrams



Stage 1	Stage 2			
I/G = 6	I/G = 7			

Critical Case : B,A

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 46%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	2	3.180	1		15	0	0		0		2073			575	575		100%	1885	0.305	
	A	2	3.180	1	10			0		0		2073	665			665	100%		1803	0.369	0.369
	B	1	3.500	2				1		0		4070		750		750			4070	0.184	0.184
	C	1	3.500	2				1		0		4070		730		730			4070	0.179	
Pedestrian Crossing				GM		FGM															
	Dp	1	min.	7	+	16	=	23	sec												

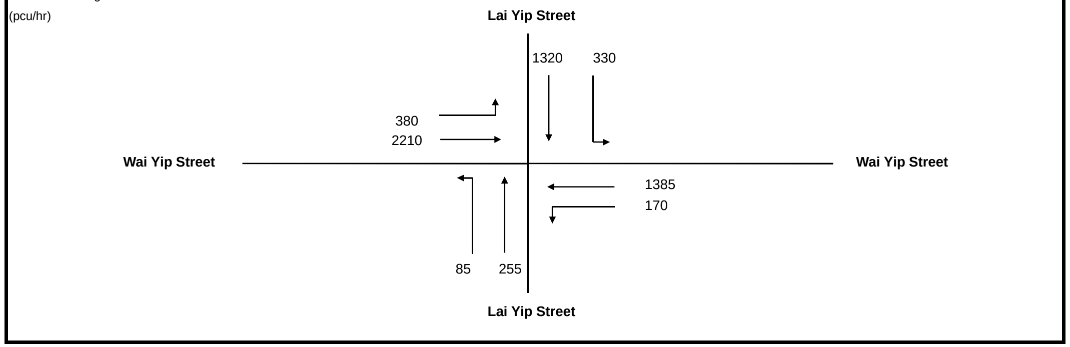
*Remark: Due to kerbside activities, there are only 2 lanes for Hung To Road westbound traffic.

JUNCTION CAPACITY CALCULATION

AECOM

Junction J3 - Lai Yip Street / Wai Yip Street	2031 AM Reference Traffic Flows (HyD NTK Interim Scheme with typical IG)	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Sep 19

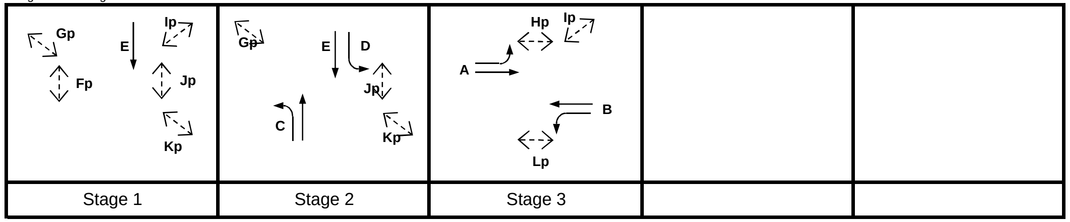
Traffic Flow Diagram
(pcu/hr)



J3

No. of stages per cycle	N =	3	
Cycle time	C =	118	sec
Sum(y)	Y =	0.737	
Lost time	L =	10	sec
Total Flow	=	6,135	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	76	sec
Min. Cycle Time C_m	$= L/(1-Y) =$	38	sec
Y_{ult}	$= 0.9-0.0075\times L =$	0.825	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times100\% =$	11.9	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y) =$	55	sec
Y_{max}	$= 1-L/C =$	0.915	

Stage/Phase Diagrams



I/G = I/G = 5 I/G = 7

Critical Case : E,A

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 12%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	3	3.300	1	16			1		0		1945	243	522		765	32%		1889	0.405	0.405
Flared Length													137								
	A	3	3.300	2				0		0		4170		1688		1688			4170	0.405	
	C	2	3.200	1	24			1		0		1935	5	120		125	4%		1930	0.065	
Flared Length													80								
	C	2	3.200	1				0		0		2075		135		135			2075	0.065	
	B	3	3.000	1	16			1		0		1915	84	378		462	18%		1883	0.245	
Flared Length													86								
	B	3	3.000	2				0		0		4110		1007		1007			4110	0.245	
	D	2	3.000	1	16			1		0		1915	279			279	100%		1751	0.159	
Flared Length													51								
	E	1,2	3.000	2				1		0		3970		1320		1320			3970	0.332	0.332
Pedestrian Crossing				GM		FGM															
	Fp	1	min.	13	+	11	=	24	sec												
	Gp	1,2	min.	5	+	5	=	10	sec												
	Hp	3	min.	11	+	10	=	21	sec												
	Ip	1,3	min.	5	+	5	=	10	sec												
	Jp	1,2	min.	11	+	9	=	20	sec												
	Kp	1,2	min.	5	+	5	=	10	sec												
	Lp	3	min.	11	+	10	=	21	sec												

*Remarks: Flows of left-turning movements of Phase A, B, C and D are deducted by the capcity of the flared lanes.

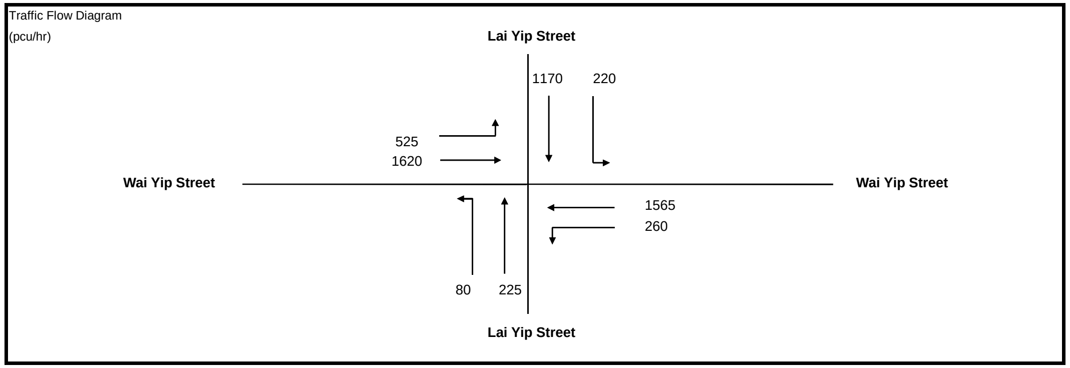
JUNCTION CAPACITY CALCULATION

AECOM

Junction J3 - Lai Yip Street / Wai Yip Street	2031 AM Reference Traffic Flows (HyD NTK Interim Scheme with typical IG)	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Sep 19

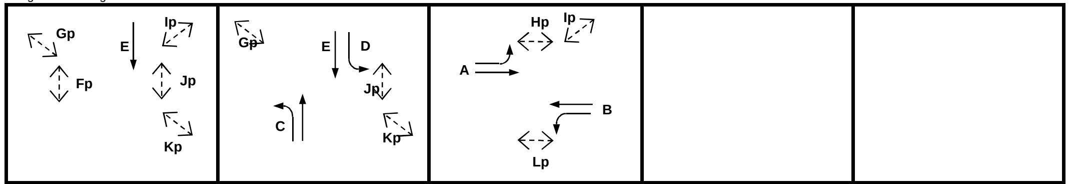
J3

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	3	
Cycle time	C =	118	sec
Sum(y)	Y =	0.586	
Lost time	L =	20	sec
Total Flow	=	5,665	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	85	sec
Min. Cycle Time C_m	$= L/(1-Y) =$	48	sec
Y_{ult}	$= 0.9-0.0075\times L =$	0.750	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\mathrm{x}100\% =$	28.0	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y) =$	57	sec
Y_{max}	$= 1-L/C =$	0.831	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		
I/G =	I/G = 13	I/G = 9		

Critical Case : E,B

R.C.(C) $= (0.9\mathrm{x}Y_{max}-Y)/Y\mathrm{x}100\% =$ 28%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	3	3.300	1	16			1		0		1945	388	226		614	63%		1836	0.334	
Flared Length													137								
	A	3	3.300	2				0		0		4170		1394		1394			4170	0.334	
	C	2	3.200	1	24			1		0		1935	5	106		111	5%		1930	0.057	
Flared Length													75								
	C	2	3.200	1				0		0		2075		119		119			2075	0.057	
	B	3	3.000	1	16			1		0		1915	174	368		542	32%		1859	0.291	0.291
Flared Length													86								
	B	3	3.000	2				0		0		4110		1197		1197			4110	0.291	
	D	2	3.000	1	16			1		0		1915	169			169	100%		1751	0.097	
Flared Length													51								
	E	1,2	3.000	2				1		0		3970		1170		1170			3970	0.295	0.295
Pedestrian Crossing				GM		FGM															
	Fp	1	min.	13	+	11	=	24	sec												
	Gp	1,2	min.	5	+	5	=	10	sec												
	Hp	3	min.	11	+	10	=	21	sec												
	Ip	1,3	min.	5	+	5	=	10	sec												
	Jp	1,2	min.	11	+	9	=	20	sec												
	Kp	1,2	min.	5	+	5	=	10	sec												
	Lp	3	min.	11	+	10	=	21	sec												

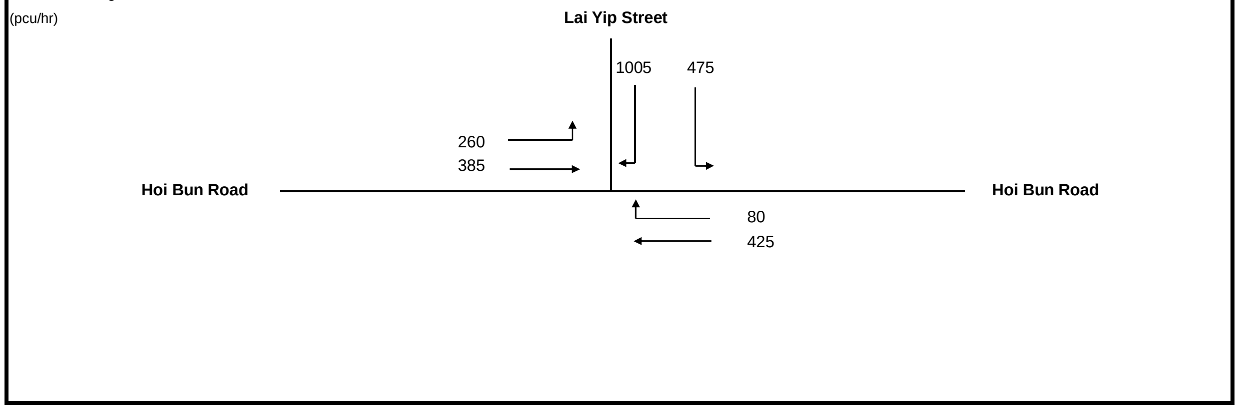
*Remarks: Flows of left-turning movements of Phase A, B, C and D are deducted by the capcity of the flared lanes.

JUNCTION CAPACITY CALCULATION

AECOM

Junction J4 - Hoi Bun Road / Lai Yip Street	2031 AM Reference Traffic Flows	DESIGN: SL	CHECK: SL	JOB NO: 60493364	DATE: Feb 19

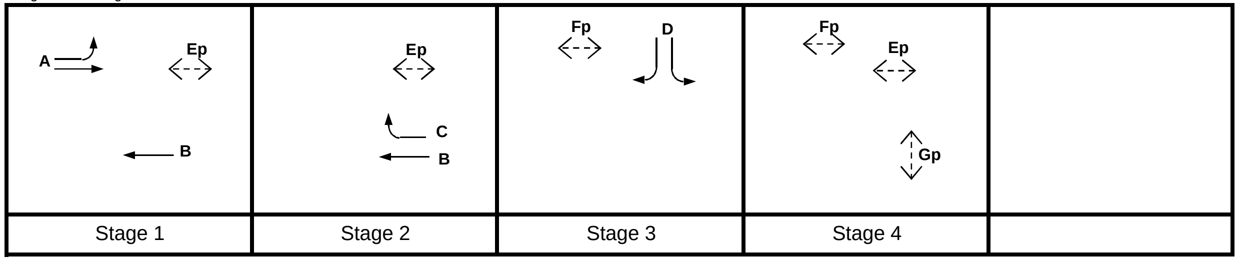
Traffic Flow Diagram
(pcu/hr)



J4

No. of stages per cycle		N =	4	
Cycle time		C =	118	sec
Sum(y)		Y =	0.501	
Lost time		L =	35	sec
Total Flow		=	2,630	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y)$ =		115	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	70	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.638	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times100\%$	=	27.1	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	79	sec
Y_{max}	$= 1-L/C$	=	0.703	

Stage/Phase Diagrams



I/G = 8   I/G = 5   I/G = 8   G = 7   I/G = 10

Critical Case : A,C,D,Gp

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\%$ = 26%

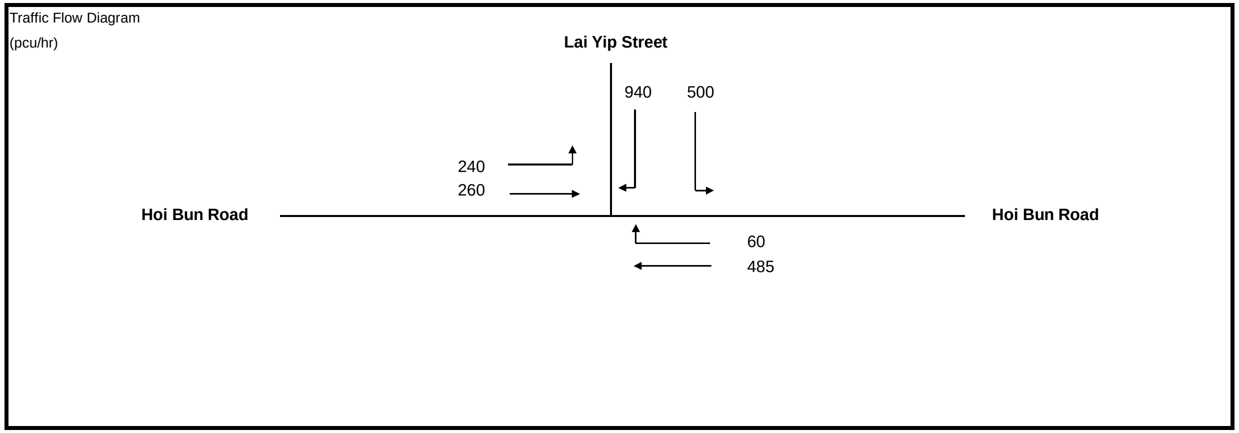
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
	A	1	3.250	1	10			1		0		1940	260			260	100%		1687	0.154	
	A	1	3.250	1				0		0		2080		385		385			2080	0.185	0.185
	B	1,2	3.000	1				1		0		1915		425		425			1915	0.222	
	C	2	3.000	1		15	0	0		0		2055			80	80		100%	1868	0.043	0.043
	D	3	3.300	1	12.5			1		0		1945	475			475	100%		1737	0.274	0.274
	D	3	3.300	2		15	0	0		0		4170			1005	1005		100%	3791	0.265	
Pedestrian Crossing				GM		FGM															
	Ep	1,2,4	min.	12	+	9	=	21	sec												
	Fp	3,4	min.	7	+	6	=	13	sec												
	Gp	4	min.	7	+	7	=	14	sec												*

JUNCTION CAPACITY CALCULATION

AECOM

Junction J4 - Hoi Bun Road / Lai Yip Street	2031 PM Reference Traffic Flows	DESIGN: SL	CHECK: SL	JOB NO: 60493364	DATE: Jun 19

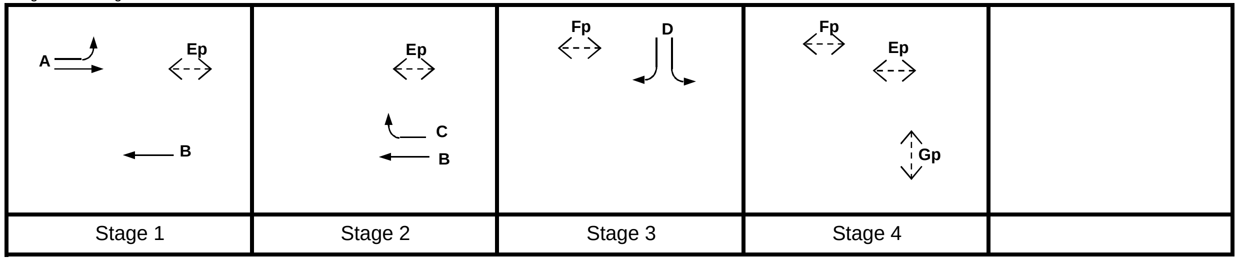
Traffic Flow Diagram
(pcu/hr)



J4

No. of stages per cycle		N =	4	
Cycle time		C =	108	sec
Sum(y)		Y =	0.541	
Lost time		L =	28	sec
Total Flow		=	2,485	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$		102	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	61	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.690	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times 100\%$	=	27.5	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	70	sec
Y_{max}	$= 1-L/C$	=	0.741	

Stage/Phase Diagrams



I/G = I/G = 5 I/G = 8 G = 7 I/G = 10

Critical Case : B,D,Gp

R.C.(C) $= (0.9\times Y_{max}-Y)/Y\times 100\% =$ 23%

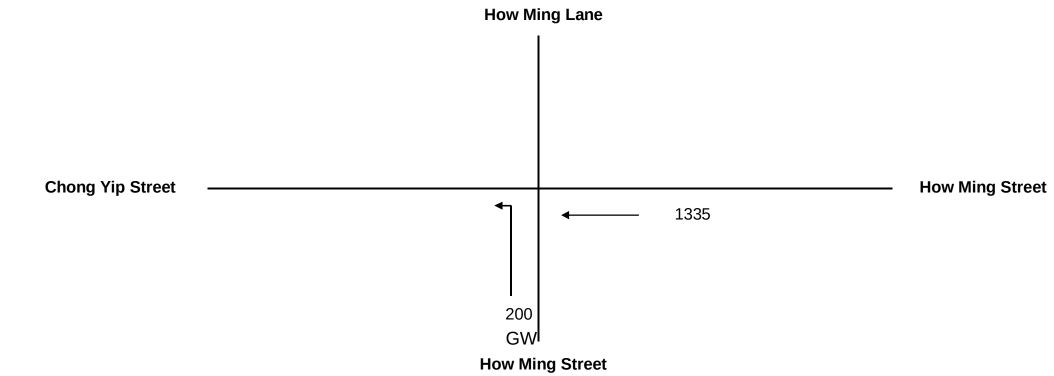
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.250	1	10			1		0		1940	240			240	100%		1687	0.142	
	A	1	3.250	1				0		0		2080		260		260			2080	0.125	
	B	1,2	3.000	1				1		0		1915		485		485			1915	0.253	0.253
	C	2	3.000	1		15	0	0		0		2055			60	60		100%	1868	0.032	
	D	3	3.300	1	12.5			1		0		1945	500			500	100%		1737	0.288	0.288
	D	3	3.300	2		15	0	0		0		4170			940	940		100%	3791	0.248	
Pedestrian Crossing				GM		FGM															
	Ep	1,2,4	min.	12	+	9	=	21	sec												
	Fp	3,4	min.	7	+	6	=	13	sec												
	Gp	4	min.	7	+	7	=	14	sec												*

JUNCTION CAPACITY CALCULATION

AECOM

Junction J5 - How Ming Street / Chong Yip Street	2031 AM Reference Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jan 19

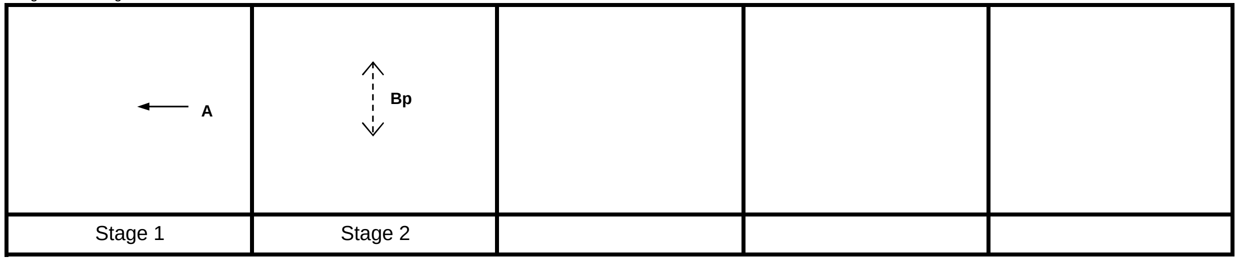
Traffic Flow Diagram
(pcu/hr)



J5

No. of stages per cycle	N =	2	
Cycle time	C =	90	sec
Sum(y)	Y =	0.326	
Lost time	L =	20	sec
Total Flow	=	1,335	pcu
Optimum Cycle C_o = (1.5×L+5)/(1-Y)	=	52	sec
Min. Cycle Time C_m = L/(1-Y)	=	30	sec
Y_{ult} = 0.9-0.0075×L	=	0.750	
$R.C._{ult}$ = (Y_{ult}-Y)/Yx100%	=	130.3	%
Practical Cycle Time C_p = 0.9×L/(0.9-Y)	=	31	sec
Y_{max} = 1-L/C	=	0.778	

Stage/Phase Diagrams



I/G = 6 G = 5 I/G = 10

Critical Case : A,Bp

R.C.(C) = (0.9xY_{max}-Y)/Yx100% = 115%

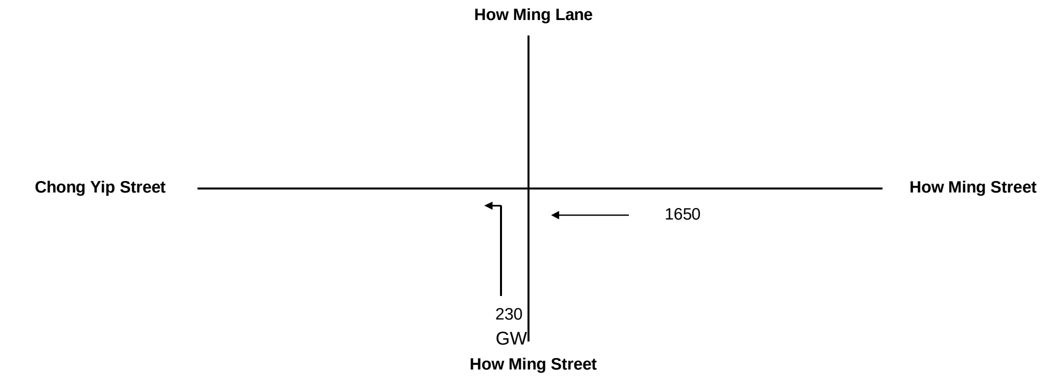
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
←	A	1	3.650	2				1		0		4100		1335		1335			4100	0.326	0.326
Pedestrian Crossing				GM		FGM															
	Bp	2	min.	5	+	7	=	12	sec												*

JUNCTION CAPACITY CALCULATION

AECOM

Junction J5 - How Ming Street / Chong Yip Street	2031 PM Reference Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jan 19

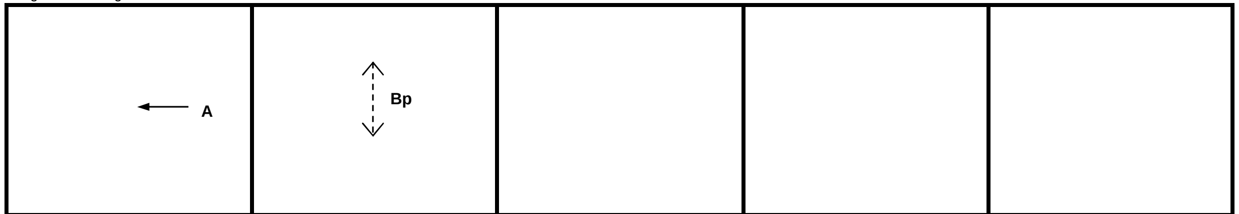
Traffic Flow Diagram
(pcu/hr)



J5

No. of stages per cycle	N =	2	
Cycle time	C =	90	sec
Sum(y)	Y =	0.402	
Lost time	L =	20	sec
Total Flow	=	1,650	pcu
Optimum Cycle C_o = (1.5×L+5)/(1-Y)	=	59	sec
Min. Cycle Time C_m = L/(1-Y)	=	33	sec
Y_{ult} = 0.9-0.0075×L	=	0.750	
$R.C._{ult}$ = (Y_{ult}-Y)/Yx100%	=	86.4	%
Practical Cycle Time C_p = 0.9×L/(0.9-Y)	=	36	sec
Y_{max} = 1-L/C	=	0.778	

Stage/Phase Diagrams



Stage 1	Stage 2			

I/G = 6 G = 5 I/G = 10

Critical Case : A,Bp

R.C.(C) = (0.9xY_{max}-Y)/Yx100% = 74%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
←	A	1	3.650	2				1		0		4100		1650		1650			4100	0.402	0.402
Pedestrian Crossing				GM		FGM															
	Bp	2	min.	5	+	7	=	12	sec												*

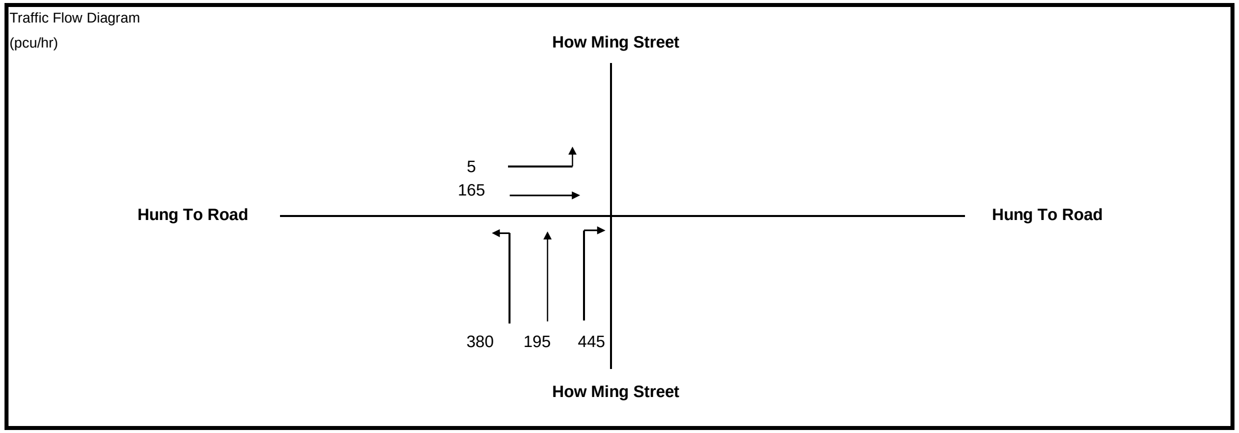
JUNCTION CAPACITY CALCULATION

AECOM

Junction J6 - Hung To Road / How Ming Street	2031 AM Reference Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

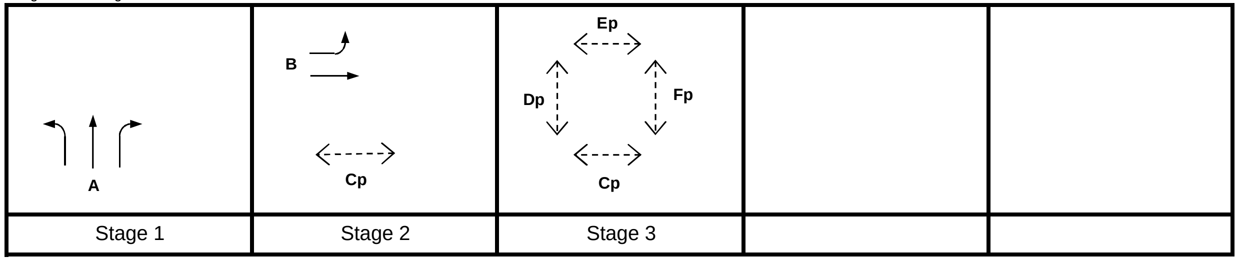
J6

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	3	
Cycle time		C =	118	sec
Sum(y)		Y =	0.435	
Lost time		L =	29	sec
Total Flow		=	1,190	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y)$	=	86	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	51	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.683	
R.C.$_{ult}$	$= (Y_{ult}-Y)/Y\times100\%$	=	56.7	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	56	sec
Y_{max}	$= 1-L/C$	=	0.754	

Stage/Phase Diagrams



I/G = 6 I/G = 5 G = 10 I/G = 10

Critical Case : A,B,Dp

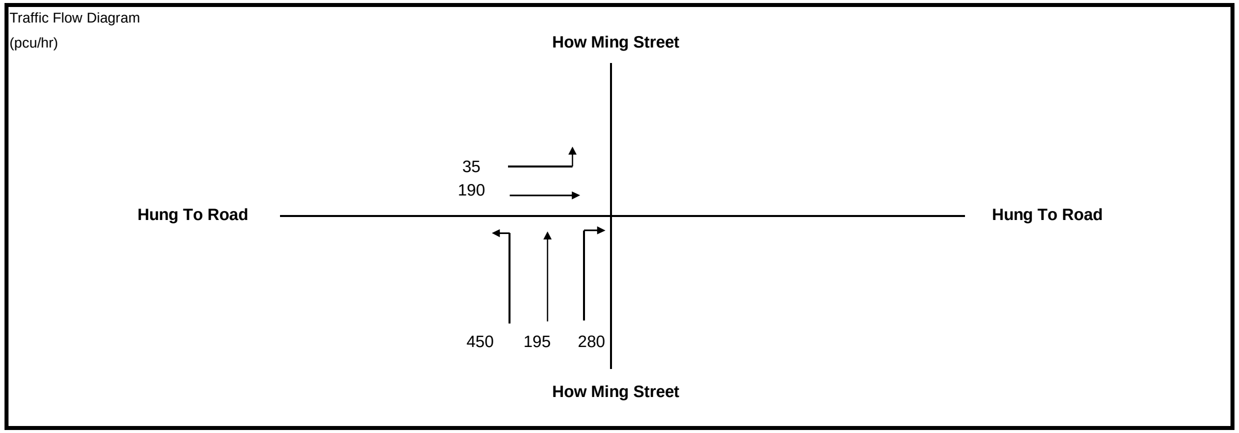
R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 56%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	4.000	1	10			1		0		2015	380			380	100%		1752	0.217	
	A	1	4.000	1		10	0	1		0		2015		195	445	640		70%	1825	0.351	0.351
	B	2	4.000	1	10			1		0		2015	5	165		170	3%		2006	0.085	0.085
Pedestrian Crossing				GM		FGM															
	Cp	2,3	min.	7	+	10	=	17	sec												
	Dp	3	min.	10	+	8	=	18	sec												*
	Ep	3	min.	6	+	9	=	15	sec												
	Fp	3	min.	6	+	9	=	15	sec												

JUNCTION CAPACITY CALCULATION

AECOM

Junction J6 - Hung To Road / How Ming Street	2031 PM Reference Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

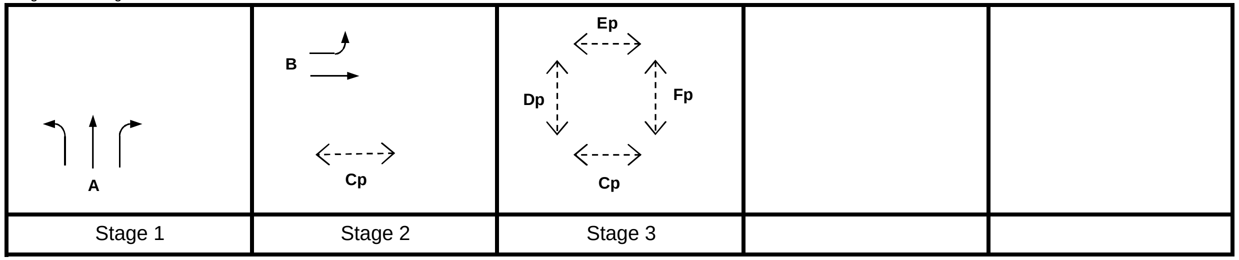


J6

No. of stages per cycle	N =	3	
Cycle time	C =	108	sec
Sum(y)	Y =	0.371	
Lost time	L =	29	sec
Total Flow	=	1,150	pcu

Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y) =$	77	sec
Min. Cycle Time C_m	$= L/(1-Y) =$	46	sec
Y_{ult}	$= 0.9-0.0075 \times L =$	0.683	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y \times 100\% =$	83.9	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y) =$	49	sec
Y_{max}	$= 1-L/C =$	0.731	

Stage/Phase Diagrams



I/G = 6 I/G = 5 G = 10 I/G = 10

Critical Case : A,B,Dp

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 77%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	4.000	1	10			1		0		2015	450			450	100%		1752	0.257	0.257
	A	1	4.000	1		10	0	1		0		2015		195	280	475		59%	1851	0.257	
	B	2	4.000	1	10			1		0		2015	35	190		225	16%		1969	0.114	0.114
Pedestrian Crossing				GM		FGM															
	Cp	2,3	min.	7	+	10	=	17	sec												
	Dp	3	min.	10	+	8	=	18	sec												*
	Ep	3	min.	6	+	9	=	15	sec												
	Fp	3	min.	6	+	9	=	15	sec												

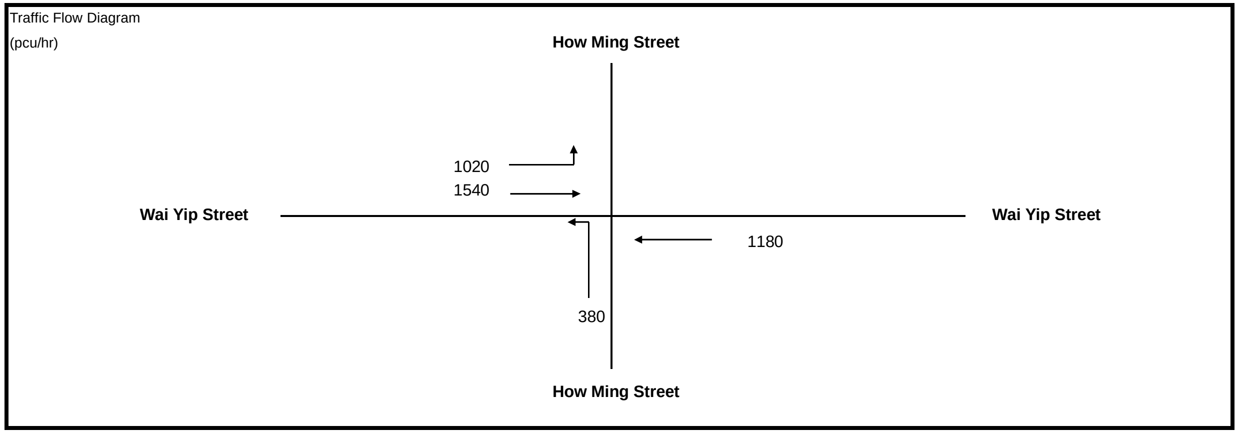
JUNCTION CAPACITY CALCULATION

AECOM

Junction J7 - Wai Yip Street / How Ming Street	2031 AM Reference Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: -	DATE: Jun 19

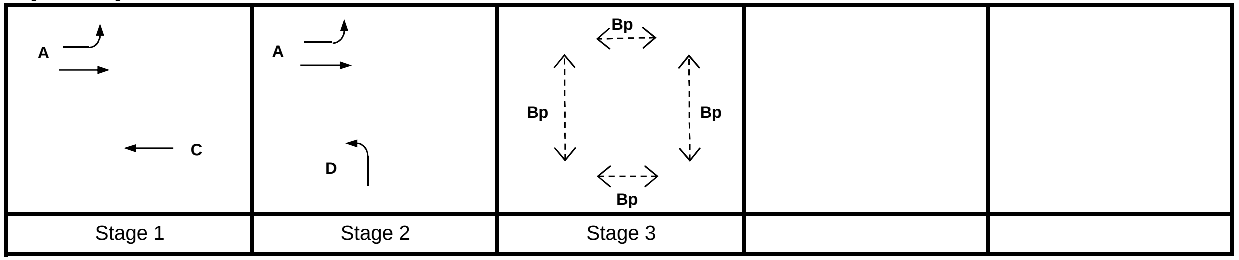
J7

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	3	
Cycle time		C =	118	sec
Sum(y)		Y =	0.586	
Lost time		L =	30	sec
Total Flow		=	4,120	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y)$	=	121	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	72	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.675	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times100\%$	=	15.2	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	86	sec
Y_{max}	$= 1-L/C$	=	0.746	

Stage/Phase Diagrams



I/G = I/G = 8 G = 8 I/G = 15

Critical Case : A,Bp

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 15%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1,2	3.000	1	15			1		0		1915	1020	0		1020	100%		1741	0.586	0.586
	A	1,2	3.000	2				0		0		4110		1540		1540			4110	0.375	
	C	1	3.000	3				1		0		6025		1180		1180			6025	0.196	
	D	2	3.500	1	15			1		0		1965	380			380	100%		1786	0.213	
Pedestrian Crossing				GM		FGM															
	Bp	3	min.	8	+	11	=	19	sec												*

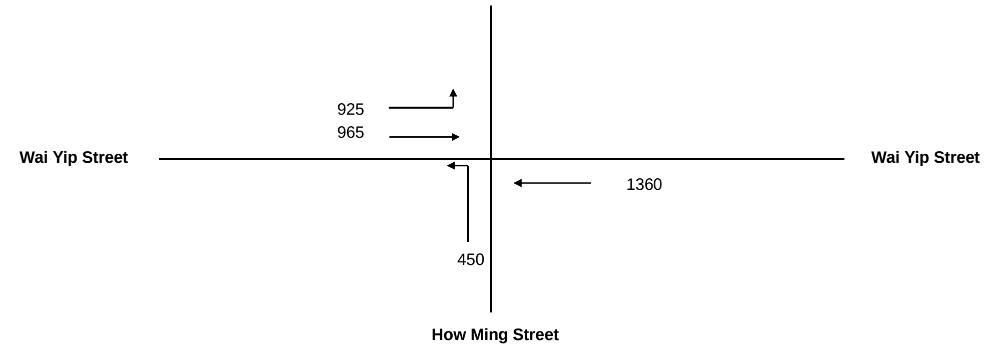
JUNCTION CAPACITY CALCULATION

AECOM

Junction J7 - Wai Yip Street / How Ming Street	2031 PM Reference Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: -	DATE: Jul 19

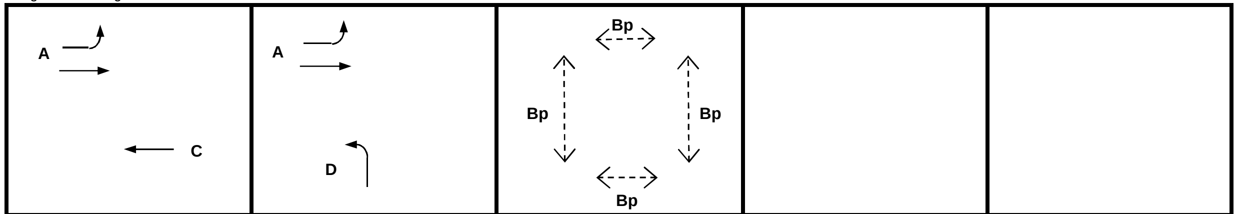
J7

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	3	
Cycle time		C =	118	sec
Sum(y)		Y =	0.531	
Lost time		L =	30	sec
Total Flow		=	3,700	pcu
Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y)$	=	107	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	64	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.675	
R.C.$_{ult}$	$= (Y_{ult}-Y)/Y \times 100\%$	=	27.0	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	73	sec
Y_{max}	$= 1-L/C$	=	0.746	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G =   I/G = 8   G = 8   I/G = 15

Critical Case : A,Bp

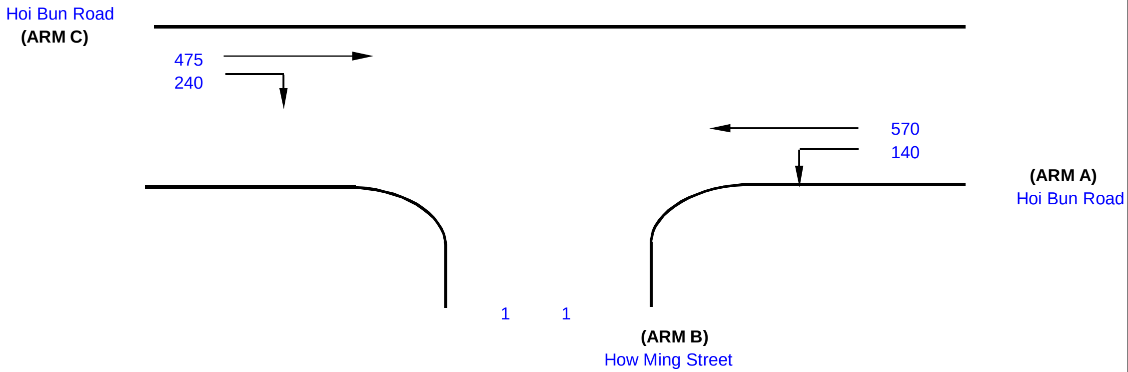
R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 26%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1,2	3.000	1	15			1		0		1915	925	0		925	100%		1741	0.531	0.531
	A	1,2	3.000	2				0		0		4110		965		965			4110	0.235	
	C	1	3.000	3				1		0		6025		1360		1360			6025	0.226	
	D	2	3.500	1	15			1		0		1965	450			450	100%		1786	0.252	
Pedestrian Crossing				GM		FGM															
	Bp	3	min.	8	+	11	=	19	sec												*

PRIORITY JUNCTION CAPACITY CALCULATION

AECOM

Junction J8 - Hoi Bun Road / How Ming Street	2031 AM Reference Traffic Flows	Designed By : SL	Checked By : DW	Job No. : 60493364	Date : Oct 19



J8

NOTES : (GEOMETRIC INPUT DATA)

W	= Major Road Width (6.4 - 20.0)
W cr	= Central Reserve width (1.2 - 9.0, kerbed central reserve only)
W b-a	= Lane width available to vehicle waiting in stream b-a (2.05 - 4.70)
W b-c	= Lane width available to vehicle waiting in stream b-c (2.05 - 4.70)
W c-b	= Lane width available to vehicle waiting in stream c-b (2.05 - 4.70)
Vl b-a	= Visibility to the left for vehicles waiting in stream b-a (22.0 - 250.0)
Vr b-a	= Visibility to the right for vehicles waiting in stream b-a (17.0 - 250.0)
Vr b-c	= Visibilitu to the right for vehicles waiting in stream b-c (17.0 - 250.0)
Vr c-b	= Visibility to the right for vehicles waiting in stream c-b (17.0 - 250.0)
D	= Stream-specific B-A
E	= Stream-specific B-C
F	= Stream-specific C-B
Y	= (1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)				*MAJOR ROAD (ARM C)*				*MINOR ROAD (ARM B)*			
W	=	5.75	(metres)	W c-b	=		(metres)	W b-a	=	3.15	(metres)
W cr	=	0.85	(metres)	Vr c-b	=		(metres)	W b-c	=	3.65	(metres)
q a-b	=	140	(pcu/hr)	q c-a	=	475	(pcu/hr)	Vl b-a	=	74	(metres)
q a-c	=	570	(pcu/hr)	q c-b	=	240	(pcu/hr)	Vr b-a	=	62	(metres)
								Vr b-c	=	97	(metres)
								q b-a	=	1	(pcu/hr)
								q b-c	=	1	(pcu/hr)

GEOMETRIC FACTORS :

D	=	0.862065
E	=	0.979300
F	=	0.585955
Y	=	0.801625

THE CAPACITY OF MOVEMENT :

Q b-a	=	232
Q b-c	=	551
Q c-b	=	315
Q b-ac	=	327

CRITICAL DFC = 0.76

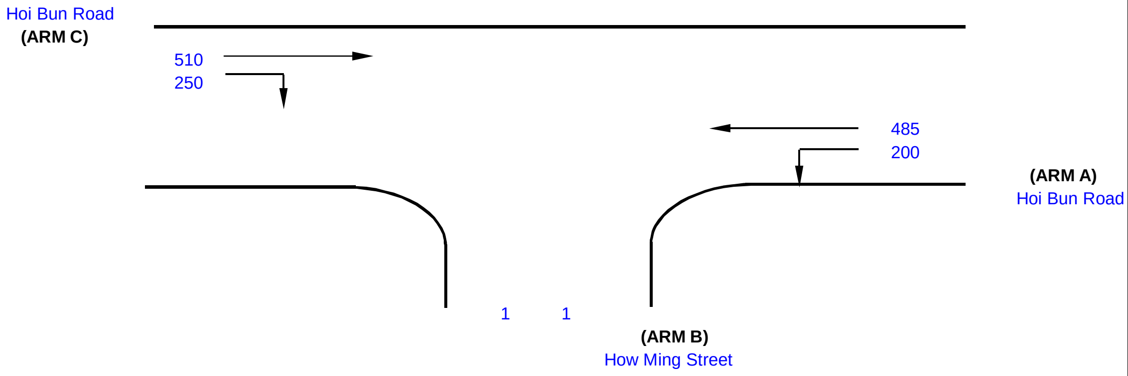
COMPARISION OF DESIGN FLOW TO CAPACITY :

DFC b-a	=	0.00
DFC b-c	=	0.00
DFC c-b	=	0.76
DFC b-ac	=	0.01

PRIORITY JUNCTION CAPACITY CALCULATION

AECOM

Junction J8 - Hoi Bun Road / How Ming Street	2031 PM Reference Traffic Flows	Designed By : SL	Checked By : DW	Job No. : 60493364	Date : Oct 19



J8

NOTES : (GEOMETRIC INPUT DATA)

W	= Major Road Width (6.4 - 20.0)
W cr	= Central Reserve width (1.2 - 9.0, kerbed central reserve only)
W b-a	= Lane width available to vehicle waiting in stream b-a (2.05 - 4.70)
W b-c	= Lane width available to vehicle waiting in stream b-c (2.05 - 4.70)
W c-b	= Lane width available to vehicle waiting in stream c-b (2.05 - 4.70)
Vl b-a	= Visibility to the left for vehicles waiting in stream b-a (22.0 - 250.0)
Vr b-a	= Visibility to the right for vehicles waiting in stream b-a (17.0 - 250.0)
Vr b-c	= Visibilitu to the right for vehicles waiting in stream b-c (17.0 - 250.0)
Vr c-b	= Visibility to the right for vehicles waiting in stream c-b (17.0 - 250.0)
D	= Stream-specific B-A
E	= Stream-specific B-C
F	= Stream-specific C-B
Y	= (1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)			*MAJOR ROAD (ARM C)*			*MINOR ROAD (ARM B)*		
W	=	5.75 (metres)	W c-b	=	(metres)	W b-a	=	3.15 (metres)
W cr	=	0.85 (metres)	Vr c-b	=	(metres)	W b-c	=	3.65 (metres)
q a-b	=	200 (pcu/hr)	q c-a	=	510 (pcu/hr)	Vl b-a	=	74 (metres)
q a-c	=	485 (pcu/hr)	q c-b	=	250 (pcu/hr)	Vr b-a	=	62 (metres)
						Vr b-c	=	97 (metres)
						q b-a	=	1 (pcu/hr)
						q b-c	=	1 (pcu/hr)

GEOMETRIC FACTORS :

D	=	0.862065
E	=	0.979300
F	=	0.585955
Y	=	0.801625

`

THE CAPACITY OF MOVEMENT :

Q b-a	=	238
Q b-c	=	568
Q c-b	=	319
Q b-ac	=	336

CRITICAL DFC = 0.78

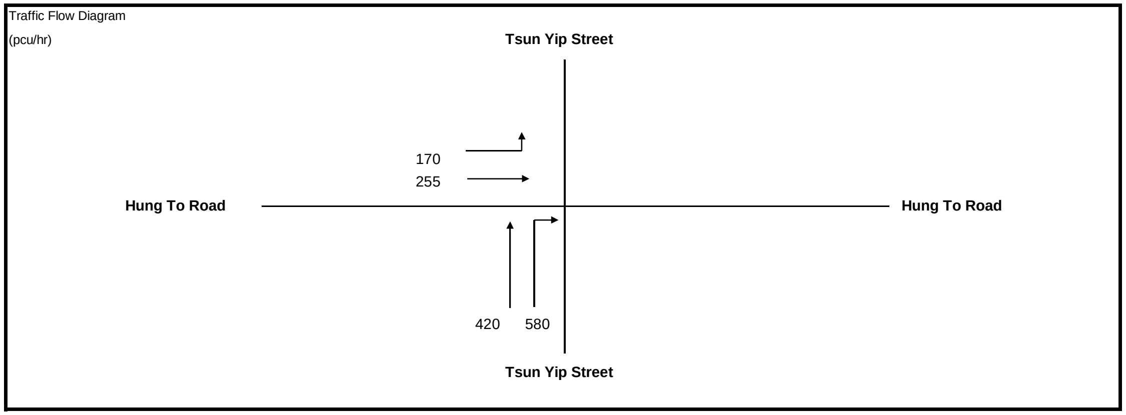
COMPARISION OF DESIGN FLOW TO CAPACITY :

DFC b-a	=	0.00
DFC b-c	=	0.00
DFC c-b	=	0.78
DFC b-ac	=	0.01

JUNCTION CAPACITY CALCULATION

AECOM

Junction J9 - Hung To Road / Tsun Yip Street	2031 AM Reference Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: May 20

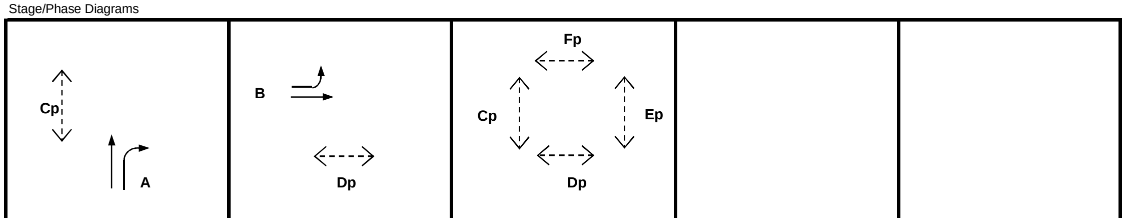


J9

No. of stages per cycle	N =	3	
Cycle time	C =	118	sec
Sum(y)	Y =	0.462	
Lost time	L =	27	sec
Total Flow	=	1,425	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$		85	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	50	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.698	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times100\%$	=	51.0	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	55	sec
Y_{max}	$= 1-L/C$	=	0.771	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G = 5 I/G = 8 G = 7 I/G = 9

Critical Case : A,B,Ep

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 50%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	B	2	3.300	1	11			1		0		1945	170			170	100%		1712	0.099	
	B	2	3.300	1				1		0		1945		255		255			1945	0.131	0.131
	A	1	3.400	1				1		0		1955		420		420			1955	0.215	
	A	1	3.400	1		13	0	1		0		1955			580	580		100%	1753	0.331	0.331
Pedestrian Crossing				GM		FGM															
	Cp	1,3	min.	6	+	6	=	12	sec												
	Dp	2,3	min.	9	+	9	=	18	sec												
	Ep	3	min.	7	+	7	=	14	sec												*
	Fp	3	min.	7	+	7	=	14	sec												

JUNCTION CAPACITY CALCULATION

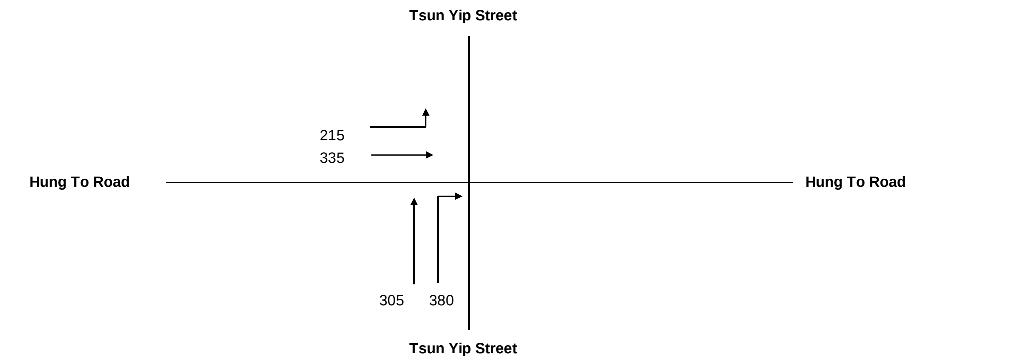
AECOM

Junction J9 - Hung To Road / Tsun Yip Street	2031 PM Reference Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

J9

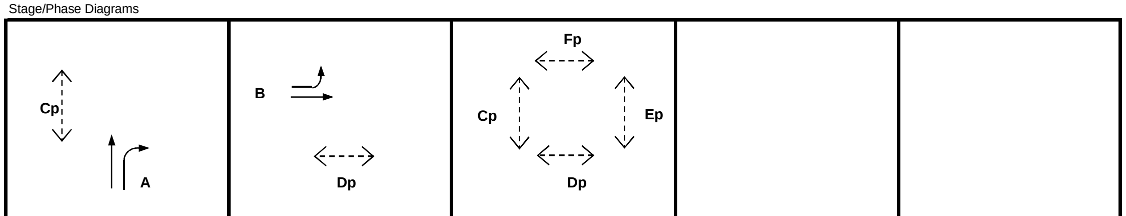
Traffic Flow Diagram

(pcu/hr)



No. of stages per cycle	N =	3	
Cycle time	C =	118	sec
Sum(y)	Y =	0.389	
Lost time	L =	27	sec
Total Flow	=	1,235	pcu
Optimum Cycle C_o = $(1.5\times L+5)/(1-Y)$	=	74	sec
Min. Cycle Time C_m = $L/(1-Y)$	=	44	sec
Y_{ult} = $0.9-0.0075\times L$	=	0.698	
$R.C._{ult}$ = $(Y_{ult}-Y)/Y\times100\%$	=	79.3	%
Practical Cycle Time C_p = $0.9\times L/(0.9-Y)$	=	48	sec
Y_{max} = $1-L/C$	=	0.771	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G = 5 I/G = 8 G = 7 I/G = 9

Critical Case : A,B,Ep

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 78%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	B	2	3.300	1	11			1		0		1945	215			215	100%		1712	0.126	
	B	2	3.300	1				1		0		1945		335		335			1945	0.172	0.172
	A	1	3.400	1				1		0		1955		305		305			1955	0.156	
	A	1	3.400	1		13	0	1		0		1955			380	380		100%	1753	0.217	0.217
Pedestrian Crossing				GM		FGM															
	Cp	1,3	min.	6	+	6	=	12	sec												
	Dp	2,3	min.	9	+	9	=	18	sec												
	Ep	3	min.	7	+	7	=	14	sec												*
	Fp	3	min.	7	+	7	=	14	sec												

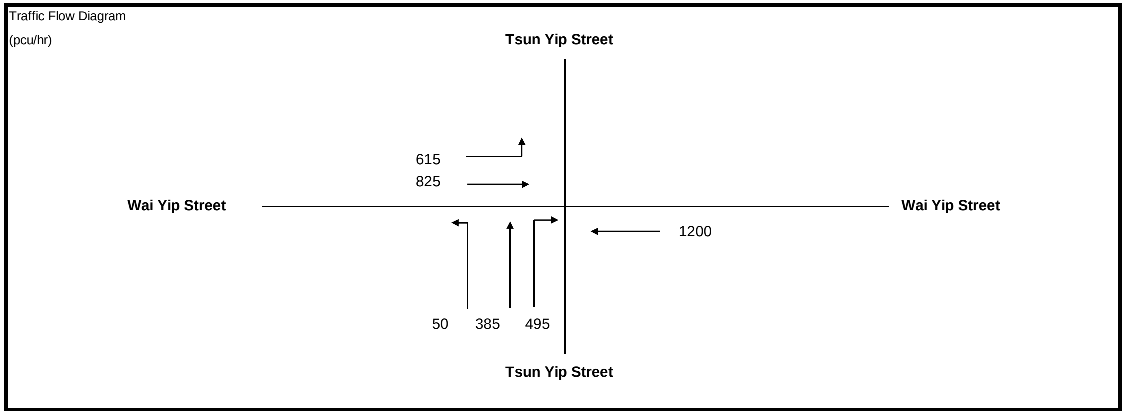
JUNCTION CAPACITY CALCULATION

AECOM

Junction J10 - Wai Yip Street / Tsun Yip Street	2031 AM Reference Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: May 20

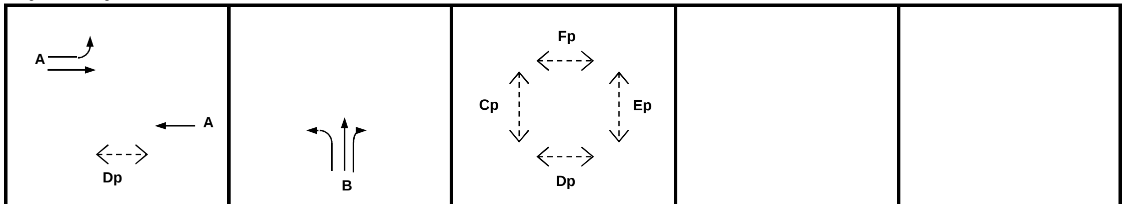
J10

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	3	
Cycle time	C =	118	sec
Sum(y)	Y =	0.417	
Lost time	L =	39	sec
Total Flow	=	3,570	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	109	sec
Min. Cycle Time C_m	$= L/(1-Y)$ =	67	sec
Y_{ult}	$= 0.9-0.0075\times L$ =	0.608	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times100\%$ =	45.8	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$ =	73	sec
Y_{max}	$= 1-L/C$ =	0.669	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G = 7 I/G = 8 G = 12 I/G = 14

Critical Case : A,B,Fp

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 45%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.000	1	10			1		0		1915	420			420	100%		1665	0.252	0.252
	A	1	3.000	1	17.5					0		2055	195	307		502	39%		1989	0.252	
	A	1	3.000	1				0		0		2055		518		518			2055	0.252	
	A	1	3.000	3				1		0		6025		1200		1200			6025	0.199	
	B	2	3.300	1	12.5			1		0		1945	50	264		314	16%		1908	0.164	
	B	2	3.300	1		18	0			0		2085		121	204	326		63%	1981	0.164	0.164
	B	2	3.300	1		15	0	1		0		1945			291	291		100%	1768	0.164	
Pedestrian Crossing				GM		FGM															
	Cp	3	min.	9	+	8	=	17	sec												
	Dp	1,3	min.	14	+	14	=	28	sec												
	Ep	3	min.	9	+	8	=	17	sec												
	Fp	3	min.	12	+	12	=	24	sec												*

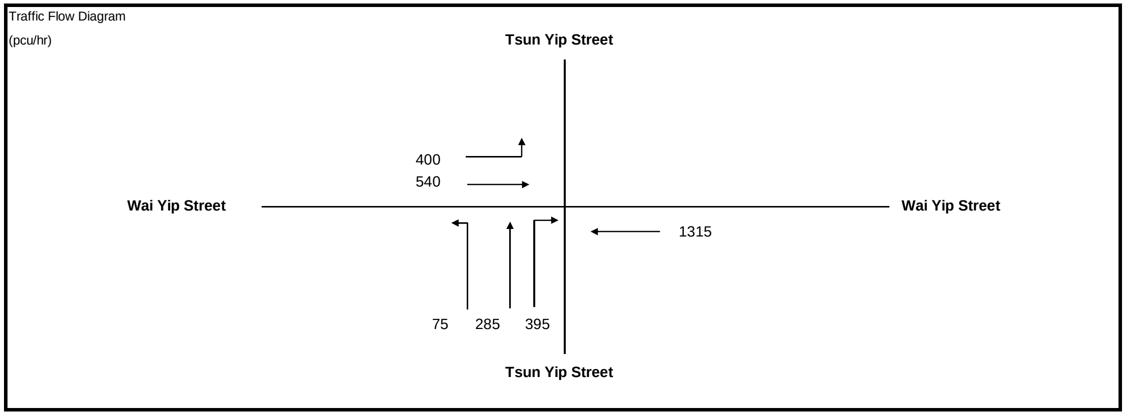
JUNCTION CAPACITY CALCULATION

AECOM

Junction J10 - Wai Yip Street / Tsun Yip Street	2031 PM Reference Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

Traffic Flow Diagram

(pcu/hr)

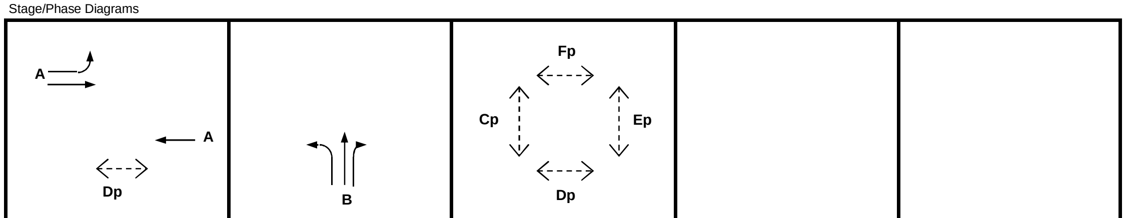


J10

No. of stages per cycle	N =	3	
Cycle time	C =	108	sec
Sum(y)	Y =	0.352	
Lost time	L =	39	sec
Total Flow	=	3,010	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	98	sec
Min. Cycle Time C_m	$= L/(1-Y)$ $=$	60	sec
Y_{ult}	$= 0.9-0.0075\times L$ $=$	0.608	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times100\%$ $=$	72.4	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$ $=$	64	sec
Y_{max}	$= 1-L/C$ $=$	0.639	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G = 7 I/G = 8 G = 12 I/G = 14

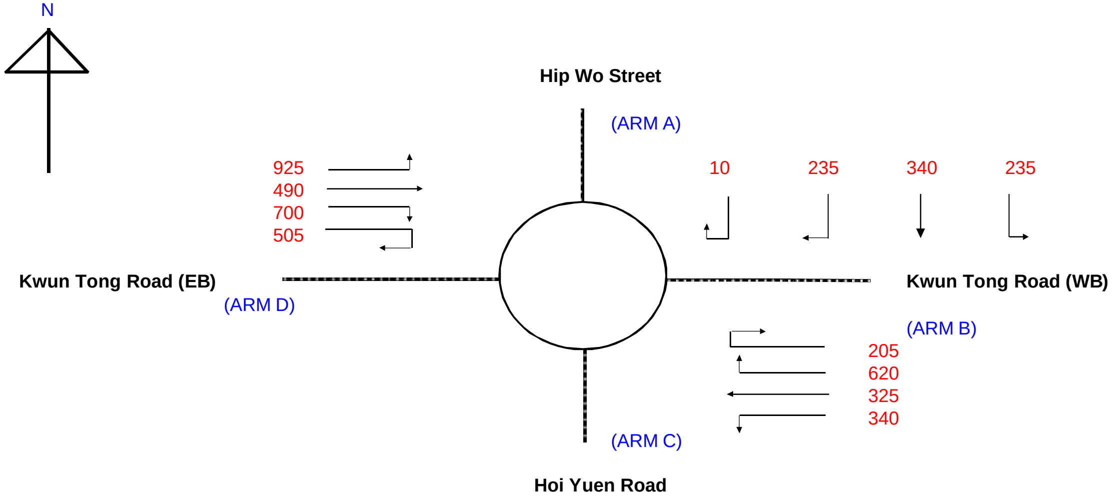
Critical Case : A,B,Fp

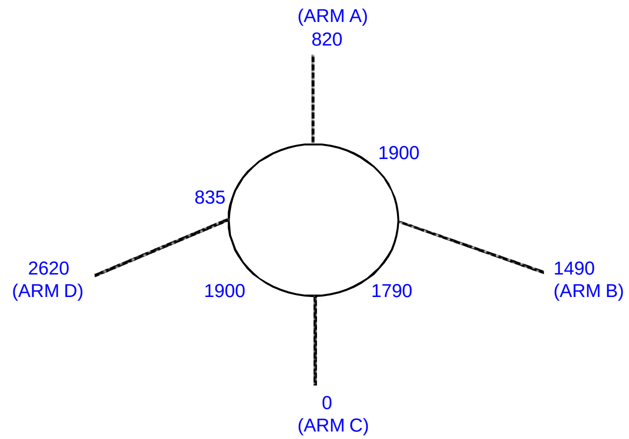
R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 63%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.000	1	10			1		0		1915	274			274	100%		1665	0.165	
	A	1	3.000	1	17.5					0		2055	126	202		328	38%		1989	0.165	
	A	1	3.000	1				0		0		2055		338		338			2055	0.165	
	A	1	3.000	3				1		0		6025		1315		1315			6025	0.218	0.218
	B	2	3.300	1	12.5			1		0		1945	75	177		252	30%		1878	0.134	0.134
	B	2	3.300	1		18	0			0		2085		108	158	266		59%	1987	0.134	
	B	2	3.300	1		15	0	1		0		1945			237	237		100%	1768	0.134	
Pedestrian Crossing				GM		FGM															
	Cp	3	min.	9	+	8	=	17	sec												
	Dp	1,3	min.	14	+	14	=	28	sec												
	Ep	3	min.	9	+	8	=	17	sec												
	Fp	3	min.	12	+	12	=	24	sec												*

ROUNDABOUT CAPACITY CALCULATION

Junction	J11 Kwung Tong Road / Hip Wo Street	Scenario	2031 AM Reference Traffic Flows	Project No.	Prepared By	Checked By	Date
				60493364	SL	DW	25/Sep/19





ARM	A	B	C	D
INPUT PARAMETERS:				
V = Approach half width (m)	7.00	7.00	8.00	8.00
E = Entry width (m)	8.00	7.30	9.00	9.00
L = Effective length of flare (m)	10.00	15.00	20.00	20.00
R = Entry radius (m)	100.00	45.00	40.00	40.00
D = Inscribed circle diameter (m)	83.00	86.00	83.00	86.00
A = Entry angle (degree)	30.00	40.00	25.00	25.00
Q = Entry flow (pcu/h)	820	1490	0	2620
Qc= Circulating flow across entry (pcu/h)	1900	1790	1900	835
OUTPUT PARAMETERS:				
S = Sharpness of flare = 1.6(E-V)/L	0.16	0.03	0.08	0.08
K = 1-0.00347(A-30)-0.978(1/R-0.05)	1.04	0.99	1.04	1.04
X2= V + ((E-V)/(1+2S))	7.76	7.28	8.86	8.86
M = EXP((D-60)/10)	9.97	13.46	9.97	13.46
F = 303*X2	2351	2206	2685	2685
Td= 1+(0.5/(1+M))	1.05	1.03	1.05	1.03
Fc= 0.21*Td(1+0.2*X2)	0.56	0.53	0.61	0.60
Qe= K(F-Fc*Qc)	1336	1242	1593	2273
DFC = Design flow/Capacity = Q/Qe	0.61	1.20	0.00	1.15

TOTAL ENTRY FLOWS = 4930 PCU

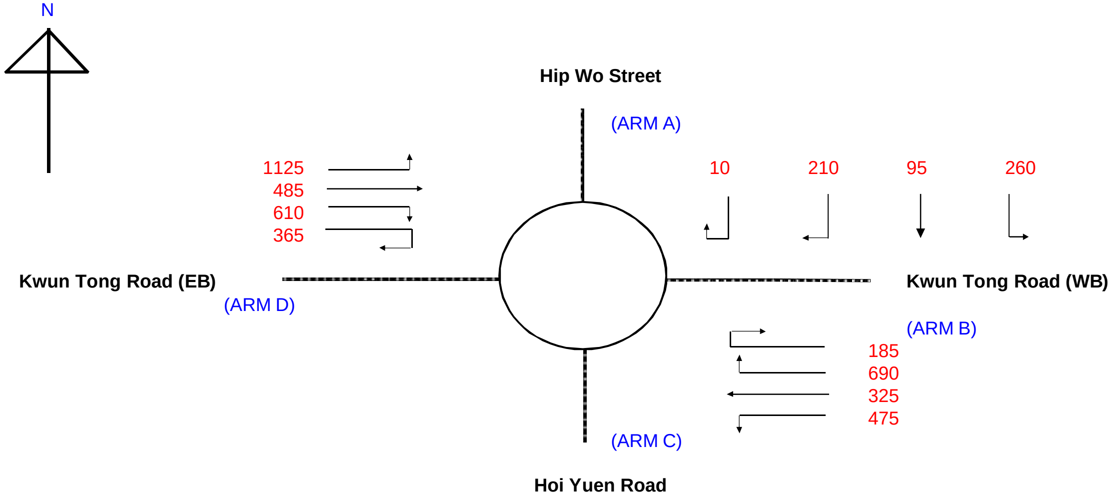
CRITICAL DFC = 1.20

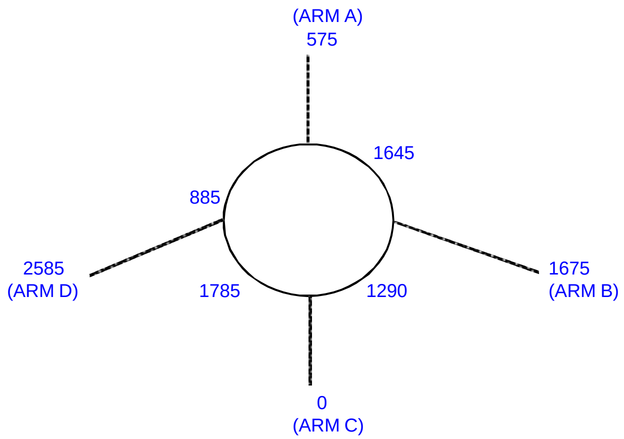
Filename : C:\old d drive data\Since\60493364 KTTA\20190703 Junction Calculation\[J11RA - I

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J11 Kwung Tong Road / Hip Wo Street	Scenario	2031 PM Reference Traffic Flows	Project No.	Prepared By	Checked By	Date
				60493364	SL	DW	25/Sep/19





ARM	A	B	C	D
INPUT PARAMETERS:				
V = Approach half width (m)	7.00	7.00	8.00	8.00
E = Entry width (m)	8.00	7.30	9.00	9.00
L = Effective length of flare (m)	10.00	15.00	20.00	20.00
R = Entry radius (m)	100.00	45.00	40.00	40.00
D = Inscribed circle diameter (m)	83.00	86.00	83.00	86.00
A = Entry angle (degree)	30.00	40.00	25.00	25.00
Q = Entry flow (pcu/h)	575	1675	0	2585
Qc= Circulating flow across entry (pcu/h)	1645	1290	1785	885
OUTPUT PARAMETERS:				
S = Sharpness of flare = 1.6(E-V)/L	0.16	0.03	0.08	0.08
K = 1-0.00347(A-30)-0.978(1/R-0.05)	1.04	0.99	1.04	1.04
X2= V + ((E-V)/(1+2S))	7.76	7.28	8.86	8.86
M = EXP((D-60)/10)	9.97	13.46	9.97	13.46
F = 303*X2	2351	2206	2685	2685
Td= 1+(0.5/(1+M))	1.05	1.03	1.05	1.03
Fc= 0.21*Td(1+0.2*X2)	0.56	0.53	0.61	0.60
Qe= K(F-Fc*Qc)	1485	1507	1665	2242
DFC = Design flow/Capacity = Q/Qe	0.39	1.11	0.00	1.15

TOTAL ENTRY FLOWS = 4835 PCU

CRITICAL DFC = 1.15

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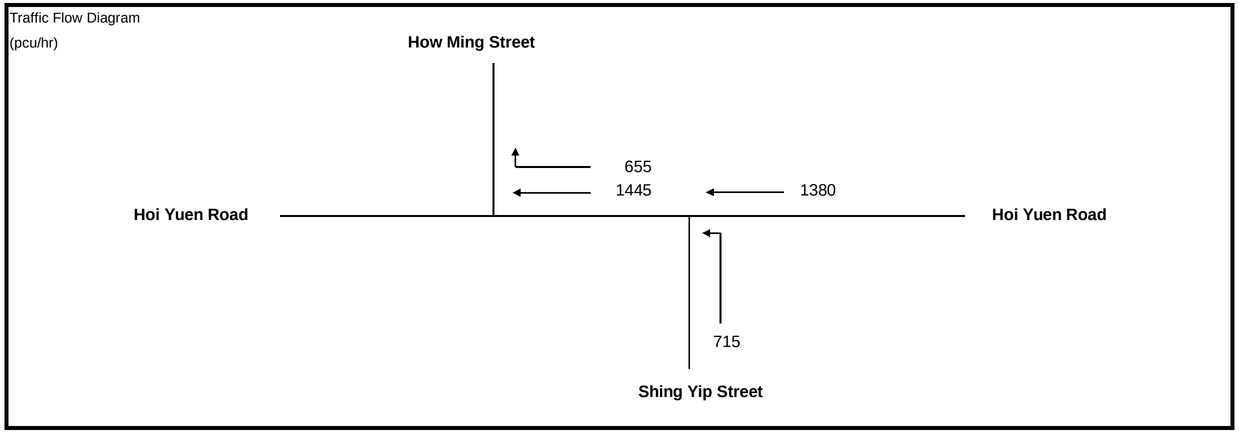
JUNCTION CAPACITY CALCULATION

AECOM

Junction J12 - Hoi Yuen Road / How Ming Street / Shing Yip Street	2031 AM Reference Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

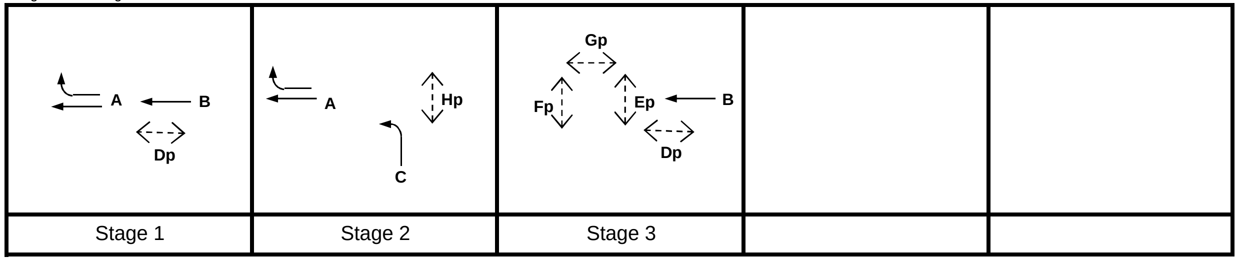
Traffic Flow Diagram
(pcu/hr)



J12

No. of stages per cycle		N =	3	
Cycle time		C =	100	sec
Sum(y)		Y =	0.545	
Lost time		L =	28	sec
Total Flow		=	4,195	pcu
Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y)$	=	103	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	62	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.690	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y \times 100\%$	=	26.5	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	71	sec
Y_{max}	$= 1-L/C$	=	0.720	

Stage/Phase Diagrams



I/G = I/G = 7 G = 8 I/G = 14

Critical Case : A,Fp

R.C.(C) $= (0.9 \times Y_{max}-Y)/Y \times 100\% =$ 19%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1,2	4.000	1				1		0		2015		1099		1099			2015	0.545	0.545
	A	1,2	4.000	1		10	0	1		0		2015		346	655	1001		65%	1835	0.545	
	B	1,3	4.000	2				1		0		4170		1380		1380			4170	0.331	
	C	2	3.000	3	8			1		0		6025	715			715	100%		5074	0.141	
Pedestrian Crossing				GM		FGM															
	Dp	1,3	min.	8	+	9	=	17	sec												
	Ep	3	min.	8	+	13	=	21	sec												
	Fp	3	min.	8	+	11	=	19	sec												*
	Gp	3	min.	8	+	8	=	16	sec												
	Hp	2	min.	8	+	10	=	18	sec												

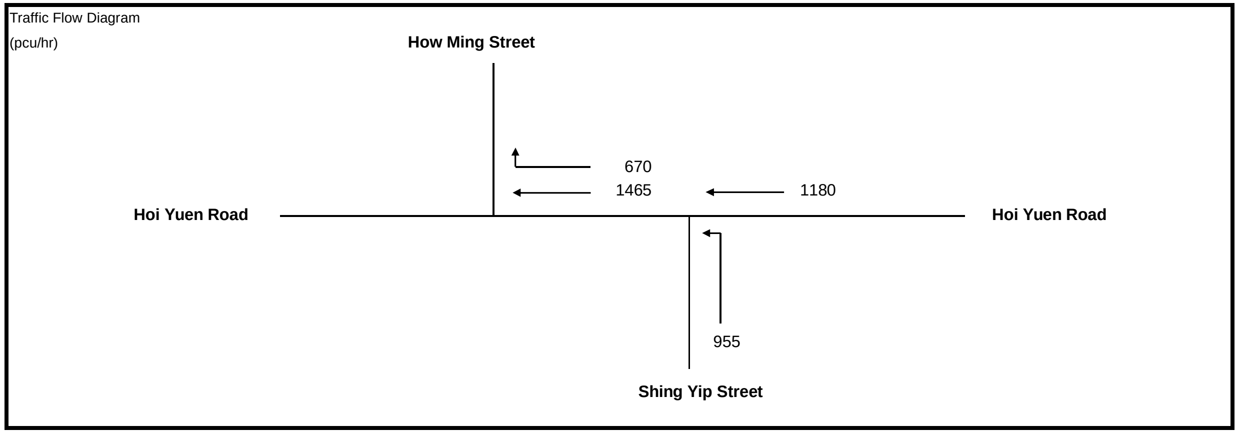
*Remark: Due to kerbside activities, there are only 2 lanes for Hoi Yuen Road westbound traffic.

JUNCTION CAPACITY CALCULATION

AECOM

Junction J12 - Hoi Yuen Road / How Ming Street / Shing Yip Street	2031 PM Reference Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

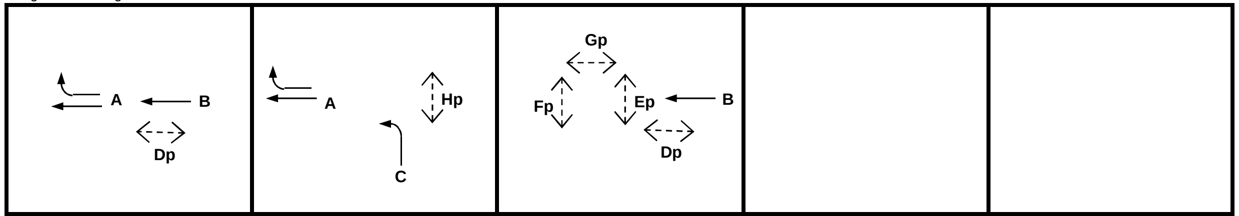
Traffic Flow Diagram
(pcu/hr)



J12

No. of stages per cycle		N =	3	
Cycle time		C =	90	sec
Sum(y)		Y =	0.555	
Lost time		L =	28	sec
Total Flow		=	4,270	pcu
Optimum Cycle C_o	= (1.5×L+5)/(1-Y)	=	106	sec
Min. Cycle Time C_m	= L/(1-Y)	=	63	sec
Y_{ult}	= 0.9-0.0075×L	=	0.690	
R.C.$_{ult}$	= (Y_{ult}-Y)/Yx100%	=	24.4	%
Practical Cycle Time C_p	= 0.9×L/(0.9-Y)	=	73	sec
Y_{max}	= 1-L/C	=	0.689	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G = I/G = 7 G = 8 I/G = 14

Critical Case : A,Fp

R.C.(C) = $(0.9xY_{max}$-Y)/Yx100% = 12%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1,2	4.000	1				1		0		2015		1118		1118			2015	0.555	
	A	1,2	4.000	1		10	0	1		0		2015		347	670	1017		66%	1834	0.555	0.555
	B	1,3	4.000	2				1		0		4170		1180		1180			4170	0.283	
	C	2	3.000	3	8			1		0		6025	955			955	100%		5074	0.188	
Pedestrian Crossing				GM		FGM															
	Dp	1,3	min.	8	+	9	=	17	sec												
	Ep	3	min.	8	+	13	=	21	sec												
	Fp	3	min.	8	+	11	=	19	sec												*
	Gp	3	min.	8	+	8	=	16	sec												
	Hp	2	min.	8	+	10	=	18	sec												

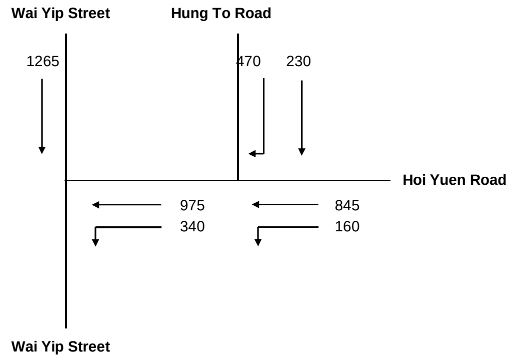
*Remark: Due to kerbside activities, there are only 2 lanes for Hoi Yuen Road westbound traffic.

JUNCTION CAPACITY CALCULATION

AECOM

Junction J13 - Wai Yip Street / Hoi Yuen Road / Hung To Road	2031 AM Reference Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: May 20

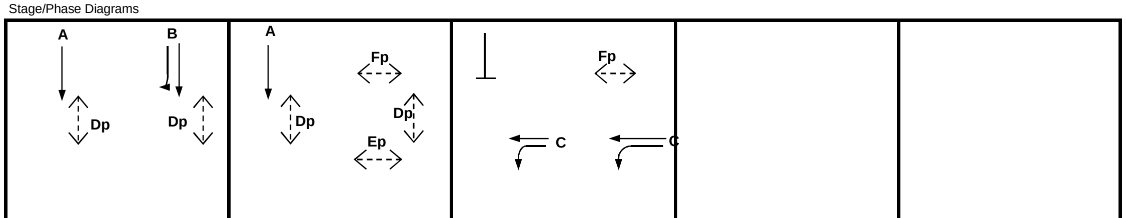
Traffic Flow Diagram
(pcu/hr)



J13

No. of stages per cycle	N =	3	
Cycle time	C =	100	sec
Sum(y)	Y =	0.430	
Lost time	L =	29	sec
Total Flow	=	4,285	pcu
Optimum Cycle C_o = $(1.5 \times L+5)/(1-Y)$	=	85	sec
Min. Cycle Time C_m = $L/(1-Y)$	=	51	sec
Y_{ult} = $0.9-0.0075 \times L$	=	0.683	
$R.C._{ult}$ = $(Y_{ult}-Y)/Y \times 100\%$	=	58.6	%
Practical Cycle Time C_p = $0.9 \times L/(0.9-Y)$	=	56	sec
Y_{max} = $1-L/C$	=	0.710	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G = 8 G = 5 I/G = 12 I/G = 6

Critical Case : B,Ep,C

R.C.(C) = $(0.9xY_{max}-Y)/Yx100\%$ = 48%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1,2	4.000	3				1		0		6325		1265		1265			6325	0.200	
	B	1	3.500	1		12	0	1		0		1965		230	129	359		36%	1881	0.191	
	B	1	3.500	1		15	0	1		0		1965			341	341		100%	1786	0.191	0.191
	C	3	3.500	1	8			1		0		1965	160	147		307	52%		1790	0.171	
	C	3	3.500	2				1		0		4070		698		698			4070	0.171	
	C	3	3.500	1	30			1		0		1965	340			340	100%		1871	0.182	
	C	3	3.500	1	32					0		2105	0	504		504	0%		2105	0.240	0.240
	C	3	3.500	1				1		0		1965		471		471			1965	0.240	
Pedestrian Crossing				GM		FGM															
	Dp	1,2	min.	5	+	12	=	17	sec												
	Ep	2	min.	5	+	9	=	14	sec												*
	Fp	2,3	min.	5	+	11	=	16	sec												

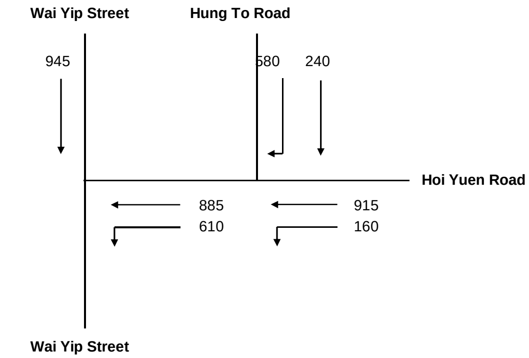
JUNCTION CAPACITY CALCULATION

AECOM

Junction J13 - Wai Yip Street / Hoi Yuen Road / Hung To Road	2031 PM Reference Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

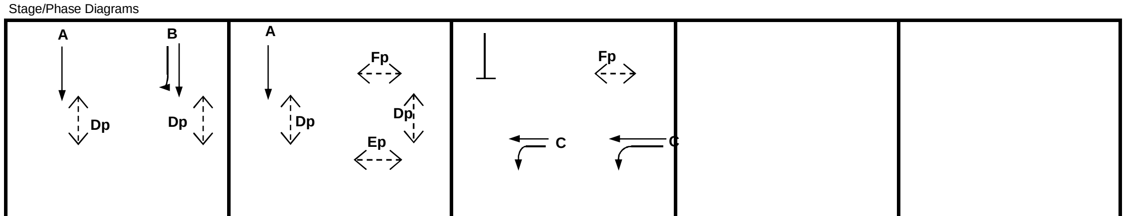
J13

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	3	
Cycle time	C =	90	sec
Sum(y)	Y =	0.477	
Lost time	L =	29	sec
Total Flow	=	4,335	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	93	sec
Min. Cycle Time C_m	$= L/(1-Y)$ =	55	sec
Y_{ult}	$= 0.9-0.0075\times L$ =	0.683	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times 100\%$ =	43.0	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$ =	62	sec
Y_{max}	= 1-L/C =	0.678	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G = 8 G = 5 I/G = 12 I/G = 6

Critical Case : B,Ep,C

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 28%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1,2	4.000	3				1		0		6325		945		945			6325	0.149	
	B	1	3.500	1		12	0	1		0		1965		240	179	419		43%	1865	0.225	
	B	1	3.500	1		15	0	1		0		1965			401	401		100%	1786	0.225	0.225
	C	3	3.500	1	8			1		0		1965	160	170		330	49%		1801	0.183	
	C	3	3.500	2				1		0		4070		745		745			4070	0.183	
	C	3	3.500	1	30			1		0		1965	473			473	100%		1871	0.253	0.253
	C	3	3.500	1	32					0		2105	137	388		526	26%		2080	0.253	
	C	3	3.500	1				1		0		1965		497		497			1965	0.253	
Pedestrian Crossing				GM		FGM															
	Dp	1,2	min.	5	+	12	=	17	sec												
	Ep	2	min.	5	+	9	=	14	sec												*
	Fp	2,3	min.	5	+	11	=	16	sec												

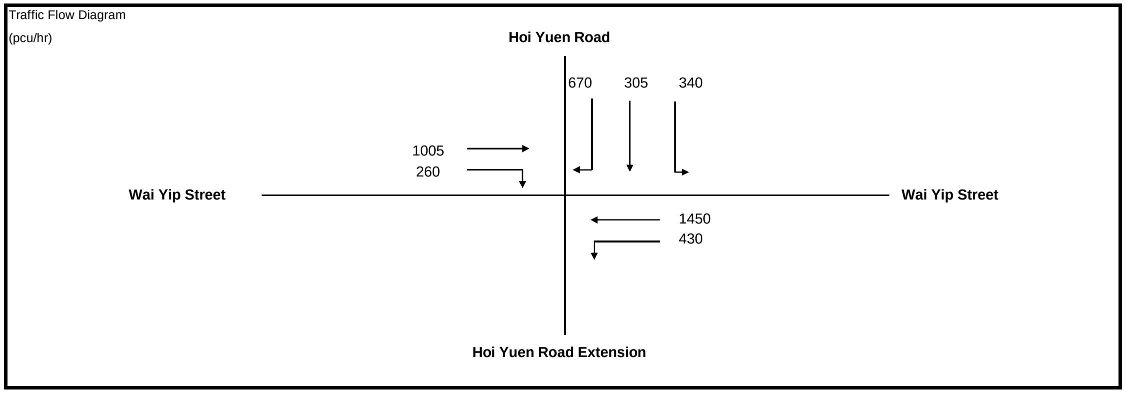
JUNCTION CAPACITY CALCULATION

AECOM

Junction J14 - Hoi Yuen Road / Wai Yip Street	2031 AM Reference Traffic Flows - Imp Scheme 2 (with J19 Imp Scheme)	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: May 20

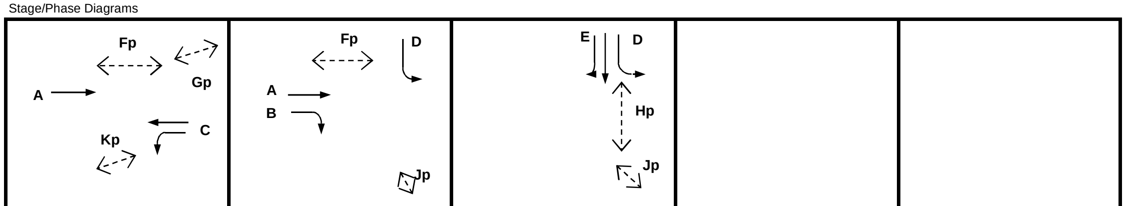
J14

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	3	
Cycle time	C =	120	sec
Sum(y)	Y =	0.681	
Lost time	L =	12	sec
Total Flow	=	4,460	pcu
Optimum Cycle C_o = $(1.5\times L+5)/(1-Y)$	=	72	sec
Min. Cycle Time C_m = $L/(1-Y)$	=	38	sec
Y_{ult} = $0.9-0.0075\times L$	=	0.810	
$R.C._{ult}$ = $(Y_{ult}-Y)/Y\times100\%$	=	19.0	%
Practical Cycle Time C_p = $0.9\times L/(0.9-Y)$	=	49	sec
Y_{max} = $1-L/C$	=	0.900	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		
I/G =	I/G = 7	I/G = 7		

Critical Case : A,E

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 19%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1,2	3.500	1				1		0		1965		895		895			1965	0.455	0.455
Flared Lane														110							
	B	2	3.500	2		18	0	0		0		4210			260	260		100%	3886	0.067	
	C	1	3.500	2				0		0		4210		1450		1450			4210	0.344	
	C	1	3.500	1	18			1		0		1965	430			430	100%		1814	0.237	
	D	2,3	3.500	1	15			1		0		1965	340			340	100%		1786	0.190	
	E	3	3.300	1		25	0			0		2085		305	155	460		34%	2044	0.225	
	E	3	3.300	1		20	0	1		0		1945			408	408		100%	1809	0.225	0.225
Flared Lane															107						
Pedestrian Crossing				GM		FGM															
	Fp	1,2	min.	11	+	22	=	33	sec												
	Gp	1	min.	5	+	7	=	12	sec												
	Hp	3	min.	20	+	15	=	35	sec												
	Jp	2,3	min.	5	+	5	=	10	sec												
	Kp	1	min.	6	+	12	=	18	sec												

*Remarks: Flows of Wai Yip Street eastbound straight-ahead movement and Hoi Yuen Road southbound right-turning movement are deducted by flows capacity of the flared lane.

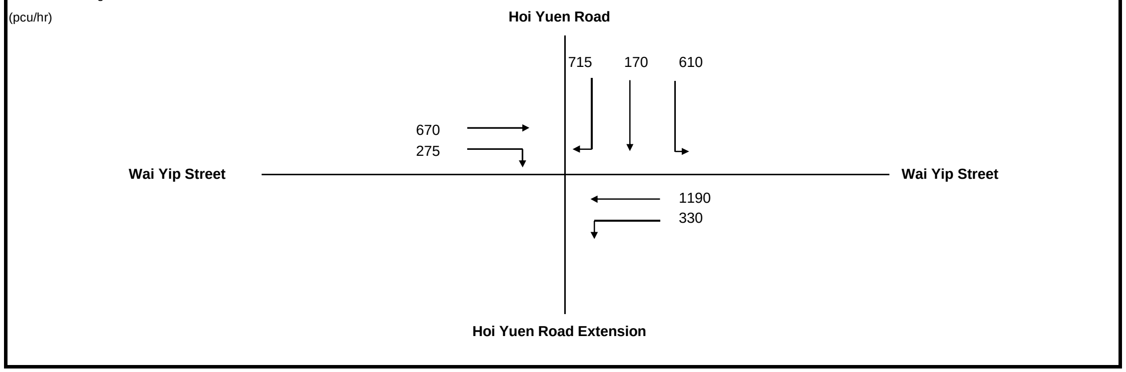
JUNCTION CAPACITY CALCULATION

AECOM

Junction J14 - Hoi Yuen Road / Wai Yip Street	2031 PM Reference Traffic Flows - Imp Scheme 2 (with J19 Imp Scheme)	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

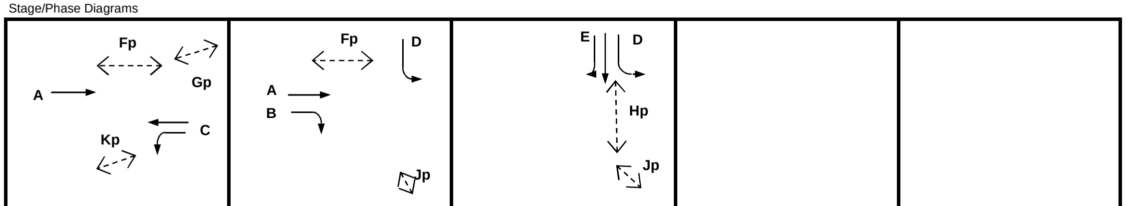
J14

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	3	
Cycle time	C =	120	sec
Sum(y)	Y =	0.624	
Lost time	L =	12	sec
Total Flow	=	3,960	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	61	sec
Min. Cycle Time C_m	$= L/(1-Y) =$	32	sec
Y_{ult}	$= 0.9-0.0075\times L =$	0.810	
R.C.$_{ult}$	$= (Y_{ult}-Y)/Y\text{x}100\% =$	29.8	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y) =$	39	sec
Y_{max}	$= 1-L/C =$	0.900	

Stage/Phase Diagrams



I/G = 7 I/G = I/G = 7

Critical Case : C,D

R.C.(C) $= (0.9\text{x}Y_{max}\text{-}Y)/Y\text{x}100\% =$ 30%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1,2	3.500	1				1		0		1965		560		560			1965	0.285	
Flared Lane														110							
	B	2	3.500	2		18	0	0		0		4210			275	275		100%	3886	0.071	
	C	1	3.500	2				0		0		4210		1190		1190			4210	0.283	0.283
	C	1	3.500	1	18			1		0		1965	330			330	100%		1814	0.182	
	D	2,3	3.500	1	15			1		0		1965	610			610	100%		1786	0.341	0.341
	E	3	3.300	1		25	0			0		2085		170	240	410		59%	2014	0.203	
	E	3	3.300	1		20	0	1		0		1945			368	368		100%	1809	0.203	
Flared Lane															107						
Pedestrian Crossing				GM		FGM															
	Fp	1,2	min.	11	+	22	=	33	sec												
	Gp	1	min.	5	+	7	=	12	sec												
	Hp	3	min.	20	+	15	=	35	sec												
	Jp	2,3	min.	5	+	5	=	10	sec												
	Kp	1	min.	6	+	12	=	18	sec												

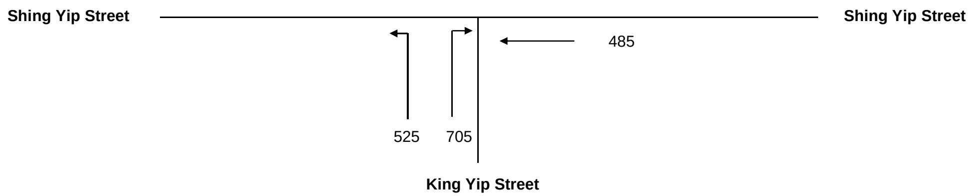
*Remarks: Flows of Wai Yip Street eastbound straight-ahead movement and Hoi Yuen Road southbound right-turning movement are deducted by flows capacity of the flared lane.

JUNCTION CAPACITY CALCULATION

AECOM

Junction J15 - Shing Yip Street / King Yip Street	2031 AM Reference Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jul 19

Traffic Flow Diagram
(pcu/hr)

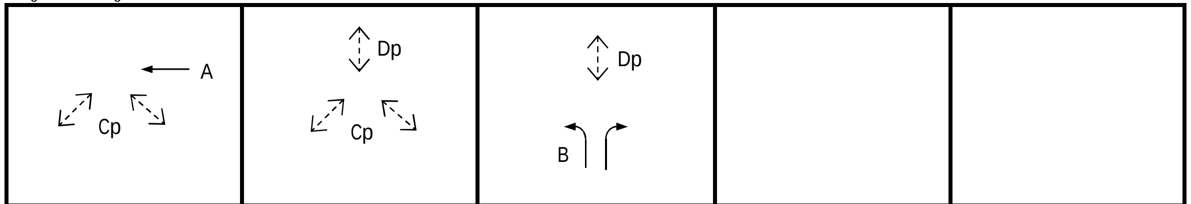


J15

No. of stages per cycle	N =	3	
Cycle time	C =	140	sec
Sum(y)	Y =	0.419	
Lost time	L =	20	sec
Total Flow	=	1,715	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	60	sec
Min. Cycle Time C_m	$= L/(1-Y)$ =	34	sec
Y_{ult}	$= 0.9-0.0075\times L$ =	0.750	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times100\%$ =	79.1	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$ =	37	sec
Y_{max}	= 1-L/C =	0.857	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G = 5 I/G = 12 I/G = 5

Critical Case : A,IG(AtoB),B

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 84%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.000	2				1		0		3970		485		485			3970	0.122	0.122
	B	3	3.500	1	15			1		0		1965	362			362	100%		1786	0.203	
Flared Lane													163								
	B	3	3.500	1		20	0	1		0		1965			542	542		100%	1828	0.297	0.297
Flared Lane															163						
Pedestrian Crossing				GM		FGM															
	Cp	1,2	min.	10	+	12	=	22	sec												
	C1p	1	min.	10	+		=	10	sec												
	C2p	2	min.		+	12	=	12	sec												
	Dp	2,3	min.	7	+	8	=	15	sec												
	D1p	2	min.	7	+		=	7	sec												
	D2p	3	min.		+	8	=	8	sec												
	IG(AtoB	2	min.		+	12	=	12	sec												*

*Remark: Flows of Phase B are deducted by flows capacity of the flared lane.

*Remark: As this calculation sheet cannot analyse pedestrian crossing whith 2 phases, so Cp and Dp are sub-divided for analysis.

JUNCTION CAPACITY CALCULATION

AECOM

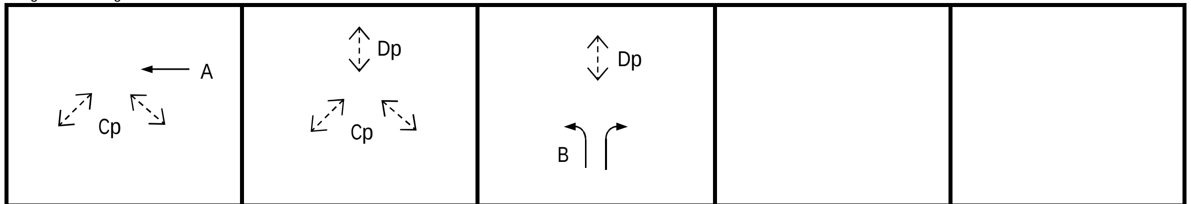
Junction J15 - Shing Yip Street / King Yip Street	2031 PM Reference Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jul 19

J15

Traffic Flow Diagram
(pcu/hr)

No. of stages per cycle	N =	3	
Cycle time	C =	140	sec
Sum(y)	Y =	0.470	
Lost time	L =	20	sec
Total Flow	=	1,780	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	66	sec
Min. Cycle Time C_m	$= L/(1-Y) =$	38	sec
Y_{ult}	$= 0.9-0.0075\times L =$	0.750	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times100\% =$	59.7	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y) =$	42	sec
Y_{max}	$= 1-L/C =$	0.857	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G = 5   I/G = 12   I/G = 5

Critical Case : A,IG(AtoB),B

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 64%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
←	A	1	3.000	2				1		0		3970		275		275			3970	0.069	0.069
↰	B	3	3.500	1	15			1		0		1965	447			447	100%		1786	0.250	
Flared Lane													163								
↱	B	3	3.500	1		20	0	1		0		1965			732	732		100%	1828	0.400	0.400
Flared Lane															163						
Pedestrian Crossing				GM		FGM															
	Cp	1,2	min.	10	+	12	=	22	sec												
	C1p	1	min.	10	+		=	10	sec												
	C2p	2	min.		+	12	=	12	sec												
	Dp	2,3	min.	7	+	8	=	15	sec												
	D1p	2	min.	7	+		=	7	sec												
	D2p	3	min.		+	8	=	8	sec												
	IG(AtoE	2	min.		+	12	=	12	sec												*

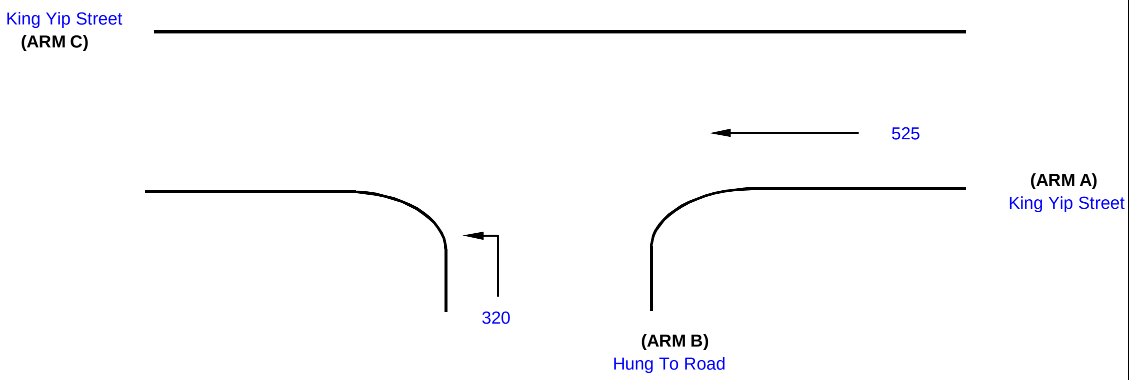
*Remark: Flows of Phase B are deducted by flows capacity of the flared lane.

*Remark: As this calculation sheet cannot analyse pedestrian crossing whith 2 phases, so Cp and Dp are sub-divided for analysis.

PRIORITY JUNCTION CAPACITY CALCULATION

AECOM

Junction J16 - Hung To Road / King Yip Street	2031 AM Reference Traffic Flows	Designed By : SL	Checked By : DW	Job No. : 60493364	Date : Oct 19



J16

NOTES : (GEOMETRIC INPUT DATA)

W	= Major Road Width (6.4 - 20.0)
W cr	= Central Reserve width (1.2 - 9.0, kerbed central reserve only)
W b-a	= Lane width available to vehicle waiting in stream b-a (2.05 - 4.70)
W b-c	= Lane width available to vehicle waiting in stream b-c (2.05 - 4.70)
W c-b	= Lane width available to vehicle waiting in stream c-b (2.05 - 4.70)
Vl b-a	= Visibility to the left for vehicles waiting in stream b-a (22.0 - 250.0)
Vr b-a	= Visibility to the right for vehicles waiting in stream b-a (17.0 - 250.0)
Vr b-c	= Visibilitu to the right for vehicles waiting in stream b-c (17.0 - 250.0)
Vr c-b	= Visibility to the right for vehicles waiting in stream c-b (17.0 - 250.0)
D	= Stream-specific B-A
E	= Stream-specific B-C
F	= Stream-specific C-B
Y	= (1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)				*MAJOR ROAD (ARM C)*				*MINOR ROAD (ARM B)*			
W	=	8	(metres)	W c-b	=		(metres)	W b-a	=		(metres)
W cr	=	0	(metres)	Vr c-b	=		(metres)	W b-c	=	4.07	(metres)
q a-b	=	0	(pcu/hr)	q c-a	=	0	(pcu/hr)	Vl b-a	=		(metres)
q a-c	=	525	(pcu/hr)	q c-b	=	0	(pcu/hr)	Vr b-a	=		(metres)
								Vr b-c	=	100	(metres)
								q b-a	=	0	(pcu/hr)
								q b-c	=	320	(pcu/hr)

GEOMETRIC FACTORS :

D	=	0.533219
E	=	1.020769
F	=	0.585955
Y	=	0.724000

THE CAPACITY OF MOVEMENT :

Q b-a	=	261
Q b-c	=	619
Q c-b	=	355
Q b-ac	=	619

CRITICAL DFC = 0.52

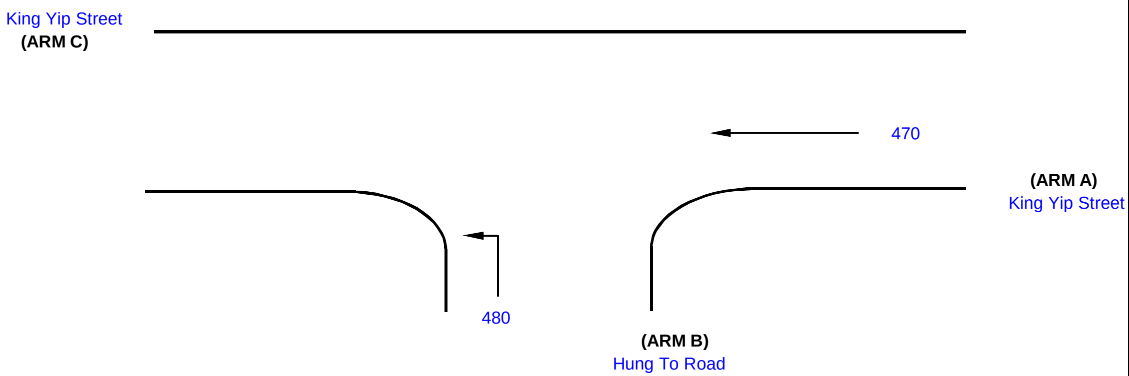
COMPARISION OF DESIGN FLOW TO CAPACITY :

DFC b-a	=	0.00
DFC b-c	=	0.52
DFC c-b	=	0.00
DFC b-ac	=	0.52

PRIORITY JUNCTION CAPACITY CALCULATION

AECOM

Junction J16 - Hung To Road / King Yip Street	2031 PM Reference Traffic Flows	Designed By : SL	Checked By : DW	Job No. : 60493364	Date : Oct 19



J16

NOTES : (GEOMETRIC INPUT DATA)

W	= Major Road Width (6.4 - 20.0)
W cr	= Central Reserve width (1.2 - 9.0, kerbed central reserve only)
W b-a	= Lane width available to vehicle waiting in stream b-a (2.05 - 4.70)
W b-c	= Lane width available to vehicle waiting in stream b-c (2.05 - 4.70)
W c-b	= Lane width available to vehicle waiting in stream c-b (2.05 - 4.70)
Vl b-a	= Visibility to the left for vehicles waiting in stream b-a (22.0 - 250.0)
Vr b-a	= Visibility to the right for vehicles waiting in stream b-a (17.0 - 250.0)
Vr b-c	= Visibilitu to the right for vehicles waiting in stream b-c (17.0 - 250.0)
Vr c-b	= Visibility to the right for vehicles waiting in stream c-b (17.0 - 250.0)
D	= Stream-specific B-A
E	= Stream-specific B-C
F	= Stream-specific C-B
Y	= (1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)				*MAJOR ROAD (ARM C)*				*MINOR ROAD (ARM B)*			
W	=	8	(metres)	W c-b	=		(metres)	W b-a	=		(metres)
W cr	=	0	(metres)	Vr c-b	=		(metres)	W b-c	=	4.07	(metres)
q a-b	=	0	(pcu/hr)	q c-a	=	0	(pcu/hr)	Vl b-a	=		(metres)
q a-c	=	470	(pcu/hr)	q c-b	=	0	(pcu/hr)	Vr b-a	=		(metres)
								Vr b-c	=	100	(metres)
								q b-a	=	0	(pcu/hr)
								q b-c	=	480	(pcu/hr)

GEOMETRIC FACTORS :

D	=	0.533219
E	=	1.020769
F	=	0.585955
Y	=	0.724000

THE CAPACITY OF MOVEMENT :

Q b-a	=	268
Q b-c	=	634
Q c-b	=	364
Q b-ac	=	634

CRITICAL DFC = 0.76

COMPARISION OF DESIGN FLOW TO CAPACITY :

DFC b-a	=	0.00
DFC b-c	=	0.76
DFC c-b	=	0.00
DFC b-ac	=	0.76

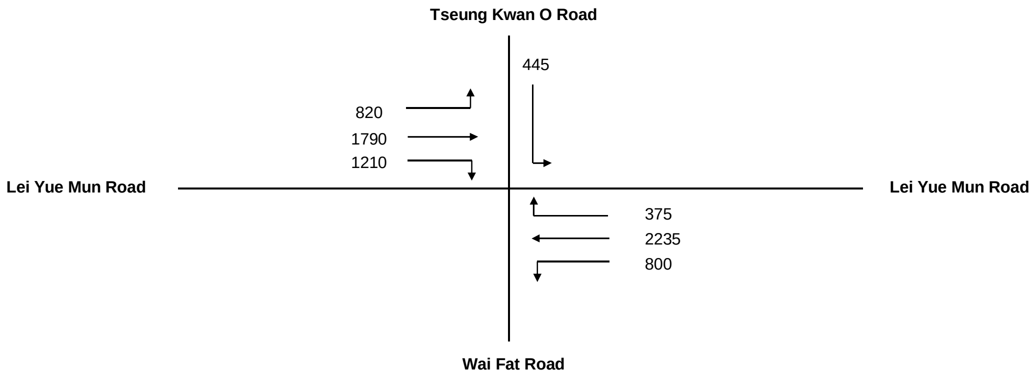
JUNCTION CAPACITY CALCULATION

AECOM

Junction J17 - Lei Yue Mun Road / Tseung Kwan O Road / Wai Fat Road	2031 AM Reference Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

J17

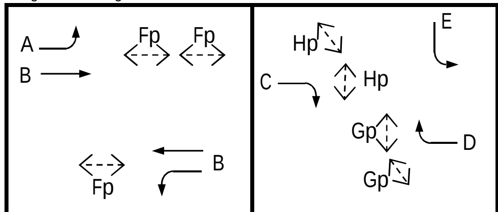
Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	2	
Cycle time	C =	130	sec
Sum(y)	Y =	0.665	
Lost time	L =	15	sec
Total Flow	=	7,675	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	82	sec
Min. Cycle Time C_m	$= L/(1-Y)$ =	45	sec
Y_{ult}	$= 0.9-0.0075\times L$ =	0.788	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times 100\%$ =	18.5	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$ =	57	sec
Y_{max}	= 1-L/C =	0.885	

Stage/Phase Diagrams



Stage 1	Stage 2			
I/G = 8	I/G = 9			

Critical Case : B,C

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 20%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
	A	1	3.500	2	25			1		0		4070	820			820	100%		3840	0.214	
	B	1	3.500	3				0		0		6315		1790		1790			6315	0.283	
	C	2	3.600	2		20	0	0		0		4230			1210	1210		100%	3935	0.308	0.308
	B	1	3.200	2	20			1		0		4010	800			800	100%		3730	0.214	
	B	1	3.300	3				0		0		6255		2235		2235			6255	0.357	0.357
	D	2	3.500	2		32	0	0		0		4210			375	375		100%	4021	0.093	
	E	2	3.650	2	15			1		0		4100	445			445	100%		3727	0.119	
Pedestrian Crossing				GM		FGM															
	Fp	1	min.	8	+	13	=	21	sec												
	Gp	2	min.	20	+	13	=	33	sec												
	Hp	2	min.	9	+	13	=	22	sec												

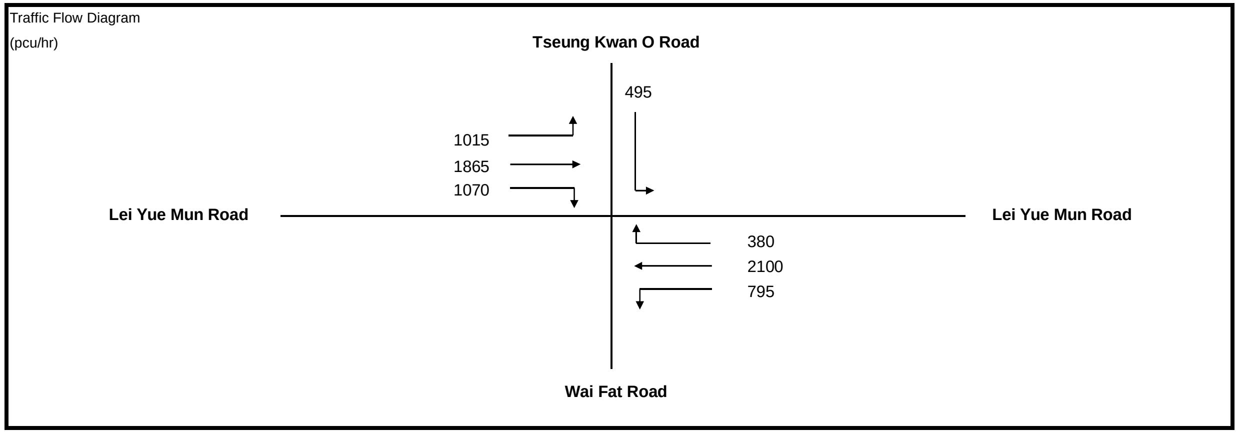
JUNCTION CAPACITY CALCULATION

AECOM

Junction J17 - Lei Yue Mun Road / Tseung Kwan O Road / Wai Fat Road	2031 PM Reference Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

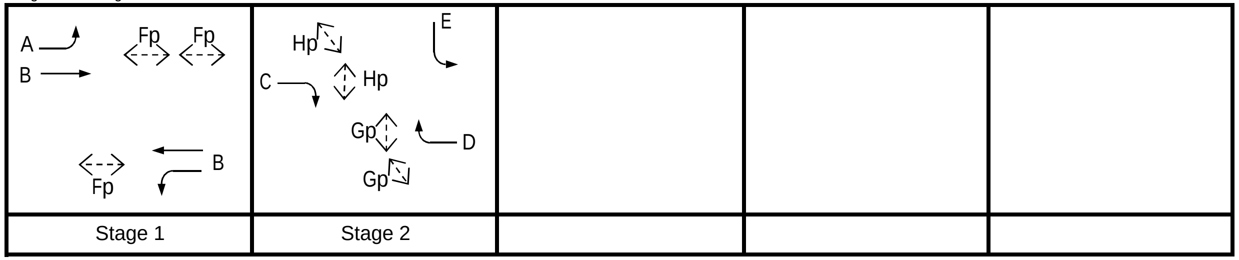
J17

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	2	
Cycle time	C =	130	sec
Sum(y)	Y =	0.608	
Lost time	L =	15	sec
Total Flow	=	7,720	pcu
Optimum Cycle C_o = $(1.5\times L+5)/(1-Y)$	=	70	sec
Min. Cycle Time C_m = $L/(1-Y)$	=	38	sec
Y_{ult} = $0.9-0.0075\times L$	=	0.788	
$R.C._{ult}$ = $(Y_{ult}-Y)/Y\times100\%$	=	29.6	%
Practical Cycle Time C_p = $0.9\times L/(0.9-Y)$	=	46	sec
Y_{max} = $1-L/C$	=	0.885	

Stage/Phase Diagrams



I/G = 8   I/G = 9

Critical Case : B,C

R.C.(C) = $(0.9\text{x}Y_{max}\text{-}Y)/Y\text{x}100\%$ = 31%

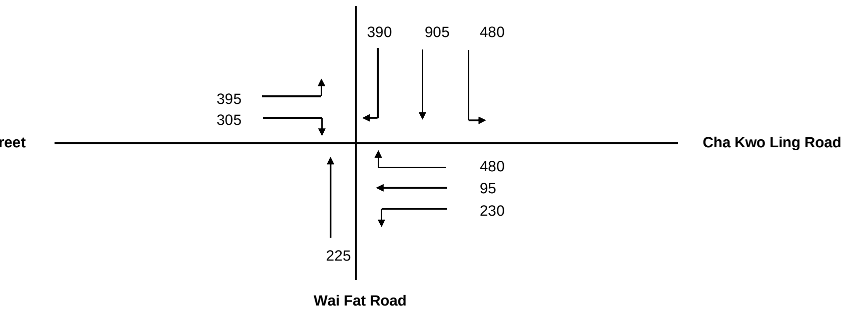
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.500	2	25			1		0		4070	1015			1015	100%		3840	0.264	
	B	1	3.500	3				0		0		6315		1865		1865			6315	0.295	
	C	2	3.600	2		20	0	0		0		4230			1070	1070		100%	3935	0.272	0.272
	B	1	3.200	2	20			1		0		4010	795			795	100%		3730	0.213	
	B	1	3.300	3				0		0		6255		2100		2100			6255	0.336	0.336
	D	2	3.500	2		32	0	0		0		4210			380	380		100%	4021	0.094	
	E	2	3.650	2	15			1		0		4100	495			495	100%		3727	0.133	
Pedestrian Crossing				GM		FGM															
	Fp	1	min.	8	+	13	=	21	sec												
	Gp	2	min.	20	+	13	=	33	sec												
	Hp	2	min.	9	+	13	=	22	sec												

JUNCTION CAPACITY CALCULATION

AECOM

Junction J18 - Cha Kwo Ling Road / Wai Fat Road / Shing Yip Street	2031 AM Reference Traffic Flows - Imp Scheme	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

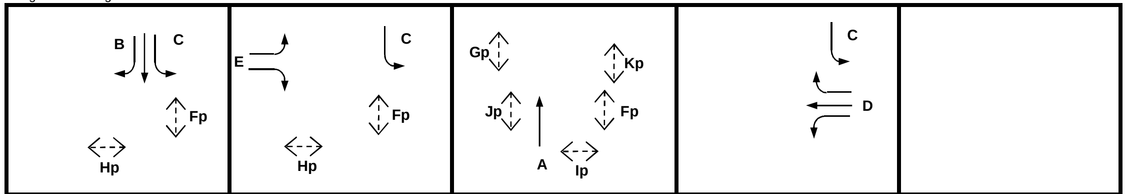
Traffic Flow Diagram
(pcu/hr)



J18

No. of stages per cycle	N =	4	
Cycle time	C =	140	sec
Sum(y)	Y =	0.487	
Lost time	L =	42	sec
Total Flow	=	3,505	pcu
Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y) =$	133	sec
Min. Cycle Time C_m	$= L/(1-Y) =$	82	sec
Y_{ult}	$= 0.9-0.0075 \times L =$	0.585	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y \times 100\% =$	20.1	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y) =$	92	sec
Y_{max}	$= 1-L/C =$	0.700	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3	Stage 4	

I/G = 5 I/G = 15 G = 7 I/G = 11 I/G = 7

Critical Case : B,E,Ip,D

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 29%

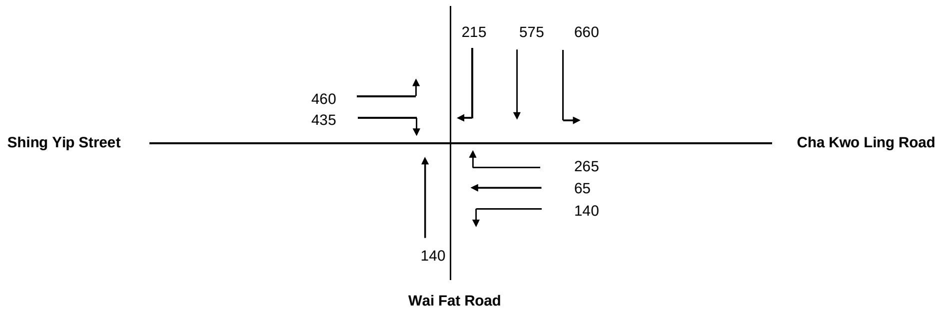
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	3	3.650	2				1		0		4100		225		225			4100	0.055	
	C	1,2,4	3.400	1	15			1		0		1955	480			480	100%		1777	0.270	
	B	1	3.400	2				0		0		4190		905		905			4190	0.216	0.216
	B	1	3.400	1		25	0	1		0		1955			390	390		100%	1844	0.211	
	D	4	3.400	1	10			1		0		1955	230			230	100%		1700	0.135	
	D	4	3.400	1		22	0	0		0		2095		95	197	292		67%	2003	0.146	0.146
	D	4	3.300	1		20	0	0		0		2085			283	283		100%	1940	0.146	
	E	2	3.300	1	15			1		0		1945	221			221	100%		1768	0.125	0.125
	E	2	3.300	1	18	20	0			0		2085	174		68	241	72%	28%	1929	0.125	
	E	2	3.300	1		15	0	0		0		2085			237	237		100%	1895	0.125	
Pedestrian Crossing				GM		FGM															
	Fp	1,2,3	min.	5	+	12	=	17	sec												
	Gp	3	min.	5	+	9	=	14	sec												
	Hp	1,2	min.	5	+	9	=	14	sec												
	Ip	3	min.	7	+	9	=	16	sec												*
	Jp	3	min.	5	+	6	=	11	sec												
	Kp	3	min.	5	+	12	=	17	sec												

JUNCTION CAPACITY CALCULATION

AECOM

Junction J18 - Cha Kwo Ling Road / Wai Fat Road / Shing Yip Street	2031 PM Reference Traffic Flows - Imp Scheme	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

Traffic Flow Diagram
(pcu/hr)

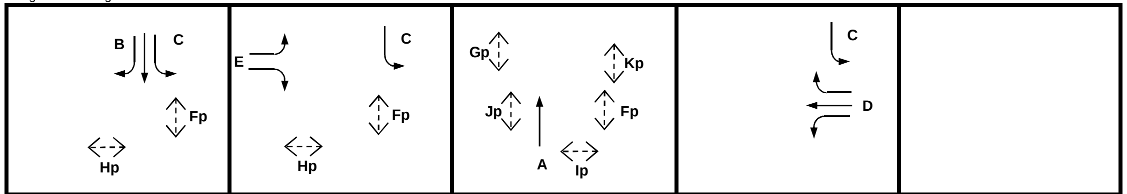


J18

No. of stages per cycle	N =	4	
Cycle time	C =	140	sec
Sum(y)	Y =	0.381	
Lost time	L =	42	sec
Total Flow	=	2,955	pcu

Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y)$ =		110	sec
Min. Cycle Time C_m	= L/(1-Y)	=	68	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.585	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y \times 100\%$	=	53.6	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	73	sec
Y_{max}	= 1-L/C	=	0.700	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3	Stage 4	

I/G = 5 I/G = 15 G = 7 I/G = 11 I/G = 7

Critical Case : B,E,Ip,D

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 65%

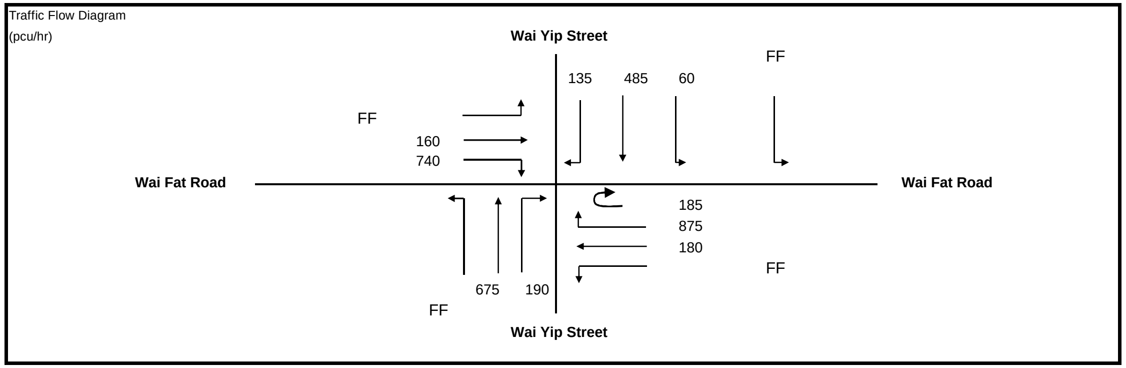
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	3	3.650	2				1		0		4100		140		140			4100	0.034	
	C	1,2,4	3.400	1	15			1		0		1955	660			660	100%		1777	0.371	
	B	1	3.400	2				0		0		4190		575		575			4190	0.137	0.137
	B	1	3.400	1		25	0	1		0		1955			215	215		100%	1844	0.117	
	D	4	3.400	1	10			1		0		1955	140			140	100%		1700	0.082	
	D	4	3.400	1		22	0	0		0		2095		65	103	168		61%	2011	0.084	0.084
	D	4	3.300	1		20	0	0		0		2085			162	162		100%	1940	0.084	
	E	2	3.300	1	15			1		0		1945	283			283	100%		1768	0.160	
	E	2	3.300	1	18	20	0			0		2085	177		132	309	57%	43%	1931	0.160	0.160
	E	2	3.300	1		15	0	0		0		2085			303	303		100%	1895	0.160	
Pedestrian Crossing				GM		FGM															
	Fp	1,2,3	min.	5	+	12	=	17	sec												
	Gp	3	min.	5	+	9	=	14	sec												
	Hp	1,2	min.	5	+	9	=	14	sec												
	Ip	3	min.	7	+	9	=	16	sec												*
	Jp	3	min.	5	+	6	=	11	sec												
	Kp	3	min.	5	+	12	=	17	sec												

JUNCTION CAPACITY CALCULATION

AECOM

Junction J19 - Wai Yip Street / Wai Fat Road	2031 AM Reference Traffic Flows (free flow to Wai Fat Road)	DESIGN: DW	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

Traffic Flow Diagram
(pcu/hr)



J19

No. of stages per cycle N = 4

Cycle time C = 140 sec

Sum(y) Y = 0.883

Lost time L = 24 sec

Total Flow = 3,685 pcu

Optimum Cycle C_o $= (1.5\times L+5)/(1-Y) =$ 350 sec

Min. Cycle Time C_m $= L/(1-Y) =$ 205 sec

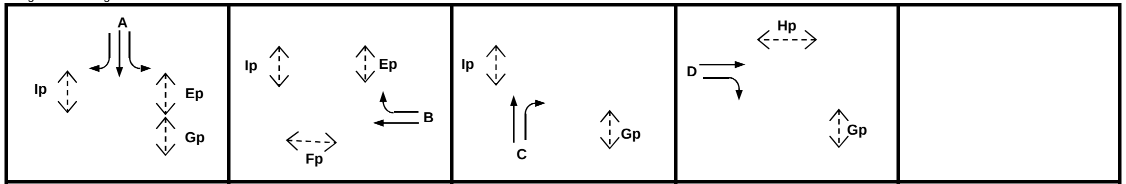
Y_{ult} $= 0.9-0.0075\times L =$ 0.720

$R.C._{ult}$ $= (Y_{ult}-Y)/Y \times 100\% =$ -18.5 %

Practical Cycle Time C_p $= 0.9\times L/(0.9-Y) =$ 1272 sec

Y_{max} $= 1-L/C =$ 0.829

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3	Stage 4	

I/G = 8 I/G = 6 I/G = 8 I/G = 6

Critical Case : A,B,C,D

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ -16%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	D	4	3.850	1		27	0	0		0		2140		160	295	455		65%	2066	0.220	0.220
	D	4	3.850	1		25	0	0		0		2140			445	445		100%	2019	0.220	
	C	3	3.500	1		20	0	0		0		2105			190	190		100%	1958	0.097	
	C	3	3.500	2				0		0		4210		675		675			4210	0.160	0.160
	B	2	3.500	2		20	0	0		0		4210			1022	1022		100%	3916	0.261	0.261
Flared Lane															38						
	B	2	3.500	1				0		0		2105		108		108			2105	0.051	
Flared Lane														72							
	A	1	3.500	1	15			0		0		2105	60			60	100%		1914	0.031	
	A	1	3.500	1		25	0	0		0		2105		365	135	500		27%	2071	0.241	0.241
Flared Lane														120							
Pedestrian Crossing				GM		FGM															
	Ep	1,2	min.	5	+	7	=	12	sec												
	Fp	2	min.	11	+	10	=	21	sec												
	Gp	1,3,4	min.	7	+	14	=	21	sec												
	Hp	4	min.	10	+	9	=	19	sec												
	Ip	1,2,3	min.	5	+	7	=	12	sec												

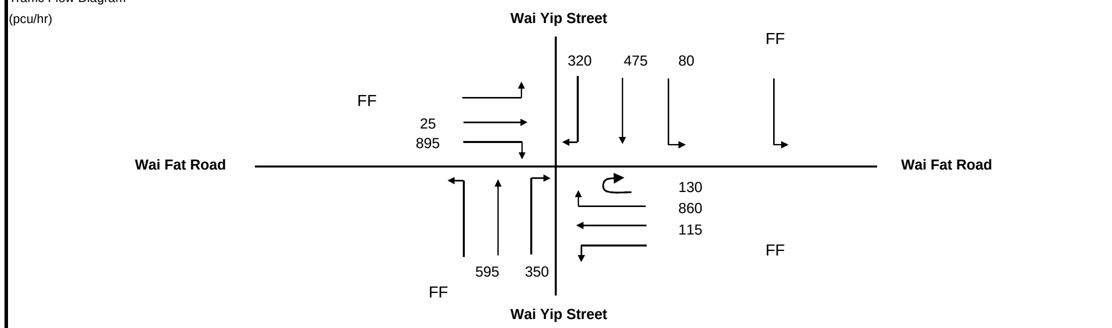
*Remark: Flows of Phase A & B are deducted by capcity flows of flared lane.

JUNCTION CAPACITY CALCULATION

AECOM

Junction J19 - Wai Yip Street / Wai Fat Road	2031 PM Reference Traffic Flows (free flow to Wai Fat Road)	DESIGN: DW	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

Traffic Flow Diagram
(pcu/hr)

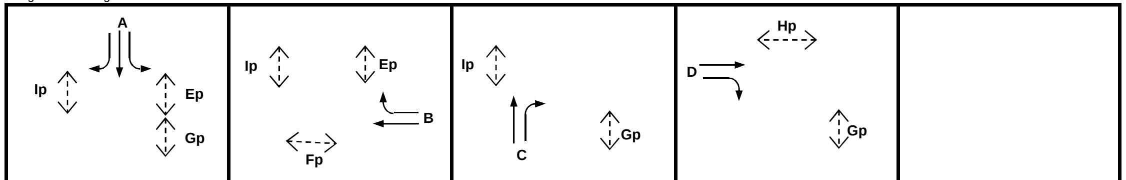


J19

No. of stages per cycle	N =	4	
Cycle time	C =	140	sec
Sum(y)	Y =	0.979	
Lost time	L =	24	sec
Total Flow	=	3,845	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	1921	sec
Min. Cycle Time C_m	$= L/(1-Y)$ =	1125	sec
Y_{ult}	$= 0.9-0.0075\times L$ =	0.720	
$R.C._{ult}$	$= (Y_{ult}-Y)/Yx100\%$ =	-26.4	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$ =	-275	sec
Y_{max}	= 1-L/C =	0.829	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3	Stage 4	
I/G = 8	I/G = 6	I/G = 8	I/G = 6	

Critical Case : A,B,C,D

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ -24%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	D	4	3.850	1		27	0	0		0		2140		25	437	462		95%	2033	0.227	0.227
	D	4	3.850	1		25	0	0		0		2140			458	458		100%	2019	0.227	
	C	3	3.500	1		20	0	0		0		2105			350	350		100%	1958	0.179	0.179
	C	3	3.500	2				0		0		4210		595		595			4210	0.141	
	B	2	3.500	2		20	0	0		0		4210			952	952		100%	3916	0.243	0.243
Flared Lane															38						
	B	2	3.500	1				0		0		2105		43		43			2105	0.020	
Flared Lane														72							
	A	1	3.500	1	15			0		0		2105	80			80	100%		1914	0.042	
	A	1	3.500	1		25	0	0		0		2105		355	320	675		47%	2047	0.330	0.330
Flared Lane														120							
Pedestrian Crossing				GM		FGM															
	Ep	1,2	min.	5	+	7	=	12	sec												
	Fp	2	min.	11	+	10	=	21	sec												
	Gp	1,3,4	min.	7	+	14	=	21	sec												
	Hp	4	min.	10	+	9	=	19	sec												
	Ip	1,2,3	min.	5	+	7	=	12	sec												

*Remark: Flows of Phase A & B are deducted by capcity flows of flared lane.

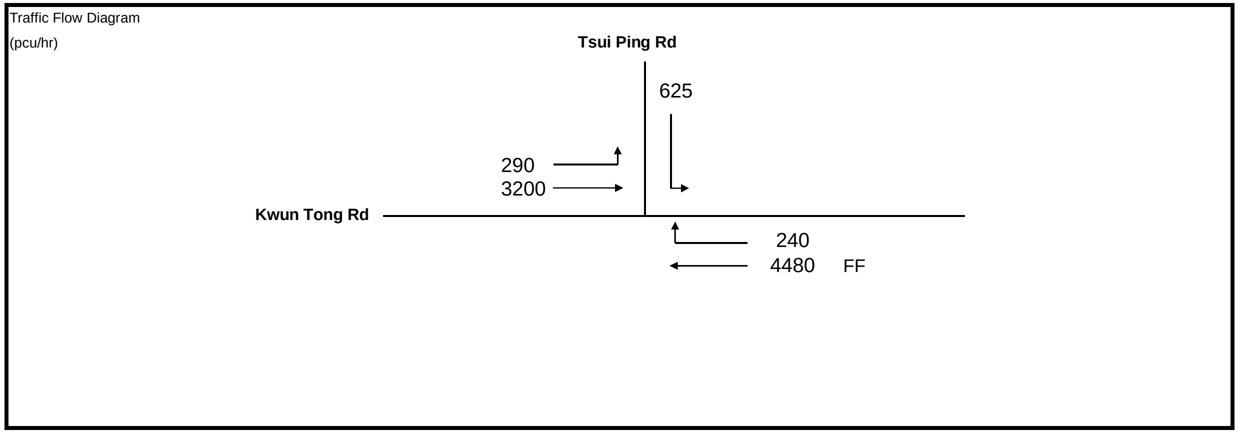
JUNCTION CAPACITY CALCULATION

AECOM

Junction J20 - Kwun Tong Rd / Tsui Ping Rd	2031 AM Reference Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

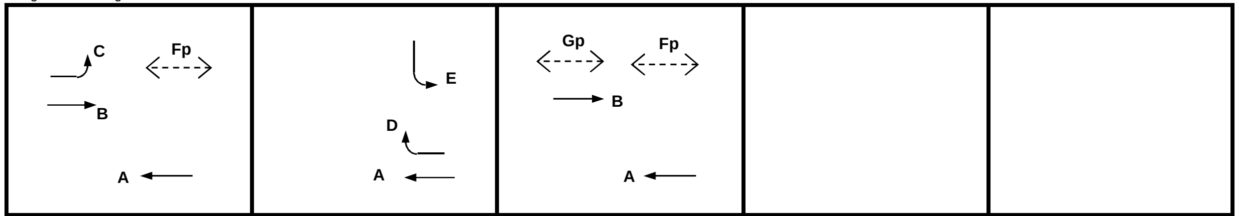
J20

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	3	
Cycle time		C =	130	sec
Sum(y)		Y =	0.682	
Lost time		L =	9	sec
Total Flow		=	4,355	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y)$	=	58	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	28	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.833	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times100\%$	=	22.0	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	37	sec
Y_{max}	$= 1-L/C$	=	0.931	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		
I/G = 6	I/G =	I/G = 5		

Critical Case : B,E

R.C.(C) $= (0.9\mathrm{x}Y_{max}-Y)/Y\mathrm{x}100\% =$ 23%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	B	1,3	3.300	3				0		0		6255		3200		3200			6255	0.512	0.512
	C	1	3.300	1	15			1		0		1945	290			290	100%		1768	0.164	
	E	2	3.300	2	15			1		0		4030	625			625	100%		3664	0.171	0.171
	D	2	3.300	1		15	0	0		0		2085			240	240		100%	1895	0.127	
Pedestrian Crossing				GM		FGM															
	Fp	1,3	min.	8	+	10	=	18	sec												
	Gp	3	min.	6	+	8	=	14	sec												

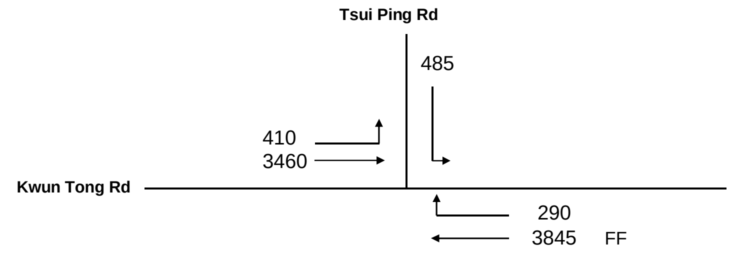
JUNCTION CAPACITY CALCULATION

AECOM

Junction J20 - Kwun Tong Rd / Tsui Ping Rd	2031 PM Reference Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

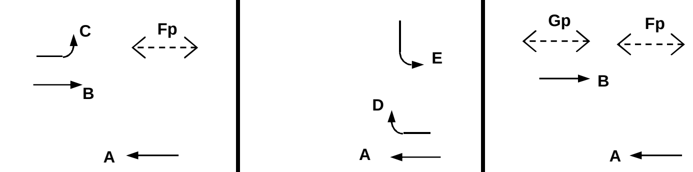
J20

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	3	
Cycle time		C =	130	sec
Sum(y)		Y =	0.706	
Lost time		L =	10	sec
Total Flow		=	4,645	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y)$	=	68	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	34	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.825	
R.C.$_{ult}$	$= (Y_{ult}-Y)/Y\times100\%$	=	16.8	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	46	sec
Y_{max}	$= 1-L/C$	=	0.923	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		
I/G = 5	I/G =	I/G = 7		

Critical Case : B,D

R.C.(C) $= (0.9\text{x}Y_{max}-Y)/Y\text{x}100\%$ = 18%

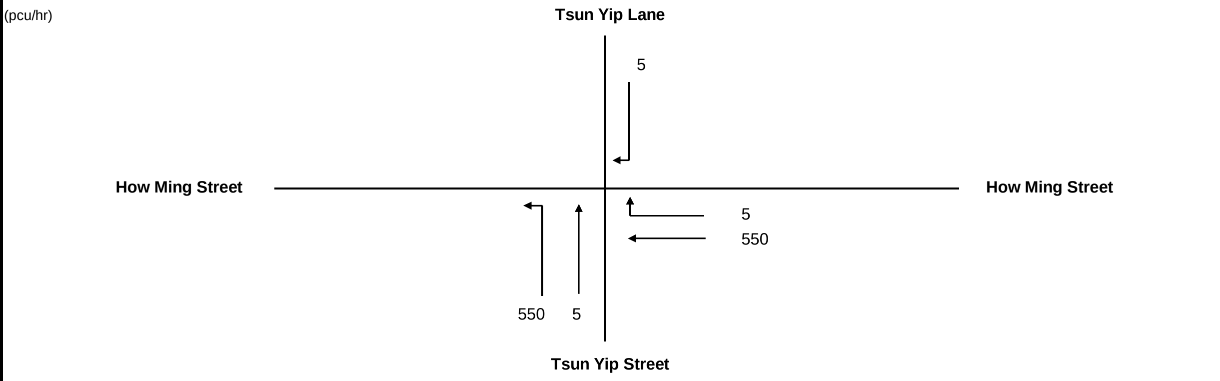
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
	B	1,3	3.300	3				0		0		6255		3460		3460			6255	0.553	0.553
	C	1	3.300	1	15			1		0		1945	410			410	100%		1768	0.232	
	E	2	3.300	2	15			1		0		4030	485			485	100%		3664	0.132	
	D	2	3.300	1		15	0	0		0		2085			290	290		100%	1895	0.153	0.153
Pedestrian Crossing				GM		FGM															
	Fp	1,3	min.	8	+	10	=	18	sec												
	Gp	3	min.	6	+	8	=	14	sec												

JUNCTION CAPACITY CALCULATION

AECOM

Junction J21 - How Ming Street / Tsun Yip Street / Tsun Yip Lane	2031 AM Reference Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

Traffic Flow Diagram
(pcu/hr)

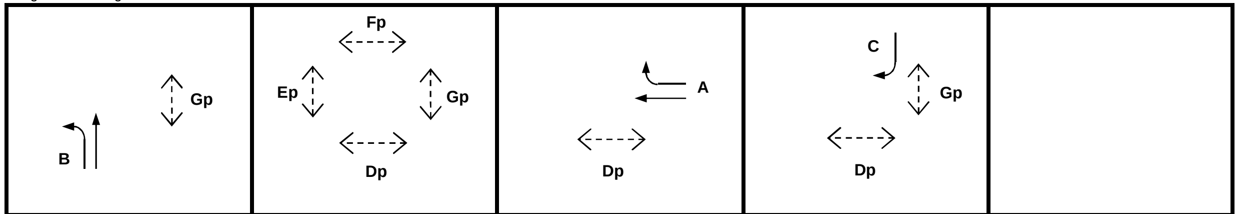


J21

No. of stages per cycle	N =	4	
Cycle time	C =	108	sec
Sum(y)	Y =	0.469	
Lost time	L =	44	sec
Total Flow	=	1,115	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$		134	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	83	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.570	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times 100\%$	=	21.4	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	92	sec
Y_{max}	$= 1-L/C$	=	0.593	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3	Stage 4	

I/G = 7 G = 7 I/G = 12 I/G = 5 G = 5 I/G = 10

Critical Case : B,Ep,A,C

R.C.(C) $= (0.9\times Y_{max}-Y)/Y\times 100\% =$ 14%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	3	3.000	1				1		0	-575	1915		229		229			1340	0.171	0.171
	A	3	3.000	1		25	0	1		0		1915		321	5	326		2%	1913	0.171	
	B	1	3.800	1	20			1		0		1995	550	5		555	99%		1857	0.299	0.299
	C	4	3.000	1		25	0	1		0		1915			5	5		100%	1807	0.003	
Pedestrian Crossing				GM		FGM															
	Dp	2,3,4	min.	8	+	8	=	16	sec												
	Ep	2	min.	7	+	10	=	17	sec												*
	Fp	2	min.	6	+	6	=	12	sec												
	Gp	1,2,4	min.	6	+	6	=	12	sec												

*Remark: Due to kerside activities, capacity of 1 lane of How Ming Street is redued by half.

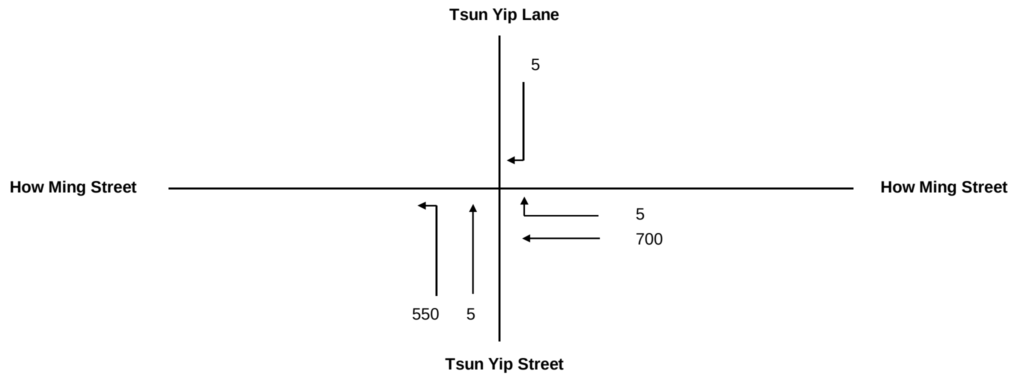
JUNCTION CAPACITY CALCULATION

AECOM

Junction J21 - How Ming Street / Tsun Yip Street / Tsun Yip Lane	2031 PM Reference Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

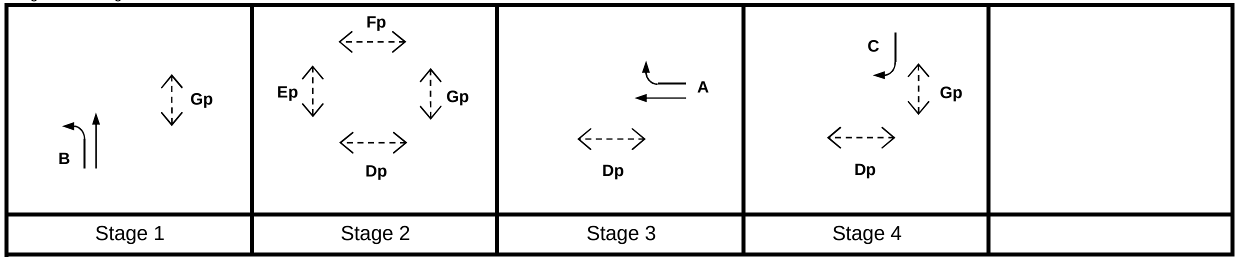
J21

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	4	
Cycle time	C =	120	sec
Sum(y)	Y =	0.516	
Lost time	L =	44	sec
Total Flow	=	1,265	pcu
Optimum Cycle C_o = (1.5×L+5)/(1-Y)	=	147	sec
Min. Cycle Time C_m = L/(1-Y)	=	91	sec
Y_{ult} = 0.9-0.0075×L	=	0.570	
$R.C._{ult}$ = $(Y_{ult}$-Y)/Yx100%	=	10.6	%
Practical Cycle Time C_p = 0.9×L/(0.9-Y)	=	103	sec
Y_{max} = 1-L/C	=	0.633	

Stage/Phase Diagrams



I/G = 7 G = 7 I/G = 12 I/G = 5 G = 5 I/G = 10

Critical Case : B,Ep,A,C

R.C.(C) = $(0.9xY_{max}$-Y)/Yx100% = 11%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	3	3.000	1				1		0	-575	1915		290		290			1340	0.217	
	A	3	3.000	1		25	0	1		0		1915		410	5	415		1%	1914	0.217	0.217
	B	1	3.800	1	20			1		0		1995	550	5		555	99%		1857	0.299	0.299
	C	4	3.000	1		25	0	1		0		1915			5	5		100%	1807	0.003	
Pedestrian Crossing				GM		FGM															
	Dp	2,3,4	min.	8	+	8	=	16	sec												
	Ep	2	min.	7	+	10	=	17	sec												*
	Fp	2	min.	6	+	6	=	12	sec												
	Gp	1,2,4	min.	6	+	6	=	12	sec												

*Remark: Due to kerside activities, capacity of 1 lane of How Ming Street is redued by half.

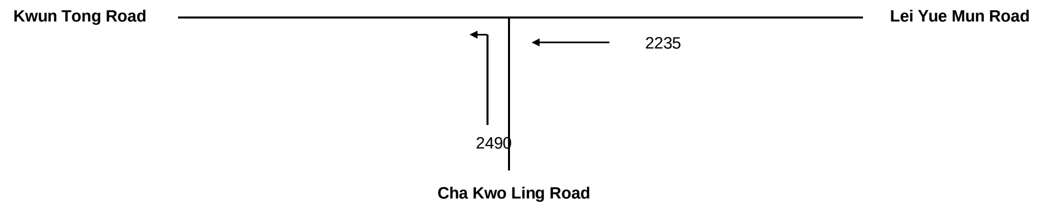
JUNCTION CAPACITY CALCULATION

AECOM

Junction J22 - Lei Yue Mun Road / Cha Kwo Ling Road	2031 AM Reference Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

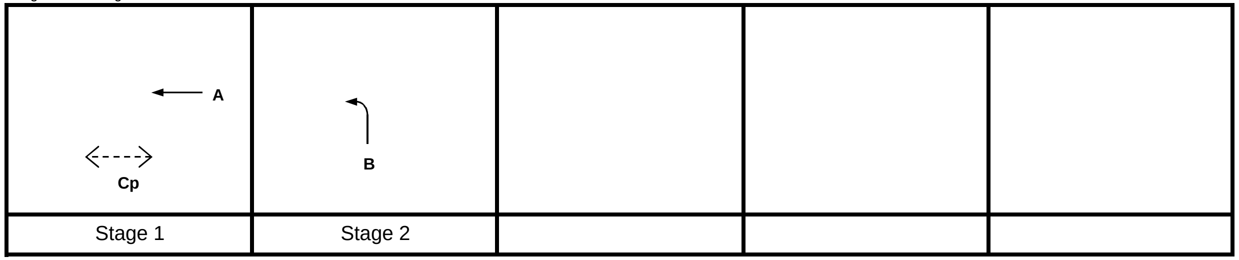
J22

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	2	
Cycle time		C =	130	sec
Sum(y)		Y =	0.710	
Lost time		L =	14	sec
Total Flow		=	14,405	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y)$	=	90	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	48	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.795	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times100\%$	=	12.0	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	66	sec
Y_{max}	$= 1-L/C$	=	0.892	

Stage/Phase Diagrams



I/G = 6   I/G = 10

Critical Case : A,B

R.C.(C) $= (0.9\times Y_{max}-Y)/Y\times100\% =$ 13%

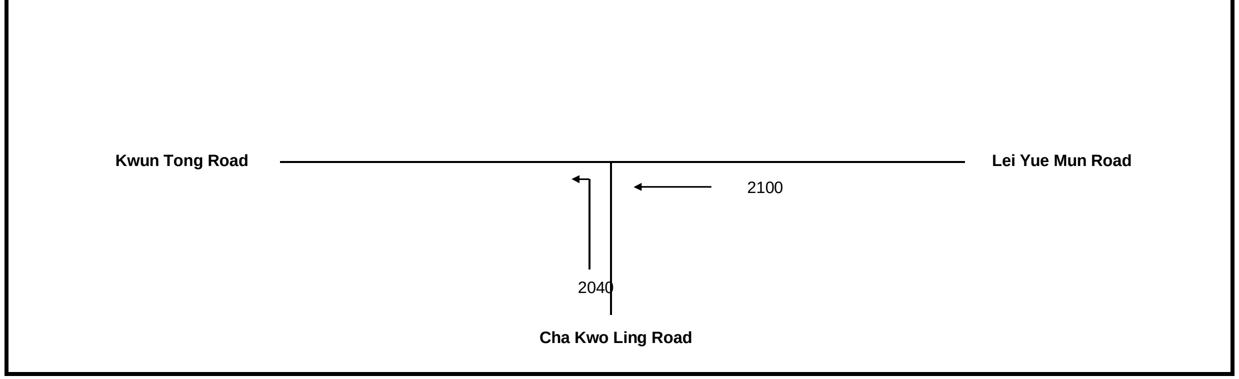
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
←	A	1	3.000	4				1		0		8080		2235		2235			8080	0.277	0.277
↰	B	2	4.000	3	15			1		0		6325	2490			2490	100%		5750	0.433	0.433
Pedestrian Crossing				GM		FGM															
	Cp	1	min.	7	+	15	=	22	sec												

JUNCTION CAPACITY CALCULATION

AECOM

Junction J22 - Lei Yue Mun Road / Cha Kwo Ling Road	2031 PM Reference Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

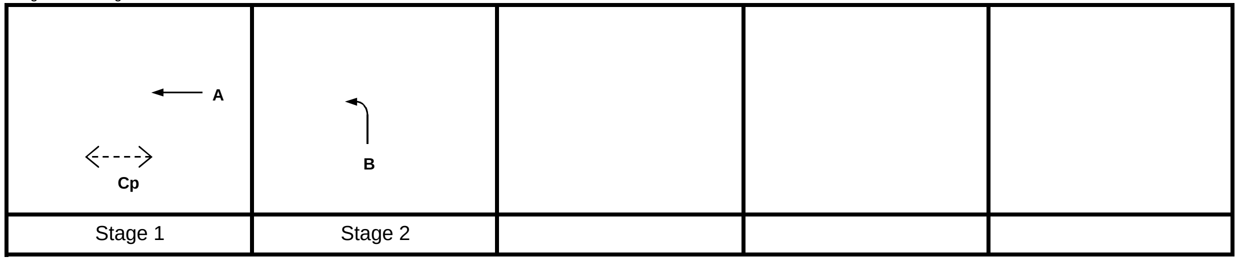
Traffic Flow Diagram
(pcu/hr)



J22

No. of stages per cycle		N =	2	
Cycle time		C =	130	sec
Sum(y)		Y =	0.615	
Lost time		L =	14	sec
Total Flow		=	14,405	pcu
Optimum Cycle C_o	= (1.5×L+5)/(1-Y)	=	67	sec
Min. Cycle Time C_m	= L/(1-Y)	=	36	sec
Y_{ult}	= 0.9-0.0075×L	=	0.795	
$R.C._{ult}$	= (Y_{ult}-Y)/Yx100%	=	29.3	%
Practical Cycle Time C_p	= 0.9×L/(0.9-Y)	=	44	sec
Y_{max}	= 1-L/C	=	0.892	

Stage/Phase Diagrams



I/G = 6 I/G = 10

Critical Case : A,B

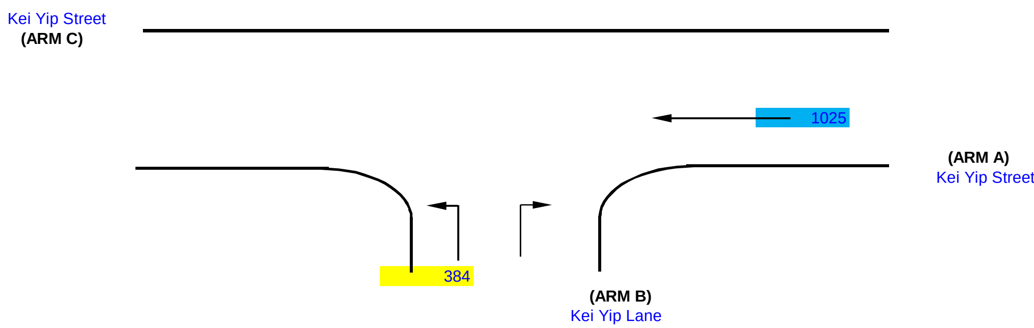
R.C.(C) = (0.9xY_{max}-Y)/Yx100% = 31%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
←	A	1	3.000	4				1		0		8080		2100		2100			8080	0.260	0.260
↰	B	2	4.000	3	15			1		0		6325	2040			2040	100%		5750	0.355	0.355
Pedestrian Crossing				GM		FGM															
	Cp	1	min.	7	+	15	=	22	sec												

PRIORITY JUNCTION CAPACITY CALCULATION

AECOM

Junction J23 - Kei Yip Street / Kei Yip Lane	2031 AM Reference Traffic Flows	Designed By : SL	Checked By : DW	Job No. : 60493364	Date : Jun 20



J23

NOTES : (GEOMETRIC INPUT DATA)

W	= Major Road Width (6.4 - 20.0)
W cr	= Central Reserve width (1.2 - 9.0, kerbed central reserve only)
W b-a	= Lane width available to vehicle waiting in stream b-a (2.05 - 4.70)
W b-c	= Lane width available to vehicle waiting in stream b-c (2.05 - 4.70)
W c-b	= Lane width available to vehicle waiting in stream c-b (2.05 - 4.70)
Vl b-a	= Visibility to the left for vehicles waiting in stream b-a (22.0 - 250.0)
Vr b-a	= Visibility to the right for vehicles waiting in stream b-a (17.0 - 250.0)
Vr b-c	= Visibilitu to the right for vehicles waiting in stream b-c (17.0 - 250.0)
Vr c-b	= Visibility to the right for vehicles waiting in stream c-b (17.0 - 250.0)
D	= Stream-specific B-A
E	= Stream-specific B-C
F	= Stream-specific C-B
Y	= (1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)			*MAJOR ROAD (ARM C)*			*MINOR ROAD (ARM B)*		
W	=	8.25 (metres)	W c-b	=	(metres)	W b-a	=	(metres)
W cr	=	0 (metres)	Vr c-b	=	(metres)	W b-c	=	4 (metres)
q a-b	=	0 (pcu/hr)	q c-a	=	0 (pcu/hr)	Vl b-a	=	250 (metres)
q a-c	=	1025 (pcu/hr)	q c-b	=	0 (pcu/hr)	Vr b-a	=	70 (metres)
						Vr b-c	=	70 (metres)
						q b-a	=	0 (pcu/hr)
						q b-c	=	384 (pcu/hr)

GEOMETRIC FACTORS :

D	=	0.664980
E	=	0.986420
F	=	0.585955
Y	=	0.715375

THE CAPACITY OF MOVEMENT :

Q b-a	=	239
Q b-c	=	472
Q c-b	=	280
Q b-ac	=	472

CRITICAL DFC = 0.81

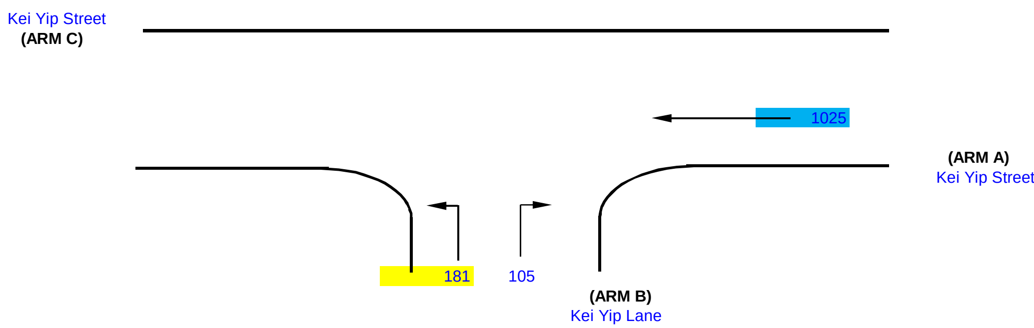
COMPARISION OF DESIGN FLOW TO CAPACITY :

DFC b-a	=	0.00
DFC b-c	=	0.81
DFC c-b	=	0.00
DFC b-ac	=	0.81

PRIORITY JUNCTION CAPACITY CALCULATION

AECOM

Junction J23 - Kei Yip Street / Kei Yip Lane	2031 AM Reference Traffic Flows	Designed By : SL	Checked By : DW	Job No. : 60493364	Date : Jun 20



J23

NOTES : (GEOMETRIC INPUT DATA)

W	= Major Road Width (6.4 - 20.0)
W cr	= Central Reserve width (1.2 - 9.0, kerbed central reserve only)
W b-a	= Lane width available to vehicle waiting in stream b-a (2.05 - 4.70)
W b-c	= Lane width available to vehicle waiting in stream b-c (2.05 - 4.70)
W c-b	= Lane width available to vehicle waiting in stream c-b (2.05 - 4.70)
Vl b-a	= Visibility to the left for vehicles waiting in stream b-a (22.0 - 250.0)
Vr b-a	= Visibility to the right for vehicles waiting in stream b-a (17.0 - 250.0)
Vr b-c	= Visibilitu to the right for vehicles waiting in stream b-c (17.0 - 250.0)
Vr c-b	= Visibility to the right for vehicles waiting in stream c-b (17.0 - 250.0)
D	= Stream-specific B-A
E	= Stream-specific B-C
F	= Stream-specific C-B
Y	= (1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)				*MAJOR ROAD (ARM C)*				*MINOR ROAD (ARM B)*			
W	=	8.25	(metres)	W c-b	=		(metres)	W b-a	=	2.05	(metres)
W cr	=	0	(metres)	Vr c-b	=		(metres)	W b-c	=	2.05	(metres)
q a-b	=	0	(pcu/hr)	q c-a	=	0	(pcu/hr)	Vl b-a	=	250	(metres)
q a-c	=	1025	(pcu/hr)	q c-b	=	0	(pcu/hr)	Vr b-a	=	70	(metres)
								Vr b-c	=	70	(metres)
								q b-a	=	105	(pcu/hr)
								q b-c	=	181	(pcu/hr)

GEOMETRIC FACTORS :

D	=	0.860050
E	=	0.811368
F	=	0.585955
Y	=	0.715375

`

THE CAPACITY OF MOVEMENT :

Q b-a	=	310
Q b-c	=	388
Q c-b	=	280
Q b-ac	=	355

CRITICAL DFC = 0.81

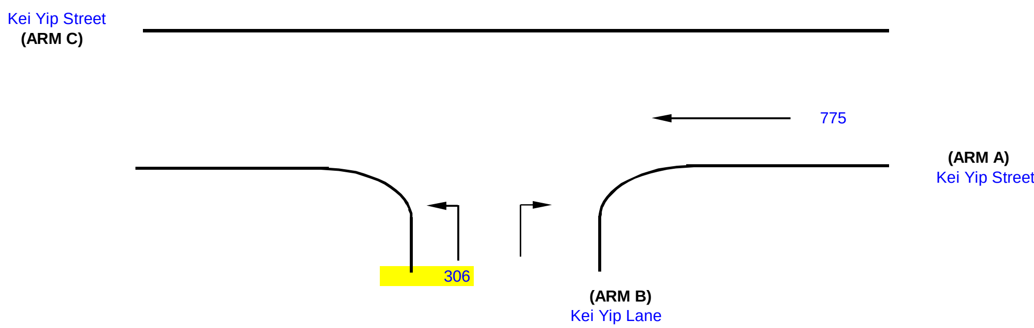
COMPARISION OF DESIGN FLOW TO CAPACITY :

DFC b-a	=	0.34
DFC b-c	=	0.47
DFC c-b	=	0.00
DFC b-ac	=	0.81

PRIORITY JUNCTION CAPACITY CALCULATION

AECOM

Junction J23 - Kei Yip Street / Kei Yip Lane	2031 PM Reference Traffic Flows	Designed By : SL	Checked By : DW	Job No. : 60493364	Date : Jun 20



J23

NOTES : (GEOMETRIC INPUT DATA)

W	= Major Road Width (6.4 - 20.0)
W cr	= Central Reserve width (1.2 - 9.0, kerbed central reserve only)
W b-a	= Lane width available to vehicle waiting in stream b-a (2.05 - 4.70)
W b-c	= Lane width available to vehicle waiting in stream b-c (2.05 - 4.70)
W c-b	= Lane width available to vehicle waiting in stream c-b (2.05 - 4.70)
Vl b-a	= Visibility to the left for vehicles waiting in stream b-a (22.0 - 250.0)
Vr b-a	= Visibility to the right for vehicles waiting in stream b-a (17.0 - 250.0)
Vr b-c	= Visibilitu to the right for vehicles waiting in stream b-c (17.0 - 250.0)
Vr c-b	= Visibility to the right for vehicles waiting in stream c-b (17.0 - 250.0)
D	= Stream-specific B-A
E	= Stream-specific B-C
F	= Stream-specific C-B
Y	= (1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)				*MAJOR ROAD (ARM C)*				*MINOR ROAD (ARM B)*			
W	=	8.25	(metres)	W c-b	=		(metres)	W b-a	=		(metres)
W cr	=	0	(metres)	Vr c-b	=		(metres)	W b-c	=	4	(metres)
q a-b	=	0	(pcu/hr)	q c-a	=	0	(pcu/hr)	Vl b-a	=	250	(metres)
q a-c	=	775	(pcu/hr)	q c-b	=	0	(pcu/hr)	Vr b-a	=	70	(metres)
								Vr b-c	=	70	(metres)
								q b-a	=	0	(pcu/hr)
								q b-c	=	306	(pcu/hr)

GEOMETRIC FACTORS :

D	=	0.664980
E	=	0.986420
F	=	0.585955
Y	=	0.715375

`

THE CAPACITY OF MOVEMENT :

Q b-a	=	283
Q b-c	=	536
Q c-b	=	318
Q b-ac	=	536

CRITICAL DFC = 0.57

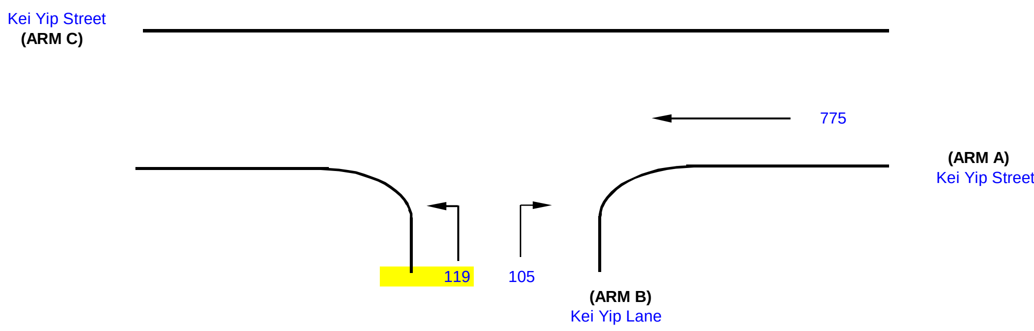
COMPARISION OF DESIGN FLOW TO CAPACITY :

DFC b-a	=	0.00
DFC b-c	=	0.57
DFC c-b	=	0.00
DFC b-ac	=	0.57

PRIORITY JUNCTION CAPACITY CALCULATION

AECOM

Junction J23 - Kei Yip Street / Kei Yip Lane	2031 PM Reference Traffic Flows	Designed By : SL	Checked By : DW	Job No. : 60493364	Date : Jun 20



NOTES : (GEOMETRIC INPUT DATA)

J23

W	= Major Road Width (6.4 - 20.0)
W cr	= Central Reserve width (1.2 - 9.0, kerbed central reserve only)
W b-a	= Lane width available to vehicle waiting in stream b-a (2.05 - 4.70)
W b-c	= Lane width available to vehicle waiting in stream b-c (2.05 - 4.70)
W c-b	= Lane width available to vehicle waiting in stream c-b (2.05 - 4.70)
Vl b-a	= Visibility to the left for vehicles waiting in stream b-a (22.0 - 250.0)
Vr b-a	= Visibility to the right for vehicles waiting in stream b-a (17.0 - 250.0)
Vr b-c	= Visibilitu to the right for vehicles waiting in stream b-c (17.0 - 250.0)
Vr c-b	= Visibility to the right for vehicles waiting in stream c-b (17.0 - 250.0)
D	= Stream-specific B-A
E	= Stream-specific B-C
F	= Stream-specific C-B
Y	= (1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)				*MAJOR ROAD (ARM C)*				*MINOR ROAD (ARM B)*			
W	=	8.25	(metres)	W c-b	=		(metres)	W b-a	=	2.05	(metres)
W cr	=	0	(metres)	Vr c-b	=		(metres)	W b-c	=	2.05	(metres)
q a-b	=	0	(pcu/hr)	q c-a	=	0	(pcu/hr)	Vl b-a	=	250	(metres)
q a-c	=	775	(pcu/hr)	q c-b	=	0	(pcu/hr)	Vr b-a	=	70	(metres)
								Vr b-c	=	70	(metres)
								q b-a	=	105	(pcu/hr)
								q b-c	=	119	(pcu/hr)

GEOMETRIC FACTORS :

D	=	0.860050
E	=	0.811368
F	=	0.585955
Y	=	0.715375

`

THE CAPACITY OF MOVEMENT :

Q b-a	=	366
Q b-c	=	441
Q c-b	=	318
Q b-ac	=	402

CRITICAL DFC = 0.56

COMPARISION OF DESIGN FLOW TO CAPACITY :

DFC b-a	=	0.29
DFC b-c	=	0.27
DFC c-b	=	0.00
DFC b-ac	=	0.56

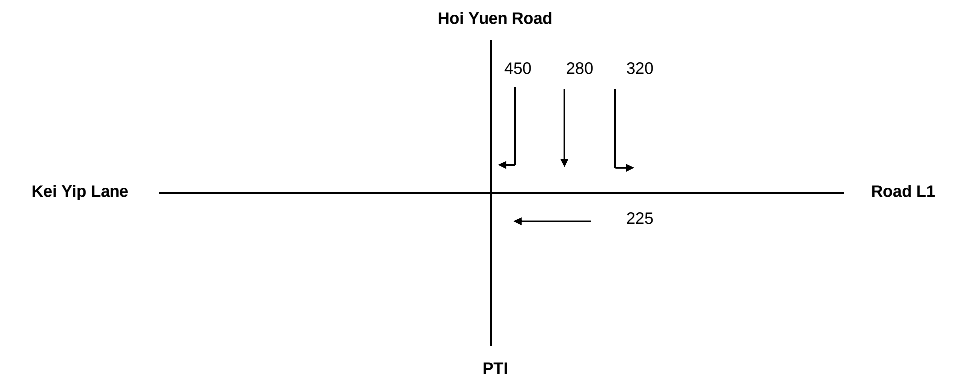
JUNCTION CAPACITY CALCULATION

AECOM

Junction J24 - Hoi Yuen Road / Kei Yip Lane / Road L1	2031 AM Reference Traffic Flows - with J19 Imp Scheme	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

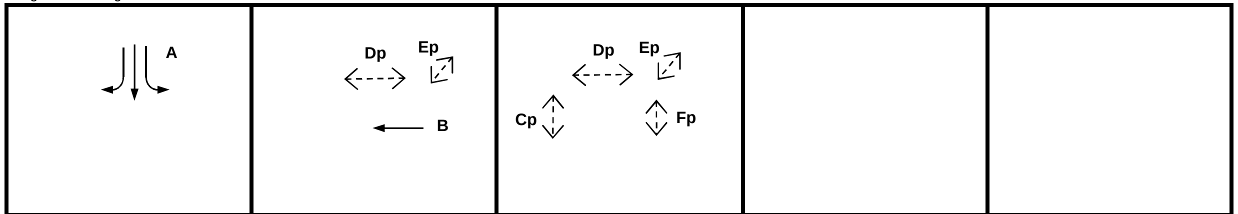
J24

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	3	
Cycle time	C =	90	sec
Sum(y)	Y =	0.304	
Lost time	L =	27	sec
Total Flow	=	1,275	pcu
Optimum Cycle C_o = (1.5×L+5)/(1-Y)	=	65	sec
Min. Cycle Time C_m = L/(1-Y)	=	39	sec
Y_{ult} = 0.9-0.0075×L	=	0.698	
$R.C._{ult}$ = (Y_{ult}-Y)/Yx100%	=	129.7	%
Practical Cycle Time C_p = 0.9×L/(0.9-Y)	=	41	sec
Y_{max} = 1-L/C	=	0.700	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G = 5 I/G = 8 G = 5 I/G = 11

Critical Case : A,B,Cp

R.C.(C) = (0.9xY_{max}-Y)/Yx100% = 108%

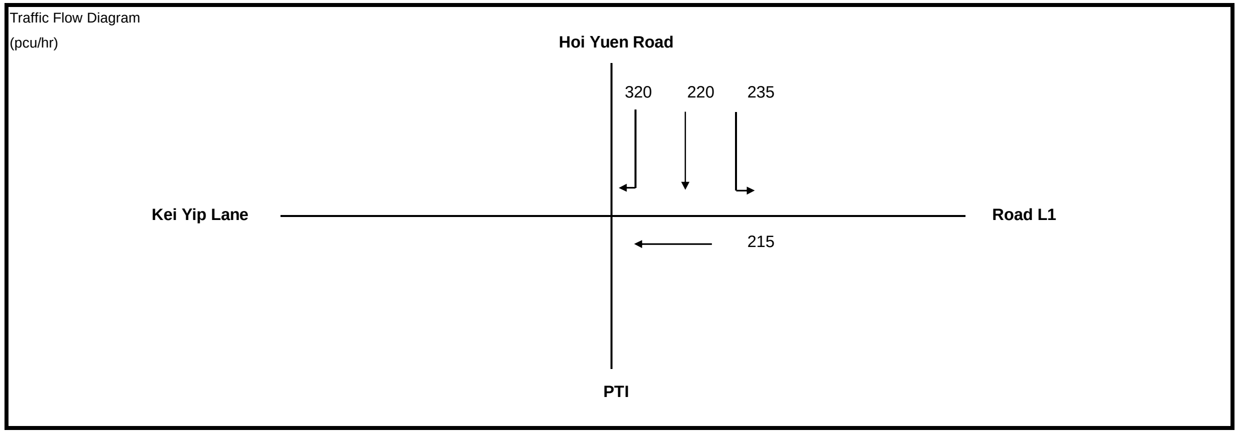
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.800	1	15			1		0		1995	320			320	100%		1814	0.176	
	A	1	3.800	1		15	0	0		0		2135		280	114	394		29%	2075	0.190	
	A	1	3.800	1		12	0	1		0		1995			336	336		100%	1773	0.190	0.190
	B	2	3.600	1				1		0		1975		225		225			1975	0.114	0.114
Pedestrian Crossing				GM		FGM															
	Cp	3	min.	5	+	9	=	14	sec												*
	Dp	2,3	min.	8	+	15	=	23	sec												
	Ep	2,3	min.	5	+	6	=	11	sec												
	Fp	3	min.	5	+	5	=	10	sec												

JUNCTION CAPACITY CALCULATION

AECOM

Junction J24 - Hoi Yuen Road / Kei Yip Lane / Road L1	2031 PM Reference Traffic Flows - with J19 Imp Scheme	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

Traffic Flow Diagram
(pcu/hr)



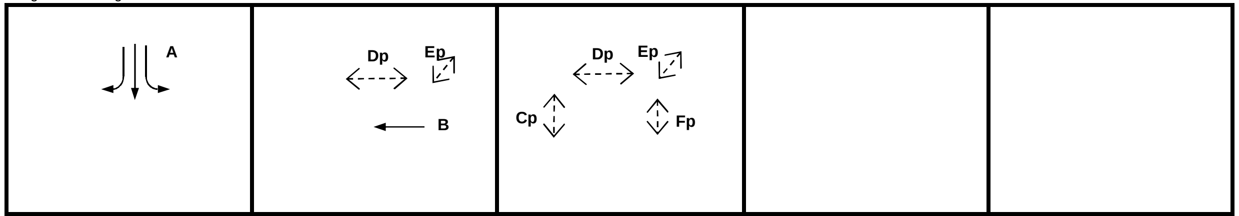
J24

No. of stages per cycle		N =	3	
Cycle time		C =	90	sec
Sum(y)		Y =	0.249	
Lost time		L =	27	sec
Total Flow		=	990	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y)$	=	61	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	36	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.698	
R.C.$_{ult}$	$= (Y_{ult}-Y)/Y\mathrm{x}100\%$	=	180.3	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	37	sec
Y_{max}	$= 1-L/C$	=	0.700	

Critical Case : A,B,Cp

R.C.(C) $= (0.9\mathrm{x}Y_{max}-Y)/Y\mathrm{x}100\%$ = 153%

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G = 5 I/G = 8 G = 5 I/G = 11

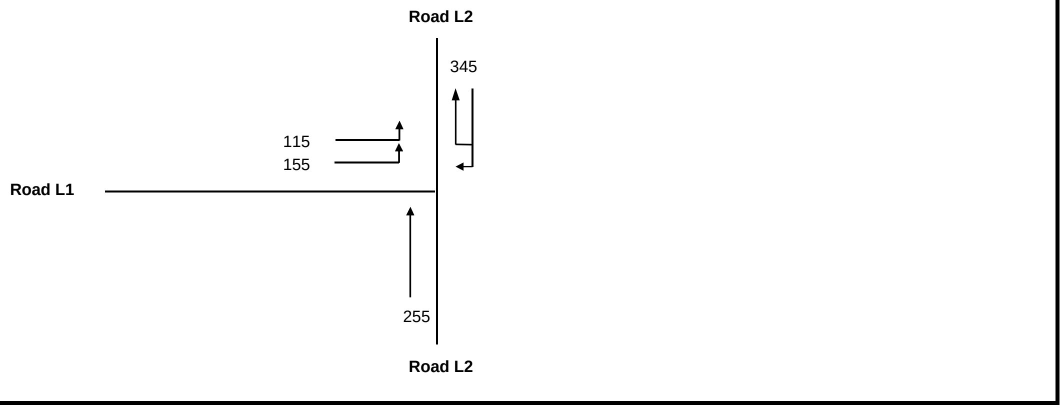
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m)		OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr)			TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%)		REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
					LEFT	RIGHT							LEFT	STRAIGHT AHEAD	RIGHT		LEFT	RIGHT			
	A	1	3.800	1	15			1		0		1995	235			235	100%		1814	0.130	
	A	1	3.800	1		15	0	0		0		2135		220	72	292		25%	2084	0.140	
	A	1	3.800	1		12	0	1		0		1995			248	248		100%	1773	0.140	0.140
	B	2	3.600	1				1		0		1975		215		215			1975	0.109	0.109
Pedestrian Crossing				GM		FGM															
	Cp	3	min.	5	+	9	=	14	sec												*
	Dp	2,3	min.	8	+	15	=	23	sec												
	Ep	2,3	min.	5	+	6	=	11	sec												
	Fp	3	min.	5	+	5	=	10	sec												

JUNCTION CAPACITY CALCULATION

AECOM

Junction J25 - Road L1 / Road L2	2031 AM Reference Traffic Flows - with J19 Imp Scheme (w UT at Road L2)	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Sep 19

Traffic Flow Diagram
(pcu/hr)

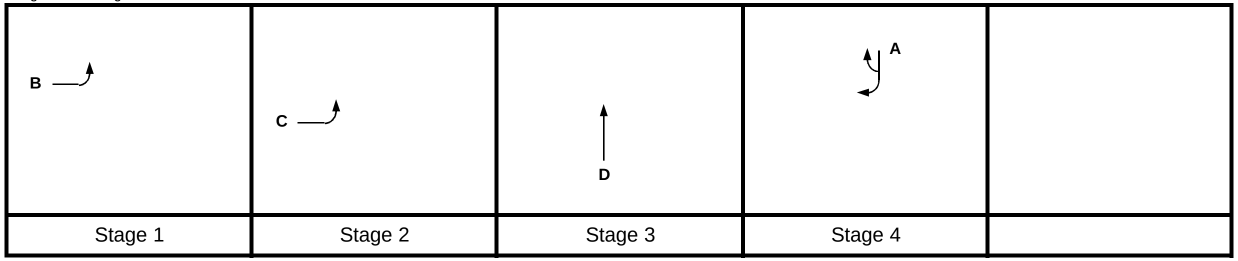


J25

No. of stages per cycle	N =	4	
Cycle time	C =	108	sec
Sum(y)	Y =	0.441	
Lost time	L =	17	sec
Total Flow	=	870	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y)$	=	55	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	30	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.773	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times100\%$	=	75.3	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	33	sec
Y_{max}	$= 1-L/C$	=	0.843	

Stage/Phase Diagrams



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

Critical Case : B,C,D,A

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 72%

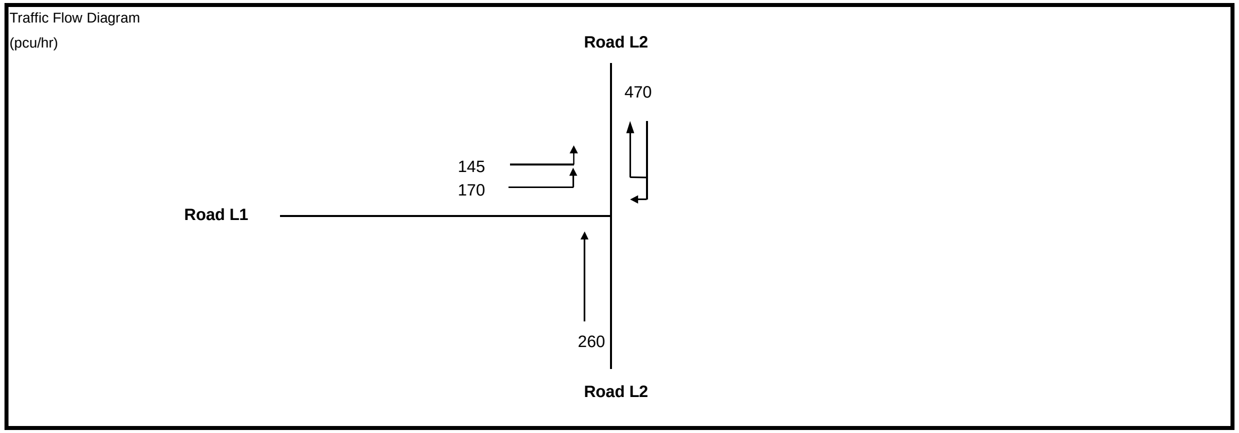
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m)		OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr)			TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%)		REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
					LEFT	RIGHT							LEFT	STRAIGHT AHEAD	RIGHT		LEFT	RIGHT			
	A	4	5.000	1		15	0	1		0		2115			345	345		100%	1923	0.179	0.179
	B	1	4.500	1	15			1		0		2065	115			115	100%		1877	0.061	0.061
	C	2	3.700	1	17			0		0		2125	155			155	100%		1953	0.079	0.079
	D	3	5.000	1				1		0		2115		255		255			2115	0.121	0.121

JUNCTION CAPACITY CALCULATION

AECOM

Junction J25 - Road L1 / Road L2	2031 PM Reference Traffic Flows - with J19 Imp Scheme (w UT at Road L2)	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Sep 19

Traffic Flow Diagram
(pcu/hr)

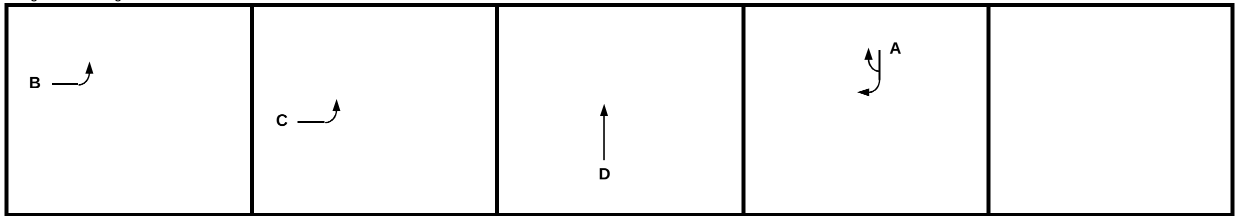


J25

No. of stages per cycle	N =	4	
Cycle time	C =	108	sec
Sum(y)	Y =	0.532	
Lost time	L =	17	sec
Total Flow	=	1,045	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	65	sec
Min. Cycle Time C_m	$= L/(1-Y)$ =	36	sec
Y_{ult}	$= 0.9-0.0075\times L$ =	0.773	
R.C.$_{ult}$	$= (Y_{ult}-Y)/Y\times100\%$ =	45.3	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$ =	42	sec
Y_{max}	$= 1-L/C$ =	0.843	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3	Stage 4	
I/G = 5	I/G = 5	I/G = 6	I/G = 5	

Critical Case : B,C,D,A

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 43%

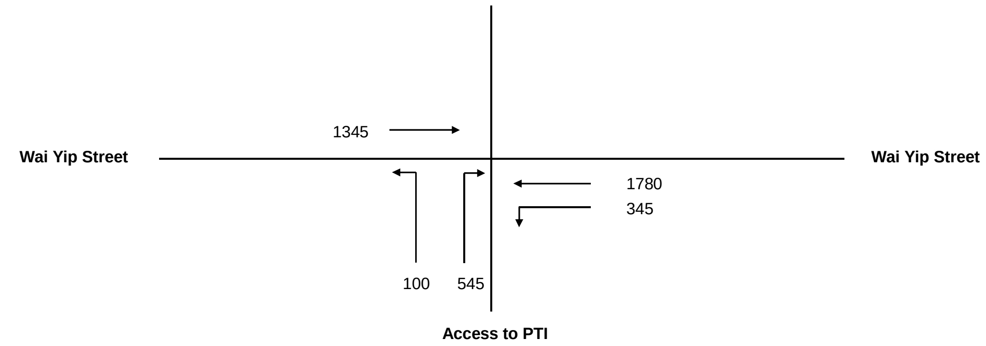
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m)		OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr)			TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%)		REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
					LEFT	RIGHT							LEFT	STRAIGHT AHEAD	RIGHT		LEFT	RIGHT			
	A	4	5.000	1		15	0	1		0		2115			470	470		100%	1923	0.244	0.244
	B	1	4.500	1	15			1		0		2065	145			145	100%		1877	0.077	0.077
	C	2	3.700	1	17			0		0		2125	170			170	100%		1953	0.087	0.087
	D	3	5.000	1				1		0		2115		260		260			2115	0.123	0.123

JUNCTION CAPACITY CALCULATION

AECOM

Junction J26 - Wai Yip Street / Road L2	2031 AM Reference Traffic Flows - with J19 Imp Scheme	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jan 19

Traffic Flow Diagram
(pcu/hr)

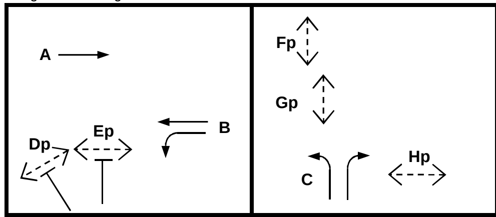


J26

No. of stages per cycle	N =	2	
Cycle time	C =	120	sec
Sum(y)	Y =	0.685	
Lost time	L =	10	sec
Total Flow	=	14,215	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	64	sec
Min. Cycle Time C_m	$= L/(1-Y)$ =	32	sec
Y_{ult}	$= 0.9-0.0075\times L$ =	0.825	
R.C.$_{ult}$	$= (Y_{ult}-Y)/Y\times100\%$ =	20.4	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$ =	42	sec
Y_{max}	= 1-L/C =	0.917	

Stage/Phase Diagrams



Stage 1	Stage 2			

I/G = 7 I/G = 5

Critical Case : B,C

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 20%

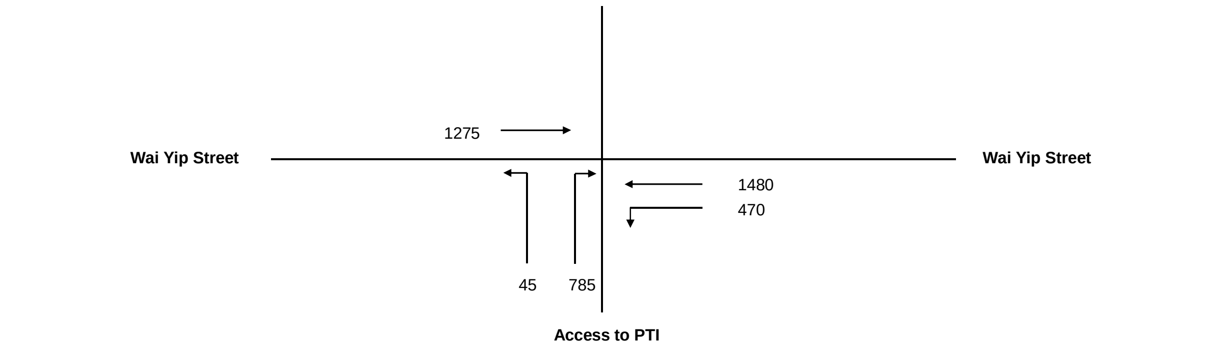
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.500	2				1		0		4070		1345		1345			4070	0.330	
	B	1	3.000	1	12			1		0		1915	345	658		1003	34%		1836	0.546	0.546
	B	1	3.000	1				0		0		2055		1122		1122			2055	0.546	
	C	2	3.500	1	15			1		0		1965	100			100	100%		1786	0.056	
	C	2	3.500	2		20	0	0		0		4210			545	545		100%	3916	0.139	0.139
Pedestrian Crossing				GM		FGM															
	Dp	1	min.	5	+	5	=	10	sec												
	Ep	1	min.	5	+	6	=	11	sec												
	Fp	2	min.	5	+	6	=	11	sec												
	Gp	2	min.	5	+	8	=	13	sec												
	Hp	2	min.	5	+	8	=	13	sec												

JUNCTION CAPACITY CALCULATION

AECOM

Junction J26 - Wai Yip Street / Road L2	2031 PM Reference Traffic Flows - with J19 Imp Scheme	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jan 19

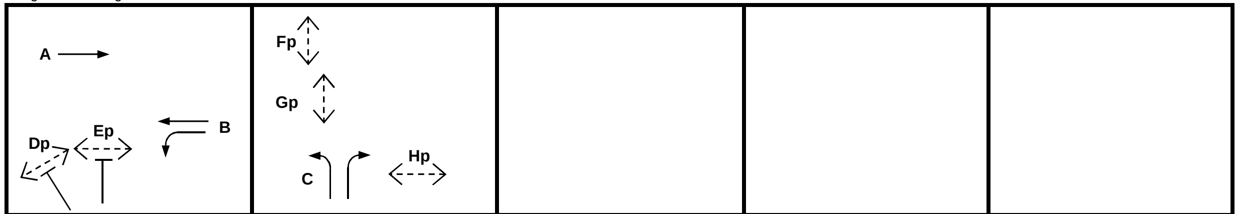
Traffic Flow Diagram
(pcu/hr)



J26

No. of stages per cycle		N =	2	
Cycle time		C =	120	sec
Sum(y)		Y =	0.706	
Lost time		L =	10	sec
Total Flow		=	14,215	pcu
Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y) =$		68	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	34	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.825	
R.C.$_{ult}$	$= (Y_{ult}-Y)/Y \times 100\%$	=	16.8	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	46	sec
Y_{max}	$= 1-L/C$	=	0.917	

Stage/Phase Diagrams



Stage 1	Stage 2			
I/G = 7	I/G = 5			

Critical Case : B,C

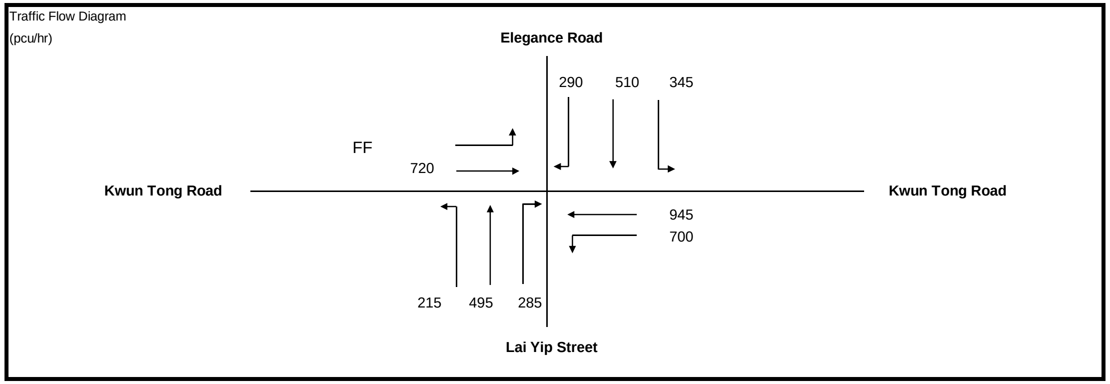
R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 17%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.500	2				1		0		4070		1275		1275			4070	0.313	
	B	1	3.000	1	12			1		0		1915	470	440		910	52%		1799	0.506	0.506
	B	1	3.000	1				0		0		2055		1040		1040			2055	0.506	
	C	2	3.500	1	15			1		0		1965	45			45	100%		1786	0.025	
	C	2	3.500	2		20	0	0		0		4210			785	785		100%	3916	0.200	0.200
Pedestrian Crossing				GM		FGM															
	Dp	1	min.	5	+	5	=	10	sec												
	Ep	1	min.	5	+	6	=	11	sec												
	Fp	2	min.	5	+	6	=	11	sec												
	Gp	2	min.	5	+	8	=	13	sec												
	Hp	2	min.	5	+	8	=	13	sec												

JUNCTION CAPACITY CALCULATION

AECOM

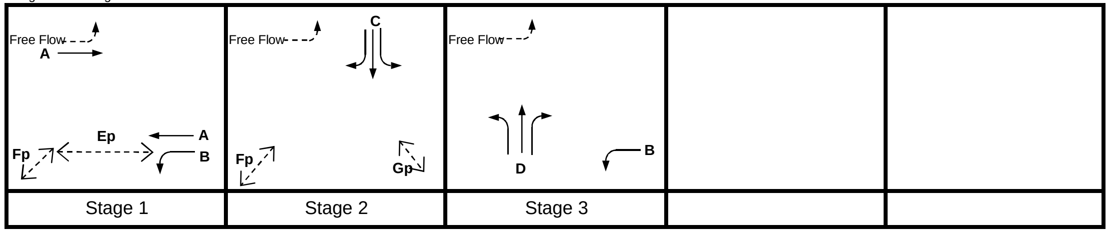
Junction J1 - Kwun Tong Road / Lai Yip Street	2031 AM Design Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19



J1

No. of stages per cycle	N =	3	
Cycle time	C =	118	sec
Sum(y)	Y =	0.641	
Lost time	L =	19	sec
Total Flow	=	4,505	pcu
Optimum Cycle C_o	= (1.5×L+5)/(1-Y) =	93	sec
Min. Cycle Time C_m	= L/(1-Y) =	53	sec
Y_{ult}	= 0.9-0.0075×L =	0.758	
$R.C._{ult}$	= (Y_{ult}-Y)/Yx100% =	18.1	%
Practical Cycle Time C_p	= 0.9×L/(0.9-Y) =	66	sec
Y_{max}	= 1-L/C =	0.839	

Stage/Phase Diagrams



I/G = 8 I/G = 6 I/G = 8

Critical Case : A,C,D

R.C.(C) = $(0.9xY_{max}$-Y)/Yx100% = 18%

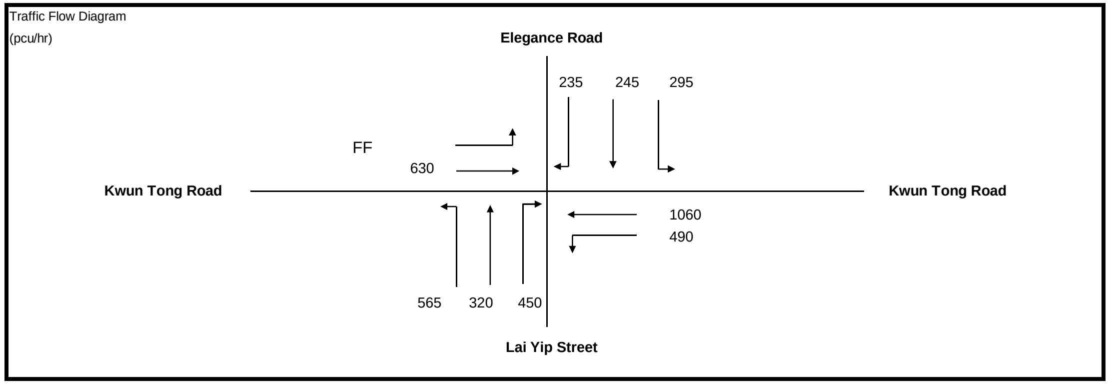
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.220	2				0		0		4154		720		720			4154	0.173	
	A	1	3.125	2				0		0		4135		945		945			4135	0.229	0.229
	B	1,3	3.220	1	10			1		0	-253	1937	700			700	100%		1464	0.478	
	C	2	3.180	1	10			1		0		1933	345			345	100%		1681	0.205	0.205
	C	2	3.180	1				0		0		2073		352		352			2073	0.170	
	C	2	3.180	1		25	0	0		0		2073		158	183	341		54%	2008	0.170	
Flared Length															107						
	D	3	3.500	1	10			1		0		1965	78	318		396	20%		1909	0.208	
Flared Length													137								
	D	3	3.500	1		15	0	0		0		2105		124	285	409		70%	1968	0.208	0.208
Flared Length														53							
Pedestrian Crossing				GM		FGM															
	Ep	1	min.	7	+	9	=	16	sec												
	Fp	1,2	min.	7	+	6	=	13	sec												
	Gp	2	min.	5	+	6	=	11	sec												
*Remark:		Flows of Phase C (right-turning movement) and Phase D (left-turning and straight-ahead movements) are deducted by flows capacity of the flared lane.																			
		As left-turn lane for Phase B is not a full lane, capacity of this lane is deducted.																			

JUNCTION CAPACITY CALCULATION

AECOM

Junction J1 - Kwun Tong Road / Lai Yip Street	2031 PM Design Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

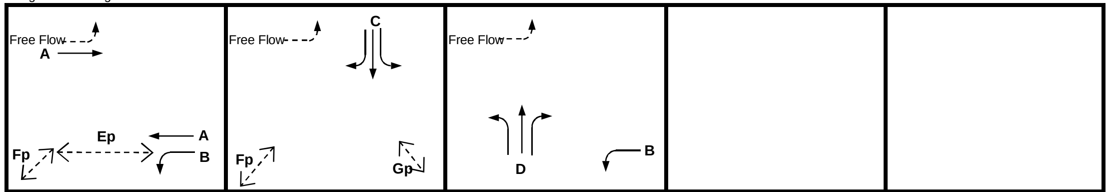
Traffic Flow Diagram
(pcu/hr)



J1

No. of stages per cycle	N =	3	
Cycle time	C =	118	sec
Sum(y)	Y =	0.740	
Lost time	L =	19	sec
Total Flow	=	4,290	pcu
Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y) =$	129	sec
Min. Cycle Time C_m	$= L/(1-Y)$ =	73	sec
Y_{ult}	$= 0.9-0.0075 \times L$ =	0.758	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y \times 100\%$ =	2.4	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$ =	107	sec
Y_{max}	= 1-L/C =	0.839	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G = 8 I/G = 6 I/G = 8

Critical Case : A,C,D

R.C.(C) $= (0.9 \times Y_{max}-Y)/Y \times 100\%$ = 2%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
	A	1	3.220	2				0		0		4154		630		630			4154	0.152	
	A	1	3.125	2				0		0		4135		1060		1060			4135	0.256	0.256
	B	1,3	3.220	1	10			1		0	-253	1937	490			490	100%		1464	0.335	
	C	2	3.180	1	10			1		0		1933	295			295	100%		1681	0.176	0.176
	C	2	3.180	1				0		0		2073		190		190			2073	0.092	
	C	2	3.180	1		25	0	0		0		2073		55	128	183		70%	1989	0.092	
Flared Length															107						
	D	3	3.500	1	10			1		0		1965	428	113		541	79%		1757	0.308	0.308
Flared Length													137								
	D	3	3.500	1		15	0	0		0		2105		154	450	604		75%	1959	0.308	
Flared Length														53							
Pedestrian Crossing				GM		FGM															
	Ep	1	min.	7	+	9	=	16	sec												
	Fp	1,2	min.	7	+	6	=	13	sec												
	Gp	2	min.	5	+	6	=	11	sec												

*Remark: Flows of Phase C (right-turning movement) and Phase D (left-turning and straight-ahead movements) are deducted by flows capacity of the flared lane.
As left-turn lane for Phase B is not a full lane, capacity of this lane is deducted.

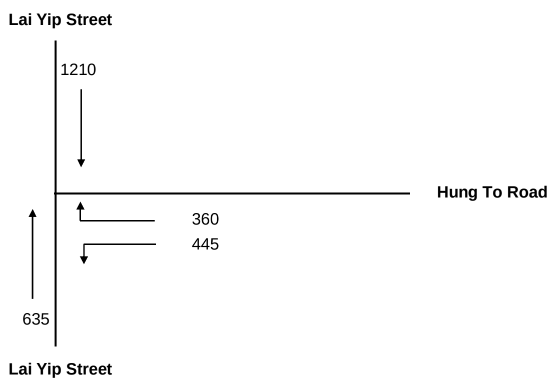
JUNCTION CAPACITY CALCULATION

AECOM

Junction J2 - Hung To Road / Lai Yip Street	2031 AM Design Traffic Flows	DESIGN: 0	CHECK: 0	JOB NO: 60493364	DATE: Jun 19

J2

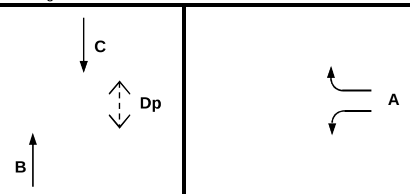
Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	2	
Cycle time	C =	118	sec
Sum(y)	Y =	0.544	
Lost time	L =	11	sec
Total Flow	=	2,650	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	47	sec
Min. Cycle Time C_m	$= L/(1-Y)$ $=$	24	sec
Y_{ult}	$= 0.9-0.0075\times L$ $=$	0.818	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times100\%$ $=$	50.2	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$ $=$	28	sec
Y_{max}	$= 1-L/C$ $=$	0.907	

Stage/Phase Diagrams



Stage 1	Stage 2			
I/G = 7	I/G = 6			

Critical Case : C,A

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 50%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	2	3.180	1		15	0	0		0		2073			360	360		100%	1885	0.191	
	A	2	3.180	1	10			0		0		2073	445			445	100%		1803	0.247	0.247
	B	1	3.500	2				1		0		4070		635		635			4070	0.156	
	C	1	3.500	2				1		0		4070		1210		1210			4070	0.297	0.297
Pedestrian Crossing				GM		FGM															
	Dp	1	min.	7	+	16	=	23	sec												

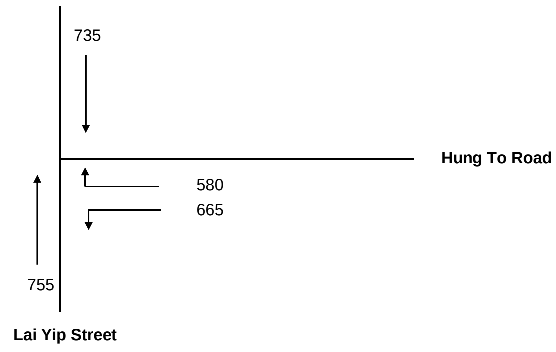
*Remark: Due to kerbside activities, there are only 2 lanes for Hung To Road westbound traffic.

JUNCTION CAPACITY CALCULATION

AECOM

Junction J2 - Hung To Road / Lai Yip Street	2031 PM Design Traffic Flows	DESIGN: 0	CHECK: 0	JOB NO: 60493364	DATE: Jun 19

Traffic Flow Diagram
(pcu/hr)

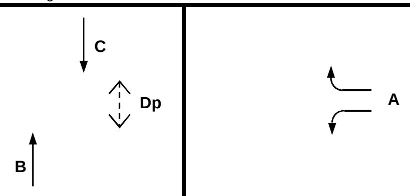


J2

No. of stages per cycle	N =	2	
Cycle time	C =	108	sec
Sum(y)	Y =	0.554	
Lost time	L =	11	sec
Total Flow	=	2,735	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	48	sec
Min. Cycle Time C_m	$= L/(1-Y)$ $=$	25	sec
Y_{ult}	$= 0.9-0.0075\times L$ $=$	0.818	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\mathrm{x}100\%$ $=$	47.5	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$ $=$	29	sec
Y_{max}	$= 1-L/C$ $=$	0.898	

Stage/Phase Diagrams



Stage 1	Stage 2			
I/G = 6	I/G = 7			

Critical Case : B,A

R.C.(C) $= (0.9\mathrm{x}Y_{max}-Y)/Y\mathrm{x}100\% =$ 46%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	2	3.180	1		15	0	0		0		2073			580	580		100%	1885	0.308	
	A	2	3.180	1	10			0		0		2073	665			665	100%		1803	0.369	0.369
	B	1	3.500	2				1		0		4070		755		755			4070	0.186	0.186
	C	1	3.500	2				1		0		4070		735		735			4070	0.181	
Pedestrian Crossing				GM		FGM															
	Dp	1	min.	7	+	16	=	23	sec												

*Remark: Due to kerbside activities, there are only 2 lanes for Hung To Road westbound traffic.

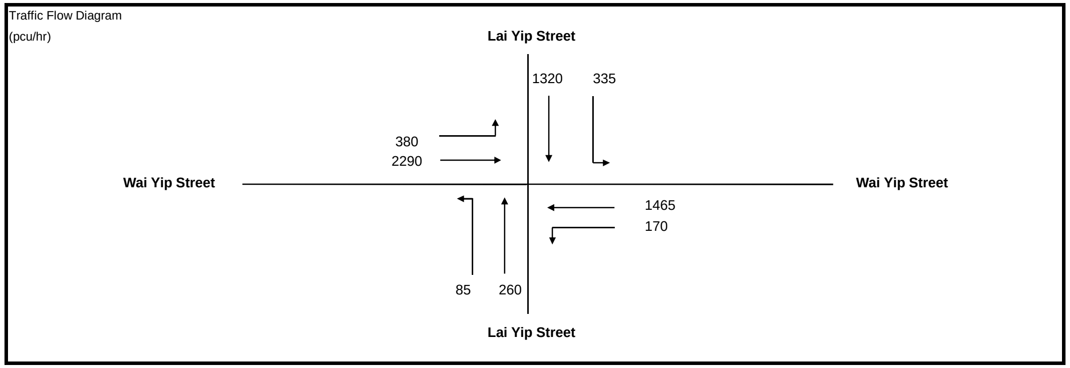
JUNCTION CAPACITY CALCULATION

AECOM

Junction J3 - Lai Yip Street / Wai Yip Street	2031 AM Design Traffic Flows (HyD NTK Interim Scheme with typical IG)	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

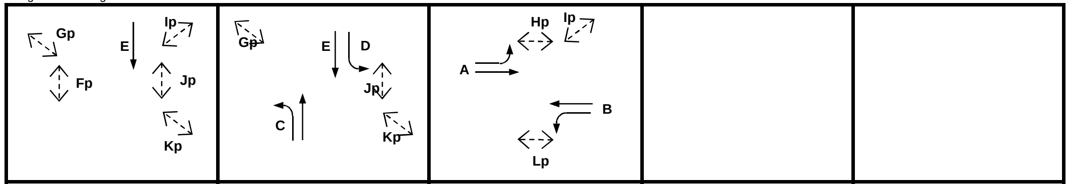
J3

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	3	
Cycle time	C =	118	sec
Sum(y)	Y =	0.750	
Lost time	L =	10	sec
Total Flow	=	6,305	pcu
Optimum Cycle C_o	= (1.5×L+5)/(1-Y) =	80	sec
Min. Cycle Time C_m	= L/(1-Y) =	40	sec
Y_{ult}	= 0.9-0.0075×L =	0.825	
$R.C._{ult}$	= (Y_{ult}-Y)/Yx100% =	9.9	%
Practical Cycle Time C_p	= 0.9×L/(0.9-Y) =	60	sec
Y_{max}	= 1-L/C =	0.915	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		
I/G =	I/G = 5	I/G = 7		

Critical Case : E,A

R.C.(C) = $(0.9xY_{max}-Y)/Yx100\%$ = 10%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	3	3.300	1	16			1		0		1945	243	547		790	31%		1890	0.418	0.418
Flared Length													137								
	A	3	3.300	2				0		0		4170		1743		1743			4170	0.418	
	C	2	3.200	1	24			1		0		1935	5	123		128	4%		1930	0.066	
Flared Length													80								
	C	2	3.200	1				0		0		2075		137		137			2075	0.066	
	B	3	3.000	1	16			1		0		1915	84	403		487	17%		1885	0.258	
Flared Length													86								
	B	3	3.000	2				0		0		4110		1062		1062			4110	0.258	
	D	2	3.000	1	16			1		0		1915	284			284	100%		1751	0.162	
Flared Length													51								
	E	1,2	3.000	2				1		0		3970		1320		1320			3970	0.332	0.332
Pedestrian Crossing				GM		FGM															
	Fp	1	min.	13	+	11	=	24	sec												
	Gp	1,2	min.	5	+	5	=	10	sec												
	Hp	3	min.	11	+	10	=	21	sec												
	Ip	1,3	min.	5	+	5	=	10	sec												
	Jp	1,2	min.	11	+	9	=	20	sec												
	Kp	1,2	min.	5	+	5	=	10	sec												
	Lp	3	min.	11	+	10	=	21	sec												

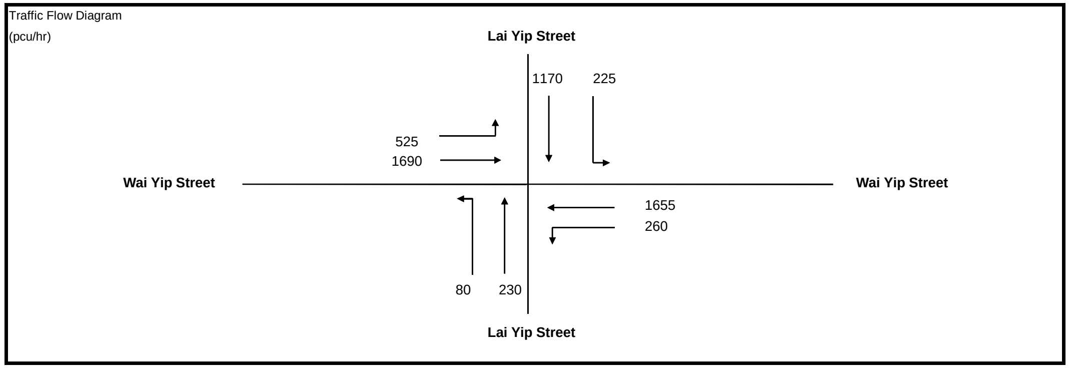
*Remarks: Flows of left-turning movements of Phase A, B, C and D are deducted by the capcity of the flared lanes.

JUNCTION CAPACITY CALCULATION

AECOM

Junction J3 - Lai Yip Street / Wai Yip Street	2031 AM Design Traffic Flows (HyD NTK Interim Scheme with typical IG)	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

Traffic Flow Diagram
(pcu/hr)



J3

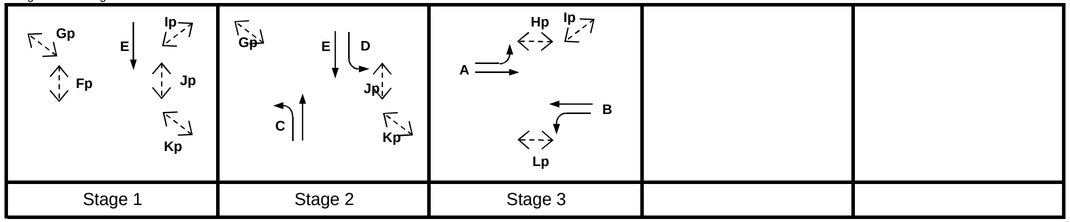
No. of stages per cycle N = 3

Cycle time C = 118 sec

Sum(y) Y = 0.601
Lost time L = 20 sec
Total Flow = 5,835 pcu

Optimum Cycle C_o = (1.5×L+5)/(1-Y) = 88 sec
Min. Cycle Time C_m = L/(1-Y) = 50 sec
Y_{ult} = 0.9-0.0075×L = 0.750
$R.C._{ult}$ = (Y_{ult}-Y)/Yx100% = 24.8 %
Practical Cycle Time C_p = 0.9×L/(0.9-Y) = 60 sec
Y_{max} = 1-L/C = 0.831

Stage/Phase Diagrams



I/G = I/G = 13 I/G = 9

Critical Case : E,B

R.C.(C) = $(0.9xY_{max}-Y)/Yx100\%$ = 24%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	3	3.300	1	16			1		0		1945	388	248		636	61%		1840	0.346	
Flared Length													137								
	A	3	3.300	2				0		0		4170		1442		1442			4170	0.346	
	C	2	3.200	1	24			1		0		1935	5	108		113	4%		1930	0.059	
Flared Length													75								
	C	2	3.200	1				0		0		2075		122		122			2075	0.059	
	B	3	3.000	1	16			1		0		1915	174	396		570	31%		1862	0.306	0.306
Flared Length													86								
	B	3	3.000	2				0		0		4110		1259		1259			4110	0.306	
	D	2	3.000	1	16			1		0		1915	174			174	100%		1751	0.099	
Flared Length													51								
	E	1,2	3.000	2				1		0		3970		1170		1170			3970	0.295	0.295
Pedestrian Crossing				GM		FGM															
	Fp	1	min.	13	+	11	=	24	sec												
	Gp	1,2	min.	5	+	5	=	10	sec												
	Hp	3	min.	11	+	10	=	21	sec												
	Ip	1,3	min.	5	+	5	=	10	sec												
	Jp	1,2	min.	11	+	9	=	20	sec												
	Kp	1,2	min.	5	+	5	=	10	sec												
	Lp	3	min.	11	+	10	=	21	sec												

*Remarks: Flows of left-turning movements of Phase A, B, C and D are deducted by the capcity of the flared lanes.

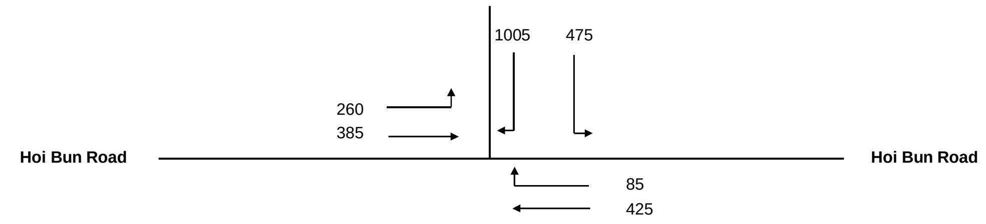
JUNCTION CAPACITY CALCULATION

AECOM

Junction J4 - Hoi Bun Road / Lai Yip Street	2031 AM Design Traffic Flows (HMS Reverse)	DESIGN: SL	CHECK: SL	JOB NO: 60493364	DATE: Feb 19

J4

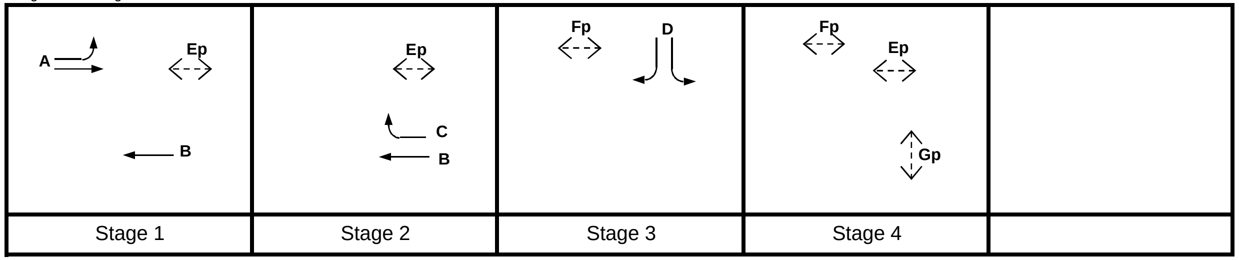
Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	4	
Cycle time	C =	118	sec
Sum(y)	Y =	0.504	
Lost time	L =	35	sec
Total Flow	=	2,635	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	116	sec
Min. Cycle Time C_m	$= L/(1-Y)$ =	71	sec
Y_{ult}	$= 0.9-0.0075\times L$ =	0.638	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times100\%$ =	26.5	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$ =	80	sec
Y_{max}	= 1-L/C =	0.703	

Stage/Phase Diagrams



I/G = 8 I/G = 5 I/G = 8 G = 7 I/G = 10

Critical Case : A,C,D,Gp

R.C.(C) $= (0.9\times Y_{max}-Y)/Y\times100\% =$ 26%

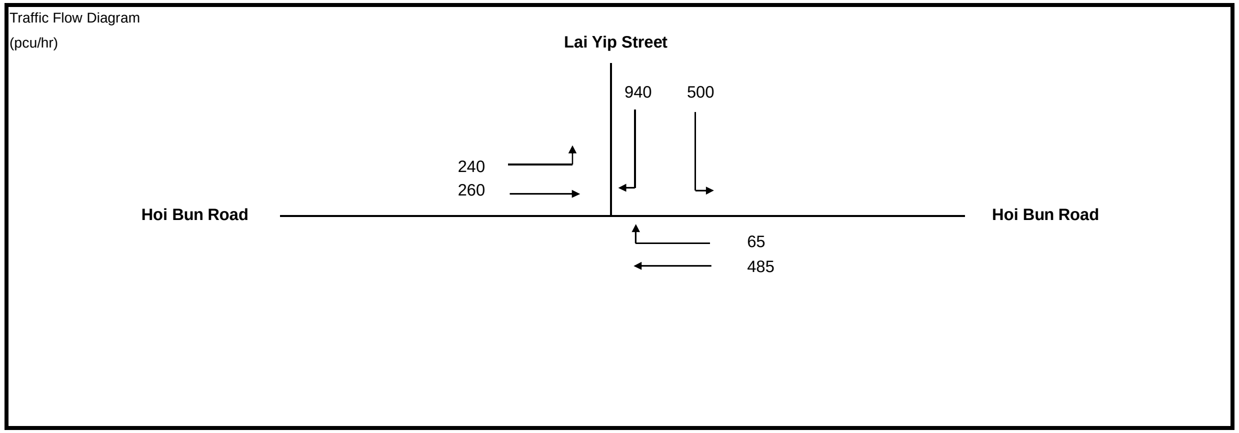
MOVEMENT	PHASE	STAGE	35	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
	A	1	3.250	1	10			1		0		1940	260			260	100%		1687	0.154	
	A	1	3.250	1				0		0		2080		385		385			2080	0.185	0.185
	B	1,2	3.000	1				1		0		1915		425		425			1915	0.222	
	C	2	3.000	1		15	0	0		0		2055			85	85		100%	1868	0.045	0.045
	D	3	3.300	1	12.5			1		0		1945	475			475	100%		1737	0.274	0.274
	D	3	3.300	2		15	0	0		0		4170			1005	1005		100%	3791	0.265	
Pedestrian Crossing				GM		FGM															
	Ep	1,2,4	min.	12	+	9	=	21	sec												
	Fp	3,4	min.	7	+	6	=	13	sec												
	Gp	4	min.	7	+	7	=	14	sec												*

JUNCTION CAPACITY CALCULATION

Junction J4 - Hoi Bun Road / Lai Yip Street	2031 PM Design Traffic Flows	DESIGN: SL	CHECK: SL	JOB NO: 60493364	DATE: Jun 19

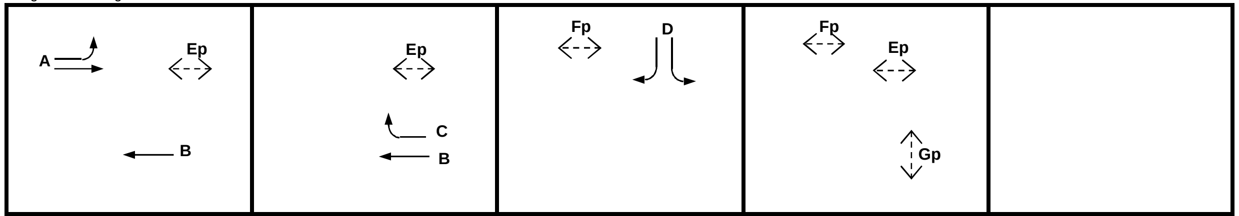
J4

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	4	
Cycle time		C =	108	sec
Sum(y)		Y =	0.541	
Lost time		L =	28	sec
Total Flow		=	2,490	pcu
Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y)$	=	102	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	61	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.690	
R.C.$_{ult}$	$= (Y_{ult}-Y)/Y \times 100\%$	=	27.5	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	70	sec
Y_{max}	$= 1-L/C$	=	0.741	

Stage/Phase Diagrams



I/G = I/G = 5 I/G = 8 G = 7 I/G = 10

Critical Case : B,D,Gp

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\%$ = 23%

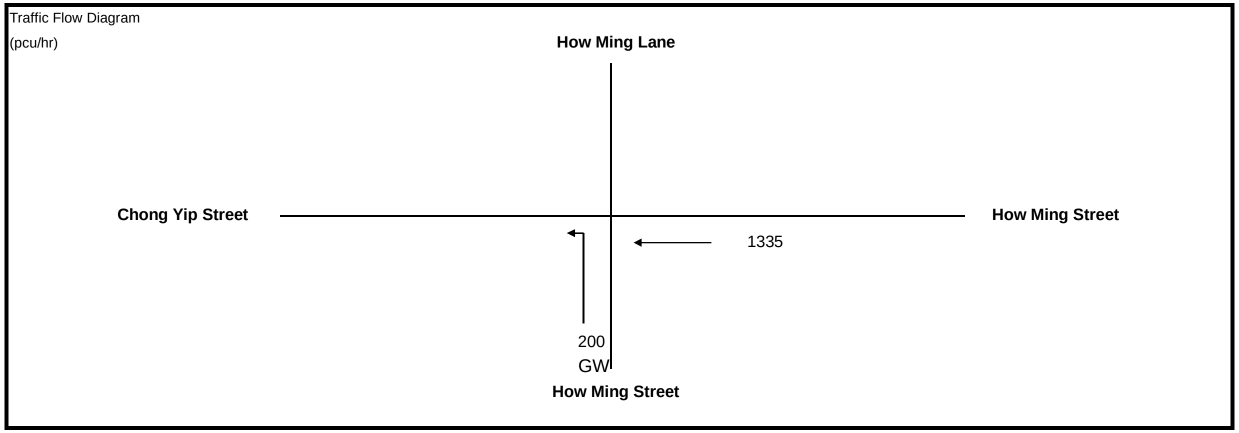
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.250	1	10			1		0		1940	240			240	100%		1687	0.142	
	A	1	3.250	1				0		0		2080		260		260			2080	0.125	
	B	1,2	3.000	1				1		0		1915		485		485			1915	0.253	0.253
	C	2	3.000	1		15	0	0		0		2055			65	65		100%	1868	0.035	
	D	3	3.300	1	12.5			1		0		1945	500			500	100%		1737	0.288	0.288
	D	3	3.300	2		15	0	0		0		4170			940	940		100%	3791	0.248	
Pedestrian Crossing				GM		FGM															
	Ep	1,2,4	min.	12	+	9	=	21	sec												
	Fp	3,4	min.	7	+	6	=	13	sec												
	Gp	4	min.	7	+	7	=	14	sec												*

JUNCTION CAPACITY CALCULATION

AECOM

Junction J5 - How Ming Street / Chong Yip Street	2031 AM Design Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jan 19

Traffic Flow Diagram
(pcu/hr)

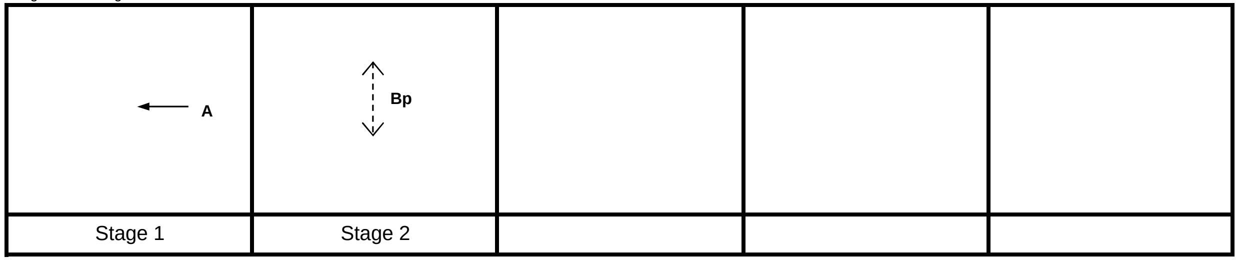


J5

No. of stages per cycle	N =	2	
Cycle time	C =	90	sec
Sum(y)	Y =	0.326	
Lost time	L =	20	sec
Total Flow	=	1,335	pcu

Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y) =$	52	sec
Min. Cycle Time C_m	$= L/(1-Y) =$	30	sec
Y_{ult}	$= 0.9-0.0075 \times L =$	0.750	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y \times 100\% =$	130.3	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y) =$	31	sec
Y_{max}	$= 1-L/C =$	0.778	

Stage/Phase Diagrams



I/G = 6 G = 5 I/G = 10

Critical Case : A,Bp

R.C.(C) $= (0.9 \times Y_{max}-Y)/Y \times 100\% =$ 115%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
←	A	1	3.650	2				1		0		4100		1335		1335			4100	0.326	0.326
Pedestrian Crossing				GM		FGM															
	Bp	2	min.	5	+	7	=	12	sec												*

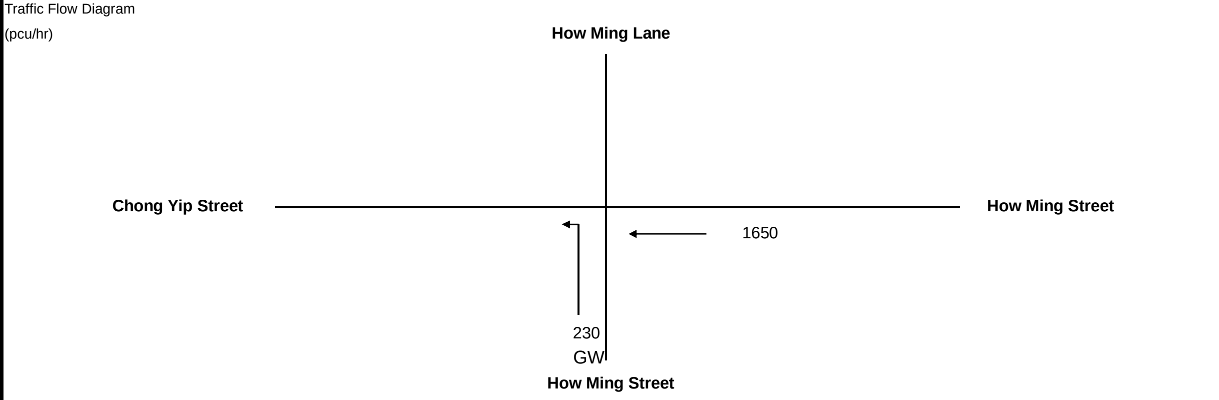
JUNCTION CAPACITY CALCULATION

AECOM

Junction J5 - How Ming Street / Chong Yip Street	2031 PM Design Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jan 19

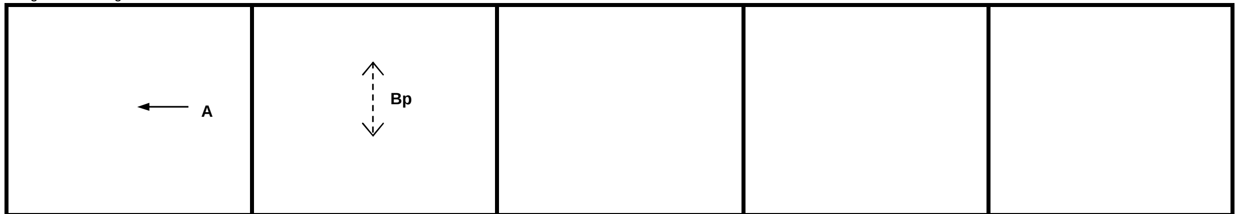
J5

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	2	
Cycle time		C =	90	sec
Sum(y)		Y =	0.402	
Lost time		L =	20	sec
Total Flow		=	1,650	pcu
Optimum Cycle C_o	= (1.5×L+5)/(1-Y)	=	59	sec
Min. Cycle Time C_m	= L/(1-Y)	=	33	sec
Y_{ult}	= 0.9-0.0075×L	=	0.750	
R.C.$_{ult}$	= (Y_{ult}-Y)/Yx100%	=	86.4	%
Practical Cycle Time C_p	= 0.9×L/(0.9-Y)	=	36	sec
Y_{max}	= 1-L/C	=	0.778	

Stage/Phase Diagrams



Stage 1	Stage 2			

I/G = 6 G = 5 I/G = 10

Critical Case : A,Bp

R.C.(C) = (0.9xY_{max}-Y)/Yx100% = 74%

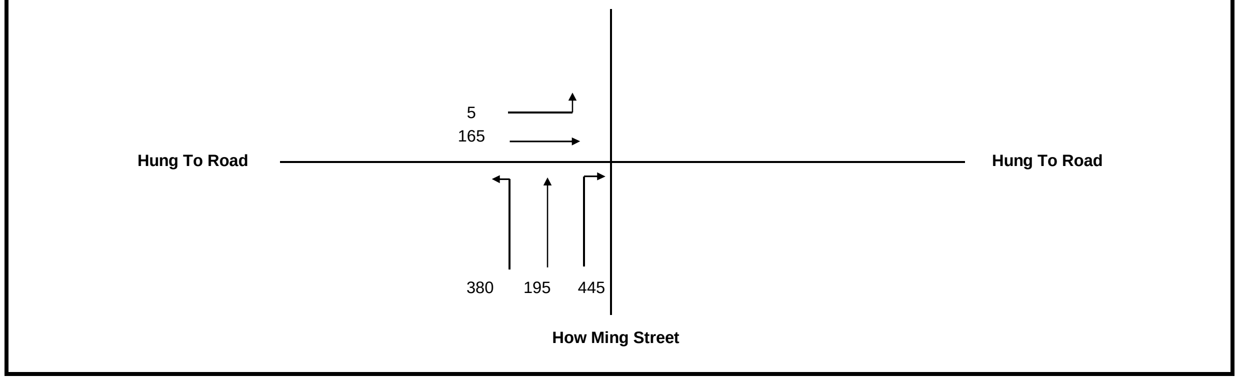
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
←	A	1	3.650	2				1		0		4100		1650		1650			4100	0.402	0.402
Pedestrian Crossing				GM		FGM															
	Bp	2	min.	5	+	7	=	12	sec												*

JUNCTION CAPACITY CALCULATION

AECOM

Junction J6 - Hung To Road / How Ming Street	2031 AM Design Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

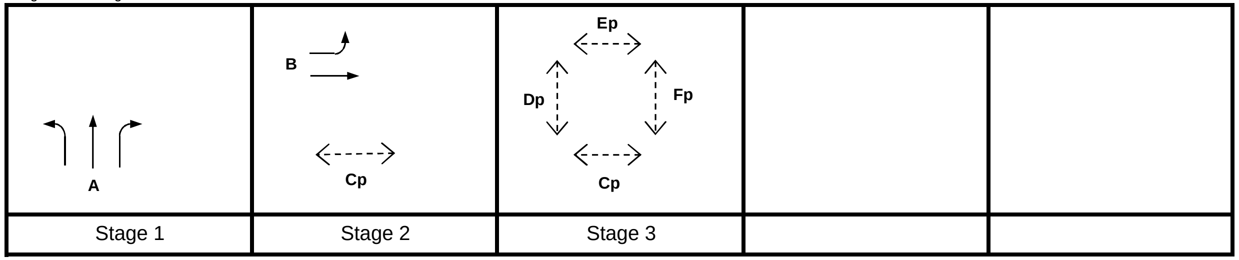
Traffic Flow Diagram
(pcu/hr)



J6

No. of stages per cycle		N =	3	
Cycle time		C =	118	sec
Sum(y)		Y =	0.435	
Lost time		L =	29	sec
Total Flow		=	1,190	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y)$	=	86	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	51	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.683	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times100\%$	=	56.7	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	56	sec
Y_{max}	$= 1-L/C$	=	0.754	

Stage/Phase Diagrams



I/G = 6 I/G = 5 G = 10 I/G = 10

Critical Case : A,B,Dp

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 56%

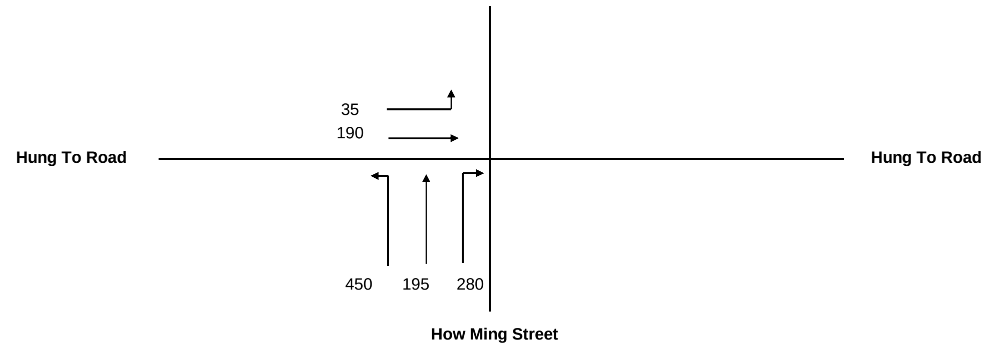
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	4.000	1	10			1		0		2015	380			380	100%		1752	0.217	
	A	1	4.000	1		10	0	1		0		2015		195	445	640		70%	1825	0.351	0.351
	B	2	4.000	1	10			1		0		2015	5	165		170	3%		2006	0.085	0.085
Pedestrian Crossing				GM		FGM															
	Cp	2,3	min.	7	+	10	=	17	sec												
	Dp	3	min.	10	+	8	=	18	sec												*
	Ep	3	min.	6	+	9	=	15	sec												
	Fp	3	min.	6	+	9	=	15	sec												

JUNCTION CAPACITY CALCULATION

AECOM

Junction J6 - Hung To Road / How Ming Street	2031 PM Design Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

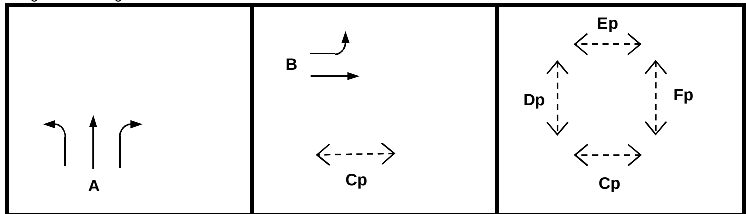
Traffic Flow Diagram
(pcu/hr)



J6

No. of stages per cycle		N =	3	
Cycle time		C =	108	sec
Sum(y)		Y =	0.371	
Lost time		L =	29	sec
Total Flow		=	1,150	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y)$	=	77	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	46	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.683	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times 100\%$	=	83.9	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	49	sec
Y_{max}	$= 1-L/C$	=	0.731	

Stage/Phase Diagrams



I/G = 6 I/G = 5 G = 10 I/G = 10

Critical Case : A,B,Dp

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 77%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	4.000	1	10			1		0		2015	450			450	100%		1752	0.257	0.257
	A	1	4.000	1		10	0	1		0		2015		195	280	475		59%	1851	0.257	
	B	2	4.000	1	10			1		0		2015	35	190		225	16%		1969	0.114	0.114
Pedestrian Crossing				GM		FGM															
	Cp	2,3	min.	7	+	10	=	17	sec												
	Dp	3	min.	10	+	8	=	18	sec												*
	Ep	3	min.	6	+	9	=	15	sec												
	Fp	3	min.	6	+	9	=	15	sec												

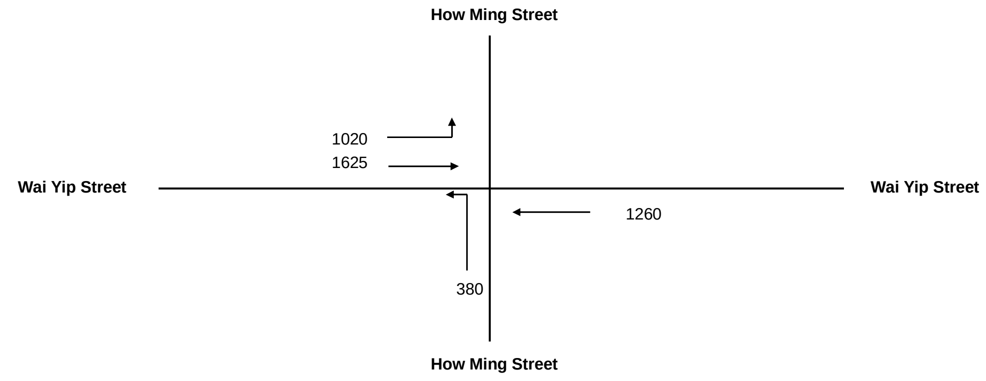
JUNCTION CAPACITY CALCULATION

AECOM

Junction J7 - Wai Yip Street / How Ming Street	2031 AM Design Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: -	DATE: Jun 19

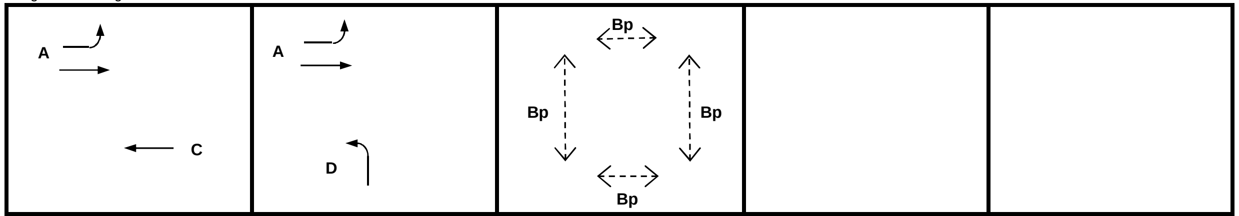
J7

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	3
Cycle time		C =	118 sec
Sum(y)		Y =	0.586
Lost time		L =	30 sec
Total Flow		=	4,285 pcu
Optimum Cycle C_o	= (1.5×L+5)/(1-Y) =		121 sec
Min. Cycle Time C_m	= L/(1-Y)	=	72 sec
Y_{ult}	= 0.9-0.0075×L	=	0.675
$R.C._{ult}$	= $(Y_{ult}$-Y)/Yx100%	=	15.2 %
Practical Cycle Time C_p	= 0.9×L/(0.9-Y)	=	86 sec
Y_{max}	= 1-L/C	=	0.746

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G = I/G = 8 G = 8 I/G = 15

Critical Case : A,Bp

R.C.(C) = $(0.9xY_{max}$-Y)/Yx100% = 15%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1,2	3.000	1	15			1		0		1915	1020	0		1020	100%		1741	0.586	0.586
	A	1,2	3.000	2				0		0		4110		1625		1625			4110	0.395	
	C	1	3.000	3				1		0		6025		1260		1260			6025	0.209	
	D	2	3.500	1	15			1		0		1965	380			380	100%		1786	0.213	
Pedestrian Crossing				GM		FGM															
	Bp	3	min.	8	+	11	=	19	sec												*

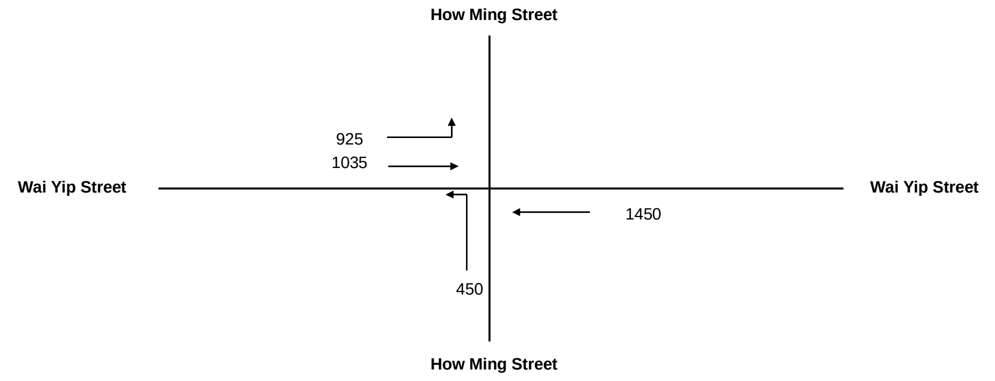
JUNCTION CAPACITY CALCULATION

AECOM

Junction J7 - Wai Yip Street / How Ming Street	2031 PM Design Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: -	DATE: Jul 19

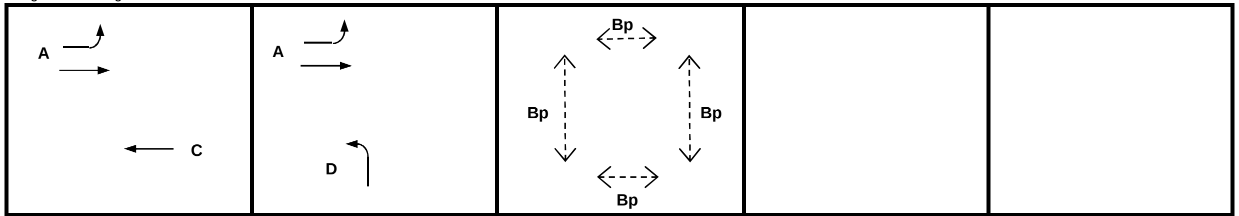
J7

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	3	
Cycle time		C =	118	sec
Sum(y)		Y =	0.493	
Lost time		L =	37	sec
Total Flow		=	3,860	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y)$	=	119	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	73	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.623	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times 100\%$	=	26.4	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	82	sec
Y_{max}	$= 1-L/C$	=	0.686	

Stage/Phase Diagrams



I/G = 8 I/G = 8 G = 8 I/G = 15

Critical Case : C,D,Bp

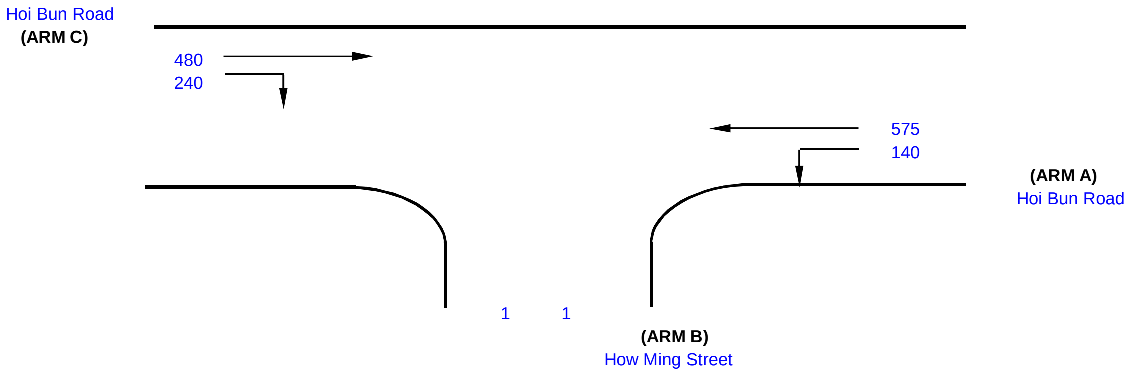
R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 25%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1,2	3.000	1	15			1		0		1915	925	0		925	100%		1741	0.531	
	A	1,2	3.000	2				0		0		4110		1035		1035			4110	0.252	
	C	1	3.000	3				1		0		6025		1450		1450			6025	0.241	0.241
	D	2	3.500	1	15			1		0		1965	450			450	100%		1786	0.252	0.252
Pedestrian Crossing				GM		FGM															
	Bp	3	min.	8	+	11	=	19	sec												*

PRIORITY JUNCTION CAPACITY CALCULATION

AECOM

Junction J8 - Hoi Bun Road / How Ming Street	2031 AM Design Traffic Flows	Designed By : SL	Checked By : DW	Job No. : 60493364	Date : Oct 19



J8

NOTES : (GEOMETRIC INPUT DATA)

W	= Major Road Width (6.4 - 20.0)
W cr	= Central Reserve width (1.2 - 9.0, kerbed central reserve only)
W b-a	= Lane width available to vehicle waiting in stream b-a (2.05 - 4.70)
W b-c	= Lane width available to vehicle waiting in stream b-c (2.05 - 4.70)
W c-b	= Lane width available to vehicle waiting in stream c-b (2.05 - 4.70)
Vl b-a	= Visibility to the left for vehicles waiting in stream b-a (22.0 - 250.0)
Vr b-a	= Visibility to the right for vehicles waiting in stream b-a (17.0 - 250.0)
Vr b-c	= Visibilitu to the right for vehicles waiting in stream b-c (17.0 - 250.0)
Vr c-b	= Visibility to the right for vehicles waiting in stream c-b (17.0 - 250.0)
D	= Stream-specific B-A
E	= Stream-specific B-C
F	= Stream-specific C-B
Y	= (1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)			*MAJOR ROAD (ARM C)*			*MINOR ROAD (ARM B)*		
W	=	5.75 (metres)	W c-b	=	(metres)	W b-a	=	3.15 (metres)
W cr	=	0.85 (metres)	Vr c-b	=	(metres)	W b-c	=	3.65 (metres)
q a-b	=	140 (pcu/hr)	q c-a	=	480 (pcu/hr)	Vl b-a	=	74 (metres)
q a-c	=	575 (pcu/hr)	q c-b	=	240 (pcu/hr)	Vr b-a	=	62 (metres)
						Vr b-c	=	97 (metres)
						q b-a	=	1 (pcu/hr)
						q b-c	=	1 (pcu/hr)

GEOMETRIC FACTORS :

D	=	0.862065
E	=	0.979300
F	=	0.585955
Y	=	0.801625

`

THE CAPACITY OF MOVEMENT :

Q b-a	=	230
Q b-c	=	549
Q c-b	=	314
Q b-ac	=	324

CRITICAL DFC = 0.76

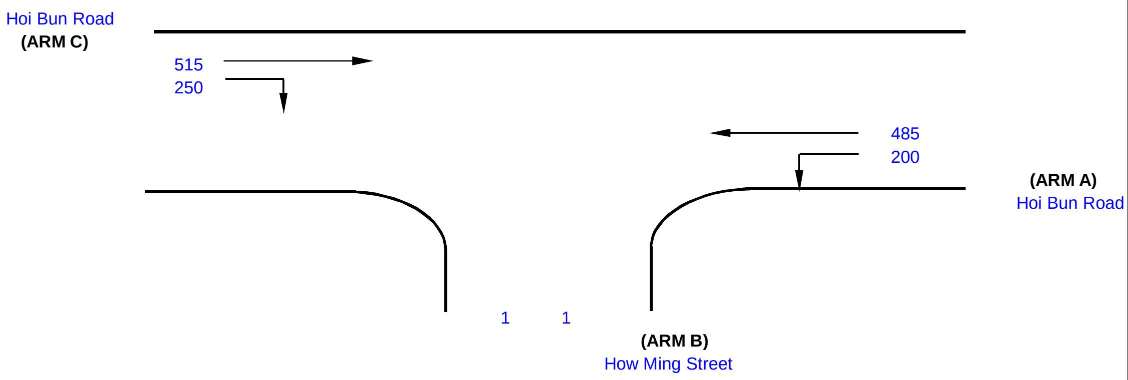
COMPARISION OF DESIGN FLOW TO CAPACITY :

DFC b-a	=	0.00
DFC b-c	=	0.00
DFC c-b	=	0.76
DFC b-ac	=	0.01

PRIORITY JUNCTION CAPACITY CALCULATION

AECOM

Junction J8 - Hoi Bun Road / How Ming Street	2031 PM Design Traffic Flows	Designed By : SL	Checked By : DW	Job No. : 60493364	Date : Oct 19



J8

NOTES : (GEOMETRIC INPUT DATA)

W	= Major Road Width (6.4 - 20.0)
W cr	= Central Reserve width (1.2 - 9.0, kerbed central reserve only)
W b-a	= Lane width available to vehicle waiting in stream b-a (2.05 - 4.70)
W b-c	= Lane width available to vehicle waiting in stream b-c (2.05 - 4.70)
W c-b	= Lane width available to vehicle waiting in stream c-b (2.05 - 4.70)
Vl b-a	= Visibility to the left for vehicles waiting in stream b-a (22.0 - 250.0)
Vr b-a	= Visibility to the right for vehicles waiting in stream b-a (17.0 - 250.0)
Vr b-c	= Visibilitu to the right for vehicles waiting in stream b-c (17.0 - 250.0)
Vr c-b	= Visibility to the right for vehicles waiting in stream c-b (17.0 - 250.0)
D	= Stream-specific B-A
E	= Stream-specific B-C
F	= Stream-specific C-B
Y	= (1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)			*MAJOR ROAD (ARM C)*			*MINOR ROAD (ARM B)*		
W	=	5.75 (metres)	W c-b	=	(metres)	W b-a	=	3.15 (metres)
W cr	=	0.85 (metres)	Vr c-b	=	(metres)	W b-c	=	3.65 (metres)
q a-b	=	200 (pcu/hr)	q c-a	=	515 (pcu/hr)	Vl b-a	=	74 (metres)
q a-c	=	485 (pcu/hr)	q c-b	=	250 (pcu/hr)	Vr b-a	=	62 (metres)
						Vr b-c	=	97 (metres)
						q b-a	=	1 (pcu/hr)
						q b-c	=	1 (pcu/hr)

GEOMETRIC FACTORS :

D	=	0.862065
E	=	0.979300
F	=	0.585955
Y	=	0.801625

`

THE CAPACITY OF MOVEMENT :

Q b-a	=	238
Q b-c	=	568
Q c-b	=	319
Q b-ac	=	335

CRITICAL DFC = 0.78

COMPARISION OF DESIGN FLOW TO CAPACITY :

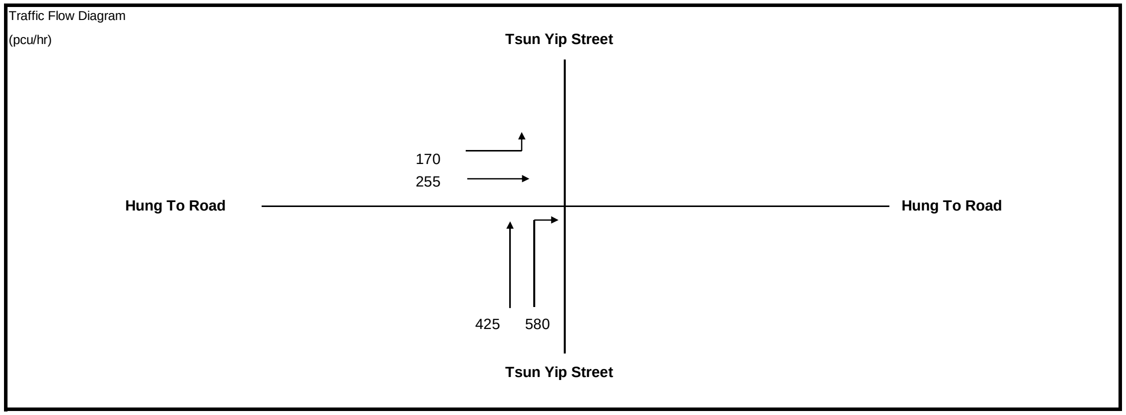
DFC b-a	=	0.00
DFC b-c	=	0.00
DFC c-b	=	0.78
DFC b-ac	=	0.01

JUNCTION CAPACITY CALCULATION

AECOM

Junction J9 - Hung To Road / Tsun Yip Street	2031 AM Design Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: May 20

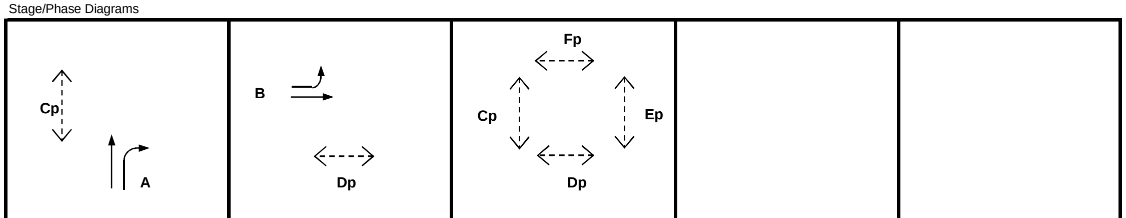
Traffic Flow Diagram
(pcu/hr)



J9

No. of stages per cycle	N =	3	
Cycle time	C =	118	sec
Sum(y)	Y =	0.462	
Lost time	L =	27	sec
Total Flow	=	1,430	pcu
Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y) =$	85	sec
Min. Cycle Time C_m	$= L/(1-Y) =$	50	sec
Y_{ult}	$= 0.9-0.0075 \times L =$	0.698	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y \times 100\% =$	51.0	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y) =$	55	sec
Y_{max}	$= 1-L/C =$	0.771	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G = 5 I/G = 8 G = 7 I/G = 9

Critical Case : A,B,Ep

R.C.(C) $= (0.9 \times Y_{max}-Y)/Y \times 100\% =$ 50%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	B	2	3.300	1	11			1		0		1945	170			170	100%		1712	0.099	
	B	2	3.300	1				1		0		1945		255		255			1945	0.131	0.131
	A	1	3.400	1				1		0		1955		425		425			1955	0.217	
	A	1	3.400	1		13	0	1		0		1955			580	580		100%	1753	0.331	0.331
Pedestrian Crossing				GM		FGM															
	Cp	1,3	min.	6	+	6	=	12	sec												
	Dp	2,3	min.	9	+	9	=	18	sec												
	Ep	3	min.	7	+	7	=	14	sec												*
	Fp	3	min.	7	+	7	=	14	sec												

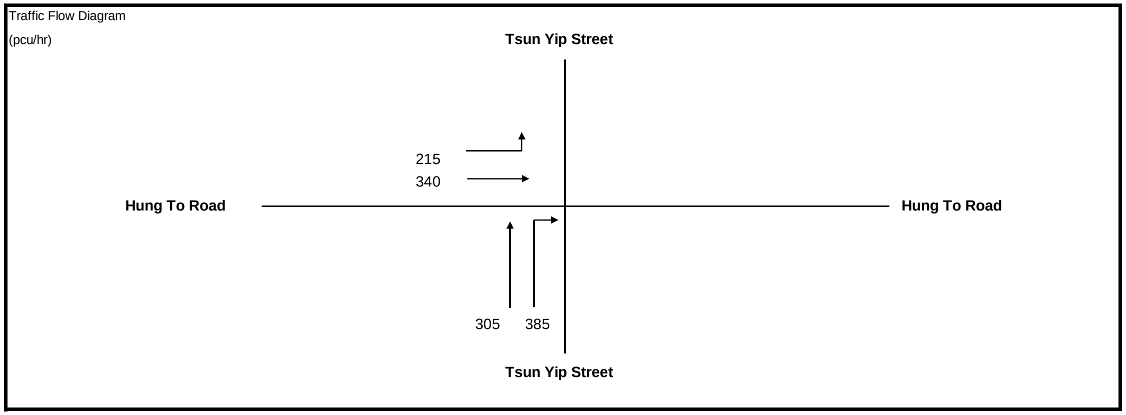
JUNCTION CAPACITY CALCULATION

AECOM

Junction J9 - Hung To Road / Tsun Yip Street	2031 PM Design Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

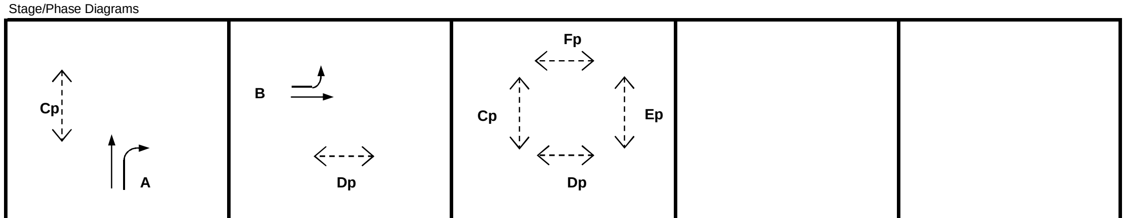
J9

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	3	
Cycle time	C =	118	sec
Sum(y)	Y =	0.394	
Lost time	L =	27	sec
Total Flow	=	1,245	pcu
Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y) =$	75	sec
Min. Cycle Time C_m	$= L/(1-Y)$ =	45	sec
Y_{ult}	$= 0.9-0.0075 \times L$ =	0.698	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y \times 100\%$ =	76.8	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$ =	48	sec
Y_{max}	= 1-L/C =	0.771	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G = 5 I/G = 8 G = 7 I/G = 9

Critical Case : A,B,Ep

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\%$ = 76%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	B	2	3.300	1	11			1		0		1945	215			215	100%		1712	0.126	
	B	2	3.300	1				1		0		1945		340		340			1945	0.175	0.175
	A	1	3.400	1				1		0		1955		305		305			1955	0.156	
	A	1	3.400	1		13	0	1		0		1955			385	385		100%	1753	0.220	0.220
Pedestrian Crossing				GM		FGM															
	Cp	1,3	min.	6	+	6	=	12	sec												
	Dp	2,3	min.	9	+	9	=	18	sec												
	Ep	3	min.	7	+	7	=	14	sec												*
	Fp	3	min.	7	+	7	=	14	sec												

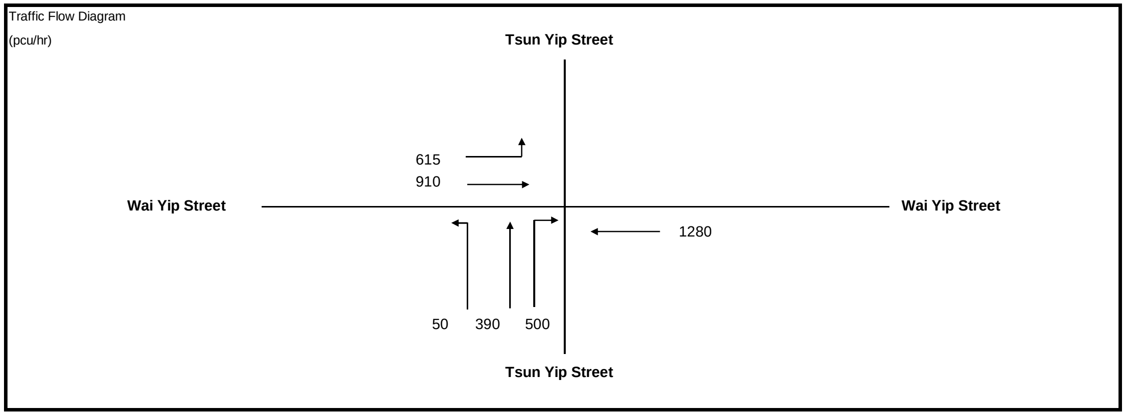
JUNCTION CAPACITY CALCULATION

AECOM

Junction J10 - Wai Yip Street / Tsun Yip Street	2031 AM Design Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Mar 20

J10

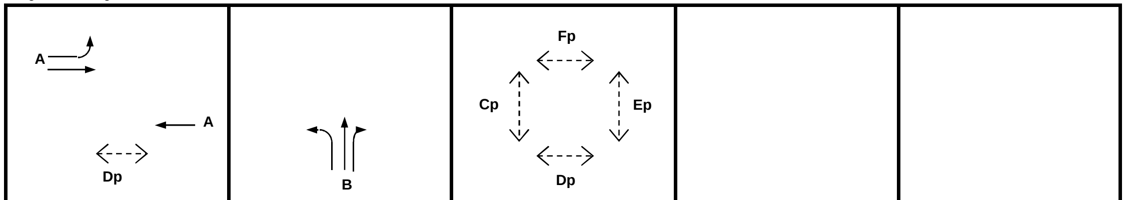
Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	3	
Cycle time	C =	118	sec
Sum(y)	Y =	0.433	
Lost time	L =	39	sec
Total Flow	=	3,745	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	112	sec
Min. Cycle Time C_m	$= L/(1-Y)$ =	69	sec
Y_{ult}	$= 0.9-0.0075\times L$ =	0.608	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times 100\%$ =	40.4	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$ =	75	sec
Y_{max}	= 1-L/C =	0.669	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G = 7 I/G = 8 G = 12 I/G = 14

Critical Case : A,B,Fp

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 39%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.000	1	10			1		0		1915	444			444	100%		1665	0.267	0.267
	A	1	3.000	1	17.5					0		2055	171	362		533	32%		2000	0.267	
	A	1	3.000	1				0		0		2055		548		548			2055	0.267	
	A	1	3.000	3				1		0		6025		1280		1280			6025	0.212	
	B	2	3.300	1	12.5			1		0		1945	50	267		317	16%		1909	0.166	
	B	2	3.300	1		18	0			0		2085		123	206	329		63%	1982	0.166	0.166
	B	2	3.300	1		15	0	1		0		1945			294	294		100%	1768	0.166	
Pedestrian Crossing				GM		FGM															
	Cp	3	min.	9	+	8	=	17	sec												
	Dp	1,3	min.	14	+	14	=	28	sec												
	Ep	3	min.	9	+	8	=	17	sec												
	Fp	3	min.	12	+	12	=	24	sec												*

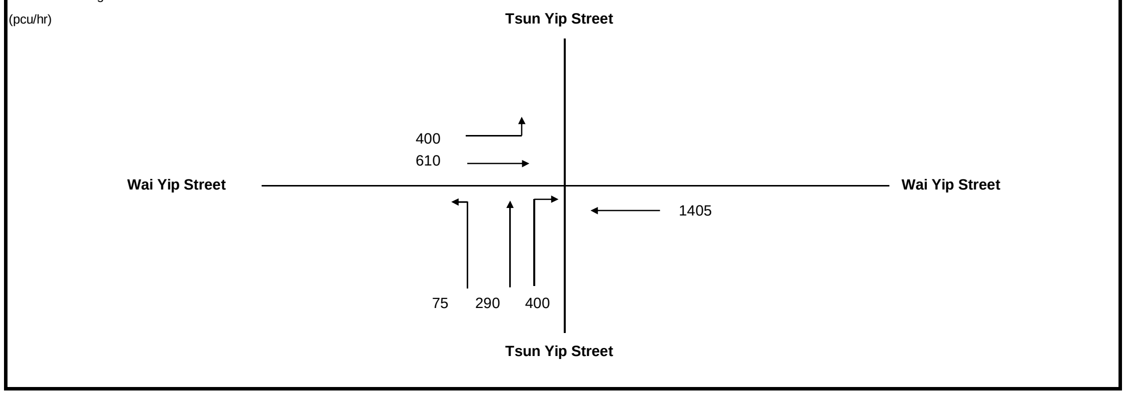
JUNCTION CAPACITY CALCULATION

AECOM

Junction J10 - Wai Yip Street / Tsun Yip Street	2031 PM Design Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

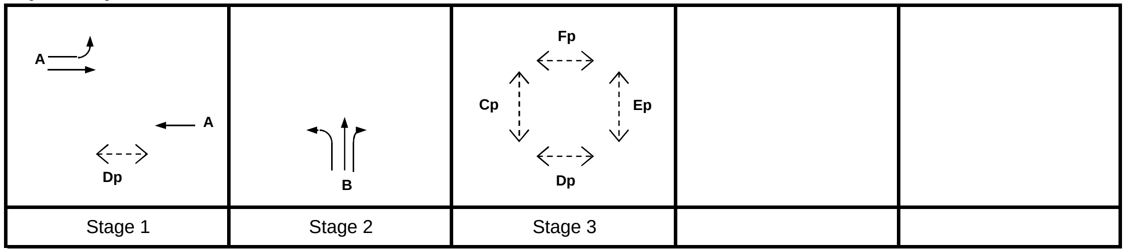
J10

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	3	
Cycle time	C =	108	sec
Sum(y)	Y =	0.369	
Lost time	L =	39	sec
Total Flow	=	3,180	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	101	sec
Min. Cycle Time C_m	$= L/(1-Y) =$	62	sec
Y_{ult}	$= 0.9-0.0075\times L =$	0.608	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times 100\% =$	64.6	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y) =$	66	sec
Y_{max}	$= 1-L/C =$	0.639	

Stage/Phase Diagrams



I/G = 7 I/G = 8 G = 12 I/G = 14

Critical Case : A,B,Fp

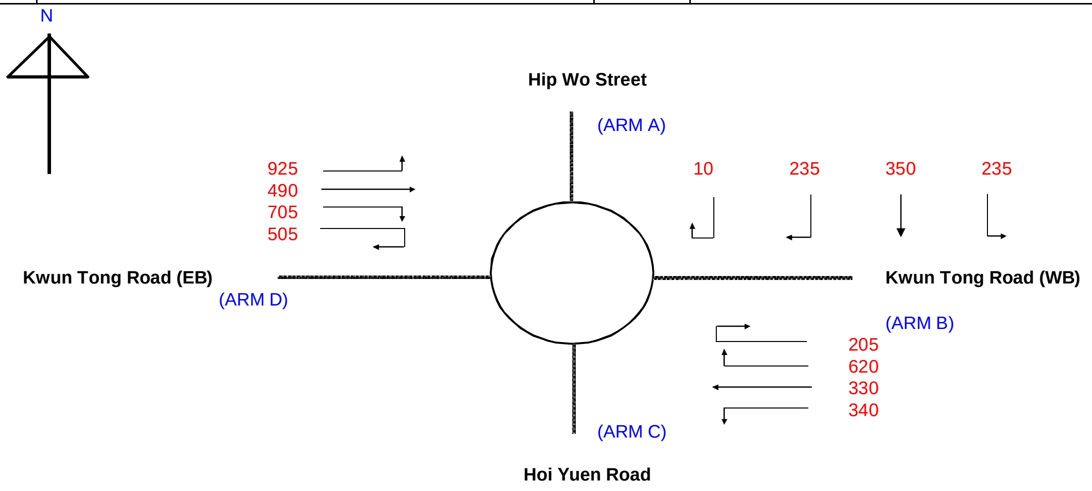
R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 56%

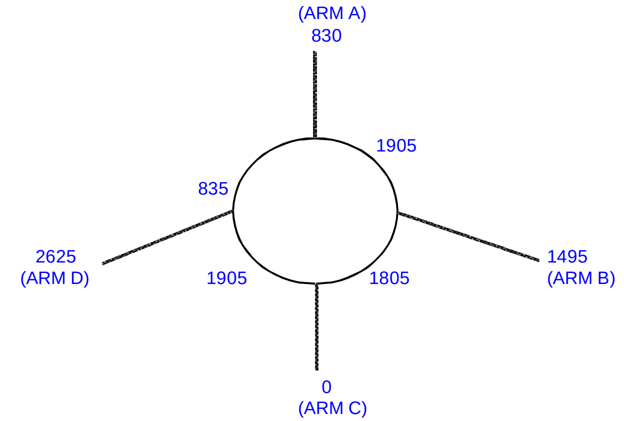
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.000	1	10			1		0		1915	294			294	100%		1665	0.176	
	A	1	3.000	1	17.5					0		2055	106	247		354	30%		2003	0.176	
	A	1	3.000	1				0		0		2055		363		363			2055	0.176	
	A	1	3.000	3				1		0		6025		1405		1405			6025	0.233	0.233
	B	2	3.300	1	12.5			1		0		1945	75	180		255	29%		1879	0.136	0.136
	B	2	3.300	1		18	0			0		2085		110	160	270		59%	1987	0.136	
	B	2	3.300	1		15	0	1		0		1945			240	240		100%	1768	0.136	
Pedestrian Crossing				GM		FGM															
	Cp	3	min.	9	+	8	=	17	sec												
	Dp	1,3	min.	14	+	14	=	28	sec												
	Ep	3	min.	9	+	8	=	17	sec												
	Fp	3	min.	12	+	12	=	24	sec												*

ROUNDABOUT CAPACITY CALCULATION

AECOM

Junction	J11 Kwung Tong Road / Hip Wo Street	Scenario	2031 AM Design Traffic Flows	Project No.	Prepared By	Checked By	Date
				60493364	SL	DW	29/Oct/19





ARM	A	B	C	D
INPUT PARAMETERS:				
V = Approach half width (m)	7.00	7.00	8.00	8.00
E = Entry width (m)	8.00	7.30	9.00	9.00
L = Effective length of flare (m)	10.00	15.00	20.00	20.00
R = Entry radius (m)	100.00	45.00	40.00	40.00
D = Inscribed circle diameter (m)	83.00	86.00	83.00	86.00
A = Entry angle (degree)	30.00	40.00	25.00	25.00
Q = Entry flow (pcu/h)	830	1495	0	2625
Qc= Circulating flow across entry (pcu/h)	1905	1805	1905	835
OUTPUT PARAMETERS:				
S = Sharpness of flare = 1.6(E-V)/L	0.16	0.03	0.08	0.08
K = 1-0.00347(A-30)-0.978(1/R-0.05)	1.04	0.99	1.04	1.04
X2= V + ((E-V)/(1+2S))	7.76	7.28	8.86	8.86
M = EXP((D-60)/10)	9.97	13.46	9.97	13.46
F = 303*X2	2351	2206	2685	2685
Td= 1+(0.5/(1+M))	1.05	1.03	1.05	1.03
Fc= 0.21*Td(1+0.2*X2)	0.56	0.53	0.61	0.60
Qe= K(F-Fc*Qc)	1334	1234	1589	2273
DFC = Design flow/Capacity = Q/Qe	0.62	1.21	0.00	1.15

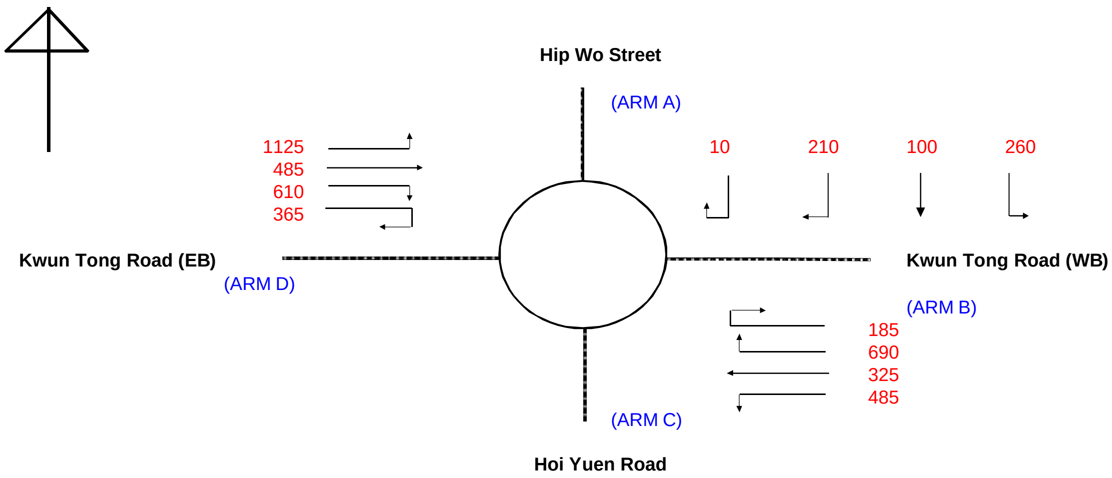
TOTAL ENTRY FLOWS = 4950 PCU

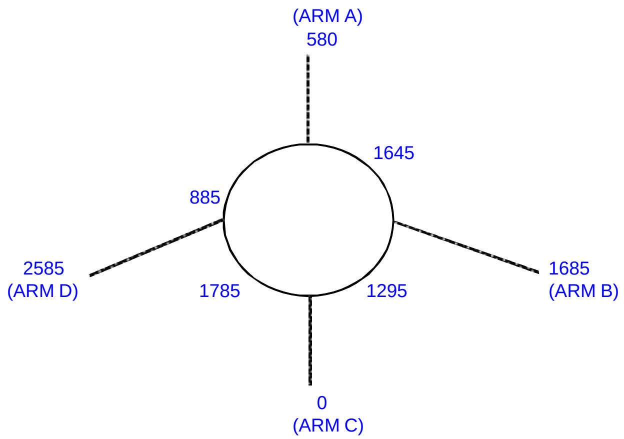
CRITICAL DFC = 1.21

Filename : C:\old d drive data\Since\60493364 KTTA\20190703 Junction Calculation\[J11RA

ROUNDABOUT CAPACITY CALCULATION

Junction	J11 Kwung Tong Road / Hip Wo Street	Scenario	2031 PM Design Traffic Flows	Project No.	Prepared By	Checked By	Date
				60493364	SL	DW	29/Oct/19





ARM	A	B	C	D
INPUT PARAMETERS:				
V = Approach half width (m)	7.00	7.00	8.00	8.00
E = Entry width (m)	8.00	7.30	9.00	9.00
L = Effective length of flare (m)	10.00	15.00	20.00	20.00
R = Entry radius (m)	100.00	45.00	40.00	40.00
D = Inscribed circle diameter (m)	83.00	86.00	83.00	86.00
A = Entry angle (degree)	30.00	40.00	25.00	25.00
Q = Entry flow (pcu/h)	580	1685	0	2585
Qc= Circulating flow across entry (pcu/h)	1645	1295	1785	885
OUTPUT PARAMETERS:				
S = Sharpness of flare = 1.6(E-V)/L	0.16	0.03	0.08	0.08
K = 1-0.00347(A-30)-0.978(1/R-0.05)	1.04	0.99	1.04	1.04
X2= V + ((E-V)/(1+2S))	7.76	7.28	8.86	8.86
M = EXP((D-60)/10)	9.97	13.46	9.97	13.46
F = 303*X2	2351	2206	2685	2685
Td= 1+(0.5/(1+M))	1.05	1.03	1.05	1.03
Fc= 0.21*Td(1+0.2*X2)	0.56	0.53	0.61	0.60
Qe= K(F-Fc*Qc)	1485	1504	1665	2242
DFC = Design flow/Capacity = Q/Qe	0.39	1.12	0.00	1.15

TOTAL ENTRY FLOWS = 4850 PCU

CRITICAL DFC = 1.15

Filename : C:\old d drive data\Since\60493364 KTTA\20190703 Junction Calculation\[J11RA -

JUNCTION CAPACITY CALCULATION

AECOM

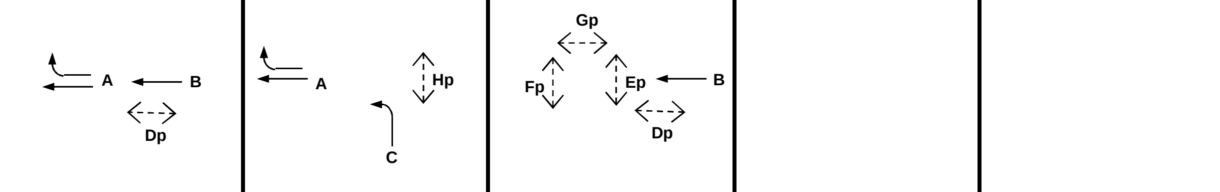
Junction J12 - Hoi Yuen Road / How Ming Street / Shing Yip Street	2031 AM Design Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

Traffic Flow Diagram
(pcu/hr)

J12

No. of stages per cycle	N =	3	
Cycle time	C =	100	sec
Sum(y)	Y =	0.550	
Lost time	L =	28	sec
Total Flow	=	4,240	pcu
Optimum Cycle C_o	= (1.5×L+5)/(1-Y) =	105	sec
Min. Cycle Time C_m	= L/(1-Y) =	62	sec
Y_{ult}	= 0.9-0.0075×L =	0.690	
R.C.$_{ult}$	= (Y_{ult}-Y)/Yx100% =	25.4	%
Practical Cycle Time C_p	= 0.9×L/(0.9-Y) =	72	sec
Y_{max}	= 1-L/C =	0.720	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G = I/G = 7 G = 8 I/G = 14

Critical Case : A,Fp

R.C.(C) = (0.9xY_{max}-Y)/Yx100% = 18%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1,2	4.000	1				1		0		2015		1109		1109			2015	0.550	0.550
	A	1,2	4.000	1		10	0	1		0		2015		356	655	1011		65%	1837	0.550	
	B	1,3	4.000	2				1		0		4170		1395		1395			4170	0.335	
	C	2	3.000	3	8			1		0		6025	725			725	100%		5074	0.143	
Pedestrian Crossing				GM		FGM															
	Dp	1,3	min.	8	+	9	=	17	sec												
	Ep	3	min.	8	+	13	=	21	sec												
	Fp	3	min.	8	+	11	=	19	sec												*
	Gp	3	min.	8	+	8	=	16	sec												
	Hp	2	min.	8	+	10	=	18	sec												

*Remark: Due to kerbside activities, there are only 2 lanes for Hoi Yuen Road westbound traffic.

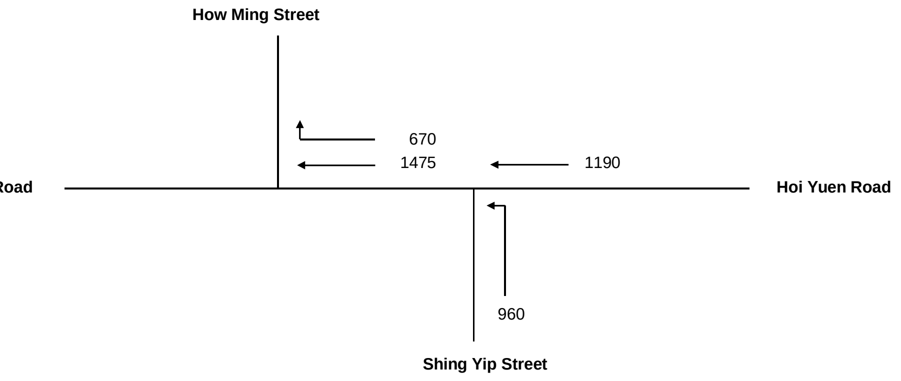
JUNCTION CAPACITY CALCULATION

AECOM

Junction J12 - Hoi Yuen Road / How Ming Street / Shing Yip Street	2031 PM Design Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

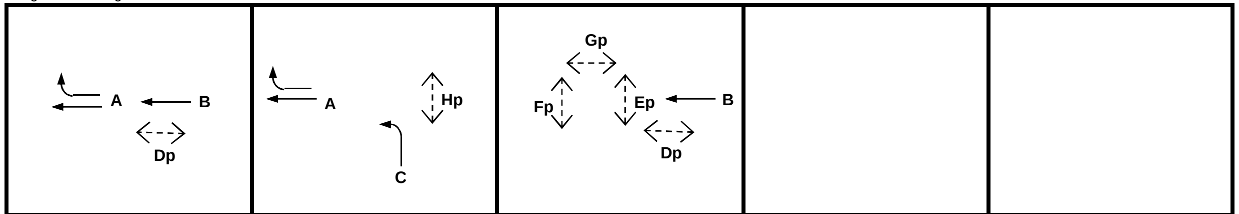
J12

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	3	
Cycle time		C =	90	sec
Sum(y)		Y =	0.557	
Lost time		L =	28	sec
Total Flow		=	4,295	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y)$	=	106	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	63	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.690	
R.C.$_{ult}$	$= (Y_{ult}-Y)/Y\times100\%$	=	23.8	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	74	sec
Y_{max}	$= 1-L/C$	=	0.689	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G = I/G = 7 G = 8 I/G = 14

Critical Case : A,Fp

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 11%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1,2	4.000	1				1		0		2015		1123		1123			2015	0.557	0.557
	A	1,2	4.000	1		10	0	1		0		2015		352	670	1022		66%	1835	0.557	
	B	1,3	4.000	2				1		0		4170		1190		1190			4170	0.285	
	C	2	3.000	3	8			1		0		6025	960			960	100%		5074	0.189	
Pedestrian Crossing				GM		FGM															
	Dp	1,3	min.	8	+	9	=	17	sec												
	Ep	3	min.	8	+	13	=	21	sec												
	Fp	3	min.	8	+	11	=	19	sec												*
	Gp	3	min.	8	+	8	=	16	sec												
	Hp	2	min.	8	+	10	=	18	sec												

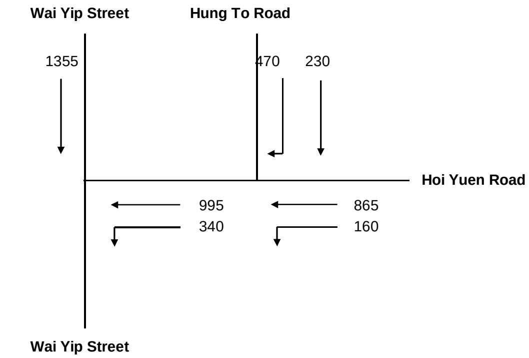
*Remark: Due to kerbside activities, there are only 2 lanes for Hoi Yuen Road westbound traffic.

JUNCTION CAPACITY CALCULATION

AECOM

Junction J13 - Wai Yip Street / Hoi Yuen Road / Hung To Road	2031 AM Design Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Mar 20

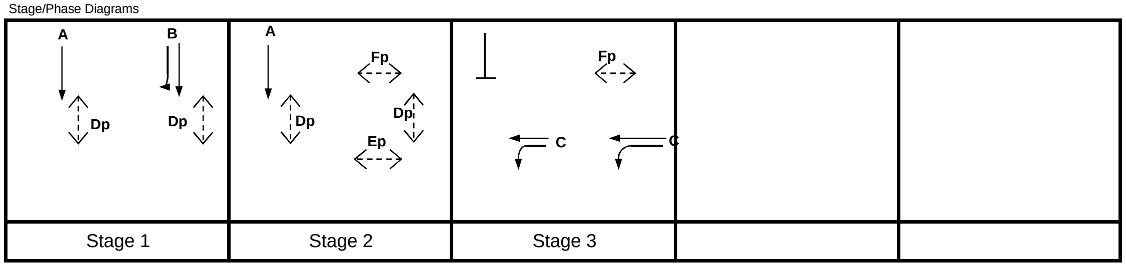
Traffic Flow Diagram
(pcu/hr)



J13

No. of stages per cycle	N =	3	
Cycle time	C =	100	sec
Sum(y)	Y =	0.435	
Lost time	L =	29	sec
Total Flow	=	4,415	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	86	sec
Min. Cycle Time C_m	$= L/(1-Y)$ =	51	sec
Y_{ult}	$= 0.9-0.0075\times L$ =	0.683	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times 100\%$ =	56.8	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$ =	56	sec
Y_{max}	= 1-L/C =	0.710	

Stage/Phase Diagrams



I/G = 8 G = 5 I/G = 12 I/G = 6

Critical Case : B,Ep,C

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 47%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1,2	4.000	3				1		0		6325		1355		1355			6325	0.214	
	B	1	3.500	1		12	0	1		0		1965		230	129	359		36%	1881	0.191	
	B	1	3.500	1		15	0	1		0		1965			341	341		100%	1786	0.191	0.191
	C	3	3.500	1	8			1		0		1965	160	154		314	51%		1793	0.175	
	C	3	3.500	2				1		0		4070		711		711			4070	0.175	
	C	3	3.500	1	30			1		0		1965	340			340	100%		1871	0.182	
	C	3	3.500	1	32					0		2105	0	515		515	0%		2105	0.244	0.244
	C	3	3.500	1				1		0		1965		480		480			1965	0.244	
Pedestrian Crossing				GM		FGM															
	Dp	1,2	min.	5	+	12	=	17	sec												
	Ep	2	min.	5	+	9	=	14	sec												*
	Fp	2,3	min.	5	+	11	=	16	sec												

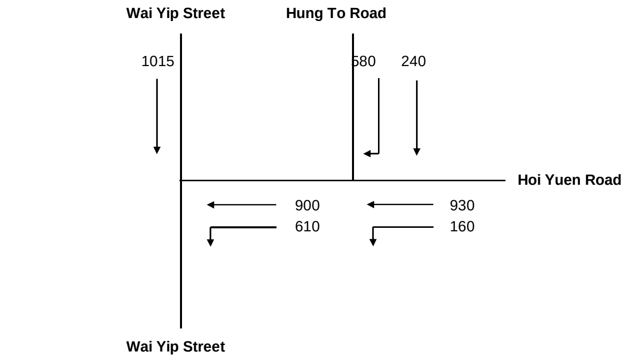
JUNCTION CAPACITY CALCULATION

AECOM

Junction J13 - Wai Yip Street / Hoi Yuen Road / Hung To Road	2031 PM Design Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

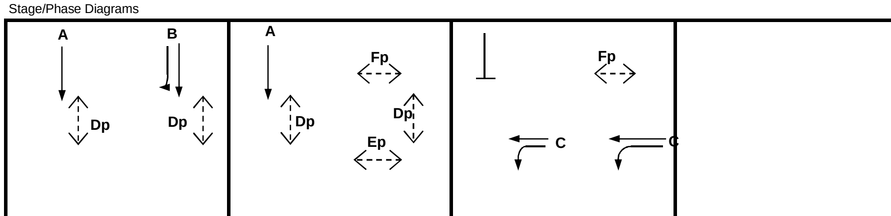
J13

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	3	
Cycle time	C =	90	sec
Sum(y)	Y =	0.480	
Lost time	L =	29	sec
Total Flow	=	4,435	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	93	sec
Min. Cycle Time C_m	$= L/(1-Y) =$	56	sec
Y_{ult}	$= 0.9-0.0075\times L =$	0.683	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\text{x}100\% =$	42.3	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y) =$	62	sec
Y_{max}	$= 1-L/C =$	0.678	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G = 8 G = 5 I/G = 12 I/G = 6

Critical Case : B,Ep,C

R.C.(C) $= (0.9\text{x}Y_{max}-Y)/Y\text{x}100\% =$ 27%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1,2	4.000	3				1		0		6325		1015		1015			6325	0.160	
	B	1	3.500	1		12	0	1		0		1965		240	179	419		43%	1865	0.225	
	B	1	3.500	1		15	0	1		0		1965			401	401		100%	1786	0.225	0.225
	C	3	3.500	1	8			1		0		1965	160	175		335	48%		1803	0.186	
	C	3	3.500	2				1		0		4070		755		755			4070	0.186	
	C	3	3.500	1	30			1		0		1965	478			478	100%		1871	0.255	0.255
	C	3	3.500	1	32					0		2105	132	399		531	25%		2081	0.255	
	C	3	3.500	1				1		0		1965		501		501			1965	0.255	
Pedestrian Crossing				GM		FGM															
	Dp	1,2	min.	5	+	12	=	17	sec												
	Ep	2	min.	5	+	9	=	14	sec												*
	Fp	2,3	min.	5	+	11	=	16	sec												

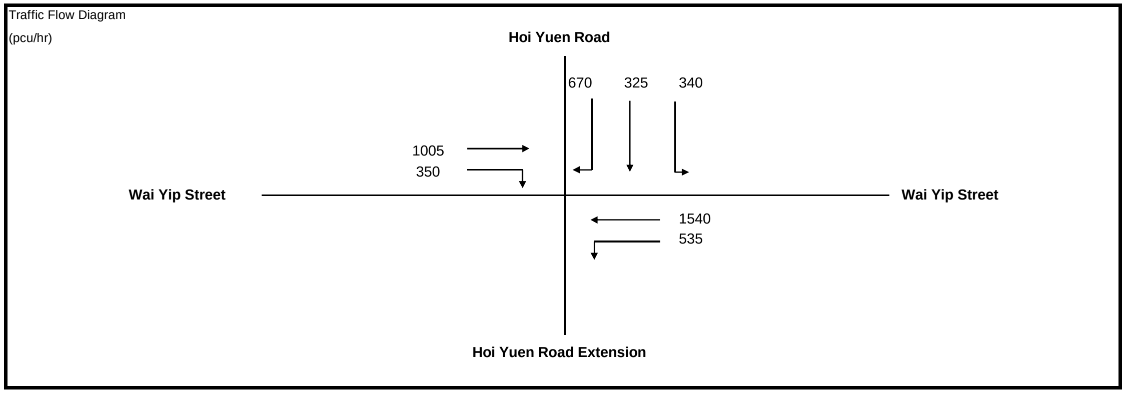
JUNCTION CAPACITY CALCULATION

AECOM

Junction J14 - Hoi Yuen Road / Wai Yip Street	2031 AM Design Traffic Flows - Imp Scheme 2 (with J19 Imp Scheme)	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: May 20

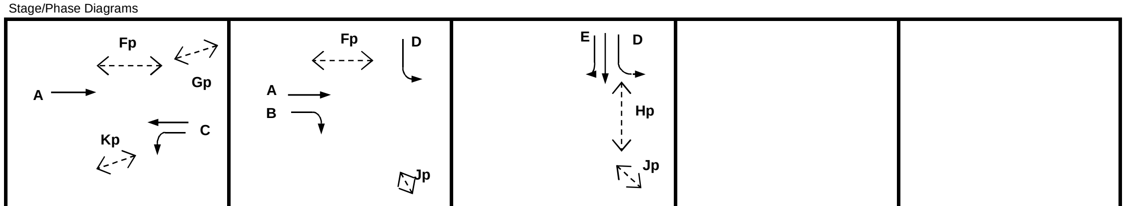
J14

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	3	
Cycle time	C =	120	sec
Sum(y)	Y =	0.686	
Lost time	L =	18	sec
Total Flow	=	4,765	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	102	sec
Min. Cycle Time C_m	$= L/(1-Y) =$	57	sec
Y_{ult}	$= 0.9-0.0075\times L =$	0.765	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times100\% =$	11.5	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y) =$	76	sec
Y_{max}	$= 1-L/C =$	0.850	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G = 7 I/G = 7 I/G = 7

Critical Case : C,B,E

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 11%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1,2	3.500	1				1		0		1965		895		895			1965	0.455	
Flared Lane														110							
	B	2	3.500	2		18	0	0		0		4210			350	350		100%	3886	0.090	0.090
	C	1	3.500	2				0		0		4210		1540		1540			4210	0.366	0.366
	C	1	3.500	1	18			1		0		1965	535			535	100%		1814	0.295	
	D	2,3	3.500	1	15			1		0		1965	340			340	100%		1786	0.190	
	E	3	3.300	1		25	0			0		2085		325	146	471		31%	2047	0.230	
	E	3	3.300	1		20	0	1		0		1945			417	417		100%	1809	0.230	0.230
Flared Lane															107						
Pedestrian Crossing				GM		FGM															
	Fp	1,2	min.	11	+	22	=	33	sec												
	Gp	1	min.	5	+	7	=	12	sec												
	Hp	3	min.	20	+	15	=	35	sec												
	Jp	2,3	min.	5	+	5	=	10	sec												
	Kp	1	min.	6	+	12	=	18	sec												

*Remarks: Flows of Wai Yip Street eastbound straight-ahead movement and Hoi Yuen Road southbound right-turning movement are deducted by flows capacity of the flared lane.

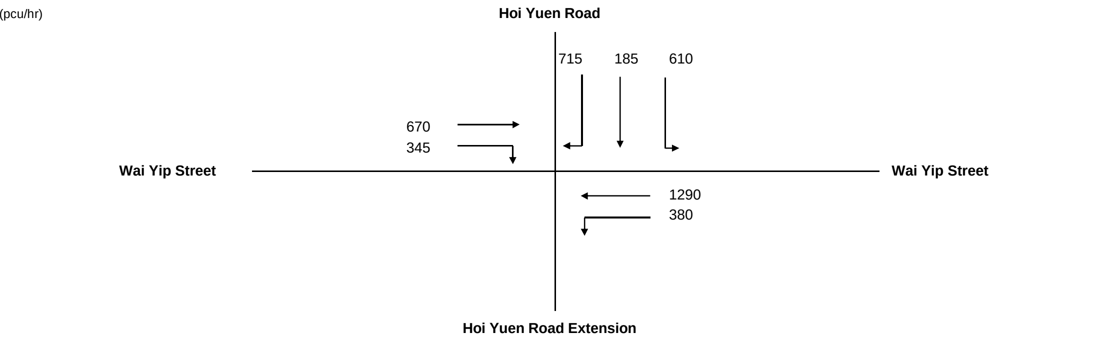
JUNCTION CAPACITY CALCULATION

AECOM

Junction J14 - Hoi Yuen Road / Wai Yip Street	2031 PM Design Traffic Flows - Imp Scheme 2 (with J19 Imp Scheme)	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

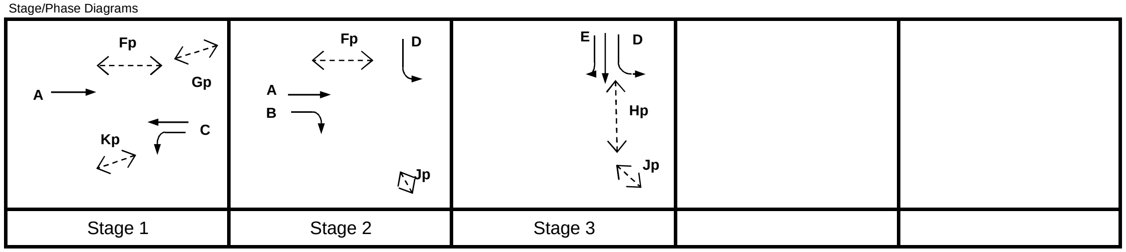
J14

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	3	
Cycle time		C =	120	sec
Sum(y)		Y =	0.648	
Lost time		L =	12	sec
Total Flow		=	4,195	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$		65	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	34	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.810	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times100\%$	=	25.0	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	43	sec
Y_{max}	= 1-L/C	=	0.900	

Stage/Phase Diagrams



I/G = 7 I/G = I/G = 7

Critical Case : C,D

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 25%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1,2	3.500	1				1		0		1965		560		560			1965	0.285	
Flared Lane														110							
	B	2	3.500	2		18	0	0		0		4210			345	345		100%	3886	0.089	
	C	1	3.500	2				0		0		4210		1290		1290			4210	0.306	0.306
	C	1	3.500	1	18			1		0		1965	380			380	100%		1814	0.209	
	D	2,3	3.500	1	15			1		0		1965	610			610	100%		1786	0.341	0.341
	E	3	3.300	1		25	0			0		2085		185	233	418		56%	2018	0.207	
	E	3	3.300	1		20	0	1		0		1945			375	375		100%	1809	0.207	
Flared Lane															107						
Pedestrian Crossing				GM		FGM															
	Fp	1,2	min.	11	+	22	=	33	sec												
	Gp	1	min.	5	+	7	=	12	sec												
	Hp	3	min.	20	+	15	=	35	sec												
	Jp	2,3	min.	5	+	5	=	10	sec												
	Kp	1	min.	6	+	12	=	18	sec												

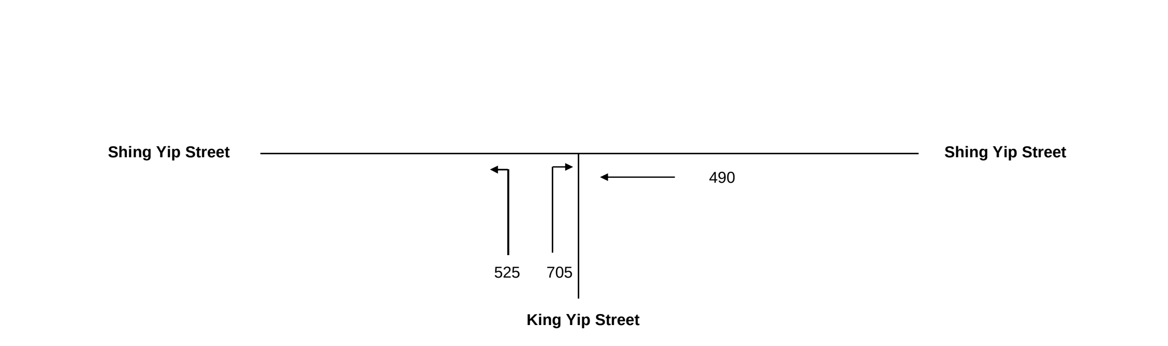
*Remarks: Flows of Wai Yip Street eastbound straight-ahead movement and Hoi Yuen Road southbound right-turning movement are deducted by flows capacity of the flared lane.

JUNCTION CAPACITY CALCULATION

AECOM

Junction J15 - Shing Yip Street / King Yip Street	2031 AM Design Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jul 19

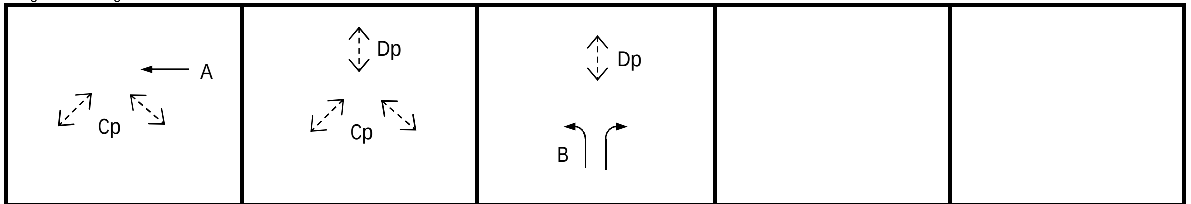
Traffic Flow Diagram
(pcu/hr)



J15

No. of stages per cycle	N =	3	
Cycle time	C =	140	sec
Sum(y)	Y =	0.420	
Lost time	L =	20	sec
Total Flow	=	1,720	pcu
Optimum Cycle C_o = $(1.5\times L+5)/(1-Y)$	=	60	sec
Min. Cycle Time C_m = $L/(1-Y)$	=	34	sec
Y_{ult} = $0.9-0.0075\times L$	=	0.750	
$R.C._{ult}$ = $(Y_{ult}-Y)/Y\times100\%$	=	78.6	%
Practical Cycle Time C_p = $0.9\times L/(0.9-Y)$	=	37	sec
Y_{max} = $1-L/C$	=	0.857	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G = 5 I/G = 12 I/G = 5

Critical Case : A,IG(AtoB),B

R.C.(C) = $(0.9xY_{max}-Y)/Yx100\%$ = 84%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
←	A	1	3.000	2				1		0		3970		490		490			3970	0.123	0.123
↰	B	3	3.500	1	15			1		0		1965	362			362	100%		1786	0.203	
Flared Lane													163								
↱	B	3	3.500	1		20	0	1		0		1965			542	542		100%	1828	0.297	0.297
Flared Lane															163						

Pedestrian Crossing			GM		FGM				
Cp	1,2	min.	10	+	12	=	22	sec	
C1p	1	min.	10	+		=	10	sec	
C2p	2	min.		+	12	=	12	sec	
Dp	2,3	min.	7	+	8	=	15	sec	
D1p	2	min.	7	+		=	7	sec	
D2p	3	min.		+	8	=	8	sec	
IG(AtoE	2	min.		+	12	=	12	sec	*

*Remark: Flows of Phase B are deducted by flows capacity of the flared lane.

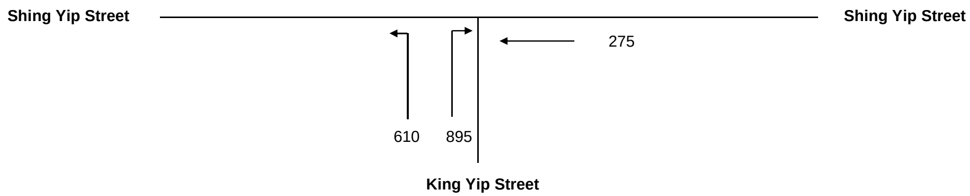
*Remark: As this calculation sheet cannot analyse pedestrian crossing whith 2 phases, so Cp and Dp are sub-divided for analysis.

JUNCTION CAPACITY CALCULATION

AECOM

Junction J15 - Shing Yip Street / King Yip Street	2031 PM Design Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jul 19

Traffic Flow Diagram
(pcu/hr)

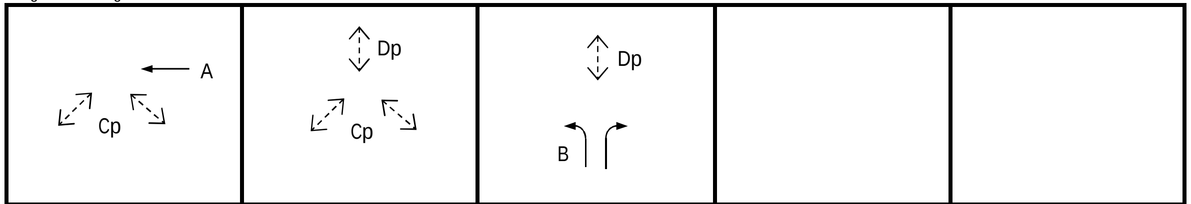


J15

No. of stages per cycle	N =	3	
Cycle time	C =	140	sec
Sum(y)	Y =	0.470	
Lost time	L =	20	sec
Total Flow	=	1,780	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	66	sec
Min. Cycle Time C_m	$= L/(1-Y) =$	38	sec
Y_{ult}	$= 0.9-0.0075\times L =$	0.750	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times100\% =$	59.7	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y) =$	42	sec
Y_{max}	$= 1-L/C =$	0.857	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G = 5　　I/G = 12　　I/G = 5

Critical Case : A,IG(AtoB),B

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 64%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
←	A	1	3.000	2				1		0		3970		275		275			3970	0.069	0.069
↰	B	3	3.500	1	15			1		0		1965	447			447	100%		1786	0.250	
Flared Lane													163								
↱	B	3	3.500	1		20	0	1		0		1965			732	732		100%	1828	0.400	0.400
Flared Lane															163						
Pedestrian Crossing				GM		FGM															
	Cp	1,2	min.	10	+	12	=	22	sec												
	C1p	1	min.	10	+		=	10	sec												
	C2p	2	min.		+	12	=	12	sec												
	Dp	2,3	min.	7	+	8	=	15	sec												
	D1p	2	min.	7	+		=	7	sec												
	D2p	3	min.		+	8	=	8	sec												
	IG(AtoB	2	min.		+	12	=	12	sec												*

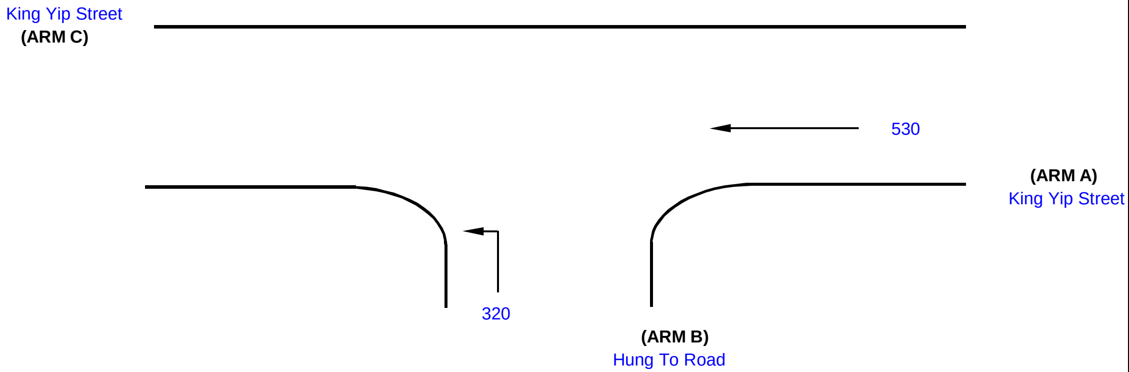
*Remark: Flows of Phase B are deducted by flows capacity of the flared lane.

*Remark: As this calculation sheet cannot analyse pedestrian crossing whith 2 phases, so Cp and Dp are sub-divided for analysis.

PRIORITY JUNCTION CAPACITY CALCULATION

AECOM

Junction J16 - Hung To Road / King Yip Street	2031 AM Design Traffic Flows	Designed By : SL	Checked By : DW	Job No. : 60493364	Date : Oct 19



NOTES : (GEOMETRIC INPUT DATA)

J16

W	= Major Road Width (6.4 - 20.0)
W cr	= Central Reserve width (1.2 - 9.0, kerbed central reserve only)
W b-a	= Lane width available to vehicle waiting in stream b-a (2.05 - 4.70)
W b-c	= Lane width available to vehicle waiting in stream b-c (2.05 - 4.70)
W c-b	= Lane width available to vehicle waiting in stream c-b (2.05 - 4.70)
Vl b-a	= Visibility to the left for vehicles waiting in stream b-a (22.0 - 250.0)
Vr b-a	= Visibility to the right for vehicles waiting in stream b-a (17.0 - 250.0)
Vr b-c	= Visibilitu to the right for vehicles waiting in stream b-c (17.0 - 250.0)
Vr c-b	= Visibility to the right for vehicles waiting in stream c-b (17.0 - 250.0)
D	= Stream-specific B-A
E	= Stream-specific B-C
F	= Stream-specific C-B
Y	= (1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)				*MAJOR ROAD (ARM C)*				*MINOR ROAD (ARM B)*			
W	=	8	(metres)	W c-b	=		(metres)	W b-a	=		(metres)
W cr	=	0	(metres)	Vr c-b	=		(metres)	W b-c	=	4.07	(metres)
q a-b	=	0	(pcu/hr)	q c-a	=	0	(pcu/hr)	Vl b-a	=		(metres)
q a-c	=	530	(pcu/hr)	q c-b	=	0	(pcu/hr)	Vr b-a	=		(metres)
								Vr b-c	=	100	(metres)
								q b-a	=	0	(pcu/hr)
								q b-c	=	320	(pcu/hr)

GEOMETRIC FACTORS :

D	=	0.533219
E	=	1.020769
F	=	0.585955
Y	=	0.724000

THE CAPACITY OF MOVEMENT :

Q b-a	=	260
Q b-c	=	618
Q c-b	=	355
Q b-ac	=	618

CRITICAL DFC = 0.52

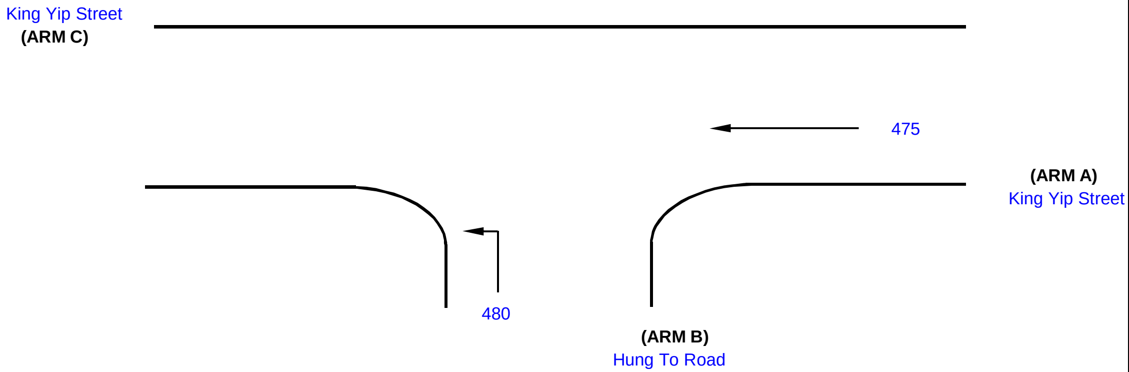
COMPARISION OF DESIGN FLOW TO CAPACITY :

DFC b-a	=	0.00
DFC b-c	=	0.52
DFC c-b	=	0.00
DFC b-ac	=	0.52

PRIORITY JUNCTION CAPACITY CALCULATION

AECOM

Junction J16 - Hung To Road / King Yip Street	2031 PM Design Traffic Flows	Designed By : SL	Checked By : DW	Job No. : 60493364	Date : Oct 19



J16

NOTES : (GEOMETRIC INPUT DATA)

W	= Major Road Width (6.4 - 20.0)
W cr	= Central Reserve width (1.2 - 9.0, kerbed central reserve only)
W b-a	= Lane width available to vehicle waiting in stream b-a (2.05 - 4.70)
W b-c	= Lane width available to vehicle waiting in stream b-c (2.05 - 4.70)
W c-b	= Lane width available to vehicle waiting in stream c-b (2.05 - 4.70)
Vl b-a	= Visibility to the left for vehicles waiting in stream b-a (22.0 - 250.0)
Vr b-a	= Visibility to the right for vehicles waiting in stream b-a (17.0 - 250.0)
Vr b-c	= Visibilitu to the right for vehicles waiting in stream b-c (17.0 - 250.0)
Vr c-b	= Visibility to the right for vehicles waiting in stream c-b (17.0 - 250.0)
D	= Stream-specific B-A
E	= Stream-specific B-C
F	= Stream-specific C-B
Y	= (1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)

W	=	8	(metres)
W cr	=	0	(metres)
q a-b	=	0	(pcu/hr)
q a-c	=	475	(pcu/hr)

MAJOR ROAD (ARM C)

W c-b	=		(metres)
Vr c-b	=		(metres)
q c-a	=	0	(pcu/hr)
q c-b	=	0	(pcu/hr)

MINOR ROAD (ARM B)

W b-a	=		(metres)
W b-c	=	4.07	(metres)
Vl b-a	=		(metres)
Vr b-a	=		(metres)
Vr b-c	=	100	(metres)
q b-a	=	0	(pcu/hr)
q b-c	=	480	(pcu/hr)

GEOMETRIC FACTORS :

D	=	0.533219
E	=	1.020769
F	=	0.585955
Y	=	0.724000

`

THE CAPACITY OF MOVEMENT :

Q b-a	=	268
Q b-c	=	633
Q c-b	=	363
Q b-ac	=	633

CRITICAL DFC = 0.76

COMPARISION OF DESIGN FLOW TO CAPACITY :

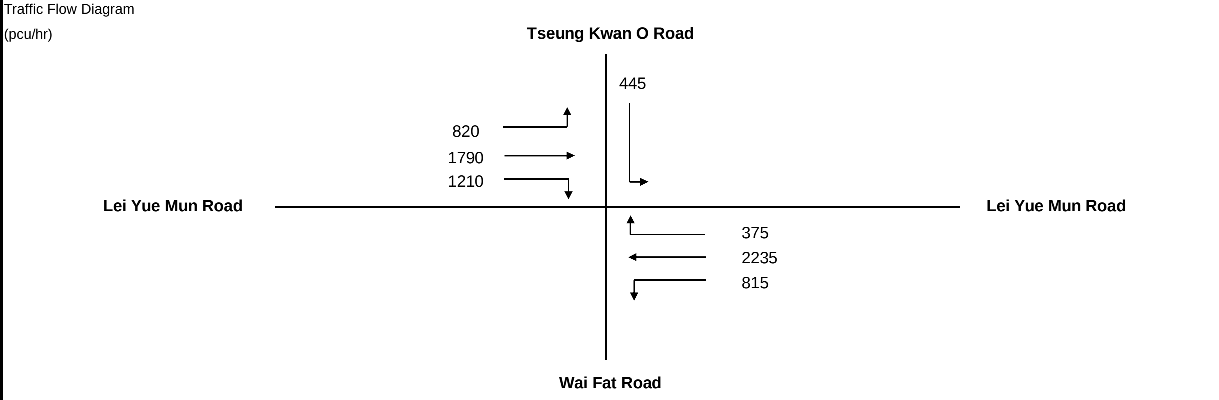
DFC b-a	=	0.00
DFC b-c	=	0.76
DFC c-b	=	0.00
DFC b-ac	=	0.76

JUNCTION CAPACITY CALCULATION

AECOM

Junction J17 - Lei Yue Mun Road / Tseung Kwan O Road / Wai Fat Road	2031 AM Design Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

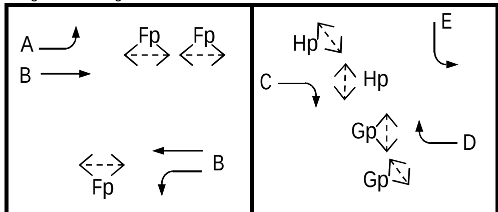
Traffic Flow Diagram
(pcu/hr)



J17

No. of stages per cycle	N =	2	
Cycle time	C =	130	sec
Sum(y)	Y =	0.665	
Lost time	L =	15	sec
Total Flow	=	7,690	pcu
Optimum Cycle C_o = $(1.5\times L+5)/(1-Y)$	=	82	sec
Min. Cycle Time C_m = $L/(1-Y)$	=	45	sec
Y_{ult} = $0.9-0.0075\times L$	=	0.788	
$R.C._{ult}$ = $(Y_{ult}-Y)/Y\times100\%$	=	18.5	%
Practical Cycle Time C_p = $0.9\times L/(0.9-Y)$	=	57	sec
Y_{max} = $1-L/C$	=	0.885	

Stage/Phase Diagrams



Stage 1	Stage 2			

I/G = 8 I/G = 9

Critical Case : B,C

R.C.(C) = $(0.9\times Y_{max}-Y)/Y\times100\%$ = 20%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.500	2	25			1		0		4070	820			820	100%		3840	0.214	
	B	1	3.500	3				0		0		6315		1790		1790			6315	0.283	
	C	2	3.600	2		20	0	0		0		4230			1210	1210		100%	3935	0.308	0.308
	B	1	3.200	2	20			1		0		4010	815			815	100%		3730	0.218	
	B	1	3.300	3				0		0		6255		2235		2235			6255	0.357	0.357
	D	2	3.500	2		32	0	0		0		4210			375	375		100%	4021	0.093	
	E	2	3.650	2	15			1		0		4100	445			445	100%		3727	0.119	
Pedestrian Crossing				GM		FGM															
	Fp	1	min.	8	+	13	=	21	sec												
	Gp	2	min.	20	+	13	=	33	sec												
	Hp	2	min.	9	+	13	=	22	sec												

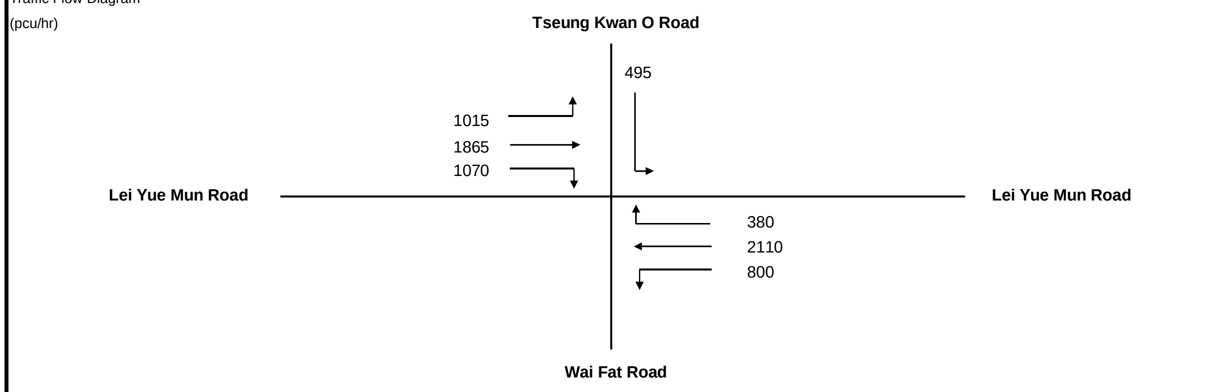
JUNCTION CAPACITY CALCULATION

AECOM

Junction J17 - Lei Yue Mun Road / Tseung Kwan O Road / Wai Fat Road	2031 PM Design Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

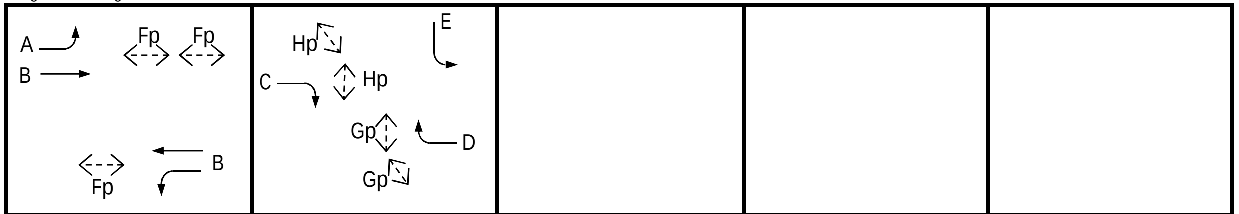
J17

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	2	
Cycle time		C =	130	sec
Sum(y)		Y =	0.609	
Lost time		L =	15	sec
Total Flow		=	7,735	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y)$	=	70	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	38	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.788	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times100\%$	=	29.3	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	46	sec
Y_{max}	$= 1-L/C$	=	0.885	

Stage/Phase Diagrams



Stage 1	Stage 2			

I/G = 8 I/G = 9

Critical Case : B,C

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 31%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m)		OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr)			TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%)		REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
					LEFT	RIGHT							LEFT	STRAIGHT AHEAD	RIGHT		LEFT	RIGHT			
	A	1	3.500	2	25			1		0		4070	1015			1015	100%		3840	0.264	
	B	1	3.500	3				0		0		6315		1865		1865			6315	0.295	
	C	2	3.600	2		20	0	0		0		4230			1070	1070		100%	3935	0.272	0.272
	B	1	3.200	2	20			1		0		4010	800			800	100%		3730	0.214	
	B	1	3.300	3				0		0		6255		2110		2110			6255	0.337	0.337
	D	2	3.500	2		32	0	0		0		4210			380	380		100%	4021	0.094	
	E	2	3.650	2	15			1		0		4100	495			495	100%		3727	0.133	
Pedestrian Crossing				GM		FGM															
	Fp	1	min.	8	+	13	=	21	sec												
	Gp	2	min.	20	+	13	=	33	sec												
	Hp	2	min.	9	+	13	=	22	sec												

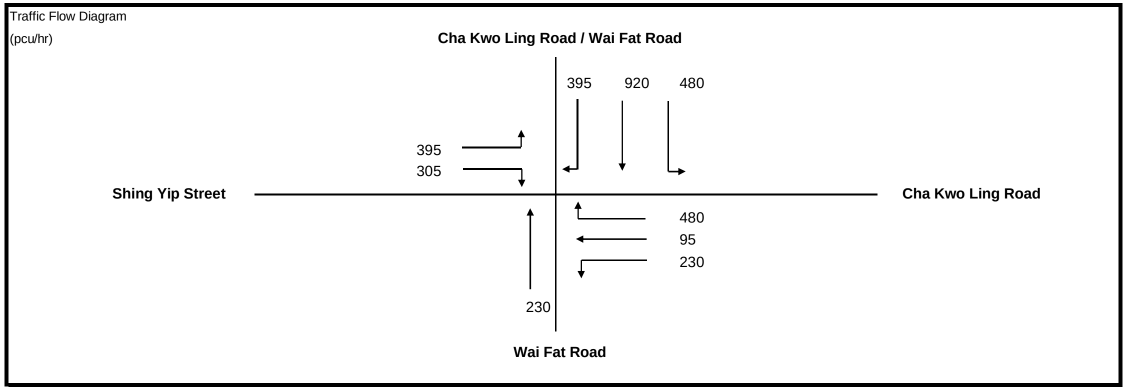
JUNCTION CAPACITY CALCULATION

AECOM

Junction J18 - Cha Kwo Ling Road / Wai Fat Road / Shing Yip Street	2031 AM Design Traffic Flows - Imp Scheme	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

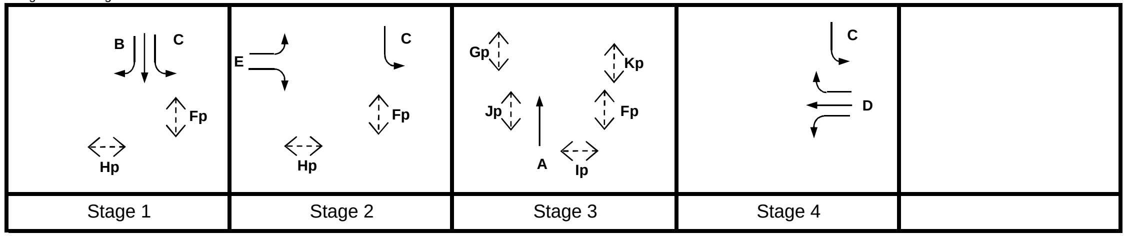
J18

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	4	
Cycle time	C =	140	sec
Sum(y)	Y =	0.491	
Lost time	L =	42	sec
Total Flow	=	3,530	pcu
Optimum Cycle C_o	= (1.5×L+5)/(1-Y) =	133	sec
Min. Cycle Time C_m	= L/(1-Y) =	82	sec
Y_{ult}	= 0.9-0.0075×L =	0.585	
$R.C._{ult}$	= $(Y_{ult}$-Y)/Yx100% =	19.2	%
Practical Cycle Time C_p	= 0.9×L/(0.9-Y) =	92	sec
Y_{max}	= 1-L/C =	0.700	

Stage/Phase Diagrams



I/G = 5 I/G = 15 G = 7 I/G = 11 I/G = 7

Critical Case : B,E,Ip,D

R.C.(C) = $(0.9xY_{max}$-Y)/Yx100% = 28%

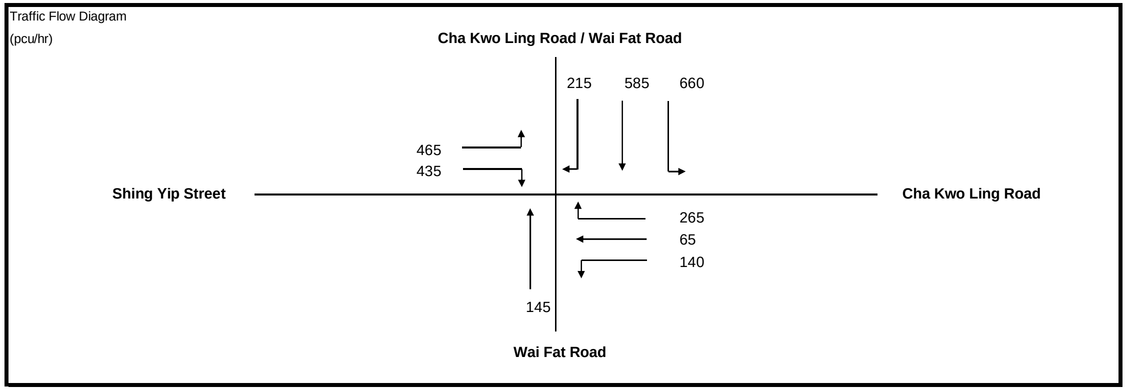
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	3	3.650	2				1		0		4100		230		230			4100	0.056	
	C	1,2,4	3.400	1	15			1		0		1955	480			480	100%		1777	0.270	
	B	1	3.400	2				0		0		4190		920		920			4190	0.220	0.220
	B	1	3.400	1		25	0	1		0		1955			395	395		100%	1844	0.214	
	D	4	3.400	1	10			1		0		1955	230			230	100%		1700	0.135	
	D	4	3.400	1		22	0	0		0		2095		95	197	292		67%	2003	0.146	0.146
	D	4	3.300	1		20	0	0		0		2085			283	283		100%	1940	0.146	
	E	2	3.300	1	15			1		0		1945	221			221	100%		1768	0.125	0.125
	E	2	3.300	1	18	20	0			0		2085	174		68	241	72%	28%	1929	0.125	
	E	2	3.300	1		15	0	0		0		2085			237	237		100%	1895	0.125	
Pedestrian Crossing				GM		FGM															
	Fp	1,2,3	min.	5	+	12	=	17	sec												
	Gp	3	min.	5	+	9	=	14	sec												
	Hp	1,2	min.	5	+	9	=	14	sec												
	Ip	3	min.	7	+	9	=	16	sec												*
	Jp	3	min.	5	+	6	=	11	sec												
	Kp	3	min.	5	+	12	=	17	sec												

JUNCTION CAPACITY CALCULATION

AECOM

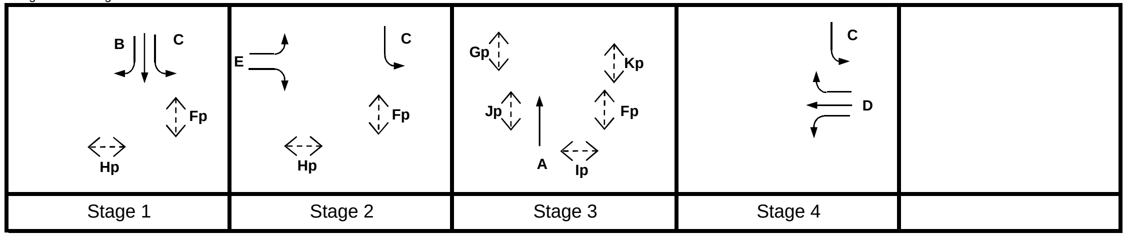
Junction J18 - Cha Kwo Ling Road / Wai Fat Road / Shing Yip Street	2031 PM Design Traffic Flows - Imp Scheme	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

J18



No. of stages per cycle		N =	4	
Cycle time		C =	140	sec
Sum(y)		Y =	0.384	
Lost time		L =	42	sec
Total Flow		=	2,975	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y)$	=	110	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	68	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.585	
R.C.$_{ult}$	$= (Y_{ult}-Y)/Y\times100\%$	=	52.3	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	73	sec
Y_{max}	$= 1-L/C$	=	0.700	

Stage/Phase Diagrams



I/G = 5 I/G = 15 G = 7 I/G = 11 I/G = 7

Critical Case : B,E,Ip,D

R.C.(C) = $(0.9\text{x}Y_{max}-Y)/Y\text{x}100\%$ = 64%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	3	3.650	2				1		0		4100		145		145			4100	0.035	
	C	1,2,4	3.400	1	15			1		0		1955	660			660	100%		1777	0.371	
	B	1	3.400	2				0		0		4190		585		585			4190	0.140	0.140
	B	1	3.400	1		25	0	1		0		1955			215	215		100%	1844	0.117	
	D	4	3.400	1	10			1		0		1955	140			140	100%		1700	0.082	
	D	4	3.400	1		22	0	0		0		2095		65	103	168		61%	2011	0.084	0.084
	D	4	3.300	1		20	0	0		0		2085			162	162		100%	1940	0.084	
	E	2	3.300	1	15			1		0		1945	284			284	100%		1768	0.161	0.161
	E	2	3.300	1	18	20	0			0		2085	181		130	311	58%	42%	1931	0.161	
	E	2	3.300	1		15	0	0		0		2085			305	305		100%	1895	0.161	
Pedestrian Crossing				GM		FGM															
	Fp	1,2,3	min.	5	+	12	=	17	sec												
	Gp	3	min.	5	+	9	=	14	sec												
	Hp	1,2	min.	5	+	9	=	14	sec												
	Ip	3	min.	7	+	9	=	16	sec												*
	Jp	3	min.	5	+	6	=	11	sec												
	Kp	3	min.	5	+	12	=	17	sec												

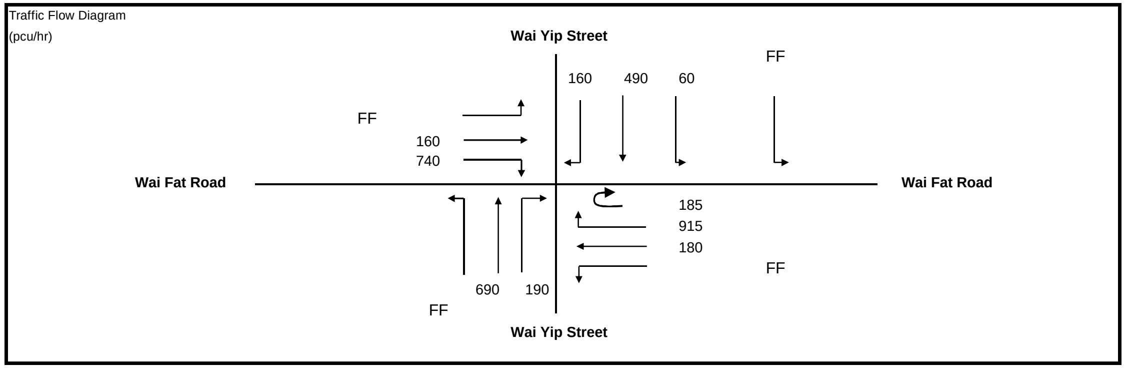
JUNCTION CAPACITY CALCULATION

AECOM

Junction J19 - Wai Yip Street / Wai Fat Road	2031 AM Design Traffic Flows (free flow to Wai Fat Road)	DESIGN: DW	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

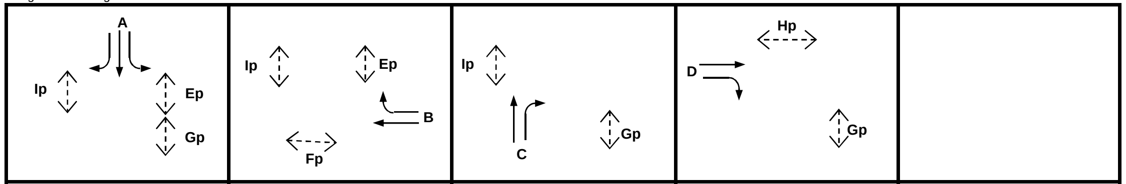
J19

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	4
Cycle time		C =	140 sec
Sum(y)		Y =	0.912
Lost time		L =	24 sec
Total Flow		=	3,770 pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y)$	=	465 sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	272 sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.720
$R.C._{ult}$	$= (Y_{ult}-Y)/Yx100\%$	=	-21.0 %
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	-1837 sec
Y_{max}	$= 1-L/C$	=	0.829

Stage/Phase Diagrams



I/G = 8 I/G = 6 I/G = 8 I/G = 6

Critical Case : A,B,C,D

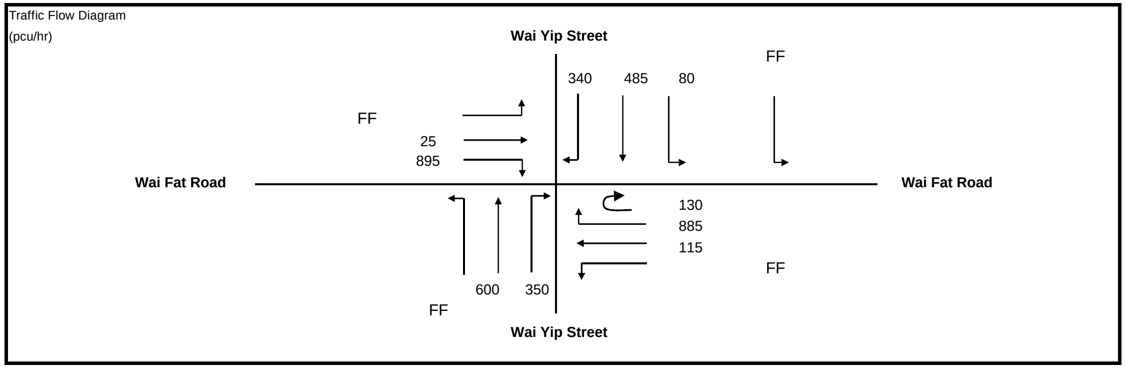
R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ -18%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	D	4	3.850	1		27	0	0		0		2140		160	295	455		65%	2066	0.220	0.220
	D	4	3.850	1		25	0	0		0		2140			445	445		100%	2019	0.220	
	C	3	3.500	1		20	0	0		0		2105			190	190		100%	1958	0.097	
	C	3	3.500	2				0		0		4210		690		690			4210	0.164	0.164
	B	2	3.500	2		20	0	0		0		4210			1062	1062		100%	3916	0.271	0.271
Flared Lane															38						
	B	2	3.500	1				0		0		2105		108		108			2105	0.051	
Flared Lane														72							
	A	1	3.500	1	15			0		0		2105	60			60	100%		1914	0.031	
	A	1	3.500	1		25	0	0		0		2105		370	160	530		30%	2068	0.256	0.256
Flared Lane														120							
Pedestrian Crossing				GM		FGM															
	Ep	1,2	min.	5	+	7	=	12	sec												
	Fp	2	min.	11	+	10	=	21	sec												
	Gp	1,3,4	min.	7	+	14	=	21	sec												
	Hp	4	min.	10	+	9	=	19	sec												
	Ip	1,2,3	min.	5	+	7	=	12	sec												

*Remark: Flows of Phase A & B are deducted by capcity flows of flared lane.

JUNCTION CAPACITY CALCULATION

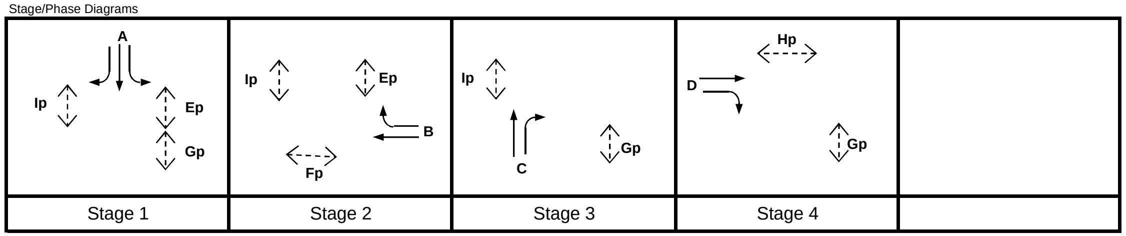
Junction J19 - Wai Yip Street / Wai Fat Road	2031 PM Design Traffic Flows (free flow to Wai Fat Road)	DESIGN: DW	CHECK: DW	JOB NO: 60493364	DATE: Jun 19



J19

No. of stages per cycle	N =	4	
Cycle time	C =	140	sec
Sum(y)	Y =	1.000	
Lost time	L =	24	sec
Total Flow	=	3,905	pcu

Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y)$	=	308889	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	180813	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.720	
R.C.$_{ult}$	$= (Y_{ult}-Y)/Yx100\%$	=	-28.0	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	-216	sec
Y_{max}	= 1-L/C	=	0.829	



I/G = 8 I/G = 6 I/G = 8 I/G = 6

Critical Case : A,B,C,D

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ -25%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	D	4	3.850	1		27	0	0		0		2140		25	437	462		95%	2033	0.227	0.227
	D	4	3.850	1		25	0	0		0		2140			458	458		100%	2019	0.227	
	C	3	3.500	1		20	0	0		0		2105			350	350		100%	1958	0.179	0.179
	C	3	3.500	2				0		0		4210		600		600			4210	0.143	
	B	2	3.500	2		20	0	0		0		4210			977	977		100%	3916	0.249	0.249
Flared Lane															38						
	B	2	3.500	1				0		0		2105		43		43			2105	0.020	
Flared Lane														72							
	A	1	3.500	1	15			0		0		2105	80			80	100%		1914	0.042	
	A	1	3.500	1		25	0	0		0		2105		365	340	705		48%	2046	0.345	0.345
Flared Lane														120							
Pedestrian Crossing				GM		FGM															
	Ep	1,2	min.	5	+	7	=	12	sec												
	Fp	2	min.	11	+	10	=	21	sec												
	Gp	1,3,4	min.	7	+	14	=	21	sec												
	Hp	4	min.	10	+	9	=	19	sec												
	Ip	1,2,3	min.	5	+	7	=	12	sec												

*Remark: Flows of Phase A & B are deducted by capcity flows of flared lane.

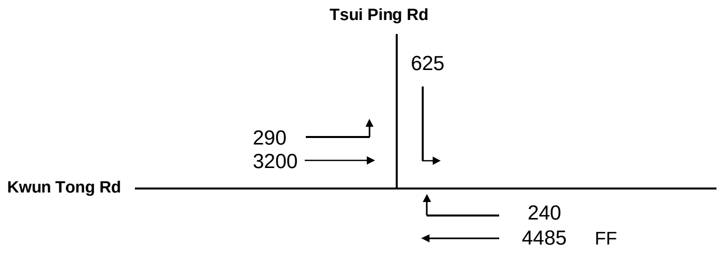
JUNCTION CAPACITY CALCULATION

AECOM

Junction J20 - Kwun Tong Rd / Tsui Ping Rd	2031 AM Design Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

J20

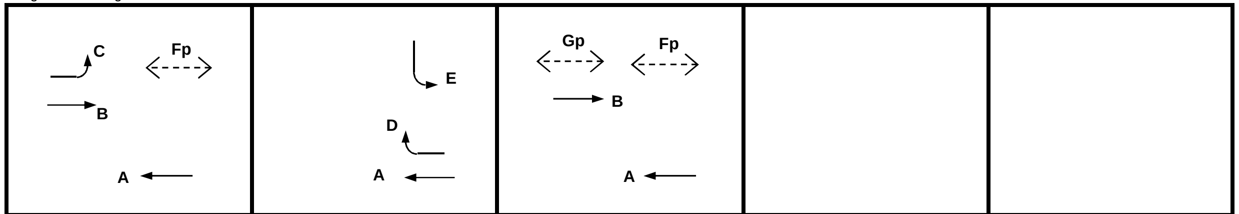
Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	3	
Cycle time	C =	130	sec
Sum(y)	Y =	0.682	
Lost time	L =	9	sec
Total Flow	=	4,355	pcu

Optimum Cycle C_o	= (1.5×L+5)/(1-Y) =		58	sec
Min. Cycle Time C_m	= L/(1-Y)	=	28	sec
Y_{ult}	= 0.9-0.0075×L	=	0.833	
$R.C._{ult}$	= (Y_{ult}-Y)/Yx100%	=	22.0	%
Practical Cycle Time C_p	= 0.9×L/(0.9-Y)	=	37	sec
Y_{max}	= 1-L/C	=	0.931	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		
I/G = 6	I/G =	I/G = 5		

Critical Case : B,E

R.C.(C) = $(0.9 \times Y_{max}-Y)/Y \times 100\%$ = 23%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	B	1,3	3.300	3				0		0		6255		3200		3200			6255	0.512	0.512
	C	1	3.300	1	15			1		0		1945	290			290	100%		1768	0.164	
	E	2	3.300	2	15			1		0		4030	625			625	100%		3664	0.171	0.171
	D	2	3.300	1		15	0	0		0		2085			240	240		100%	1895	0.127	
Pedestrian Crossing				GM		FGM															
	Fp	1,3	min.	8	+	10	=	18	sec												
	Gp	3	min.	6	+	8	=	14	sec												

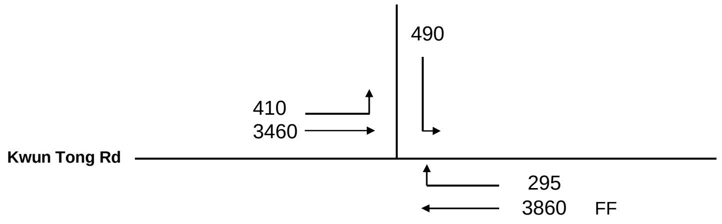
JUNCTION CAPACITY CALCULATION

AECOM

Junction J20 - Kwun Tong Rd / Tsui Ping Rd	2031 PM Design Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

J20

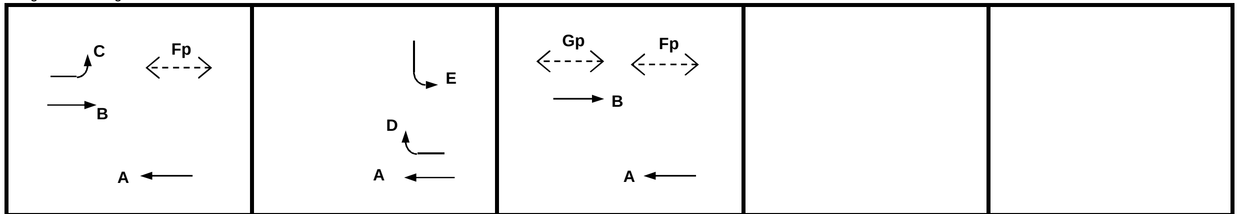
Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle N = 3
Cycle time C = 130 sec
Sum(y) Y = 0.709
Lost time L = 10 sec
Total Flow = 4,655 pcu

Optimum Cycle C_o = $(1.5\times L+5)/(1-Y)$ = 69 sec
Min. Cycle Time C_m = $L/(1-Y)$ = 34 sec
Y_{ult} = $0.9-0.0075\times L$ = 0.825
$R.C._{ult}$ = $(Y_{ult}-Y)/Y\times100\%$ = 16.4 %
Practical Cycle Time C_p = $0.9\times L/(0.9-Y)$ = 47 sec
Y_{max} = $1-L/C$ = 0.923

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G = 5 I/G = I/G = 7

Critical Case : B,D

R.C.(C) = $(0.9\text{x}Y_{max}-Y)/Y\text{x}100\%$ = 17%

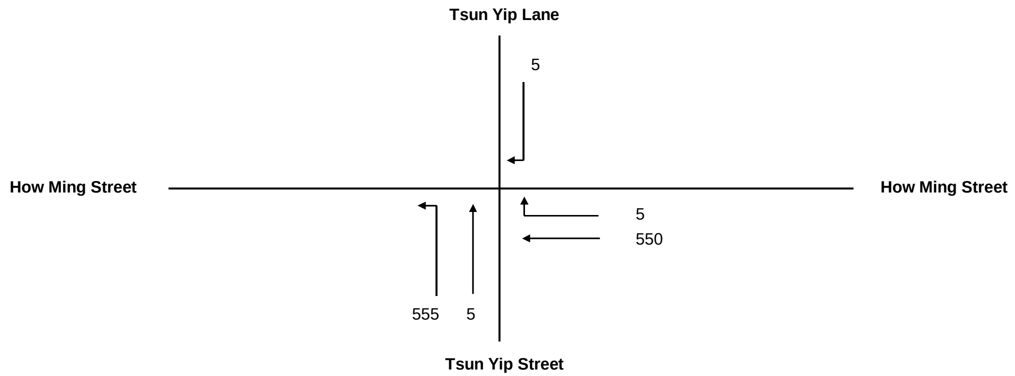
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	B	1,3	3.300	3				0		0		6255		3460		3460			6255	0.553	0.553
	C	1	3.300	1	15			1		0		1945	410			410	100%		1768	0.232	
	E	2	3.300	2	15			1		0		4030	490			490	100%		3664	0.134	
	D	2	3.300	1		15	0	0		0		2085			295	295		100%	1895	0.156	0.156
Pedestrian Crossing				GM		FGM															
	Fp	1,3	min.	8	+	10	=	18	sec												
	Gp	3	min.	6	+	8	=	14	sec												

JUNCTION CAPACITY CALCULATION

AECOM

Junction J21 - How Ming Street / Tsun Yip Street / Tsun Yip Lane	2031 AM Design Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

Traffic Flow Diagram
(pcu/hr)

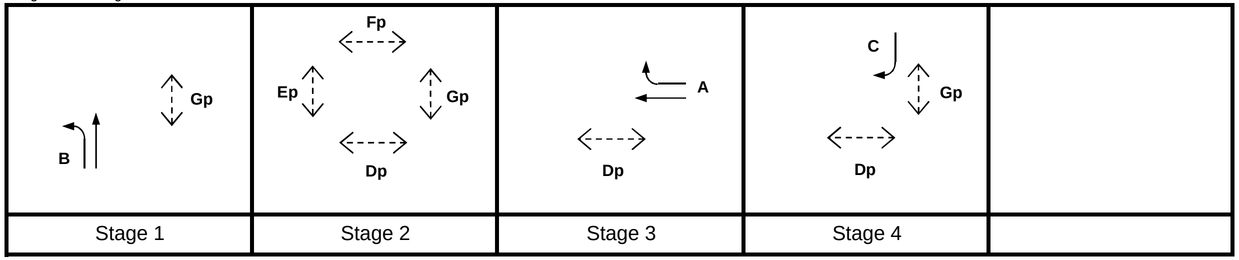


J21

No. of stages per cycle	N =	4	
Cycle time	C =	108	sec
Sum(y)	Y =	0.472	
Lost time	L =	44	sec
Total Flow	=	1,120	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	135	sec
Min. Cycle Time C_m	$= L/(1-Y) \quad =$	83	sec
Y_{ult}	$= 0.9-0.0075\times L \quad =$	0.570	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times100\% \quad =$	20.7	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y) \quad =$	93	sec
Y_{max}	$= 1-L/C \quad =$	0.593	

Stage/Phase Diagrams



I/G = 7 G = 7 I/G = 12 I/G = 5 G = 5 I/G = 10

Critical Case : B,Ep,A,C

R.C.(C) $= (0.9\text{x}Y_{max}\text{-}Y)/Y\text{x}100\% =$ 13%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	3	3.000	1				1		0	-575	1915		229		229			1340	0.171	0.171
	A	3	3.000	1		25	0	1		0		1915		321	5	326		2%	1913	0.171	
	B	1	3.800	1	20			1		0		1995	555	5		560	99%		1857	0.302	0.302
	C	4	3.000	1		25	0	1		0		1915			5	5		100%	1807	0.003	
Pedestrian Crossing				GM		FGM															
	Dp	2,3,4	min.	8	+	8	=	16	sec												
	Ep	2	min.	7	+	10	=	17	sec												*
	Fp	2	min.	6	+	6	=	12	sec												
	Gp	1,2,4	min.	6	+	6	=	12	sec												

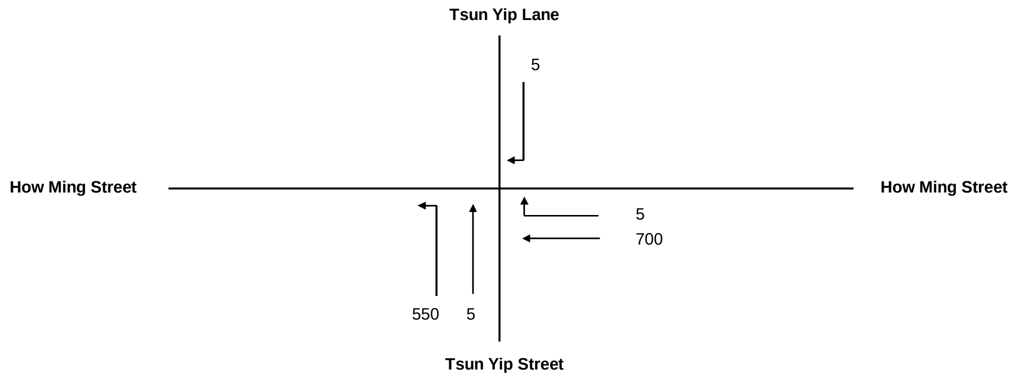
*Remark: Due to kerside activities, capacity of 1 lane of How Ming Street is redued by half.

JUNCTION CAPACITY CALCULATION

AECOM

Junction J21 - How Ming Street / Tsun Yip Street / Tsun Yip Lane	2031 PM Design Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

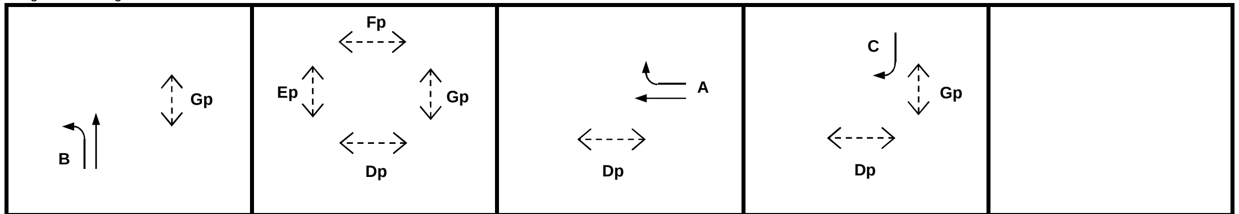
Traffic Flow Diagram
(pcu/hr)



J21

No. of stages per cycle		N =	4	
Cycle time		C =	120	sec
Sum(y)		Y =	0.516	
Lost time		L =	44	sec
Total Flow		=	1,265	pcu
Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y)$	=	147	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	91	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.570	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y \times 100\%$	=	10.6	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	103	sec
Y_{max}	$= 1-L/C$	=	0.633	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3	Stage 4	

I/G = 7 G = 7 I/G = 12 I/G = 5 G = 5 I/G = 10

Critical Case : B,Ep,A,C

R.C.(C) $= (0.9 \times Y_{max}-Y)/Y \times 100\%$ = 11%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	3	3.000	1				1		0	-575	1915		290		290			1340	0.217	
	A	3	3.000	1		25	0	1		0		1915		410	5	415		1%	1914	0.217	0.217
	B	1	3.800	1	20			1		0		1995	550	5		555	99%		1857	0.299	0.299
	C	4	3.000	1		25	0	1		0		1915			5	5		100%	1807	0.003	
Pedestrian Crossing				GM		FGM															
	Dp	2,3,4	min.	8	+	8	=	16	sec												
	Ep	2	min.	7	+	10	=	17	sec												*
	Fp	2	min.	6	+	6	=	12	sec												
	Gp	1,2,4	min.	6	+	6	=	12	sec												

*Remark: Due to kerside activities, capacity of 1 lane of How Ming Street is redued by half.

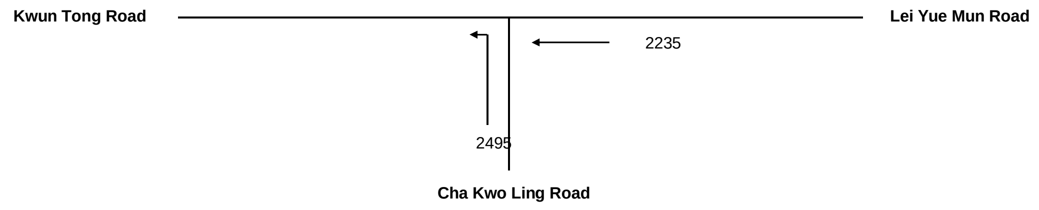
JUNCTION CAPACITY CALCULATION

AECOM

Junction J22 - Lei Yue Mun Road / Cha Kwo Ling Road	2031 AM Design Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

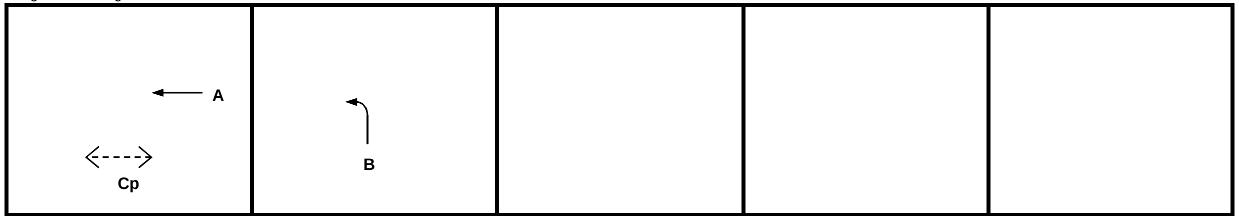
J22

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	2	
Cycle time	C =	130	sec
Sum(y)	Y =	0.711	
Lost time	L =	14	sec
Total Flow	=	14,405	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	90	sec
Min. Cycle Time C_m	$= L/(1-Y) =$	48	sec
Y_{ult}	$= 0.9-0.0075\times L =$	0.795	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times 100\% =$	11.9	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y) =$	66	sec
Y_{max}	$= 1-L/C =$	0.892	

Stage/Phase Diagrams



Stage 1	Stage 2			
I/G = 6	I/G = 10			

Critical Case : A,B

R.C.(C) $= (0.9\times Y_{max}-Y)/Y\times 100\% =$ 13%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
←	A	1	3.000	4				1		0		8080		2235		2235			8080	0.277	0.277
↰	B	2	4.000	3	15			1		0		6325	2495			2495	100%		5750	0.434	0.434
Pedestrian Crossing				GM		FGM															
	Cp	1	min.	7	+	15	=	22	sec												

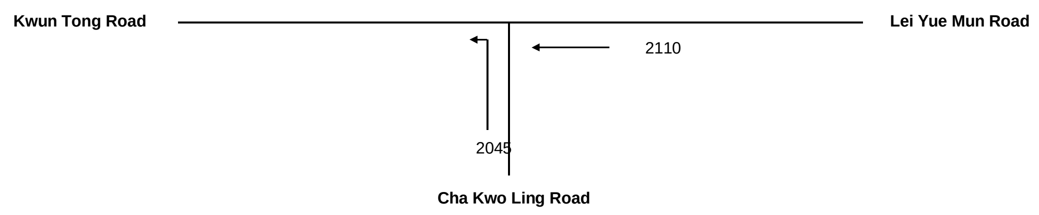
JUNCTION CAPACITY CALCULATION

AECOM

Junction J22 - Lei Yue Mun Road / Cha Kwo Ling Road	2031 PM Design Traffic Flows	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

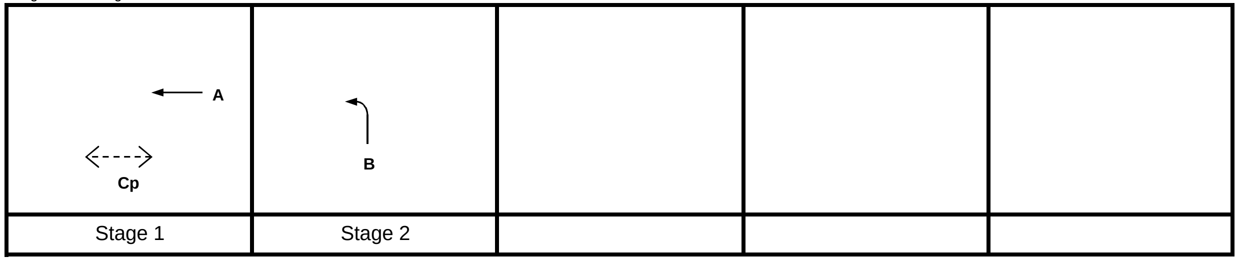
J22

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	2	
Cycle time	C =	130	sec
Sum(y)	Y =	0.617	
Lost time	L =	14	sec
Total Flow	=	14,405	pcu
Optimum Cycle C_o	= (1.5×L+5)/(1-Y) =	68	sec
Min. Cycle Time C_m	= L/(1-Y) =	37	sec
Y_{ult}	= 0.9-0.0075×L =	0.795	
$R.C._{ult}$	= (Y_{ult}-Y)/Yx100% =	28.9	%
Practical Cycle Time C_p	= 0.9×L/(0.9-Y) =	44	sec
Y_{max}	= 1-L/C =	0.892	

Stage/Phase Diagrams



I/G = 6 I/G = 10

Critical Case : A,B

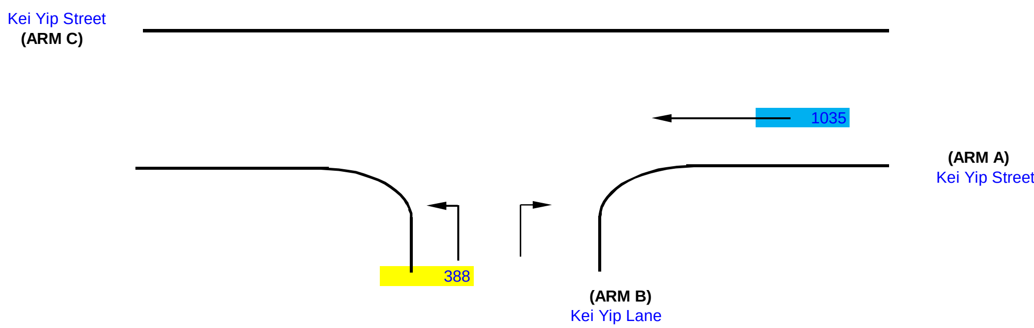
R.C.(C) = (0.9xY_{max}-Y)/Yx100% = 30%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
←	A	1	3.000	4				1		0		8080		2110		2110			8080	0.261	0.261
↰	B	2	4.000	3	15			1		0		6325	2045			2045	100%		5750	0.356	0.356
Pedestrian Crossing				GM		FGM															
	Cp	1	min.	7	+	15	=	22	sec												

PRIORITY JUNCTION CAPACITY CALCULATION

AECOM

Junction J23 - Kei Yip Street / Kei Yip Lane	2031 AM Design Traffic Flows	Designed By : SL	Checked By : DW	Job No. : 60493364	Date : Jun 20



J23

NOTES : (GEOMETRIC INPUT DATA)

W	= Major Road Width (6.4 - 20.0)
W cr	= Central Reserve width (1.2 - 9.0, kerbed central reserve only)
W b-a	= Lane width available to vehicle waiting in stream b-a (2.05 - 4.70)
W b-c	= Lane width available to vehicle waiting in stream b-c (2.05 - 4.70)
W c-b	= Lane width available to vehicle waiting in stream c-b (2.05 - 4.70)
Vl b-a	= Visibility to the left for vehicles waiting in stream b-a (22.0 - 250.0)
Vr b-a	= Visibility to the right for vehicles waiting in stream b-a (17.0 - 250.0)
Vr b-c	= Visibilitu to the right for vehicles waiting in stream b-c (17.0 - 250.0)
Vr c-b	= Visibility to the right for vehicles waiting in stream c-b (17.0 - 250.0)
D	= Stream-specific B-A
E	= Stream-specific B-C
F	= Stream-specific C-B
Y	= (1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)				*MAJOR ROAD (ARM C)*				*MINOR ROAD (ARM B)*			
W	=	8.25	(metres)	W c-b	=		(metres)	W b-a	=		(metres)
W cr	=	0	(metres)	Vr c-b	=		(metres)	W b-c	=	4	(metres)
q a-b	=	0	(pcu/hr)	q c-a	=	0	(pcu/hr)	Vl b-a	=	250	(metres)
q a-c	=	1035	(pcu/hr)	q c-b	=	0	(pcu/hr)	Vr b-a	=	70	(metres)
								Vr b-c	=	70	(metres)
								q b-a	=	0	(pcu/hr)
								q b-c	=	388	(pcu/hr)

GEOMETRIC FACTORS :

D	=	0.664980
E	=	0.986420
F	=	0.585955
Y	=	0.715375

THE CAPACITY OF MOVEMENT :

Q b-a	=	238
Q b-c	=	469
Q c-b	=	279
Q b-ac	=	469

CRITICAL DFC = 0.83

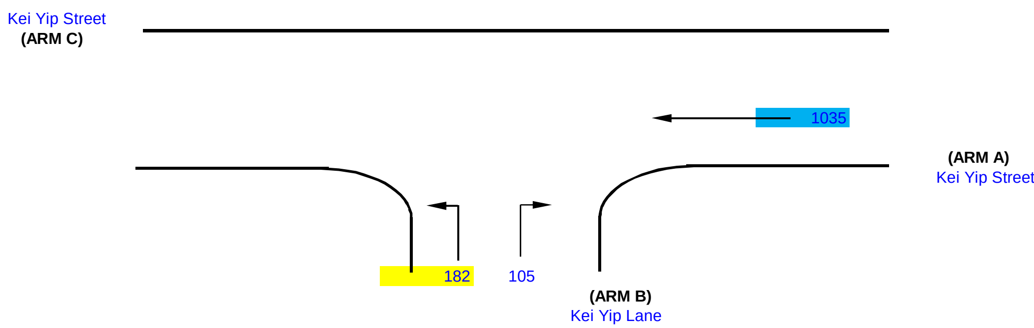
COMPARISION OF DESIGN FLOW TO CAPACITY :

DFC b-a	=	0.00
DFC b-c	=	0.83
DFC c-b	=	0.00
DFC b-ac	=	0.83

PRIORITY JUNCTION CAPACITY CALCULATION

AECOM

Junction J23 - Kei Yip Street / Kei Yip Lane	2031 AM Design Traffic Flows	Designed By : SL	Checked By : DW	Job No. : 60493364	Date : Jun 20



NOTES : (GEOMETRIC INPUT DATA)

J23

W	= Major Road Width (6.4 - 20.0)
W cr	= Central Reserve width (1.2 - 9.0, kerbed central reserve only)
W b-a	= Lane width available to vehicle waiting in stream b-a (2.05 - 4.70)
W b-c	= Lane width available to vehicle waiting in stream b-c (2.05 - 4.70)
W c-b	= Lane width available to vehicle waiting in stream c-b (2.05 - 4.70)
Vl b-a	= Visibility to the left for vehicles waiting in stream b-a (22.0 - 250.0)
Vr b-a	= Visibility to the right for vehicles waiting in stream b-a (17.0 - 250.0)
Vr b-c	= Visibilitu to the right for vehicles waiting in stream b-c (17.0 - 250.0)
Vr c-b	= Visibility to the right for vehicles waiting in stream c-b (17.0 - 250.0)
D	= Stream-specific B-A
E	= Stream-specific B-C
F	= Stream-specific C-B
Y	= (1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)			*MAJOR ROAD (ARM C)*			*MINOR ROAD (ARM B)*		
W	=	8.25 (metres)	W c-b	=	(metres)	W b-a	=	2.05 (metres)
W cr	=	0 (metres)	Vr c-b	=	(metres)	W b-c	=	2.05 (metres)
q a-b	=	0 (pcu/hr)	q c-a	=	0 (pcu/hr)	Vl b-a	=	250 (metres)
q a-c	=	1035 (pcu/hr)	q c-b	=	0 (pcu/hr)	Vr b-a	=	70 (metres)
						Vr b-c	=	70 (metres)
						q b-a	=	105 (pcu/hr)
						q b-c	=	182 (pcu/hr)

GEOMETRIC FACTORS :

D	=	0.860050
E	=	0.811368
F	=	0.585955
Y	=	0.715375

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THE CAPACITY OF MOVEMENT :

Q b-a	=	307
Q b-c	=	386
Q c-b	=	279
Q b-ac	=	353

CRITICAL DFC = 0.81

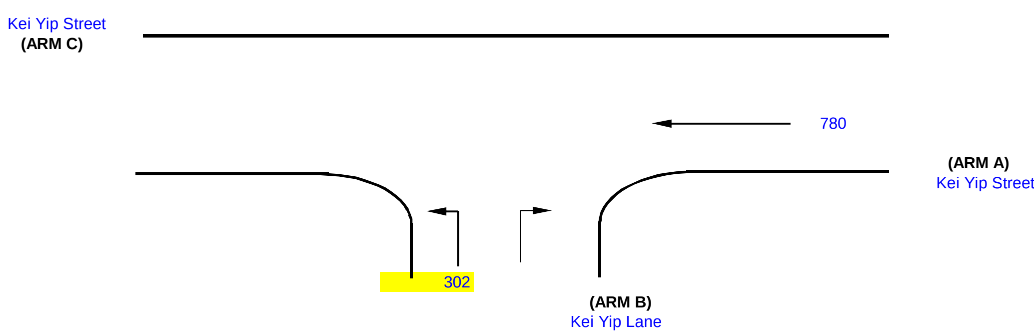
COMPARISION OF DESIGN FLOW TO CAPACITY :

DFC b-a	=	0.34
DFC b-c	=	0.47
DFC c-b	=	0.00
DFC b-ac	=	0.81

PRIORITY JUNCTION CAPACITY CALCULATION

AECOM

Junction J23 - Kei Yip Street / Kei Yip Lane	2031 PM Design Traffic Flows	Designed By : SL	Checked By : DW	Job No. : 60493364	Date : Jun 20



NOTES : (GEOMETRIC INPUT DATA)

J23

W	= Major Road Width (6.4 - 20.0)
W cr	= Central Reserve width (1.2 - 9.0, kerbed central reserve only)
W b-a	= Lane width available to vehicle waiting in stream b-a (2.05 - 4.70)
W b-c	= Lane width available to vehicle waiting in stream b-c (2.05 - 4.70)
W c-b	= Lane width available to vehicle waiting in stream c-b (2.05 - 4.70)
Vl b-a	= Visibility to the left for vehicles waiting in stream b-a (22.0 - 250.0)
Vr b-a	= Visibility to the right for vehicles waiting in stream b-a (17.0 - 250.0)
Vr b-c	= Visibilitu to the right for vehicles waiting in stream b-c (17.0 - 250.0)
Vr c-b	= Visibility to the right for vehicles waiting in stream c-b (17.0 - 250.0)
D	= Stream-specific B-A
E	= Stream-specific B-C
F	= Stream-specific C-B
Y	= (1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)				*MAJOR ROAD (ARM C)*				*MINOR ROAD (ARM B)*			
W	=	8.25	(metres)	W c-b	=		(metres)	W b-a	=		(metres)
W cr	=	0	(metres)	Vr c-b	=		(metres)	W b-c	=	4	(metres)
q a-b	=	0	(pcu/hr)	q c-a	=	0	(pcu/hr)	Vl b-a	=	250	(metres)
q a-c	=	780	(pcu/hr)	q c-b	=	0	(pcu/hr)	Vr b-a	=	70	(metres)
								Vr b-c	=	70	(metres)
								q b-a	=	0	(pcu/hr)
								q b-c	=	302	(pcu/hr)

GEOMETRIC FACTORS :

D	=	0.664980
E	=	0.986420
F	=	0.585955
Y	=	0.715375

THE CAPACITY OF MOVEMENT :

Q b-a	=	282
Q b-c	=	535
Q c-b	=	318
Q b-ac	=	535

CRITICAL DFC = 0.56

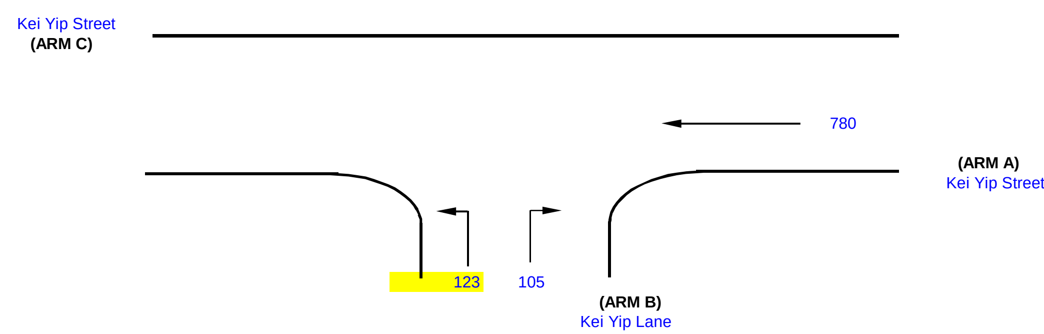
COMPARISION OF DESIGN FLOW TO CAPACITY :

DFC b-a	=	0.00
DFC b-c	=	0.56
DFC c-b	=	0.00
DFC b-ac	=	0.56

PRIORITY JUNCTION CAPACITY CALCULATION

AECOM

Junction J23 - Kei Yip Street / Kei Yip Lane	2031 PM Design Traffic Flows	Designed By : SL	Checked By : DW	Job No. : 60493364	Date : Jun 20



NOTES : (GEOMETRIC INPUT DATA)

J23

W	= Major Road Width (6.4 - 20.0)
W cr	= Central Reserve width (1.2 - 9.0, kerbed central reserve only)
W b-a	= Lane width available to vehicle waiting in stream b-a (2.05 - 4.70)
W b-c	= Lane width available to vehicle waiting in stream b-c (2.05 - 4.70)
W c-b	= Lane width available to vehicle waiting in stream c-b (2.05 - 4.70)
Vl b-a	= Visibility to the left for vehicles waiting in stream b-a (22.0 - 250.0)
Vr b-a	= Visibility to the right for vehicles waiting in stream b-a (17.0 - 250.0)
Vr b-c	= Visibilitu to the right for vehicles waiting in stream b-c (17.0 - 250.0)
Vr c-b	= Visibility to the right for vehicles waiting in stream c-b (17.0 - 250.0)
D	= Stream-specific B-A
E	= Stream-specific B-C
F	= Stream-specific C-B
Y	= (1-0.0345W)

GEOMETRIC DETAILS:

MAJOR ROAD (ARM A)				*MAJOR ROAD (ARM C)*				*MINOR ROAD (ARM B)*			
W	=	8.25	(metres)	W c-b	=		(metres)	W b-a	=	2.05	(metres)
W cr	=	0	(metres)	Vr c-b	=		(metres)	W b-c	=	2.05	(metres)
q a-b	=	0	(pcu/hr)	q c-a	=	0	(pcu/hr)	Vl b-a	=	250	(metres)
q a-c	=	780	(pcu/hr)	q c-b	=	0	(pcu/hr)	Vr b-a	=	70	(metres)
								Vr b-c	=	70	(metres)
								q b-a	=	105	(pcu/hr)
								q b-c	=	123	(pcu/hr)

GEOMETRIC FACTORS :

D	=	0.860050
E	=	0.811368
F	=	0.585955
Y	=	0.715375

`

THE CAPACITY OF MOVEMENT :

Q b-a	=	365
Q b-c	=	440
Q c-b	=	318
Q b-ac	=	402

CRITICAL DFC = 0.57

COMPARISION OF DESIGN FLOW TO CAPACITY :

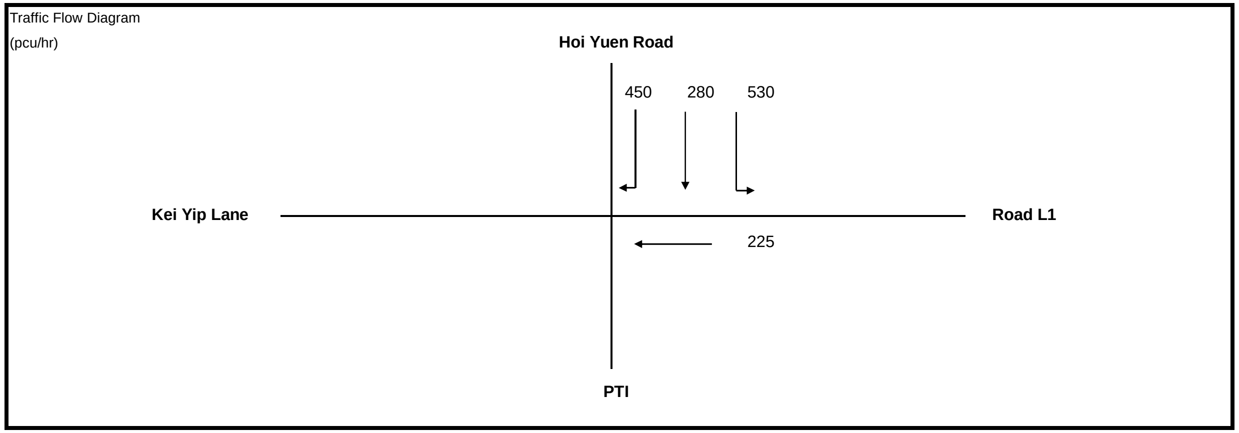
DFC b-a	=	0.29
DFC b-c	=	0.28
DFC c-b	=	0.00
DFC b-ac	=	0.57

JUNCTION CAPACITY CALCULATION

AECOM

Junction J24 - Hoi Yuen Road / Kei Yip Lane / Road L1	2031 AM Design Traffic Flows - with J19 Imp Scheme	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

Traffic Flow Diagram
(pcu/hr)

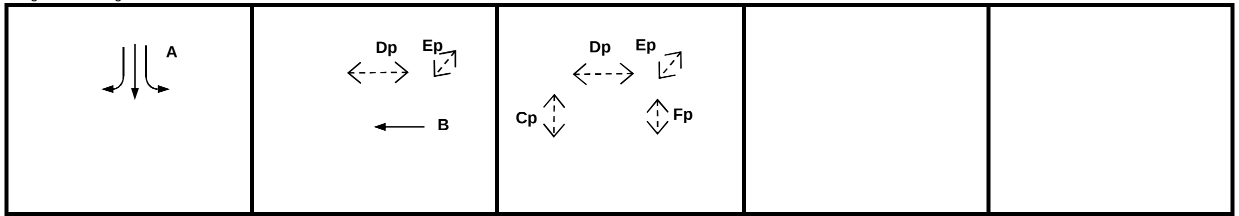


J24

No. of stages per cycle	N =	3	
Cycle time	C =	90	sec
Sum(y)	Y =	0.406	
Lost time	L =	27	sec
Total Flow	=	1,485	pcu

Optimum Cycle C_o	$= (1.5 \times L+5)/(1-Y)$ =		77	sec
Min. Cycle Time C_m	= L/(1-Y)	=	45	sec
Y_{ult}	$= 0.9-0.0075 \times L$	=	0.698	
R.C.$_{ult}$	$= (Y_{ult}-Y)/Y \times 100\%$	=	71.7	%
Practical Cycle Time C_p	$= 0.9 \times L/(0.9-Y)$	=	49	sec
Y_{max}	= 1-L/C	=	0.700	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		

I/G = 5 I/G = 8 G = 5 I/G = 11

Critical Case : A,B,Cp

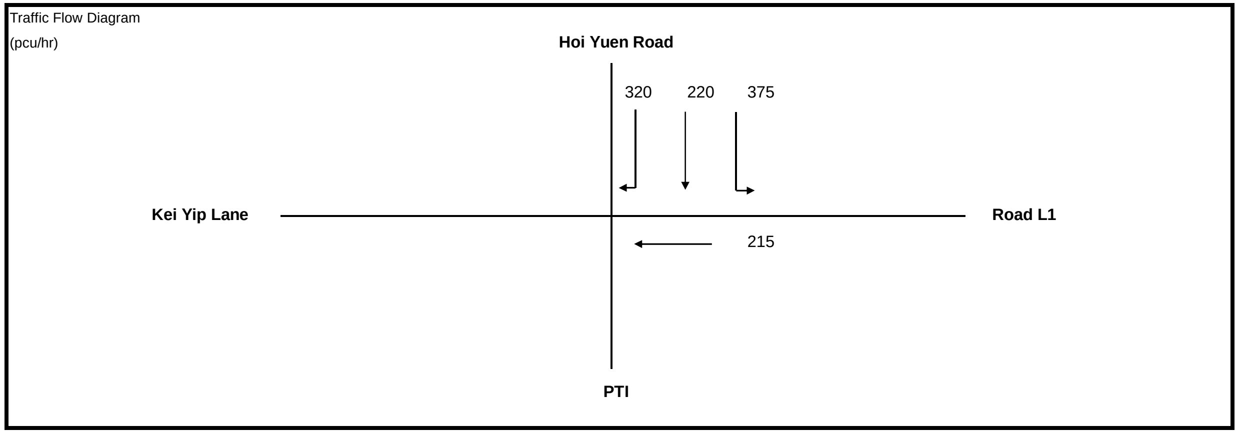
R.C.(C) $= (0.9 \times Y_{max}-Y)/Y \times 100\%$ = 55%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.800	1	15			1		0		1995	530			530	100%		1814	0.292	0.292
	A	1	3.800	1		15	0	0		0		2135		280	114	394		29%	2075	0.190	
	A	1	3.800	1		12	0	1		0		1995			336	336		100%	1773	0.190	
	B	2	3.600	1				1		0		1975		225		225			1975	0.114	0.114
Pedestrian Crossing				GM		FGM															
	Cp	3	min.	5	+	9	=	14	sec												*
	Dp	2,3	min.	8	+	15	=	23	sec												
	Ep	2,3	min.	5	+	6	=	11	sec												
	Fp	3	min.	5	+	5	=	10	sec												

JUNCTION CAPACITY CALCULATION

AECOM

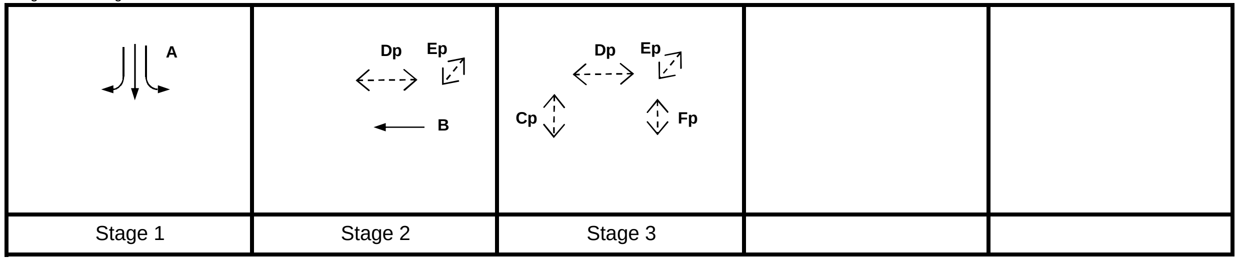
Junction J24 - Hoi Yuen Road / Kei Yip Lane / Road L1	2031 PM Design Traffic Flows - with J19 Imp Scheme	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19



J24

No. of stages per cycle	N =	3	
Cycle time	C =	90	sec
Sum(y)	Y =	0.316	
Lost time	L =	27	sec
Total Flow	=	1,130	pcu
Optimum Cycle C_o = $(1.5\times L+5)/(1-Y)$	=	66	sec
Min. Cycle Time C_m = $L/(1-Y)$	=	39	sec
Y_{ult} = $0.9-0.0075\times L$	=	0.698	
$R.C._{ult}$ = $(Y_{ult}-Y)/Y\times100\%$	=	121.0	%
Practical Cycle Time C_p = $0.9\times L/(0.9-Y)$	=	42	sec
Y_{max} = $1-L/C$	=	0.700	

Stage/Phase Diagrams



I/G = 5 I/G = 8 G = 5 I/G = 11

Critical Case : A,B,Cp

R.C.(C) = $(0.9\times Y_{max}-Y)/Y\times100\%$ = 100%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.800	1	15			1		0		1995	375			375	100%		1814	0.207	0.207
	A	1	3.800	1		15	0	0		0		2135		220	72	292		25%	2084	0.140	
	A	1	3.800	1		12	0	1		0		1995			248	248		100%	1773	0.140	
	B	2	3.600	1				1		0		1975		215		215			1975	0.109	0.109
Pedestrian Crossing				GM		FGM															
	Cp	3	min.	5	+	9	=	14	sec												*
	Dp	2,3	min.	8	+	15	=	23	sec												
	Ep	2,3	min.	5	+	6	=	11	sec												
	Fp	3	min.	5	+	5	=	10	sec												

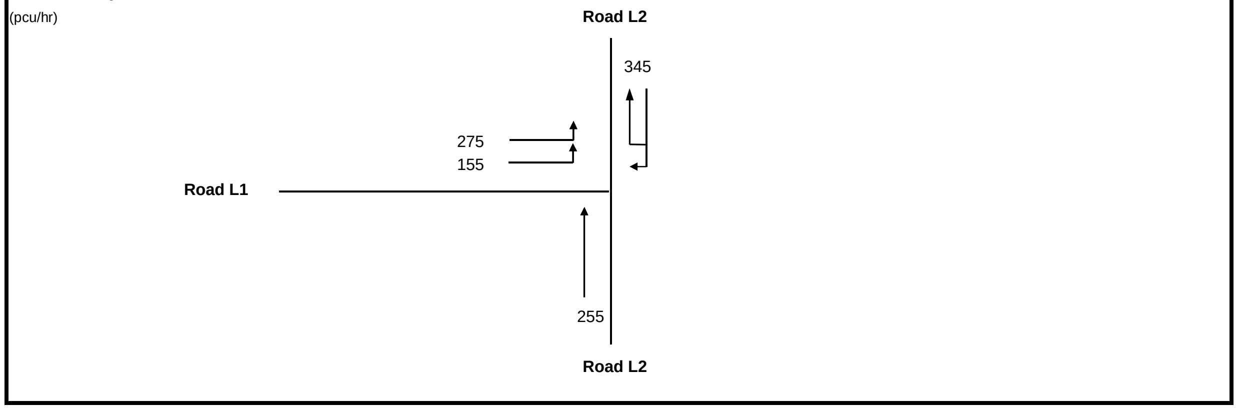
JUNCTION CAPACITY CALCULATION

AECOM

Junction J25 - Road L1 / Road L2	2031 AM Design Traffic Flows - with J19 Imp Scheme (w UT at Road L2)	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

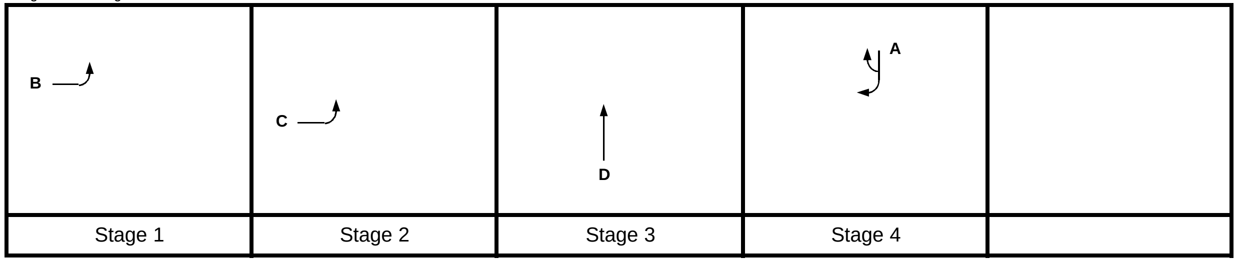
J25

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	4	
Cycle time		C =	108	sec
Sum(y)		Y =	0.526	
Lost time		L =	17	sec
Total Flow		=	1,030	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y)$	=	64	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	36	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.773	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times100\%$	=	46.9	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	41	sec
Y_{max}	$= 1-L/C$	=	0.843	

Stage/Phase Diagrams



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

Critical Case : B,C,D,A

R.C.(C) $= (0.9\text{x}Y_{max}\text{-}Y)/Y\text{x}100\% =$ 44%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m)		OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr)			TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%)		REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
					LEFT	RIGHT							LEFT	STRAIGHT AHEAD	RIGHT		LEFT	RIGHT			
	A	4	5.000	1		15	0	1		0		2115			345	345		100%	1923	0.179	0.179
	B	1	4.500	1	15			1		0		2065	275			275	100%		1877	0.146	0.146
	C	2	3.700	1	17			0		0		2125	155			155	100%		1953	0.079	0.079
	D	3	5.000	1				1		0		2115		255		255			2115	0.121	0.121

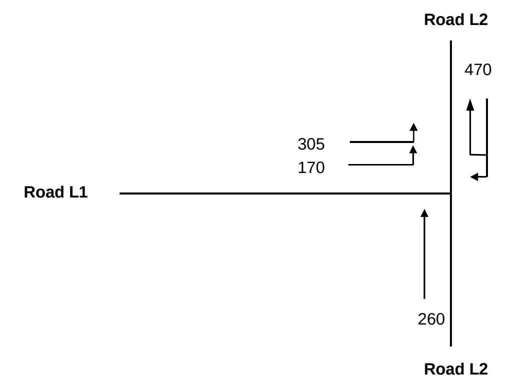
JUNCTION CAPACITY CALCULATION

AECOM

Junction J25 - Road L1 / Road L2	2031 PM Design Traffic Flows - with J19 Imp Scheme (w UT at Road L2)	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

J25

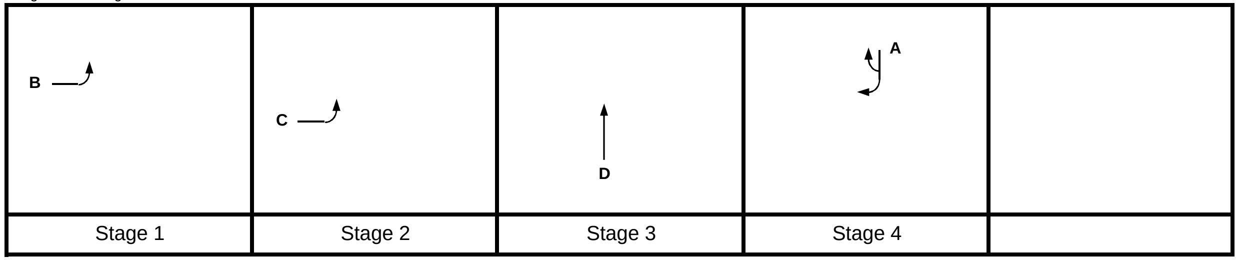
Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	4	
Cycle time	C =	108	sec
Sum(y)	Y =	0.617	
Lost time	L =	17	sec
Total Flow	=	1,205	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	80	sec
Min. Cycle Time C_m	$= L/(1-Y) =$	44	sec
Y_{ult}	$= 0.9-0.0075\times L =$	0.773	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times 100\% =$	25.2	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y) =$	54	sec
Y_{max}	$= 1-L/C =$	0.843	

Stage/Phase Diagrams



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

Critical Case : B,C,D,A

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 23%

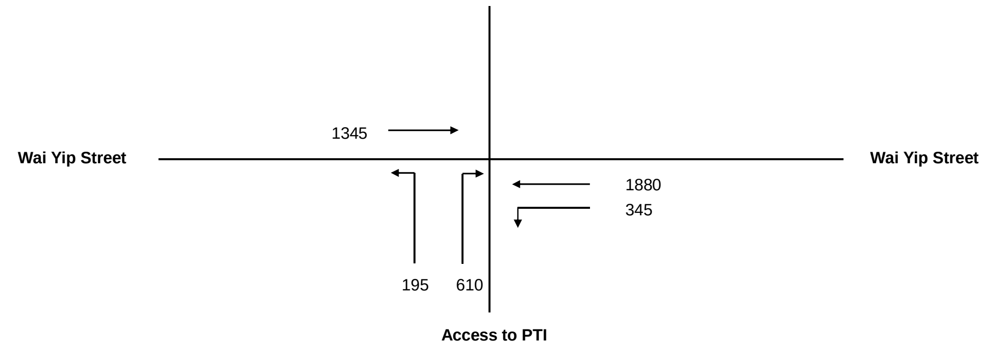
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m)		OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr)			TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%)		REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
					LEFT	RIGHT							LEFT	STRAIGHT AHEAD	RIGHT		LEFT	RIGHT			
	A	4	5.000	1		15	0	1		0		2115			470	470		100%	1923	0.244	0.244
	B	1	4.500	1	15			1		0		2065	305			305	100%		1877	0.162	0.162
	C	2	3.700	1	17			0		0		2125	170			170	100%		1953	0.087	0.087
	D	3	5.000	1				1		0		2115		260		260			2115	0.123	0.123

JUNCTION CAPACITY CALCULATION

AECOM

Junction J26 - Wai Yip Street / Road L2	2031 AM Design Traffic Flows - with J19 Imp Scheme	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Mar 19

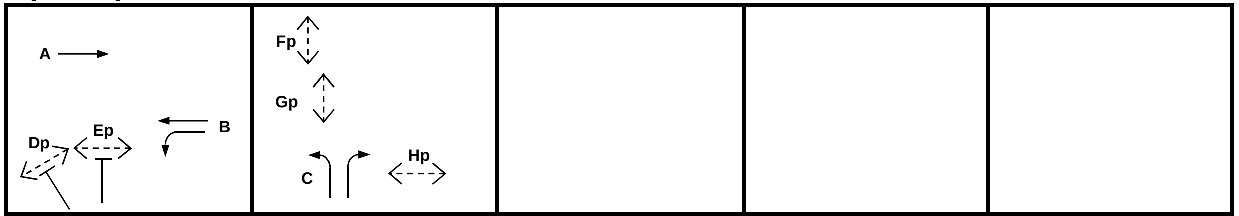
Traffic Flow Diagram
(pcu/hr)



J26

No. of stages per cycle	N =	2	
Cycle time	C =	120	sec
Sum(y)	Y =	0.727	
Lost time	L =	10	sec
Total Flow	=	4,375	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	73	sec
Min. Cycle Time C_m	$= L/(1-Y) =$	37	sec
Y_{ult}	$= 0.9-0.0075\times L =$	0.825	
R.C.$_{ult}$	$= (Y_{ult}-Y)/Y\times100\% =$	13.5	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y) =$	52	sec
Y_{max}	$= 1-L/C =$	0.917	

Stage/Phase Diagrams



I/G = 7   I/G = 5

Critical Case : B,C

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 13%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
→	A	1	3.500	2				1		0		4070		1345		1345			4070	0.330	
↰←	B	1	3.000	1	12			1		0		1915	345	706		1051	33%		1840	0.571	
←	B	1	3.000	1				0		0		2055		1174		1174			2055	0.571	0.571
↰	C	2	3.500	1	15			1		0		1965	195			195	100%		1786	0.109	
↱	C	2	3.500	2		20	0	0		0		4210			610	610		100%	3916	0.156	0.156
Pedestrian Crossing				GM		FGM															
	Dp	1	min.	5	+	5	=	10	sec												
	Ep	1	min.	5	+	6	=	11	sec												
	Fp	2	min.	5	+	6	=	11	sec												
	Gp	2	min.	5	+	8	=	13	sec												
	Hp	2	min.	5	+	8	=	13	sec												

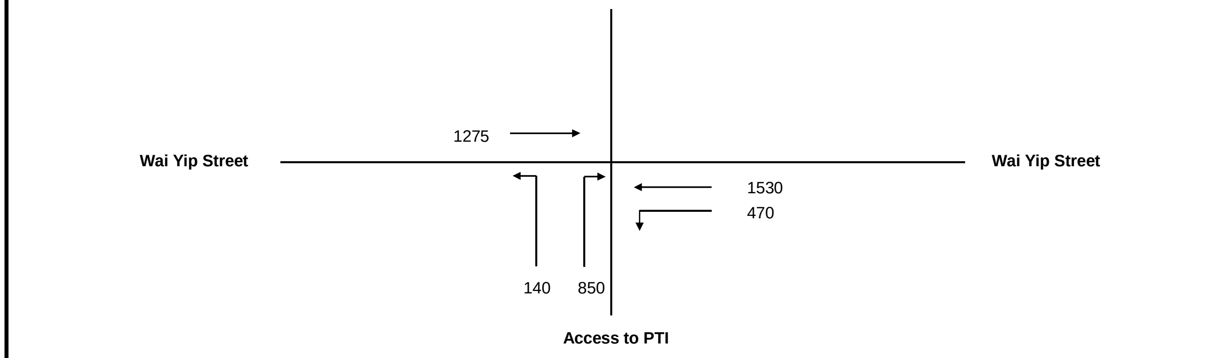
JUNCTION CAPACITY CALCULATION

AECOM

Junction J26 - Wai Yip Street / Road L2	2031 PM Design Traffic Flows - with J19 Imp Scheme	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: May 19

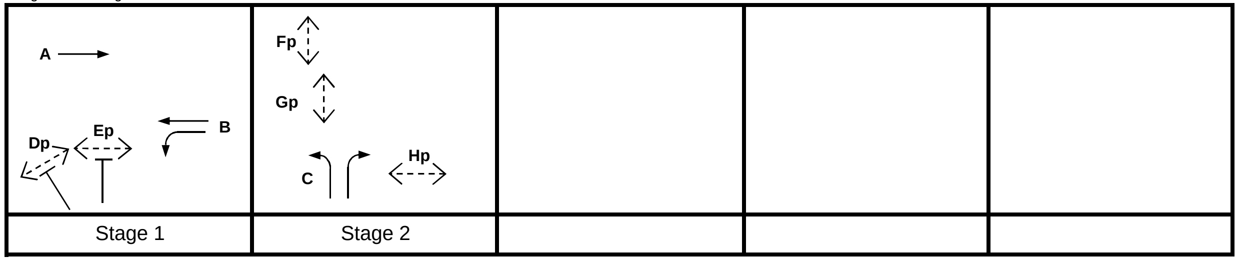
J26

Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle		N =	2	
Cycle time		C =	120	sec
Sum(y)		Y =	0.736	
Lost time		L =	10	sec
Total Flow		=	4,265	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$		76	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	38	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.825	
R.C.$_{ult}$	$= (Y_{ult}-Y)/Y\times100\%$	=	12.2	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	55	sec
Y_{max}	$= 1-L/C$	=	0.917	

Stage/Phase Diagrams



I/G = 7 I/G = 5

Critical Case : B,C

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 12%

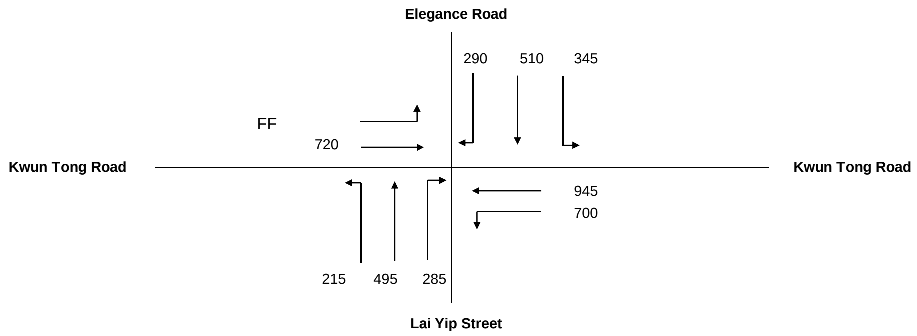
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR *y*	CRITICAL *y*
	A	1	3.500	2				1		0		4070		1275		1275			4070	0.313	
	B	1	3.000	1	12			1		0		1915	470	464		934	50%		1802	0.419	0.419
	B	1	3.000	1				0		0		2055		1066		1066			2055	0.419	
	C	2	3.500	1	15			1		0		1965	140			140	100%		1786	0.078	
	C	2	3.500	2		20	0	0		0		4210			850	850		100%	3916	0.317	0.317
Pedestrian Crossing				GM		FGM															
	Dp	1	min.	5	+	5	=	10	sec												
	Ep	1	min.	5	+	6	=	11	sec												
	Fp	2	min.	5	+	6	=	11	sec												
	Gp	2	min.	5	+	8	=	13	sec												
	Hp	2	min.	5	+	8	=	13	sec												

JUNCTION CAPACITY CALCULATION

AECOM

Junction J1 - Kwun Tong Road / Lai Yip Street	2031 AM Design Traffic Flows - Improvement Scheme	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

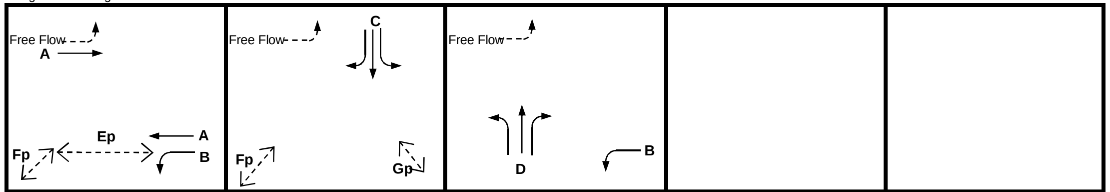
Traffic Flow Diagram
(pcu/hr)



J1

No. of stages per cycle	N =	3	
Cycle time	C =	118	sec
Sum(y)	Y =	0.683	
Lost time	L =	12	sec
Total Flow	=	4,505	pcu
Optimum Cycle C_o = $(1.5\times L+5)/(1-Y)$	=	73	sec
Min. Cycle Time C_m = $L/(1-Y)$	=	38	sec
Y_{ult} = $0.9-0.0075\times L$	=	0.810	
$R.C._{ult}$ = $(Y_{ult}-Y)/Y\text{x}100\%$	=	18.5	%
Practical Cycle Time C_p = $0.9\times L/(0.9-Y)$	=	50	sec
Y_{max} = $1-L/C$	=	0.898	

Stage/Phase Diagrams



Stage 1	Stage 2	Stage 3		
I/G = 8	I/G = 6	I/G =		

Critical Case : B,C

R.C.(C) = $(0.9\text{x}Y_{max}-Y)/Y\text{x}100\%$ = 18%

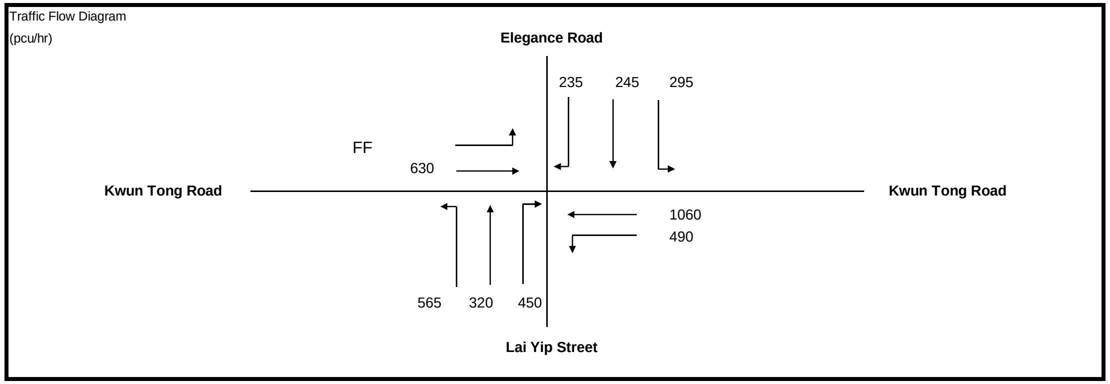
MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.220	2				0		0		4154		720		720			4154	0.173	
	A	1	3.125	2				0		0		4135		945		945			4135	0.229	
	B	1,3	3.220	1	10			1		0	-253	1937	700			700	100%		1464	0.478	0.478
	C	2	3.180	1	10			1		0		1933	345			345	100%		1681	0.205	0.205
	C	2	3.180	1				0		0		2073		352		352			2073	0.170	
	C	2	3.180	1		25	0	0		0		2073		158	183	341		54%	2008	0.170	
Flared Length															107						
	D	3	3.000	1	10			1		0		1915	78			78	100%		1665	0.047	
Flared Length													137								
	D	3	3.000	1				0		0		2055		404		404			2055	0.197	
	D	3	3.000	1		15	0	0		0		2055		91	285	376		76%	1910	0.197	
Pedestrian Crossing				GM		FGM															
	Ep	1	min.	7	+	9	=	16	sec												
	Fp	1,2	min.	7	+	6	=	13	sec												
	Gp	2	min.	5	+	6	=	11	sec												

*Remark: Flows of Phase C (right-turning movement) and Phase D (left-turning and straight-ahead movements) are deducted by flows capacity of the flared lane.
As left-turn lane for Phase B is not a full lane, capacity of this lane is deducted.

JUNCTION CAPACITY CALCULATION

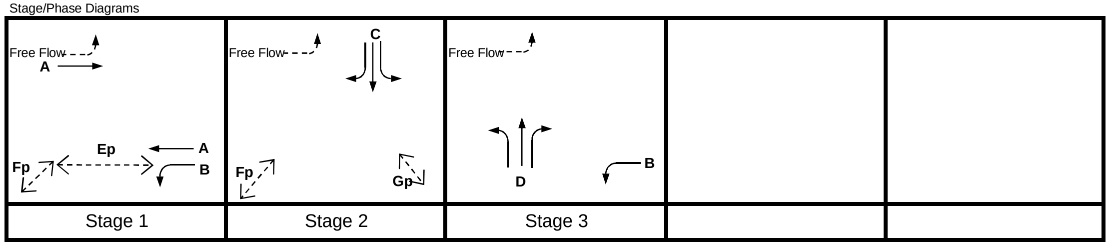
AECOM

Junction J1 - Kwun Tong Road / Lai Yip Street	2031 PM Design Traffic Flows - Improvement Scheme	DESIGN: SL	CHECK: DW	JOB NO: 60493364	DATE: Jun 19



J1

No. of stages per cycle	N =	3	
Cycle time	C =	118	sec
Sum(y)	Y =	0.689	
Lost time	L =	19	sec
Total Flow	=	4,290	pcu
Optimum Cycle C_o = $(1.5\times L+5)/(1-Y)$	=	108	sec
Min. Cycle Time C_m = $L/(1-Y)$	=	61	sec
Y_{ult} = $0.9-0.0075\times L$	=	0.758	
$R.C._{ult}$ = $(Y_{ult}-Y)/Y\times100\%$	=	10.0	%
Practical Cycle Time C_p = $0.9\times L/(0.9-Y)$	=	81	sec
Y_{max} = $1-L/C$	=	0.839	



I/G = 8 I/G = 6 I/G = 8

Critical Case : A,C,D

R.C.(C) = $(0.9xY_{max}-Y)/Yx100\%$ = 10%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	A	1	3.220	2				0		0		4154		630		630			4154	0.152	
	A	1	3.125	2				0		0		4135		1060		1060			4135	0.256	0.256
	B	1,3	3.220	1	10			1		0	-253	1937	490			490	100%		1464	0.335	
	C	2	3.180	1	10			1		0		1933	295			295	100%		1681	0.176	0.176
	C	2	3.180	1				0		0		2073		190		190			2073	0.092	
	C	2	3.180	1		25	0	0		0		2073		55	128	183		70%	1989	0.092	
Flared Length															107						
	D	3	3.000	1	10			1		0		1915	428			428	100%		1665	0.257	0.257
Flared Length													137								
	D	3	3.000	1				0		0		2055		320		320			2055	0.156	
	D	3	3.000	1		15	0	0		0		2055		0	450	450		100%	1868	0.241	

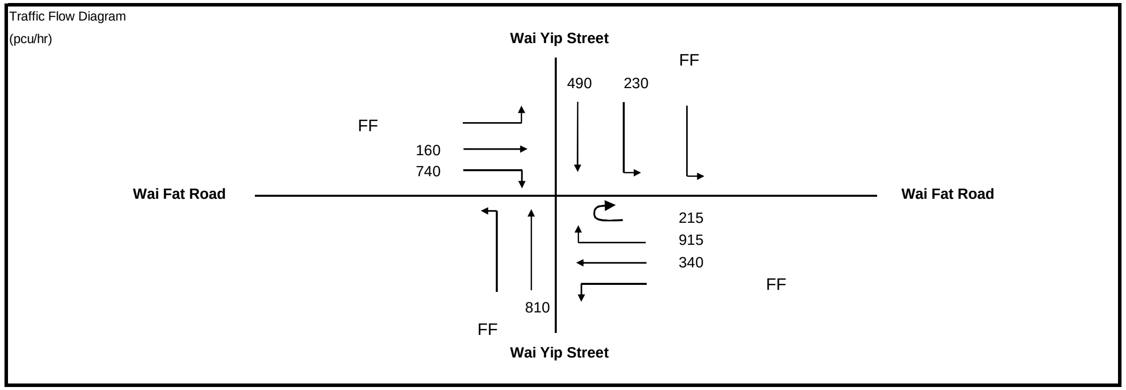
Pedestrian Crossing			GM		FGM			
Ep	1	min.	7	+	9	=	16	sec
Fp	1,2	min.	7	+	6	=	13	sec
Gp	2	min.	5	+	6	=	11	sec

*Remark: Flows of Phase C (right-turning movement) and Phase D (left-turning and straight-ahead movements) are deducted by flows capacity of the flared lane.
As left-turn lane for Phase B is not a full lane, capacity of this lane is deducted.

JUNCTION CAPACITY CALCULATION

AECOM

Junction J19 - Wai Yip Street / Wai Fat Road	2031 AM Design Traffic Flows - Medium Term Proposal	DESIGN: DW	CHECK: DW	JOB NO: 60493364	DATE: Jun 19



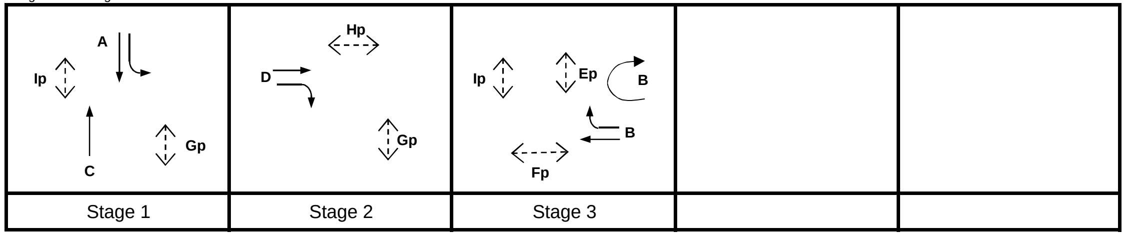
J19

No. of stages per cycle	N =	3	
Cycle time	C =	140	sec
Sum(y)	Y =	0.692	
Lost time	L =	22	sec
Total Flow	=	3,900	pcu
Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y) =$	123	sec
Min. Cycle Time C_m	$= L/(1-Y) =$	71	sec
Y_{ult}	$= 0.9-0.0075\times L =$	0.735	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\times100\% =$	6.3	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y) =$	95	sec
Y_{max}	$= 1-L/C =$	0.843	

Critical Case : C,D,B

R.C.(C) $= (0.9xY_{max}-Y)/Yx100\% =$ 10%

Stage/Phase Diagrams



I/G = 8 I/G = 11 I/G = 6

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	D	2	3.850	1		27	0	0		0		2140		160	295	455		65%	2066	0.220	0.220
	D	2	3.850	1		25	0	0		0		2140			445	445		100%	2019	0.220	
	C	1	3.500	2				0		0		4210		810		810			4210	0.192	0.192
	B	3	3.500	2		20	0	0		0		4210			1092	1092		100%	3916	0.279	0.279
Flared Lane (u-turn)															38						
	B	3	3.500	1				0		0		2105		268		268			2105	0.127	
Flared Lane														72							
	A	1	3.500	1	15			0		0		2105	230			230	100%		1914	0.120	
	A	1	3.500	1	17			0		0		2105	0	370		370	0%		2105	0.176	
Flared Lane														120							
Pedestrian Crossing				GM		FGM															
	Ep	3	min.	5	+	10	=	15	sec												
	Fp	3	min.	11	+	10	=	21	sec												
	Gp	1,2	min.	7	+	14	=	21	sec												
	Hp	2	min.	14	+	13	=	27	sec												
	Ip	1,3	min.	5	+	10	=	15	sec												

*Remark: Flows of Phase A & B are deducted by capcity flows of flared lane.

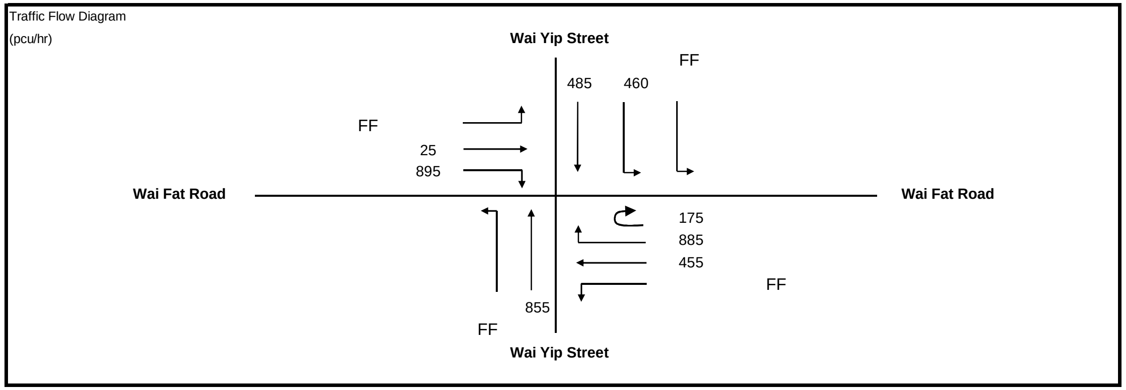
JUNCTION CONCAPACITY CALCULATION

AECOM

Junction J19 - Wai Yip Street / Wai Fat Road	2031 PM Design Traffic Flows - Medium Term Proposal	DESIGN: DW	CHECK: DW	JOB NO: 60493364	DATE: Jun 19

J19

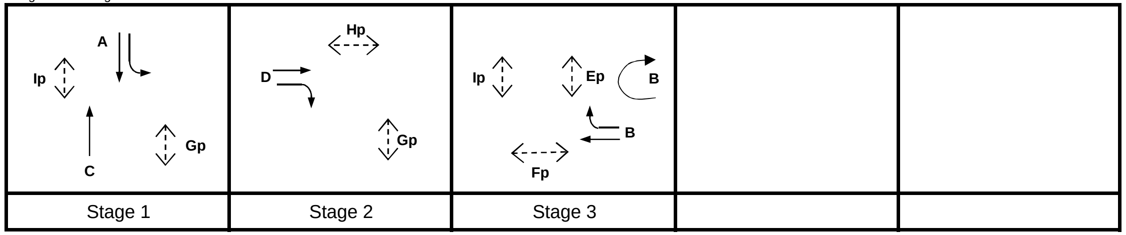
Traffic Flow Diagram
(pcu/hr)



No. of stages per cycle	N =	3	
Cycle time	C =	140	sec
Sum(y)	Y =	0.691	
Lost time	L =	22	sec
Total Flow	=	4,235	pcu

Optimum Cycle C_o	$= (1.5\times L+5)/(1-Y)$	=	123	sec
Min. Cycle Time C_m	$= L/(1-Y)$	=	71	sec
Y_{ult}	$= 0.9-0.0075\times L$	=	0.735	
$R.C._{ult}$	$= (Y_{ult}-Y)/Y\text{x}100\%$	=	6.4	%
Practical Cycle Time C_p	$= 0.9\times L/(0.9-Y)$	=	95	sec
Y_{max}	$= 1-L/C$	=	0.843	

Stage/Phase Diagrams



I/G = 8 I/G = 11 I/G = 6

Critical Case : C,D,B

R.C.(C) $= (0.9\text{x}Y_{max}-Y)/Y\text{x}100\% =$ 10%

MOVEMENT	PHASE	STAGE	LANE WIDTH (m)	NO. OF LANES	RADIUS (m) LEFT	RADIUS (m) RIGHT	OPPOSING TRAFFIC	NEAR SIDE LANE	UPHILL GRADIENT (%)	GRADIENT EFFECT (pcu/hr)	ADDITIONAL CAPACITY (pcu/hr)	STRAIGHT-AHEAD SAT. FLOW (pcu/hr)	FLOW (pcu/hr) LEFT	FLOW (pcu/hr) STRAIGHT AHEAD	FLOW (pcu/hr) RIGHT	TOTAL FLOW (pcu/hr)	PROPORTION OF TURNING VEHICLES (%) LEFT	PROPORTION OF TURNING VEHICLES (%) RIGHT	REVISED SAT. FLOW (pcu/hr)	FLOW FACTOR y	CRITICAL y
	D	2	3.850	1		27	0	0		0		2140		25	437	462		95%	2033	0.227	0.227
	D	2	3.850	1		25	0	0		0		2140			458	458		100%	2019	0.227	
	C	1	3.500	2				0		0		4210		855		855			4210	0.203	0.203
	B	3	3.500	2		20	0	0		0		4210			1022	1022		100%	3916	0.261	0.261
Flared Lane (u-turn)															38						
	B	3	3.500	1				0		0		2105		383		383			2105	0.182	
Flared Lane														72							
	A	1	3.500	1	15			0		0		2105	396			396	100%		1914	0.207	
	A	1	3.500	1	17			0		0		2105	64	365		429	15%		2077	0.207	
Flared Lane														120							
Pedestrian Crossing				GM		FGM															
	Ep	3	min.	5	+	10	=	15	sec												
	Fp	3	min.	11	+	10	=	21	sec												
	Gp	1,2	min.	7	+	14	=	21	sec												
	Hp	2	min.	14	+	13	=	27	sec												
	Ip	1,3	min.	5	+	10	=	15	sec												

*Remark: Flows of Phase A & B are deducted by capcity flows of flared lane.

Attachment Vb of
MPC Paper No. 2/21

起動九龍東 Energizing Kowloon East

Agreement No. CE 61/2015 (TP)
Planning and Engineering Study on

Kwun Tong Action Area
Feasibility Study

TR11 - Landscape and Visual Impact Assessment
(Final - R3)

January 2021

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發展局起動九龍東辦事處
Energizing Kowloon East Office
Development Bureau

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Kowloon East Office
九龍東辦事處

Development Bureau
Government Secretariat
Energizing Kowloon East Office

Agreement No. CE 61/2015 (TP)

Planning and Engineering Study on Kwun Tong Action Area – Feasibility Study

TR11 – Landscape and Visual Impact Assessment (Final – R3)

12 January 2021

Prepared:	Remus Woo	(12 January 2021)
Reviewed:	Carol Hui	(12 January 2021)
Approved for Issue:	Pearl Hui	(12 January 2021)

AECOM Asia Company Ltd.

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APPENDICES

Note: Appendix B is not attached in the MPC Paper No. 2/21. For results of detailed tree survey, please refer to the Tree Survey Report (**Attachment Vc** of MPC Paper no. 2/21.)

FIGURES

1 BACKGROUND AND OBJECTIVES

1.1 Background

1.1.1 This Report presents the findings of the assessment of potential landscape and visual impacts associated with the Proposed Development of KTAA in accordance with the Clause 6.53 of the Study Brief.

1.1.2 This Study is not a “Designated Project” under Environmental Impact Assessment Ordinance (EIAO). However, for the ease of assessment purposes, the landscape impact assessment of this Landscape and Visual Impact Assessment (LVIA) is making reference to the requirements in Section 3.4.11 and Appendix H of the EIA Study Brief issued by Environmental Protection Department and Annexes 10 and 18 of the Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM). Further guidance is given by the Environmental Impact Assessment Ordinance (EIAO) Guidance Note No. 8/2010.

1.1.3 According to EIA Study Brief Section 3.4.11.2, the assessment area for the landscape impact assessment shall include areas within 500m distance from the site boundary of the Proposed Development and is shown in **Figure 1.1**.

1.1.4 The visual impact assessment of this Landscape and Visual Impact Assessment (LVIA) is prepared in accordance with the requirements of TPB PG-No. 41 - Town Planning Board Guidelines on Submission of Visual Impact Assessment for Planning Application to the Town Planning Board.

1.1.5 The assessment area for the landscape impact assessment of the Proposed Development and is shown in **Figure 1.1** while the assessment area for the visual impact assessment shall be defined by the visual envelope of the Proposed Development and is shown in **Figure 1.2**.

1.2 Objective of the Technical Report

1.2.1 The objective of the LVIA is to undertake baseline survey and analysis in order to identify critical issues and predict landscape and visual impacts during the construction and operation phases of the Proposed Development. It identifies, describes and quantifies any potential landscape and visual impacts, evaluates the significance of such impacts on sensitive receivers and proposes measures to avoid or mitigate the significance of any adverse impacts where required.

1.3 Scope of the LVIA

1.3.1 The scope of the LVIA assessment includes:

- a definition of the scope and contents of the study, including a description of the assessment methodology;
- a review of the relevant planning and development control framework;
- a baseline study providing a comprehensive description and identification of the sensitivity of the baseline Landscape Resources, Landscape Character Areas, and Visually Sensitive Receivers (VSRs);

- identification of potential sources of landscape and visual impact during construction and operation of the Proposed Development;

- identification of the potential landscape and visual impacts and prediction of their nature, magnitude of change and potential significance, before and after the mitigation measures;

- recommendation of appropriate mitigation measures and associated implementation programmes; and

- an assessment of the acceptability or otherwise of the predicted residual impacts, according to the five criteria set out in Annex 10 of the EIAO-TM.

2 PROPOSED DEVELOPMENT

2.1 General Description

2.1.1 The Study Area of KTAA is shown in **Figure 2.1**. It covers an overall area of approximately 4.2 ha. The existing facilities in KTAA includes Kwun Tong Ferry Pier Square and Pet Garden at Wai Yip Street, Kei Yip Street Public Toilet and Refuse Collection Point (RCP), Kwun Tong Ferry Pier Public Transport Interchange (PTI), Cooked Food Market (CFM), and temporary Kwun Tong Driving School (KTDS). Ferry pier facilities include Kwun Tong Public Pier, Kwun Tong Passenger Ferry Pier (KTPFP) and Kwun Tong Vehicular Ferry Pier (KTVFP).

2.1.2 The preferred development option of KTAA was presented in the working paper on Broad Cost Assessment, Preliminary Outline Development Plan (PODP), Preliminary Master Urban Design Plan and Master Landscape Plan (Final) **(WP2 (Final))** circulated on 28 March 2018 and incorporated in **TR 11 - LVIA (Draft-R1)** circulated on 9 October 2018. Under the preferred option, two building towers are proposed in the commercial site with an elevated landscape deck and at-grade PTI. In addition, three basement floors are proposed to accommodate ancillary transport facilities and public parking facilities.

2.1.3 Taking into account the comments received from relevant Government Bureaux and Department (B/Ds) and major findings from the technical assessments, Recommended Outline Development Plan (RODP) were formulated, as presented in the working paper on RODP, Recommended Master Urban Design Plan and Master Landscape Plan (Draft-R2) **(WP5 (Draft - R2))** circulated on 22 October 2018. Subsequent to the submission of WP5 (Draft – R2) and Steering Committee Meeting No. 2 on 29 October 2018, the RODP was further revised (RODP – Revision 1) and presented in the paper for discussion in Committee on Planning and Land Development (CPLD) on 4 March 2019.

2.1.4 After obtaining CPLD's member's agreement on 4 March 2019, consultation with Kwun Tong Development and Renewal Task Force of Kwun Tong District Council, Land and Development Advisory Committee, Task Force on Kai Tak Harbourfront Development of Harbourfront Commission, and Housing and Infrastructure Committee of Kowloon City District Council on the revised RODP were carried out on 2 April 2019, 16 April 2019, 15 May 2019 and 18 July 2019 respectively.

2.1.5 The RODP – Revision 1 was further amended taking account of the public comments received during consultation. As compared with the preferred option presented in TR11 - LVIA (Draft-R1), the following arrangement for the updated RODP (RODP – Revision 2), which was submitted to CPLD for discussion as matter arising item on 25 July 2019, remains unchanged:

Commercial Development (the "C" site)

- Two building towers in the commercial site with an elevated landscape deck and at-grade PTI; and
- Three basement floors are proposed to accommodate ancillary transport facilities and public parking facilities.

Government Facilities

- The Refuse Collection Point (RCP) is proposed to remain in-situ;
- A new three-storey structure is proposed at RCP's open area for temporary use as storage area and potential space for other uses after the cease of the temporary use;
- The dangerous goods vehicular (DGV) queuing area is proposed to be optimized and rearranged along Kei Yip Street upon the relocation of KTDS; and
- The existing pier facilities will be retained and the operation of piers would be maintained.

2.1.6 The major revisions to the preferred option involve the conversion of the existing Cooked Food Market to regional open space, refinement of the site area for DGV Queuing Area, reservation of GFA for government, institution or community (GIC) uses within the "C" site, refinement of the alignment of the proposed footbridges and minor revision to the junction layout.

2.1.7 After obtaining CPLD members' endorsement on the RODP – Revision 2, relevant B/Ds have further been liaised and its minor amendments were subsequently made. Taking into account the aforementioned amendments, the RODP is presented in **Figure 2.2** and the development parameters are summarized in **Table 2.1**. Considering the anticipated intake by phases and the worst case scenario, year 2031 is taken as the assessment year in the technical assessment.

Figure 2.1: Study Area of Kwun Tong Action Area

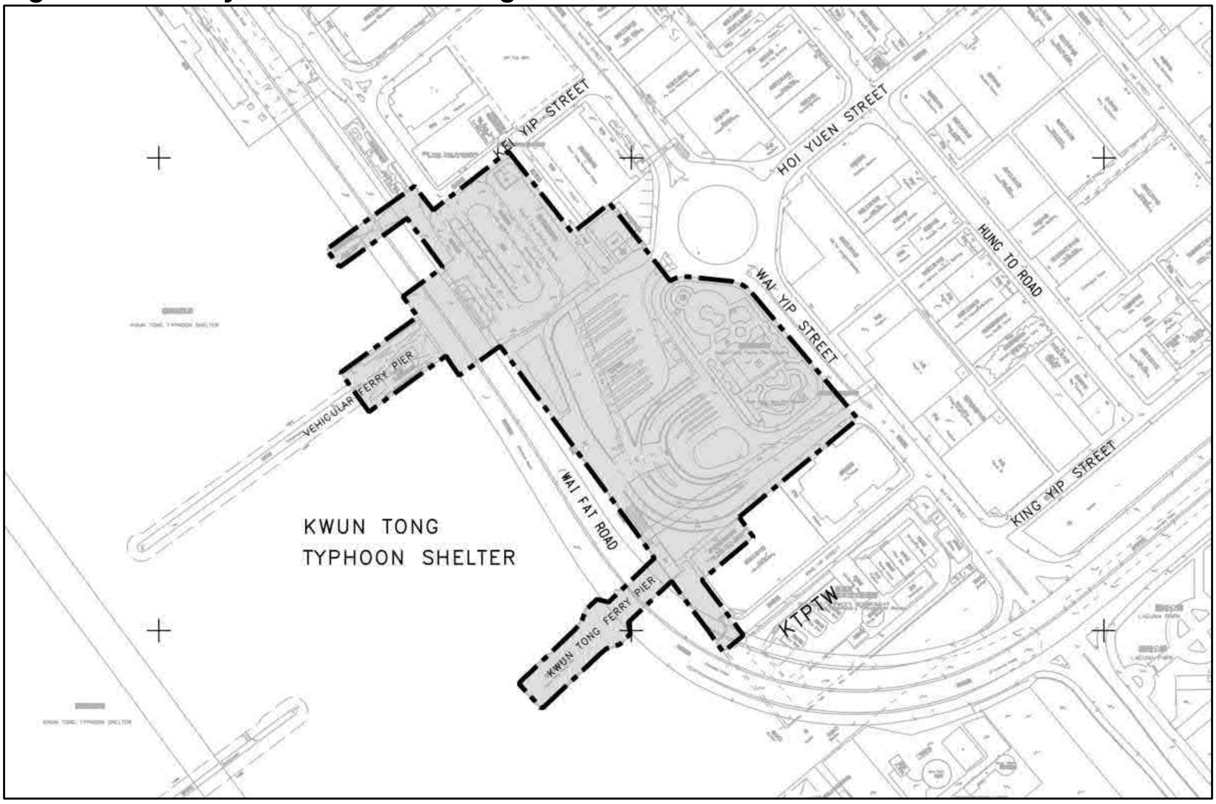
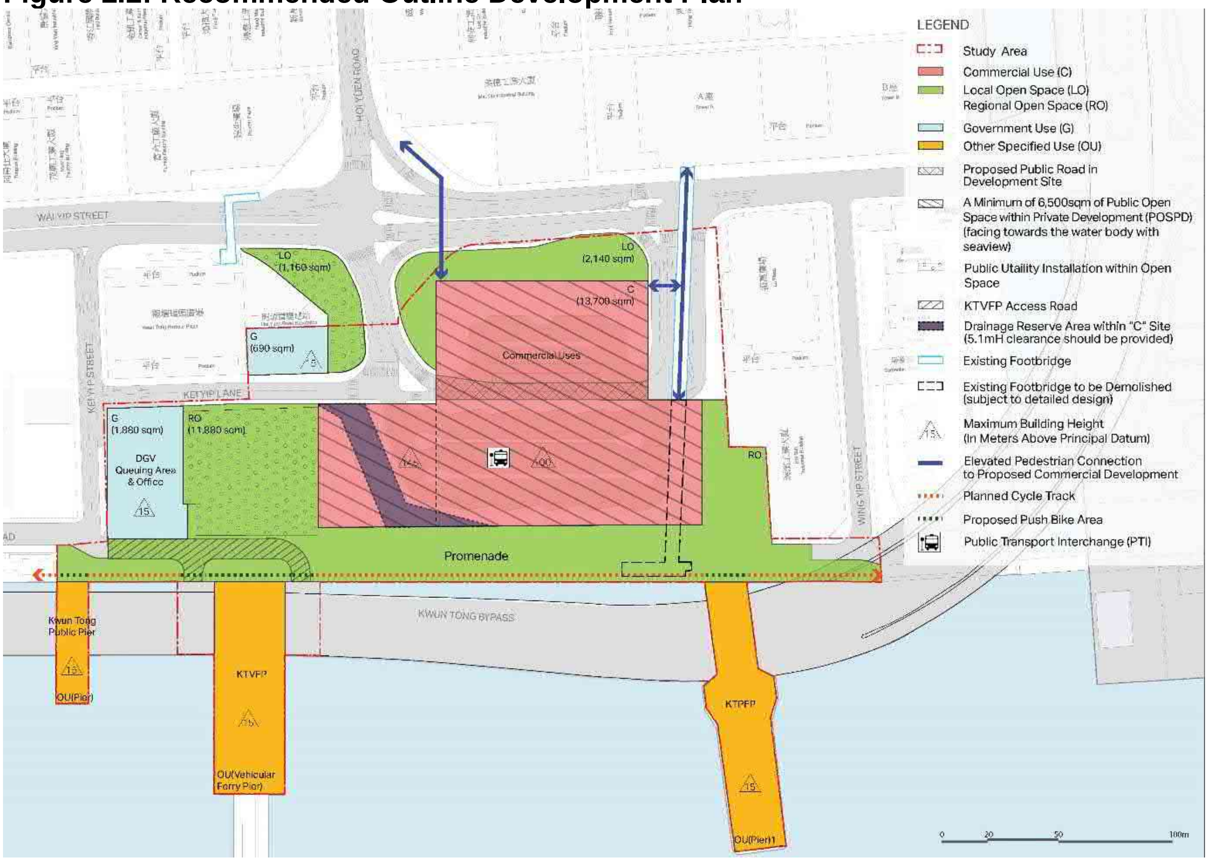


Figure 2.2: Recommended Outline Development Plan



2.1.8 The proposed development involves various commercial uses and government facilities. Development parameters for the proposed development are summarized in **Table 2.1** below.

Table 2.1 Summary of Development Parameters

Proposed/ Existing Land Use Zoning	"C"	"G" (DGV Queuing Area)	"G" (RCP Storage Area)	"OU (Pier)" (KTPFP)	"OU(Pier)" (Kwun Tong Public Pier) (in situ)	"OU (Pier)" (KTVFP) (in situ)	"O"
Site Area (approx. m²)	***13,700***	***1,880***	***690***	***2,600***	***740***	***4,000***	***15,180***
Plot Ratio (approx.)	6.52#	0.05	1.53	In situ	In situ	In situ	-
Max. Building Height (mPD)	100	15	15	15	15	15	-
- Office	62,600	-	-	-	-	-	-
- Retail / F&B	17,000	-	-	-	-	-	-
-Arts and Cultural Institutional	-	-	-	1,700	-	-	-
- GIC	2,700	90	780* + 275	-	-	-	-
- PTI	7,050	-	-	-	-	-	-
- Pier	-	-	-	2,390*	-	845*	-
Total GFA (m²)	**89,350**	**90**	**1,055**	**4,090**	**-**	**845**	**-**

Note: * Existing provision to be maintained
 # Net PR: 8.06

3 ENVIRONMENTAL LEGISLATION, STANDARDS AND CRITERIA

3.1.1 The following legislation, standards and guidelines are applicable to the landscape and visual impact assessment for construction and operation of the Proposed Development:

- Environmental Impact Assessment Ordinance (Cap. 499) and the Technical Memorandum on EIA Process (EIAO-TM), particularly Annexes 10 and 18;
- Environmental Impact Assessment Ordinance Guidance Note No. 8/2010;
- Town Planning Board Guideline No. 41 – Guideline on submissions of Visual Impact Assessment for Planning Applications to the Town Planning Board;
- Town Planning Ordinance (Cap. 131);
- Country Park Ordinance (Cap 208);
- Animals and Plants (Protection of Endangered Species) Ordinance (Cap 187A);
- Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586);
- Hong Kong Planning Standards and Guidelines Chapters 4, 10 and 11;
- Agriculture, Fisheries and Conservation Department (AFCD) Nature Conservation Practice Note No. 2 - Measurement of Diameter at Breast Height (DBH);
- AFCD Nature Conservation Practice Note No. 3 – The Use of Plant Names;
- DEVB TCW No. 5/2020 – Registration and Preservation of Old and Valuable Trees;
- ETWB TCW No. 8/2005 - Aesthetic Design of Ancillary Buildings in Engineering Projects;
- DEVB TCW No. 2/2012 - Allocation of Space for Quality Greening on Roads;
- DEVB TCW No. 6/2015 - Maintenance of Vegetation and Hard Landscape Features;
- DEVB TCW No. 4/2020 - Tree Preservation;
- Geotechnical Engineering Office (GEO) Publication No. 1/2011 – Technical Guidelines on Landscape Treatment and Bio-Engineering for Man-Made Slopes and Retaining Walls;
- Guidelines on Tree Transplanting (September 2014) issued by Greening, Landscape and Tree Management (GLTM) Section of Development Bureau (DEVB);
- Guidelines on Tree Preservation during Development (April 2015) issued by GLTM Section of DevB; and
- Landscape Value Mapping of Hong Kong (2005 Edition)
- The Register of Old and Valuable Trees – Hong Kong, maintained by the Leisure and Cultural Services Department
- Geographical Information System on Hong Kong Heritage (accessible at: http://www5.lcsd.gov.hk/internet/index.html)

- Public Open Space in Private Developments Design and Management Guidelines by Development Bureau.

3.1.2 The Outline Zoning Plan (OZP) gazetted under the Town Planning Ordinance provides the statutory framework for land use development. For this Proposed Development, reference has been made to both Approved Kwun Tong (South) Outline Zoning Plan No. S/K14S/22 and Approved Kai Tak Outline Zoning Plan No. S/K22/6 gazetted under section 9(5) of TPO on 9 November 2018 and 25 May 2018 respectively.

4 LANDSCAPE IMPACT ASSESSMENT METHODOLOGY

4.1.1 The landscape impacts have been assessed according to the following procedures:

4.1.2 ***Identification of the baseline landscape resources (LRs) and landscape characters found within the study area.*** This is achieved by site visits and desktop study of topographical maps, information databases and photographs.

4.1.3 ***Assessment of the degree of sensitivity of the LRs and landscape character areas (LCAs).*** This is achieved by desktop study of Landscape Value Mapping of Hong Kong and other relevant information. This is influenced by a number of factors including:

- whether the LRs/ LCAs are considered to be of local, regional, national or global importance;
- whether there are any statutory or regulatory limitations/requirements relating to the LRs/ LCAs;
- quality and maturity of the LRs/ LCAs;
- rarity of the LRs/ LCAs; and
- ability of the LRs/ LCAs to accommodate change.

4.1.4 The sensitivity of each LR and LCA is classified as follows:

High: Important landscape character or landscape resource of particularly distinctive character or high importance, sensitive to relatively small change.

Medium: Landscape character or landscape resource of moderately valued landscape characteristics reasonably tolerant to change.

Low: Landscape character or landscape resource, the nature of which is largely tolerant to change.

4.1.5 ***Identification of potential sources of landscape changes.*** These are the various elements of the construction works and operation procedures that would generate landscape impacts.

4.1.6 ***Identification of the magnitude of landscape change.*** The magnitude of the change depends on a number of factors including the physical extent of the change, the compatibility of the Proposed Development with the surrounding landscape, the duration of impact and the reversibility of change. Landscape changes have been quantified wherever possible. The magnitude of landscape changes is classified as follows:

Large:	The landscape character or landscape resource would involve a major change.
Intermediate:	The landscape character or landscape resource would involve a moderate change.
Small:	The landscape or landscape resource would involve slight or barely perceptible change.
Negligible:	The landscape or landscape resource would involve no discernible change.

4.1.7 Identification of potential landscape mitigation and enhancement measures. These may take the form of:

- adopting alternative designs or revisions to the basic engineering and landscaping design to prevent and/or minimise adverse impacts before adopting other mitigation or compensatory measures to alleviate the impacts;
- potential mitigation measures include preservation of vegetation and natural landscape resources, transplanting trees with value and in good condition, colour and textual treatments to structures (e.g. the promenade and breakwater); and
- potential compensatory measures include the implementation of landscape design and beautification works (e.g. provision of amenity planting, screen planting, reinstatement of disturbed lands, aesthetic design of aboveground/above-sea-level structures/hardscape features such as using finishes, colour scheme, texture of materials) to generate potentially beneficial long term impacts.
- A programme for the mitigation measures is provided and discussed in **Section 10.2**. The agencies responsible for the funding, implementation, management and maintenance of the mitigation measures are proposed in **Table 10.1** and **Table 10.2**.

4.1.8 Assessment of the significance of landscape impacts before and after the implementation of the mitigation measures and enhancement measures. By synthesizing the magnitude of the various impacts and the sensitivity of the various landscape resources, it is possible to categorise impacts in a logical, well-reasoned and consistent fashion. Table 4.1 shows the rationale for dividing the degree of significance into four thresholds, namely insubstantial, slight, moderate, and substantial, depending on the combination of a negligible-small-intermediate-large magnitude of change and a low-medium-high degree of sensitivity of LRs/ LCAs.

Table 4.1 Relationship between Receptor Sensitivity and Magnitude of Change in Defining Impact Significance

Impact Significance		Receptor Sensitivity (LRs/ LCAs)		
		Low	**Medium**	**High**
Magnitude of Change relative to baseline conditions caused by the Proposed Development	**Large**	Moderate	Moderate / Substantial	Substantial
	Intermediate	Slight / Moderate	Moderate	Moderate / Substantial
	Small	Insubstantial / Slight	Slight / Moderate	Moderate
	Negligible	Insubstantial	Insubstantial	Insubstantial

Note: All impacts are "Adverse" unless otherwise indicated.

4.1.9 The significance thresholds are defined as follows:

Substantial: Adverse / beneficial impact where the proposal would cause significant deterioration or improvement in existing landscape quality.

Moderate: Adverse / beneficial impact where the proposal would cause a noticeable deterioration or improvement in existing landscape quality.

Slight: Adverse / beneficial impact where the proposal would cause a barely perceptible deterioration or improvement in existing landscape quality.

Insubstantial: No discernible change in the existing landscape quality.

4.1.10 ***Assessment of Acceptability of Impacts.*** An overall assessment of the acceptability, or otherwise, of the impacts according to the five criteria set out in Annex 10 of the EIAO-TM.

5 REVIEW OF PLANNING AND DEVELOPMENT CONTROL FRAMEWORK

5.1.1 Plans and studies relevant to the Proposed Development have been reviewed to identify areas of high landscape value, Open Spaces, Government, Institution or Community and Commercial land uses. Relevant guidelines on landscape and urban design strategies and frameworks that may affect the appreciation of the Proposed Development have also reviewed. This aims to identify Proposed Development limitations and implications in landscape planning terms.

5.1.2 The Study Area of the KTAA is primarily covered by the Approved Kwun Tong (South) Outline Zoning Plan (OZP) No. S/K14S/22 (November 2018) and the Approved Kai Tak Outline Zoning Plan (OZP) No. S/K22/6 (May 2018). The land uses within the Study Area is shown in **Appendix A**. The land uses potentially affected by the Proposed Development and the future outlook of the area are discussed and summarised in **Table 5.1**.

Table 5.1 Summary of the Review of Planning and Development Control Framework

OZP Plan Title and No.	Land Use Zonings	Approx. Area of the Land Use Zones to be Affected	Current Design and Conservation Intention in the OZP	Anticipated Future Outlook of the Area Caused by the Proposed Development
Approved Kwun Tong (South) Outline Zoning Plan No. S/K14S/22 (November 2018) **Approved Kai Tak Outline Zoning Plan No. S/K22/6 (May 2018)**	Open Space (O)	5235 m^2	The current design is in line with the primary intention of the approved OZP that outdoor open-air public space will be provided for active and/or passive recreational uses serving the needs of local residents as well as the general public.	The Proposed Development includes demolish of existing Kwun Tong Ferry Square and Pets Garden, construction of commercial towers, re-provision of open space & PTI and junction improvement works at Hoi Yuen Road Roundabout. This area is expected to be improved in terms of design quality and function aspect. The Proposed Development will bring revitalisation to both local and regional contexts. The re-provision of open space integrating with the proposed commercial towers and associated building structure will also largely enhance user experience during visit to the area.

OZP Plan Title and No.	Land Use Zonings	Approx. Area of the Land Use Zones to be Affected	Current Design and Conservation Intention in the OZP	Anticipated Future Outlook of the Area Caused by the Proposed Development
	Government, Institution or Community (G/IC)	20,988 m^2	The current design is in line with the primary intention of the approved OZP that land will be provided for G/IC uses.	The Proposed Development transforms Kwun Tong Action Area into a premier business district, and as a catalyst to promote development of creative, arts and cultural uses. The proposed development involves demolition of existing bus terminus and associated structure for the construction of commercial towers, RCP, building for storage and PTI, the modification works of the DGV queuing area. Open space in connection to the linear waterfront promenade is also re-provided under the proposed development. As mentioned above, the proposed development intended to create a better environment as part of an emerging CBD, with allocation of modern style commercial buildings around, the visual compatibility of the Proposed Development to the local and regional contexts are maintained. The significance of change to the land use is therefore considered to be negligible.

5.1.3 Taken into account both the works under the Proposed Development and proposed works by others, it can be concluded that there will be changes proposed in the land use of the approved Kwun Tong (South) Outline Zoning Plan No. S/K14S/22 (November 2018) and Kai Tak Outline Zoning Plan No. S/K22/6 (May 2018). With the provision of the works under the Proposed Development, the landscape and visual quality within the Proposed Development Boundary will be enhanced, thereby bringing in beneficial impacts to the area within the Proposed Development Boundary and nearby areas. The open spaces created within the Proposed Development Boundary and adjacent Kwun Tong Promenade will be more accessible to the public and a more pleasant and welcoming space will be created. The significance of overall changes will therefore be large but compatible with the existing environment in the local and regional context. The type of landscape within the Proposed Development Boundary after the completion of the proposed works will however be fairly common in Hong Kong.

6 BASELINE STUDY

6.1 Broad-Brush Tree Survey

6.1.1 A board-brush tree survey, as shown in **Appendix B**[(a)], for providing baseline information on the LRs and LCAs, was carried out in December 2016 in accordance with the Study Brief to identify factors such as dominant tree species, maturity, rarity, and any plant species of specific conservation interest, etc. which would be potentially affected by the Proposed Development.

6.1.2 There are approximately 218 nos of trees in total identified within the Subject Site, in which 111 nos observed in PTI, along roadside and within Kwun Tong Driving School Lot; and 107 nos observed in the existing Kwun Tong Ferry Square and Pets Garden.[(b)]

6.1.3 No OVTs were identified within the Subject Site Boundary, yet one potentially registrable OVT (pOVT) of *Ficus microcarpa* with a Diameter at Breast Height (DBH) of about 1.2m is recorded. This pOVT is growing on a wall within the dangerous goods vehicular (DVG) queuing area, which was surveyed in TG8 of the "Road Side Planter and Bus Terminus" Zone of the Broad-Bush Tree Survey Plans on **Appendix B**.[(a)] All trees assessed in the broad-brush tree survey were common in Hong Kong and none of the trees was plant species of specific conservation interest.

6.1.4 The dominant tree species in the PTI, along roadside and within Kwun Tong Driving School Lot are *Spathodea campanulata, Hibiscus tiliaceus* and *Callistemon viminalis.* Those trees are generally in heavy standard size, ranging from 95-400mm girth.

6.1.5 The dominant tree species in the existing Kwun Tong Ferry Square and Pets Garden are *Aleurites moluccana*, *Spathodea campanulata* and *Ficus microcarpus.* Those trees are generally in mature size, ranging from 130 to 480mm girth.

6.1.6 In order to enhance a better connectivity and sustainability of the Subject Site, the Proposed Development involves rationise existing government facilities and optimize development potential. All existing trees within the Boundary are inevitably in directly or indirectly. Given the maturity of the existing trees, transplanting of trees, especially within the Kwun Tong Ferry Square and Pets Garden is technically difficult. A detailed tree survey is recommended to be carried out at the detailed design stage, in order to obtain more accurate information, e.g. precise locations of the existing trees, DBHs of individual trees and species of individuals etc., for the development of a detailed tree preservation proposal.

6.2 Landscape Resources and Landscape Character Areas

6.2.1 The details of Baseline Landscape Resources (LRs) and Landscape Character Areas (LCAs) that will be potentially affected by the Proposed Development, together with their sensitivity are provided in **Table 6.1**. The locations of baseline LRs and LCAs are indicated in **Figure 1.1** and **Figure 1.13** and the photographs of the identified LRs and LCAs within the Study Area are provided in **Figures 1.11**, **1.12** and **1.14**

Note:
(a) Appendix B is not attached in the MPC Paper No. 2/21. For results of detailed tree survey, please refer to the Tree Survey Report (**Attachment Vc** of MPC Paper no. 2/21.)
(b) According to the broad-brush tree survey done in December 2016, about 218 nos. of trees are identified. Detailed tree survey was conducted in 2019/2020, and as documented in the Tree Survey Report (i.e. **Attachment Vc** of MPC Paper No. 2/21), there are 238 nos. of trees were identified within the Subject Site.

Table 6.1 Baseline LRs and LCAs and their Sensitivity

ID No.	Description	Sensitivity
	Landscape Resources	
LR 1	***Promenade & Pier*** Seafront Promenade and Piers consist of a linear open space located at the southwest of the KTAA serving mainly passive activities, such as jogging, rambling and resting. Facilities including Kwun Tong Public Pier, Kwun Tong Ferry Pier and Kwun Tong Vehicular Ferry Pier are located within this LR. Planting in this type of LR is generally simple in forms and geometry, so as to provide a strong legibility of the space. LR 1 is a common, well-established landscape resource frequently used by local residents and tourists for passive uses. Therefore, it is an important landscape resource and its capacity to accommodate changes is considered medium.	Medium
LR 2	***Recreational Promenade*** The Recreation Promenade LR includes the Kwun Tong Promenade at the northwest side of KTAA and Kai Tak Runway Park Phase 1 at the southwest side of the KTAA across the typhoon shelter. This LR consists of promenade open space for enjoyment by the public. Simple form shade trees and sun shading structures are located within this LR. This LR is a common, well-established, high quality landscape resource frequently used by local residents and tourists for passive uses. Therefore, it is an important landscape resource and its capacity to accommodate changes is considered high.	High
LR 3	***Recreational Ground*** This type of LR is composed a numbers of recreational open spaces within the Assessment Area. It is Tsun Yip Street Playground at the northwest, of KTAA; Wai Lok Street Temporary Soccer Pitch at the southeast of KTAA; Tsui Ping River Garden at the northeast of KTAA which is under construction; Kwun Tong Ferry Square and Pets Garden at the northeast side of KTAA, Laguna Park at the far northeast side of the Proposed Development. This type of LR is a typical and formal recreational open space for the enjoyment by the local residents as well as public. The quality of this LR is medium in general. Therefore, LR 3 can tolerate medium changes.	Medium
LR 4	***Infrastructure Facilities*** This type of LR is composed of bus terminal and the LPG filling station where located within Assessment Area. This LR is major facility frequently used by the locals and tourist. It also serves an important role for local business hub. As this LR is mainly for vehicular uses, making this LR not quite suitable for leisure activities. The quality of LR 4 is low. Therefore, the sensitivity of LR4 is low.	Low
LR 5	***Public Works Facilities*** This type of LR is composed of the DGV Dangerous Goods Vehicular Ferry, Kwun Tong Diving School, Kwun Tong Intermediate Sewage Pumping Station, CLP Hoi Yuen Road Substation, Kwun Tong Preliminary Treatment Works at Wing Yip Street and Kwun Tong Pumping Station at Wai Lok Street. As this is a public works facilities, this LR is generally fenced off and restricted to the public. This LR is not suitable for leisure activities to the public and there is no any special landscape feature. Only a small amount of workers visit LR 5 and the time they stay in LR 5 is short on a daily basis, so it is an unimportant landscape resource in the local and regional context. The quality of LR 5 is low. Therefore, the sensitivity of LR5 is medium.	Low

ID No.	Description	Sensitivity
LR 6	***Commercial & Industrial Development*** This type of LR is composed of a range of commercial buildings and industrial buildings at the northwest side of the Proposed Development. In principle, the commercial and industrial buildings were mid-rise to high-rise buildings at north-western side as background. In addition, Shing Yip Street Rest Garden at the northeast of the Proposed Development which will be closed and form part of a land for a land sale site for commercial use. As these commercial and industrial buildings have a great demand for local businesses, roads within this type of LR are usually frequently used by trucks and private cars. LR 6 is a very common and not very well established landscape resource. Only workers for these commercial and industrial buildings visit LR 6 and the time they stay in LR 6 is short on a daily basis, so it is a major landscape resource in the local and regional context. The quality of LR 6 is medium. Therefore, LR 6 can tolerate medium changes.	Medium
LR 7	***Residential Development*** This type of LR is the residential development located at the east side of the KTAA such as Laguna City. Associated facilities such as shops, restaurants and leisure areas are also located in the LR. The residential buildings in LR7 are mid-rise building that served residential usages for the local residents. Tourists are seldom visiting LR7. The quality of LR 7 was fair especially for the residents in LR7. Therefore, LR 7 can tolerate medium changes.	Medium
LR 8	***Vacant Lot*** This type of LR is the vacant area located along Wai Lok Street at the southeast side and at the southwest across the typhoon shelter of the Proposed Development. This LR is planned for the future development of Kai Tak Runway Park Phase 2. The LR8 is idling for a long period and fenced off for public access. Wildly growth with unpleased form vegetation occupied most of the LR8. Since this LR is idling for a long period of time a no public can be accessible. The quality of LR 8 was low. Therefore, sensibility of LR 8 to the change is low.	Low
LR 9	***Community Facilities*** This type of LR mainly composed the low-rise building of Yung Fung Shee Memorial Centre East Kowloon Health Centre serving this district; Tsun Yip Cooked Food Market on Tsun Yip Street and Kwun Tong Ferry Concourse Cooked Food Market in front of Kwun Tong Ferry Pier. Only locals and workers of this area will be visiting this LR in regular basis. The LR9 only composing G/IC buildings, simple form of street trees with no open space. The quality of LR 9 is low. Therefore, sensibility of LR 9 to the change is low.	Low
LR 10	***Traffic Route underneath Elevated Road*** This type of LR is the traffic route under the Kwun Tong By-pass. LR10 is mainly for vehicular usage with some typical highway construction facility. Roadside amenity planting is planting a both side of the traffic route. As there are mainly commercial and industrial businesses in this district, private car and heavy vehicles such as trucks and lorry are mainly	Medium

ID No.	Description	Sensitivity
	the users on this LR. The quality of LR 10 is medium. Therefore, the sensitivity of LR10 is medium.	
LR 11	***Typhoon Shelter*** The landscape resource comprises water bodies mainly for vessels berthing. As the water bodies are protected by its surroundings, it was relatively static. LR 11 being adjacent to Recreational Promenade is often visited by visitors. It is well established and important in the local context. Therefore, the sensitivity of LR11 is medium.	Medium
LR 12	***Harbour Water*** The landscape resource comprises mainly the open water body in between the Kowloon side and Hong Kong Island side. Ferries and other vessels often travel across this type of LR, forming part of the landscape of the place. LR 12 is of high quality and a common landscape resource. It is well established and important in the local context. Therefore, the sensitivity of LR12 is medium.	Medium
LR 13	***Nullah*** This type of LR the King Yip Street nullah (Tsui Ping River) located at the northeast side of the Proposed Development. This LR is located in the centre of Kwun Tong district adjacent to the residential and commercial areas. Amenity planting of species *Macaranga tanarius, Acacia confusa* are planted on embankment and *Melaleuca leucadendra* as Roadside planting along King Yip Street. The quality of LR 13 is medium. Therefore, Therefore, the sensitivity of LR13 is medium.	Medium
	Landscape Character Areas	
LCA 1	***Industrial Urban Landscape*** This type of LCA comprises mainly the industrial development at the northern part of the Proposed Development and the vacant sites at southeast side of the development. As those industrial developments have a great demand for local businesses, roads within this type of LCA are usually frequently used by trucks and private cars. LR 6 is a very common and not very well established landscape resource. Only workers for this industrial development visit this LCA and the time they stay in this LCA is short on a daily basis. The quality of LCA 1 is medium. Therefore, LCA 1 can tolerate medium changes.	Medium
LCA 2	***Residential Urban Landscape*** This type of LCA is the residential development located at the east side of the Proposed Development such as Laguna City. Associated facilities such as shops, restaurants and leisure areas are also located in this LCA. The residential buildings in this LCA are mid-rise building that served residential usages for the local residents. Tourists are seldom visiting this LCA. The quality of LCA 2 was fair. Therefore, LCA 2 can tolerate medium changes.	Medium
LCA 3	***Ongoing Major Development Landscape*** This type of LR is composed a number of recreational open spaces, bus terminal and the LPG filling station. Whereas, these areas are under construction or will be re-developed within the Assessment Area.	Medium

ID No.	Description	Sensitivity
	The quality of this LR is medium in general. Therefore, LR 3 can tolerate medium changes.	
LCA 4	***Typhoon Shelter Landscape*** This LCA comprises water bodies mainly for vessels parking. As the water bodies are protected by its surroundings, it was relatively static. This LCA being adjacent to Recreational Promenade is often visited by visitors. It is well established and important in the local context. Therefore, the sensitivity of LCA 4 is medium.	Medium
LCA 5	***Inshore Water Landscape*** This LCA comprises mainly the open water body in between the Kowloon side and Hong Kong Island side. Ferries and other vessels often travel across this type of LCA, forming part of the landscape of the place. This LCA is of high quality and a common landscape character. It is well established and important in the local context. Therefore, the sensitivity of LCA 5 is medium.	Medium

7 LANDSCAPE IMPACT ASSESSMENT

7.1 Sources of Landscape Impacts

7.1.1 The sources of landscape impacts in the construction phase would include:

- Demolition works of existing structures and open space;
- Proposed junction improvement works at Hoi Yuen Road Roundabout;
- Modification of Existing Kwun Tong Driving School and DGV queuing area;
- Construction of open space and promenade in connecting to adjacent Kwun Tong promenade;
- Construction of RCP, public toilet and new building structures for storage area; and
- Construction of commercial development, carpark facilities and Public Transport Interchange.

7.1.2 The sources of landscape impacts in the operation phase would include:

- Operation of open spaces on the podium deck; and
- Operation commercial buildings within the Proposed Development Boundary.

7.1.3 Since the proposed works are intended to improve the existing quality and connection within and adjacent to the Study Area, the anticipated residual impact on the LRs and LCAs in the operation phase are expected to be beneficial in general.

7.2 Magnitude of Landscape Impacts

7.2.1 The magnitude of unmitigated landscape impacts associated with the construction and operation phases of the Proposed Development are assessed and described in **Table 7.1**.

Table 7.1 Magnitude of Landscape Impact during Construction and Operation

ID	Landscape Resources/ Character Areas	Potential Source of Impact	Description of Impacts	Magnitude of Change (Large/ Intermediate/ Small/ Negligible/Not Affected)	
				Construction	Operation
Landscape Resources					
LR 1	Promenade & Pier	• Construction of future Promenade. Within the construction sites, there may be temporary site office, ancillary facilities and stockpiles. The access of the general public to parts/all of the Proposed Development Area may also be restricted; • Streetscape improvement works.	Within the Proposed Development boundary, the Promenade and its vicinity will be revitalised with enhanced paving and amenity planting. In view of the above, it is considered that the unmitigated impact on LR 1 will be intermediate. Hoardings will be erected on the periphery of construction sites and access to partial area of the LR will be restricted during construction.	Intermediate	Intermediate
LR 2	Recreational Promenade	Not Affected	Not Affected	Not Affected	Not Affected
LR 3	Recreation Ground	• Construction of a commercial development with at-grade and elevated open spaces as well as at-grade PTI. Within the construction sites, there may be temporary site office, ancillary facilities and stockpiles. The access of the general public to parts/all of the Proposed Development Area may also be restricted; • Construction of a Public Transport Interchange.	The Kwun Tong Ferry Square and Pets Garden, which located in this LR will be demolished and a PTI with podium open spaces will be re-constructed. Hoardings will be erected on the periphery of construction sites and access to partial area of the LR will be restricted during construction. In view of the above, it is considered that the impact on LR 3 will be negligible during construction phase. However, a Promenade will be constructed as re-provision of open space. Thus, the impact on LR 3 will be negligible.	Negligible	Negligible

ID	Landscape Resources/ Character Areas	Potential Source of Impact	Description of Impacts	Magnitude of Change (Large/ Intermediate/ Small/ Negligible/Not Affected)	
				Construction	Operation
LR 4	Infrastructure Facilities	• Construction of a commercial development. Within the construction sites, there may be temporary site office, ancillary facilities and stockpiles. The access of the general public to parts/all of the Proposed Development Area may also be restricted; • Construction of a Public Transport Interchange.	The Bus Terminal, Car park which located in this LR will be demolished and a temporary PTI will be provided during construction phase. Hoardings will be erected on the periphery of construction sites and access to partial area of the LR will be restricted during construction. In view of the above, it is considered that the unmitigated impact on LR 4 will be large in construction phase. However, a podium open space will be re-provided. Thus, the impact on LR 4 will be negligible.	Large	Negligible
LR 5	Public Works Facilities	• Modification works of DGV queuing area and provision of at-grade open space are expected. There may be temporary site office, ancillary facilities and stockpiles. The access of the general public to parts/all of the Proposed Development Area may also be restricted; • Streetscape improvement works.	Hoardings will be erected on the periphery of construction sites and access to partial area of the LR will be restricted during construction. In view of the above, it is considered that the unmitigated impact on LR 5 will be large in construction phase. However, at-grade open space will be re-provided and existing DGV queuing area will be modified with better queuing environment. Thus, the impact on LR 5 will be negligible.	Negligible	Negligible
LR 6	Commercial & Industrial Development	Not Affected	Not Affected	Not Affected	Not Affected
LR 7	Residential Development	Not Affected	Not Affected	Not Affected	Not Affected
LR 8	Vacant Lot	Not Affected	Not Affected	Not Affected	Not Affected

ID	Landscape Resources/ Character Areas	Potential Source of Impact	Description of Impacts	Magnitude of Change (Large/ Intermediate/ Small/ Negligible/Not Affected)	
				Construction	Operation
LR 9	Community Facilities	Not Affected	Not Affected	Not Affected	Not Affected
LR 10	Traffic Route underneath Elevated Road	Not Affected	Not Affected	Not Affected	Not Affected
LR 11	Typhoon Shelter	Not Affected	Not Affected	Not Affected	Not Affected
LR 12	Harbour Water	Not Affected	Not Affected	Not Affected	Not Affected
LR 13	Nullah	Not Affected	Not Affected	Not Affected	Not Affected
Landscape Resources					
LCA 1	Industrial Urban Landscape	Not Affected	Not Affected	Not Affected	Not Affected
LCA 2	Residential Urban Landscape	Not Affected	Not Affected	Not Affected	Not Affected

ID	Landscape Resources/ Character Areas	Potential Source of Impact	Description of Impacts	Magnitude of Change (Large/ Intermediate/ Small/ Negligible/Not Affected)	
				Construction	Operation
LCA 3	Ongoing Major Development Landscape	• Construction of a commercial development with at-grade and elevated open spaces as well as at-grade PTI. Within the construction sites, there may be temporary site office, ancillary facilities and stockpiles. The access of the general public to parts/all of the Proposed Development Area may also be restricted; • Construction of a commercial development. Within the construction sites, there may be temporary site office, ancillary facilities and stockpiles. The access of the general public to parts/all of the Proposed Development Area may also be restricted; • Construction of a Public Transport Interchange. • Modification works of DGV queuing area and provision of at-grade open space are expected. There may be temporary site office, ancillary facilities and stockpiles. The access of the public to parts/parts/all the Proposed Development Area may also be restricted; • Streetscape improvement works.	The Kwun Tong Ferry Square and Pets Garden, which located in this LCA will be demolished and a PTI with podium open spaces will be re-constructed. Hoardings will be erected on the periphery of construction sites and access to partial area of the LR will be restricted during construction. In view of the above, it is considered that the unmitigated impact on this LCA will be large in construction phase. However, a podium open space will be re-provided. Thus, the impact on this LCA will be negligible. .	Large	Negligible

ID	Landscape Resources/ Character Areas	Potential Source of Impact	Description of Impacts	Magnitude of Change (Large/ Intermediate/ Small/ Negligible/Not Affected)	
				Construction	Operation
LCA 4	Typhoon Shelter Landscape	Not Affected	Not Affected	Not Affected	Not Affected
LCA 5	Inshore Water Landscape	Not Affected	Not Affected	Not Affected	Not Affected

7.3 Significance of Unmitigated Landscape Impacts

7.3.1 The significance of landscape impacts, before implementation of mitigation measures, in the construction and operation phases are assessed and presented in **Table 11.1**.

8 VISUAL IMPACT ASSESSMENT METHODOLOGY

8.1.1 The Assessment Area for the visual impact assessment is defined by the visual envelope of the Proposed Development. The visual impact assessment boundaries are shown in **Figure 1.2**.

8.1.2 The assessment of visual impacts has involved the following procedures.

8.1.3 ***Identification of the Visual Envelopes of the Proposed Development.*** This is achieved by site visit and desktop study of topographic maps and photographs. Distance and other factors will be considered, to determine the zone of visual influence and the visibility of the Proposed Development from various locations. The Zone of Visual Influence /Visual Envelope is that area from which any part of the Proposed Development can be seen; usually defined by natural ridgeline, man-made features, road infrastructures, etc.

8.1.4 The Assessment Area for the VIA is defined by the visual envelope of the Proposed Development and the Zone of Visual Influence (ZVI) is determined. The VIA will include:

(1) Identification of View Points (VPs) within the ZVI and;
(2) Assessment of the visual sensitivity of the public viewer from the VPs;

8.1.5 These various elements of the VIA are detailed below.

8.1.6 ***Identification of the VPs within the Visual Envelopes*** These VPs are where members of the public or tourists can assess or view the site easily.

8.1.7 Assessment of the degree of sensitivity to change of the VPs. Factors considered include:

- the impact on sensitive public viewers from the most affected viewing points, include key pedestrian nodes, popular areas used by the public or tourists for outdoor activities, recreation, rest, sitting-out, leisure, walking, sight-seeing, and prominent travel routes where travellers' visual attention may be caught by the Proposed Development;
- People engaged in working activities are regarded as less sensitive to the visual changes;
- Viewing point should be at human eye level for a realistic presentation of the views;
- Key public viewing points may refer to Chapter 11 on Urban design Guidelines in the Hong Kong Planning Standards and Guidelines (HKPSG), the Explanatory Statement of the relevant statutory plans, adopted outline development plans and layout plans, and completed planning studies available for public reference;
- Local viewpoints should be determined with reference to the setting of the Proposed Development and views of local significance;

8.1.8 The sensitivity of VPs is classified as follows:

High:	The VP is highly sensitive to any change in their viewing experience.
Medium:	The VP is moderately sensitive to any change in their viewing experience.
Low:	The VP is only slightly sensitive to any change in their viewing experience.

8.2 Visual elements

8.2.1 This includes major physical structures, visual resources or attractors, and/ or visual eyesores or detractors that currently exist or area known to be planned within the assessment area. Different visual elements may enhance, degrade or neutralize the overall visual impact of the development being assessed;

8.2.2 This VIA will demonstrate whether and how the Proposed Development would cause impact on the views to ridgelines and harbour if the site location is within the assessment area where views to ridgelines and the harbour may be reduced or blocked.

8.2.3 Appraisal of visual changes. Visual changes may be positive or negative and they are not necessarily mutually exclusive:

8.2.4 Visual Composition: the total visual effects of all the visual elements due to their variation in locations, massing, heights, dispositions, scales, forms, proportions and characters vis-a-viz the overall visual backdrop. It may result in visual balance, compatibility, harmony, unity or contrast. This appraisal should have due regard to the overall visual context and character within the wider and local contexts;

8.2.5 Visual Obstruction: this appraisal should assess the degree of visual obstruction and loss of views or visual openness due to the Proposed Development from all key public viewing points within the assessment area. Blockage or partial blockage of views which substantially reduce visual permeability, existing panorama, vistas, visual resources or visual amenities should be avoided or minimized, in particular with regard to impact on prominent ridgelines, the harbour, natural coastlines, open sea horizon, skyline, scenic areas, valued landscape, special landmark, heritage features to be preserved, etc.

8.2.6 Effect on public viewers: this VIA will assess and demonstrate the effects of visual changes from key public viewing points with direct sightlines to the Proposed Development.

8.2.7 Effect on Visual Resources: this VIA will appraise if the condition, quality and character of the assessment area is changed positively or negatively as a result of the development, and any on-site, off-site visual impact related to the development.

8.2.8 The resultant overall impact may be concluded and classified within a range of threshold:

Enhanced:	If the Proposed Development in overall term will improve the visual quality and complement the visual character of its setting from most of the identified key public viewing point.
Partly Enhanced/ Partly Adverse:	If the Proposed Development will exhibit enhanced visual effect to some of the identified key public viewing points and at the same time, with or without mitigation measures, exhibit adverse visual effects to some other key public viewing points.
Negligible:	If the Proposed Development will, with or without mitigation measures, in overall term have insignificant visual effects to most of the identified key public viewing points, or the visual effects would be screened or filtered by other distracting visual elements in the assessment area.
Slightly Adverse:	If the Proposed Development will, with or without mitigation measures, result in overall term some negative visual effects to most of the identified key public viewing points.

Moderately Adverse: If the Proposed Development will, with or without mitigation measures, result in overall term negative visual effects to most of the key identified key public viewing points.

Significantly Adverse: If the Proposed Development will in overall term cause serious and detrimental visual effects to most of the identified key public viewing points even with mitigation measures.

9 VISUAL IMPACT ASSESSMENT

9.1 Visual Envelope

9.1.1 The assessment area for the visual impact assessment is defined by the visual envelope of the Proposed Development. The visual envelope covers the fields of views from all sensitive viewers in direct sight of the Proposed Development.

9.1.2 As seen in **Figure 1.2**, the assessment area extends to include mid to long range views in the future Runway Park Phase 2 and to Quarry Bay Park in Hong Kong Island locating to the south of the Proposed Development. The assessment area also covers view from to the west of the immediate neighbouring site- Kwun Tong Promenade.

9.1.3 The assessment area is predominantly occupied by developed areas which are mainly commercial uses included working population of adjacent offices and industrial buildings. Public open spaces such as Kwun Tong Promenade in vicinity of the Proposed Development and Quarry Bay Park are also included.

9.1.4 The extent of the assessment area is delineated in **Figure 1.2**.

9.2 Viewing points

9.2.1 Within the Visual Envelope, the following View Points are identified:

i. VP1: View from Kwun Tong Promenade;
ii. VP2: View from cross-harbour Ferry to Kwun Tong Ferry Pier;
iii. VP3: View from Landscape Deck of Cruise Terminal Building;
iv. VP4: View from Kai Tak Runway Park Phase 2;
v. VP5: View from Quarry Bay Park.

Other viewpoints (VP) along Hoi Yuen Road and Cha Kwo Ling Waterfront Promenade providing views of the proposed development from the north and the southeast have been explored. However, these VPs are either blocked by existing structure which the Proposed Development cannot be viewed or inaccessible for carrying out assessment. Thus, these two VPs are excluded in this assessment.

9.2.2 The location of all VPs is shown in **Figure 1.21**.

9.2.3 VP 1 – View from Kwun Tong Promenade:

VP1 located around 200m away to the North-west of the Proposed Development. The VP is taken at the edge of the KT Promenade underneath the Kwun Tong By-pass vehicular highway structure. Key components of this VP consist of the Promenade and elevated road structures in the foreground and the industrial buildings in the background. The key public viewers of this VP are mainly the open space users of the Promenade and daytime workers in Kwun Tong District. The duration of the Proposed Development be visible by the public viewers is long and the distance over the Proposed Development is short. Thus, the visual sensitivity of the public viewers from this VP is graded as *High*. Existing photo of VP1 is shown in **Figure 1.22**.

9.2.4 VP 2 – View from cross-harbour Ferry to Kwun Tong Ferry Pier:

Kwun Tong Ferry Pier located to the South of the Proposed Development at immediate vicinity to the proposed development. The selected VP is a kinetic view point taken on a ferry operating from North Point to Kwun Tong. The general view of this VP consists of Victoria Harbour in the foreground and the ferry pier, KT Promenade, Kwun Tong By-pass highway structure and industrial buildings in the background. The distance over the Proposed Development is varying from long to short and the duration over the Proposed Development is long. However, the key public viewers of this VP are mainly the travellers on the ferry. Thus, the visual sensitivity of the public viewers from this VP is graded as *medium*. Existing photo of VP2 is shown in **Figure 1.22**.

9.2.5 VP 3 – View from Landscape Deck of Cruise Terminal Building:

The Cruise Terminal Building at former Kai Tak Airport runway located across Kwun Tong Typhoon Shelter to the South-west of the Proposed Development at approximate 1000m from the site boundary. The VP 3 is taken from the tip of the landscape deck of the Cruise Terminal where favoured by visitors during weekends. The general view of this VP consists of Kwun Tong Typhoon Shelter, the ferry pier in the foreground and KT Promenade, Kwun Tong By-pass highway structure, industrial buildings in the background. The distance over the Proposed Development is in long range (approximate 1000m) the duration over the Proposed Development is long. Considered the type of public viewers mainly appear during weekends, the visual sensitivity of the public viewers from this VP is graded as *medium*. Existing photo of VP3 is shown in **Figure 1.22**.

9.2.6 VP 4 – View from Runway Park Phase 2:

Runway Park Phase 2 locates at around 1000m to the West of the Proposed Development in vicinity to the Cruise Terminal. The general view of this VP consists of open lawn with Runway Park Phase 1, Kwun Tong Typhoon Shelter, the ferry pier in the foreground and Kwun Tong Promenade, Kwun Tong By-pass highway structure, industrial buildings view in the background. This VP currently located on a vacant lot which is envisaged as the future Runway Park Phase 2. The key public viewers of this VP are the future park users. The distance over the Proposed Development is in long range (approximate 1000m) the duration over the Proposed Development is long. Considered the type of public viewers mainly the future park users appear during weekends, the visual sensitivity of the public viewers from this VP is graded as *medium*. Existing photo of VP4 is shown in **Figure 1.22**.

9.2.7 VP 5 – View from Quarry Bay Park:

Quarry Bay Park located about 2000m from the Subject Site across the Victoria Harbour to the South of the Proposed Development. The general view of this VP consists of mainly the harbour view and high density Kwun Tong urban area with mixes of commercial/ industrial blocks in front and residential estates at the back; prominent ridgelines of former Anderson Road Quarry Site as well as Kowloon Peak forms the background of the view. The distance over the Proposed Development is in long range (approximate 2000m) the duration over the Proposed Development is short. Thus, the visual sensitivity of the public viewers from this VP is graded as *low*. Existing photo of VP4 is shown in **Figure 1.22**.

9.3 Visual Elements

9.3.1 The visual outlook is shaped by the combined composition of all the visual elements which come into sight of the viewers. Presently the assessment area is dominated by following visual elements:

9.3.2 The southeast to northeast extent of the assessment area is dominated by high density urban landscape character of Kwun Tong District. The Kwun Tong District is recently undergoing a transition from industrial area to a future CBD. This emerging District consists building blocks ranging from medium-rise industrial blocks such as Lu Plaza, Hoi Bun Industrial Building, Mai Tak Industrial Building and Pioneer Industrial Building; to modern style high-rise blocks such as Manulife Financial Centre, One Harbour Square and Kwun Tong Harbour Plaza. Open spaces such as Tsui Ping River, Laguna Park and Planned Cha Kwo Ling Promenade are located further east extent of the Proposed Development. Elevated Kwun Tong By-pass highway structure as a visually dominant element along the KT Waterfront, at approximately the same level, low-rise buildings including Kwun Tong Driving School and ferry piers are also observed.

9.3.3 The South-west to West extent of the assessment area covers the Kwun Tong Typhoon Shelter, former Kai Tak Airport Runway where two of the VPs are located- the Cruise Terminal building and the future Runway Park Phase 2. The linear alignment of former Runway adding up an iconic structure of the Cruise Terminal extends into the Victoria Harbour as a visual predominance identity to viewers of both of Kwun Tong District and Hong Kong Island. The place with other recreation facilities is intended to create as a popular tourist attraction for both local and overseas visitors especially during weekends.

9.3.4 The southern extent of the assessment area is Victoria Harbour where marine transportation including ferry- a popular mode of transport across Victoria Harbour takes place. Further south of the assessment area is Quarry Bay Park, which is one of the district open spaces, that provides passive recreation to visitors and residents of Hong Kong Island.

9.4 VP1 – View from Kwun Tong Promenade

Visual Composition

9.4.1 As shown in **Figure 1.23**, the view of VP1 is taken from Kwun Tong Promenade. Being located in the Kwun Tong Promenade, the view is dominated by static waterfront, elevated highway structures and the One Harbour Square in the foreground.

9.4.2 The height and the massing of the Proposed Development will become dominant to this VP as compared to the surroundings at the back.

Visual Obstruction

9.4.3 The Proposed Development will create a dominant backdrop to this VP which partially obstructs the sky view and reduces the openness of the VP. The elevated landscape deck and the at-grade open space is partially obstructed by the re-provisioned DGV queuing area, which is located along Kei Yip Street and next to the One Harbour Square.

Effect on Public Viewers

9.4.4 The sensitivity of the public viewers of this VP is high. The Proposed Development is located in close proximity to the VP, form and alignment of the tower blocks are perpendicular to the waterfront. The visual impact to this VP is reduced by arrangement of the building towers and the open space. Tower T1 has been set back from waterfront and the building height of T1 and T2 is 99.25 mPD and 88.75 mPD respectively to provide a stepped height profile. This creates a visual openness from this VP toward the Proposed Development.

9.4.5 The Proposed Development is located between the Hoi Bun Industrial Building and existing driving school cum DGV queuing area, which is proposed to turn into re-provisioned DGV queuing area and at-grade open space. Although the Proposed Development consisting of two tower blocks may have negative effect to the recreational users of this VP, the intrusiveness could be reduced with amenity planting at the proposed green deck and intercepted by innovative façade design/ treatment, i.e. architectural features of the building façade and the skycourt with greening features. In view of the above, the magnitude of change is *slight* and the overall visual impact is considered as *slightly adverse*.

Effect on Visual Resources

9.4.6 In the more immediate foreground, the vertical wall structure of the DGV queuing area shall maintain with more innovative façade design of the vertical wall structure, the visual appeal would improve. Towards the back, the tower blocks (not higher than +100mPD) of the Proposed Development occupied the sky view and create visual change to this VP. The massing of the Proposed Development partially occupied the view of this VP. However, the tree planting on the proposed green deck in the foreground of this VP will reduce visual intrusiveness of the hard edge of the Proposed Development.

9.4.7 The size of the DGV queuing area is reduced in return of more open-air spaces. The vertical wall structure is mitigated through innovative façade design.

9.5 VP2 – View from Cross-harbour Ferry to Kwun Tong Ferry Pier

Visual Composition

9.5.1 As shown in **Figure 1.24**, the view from ferry has an open view to the sky view even with existing buildings, waterfront and elevated Kwun Tong By-pass dominated the view.

9.5.2 The overall building height of the Proposed Development will not be higher than the surrounding buildings and the upper portion of the Proposed Development visually merged to the adjacent existing buildings to become a united building mass to this VP.

9.5.3 The Proposed Development located at the existing PTI, in between the Hoi Bun Industrial Building and Hoi Yuen Road extension. The massing of the Proposed Development dominated the visual composition of this VP while some parts of the lower portion of the Proposed Development are blocked by the existing elevated Kwun Tong By-pass in the foreground.

Visual Obstruction

9.5.4 The proposed building height of the Proposed Development is less than 100mPD which is in similar height of the adjacent new-built commercial blocks.

9.5.5 The obstruction of the Proposed Development will have effect to this VP and moderately reduces the sky openness of the VP.

Effect on Public Viewers

9.5.6 The sensitivity of the public viewers of this VP is medium. The Proposed Development is located to the North of the ferry route from North Point to Kwun Tong. The view to the Proposed Development is partially intercepted by the elevated Kwun Tong by-pass in the front, the PTI and elevated green deck are less visible to this VP. The skycourt with greening features at the tower, the existing trees to be retained and tree compensatory planting along the waterfront promenade can reduce the visual impact from this VP. Adding up the above considerations, the magnitude of change to this VP is *moderate*. As the Proposed Development is going to reinstate the CBD image, the overall visual impact to this VP is therefore *Slightly adverse.*

Effect on Visual Resources

9.5.7 The PTI with the green deck and the lower portion of the tower blocks are intercepted by the Elevated Kwun Tong By-pass.

9.5.8 The view from this VP is largely characterized by the existing elevated Kwun Tong By-pass and the Kwun Tong Promenade in the foreground and the commercial buildings in the background. The mid- to top portion of the Proposed Development is visible from this VP but visually blended into the existing blocks in the background of this VP.

9.6 VP3 – View from Landscape Deck of Cruise Terminal Building

Visual Composition

9.6.1 As shown in **Figure 1.25**, the view from the Landscape Deck of Cruise Terminal Building is characterized by the mid- to high-rise buildings with industrial/commercial blocks to the left of the VP and residential estates- the Laguna Plaza to the right. Open lawn of Runway Park Phase 1 and the KT Typhoon Shelter are also forms as one of the major visual elements in the foreground of this VP.

9.6.2 The Proposed Development is further beyond the Typhoon Shelter, at approximately 1000m from the VP. The building height of the Proposed Development is not higher than +100 mPD which is similar to the height of the adjacent buildings.

Visual Obstruction

9.6.3 The Proposed Development is noticeable 1000m away from the VP. Limited obstructions of the sky view and the existing buildings are found in the VP. However, most of the previously stated visual elements still visually intact from this VP.

Effect on Public Viewers

9.6.4 The sensitivity of recreational users in the VP is medium. The Proposed Development will not block the view to the Kwun Tong Promenade and open lawn of Runway Park Phase 1 at the foreground. The blockage of the sky view is minimum with the Proposed Development blended in with the existing buildings in the surrounding and enhancing the Kowloon East CBD2 image in front of the relatively aged industrial buildings. In view of the above, the magnitude of change to this VP is *moderate*. Considering the Proposed Development would not degrade the visual composition of this VP, the visual impact to this VP is considered *Slightly adverse*.

Effect on Visual Resources

9.6.5 The view from this VP is largely characterized by the Open lawn in Runway Park Phase 1, the Kwun Tong Promenade in the foreground and the high density buildings in the background. The Proposed Development is visible from this VP. The tower blocks (not higher than100mPD) of the Proposed Development create visual change to this VP. The two building mass of the Proposed Development is blended in with the existing surrounding buildings, further enhancing the CBD2 identity along the waterfront and is complementary to the planned tourism and entertainment uses at the Kai Tak Runway Tip (KTRT).

9.6.6 As stated above, the Proposed Development will only have minimal obstructions to the prominent visual resources / elements at the back of this VP. The Proposed Development will not block view to the open lawn or Typhoon Shelter and will not degrade the visual amenity that is enjoyed from the VP.

9.7 VP4 – View from Kai Tak Runway Park Phase 2

Visual Composition

9.7.1 As shown in **Figure 1.26**, the view from Kai Tak Runway Park Phase 2 dominated equally by waterfront of the Typhon Shelter in the foreground and medium to high-rise buildings in the background. Sky view can also be seen above those existing buildings.

9.7.2 The Proposed Development located at adjacent to the existing group of industrial/ commercial towers forming a major visual composition together with One Harbour Plaza and Kwun Tong Harbour Plaza of this VP.

Visual Obstruction

9.7.3 The Proposed Development will be built in front of the existing buildings of similar height which will slightly reduce the visual openness of the locality, the open sky view is still mostly maintained.

9.7.4 Height of the Proposed Development will not exceed the surrounding buildings and could effectively blend in with the existing building cluster. The Proposed Development would further uplift the city image along the waterfront, enhancing the CBD2 characteristic. Beside limited ridgeline behind Laguna plaza will be obstructed, most of the sky view of this VP is not blocked by the Proposed Development.

Effect on Public Viewers

9.7.5 The sensitivity of the public viewers of this VP is medium. Upon the completion of the Proposed Development, the presence of new tower blocks will have slightly negative visual impact to the recreational users of this VP. With the Kwun Tong By-pass highway structure located in front of the Proposed Development, the intrusiveness of PTI and elevated green deck is graded as negligible at a distance of 1000m.

9.7.6 As aforementioned, visual quality of an emerging CBD will be improved with good quality of building design along the prominent waterfront. The negative effect would be reduced by integration of the existing towers, and stepped buildings height (+88.5mPD for tower towards to waterfront and +99 mPD for tower towards inner city). In view of the above, the magnitude of change is *slight to moderate* and the overall visual impact is considered as *slightly adverse*.

Effect on Visual Resources

9.7.7 The tower blocks (not higher than +100mPD) of the Proposed Development create visual change to this VP. The height of the Proposed Development is similar to the surrounding developments, blending in with the building cluster in terms of building mass and providing an updated waterfront image in terms of design.

9.7.8 As stated above, the Proposed Development is 1000m away from this VP and has limited blockage of the sky view and the ridgeline behind Laguna plaza, visual resources / elements of this view. As such, it is unlikely that the Proposed Development will significantly degrade the visual amenity that is enjoyed from the VP. In fact, the updated waterfront image and quality could be considered as an improvement.

9.8 VP5 – View from Quarry Bay Park

Visual Composition

9.8.1 As shown in **Figure 1.27**, the view from Quarry Bay Park located about 2000m from the Subject Site has an open view of the sky and the existing high density developments as background of this VP.

9.8.2 The location and height of the Proposed Development create minor visual change to the existing visual composition. Most of the existing visual composition are maintained. The proposed development only blocks the commercial/industrial buildings behind with apparent stepped-down building height effect.

9.8.3 The Proposed Development is visually blend in with to the existing buildings in the background to become a united visual composition to this VP.

Visual Obstruction

9.8.4 The Proposed Development is located beyond Victoria Harbour in the foreground, limited visual obstruction to the existing low-rise building in Kwun Tong District is found. However, the visual openness of this VP remains the same and is not obstructed by the Proposed Development.

Effect on Public Viewers

9.8.5 The sensitivity of the public viewers of this VP is low. Due to the fact that the Kwun Tong district is dominated by commercial/ Industrial blocks, the Proposed Development will be a new commercial development in terms of building form and design. With building height restriction in Kwun Tong District, the height of proposed towers blocks is not higher than +100mPD. The ridge-line of former Anderson Road Quarry Site at background is preserved.

9.8.6 Two tower blocks of the proposed development with backdrop of numerous buildings located across the Victoria harbour and relatively far away from Quarry Bay Park. The PTI and the elevated green deck are likely blocked by the existing Kwun Tong by-pass when viewing in a distance. Considering in the ability to enhance and renew the waterfront CBD2 image, the magnitude of change is considered *negligible* and visual impact to the recreational users in the Quarry Bay Park is considered *negligible*.

Effect on Visual Resources

9.8.7 Due to the prominent location of the Proposed Development, the tower blocks (not higher than +100mPD) of the Proposed Development is still visible. As the height of the Proposed Development is similar to the surrounding developments and visually blends in with other existing buildings of Kwun Tong District, it therefore creates no significant visual change to this VP in a long distance.

9.8.8 The view from this VP is largely characterized by the high density of urban development in which the commercial/ industrial development by the Victoria Harbour in the foreground and residential estate and the Anderson Road Quarry Site in the background. The Proposed Development being located within the commercial/ industrial area is visible from this VP but is compatible to the surrounding environment.

9.8.9 The two building blocks of the Proposed Development will not block the sky view and ridgeline of the VP and the Proposed Development blended into the existing surrounding buildings. Thus, the Proposed Development is compatible to the surrounding environment.

10 LANDSCAPE AND VISUAL MITIGATION MEASURES

10.1.1 With the aim to reorganise existing government uses for a new commercial site along the Kowloon East CBD2 waterfront, the Proposed Development has considered a number of measures to mitigate landscape and visual impact brought to the area. These measures include:

- Proposed building disposition in a stepped height profile with the high point not exceeding the existing building height restriction of 100mPD, and opening facing the waterfront;
- Integration of large extent of green and open space area including at-grade open space (promenade and park spaces) linking up to the proposed landscape deck within the development site (i.e. “C” site);
- The overall spatial planning would allow multi-level open space along an opened-up promenade, which is an improvement to the exiting configuration. (Please refer to **Figure 1.29** for better illustration of the design proposal)

10.1.2 Nonetheless, potential adverse impacts on some LRs and LCAs during the construction and operation phases, and adverse visual impacts on VSRs during the construction and operation phases would be unavoidable. Therefore, Landscape and Visual Mitigation Measures during the construction and operation phases are proposed to alleviate the potential adverse impacts.

10.1.3 These landscape and visual mitigation measures recommended for the construction and operation phases, with indications of the corresponding Funding, Implementation, and Maintenance and Management Agencies, are listed in **Table 10.1 and Table 10.2**.

Table 10.1 Landscape and Visual Mitigation Measures for Construction Phase

ID No.	Landscape and Visual Mitigation Measures	Funding Agency	Implementation Agency	Maintenance/ Management Agency
CM1 (L)	**Preservation of Existing Trees and Other Vegetation** All the existing Trees to be retained should be carefully protected during the construction phase. Existing trees are to be assessed based on their health condition, amenity value as well as the feasibility of transplanting. In case removal of existing trees are unavoidable, hierarchy of removal of existing trees in accordance with DEVB TCW No. 7/2015 titled "Tree Preservation" and the latest "Guidelines on Tree Preservation during Development" issued by GLTM Section of DEVB, including provision of Tree Protection Zones (TPZs) will be adopted. Any existing vegetation in landscaped areas and natural terrain not to be affected by the Proposed Development should also be carefully preserved. Therefore, these existing landscape elements can maintain their qualities throughout the construction phase.	ArchSD/ CEDD	ArchSD/ CEDD	ArchSD/ CEDD/LCSD
CM2 (V)	**Control of Night-time Lighting Glare** Lighting for the construction works at night, if any, should be carefully controlled to prevent light overspill to the nearby VSRs and into the sky.	ArchSD/ CEDD	ArchSD/ CEDD	ArchSD/ CEDD
CM3 (L) (V)	**Erection of Decorative Screen Hoardings** Decorative Hoardings, with designs and forms compatible with the surrounding settings, should be erected during the construction phase to minimise the potential landscape and visual impacts from the construction works and activities, e.g. avoiding unintended destruction of existing trees and other landscape elements, and reducing visual bulkiness of the screen hoardings, etc.	ArchSD/ CEDD	ArchSD/ CEDD	ArchSD/ CEDD
CM4 (L) (V)	**Management of Construction Activities and Facilities** The layout and arrangement of construction site facilities which include site office and temporary storage area should be properly managed and construction activities at the site should be carefully supervised	ArchSD/ CEDD	ArchSD/ CEDD	ArchSD/ CEDD

	and controlled to minimise potential adverse landscape and visual impacts.

Note: (L) denotes a landscape mitigation measure whereas (V) denotes a visual mitigation measure.

Table 10.2 Landscape and Visual Mitigation Measures for Operation Phase

ID No.	Landscape and Visual Mitigation Measures	Funding Agency	Implement-ation Agency	Maintenance/ Management Agency
OM1 (L) (V)	**Provision of Buffer Planting** Buffer Planting shall be provided at the perimeter of potential intrusive aboveground structures, so as to visually screen and soften their hard edges and surfaces and create a more harmonious landscape.	ArchSD/ CEDD / Future Lot Owner	ArchSD/ CEDD / Future Lot Owner	LCSD and its maintenance agents / Future Lot Owner
OM2 (L) (V)	**Provision of Amenity Planting** Opportunity of Amenity Planting shall be maximised within the Study Area, so that the proposed works will be more compatible and harmonious with the surroundings landscape- and visual-wise.	ArchSD/ CEDD / Future Lot Owner	ArchSD/ CEDD / Future Lot Owner	LCSD and its maintenance agents / Future Lot Owner
OM3 (L) (V)	**Reinstatement of Temporarily Disturbed Landscape Areas** During the Operation Phase, all disturbed hard and soft landscape areas within temporary works sites and works areas caused by the proposed works shall have already been reinstated equal or better quality to the satisfaction of the relevant Government Departments, so as to maintain or improve the existing landscape and visual quality.	ArchSD/ CEDD	ArchSD/ CEDD	*Various Government Departments
OM4 (L) (V)	**Green Roof, Vertical Green, Building Disposition and Building Height** Green roof and vertical green will be introduced on the roof and building façade respectively. Adjacent built environment will be considered when designing and arrangement of the disposition of towers, stepped height profile and façade design of the buildings in order that the Proposed Development can blend into the adjacent buildings.	Future Lot Owner	Future Lot Owner	Future Lot Owner

Note: (L) denotes a landscape mitigation measure whereas (V) denotes a visual mitigation measure.

* Remarks: The arrangement of maintenance/management agencies are subject to agreement with corresponding departments/parties in accordance with WP4 Implementation Strategy. The identified key potential management and maintenance departments are: CEDD, LCSD (e.g. open spaces, promenade and soft landscape, etc.); ArchSD (e.g. ground finishes, hard landscape, above-podium architectural features, etc.

The Contractor shall be responsible for the maintenance of the soft landscape works during the establishment period at operation phase. ArchSD/ CEDD /LCSD shall then be responsible for the management and maintenance of the soft landscape work until such time those are successfully handed over to the designated agent/department.

10.1.4 The mitigation measures (refer to **Figure 1.28)** for the construction and operation phase listed above should be implemented as early as possible to minimise the landscape and visual impacts during the construction stage. Photomontages of the Proposed Development (based on the RODP of **Figure 2.2**) built with and without mitigation measures on Day 1 and after 10 years are illustrated in **Figures 1.23 to 1.27**.

11 RESIDUAL IMPACT

11.1 Significance of Residual Landscape and Visual Impacts

11.1.1 The potential significance of the landscape and visual impacts would include the demolition of existing recreational park, bus terminus and the construction of the new building towers buildings, PTI. And the ancillary facilities. The potential significance of the landscape impacts during the construction and operation phases before and after mitigation is presented in **Table 11.1**. The assessment followed the proposed methodology described in **Section 4** and assumed that the appropriate mitigation measures identified in **Tables 10.1 and 10.2** would be implemented.

11.1.2 The Proposed Development include the construction of commercial development, a podium deck, Public Transport Interchange and the ancillary facilities as well as the streetscape improvement works. It is anticipated with the implementation of the recommended mitigation measures that the proposed works would have slightly beneficial residual impacts, on the affected portions of LR 1, LR 3, LR 3 and LR 5, during operation phase.

11.1.3 During the operation phase, the new building towers would be the key sources of landscape and visual impacts. However, the introducing of the landscape deck above the PTI and the open space along the promenade with the implementation of the recommended mitigation measures, the overall residual landscape and visual impacts of the Proposed Development would be reduced.

11.1.4 The potential landscape impacts caused by the Proposed Development during its construction phase would be moderate significance on LR1, LR 3 and LR 4; insubstantial significance on LR 2 and negligible on LR 5. With the implementation of proposed mitigation measures, the residual impact on these LRs would be Slightly Beneficial.

Table 11.1 Significance of Landscape Impacts during Construction and Operation Phases

ID No.	Landscape Resource / Character Areas	Sensitivity (Low, Medium, High)		Magnitude of Change (Negligible, Small, Intermediate, Large, Not Affected		Impact Significance before Mitigation (Insubstantial, Slight, Moderate, Substantial, Not Affected) ('+ve' indicating beneficial impact)		Recommended Mitigation Measures	Significance of Residual Impact (Insubstantial, Slight, Moderate, Substantial, Not Affected		
		Construction	Operation	Construction	Operation	Construction	Operation		Construction	Operation Day 1	Operation Year 10
Landscape Resources											
LR 1	Promenade & Pier	Medium	Medium	Intermediate	Intermediate	Moderate	Moderate	CM1, CM2, CM3, CM4, OM1, OM2, OM3	Moderate	Slightly Beneficial	Slightly Beneficial
LR 2	Recreational Promenade	High	High	Not Affected	Not Affected	Insubstantial	Insubstantial	Not Required	Insubstantial	Insubstantial	Insubstantial
LR 3	Recreation Ground	Medium	Medium	Large	Negligible	Moderate	Insubstantial	CM1, CM2, CM3, CM4, OM1, OM2, OM3	Moderate	Slightly Beneficial	Slightly Beneficial
LR 4	Infrastructure Facilities	Low	Medium	Large	Negligible	Moderate	Insubstantial	CM1, CM2, CM3, CM4, OM1, OM2, OM3	Moderate	Slightly Beneficial	Slightly Beneficial
LR 5	Public Works Facilities	Low	Medium	Intermediate	Negligible	Slight	Insubstantial	CM1, CM2, CM3, CM4, OM1, OM2, OM3	Slight	Slightly Beneficial	Slightly Beneficial
LR 6	Commercial & Industrial Development	Medium	Medium	Not Affected	Not Affected	Not Affected	Not Affected	CM2	Not Affected	Not Affected	Not Affected
LR 7	Residential Development	Medium	Medium	Not Affected	Not Affected	Not Affected	Not Affected	Not Required	Not Affected	Not Affected	Not Affected
LR 8	Vacant Lot	Low	Low	Not Affected	Not Affected	Not Affected	Not Affected	Not Required	Not Affected	Not Affected	Not Affected
LR 9	Community Facilities	Low	Low	Not Affected	Not Affected	Not Affected	Not Affected	Not Required	Not Affected	Not Affected	Not Affected
LR 10	Traffic Route underneath Elevated Road	Medium	Medium	Not Affected	Not Affected	Not Affected	Not Affected	Not Required	Not Affected	Not Affected	Not Affected
LR 11	Typhoon Shelter	Medium	Medium	Not Affected	Not Affected	Not Affected	Not Affected	CM2	Not Affected	Not Affected	Not Affected
LR 12	Harbour Water	Medium	Medium	Not Affected	Not Affected	Not Affected	Not Affected	CM2	Not Affected	Not Affected	Not Affected
LR13	Nullah	Medium	Medium	Not Affected	Not Affected	Not Affected	Not Affected	Not Required	Not Affected	Not Affected	Not Affected
Landscape Character Areas											
LCA 1	Industrial Urban Landscape	Medium	Medium	Not Affected	Not Affected	Not Affected	Not Affected	Not Affected	Not Affected	Not Affected	Not Affected
LCA 2	Residential Urban Landscape	Medium	Medium	Not Affected	Not Affected	Not Affected	Not Affected	Not Required	Not Affected	Not Affected	Not Affected

ID No.	Landscape Resource / Character Areas	Sensitivity (Low, Medium, High)		Magnitude of Change (Negligible, Small, Intermediate, Large, Not Affected		Impact Significance before Mitigation (Insubstantial, Slight, Moderate, Substantial, Not Affected) ('+ve' indicating beneficial impact)		Recommended Mitigation Measures	Significance of Residual Impact (Insubstantial, Slight, Moderate, Substantial, Not Affected		
		Construction	Operation	Construction	Operation	Construction	Operation		Construction	Operation	
										Day 1	Year 10
LCA 3	Ongoing Major Development Landscape	Medium	Medium	Large	Negligible	Moderate	Insubstantial	CM1, CM2, CM3, CM4, OM1, OM2, OM3	Moderate	Slightly Beneficial	Slightly Beneficial
LCA 4	Typhoon Shelter Landscape	Medium	Medium	Not Affected	Not Affected	Not Affected	Not Affected	CM2	Not Affected	Not Affected	Not Affected
LCA 5	Inshore Water Landscape	Medium	Medium	Not Affected	Not Affected	Not Affected	Not Affected	CM2	Not Affected	Not Affected	Not Affected

12 CONCLUSION OF THE OVERALL LANDSCAPE AND VISUAL IMPACT

12.1.1 During the construction phase, the key sources of landscape and visual impacts would include construction of the podium deck, commercial buildings, and construction of open spaces, modification of DGV queuing area. The visual experience of the VSRs would not be significantly changed. With the implementation of the recommended mitigation measures, it is considered that the residual landscape and visual impact is **acceptable.**

Table 12.1 Summary of Visual Impact of VPs

ID No.	Viewing Point	Visual Sensitivity	Magnitude of Change	Visual Impact
VP1	View from Kwun Tong Promenade	High	Slight	Slightly Adverse
VP2	View from cross-harbour Ferry to Kwun Tong Ferry Pier	Medium	Moderate	Slightly Adverse
VP3	View from Landscape Deck of Cruise Terminal Building	Medium	Moderate	Slightly Adverse
VP4	View from Kai Tak Runway Park Phase 2	Medium	Slight to Moderate	Slightly Adverse
VP5	View from Quarry Bay Park	Low	Negligible	Negligible

12.1.2 During the operation phase, the landscape deck and the commercial buildings would be the key sources of landscape and visual impacts. Considered the visual sensitivity of public viewer and the magnitude of change of the VPs from Table 12.1, visual sensitivity of public viewer of VP1 is high and the magnitude of change is rated slight; Visual sensitivity of public viewer of VP2 is medium and the magnitude of change is rated moderate; visual sensitivity of public viewer of VP3 is medium and the magnitude of change is rated moderate; Visual sensitivity of public viewer of VP4 is medium and the magnitude of change is rated slight to moderate; Visual sensitivity of public viewer of VP5 is low and the magnitude of change is rated negligible. In additional to the introduction of the skycourt with greening features, podium open space, at-grade open space as well as the pet garden with the implementation of the recommended mitigation measures, the overall residual landscape and visual impacts of the Proposed Development is considered **acceptable**. Noting that VP1 provides a close-up view to the re-provisioned DGV queuing area in the foreground, VP2 and VP4 provides a dominant building mass obstructed the open sky view, the analysis results in slightly adverse visual impact for these 3 VPs. Nonetheless, the visual impact of VP1 and VP2 is reduced by the amenity planting on the landscape deck as well as the innovative façade design/ treatment such as the skycourt with greening features. The street planting along the waterfront promenade also the reduce the visual impact from VP2. The analysis of VP5 illustrates that the Proposed Development will have no noticeable visual impact, while the analysis of VP3 illustrates that the Proposed Development will only have minimal obstructions to the sky view and existing buildings. Thus, their visual impacts are considered negligible and slightly adverse from these VPs respectively.

12.1.3 The design and layout of the Proposed Development as stipulated above has carefully considered the surrounding contexts and key public viewers located within the assessment area. The massing and disposition of the building blocks have been carefully considered not to create sufficient visual blockage for workers at surrounding industrial/ commercial blocks, especially users travel along the existing footbridge from Kwun Tong Ferry Pier. The Proposed Development is set-back with provision of elevated green deck on the top of the PTI to reduce the visual impact to the surroundings.

12.1.4 The introduction of the Proposed Development, having considered the sensitivity of public viewers, the visual composition, the visual resources, the effects on public viewers and the effects visual resources, will not generate significant adverse visual impact. The visual change caused by the Proposed Development is not significant when viewed from the identified VPs. It will not detract the visual value attached to the views or have a significant impact to the visual accessibility to the existing visual amenity and resources nearby. Urban design such as creation of road-side planting and disposition of buildings proposed as part of the Proposed Development would serve to improve the overall quality and help alleviate to some degree the potential visual impact arising from the new developments. Mitigation measures such as greening measures and facade treatments may be explored in subsequent architectural design stage to further improve the overall aesthetics and visual interests of the Proposed Development.

12.1.5 Beside VP1, VP2, VP3 and VP4 of which their visual impact is graded slightly adverse, the visual impact of VP5 are graded negligible. Efforts have been made to ameliorate the potential visual impact of the Proposed Development as far as possible. Whilst some degree of visual obstruction will occur, they are generally insignificant. In return, the Proposed Development and a quality green deck will make a positive contribution to urban innovation and support a sustainable development of Kwun Tong district in both business and social aspects. In conclusion, the overall impact of the proposed development is considered **Acceptable.**

- End -

FIGURES

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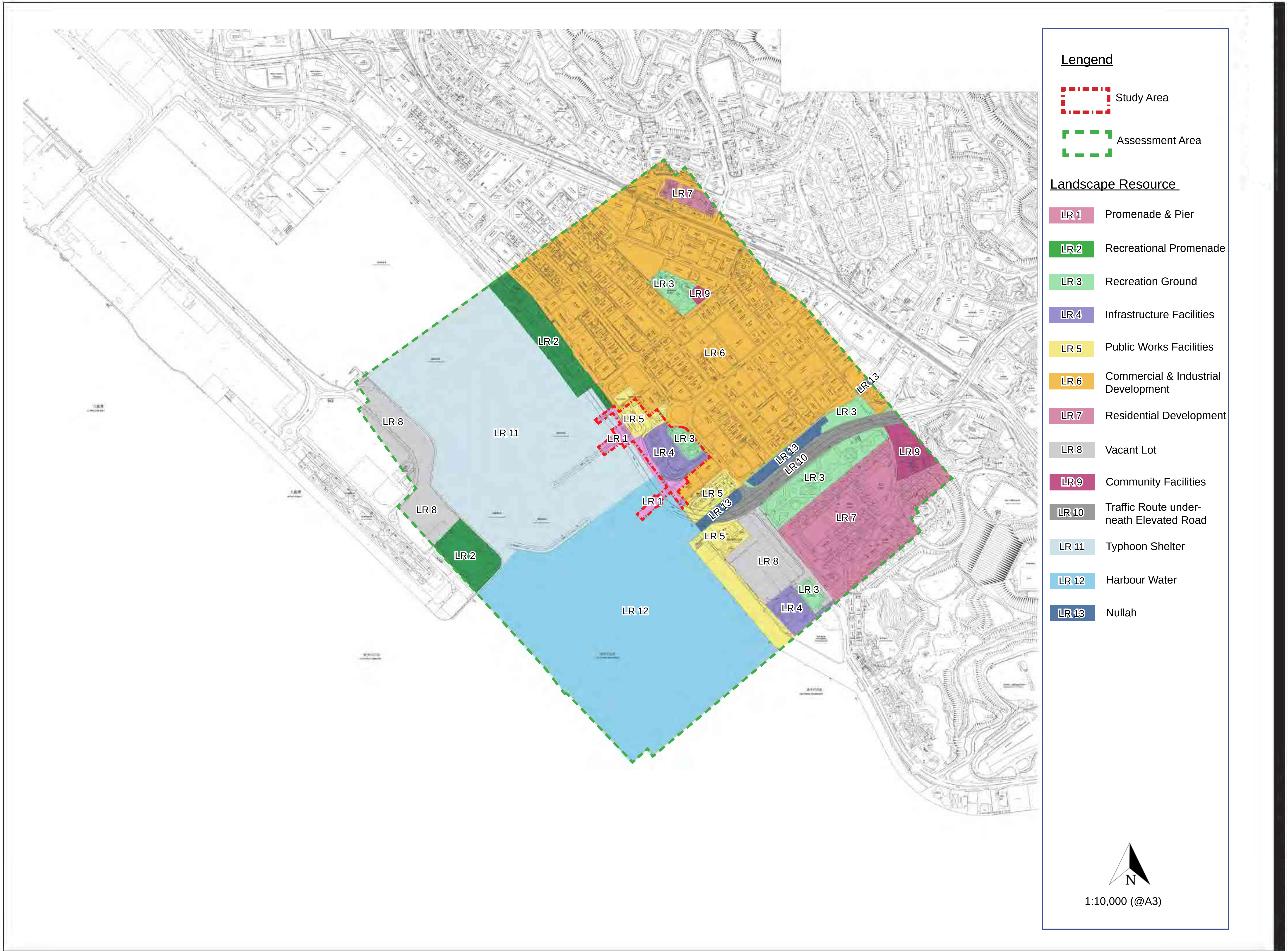


Figure 1.1

Study Boundary and Landscape Resource Plan

Agreement No. CE 61/2015(TP)

Planning and Engineering Study on Kwun Tong Action Area Feasibility Study

Landscape and Visual Impact Assessment

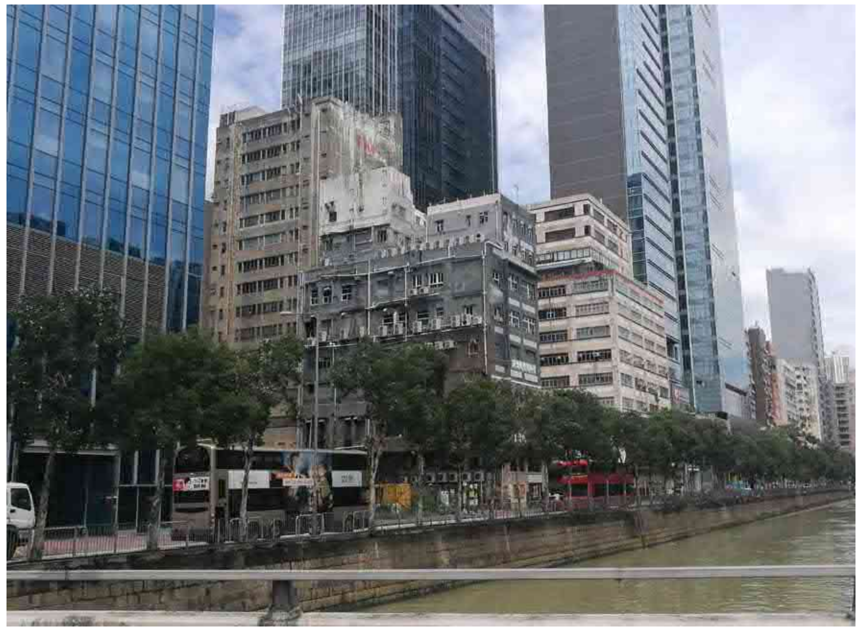
LR 1 Promenade & Pier

LR 2 Recreational Promenade

LR 3 Recreation Ground

LR 4 Infrastructure Facilities

LR 5 Public Works Facilities



LR 6 Commercial & Industrial Development

LR 7 Residential Development

LR 8 Vacant Lot

LR 9 Health Centre

Figure 1.11

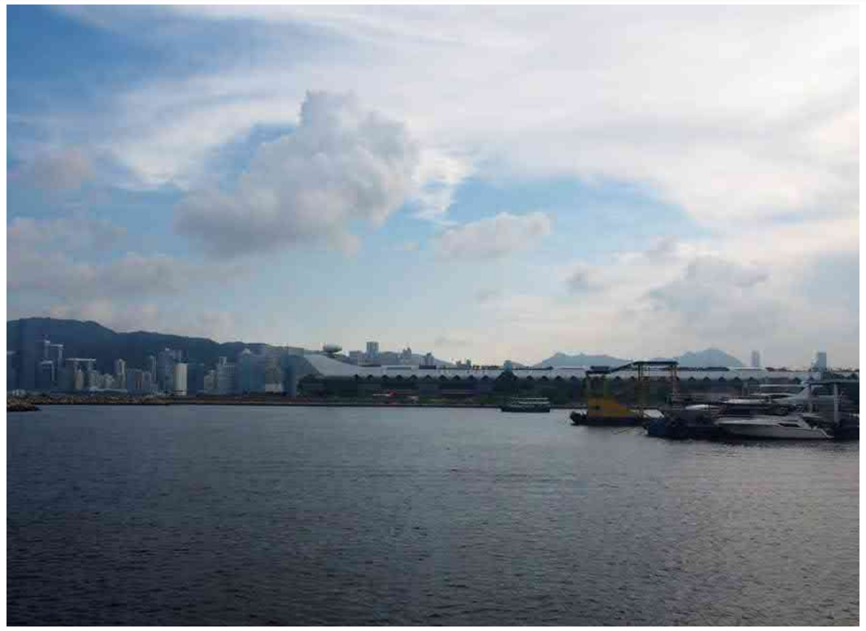
Photos of Landscape Resource (1 of 2)

Agreement No. CE 61/2015(TP)

Planning and Engineering Study on Kwun Tong Action Area Feasibility Study

Landscape and Visual Impact Assessment

LR 10 Traffic Route underneath Elevated Road



LR 11 Typhoon Shelter

LR 12 Harbour Water

LR 13 Nullah

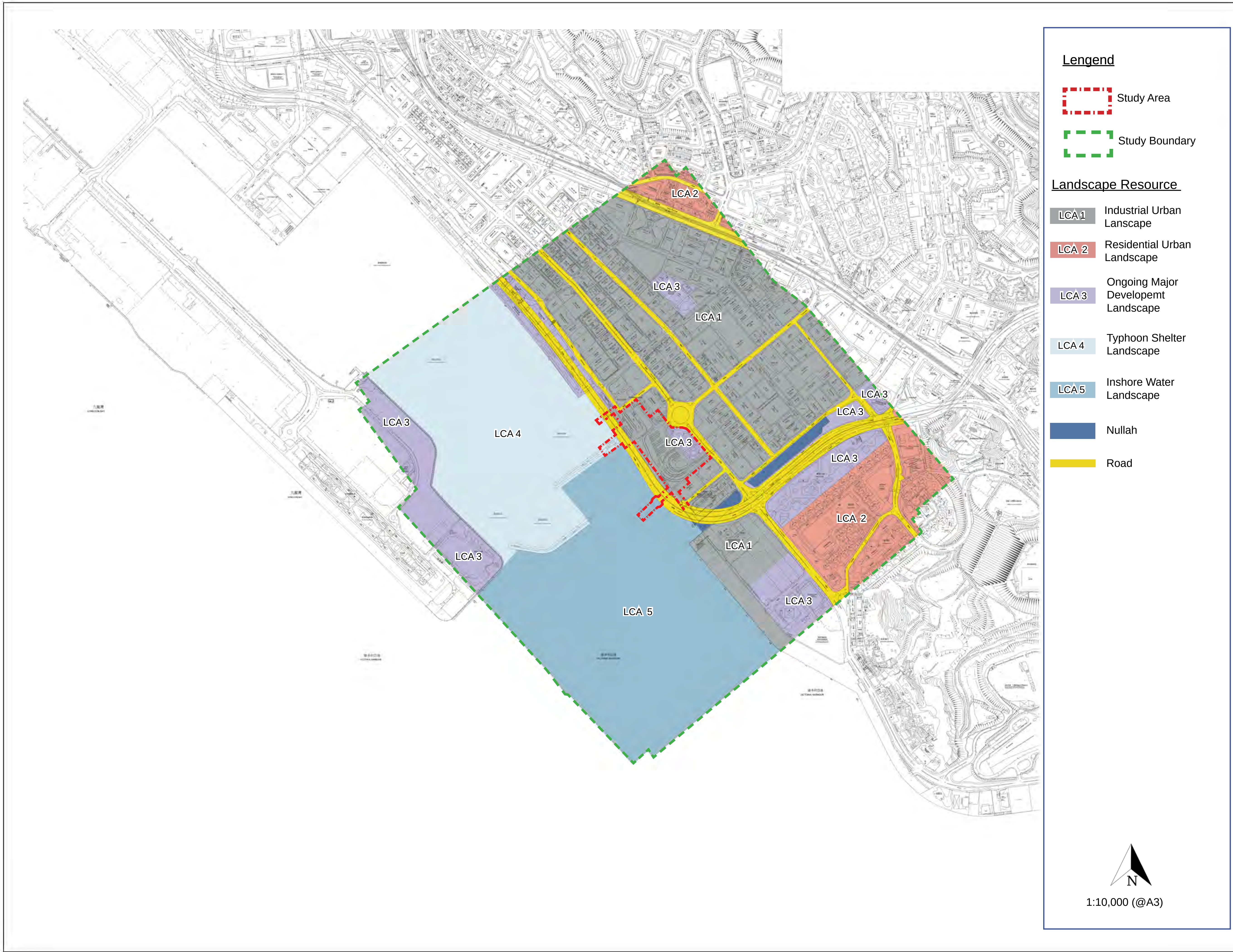


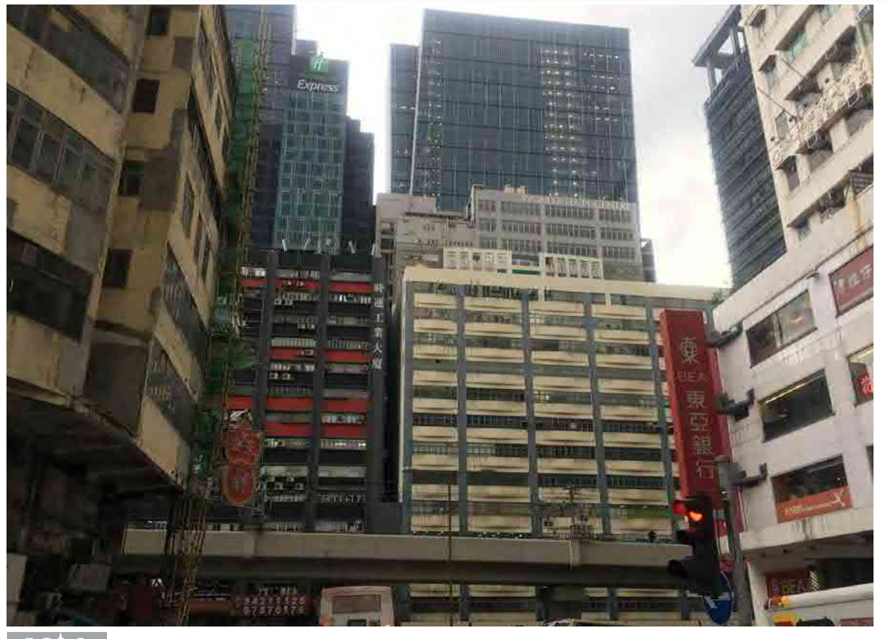
Figure 1.13

Plan of Landscape Character Areas

Agreement No. CE 61/2015(TP)

Planning and Engineering Study on Kwun Tong Action Area Feasibility Study

Landscape and Visual Impact Assessment



LCA 1 Industrial Urban Lanscape

LCA 2 Residential Urban Landscape

LCA 3 Ongoing Major Developemt Landscape

LCA 4 Typhoon Shelter Landscape

LCA 5 Inshore Water Landscape

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Photos of Landscape Character Areas

Figure 1.14

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Planning and Engineering Study on Kwun Tong Action Area Feasibility Study

Landscape and Visual Impact Assessment

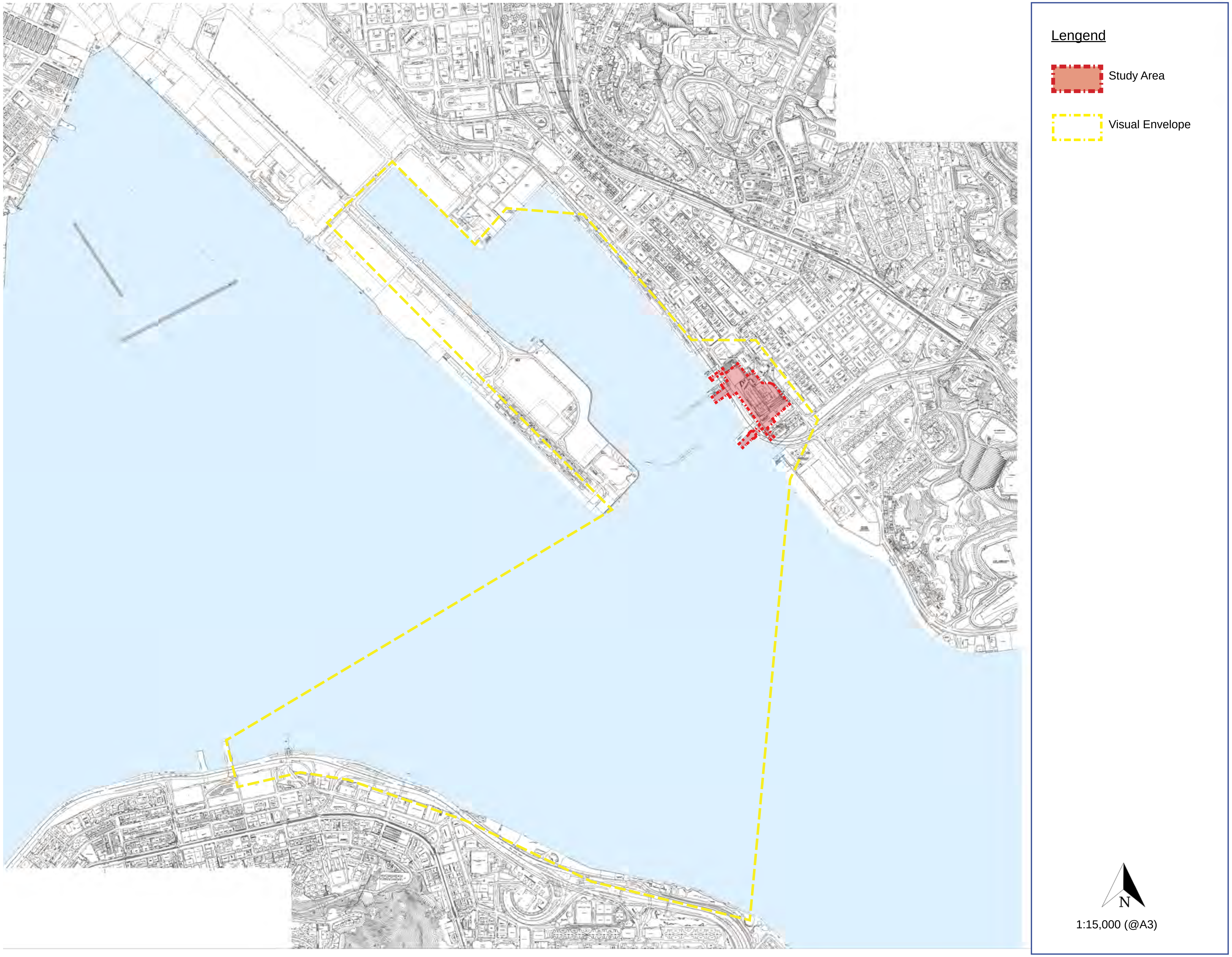

Figure 1.2

Visual Envelope for Visual Impact Assessment

Agreement No. CE 61/2015(TP)

Planning and Engineering Study on Kwun Tong Action Area Feasibility Study

Landscape and Visual Impact Assessment

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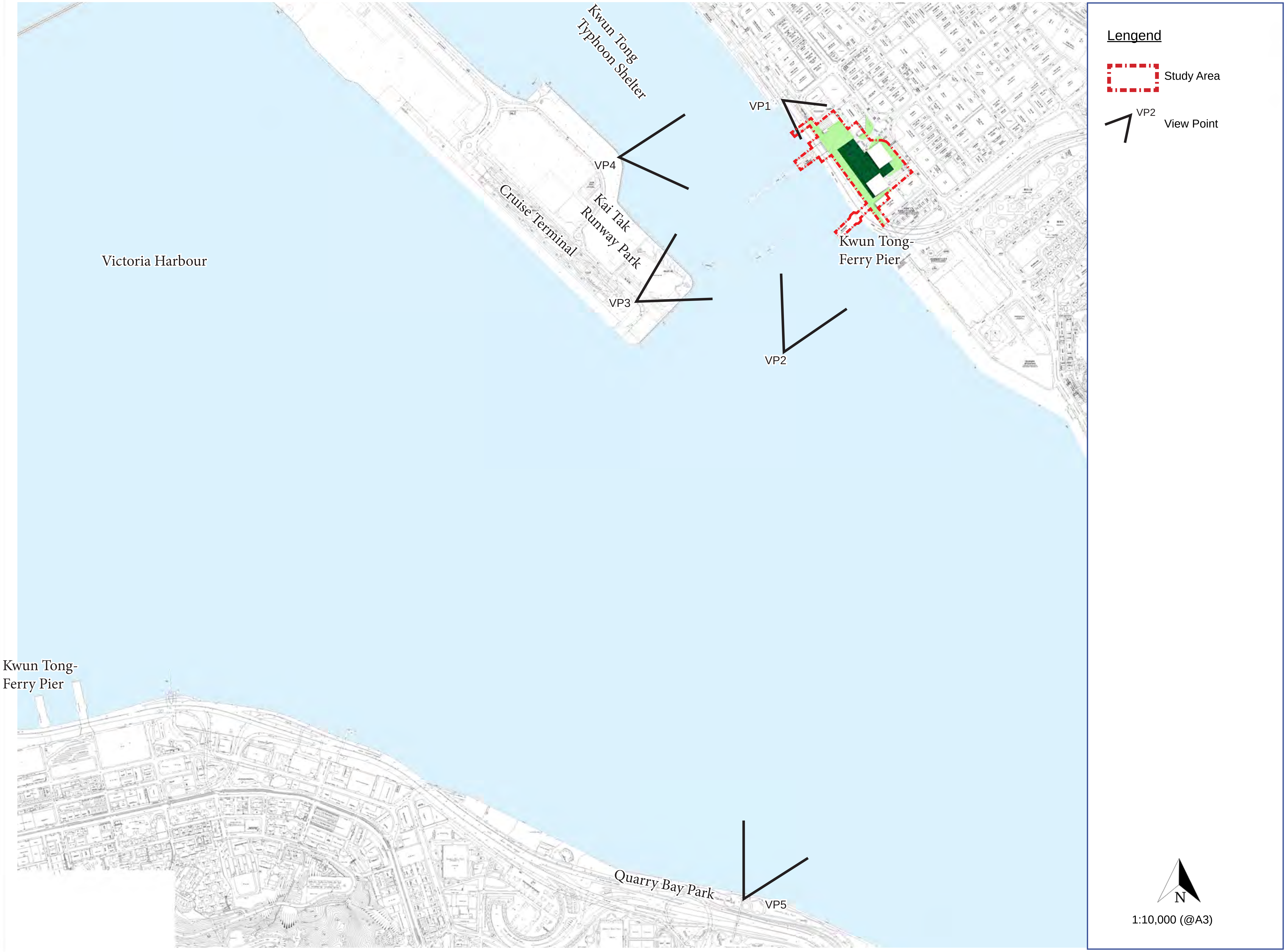

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View Point Location for Visual Impact Assessment

Figure 1.21

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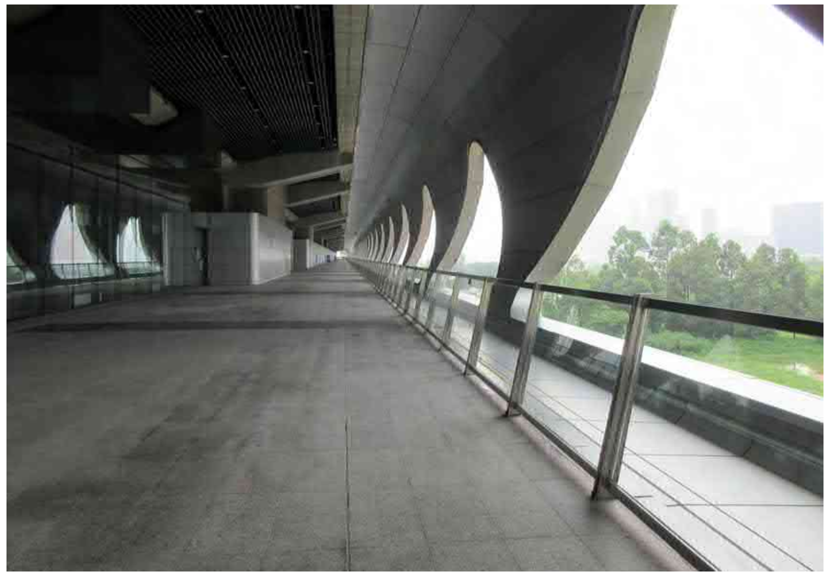
Planning and Engineering Study on Kwun Tong Action Area Feasibility Study

Landscape and Visual Impact Assessment

VP1 Kwun Tong Promenade

VP2 Cross- Harbour Ferry



VP3 Landscape Deck of Cruise Terminal Building

VP4 Kai Tak Runway Park Phase 2

VP5 Quarry Bay Park

Photos of View Point 1-5

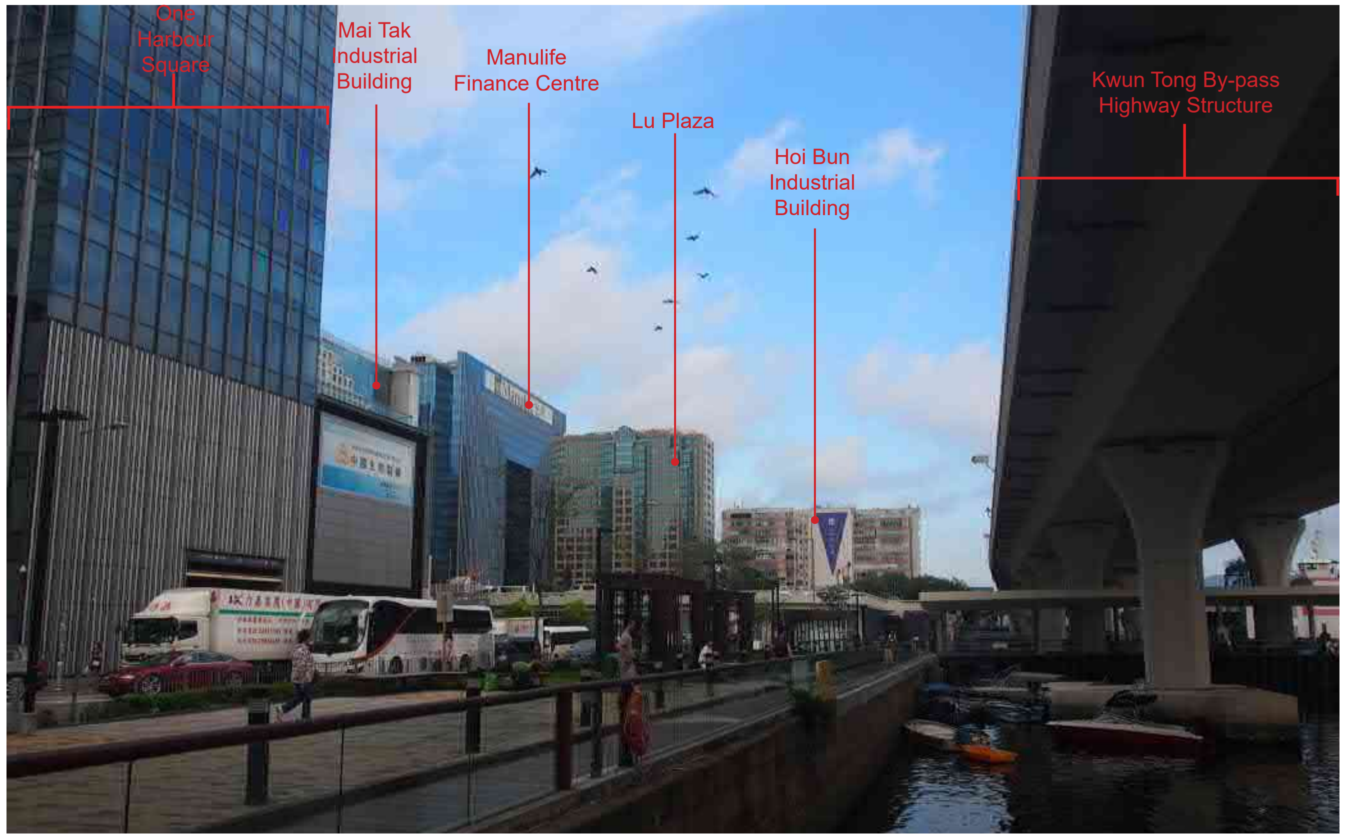
Figure 1.22

Agreement No. CE 61/2015(TP)

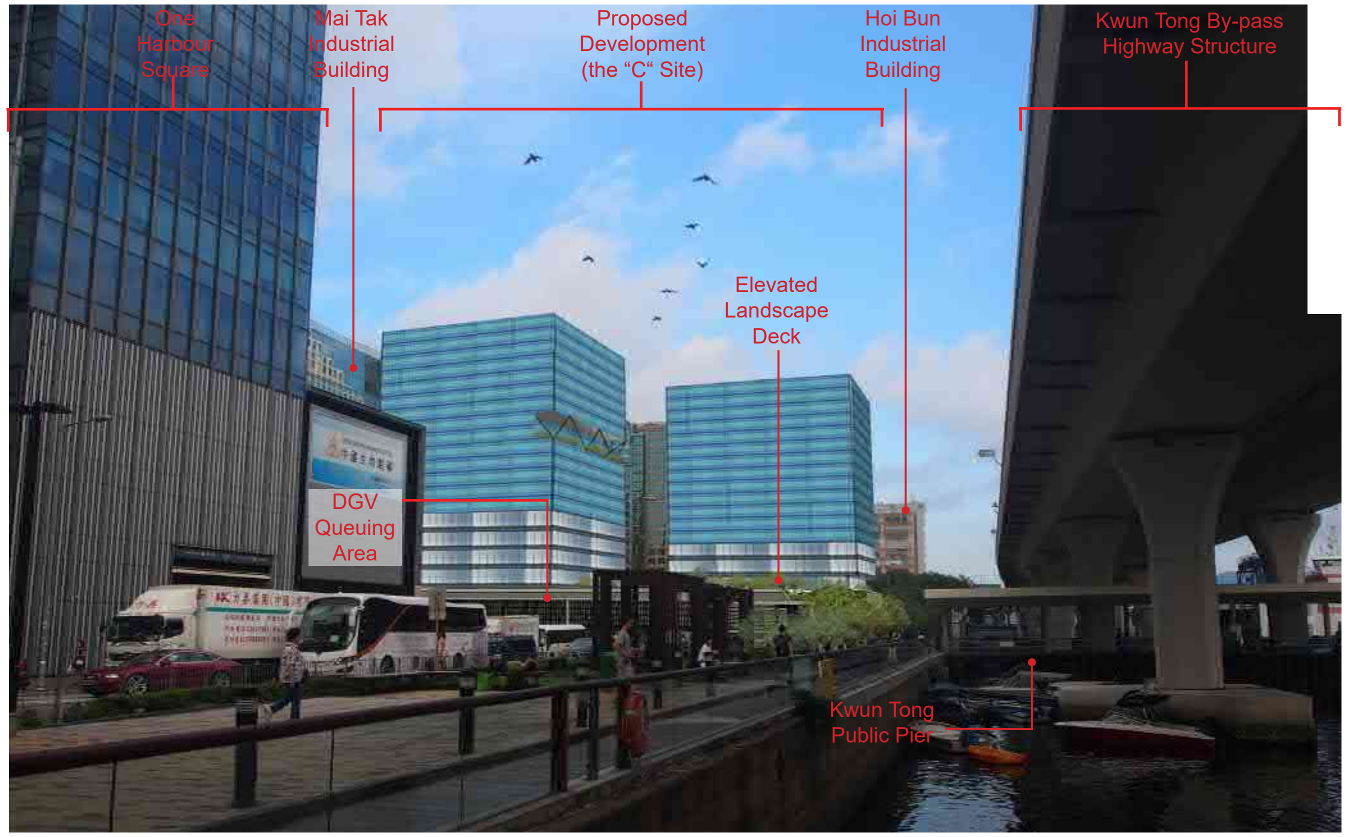
Planning and Engineering Study on Kwun Tong Action Area Feasibility Study

Landscape and Visual Impact Assessment

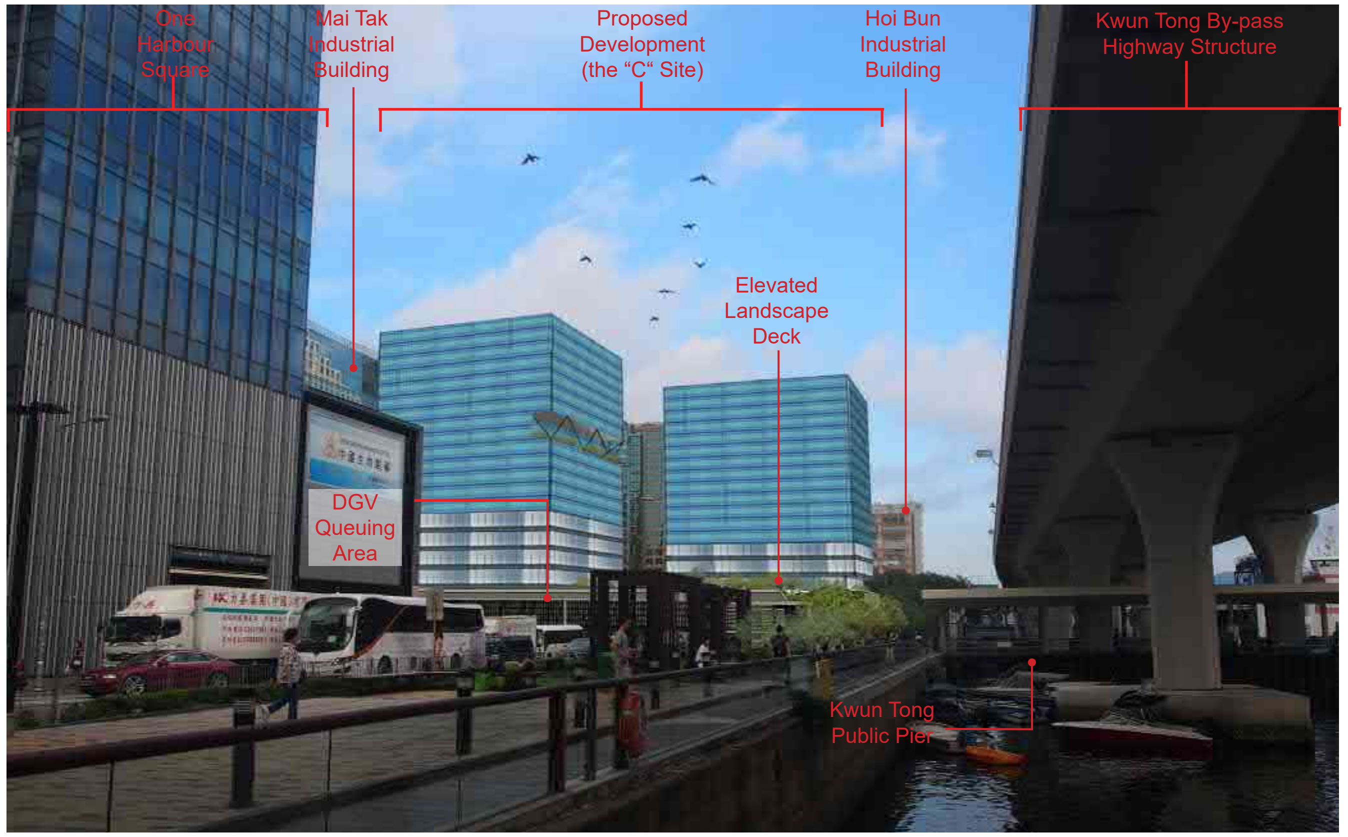
VP1 View From Kwun Tong Promenade



VP1 Existing Condition



VP1 Day 1



VP1 10 Years Time

Reference Images

Innovative and Green Architecture Façade Design / Treatment

Innovative Vertical Wall Design / Treatment

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Figure 1.23 Views from VP1- Existing Condition/ at Day 1 & 10 Years

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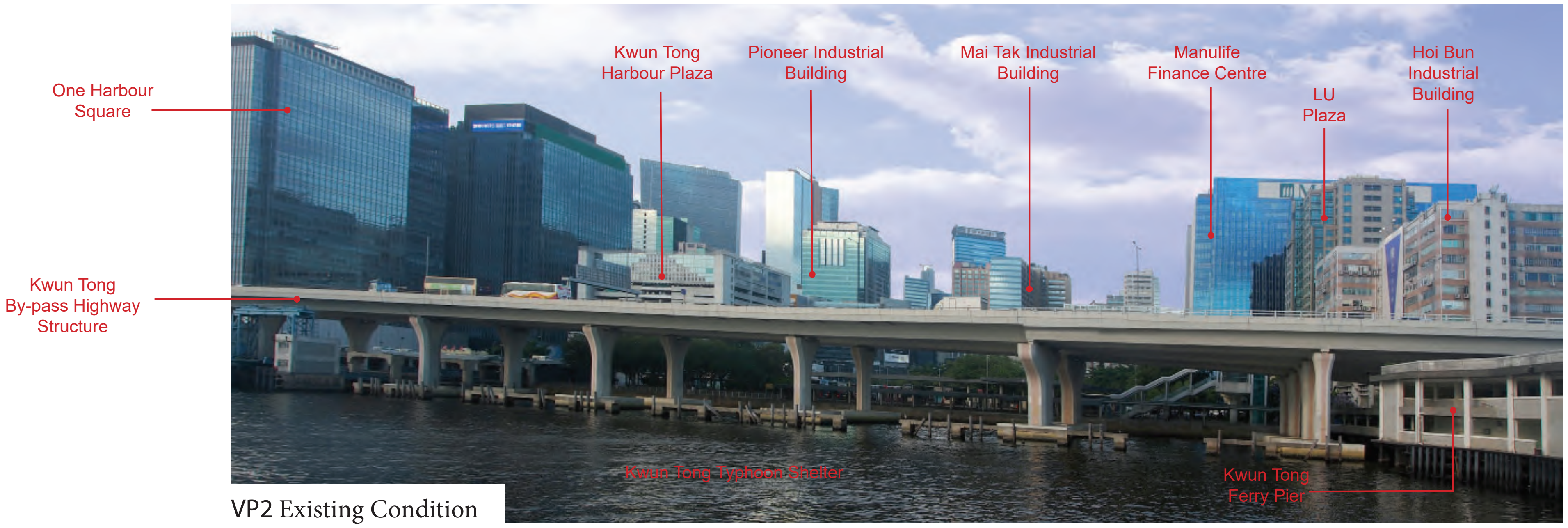
Planning and Engineering Study on Kwun Tong Action Area Feasibility Study

Landscape and Visual Impact Assessment

VP2 View From Cross- Harbour Ferry



VP2 Existing Condition

VP2 Day 1

VP2 10 Years Time

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Figure 1.24 Views from VP2- Existing Condition/ at Day 1 & 10 Years

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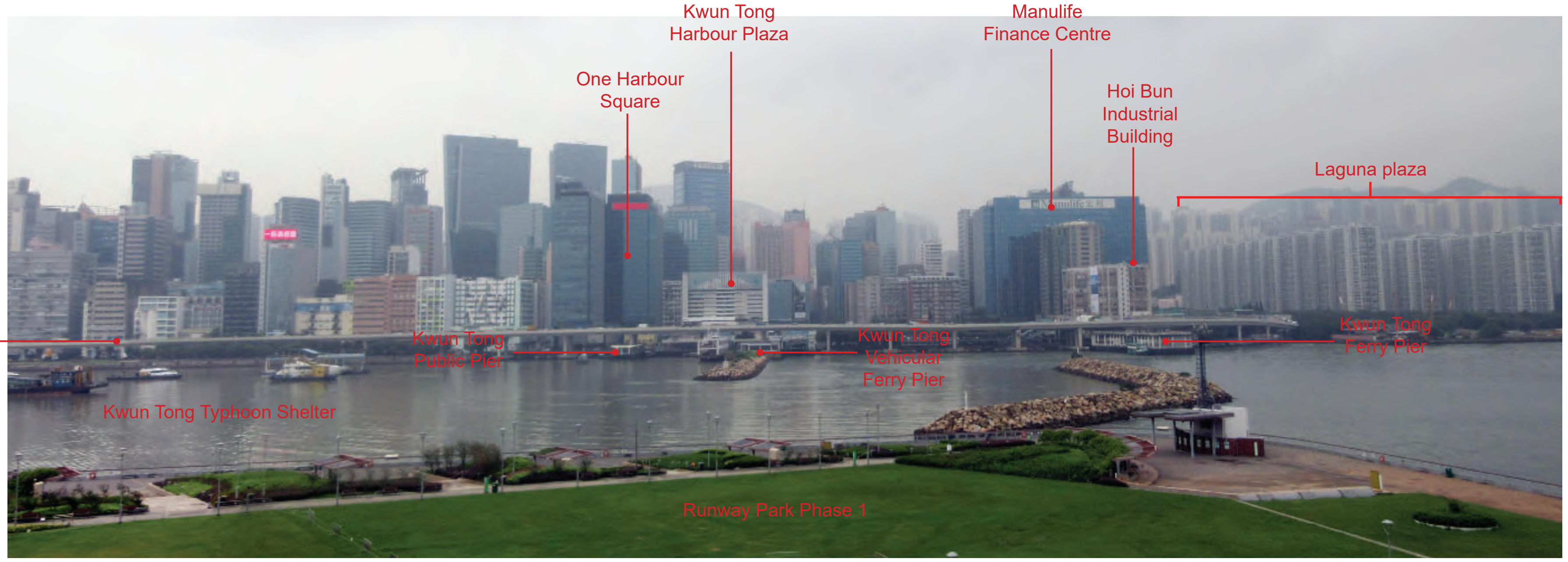
Planning and Engineering Study on Kwun Tong Action Area Feasibility Study

Landscape and Visual Impact Assessment

VP3 View From Landscape Deck of Cruise Terminal Building



VP3 Existing Condition

VP3 Day 1

VP3 10 Years Time

VP4 View From Kai Tak Runway Park Phase 2

VP4 Existing Condition

VP4 Day 1

VP4 10-year Time

Figure 1.26 Views from VP4- Existing Condition/ at Day 1 & 10 Years

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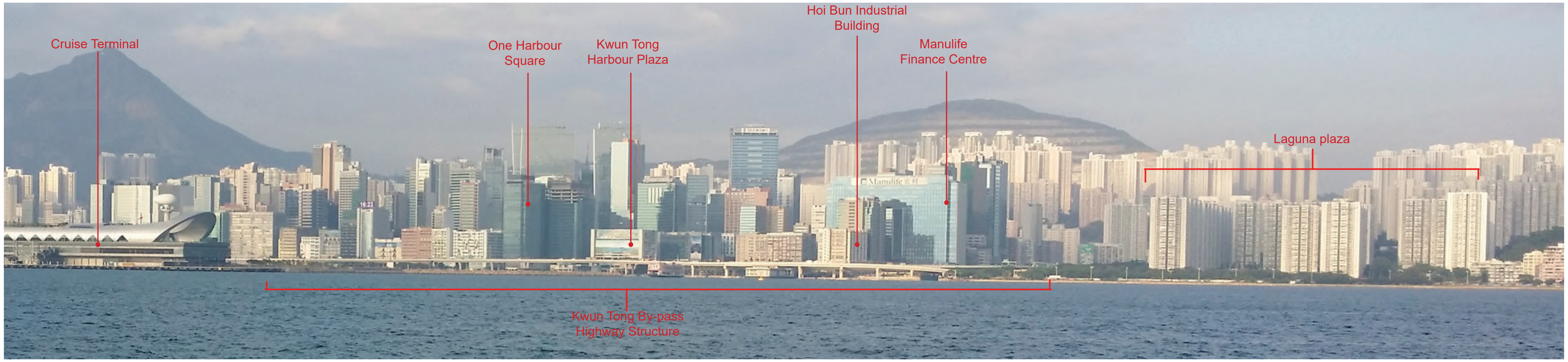
Planning and Engineering Study on Kwun Tong Action Area Feasibility Study
Landscape and Visual Impact Assessment

VP5 View From Quarry Bay Park



VP5 Existing Condition

VP5 Day 1

VP5 10-year Time

Figure 1.27 Views from VP5- Existing Condition/ at Day 1 & 10 Years

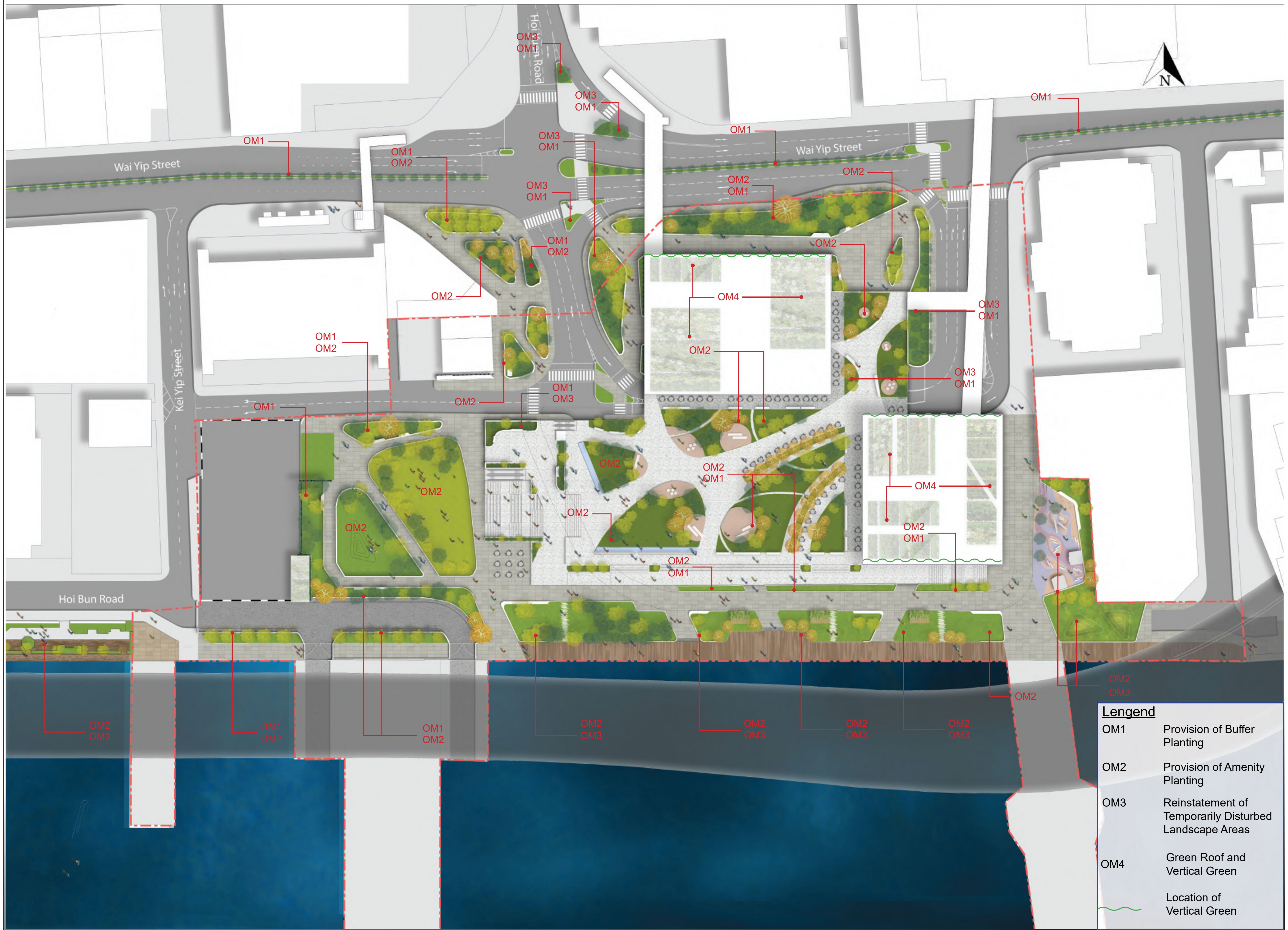


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Figure 1.28

Mitigation Plan

Agreement No. CE 61/2015(TP)

Planning and Engineering Study on Kwun Tong Action Area Feasibility Study

Landscape and Visual Impact Assessment

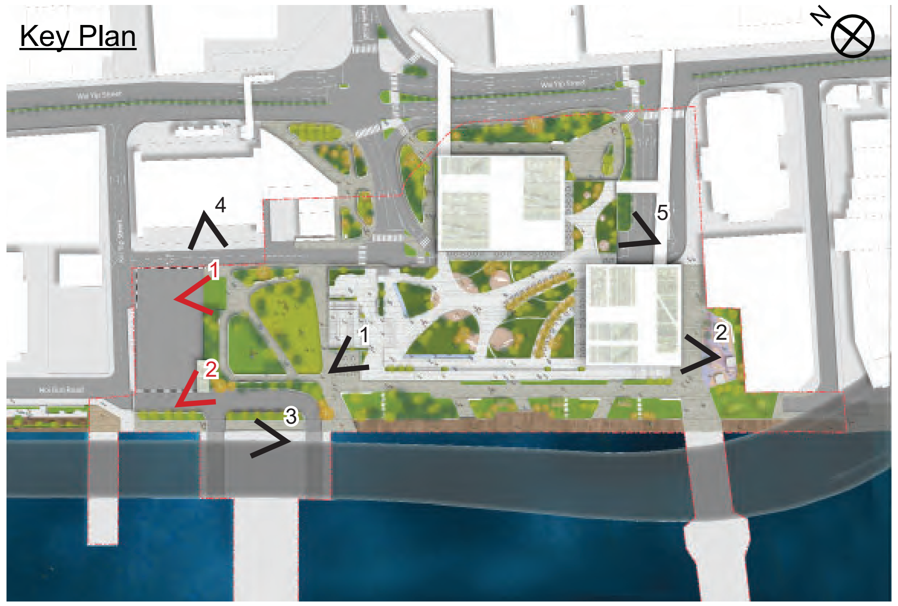
Legend

Study Area

1 Existing Condition

2 Bird's Eye View

Key Plan



1 Kwun Tong Ferry Bus Terminus

2 Kwun Tong Ferry Bus Terminus

3 Kwun Tong Driving School/
DGV Queuing Area

4 Kwun Tong Driving School/
DGV Queuing Area

5 Kwun Tong Ferry Pier Square

1 Bird's Eye View of Study Area

2 Bird's Eye View of KTAA Development

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Existing Conditions and Rendering of the Proposed Development of KTAA

Figure 1.29

Agreement No. CE 61/2015(TP)
Planning and Engineering Study on Kwun Tong Action Area Feasibility Study

Landscape and Visual Impact Assessment

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APPENDICES

APPENDIX A

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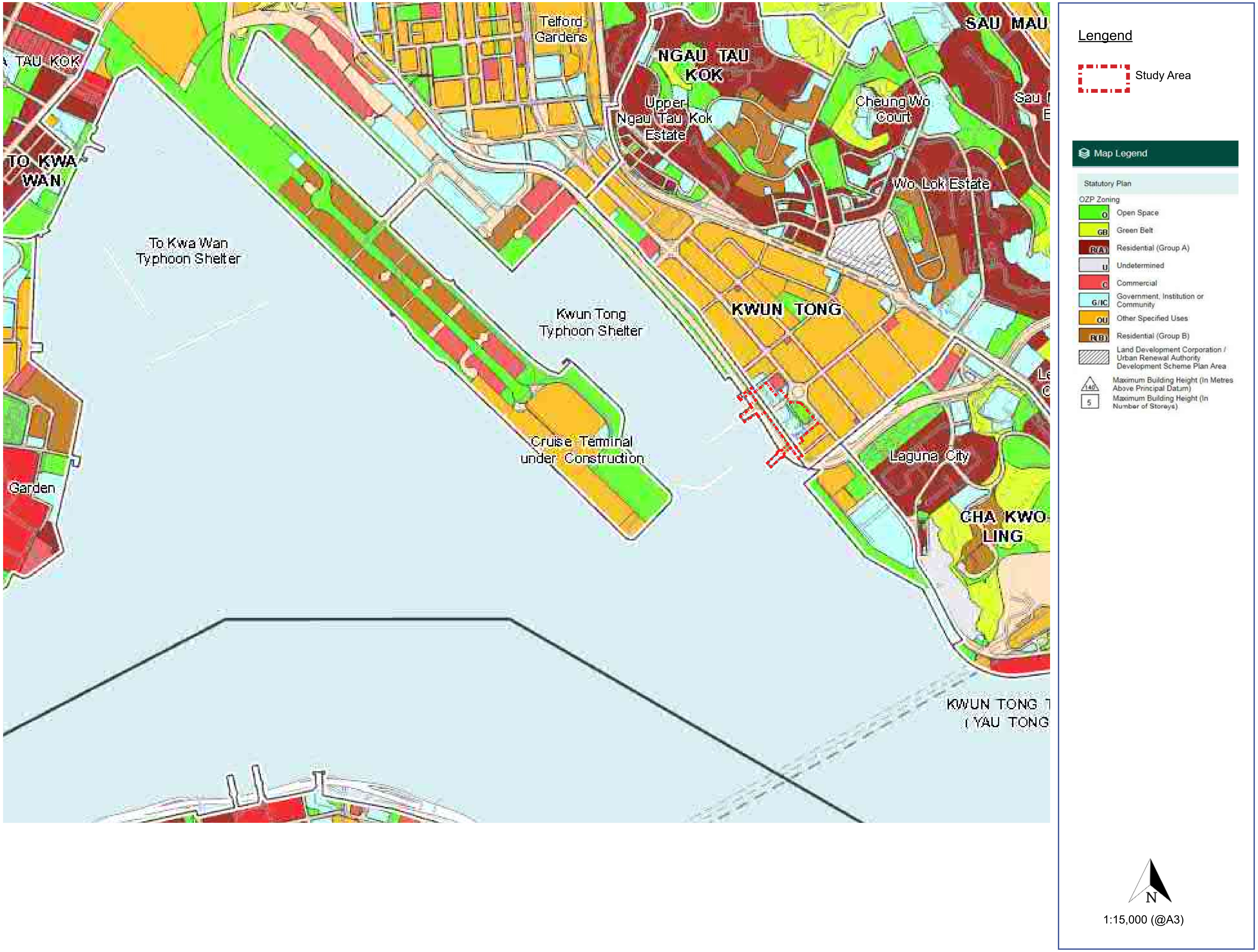

Agreement No. CE 61/2015(TP)

Planning and Engineering Study on Kwun Tong Action Area Feasibility Study

Landscape and Visual Impact Assessment

Appendix A

Kwun Tong (South) OZP No. S/K14S/22 and Kai Tak OZP No. S/K22/6

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<u>Content</u>

<u>Table List</u>

1. OBJECTIVES

1.1 The aim of this report is to propose tree preservation and tree removal for the Planning and Engineering Study on Kwun Tong Action Area – Feasibility Study (Proposed Development).

2. METHODOLOGY

In accordance with Lands Administration Office Practice Note (LAO PN) No. 7/2007, all existing individual trees with a trunk diameter larger than 95mm (300mm girth) measured at 1300mm above ground level are surveyed and identified with the following information recorded and presented in the Tree Schedule in the **Appendix 3 - Tree Assessment Schedule**:

1. Tree/ Photo No.: Individual tree is being number labelled and marked on site and denoted correspondingly on the plan.

2. Species : Botanical and Chinese names of the trees surveyed.

3. Top of Soil : Level of root collar

4. Tree size :
   - Overall Height : Height measured from ground level to the top branch;
   - Trunk Diameter: Diameter of the main trunk measured at 1.3m high above ground level;
   - Average Crown Spread: Average diameter of the foliage canopy.

5. Top of soil level above root collar:
   - Level of the individual trees is being measured at root collar.

6. Form:
   - Good (G): Well-balanced crown and straight strong trunk(s);
   - Fair (F): Slightly unbalanced crown and non-straight trunk(s);
   - Poor (P): Misshapen or awkwardly-forked trunk and/or unbalanced crown.

7. Health:
   - Good (G): Sound and healthy trees;
   - Fair (F): Trees which are with few or no visible defects or health problem;
   - Poor (P): Rot and/or cavities in the main trunk and/or crown die back, severely infected with disease.

8. Structural Condition:
   - Good (G): Trees with no or little sign of structural defect and would have low risk level of potential failure;
   - Fair (F): Trees with moderate sign of structural defect and would have medium risk level of potential failure;
   - Poor (P): Trees with significant and obvious sign of structural defect and would

have high risk level of potential failure.

9. Amenity Value: Assessed according to form, size, age, condition and situation of the tree:
    - High: Specimen or rare trees to be retained if at all possible;
    - Medium: Trees which individually or collectively make a useful but not vital contribution to the local environment;
    - Low: Dying, dangerous and unhealthy trees and trees of generally poor form and shape.

10. Survival rate after transplanting: The probability of the trees surviving after transplanting.
    - High: Trees are high survival rate after transplanting.
    - Medium: Trees are moderate survival rate after transplanting.
    - Low: Trees are less chance to survive after transplanting.

11. Suitability for Transplanting: Assess the suitability of affected trees to be transplanted taken into account the following factors: -
    - conditions of the tree to be transplanted (including form, health and structure which will affect success of the proposed transplanting);
    - size, species, and conservation status of the tree to be transplanted;
    - availability and suitability of a permanent receptor site, both within and outside the site;
    - adequate time for preparation of transplanting operation;
    - access to the existing location and transportation to the receptor site (including availability of access to accommodate the tree, topography of the proposed route, engineering limitations, etc.); and
    - cost-effectiveness

      Trees with the following features should not be considered suitable for transplanting under normal circumstances:
    - low amenity value;
    - irrecoverable form after transplanting (e.g. if substantial crown and root pruning are necessary to facilitate the transplanting);
    - low survival rate after transplanting;
    - very large size (unless the feasibility to transplant has been considered financially reasonable and technically feasible during the feasibility stage);
    - with evidence of over-maturity and onset of senescence;
    - with poor health, structure or form (e.g. imbalanced form, leaning, with major cavity/cracks/splits); or
    - undesirable species (e.g. Leucaena leucocephala which is an invasive exotic tree)
    - On steep slope or area where formation of a root ball of reasonable size is not practicable.
    - low cost effectiveness

    Having considered the above factors and features of the trees, suitability for Transplanting is assessed as follows: -
    - High: Trees are highly suitable for transplanting.
    - Medium: Trees are moderately suitable for transplanting.
    - Low: Trees are not suitable for transplanting.

12. Conservation Status:

State the rarity and protection status of the species under relevant ordinances in Hong Kong. References such as Rare and Precious Plants of Hong Kong, the International Union for the Conservation of Nature (IUCN) Red List of Threatened Species, and the Forests and Countryside Ordinance (Chapter 96) are used.

13. Recommendation: Proposed action for individual species which fall into the following three categories:
    - (R) - Retain
    - (T) - Transplant
    - (F) - Fell

14. Justification: Statement justifying the recommendation.

15. Additional Remarks: Supplementary notes towards the assessment.

3. LEGISLATION, STANDARDS AND GUIDELINES

3.1 Government Publications, Guidelines and Reports

- Agriculture, Fisheries and Conservation Department (AFCD) Nature Conservation Practice Note (NCPN) No. 02 - Measurement of Diameter at Breast Height (DBH);
- AFCD NCPN No. 03 - The Use of Plant Names
- Civil Engineering and Development Department Technical Circular (TC) No. 09/2009 - Vetting Committee on Slope Appearance
- Highways Department (HyD) TC No. 3/2008 – Independent Vetting of Tree Works under the Maintenance of HyD;
- Works Bureau Technical Circular (WBTC) No. 17/2000 - Improvement to the Appearance of Slopes
- Environment, Transport & Works Bureau (ETWB) Technical Circular (Works) (TCW) No. 34/2003 - Community Involvement in Greening Works;
- WBTC No. 7/2002 - Tree Planting in Public Works;
- ETWB TCW No. 11/2004 - Cyber Manual for Greening;
- ETWB TCW No. 29/2004 - Registration of Old and Valuable Trees, and Guidelines for their Preservation;
- ETWB TCW No. 2/2004 - Maintenance of Vegetation and Hard Landscape Features;
- Development Bureau (DEVB) Technical Circular (Works) (TCW) No. 2/2012 - Allocation of Space for Quality Greening on Roads;
- DEVB TCW No. 2/2013 - Greening on Footbridges and Flyovers
- DEVB TC(W) No 6/2015 – Maintenance of Vegetation and Hard Landscape Features
- DEVB TC(W) No 7/2015 – Tree Preservation
- DEVB TC(W) No 4/2020 – Tree Preservation
- Latest Guidelines for Tree Risk Assessment and Management Arrangement on an Area Basis and on a Tree Basis issued by Greening, Landscape and Tree Management Section (GLTM)/DevB ;
- Geotechnical Engineering Office Publication No. 1/2011 - Technical Guidelines on Landscape Treatment for Slopes;
- Latest Proper Planting Practices issued by GLTM/DevB; and
- Guidelines on Tree Transplanting issued by GLTM Section of DevB
- Skyrise Greenery - Pictorial Guide to Plant Resources for Skyrise Greenery in Hong Kong, issued by GLTM/DevB
- Lands Administration Office Practice Note Issue No. 7/2007 and No. 7/2007A – Tree Preservation and Tree Removal Application for Building Development in Private Project

4. EXISTING CONDITION OF THE TREES

4.1 Tree survey and assessment are conducted in November 2018, 240 nos. of trees had been identified on site. Additional tree survey and assessment are conducted in Aug 2019 and Jan 2020. 2 nos of trees (T029 and T040) are found dead and removed by others in the additional tree survey in Jan 2020. Therefore, 238 nos. of trees are identified in total. There are in total 22 tree species found within the study boundary, the most abundant species is *Aleurites moluccana.* (57 nos.), that mature in size. Majority of them are found in Fair to Poor condition and the survival rate after transplanting are Low.

4.2 There are other species within the site, *Acacia confusa* (2 nos.), *Araucaria heterophylla* (5 nos.), *Archontophoenix alexandrae* (9 nos.), *Bauhinia purpurea* (1 nos.), *Bauhinia x blakeana* (1 nos.), *Callistemon viminalis* (2 nos.), *Caryota mitis* (6 nos.), *Ficus elastica* (2 nos.), *Ficus microcarpa* (11 nos.), *Hibiscus tiliaceus* (39 nos.), *Hyophorbe lagenicaulis* (3 nos.), *Lagerstroemia speciosa* (4 nos.), *Leucaena leucocephala* (10 nos.), *Livistona chinensis* (8 nos.), *Macaranga tanarius var. tomentosa* (1 nos.), *Melaleuca leucadendron* (12 nos.), *Morus alba L.* (3 nos.), *Phoenix roebelenii* (2 nos.), *Podocarpus macrophyllus* (5 nos.), *Roystonea regia* (10 nos.) and *Spathodea campanulata* (44 nos.).

4.3 Trees surveyed have Good to Poor form and health condition with Low to Medium amenity value and Low to Medium survival rate after transplanting.

4.4 Majority of surveyed trees are old and mature trees from 100mm – 1200mm DBH planting in sufficient spacing. Some of the trees are restricted by concrete; some of them are found heavy leaning and severe branches broken.

4.5 The trees surveyed are all common species and no rare species included. No OVTs are identified within the submission boundary.

4.6 Location of all existing trees are provided in **Appendix 1 - Tree Survey Plan**

5. PROPOSED DEVELOPMENT

5.1 The Subject Site with a total size about 67 hectares (ha) including a water body of about 62.8 ha. KTAA has an area of about 4.2 ha. The Subject Site is bounded by Wai Yip Street and Hoi Yuen Road roundabout in the northeast, Kei Yip Street and Kei Yip Lane in the northwest, and Lu Plaza and Hoi Bun Industrial Building in the southeast.

5.2 The existing facilities in KTAA include Kwun Tong Ferry Pier Square and Pet Garden; Kei Yip Street Public Toilet and Refuse Collection Point (RCP), Kwun Tong Ferry Pier Public Transport Interchange (PTI), Cooked Food Market (CFM) and temporary Kwun Tong Driving School (KTDS). Ferry pier facilities include Kwun Tong Pubic Pier, Kwun Tong Ferry Pier and Kwun Tong Vehicular Ferry Pier (KTVFP).

6 PROPOSED TREATMENT TO THE EXISTING TREES

6.1 Recommendations for all existing trees are provided in **Appendix 2 - Tree Recommendation Plan** and **Appendix 3 - Tree Assessment Schedule**. Their general view recorded on tree photographs is presented as **Appendix 4 - Existing Tree Photo Record**.

6.2 For the trees proposed to be retained, felled and transplanted during site clearance works, the recommendation shall be carried out in accordance to **Annex A - Specification for Tree preservation, felling, transplanting**.

6.3 There are 238 nos. trees are conflicted to Proposed Development. Those trees will consider to be either transplanted or felled.

6.4 To strike a balance between cost and benefit, only trees with medium amenity value and “transplantable” trees (i.e. trees that have a very good chance of recovering to its normal form) should be considered for transplanting.

6.5 A summary of quantities, species and recommended treatments of trees is provided as follow:

Table 1 Summary of Quantities, Species and Recommended Treatments of Trees

Scientific Name	Chinese Name	Trees to be Retained	Trees to be Felled	Trees to be Transplanted	Total
Acacia confusa	台灣相思	0	2	0	2
Aleurites moluccana	石栗	10	41	7	58
Araucaria heterophylla	異葉南洋杉	0	4	1	5
Archontophoenix alexandrae	假檳榔	0	2	7	9
Bauhinia purpurea	紅花洋蹄甲	0	1	0	1
Bauhinia x blakeana	洋紫荊	0	1	0	1
Callistemon viminalis	串錢柳	0	2	0	2
Caryota mitis	魚尾葵	1	5	0	6
Ficus elastica	印度榕	2	0	0	2
Ficus microcarpa	細葉榕	3	8	0	11
Hibiscus tiliaceus	黃槿	21	18	0	39
Hyophorbe lagenicaulis	酒瓶椰子	0	0	3	3
Lagerstroemia speciosa	大花紫薇	0	1	3	4
Leucaena leucocephala	銀合歡	0	10	0	10
Livistona chinensis	蒲葵	1	4	3	8
Macaranga tanarius var. tomentosa	血桐	0	1	0	1
Melaleuca leucadendron	白千層	2	10	0	12
Morus alba L.	桑	0	3	0	3
Phoenix roebelenii	刺葵	0	2	0	2
Podocarpus macrophyllus	羅漢松	0	5	0	5
Roystonea regia	王棕	0	1	9	10
Spathodea campanulata	火焰木	0	42	2	44
Total no. of trees		**40**	**163**	**35**	**238**

6.6 Findings and recommended treatments to existing trees are summarized in **Table 2.**

Table 2 Summary of Tree Survey and Treatment Recommendations

Total Trees Surveyed	Trees to be Retained	Trees to be Felled	Trees to be Transplanted
238	40	163	35

6.7 In summary, 163 nos. of trees are proposed to be felled. 35 nos. of trees are proposed to be transplanted.

6.8 The 6 nos. of proposed transplanted trees will be transplanted to the Subject Site and 29 nos. of proposed transplanted trees will be transplanted to other locations as their final receptor location, subject to the detailed design in the later stage.

7. TREE COMPENSATION PROPOSAL

7.1 For the proposed development, 163 nos. of trees were proposed to be felled. In order to compensate the trees to be felled, a total number of 287 nos. of Heavy Standard trees would be compensated with an approximate of 4-8m spacing for each tree. However, only 271 nos. compensatory would be planted within the site boundary and the adjacent roadside amenity areas. The remaining 16 nos. compensatory trees should be planted to other locations.

7.2 Please find the summary of the compensatory planting proposal as below:

Table 3 Summary of Compensation Planting Proposal

Proposed to be Felled		Compensatory Trees	
Quantity	*Aggregated DBH*	*Quantity*	*Aggregated DBH*
163	42,230mm	287	42,250mm

7.3 The implementation of compensatory tree planting of a ratio in terms of Quantity is **1:1.76**; and in terms of Quality is **1:1**. Thus Compensatory Planting Proposal satisfies the requirements mentioned in guideline in terms of quantity and quality (total girth removal) of providing at least 1:1.

Table 4 Tree Compensatory Ratio

	Felled : Compensated	Ratio
Quality (Girth)	42,230 : 42,250	1: 1
Quantity (nos.)	163 : 287	1: 1.76

7.4 For a healthy development of tree in future, most of the trees will be planted in planting area on grade, except those planted on podium. The planting area to receive the compensation trees shall have a sufficient soil depth excluding drainage layer.

7.5 Area surrounding the compensatory trees will be planted with turf, shrub or groundcover. Area surrounding the tree root collar at a diameter of 300-500mm would keep clear of vegetation.

7.6 The proposed compensation tree species are taking reference to the Greening Master Plan for Urban Areas (Kwun Tong) and are summarizes at **Table 5**. For the tree species within the future commercial site, *Plumeria rubra, Syzygium jambos, Michelia chapensis Dandy, Elaeocarpus hainanensis*, could be flexibly selected for tree compensation. Reference could be made from “Skyrise Greenery - Pictorial Guide to Plant Resources for Skyrise Greenery in Hong Kong”, issued by GLTM/DevB. For the tree species along waterfront promenade, *Crateva unilocularis* , *Terminalia mantally* and *Terminalia catappa* could be flexibly selected for compensation.

Table 5 The Proposed Tree Species to be Compensated

Proposed Tree Species Botanical Name	*Chinese Name*	*Size*	*Live Crown Ratio*	*DBH*	*Crown Spread (m)*	*Overall height (m)*	*Quantity*
Cassia javanica	爪哇決明	Heavy Standard	40	150	3.0-4.0	5.0-6.0	5
Cinnamomum burmannii	陰香	Heavy Standard	40	150	2.5-3.0	5.0-6.0	53
Crateva unilocularis	樹頭菜	Heavy Standard	40	150	3.0-4.0	5.0-6.0	16
Elaeocarpus hainanensis	水石榕	Heavy Standard	40	150	3.0-4.0	5.0-6.0	19
Ficus benjamina 'Variegata'	花葉垂榕	Heavy Standard	40	150	3.0-4.0	5.0-6.0	10
Koelreuteria elegans	欒樹	Heavy Standard	40	150	3.0-4.0	5.0-6.0	17
Lagerstroemia speciosa	大花紫薇	Heavy Standard	40	150	3.0-4.0	4.0-5.0	33
Michelia chapensis	樂昌含笑	Heavy Standard	40	150	3.0-4.0	6.0-7.0	37
Plumeria rubra	鷄蛋花	Heavy Standard	40	100	3.0-4.0	4.0-5.0	16
Podocarpus macrophyllus	羅漢松	Heavy Standard	40	150	3.0-4.0	4.0-5.0	4
Senna siamea	鐵刀木	Heavy Standard	40	150	2.5-3.0	6.0-7.0	17
Syzygium jambos	蒲桃	Heavy Standard	40	150	3.0-4.0	6.0-7.0	15
Tabebuia impetiginosa	風鈴木	Heavy Standard	40	150	3.0-4.0	4.0-5.0	7
Terminalia mantaly	細葉欖仁	Heavy Standard	50	150	3.0-4.0	6.0-7.0	33
Terminalia catappa	大葉欖仁樹	Heavy Standard	50	150	3.0-4.0	6.0-7.0	5

7.7 Arrangement of the compensatory trees is indicatively shown in **Appendix 5 – Compensatory Planting Plan**.

8. SOFT LANDSCAPE WORK MAINTENANCE

8.1 Maintenance of landscape areas will be carried out by a qualified Landscape Contractor for a period of 12 months after the completion of the construction works and will be managed by the estate management team afterwards.

8.2 Maintenance will include the following regular operations: Watering, weeding, firming up of plants, pruning/thinning, securing of protective fencing, grass cutting, fertilizing, forking over, applying insecticide/ fungicide, replanting/ replacing of damaged/ dead plants, aeration and mulching.

8.3 Tree risk assessment would be done once a year by qualified tree arborist.

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Appendix 1

Tree Survey Plan

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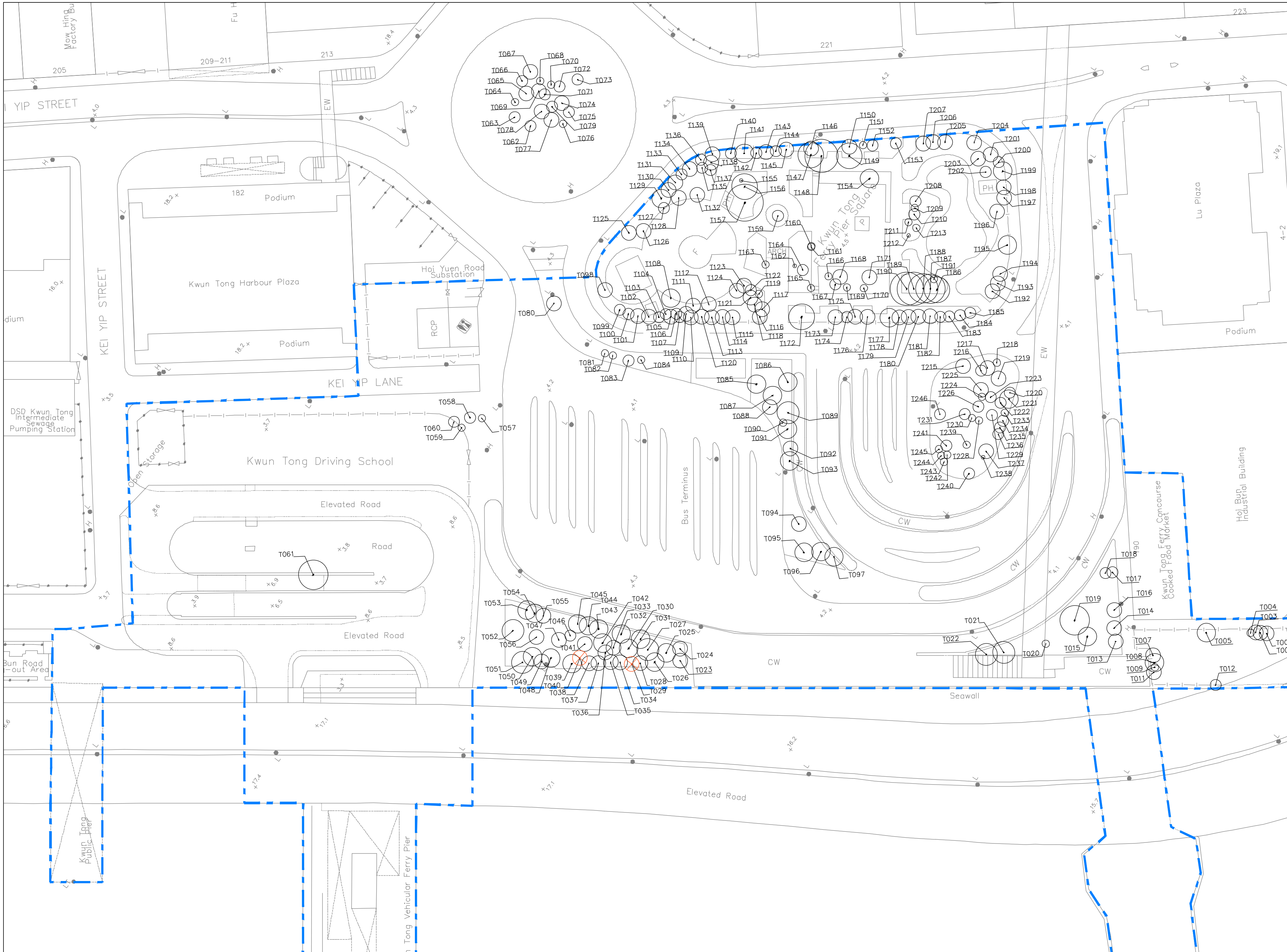

LEGEND

- Site Boundary
- Existing Tree (T062)
- Dead Tree (T029)

Project:
Agreement No. CE 61/2015 (TP)
Planning and Engineering Study on
Kwun Tong Action Area – Feasibility Study

Title:
TREE SURVEY PLAN

Date: JAN 2020
Scale: 1:1000

AECOM

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Appendix 2

Tree Recommendation Plan

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LEGEND

- Site Boundary
- T062 Tree Proposed to be Felled
- T016 Tree Proposed to be Transplanted
- T023 Tree Proposed to be Retained
- T101 Tree Proposed to be Retained (Subject to Detail Design)

Project:
Agreement No. CE 61/2015 (TP)
Planning and Engineering Study on
Kwun Tong Action Area – Feasibility Study

Title:
TREE RECOMMENDATION PLAN

N

Date: JUL 2020
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Appendix 3

Tree Assessment Schedule

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Tree Assessment Schedule
Planning and Engeering Study on Kwun Tong Action Area - Feasibility Study

Prepared by (ISA Certified Arborist: Woo Kwok Wai HK-1222A)
Field Survey was conducted on 22 November 2018. Additional field surveys were conducted on 07 Aug 2019 and 08 Jan 2020

Tree No.	Species		Measurements			Amenity Value	Form	Health Condition	Structural Condition	Suitability for Transplanting	Top of soil level above root collar	Recommendation	Remarks
	Scientific name	Chinese name	Height (m)	DBH (mm)	Crown Spread (m)	(High/ Medium/ Low)	(Good/Fair/Poor)			(High/ Medium/ Low)		(Retain/ Transplant/ Fell)	
T1	*Leucaena leucocephala*	銀合歡	7.0	180	4.0	Low	Poor	Fair	Poor	Low	3.70	Fell	Invasive species
T2	*Leucaena leucocephala*	銀合歡	7.0	130	4.0	Low	Poor	Fair	Poor	Low	3.53	Fell	Invasive species
T3	*Leucaena leucocephala*	銀合歡	7.0	210	4.0	Low	Poor	Fair	Poor	Low	3.66	Fell	Invasive species
T4	*Leucaena leucocephala*	銀合歡	4.0	100	2.0	Low	Poor	Fair	Poor	Low	3.64	Fell	Invasive species
T5	*Leucaena leucocephala*	銀合歡	7.0	180	5.0	Low	Poor	Fair	Poor	Low	3.53	Fell	Invasive species; Broken branches
T7	*Leucaena leucocephala*	銀合歡	5.0	100	4.0	Low	Poor	Fair	Poor	Low	3.62	Fell	Invasive species; Leaning
T8	*Leucaena leucocephala*	銀合歡	9.0	290	5.0	Low	Poor	Fair	Poor	Low	3.64	Fell	Invasive species; Broken branches
T9	*Leucaena leucocephala*	銀合歡	6.0	160	2.0	Low	Poor	Fair	Poor	Low	3.78	Fell	Invasive species; Broken branches
T11	*Leucaena leucocephala*	銀合歡	8.0	260	4.0	Low	Poor	Fair	Poor	Low	3.69	Fell	Invasive species; Broken branches
T12	*Leucaena leucocephala*	銀合歡	7.0	110	3.0	Low	Poor	Fair	Poor	Low	3.31	Fell	Invasive species
T13	*Lagerstroemia speciosa*	大花紫薇	3.0	110	4.0	Medium	Poor	Fair	Poor	Medium	4.39	Fell	Leaning
T14	*Lagerstroemia speciosa*	大花紫薇	4.0	140	4.0	Medium	Poor	Fair	Poor	Medium	4.46	Transplant	Leaning
T15	*Lagerstroemia speciosa*	大花紫薇	8.0	300	5.0	Medium	Poor	Fair	Poor	Medium	4.66	Transplant	
T16	*Lagerstroemia speciosa*	大花紫薇	4.0	200	4.0	Medium	Poor	Fair	Poor	Medium	4.53	Transplant	
T17	*Caryota mitis*	魚尾葵	5.0	200	3.0	Low	Poor	Fair	Poor	Low	4.37	Fell	
T18	*Caryota mitis*	魚尾葵	5.0	200	3.0	Low	Poor	Fair	Poor	Low	4.34	Fell	
T19	*Hibiscus tiliaceus*	黃槿	7.0	550	8.0	Low	Poor	Fair	Poor	Low	4.61	Fell	Imbalance crown; Low branching
T20	*Caryota mitis*	魚尾葵	6.0	100	2.0	Low	Poor	Poor	Fair	Low	4.34	Fell	Die back
T21	*Acacia confusa*	台灣相思	10.0	300	6.0	Low	Poor	Fair	Fair	Low	4.27	Fell	Imbalance crown- growing very close to the existing bridge structure
T22	*Acacia confusa*	台灣相思	11.0	350	6.0	Low	Poor	Fair	Fair	Low	4.12	Fell	Imbalance crown- growing very close to the existing bridge structure
T23	*Ficus elastica*	印度榕	4.0	300	4.0	Medium	Fair	Fair	Fair	Low	4.13	Retain	Low branching
T24	*Ficus elastica*	印度榕	3.0	250	4.0	Medium	Fair	Fair	Fair	Low	4.17	Retain	Low branching
T25	Melaleuca leucadendron	白千層	8.0	430	5.0	Low	Poor	Fair	Poor	Low	4.79	Retain	Co-dominant trunks
T26	Hibiscus tiliaceus	黃槿	6.0	240	5.0	Low	Poor	Fair	Poor	Low	4.07	Retain	Leaning; Imbalance crown; Tree suckers and watersprouts at tree base
T27	Hibiscus tiliaceus	黃槿	6.0	240	6.0	Low	Poor	Fair	Poor	Low	4.23	Retain	Leaning; Imbalance crown; Tree suckers and watersprouts at tree base
T28	Hibiscus tiliaceus	黃槿	6.0	160	4.0	Low	Poor	Fair	Poor	Low	4.06	Retain	Leaning; Imbalance crown; Tree suckers and watersprouts at tree base
T29	Hibiscus tiliaceus	黃槿	-	-	-	-		Dead		-	4.06	-	Stump Only
T30	Melaleuca leucadendron	白千層	10.0	450	5.0	Low	Poor	Fair	Poor	Low	4.80	Retain	Co-dominant trunks; Imbalance crown
T31	Hibiscus tiliaceus	黃槿	6.0	250	5.0	Low	Poor	Fair	Poor	Low	4.33	Retain	Leaning; Imbalance crown; Tree suckers and watersprouts at tree base
T32	Hibiscus tiliaceus	黃槿	7.0	260	5.0	Low	Poor	Fair	Poor	Low	4.36	Retain	Leaning; Imbalance crown; Tree suckers and watersprouts at tree base
T33	Hibiscus tiliaceus	黃槿	7.0	210	4.0	Low	Poor	Poor	Poor	Low	4.14	Retain	Leaning; Imbalance crown
T34	Hibiscus tiliaceus	黃槿	6.0	170	4.0	Low	Poor	Poor	Poor	Low	4.03	Retain	Leaning; Imbalance crown; Tree suckers and watersprouts at tree base
T35	Hibiscus tiliaceus	黃槿	5.0	210	4.0	Low	Poor	Poor	Poor	Low	4.03	Retain	Leaning; Imbalance crown
T36	Hibiscus tiliaceus	黃槿	7.0	210	4.0	Low	Poor	Poor	Poor	Low	4.21	Retain	Leaning; Imbalance crown

Tree Assessment Schedule
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T37	Hibiscus tiliaceus	黃槿	6.0	230	4.0	Low	Poor	Poor	Poor	Low	4.02	Retain	Significant crack on main trunk; uprooting
T38	Hibiscus tiliaceus	黃槿	7.0	220	4.0	Low	Poor	Poor	Poor	Low	4.06	Retain	Leaning; Imbalance crown
T39	Hibiscus tiliaceus	黃槿	6.0	260	5.0	Low	Poor	Poor	Poor	Low	4.11	Retain	Leaning; Imbalance crown
T40	Hibiscus tiliaceus	黃槿	-	-	-	-		Dead		-	4.20	-	Truncated
T41	Melaleuca leucadendron	白千層	7.0	350	4.0	Low	Poor	Poor	Poor	Low	4.97	Fell	Severe leaning
T42	Hibiscus tiliaceus	黃槿	7.0	200	5.0	Low	Poor	Poor	Poor	Low	4.20	Retain	Leaning; Imbalance crown
T43	Hibiscus tiliaceus	黃槿	7.0	250	5.0	Low	Poor	Poor	Poor	Low	4.44	Retain	Leaning; Imbalance crown
T44	Hibiscus tiliaceus	黃槿	8.0	220	5.0	Low	Poor	Poor	Poor	Low	4.55	Retain	Leaning; Imbalance crown
T45	Hibiscus tiliaceus	黃槿	8.0	300	5.0	Low	Poor	Poor	Poor	Low	4.50	Retain	Leaning; Imbalance crown
T46	Hibiscus tiliaceus	黃槿	5.0	210	3.0	Low	Poor	Poor	Poor	Low	4.44	Fell	Significant crack and tearing on main trunk
T47	Hibiscus tiliaceus	黃槿	7.0	260	4.0	Low	Poor	Poor	Poor	Low	4.41	fell	Significant crack and tearing on main trunk
T48	Hibiscus tiliaceus	黃槿	8.0	300	5.0	Low	Poor	Poor	Poor	Low	4.18	Retain	Severe leaning, Tearing of major branch
T49	Hibiscus tiliaceus	黃槿	8.0	290	4.0	Low	Poor	Poor	Poor	Low	4.12	Retain	Significant crack and tearing on main trunk
T50	Hibiscus tiliaceus	黃槿	8.0	260	5.0	Low	Poor	Poor	Poor	Low	4.27	Retain	Leaning; Imbalance crown
T51	Hibiscus tiliaceus	黃槿	9.0	420	6.0	Low	Poor	Poor	Poor	Low	4.12	Retain	Tearing of major branches
T52	Hibiscus tiliaceus	黃槿	8.0	500	6.0	Low	Poor	Poor	Poor	Low	4.31	Retain	Tearing of major branches
T53	*Hibiscus tiliaceus*	黃槿	6.0	230	5.0	Low	Poor	Poor	Poor	Low	4.60	Fell	Severe leaning
T54	*Hibiscus tiliaceus*	黃槿	7.0	350	5.0	Low	Poor	Poor	Poor	Low	4.58	Fell	Severe leaning; Imbalance crown
T55	*Hibiscus tiliaceus*	黃槿	5.0	170	4.0	Low	Poor	Poor	Poor	Low	4.54	Fell	Leaning; Imbalance crown
T56	Melaleuca leucadendron	白千層	9.0	420	4.0	Low	Poor	Poor	Poor	Low	5.17	Fell	Severe leaning; gridling root
T57	*Morus alba* L.	桑	4.0	100	2.0	Low	Poor	Poor	Poor	Low	4.30	Fell	Leaning
T58	*Macaranga tanarius var. tomentosa*	血桐	4.0	170	3.0	Low	Fair	Fair	Poor	Low	4.20	Fell	
T59	*Morus alba* L.	桑	4.0	100	2.0	Low	Poor	Poor	Poor	Low	4.31	Fell	Leaning; Tearing of major trunk
T60	*Morus alba* L.	桑	4.0	120	3.0	Low	Poor	Fair	Poor	Low	4.30	Fell	Leaning; Tearing of major trunk
T61	*Ficus microcarpa*	細葉榕	8.0	1200	8.0	Low	Fair	Good	Fair	Low	4.11	Fell	Wall tree
T62	*Roystonea regia*	王棕	9.0	350	3.0	Low	Fair	Fair	Fair	Low	5.40	Transplant	
T63	*Archontophoenix alexandrae*	假檳榔	10.0	200	3.0	Low	Poor	Fair	Fair	Low	5.37	Transplant	
T64	*Archontophoenix alexandrae*	假檳榔	9.0	150	2.0	Low	Poor	Fair	Fair	Low	5.43	Transplant	
T65	*Roystonea regia*	王棕	9.0	350	4.0	Low	Poor	Fair	Fair	Low	5.40	Transplant	
T66	*Roystonea regia*	王棕	7.0	250	3.0	Low	Poor	Fair	Fair	Low	5.26	Transplant	
T67	*Roystonea regia*	王棕	6.0	180	4.0	Low	Poor	Fair	Fair	Low	5.32	Transplant	
T68	*Roystonea regia*	王棕	10.0	300	2.0	Low	Poor	Fair	Fair	Low	5.27	Transplant	
T69	*Roystonea regia*	王棕	9.0	170	4.0	Low	Poor	Fair	Fair	Low	5.37	Transplant	
T70	*Hyophorbe lagenicaulis*	酒瓶椰子	4.0	400	2.0	Low	Poor	Fair	Fair	Medium	5.25	Transplant	
T71	*Hyophorbe lagenicaulis*	酒瓶椰子	4.0	350	3.0	Low	Poor	Fair	Fair	Medium	5.35	Transplant	
T72	*Hyophorbe lagenicaulis*	酒瓶椰子	4.0	400	3.0	Low	Poor	Fair	Fair	Medium	5.27	Transplant	
T73	*Livistona chinensis*	蒲葵	5.0	200	3.0	Low	Poor	Fair	Fair	Low	5.24	Transplant	
T74	*Roystonea regia*	王棕	9.0	270	4.0	Low	Poor	Fair	Fair	Low	5.46	Transplant	
T75	*Archontophoenix alexandrae*	假檳榔	10.0	200	3.0	Low	Poor	Fair	Fair	Low	5.44	Transplant	
T76	*Archontophoenix alexandrae*	假檳榔	9.0	150	2.0	Low	Poor	Fair	Fair	Low	5.57	Transplant	
T77	*Roystonea regia*	王棕	10.0	350	4.0	Low	Poor	Fair	Fair	Low	5.92	Transplant	
T78	*Roystonea regia*	王棕	10.0	300	4.0	Low	Poor	Fair	Fair	Low	5.62	Transplant	
T79	*Archontophoenix alexandrae*	假檳榔	10.0	220	3.0	Low	Poor	Fair	Fair	Low	5.57	Transplant	
T80	*Spathodea campanulata*	火焰木	5.0	300	4.0	Low	Poor	Fair	Poor	Low	4.26	Fell	Unbalance canopy
T81	*Spathodea campanulata*	火焰木	4.0	200	2.0	Low	Poor	Fair	Poor	Low	4.34	Fell	Bark tearing at base of trunk. Imbalance canopy.
T82	*Spathodea campanulata*	火焰木	3.0	150	2.0	Low	Poor	Fair	Poor	Low	4.30	Fell	Bark tearing at base of trunk. Imbalance canopy

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T83	*Spathodea campanulata*	火焰木	4.0	200	3.0	Low	Poor	Fair	Poor	Low	4.22	Fell	Bark tearing at base of trunk. Imbalance canopy.
T84	*Spathodea campanulata*	火焰木	4.0	150	2.0	Low	Poor	Fair	Poor	Low	4.27	Fell	Imbalance canopy
T85	*Hibiscus tiliaceus*	黃槿	5.0	450	5.0	Low	Poor	Fair	Poor	Low	4.34	Fell	Leaning
T86	*Hibiscus tiliaceus*	黃槿	7.0	320	5.0	Low	Poor	Fair	Poor	Low	4.28	Fell	Imbalance canopy. Severe leaning; uprooting
T87	*Hibiscus tiliaceus*	黃槿	7.0	280	5.0	Low	Poor	Fair	Poor	Low	4.53	Fell	Imbalance canopy. Severe leaning. Bark tearing at major trunk.
T88	*Hibiscus tiliaceus*	黃槿	5.0	220	4.0	Low	Poor	Poor	Poor	Low	4.55	Fell	Imbalance canopy. Severe leaning. Bark tearing at major trunk.
T89	*Hibiscus tiliaceus*	黃槿	5.0	270	6.0	Low	Poor	Poor	Poor	Low	4.46	Fell	Imbalance canopy. Severe leaning. Bark tearing at major trunk.
T90	*Phoenix roebelenii*	刺葵	3.0	100	2.0	Low	Poor	Fair	Poor	Low	4.44	Fell	Leaning
T91	*Hibiscus tiliaceus*	黃槿	6.0	230	5.0	Low	Poor	Poor	Poor	Low	4.49	Fell	Imbalance canopy. Severe leaning. Structural cracks at major trunk.
T92	*Hibiscus tiliaceus*	黃槿	5.0	190	4.0	Low	Poor	Poor	Poor	Low	4.52	Fell	Imbalance canopy. Severe leaning. Structural cracks at major trunk.
T93	*Hibiscus tiliaceus*	黃槿	7.0	300	5.0	Low	Poor	Poor	Poor	Low	4.55	Fell	Imbalance canopy. Severe leaning. Bark tearing at major trunk.
T94	*Hibiscus tiliaceus*	黃槿	7.0	420	4.0	Low	Poor	Poor	Poor	Low	4.52	Fell	Main leader damaged. Severe leaning. Tearing and structural cracks at major trunk.
T95	*Hibiscus tiliaceus*	黃槿	6.0	380	5.0	Low	Poor	Poor	Poor	Low	4.44	Fell	Main leader damaged. Severe leaning. Sructural Failure.
T96	*Hibiscus tiliaceus*	黃槿	5.0	340	5.0	Low	Poor	Poor	Poor	Low	4.75	Fell	Main leader damaged. Severe leaning. Tearing at major trunk.
T97	*Hibiscus tiliaceus*	黃槿	6.0	290	5.0	Low	Poor	Poor	Poor	Low	4.35	Fell	Imbalance canopy
T98	*Aleurites moluccana*	石栗	6.0	280	4.0	Low	Poor	Fair	Fair	Low	4.54	Fell	Leaning
T99	*Aleurites moluccana*	石栗	6.0	270	3.0	Low	Poor	Fair	Fair	Low	4.55	Fell	
T100	Aleurites moluccana	石栗	7.0	250	3.0	Low	Poor	Fair	Fair	Low	4.63	Retain	
T101	Aleurites moluccana	石栗	7.0	300	4.0	Low	Poor	Fair	Fair	Low	4.70	Retain	
T102	Aleurites moluccana	石栗	7.0	270	4.0	Low	Poor	Fair	Fair	Low	4.55	Retain	
T103	*Aleurites moluccana*	石栗	7.0	250	3.0	Low	Poor	Fair	Fair	Low	4.49	Fell	
T104	*Livistona chinensis*	蒲葵	5.0	180	3.0	Low	Poor	Fair	Fair	Low	4.64	Transplant	
T105	*Aleurites moluccana*	石栗	8.0	300	4.0	Low	Poor	Fair	Fair	Low	4.48	Fell	
T106	*Livistona chinensis*	蒲葵	5.0	200	3.0	Low	Poor	Fair	Fair	Low	4.68	Transplant	
T107	*Aleurites moluccana*	石栗	8.0	280	3.0	Low	Poor	Fair	Poor	Low	4.54	Fell	
T108	*Melaleuca leucadendron*	白千層	11.0	450	5.0	Low	Poor	Poor	Poor	Low	4.87	Fell	
T109	*Livistona chinensis*	蒲葵	5.0	210	4.0	Low	Poor	Fair	Fair	Low	4.68	Fell	
T110	*Aleurites moluccana*	石栗	8.0	230	4.0	Low	Poor	Poor	Poor	Low	4.51	Fell	
T111	*Melaleuca leucadendron*	白千層	10.0	300	4.0	Low	Fair	Fair	Poor	Low	4.75	Fell	
T112	*Melaleuca leucadendron*	白千層	10.0	400	4.0	Low	Poor	Poor	Poor	Low	4.70	Fell	Severe leaning
T113	*Aleurites moluccana*	石栗	8.0	250	4.0	Low	Poor	Poor	Poor	Low	4.56	Fell	Leaning; V crouch
T114	*Aleurites moluccana*	石栗	8.0	300	4.0	Low	Poor	Poor	Poor	Low	4.54	Fell	Leaning; Imbalance crown
T115	*Aleurites moluccana*	石栗	8.0	300	4.0	Low	Fair	Poor	Poor	Low	4.52	Fell	Leaning; Imbalance crown
T116	*Spathodea campanulata*	火焰木	8.0	300	4.0	Low	Poor	Poor	Poor	Low	4.39	Fell	V crouch
T117	*Spathodea campanulata*	火焰木	9.0	310	4.0	Low	Poor	Poor	Fair	Low	4.35	Fell	V crouch
T118	*Spathodea campanulata*	火焰木	8.0	160	4.0	Low	Poor	Poor	Poor	Low	4.51	Fell	Leaning
T119	*Spathodea campanulata*	火焰木	9.0	230	2.0	Low	Poor	Poor	Poor	Low	4.53	Fell	V crouch
T120	*Aleurites moluccana*	石栗	9.0	220	4.0	Low	Fair	Poor	Poor	Low	4.54	Fell	V crouch
T121	*Spathodea campanulata*	火焰木	7.0	180	4.0	Low	Poor	Poor	Poor	Low	4.59	Fell	Severe leaning; Imbalance crown
T122	*Spathodea campanulata*	火焰木	7.0	220	3.0	Low	Poor	Poor	Poor	Low	4.57	Fell	Severe leaning; Imbalance crown
T123	*Spathodea campanulata*	火焰木	9.0	240	4.0	Low	Poor	Poor	Poor	Low	4.71	Fell	Crack on trunk; V crouch
T124	*Melaleuca leucadendron*	白千層	9.0	380	4.0	Low	Poor	Poor	Poor	Low	4.74	Fell	Leaning; decay found near root collar; V crouch
T125	*Aleurites moluccana*	石栗	9.0	350	4.0	Low	Fair	Poor	Poor	Low	4.47	Retain	Die back

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T126	*Melaleuca leucadendron*	白千層	10.0	420	4.0	Low	Poor	Poor	Poor	Low	4.77	Fell	Leaning
T127	*Melaleuca leucadendron*	白千層	8.0	300	3.0	Low	Poor	Poor	Poor	Low	4.71	Fell	Leaning
T128	*Melaleuca leucadendron*	白千層	10.0	340	4.0	Low	Poor	Poor	Poor	Low	4.76	Fell	Leaning; decay found near root collar
T129	*Aleurites moluccana*	石栗	8.0	350	5.0	Low	Fair	Poor	Poor	Low	4.45	Fell	Leaning; Imbalance crown
T130	*Aleurites moluccana*	石栗	9.0	280	4.0	Low	Fair	Poor	Poor	Low	4.45	Fell	Leaning; Imbalance crown
T131	*Aleurites moluccana*	石栗	9.0	370	4.0	Low	Fair	Poor	Poor	Low	4.40	Fell	V crouch
T132	*Melaleuca leucadendron*	白千層	10.0	450	4.0	Low	Poor	Poor	Poor	Low	4.77	Fell	Leaning; Imbalance crown
T133	*Aleurites moluccana*	石栗	8.0	250	3.0	Low	Fair	Poor	Poor	Low	4.35	Fell	Leaning; Imbalance crown
T134	*Aleurites moluccana*	石栗	9.0	380	4.0	Low	Fair	Poor	Poor	Low	4.28	Fell	V crouch
T135	*Livistona chinensis*	蒲葵	9.0	230	3.0	Low	Poor	Fair	Poor	Low	4.64	Fell	Leaning
T136	*Aleurites moluccana*	石栗	9.0	250	3.0	Low	Fair	Poor	Poor	Low	4.32	Fell	Leaning; Imbalance crown
T137	*Livistona chinensis*	蒲葵	9.0	270	3.0	Low	Poor	Fair	Poor	Low	4.41	Fell	Leaning
T138	*Livistona chinensis*	蒲葵	9.0	220	4.0	Low	Poor	Fair	Poor	Low	4.40	Fell	Leaning
T139	*Aleurites moluccana*	石栗	9.0	370	4.0	Low	Poor	Fair	Poor	Low	4.32	Fell	Die back
T140	*Aleurites moluccana*	石栗	8.0	230	3.0	Low	Fair	Poor	Poor	Low	4.26	Fell	Leaning; V crouch
T141	Aleurites moluccana	石栗	8.0	350	5.0	Low	Poor	Fair	Poor	Low	4.35	Fell	Leaning; V crouch
T142	*Aleurites moluccana*	石栗	8.0	250	3.0	Low	Fair	Poor	Poor	Low	4.31	Fell	Leaning; Die back
T143	*Aleurites moluccana*	石栗	8.0	250	4.0	Low	Poor	Poor	Poor	Low	4.27	Fell	Leaning; Die back
T144	*Aleurites moluccana*	石栗	8.0	250	3.0	Low	Poor	Poor	Poor	Low	4.29	Fell	Leaning
T145	*Aleurites moluccana*	石栗	8.0	270	4.0	Low	Fair	Poor	Poor	Low	4.30	Fell	Leaning; Imbalance crown
T146	*Aleurites moluccana*	石栗	9.0	200	4.0	Low	Poor	Poor	Poor	Low	4.35	Fell	V crouch
T147	Ficus microcarpa	細葉榕	11.0	570	7.0	Low	Fair	Poor	Poor	Low	4.36	Retain	Roots restricted by concrete planter
T148	*Ficus microcarpa*	細葉榕	11.0	800	9.0	Medium	Fair	Good	Good	Medium	4.39	Retain	
T149	*Ficus microcarpa*	細葉榕	11.0	600	7.0	Low	Poor	Poor	Poor	Low	4.38	Retain	Roots restricted by concrete planter
T150	*Aleurites moluccana*	石栗	8.0	350	4.0	Low	Poor	Poor	Poor	Low	4.44	Retain	Leaning
T151	*Aleurites moluccana*	石栗	8.0	180	2.0	Low	Poor	Poor	Poor	Low	4.33	Retain	Leaning
T152	*Aleurites moluccana*	石栗	8.0	260	3.0	Low	Poor	Poor	Poor	Low	4.33	Retain	Leaning; Imbalance crown
T153	*Aleurites moluccana*	石栗	7.0	300	3.0	Low	Poor	Poor	Poor	Low	4.33	Retain	Leaning
T154	*Bauhinia x blakeana*	洋紫荊	6.0	230	5.0	Low	Poor	Poor	Poor	Low	4.62	Fell	Leaning; cavity found near root collar
T155	*Callistemon viminalis*	串錢柳	3.0	150	1.0	Low	Poor	Poor	Poor	Low	4.62	Fell	Severe leaning
T156	*Callistemon viminalis*	串錢柳	10.0	350	7.0	Low	Poor	Poor	Poor	Low	4.84	Fell	Leaning
T157	*Ficus microcarpa*	細葉榕	8.0	360	10.0	Low	Fair	Poor	Poor	Low	4.95	Fell	Imbalance crown
T159	*Caryota mitis*	魚尾葵	5.0	180	3.0	Low	Poor	Fair	Poor	Low	4.94	Fell	
T160	*Podocarpus macrophyllus*	羅漢松	5.0	200	2.0	Low	Poor	Poor	Fair	Low	4.95	Fell	
T161	*Podocarpus macrophyllus*	羅漢松	5.0	140	2.0	Low	Poor	Poor	Fair	Low	4.94	Fell	low brancing
T162	*Podocarpus macrophyllus*	羅漢松	6.0	150	1.0	Low	Poor	Poor	Poor	Low	4.77	Fell	low brancing
T163	*Podocarpus macrophyllus*	羅漢松	6.0	200	2.0	Low	Poor	Poor	Poor	Low	5.34	Fell	
T164	*Araucaria heterophylla*	異葉南洋杉	9.0	380	3.0	Medium	Fair	Poor	Poor	Low	4.89	Fell	Leaning
T165	*Podocarpus macrophyllus*	羅漢松	4.0	110	2.0	Low	Poor	Poor	Poor	Low	4.73	Fell	
T166	*Araucaria heterophylla*	異葉南洋杉	9.0	180	2.0	Low	Poor	Fair	Fair	Low	4.84	Fell	Leaning
T167	*Araucaria heterophylla*	異葉南洋杉	7.0	150	3.0	Low	Poor	Fair	Fair	Low	4.58	Fell	Leaning
T168	*Araucaria heterophylla*	異葉南洋杉	8.0	180	4.0	Low	Poor	Fair	Fair	Low	4.69	Fell	Leaning
T169	*Archontophoenix alexandrae*	假檳榔	6.0	120	2.0	Low	Poor	Fair	Fair	Low	4.47	Transplant	
T170	*Archontophoenix alexandrae*	假檳榔	5.0	100	2.0	Low	Poor	Fair	Fair	Low	4.45	Transplant	
T171	*Araucaria heterophylla*	異葉南洋杉	12.0	310	4.0	Low	Poor	Fair	Fair	Low	4.77	Transplant	Leaning
T172	*Ficus microcarpa*	細葉榕	11.0	700	7.0	Low	Poor	Fair	Poor	Low	4.59	Fell	Decay on trunk; roots restricted by concrete planter
T173	*Aleurites moluccana*	石栗	10.0	310	4.0	Low	Poor	Poor	Poor	Low	4.44	Fell	V crouch; leaning
T174	*Aleurites moluccana*	石栗	8.0	240	3.0	Medium	Fair	Good	Good	Medium	4.39	Transplant	
T175	*Aleurites moluccana*	石栗	8.0	250	4.0	Medium	Fair	Good	Good	Medium	4.40	Transplant	
T176	*Aleurites moluccana*	石栗	9.0	250	4.0	Low	Poor	Poor	Poor	Low	4.47	Fell	Leaning
T177	*Aleurites moluccana*	石栗	10.0	320	5.0	Low	Poor	Poor	Poor	Low	4.36	Fell	Roots restricted by concrete footing
T178	*Aleurites moluccana*	石栗	9.0	300	4.0	Low	Poor	Poor	Poor	Low	4.33	Fell	Leaning

Tree Assessment Schedule

Planning and Engeering Study on Kwun Tong Action Area - Feasibility Study

Prepared by (ISA Certified Arborist: Woo Kwok Wai HK-1222A)

Field Survey was conducted on 22 November 2018. Additional field surveys were conducted on 07 Aug 2019 and 08 Jan 2020

T179	*Aleurites moluccana*	石栗	8.0	290	4.0	Low	Poor	Poor	Poor	Low	4.38	Fell	broken branches
T180	*Aleurites moluccana*	石栗	8.0	280	4.0	Medium	Fair	Good	Good	Medium	4.41	Transplant	
T181	*Aleurites moluccana*	石栗	8.0	300	4.0	Low	Poor	Poor	Poor	Low	4.39	Fell	Leaning
T182	*Aleurites moluccana*	石栗	9.0	310	3.0	Medium	Fair	Good	Good	Medium	4.49	Transplant	
T183	*Aleurites moluccana*	石栗	8.0	300	3.0	Medium	Fair	Good	Good	Medium	4.45	Transplant	
T184	*Aleurites moluccana*	石栗	8.0	290	3.0	Low	Poor	Poor	Poor	Low	4.46	Fell	Leaning
T185	*Aleurites moluccana*	石栗	7.0	320	3.0	Low	Poor	Poor	Poor	Low	4.35	Fell	Leaning
T186	Ficus microcarpa	細葉榕	11.0	500	7.0	Low	Poor	Fair	Poor	Low	4.42	Fell	Roots restricted by concrete planter
T187	Ficus microcarpa	細葉榕	10.0	380	8.0	Low	Poor	Fair	Poor	Low	4.41	Fell	Roots restricted by concrete planter
T188	Ficus microcarpa	細葉榕	10.0	400	8.0	Low	Poor	Fair	Poor	Low	4.37	Fell	Roots restricted by concrete planter
T189	Ficus microcarpa	細葉榕	10.0	470	9.0	Low	Poor	Fair	Poor	Low	4.41	Fell	Roots restricted by concrete planter
T190	Ficus microcarpa	細葉榕	10.0	600	9.0	Low	Poor	Fair	Poor	Low	4.44	Fell	Roots restricted by concrete planter
T191	Bauhinia purpurea	紅花洋蹄甲	5.0	180	2.0	Low	Poor	Poor	Poor	Low	4.36	Fell	Leaning; Imbalance crown; Tree suckers and watersprouts at tree base
T192	*Aleurites moluccana*	石栗	9.0	340	4.0	Low	Poor	Poor	Poor	Low	4.44	Fell	Leaning; gridling root
T193	*Aleurites moluccana*	石栗	6.0	260	4.0	Low	Poor	Poor	Poor	Low	4.48	Fell	Gridling root
T194	*Aleurites moluccana*	石栗	9.0	330	4.0	Low	Poor	Poor	Poor	Low	4.62	Fell	Leaning
T195	*Aleurites moluccana*	石栗	9.0	340	5.0	Low	Fair	Poor	Poor	Low	4.37	Fell	Uprooting; leaning
T196	*Caryota mitis*	魚尾葵	7.0	240	4.0	Low	Poor	Fair	Poor	Low	4.58	Fell	Decay on trunk
T197	*Aleurites moluccana*	石栗	8.0	380	4.0	Low	Poor	Poor	Poor	Low	4.33	Fell	Severe leaning
T198	*Aleurites moluccana*	石栗	9.0	350	4.0	Low	Poor	Poor	Poor	Low	4.36	Fell	Leaning
T199	*Aleurites moluccana*	石栗	8.0	370	5.0	Medium	Fair	Good	Good	Medium	4.32	Transplant	
T200	*Aleurites moluccana*	石栗	7.0	220	3.0	Low	Poor	Poor	Poor	Low	4.38	Fell	
T201	*Aleurites moluccana*	石栗	6.0	250	4.0	Low	Poor	Poor	Poor	Low	4.39	Fell	Leaning
T202	*Caryota mitis*	魚尾葵	5.0	270	3.0	Low	Poor	Poor	Poor	Low	4.49	Retain	
T203	*Livistona chinensis*	蒲葵	6.0	250	4.0	Low	Fair	Poor	Poor	Low	4.46	Retain	
T204	*Aleurites moluccana*	石栗	7.0	310	4.0	Medium	Fair	Good	Good	Medium	4.37	Transplant	
T205	*Aleurites moluccana*	石栗	8.0	300	4.0	Low	Poor	Poor	Poor	Low	4.48	Retain	Leaning
T206	*Aleurites moluccana*	石栗	9.0	300	4.0	Low	Poor	Poor	Poor	Low	4.36	Retain	Leaning
T207	*Aleurites moluccana*	石栗	8.0	370	4.0	Low	Poor	Poor	Poor	Low	4.40	Fell	V crouch; leaning
T208	*Spathodea campanulata*	火焰木	6.0	200	3.0	Low	Poor	Poor	Poor	Low	4.33	Fell	Leaning
T209	*Spathodea campanulata*	火焰木	6.0	160	2.0	Medium	Fair	Good	Good	Medium	4.32	Transplant	
T210	*Spathodea campanulata*	火焰木	7.0	350	3.0	Low	Poor	Poor	Poor	Low	4.28	Fell	Gridling root; V crounch
T211	*Spathodea campanulata*	火焰木	6.0	120	2.0	Low	Poor	Poor	Poor	Low	4.31	Fell	Leaning
T212	*Spathodea campanulata*	火焰木	5.0	140	1.0	Medium	Fair	Good	Good	Medium	4.30	Transplant	
T213	*Phoenix roebelenii*	刺葵	4.0	100	2.0	Low	Poor	Poor	Poor	Low	4.39	Fell	
T215	*Spathodea campanulata*	火焰木	7.0	230	4.0	Low	Poor	Fair	Poor	Low	4.15	Fell	Imbalance canopy
T216	*Spathodea campanulata*	火焰木	6.0	120	3.0	Low	Poor	Fair	Poor	Low	4.18	Fell	Leaning
T217	*Spathodea campanulata*	火焰木	7.0	160	4.0	Low	Poor	Poor	Poor	Low	4.16	Fell	Imbalance canopy. Leaning. Canopy die-back
T218	*Spathodea campanulata*	火焰木	5.0	150	2.0	Low	Poor	Poor	Poor	Low	4.22	Fell	Imbalance canopy. Leaning. Canopy die-back
T219	*Roystonea regia*	王棕	9.0	390	4.0	Low	Fair	Fair	Fair	Low	4.61	Fell	
T220	*Spathodea campanulata*	火焰木	6.0	150	3.0	Low	Poor	Poor	Poor	Low	4.14	Fell	Imbalance canopy. Leaning. Canopy die-back
T221	*Spathodea campanulata*	火焰木	8.0	170	5.0	Low	Poor	Fair	Poor	Low	4.13	Fell	Structural crack at main trunk.
T222	*Spathodea campanulata*	火焰木	6.0	150	3.0	Low	Poor	Poor	Poor	Low	4.16	Fell	Imbalance canopy. Leaning. Canopy die-back
T223	*Spathodea campanulata*	火焰木	6.0	160	3.0	Low	Poor	Poor	Poor	Low	4.21	Fell	Imbalance canopy. Leaning. Canopy die-back
T224	*Spathodea campanulata*	火焰木	5.0	100	2.0	Low	Poor	Poor	Poor	Low	4.21	Fell	Imbalance canopy. Leaning. Canopy die-back
T225	*Spathodea campanulata*	火焰木	9.0	290	4.0	Low	Poor	Fair	Poor	Low	4.24	Fell	Imbalance canopy. Leaning. Canopy die-back

Tree Assessment Schedule
Planning and Engeering Study on Kwun Tong Action Area - Feasibility Study

Prepared by (ISA Certified Arborist: Woo Kwok Wai HK-1222A)
Field Survey was conducted on 22 November 2018. Additional field surveys were conducted on 07 Aug 2019 and 08 Jan 2020

T226	*Spathodea campanulata*	火焰木	5.0	170	3.0	Low	Poor	Poor	Poor	Low	4.18	Fell	Imbalance canopy. Leaning. Canopy die-back
T228	*Spathodea campanulata*	火焰木	6.0	140	2.0	Low	Poor	Poor	Poor	Low	4.19	Fell	Imbalance canopy. Leaning. Canopy die-back
T229	*Archontophoenix alexandrae*	假檳榔	8.0	160	3.0	Medium	Good	Good	Good	High	4.50	Fell	Imbalance canopy. Leaning. Canopy die-back
T230	*Spathodea campanulata*	火焰木	7.0	190	2.0	Low	Poor	Poor	Poor	Low	4.18	Fell	Imbalance canopy. Leaning. Canopy die-back
T231	*Spathodea campanulata*	火焰木	6.0	200	3.0	Low	Poor	Poor	Poor	Low	4.15	Fell	Imbalance canopy. Leaning. Canopy die-back
T233	*Spathodea campanulata*	火焰木	6.0	150	2.0	Low	Poor	Fair	Poor	Low	4.17	Fell	Imbalance canopy. Leaning. Canopy die-back
T234	*Spathodea campanulata*	火焰木	7.0	150	3.0	Low	Poor	Fair	Poor	Low	4.08	Fell	Severe leaning
T235	*Spathodea campanulata*	火焰木	7.0	150	3.0	Low	Poor	Poor	Poor	Low	4.06	Fell	Imbalance canopy. Leaning. Canopy die-back
T236	*Spathodea campanulata*	火焰木	7.0	150	3.0	Low	Poor	Poor	Poor	Low	4.02	Fell	Imbalance canopy. Leaning. Canopy die-back
T237	*Spathodea campanulata*	火焰木	8.0	170	4.0	Low	Poor	Poor	Poor	Low	4.07	Fell	Imbalance canopy. Leaning. Canopy die-back
T238	*Spathodea campanulata*	火焰木	6.0	130	1.0	Low	Poor	Poor	Poor	Low	3.94	Fell	Imbalance canopy. Leaning. Canopy die-back
T239	*Archontophoenix alexandrae*	假檳榔	5.0	150	2.0	Medium	Good	Good	Good	High	4.54	Fell	
T240	*Spathodea campanulata*	火焰木	6.0	220	3.0	Low	Poor	Fair	Poor	Low	3.94	Fell	Imbalance canopy. Leaning. Canopy die-back
T241	*Spathodea campanulata*	火焰木	3.0	140	3.0	Low	Poor	Poor	Poor	Low	3.92	Fell	Imbalance canopy. Leaning. Canopy die-back
T242	*Spathodea campanulata*	火焰木	5.0	150	2.0	Low	Poor	Poor	Poor	Low	3.86	Fell	Imbalance canopy. Leaning. Canopy die-back
T243	*Spathodea campanulata*	火焰木	4.0	300	2.0	Low	Poor	Poor	Poor	Low	3.85	Fell	Imbalance canopy. Leaning. Canopy die-back
T244	*Spathodea campanulata*	火焰木	5.0	200	2.0	Low	Poor	Poor	Poor	Low	3.85	Fell	Imbalance canopy. Leaning. Canopy die-back
T245	*Spathodea campanulata*	火焰木	5.0	180	2.0	Low	Poor	Poor	Poor	Low	3.93	Fell	Imbalance canopy. Leaning. Canopy die-back
T246	*Spathodea campanulata*	火焰木	7.0	300	3.0	Low	Poor	Poor	Poor	Low	4.06	Fell	Imbalance canopy. Leaning

Appendix 4

Existing Tree Photo record

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T1- Overall View

T1- Trunk Base

T2- Overall View

T2- Trunk Base

R Retain   T Transplant   F Fell   D Dead

T3- Overall View

T3- Trunk Base

T4- Overall View

T4- Trunk Base

R Retain   T Transplant   F Fell   D Dead

T5- Overall View


T5- Trunk Base

R Retain T Transplant F Fell D Dead

T7- Overall View


T7- Trunk Base

T8- Overall View


T8- Trunk Base

R Retain T Transplant F Fell D Dead

T9- Overall View


T9- Trunk Base

R Retain T Transplant F Fell D Dead

F

T11- Overall View

T11- Trunk Base

F

T12- Overall View

T12- Trunk Base

R Retain T Transplant F Fell D Dead

T13- Overall View

T13- Trunk Base

T14- Overall View

T14- Trunk Base

R Retain | T Transplant | F Fell | D Dead

T15- Overall View

T15- Trunk Base

T16- Overall View

T16- Trunk Base

R Retain T Transplant F Fell D Dead

F

T17- Overall View

T17- Trunk Base

F

T18- Overall View

T18- Trunk Base

R Retain T Transplant F Fell D Dead

T19- Overall View

T19- Trunk Base

T20- Overall View

T20- Trunk Base

R Retain T Transplant F Fell D Dead

T21- Overall View

T21- Trunk Base

T22- Overall View

T22- Trunk Base

R Retain T Transplant F Fell D Dead

T23- Overall View

T23- Trunk Base

T24- Overall View

T24- Trunk Base

R Retain T Transplant F Fell D Dead

T25- Canopy

T25- Trunk Base

T25- Trunk

R Retain | T Transplant | F Fell | D Dead

T26- Overall View

T26- Trunk Base

T27- Overall View

T27- Trunk Base

T28- Overall View

T28- Trunk Base

T29- Overall View

R Retain | T Transplant | F Fell | D Dead

T30- Overall View

T30- Trunk Base

T30- Upper Trunk

R Retain   T Transplant   F Fell   D Dead

T31- Overall View

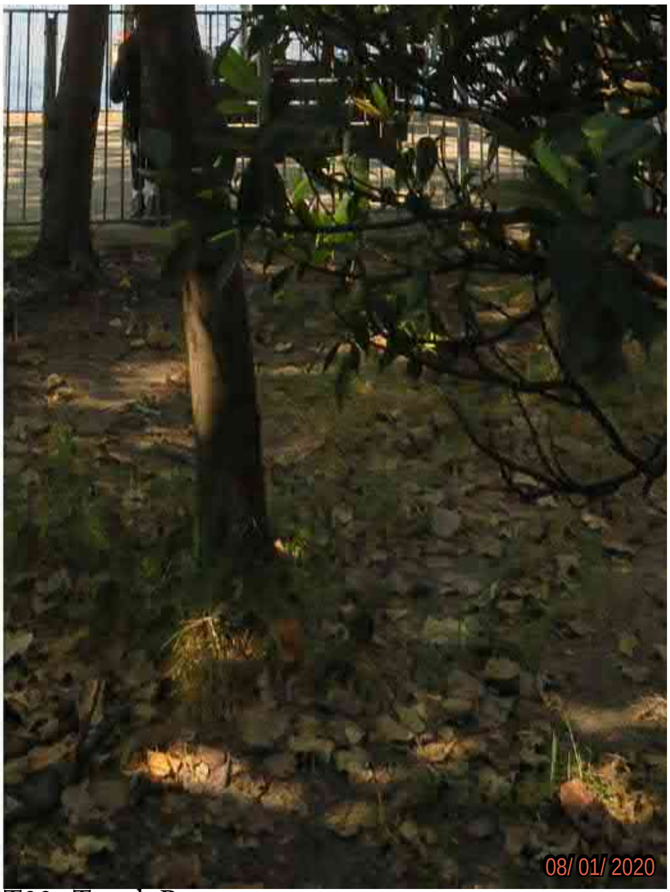
T31- Trunk Base

T32- Overall View

T32- Trunk Base

R Retain T Transplant F Fell D Dead

T33- Overall View

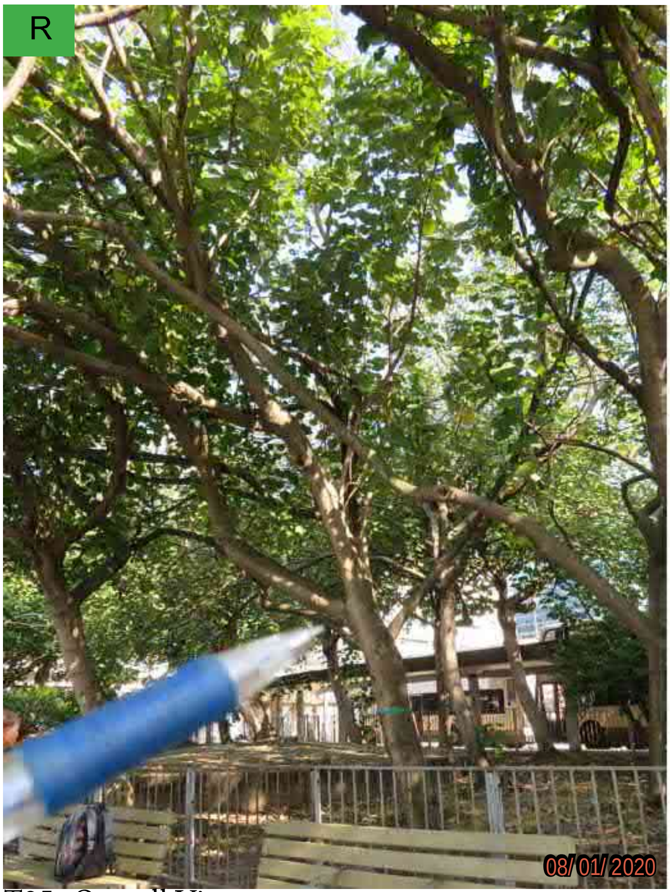


T33- Trunk Base

T34- Overall View

T34- Trunk Base

R Retain T Transplant F Fell D Dead

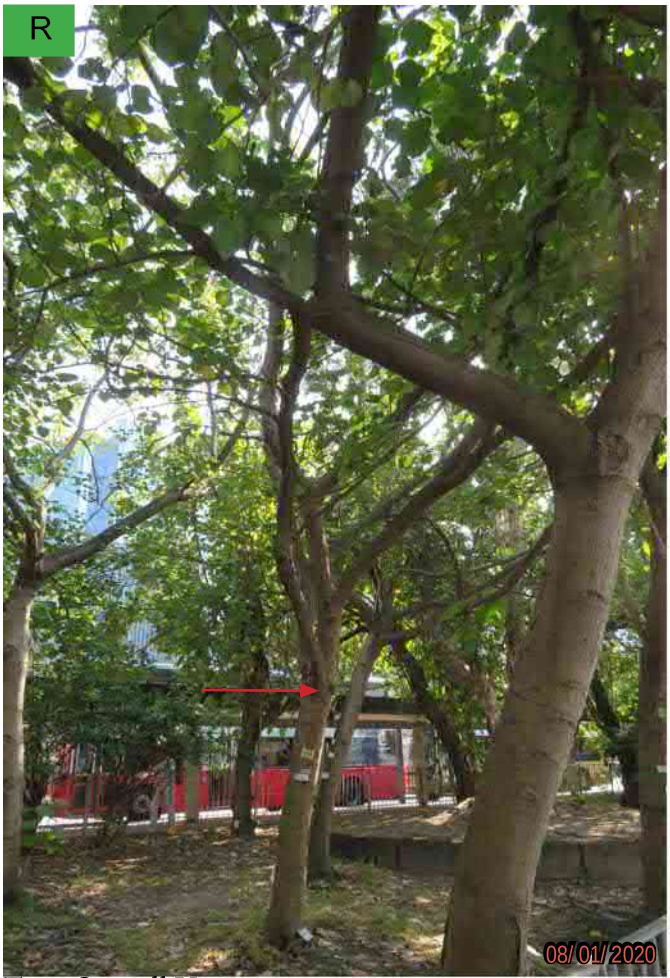


T35- Overall View

T35- Trunk Base

T35- Canopy

R Retain T Transplant F Fell D Dead



T36- Overall View

T36- Trunk Base

R Retain   T Transplant   F Fell   D Dead

R

T37- Overall View

T37- Cracks on Main Trunk

T37- Up-root

R Retain T Transplant F Fell D Dead

T38- Overall View

T38- Trunk Base

T39- Overall View

T39- Trunk Base

R Retain
T Transplant
F Fell
D Dead

T40- Overall View

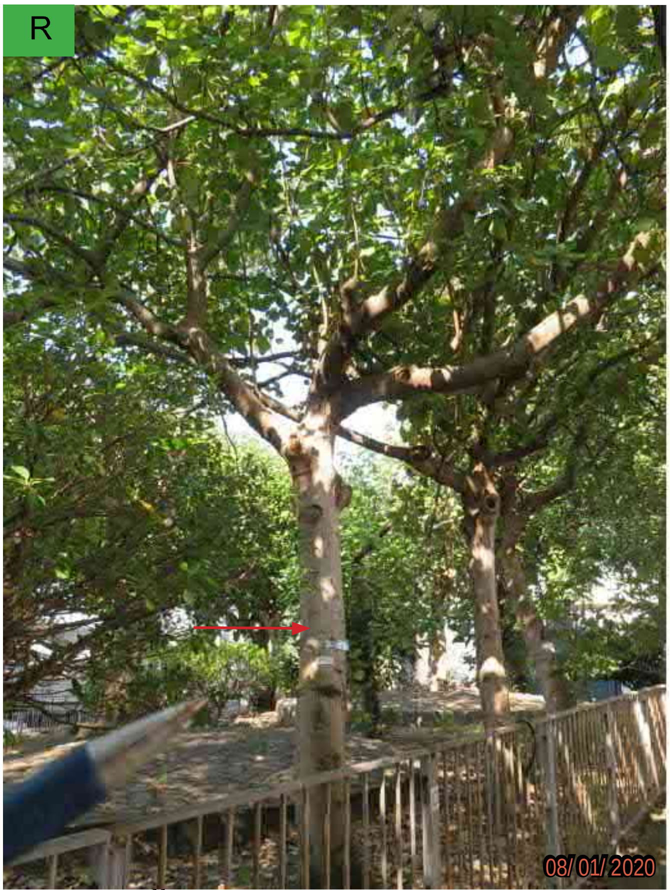
T41- Overall View

T41- Trunk Base

R Retain　T Transplant　F Fell　D Dead

T42- Overall View

T42- Trunk Base



T43- Overall View

T43- Trunk Base

R Retain T Transplant F Fell D Dead

T44- Overall View

T44- Trunk Base

T45- Overall View

T45- Trunk Base

R Retain　T Transplant　F Fell　D Dead

T46- Overall View

T46- Trunk Base

T47- Overall View

T47- Trunk Base

R Retain T Transplant F Fell D Dead

T48- Overall View

T48- Trunk Base

R Retain T Transplant F Fell D Dead

T49- Overall View

T49- Trunk Base

R Retain T Transplant F Fell D Dead

T49- Trunk Base

T49- Trunk Base

T51- Upper Trunk

T51- Overall View

T51- Trunk Base

R Retain T Transplant F Fell D Dead

T52- Overall View

T52- Upper Trunck

T52- Trunk Base

R Retain   T Transplant   F Fell   D Dead

T53- Overall View

T53.- Trunk Base

T54- Overall View

T54- Trunk Base

R Retain | T Transplant | F Fell | D Dead

T55- Overall View

T55- Trunk Base

T56- Overall View

T56- Trunk Base

R Retain T Transplant F Fell D Dead

T57- Overall View

T57- Trunk Base

T58- Overall View

T58- Trunk Base

R Retain   T Transplant   F Fell   D Dead

T59- Overall View

28/ 11/ 2018

T59- Trunk Base

T60- Overall View

T60- Trunk Base

R Retain T Transplant F Fell D Dead

F

T61- Overall View

T61- Overall View

T61- Overall View

T61- Overall View

R Retain T Transplant F Fell D Dead

T62- Overall View

T62- Trunk Base

T63- Overall View

T63- Trunk Base

R Retain   T Transplant   F Fell   D Dead

T

T64- Overall View

T64- Trunk Base

T

T65- Overall View

T65- Trunk Base

R Retain | T Transplant | F Fell | D Dead

T66- Overall View

T66- Trunk Base

T67- Overall View

T67- Trunk Base

R Retain T Transplant F Fell D Dead

T68- Overall View

T68- Trunk Base

T69- Overall View

T69- Trunk Base

R Retain   T Transplant   F Fell   D Dead

T70- Overall View

T70- Trunk Base

T71- Overall View

T72- Overall View

T72- Trunk Base

T73- Overall View

T73- Trunk Base

R Retain T Transplant F Fell D Dead

T74- Overall View

T74- Trunk Base

T75- Overall View

T75- Trunk Base

R Retain T Transplant F Fell D Dead

T76- Overall View

T76- Trunk Base

T77- Overall View

R Retain T Transplant F Fell D Dead

T78- Overall View

T79- Overall View

R Retain T Transplant F Fell D Dead

T80- Overall View

T80- Trunk Base

T81- Overall View

T81- Trunk Base

R Retain | T Transplant | F Fell | D Dead

T82- Overall View

T82- Trunk Base

T83- Overall View

T83- Trunk Base

R Retain | T Transplant | F Fell | D Dead

T84- Overall View

T84- Trunk Base

T85- Overall View

R Retain T Transplant F Fell D Dead

T86- Overall View

T86- Trunk Base and Root System

R Retain | T Transplant | F Fell | D Dead

T87- Overall View

T87- Trunk Base

T87- Structural Failure

R Retain   T Transplant   F Fell   D Dead

F

T88- Overall View

T88- Trunk Base

T89- Overall View

T89- Trunk Base

T89- Crack on Main Trunk

R Retain | T Transplant | F Fell | D Dead

T90- Overall View

T90- Trunk Base

T91- Overall View

T91- Trunk Base

R Retain T Transplant F Fell D Dead

T92- Overall View

T92- Trunk Base

T93- Overall View

T93- Trunk Base

R Retain T Transplant F Fell D Dead

F

T94- Overall View

T94- Trunk Base

F

T95- Overall View

T95- Trunk Base

R Retain T Transplant F Fell D Dead

T96- Overall View

T96- Trunk Base

T97- Overall View

T97- Trunk Base

R Retain T Transplant F Fell D Dead

T98- Overall View

T98- Trunk Base

T99- Overall View

T99- Trunk Base

R Retain | T Transplant | F Fell | D Dead

T100- Overall View

T100- Trunk Base

T101- Overall View

T101- Trunk Base

R Retain   T Transplant   F Fell   D Dead

T102- Overall View

T102- Trunk Base

T103- Overall View

T103- Trunk Base

R Retain | T Transplant | F Fell | D Dead

T104- Overall View

T104- Trunk Base

T105- Overall View

T105- Trunk Base

R Retain T Transplant F Fell D Dead

T106- Overall View

T106 Trunk Base

T107- Overall View

T107- Trunk Base

R Retain T Transplant F Fell D Dead

F

T108- Overall View

T108- Trunk Base

F

T109- Overall View

T109- Trunk Base

R Retain | T Transplant | F Fell | D Dead

T111- Overall View

T111- Trunk Base

T112- Overall View

T112- Trunk Base

R Retain T Transplant F Fell D Dead

T113- Overall View

T113- Trunk Base

T114- Overall View

T114- Trunk Base

R Retain T Transplant F Fell D Dead

T115- Overall View

T115- Trunk Base

T116- Overall View

T116- Trunk Base

R Retain T Transplant F Fell D Dead

T117- Overall View

T117- Trunk Base

T118- Overall View

T118- Trunk Base

R Retain | T Transplant | F Fell | D Dead

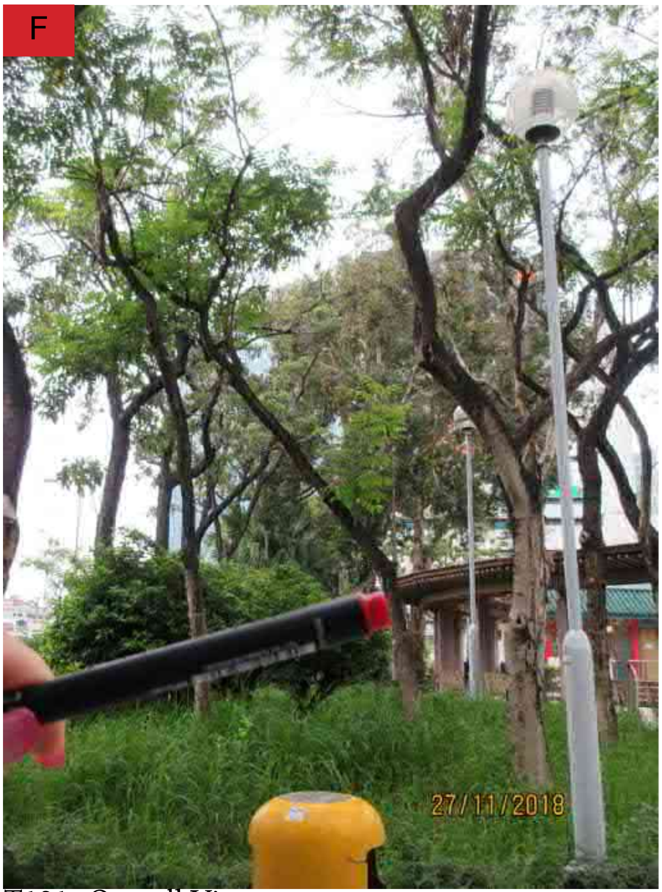
T119- Overall View

T119- Trunk Base

T120- Overall View

T120- Trunk Base

R Retain T Transplant F Fell D Dead



T121- Overall View

T121- Trunk Base

T122- Overall View

T122- Trunk Base

R Retain T Transplant F Fell D Dead

T123- Overall View

T123- Trunk Base

T124- Overall View

T124- Trunk Base

R Retain | T Transplant | F Fell | D Dead

T125- Overall View

T125- Trunk Base

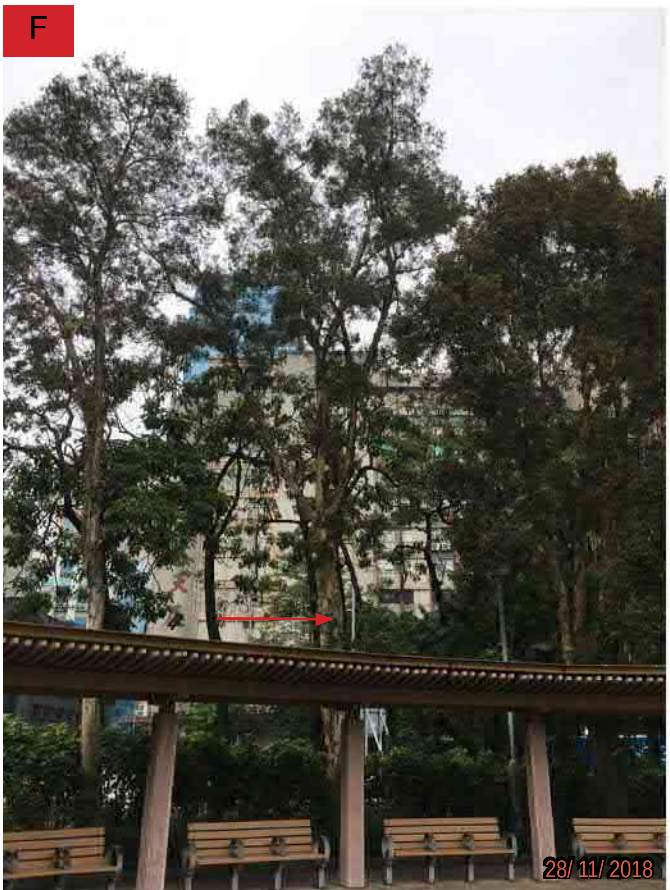
T126- Overall View

T126- Trunk Base

R Retain | T Transplant | F Fell | D Dead

T127- Overall View

T127- Trunk Base



T128- Overall View

T128- Trunk Base

R Retain T Transplant F Fell D Dead

T129- Overall View

T129- Trunk Base

T130- Overall View

T130- Trunk Base

R Retain T Transplant F Fell D Dead

T131- Overall View

T131- Trunk Base

T132- Overall View

T132- Trunk Base

R Retain T Transplant F Fell D Dead

T133- Overall View

T133- Trunk Base

T134- Overall View

T134- Trunk Base

R Retain T Transplant F Fell D Dead

T135- Overall View

T135- Trunk Base

T136- Overall View

T136- Trunk Base

R Retain T Transplant F Fell D Dead

T137- Overall View

T137- Trunk Base

T138- Overall View

T138- Trunk Base

R Retain T Transplant F Fell D Dead

T139- Overall View

T140- Overall View

T140- Trunk Base

R Retain T Transplant F Fell D Dead

T141- Overall View

T141- Overall View

T142- Overall View

T142- Trunk Base

R Retain T Transplant F Fell D Dead

T143- Overall View

T143- Trunk Base

T144- Overall View

T144- Trunk Base

R Retain T Transplant F Fell D Dead

T145- Overall View

T145- Trunk Base

T146 Overall View

T146- Trunk Base

R Retain T Transplant F Fell D Dead

T147- Overall View

T147- Lower Trunk and Root System

R Retain T Transplant F Fell D Dead

R

T148- Overall View


T148- Lower Trunk and Root System

R Retain T Transplant F Fell D Dead

R

T149- Overall View

T149- Lower Trunk and Root System

R Retain
T Transplant
F Fell
D Dead

T150- Overall View

T150- Trunk Base

T151- Overall View

T151- Trunk Base

R Retain
T Transplant
F Fell
D Dead

T152- Overall View

T152- Trunk Base

T153- Overall View

T153- Trunk Base

R Retain | T Transplant | F Fell | D Dead

T154- Overall View

T154- Trunk Base

T155- Overall View

T155- Trunk Base

R Retain T Transplant F Fell D Dead

T156- Overall View

T156- Trunk Base

R Retain
T Transplant
F Fell
D Dead

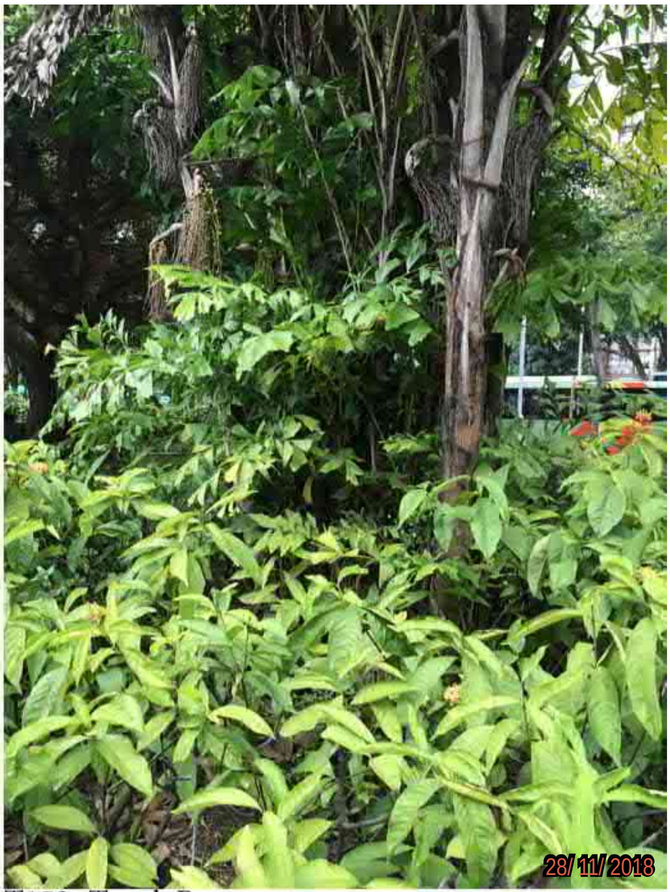
T157- Overall View

T157- Overall View

R Retain T Transplant F Fell D Dead

F

T159- Overall View



T159- Trunk Base

F

T160- Overall View

T160- Trunk Base

R Retain T Transplant F Fell D Dead

T161- Overall View

T161- Trunk Base

T162- Overall View

T162- Trunk Base

R Retain T Transplant F Fell D Dead

F

T163- Overall View

T163- Trunk Base

F

T164- Overall View

T164- Trunk Base

R Retain T Transplant F Fell D Dead

F

T165- Overall View

T165- Trunk Base

F

T166- Overall View

T166- Trunk Base

R Retain T Transplant F Fell D Dead

F

T167- Overall View

T167- Trunk Base

F

T168- Overall View

T168- Trunk Base

R Retain   T Transplant   F Fell   D Dead

T

T169- Overall View

T169- Trunk Base

R Retain T Transplant F Fell D Dead

T

T170- Overall View

T170- Trunk Base

T

T171- Overall View

T171- Trunk Base

R Retain
T Transplant
F Fell
D Dead

T172- Overall View

T172- Overall View

R Retain T Transplant F Fell D Dead

T173- Overall View

T173- Trunk Base

T174- Overall View

T174- Trunk Base

R Retain   T Transplant   F Fell   D Dead

T175- Overall View

T175- Trunk Base

T176- Overall View

T176- Trunk Base

R Retain T Transplant F Fell D Dead

T177- Overall View

T177- Trunk Base

T178- Overall View

T178- Trunk Base

R Retain T Transplant F Fell D Dead

T179- Overall View

T179- Trunk Base

T180- Overall View

T180- Trunk Base

R Retain T Transplant F Fell D Dead

T181- Overall View

T181- Trunk Base

T182- Overall View

T182- Trunk Base

R Retain   T Transplant   F Fell   D Dead

T183- Overall View

T183- Trunk Base

T184- Overall View

T184- Trunk Base

R Retain | T Transplant | F Fell | D Dead

T185- Overall View

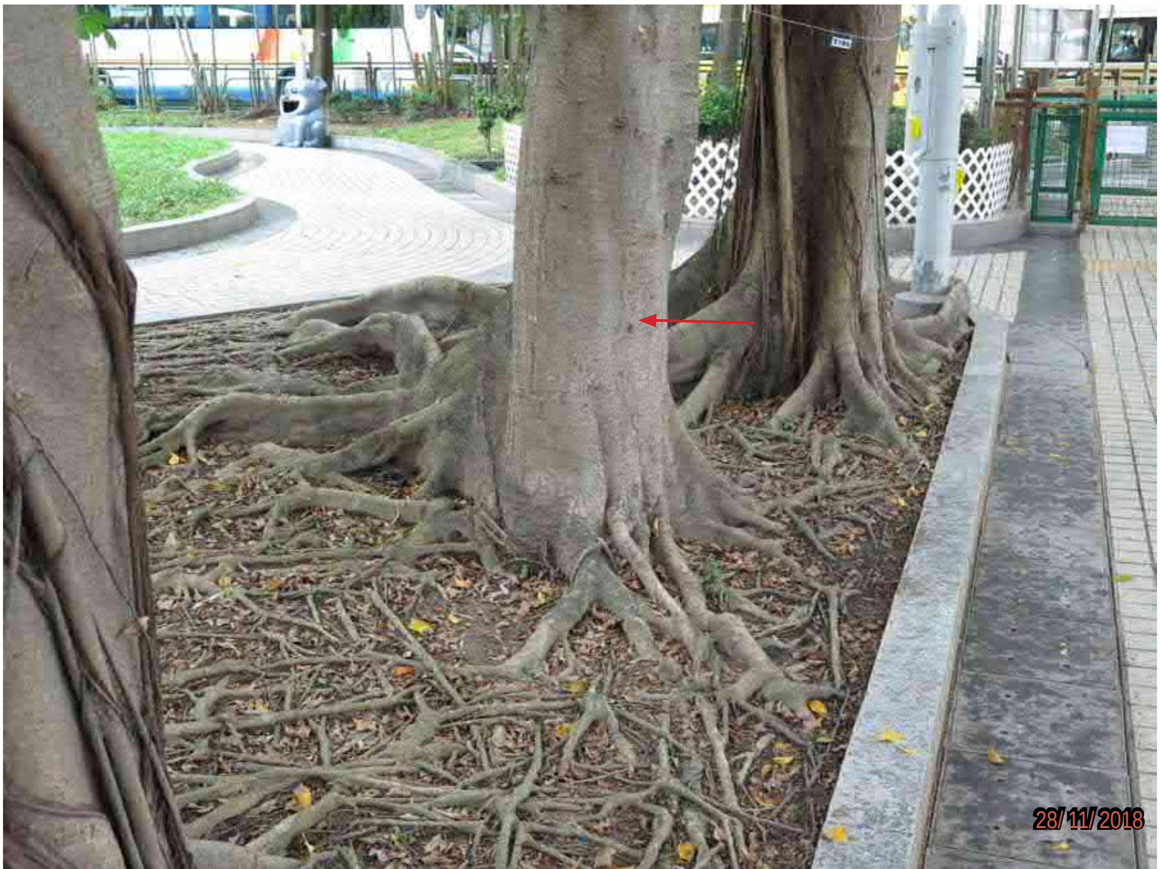
T185- Trunk Base

T186- Overall View

T186- Trunk Base

R Retain T Transplant F Fell D Dead

T187- Overall View



T187- Trunk Base

R Retain T Transplant F Fell D Dead

T188- Overall View

T188- Trunk Base

R Retain T Transplant F Fell D Dead

F

T189- Overall View

T189- Trunk Base

R Retain T Transplant F Fell D Dead

F

T190- Overall View

T190- Trunk Base

R Retain T Transplant F Fell D Dead

T191- Overall View

T191- Trunk Base

R Retain
T Transplant
F Fell
D Dead

F

T192- Overall View

T192- Trunk Base

R Retain T Transplant F Fell D Dead

F

T193- Overall View

T193- Trunk Base

R Retain T Transplant F Fell D Dead

F

T194- Overall View

T194- Trunk Base

R Retain | T Transplant | F Fell | D Dead

F

T195- Overall View

T195- Trunk Base

R Retain T Transplant F Fell D Dead

F

T196- Overall View

T196- Trunk Base

R Retain | T Transplant | F Fell | D Dead

F

T197- Overall View

T197- Trunk Base

R Retain | T Transplant | F Fell | D Dead

F

T198- Overall View

T198- Trunk Base

R Retain | T Transplant | F Fell | D Dead

T

T199- Overall View

T199- Trunk Base

R Retain | T Transplant | F Fell | D Dead

F

T200- Overall View

T200- Trunk Base

R Retain
T Transplant
F Fell
D Dead

F

T201- Overall View

T201- Trunk Base

R Retain T Transplant F Fell D Dead

T202- Overall View

T202- Trunk Base

R Retain | T Transplant | F Fell | D Dead

T203- Overall View

T203- Trunk Base

R Retain   T Transplant   F Fell   D Dead

T204- Overall View

T204- Trunk Base

R Retain T Transplant F Fell D Dead

R

T205- Overall View

T205- Trunk Base

R Retain T Transplant F Fell D Dead

T206- Overall View

T206- Trunk Base

R Retain T Transplant F Fell D Dead

F

T207- Overall View

T207- Mid-trunk

T207- Trunk Base

R Retain T Transplant F Fell D Dead

F

T208- Overall View

T208- Trunk Base

T

T209- Overall View

T209- Trunk Base

R Retain T Transplant F Fell D Dead

T210- Overall View

T210- Trunk Base

T211- Overall View

T211- Trunk Base

R Retain | T Transplant | F Fell | D Dead

T212- Overall View

T212- Trunk Base

T213- Overall View

T213- Trunk Base

R Retain   T Transplant   F Fell   D Dead

T215- Overall View

T215- Trunk Base

T216- Overall View

T216- Trunk Base

R Retain T Transplant F Fell D Dead

T217- Overall View

T217- Trunk Base

T218- Overall View

T218- Trunk Base

R Retain T Transplant F Fell D Dead

T219- Overall View

T219- Trunk Base

T220- Overall View

T220- Trunk Base

R Retain   T Transplant   F Fell   D Dead

T221- Overall View

T221- Trunk Base

T222- Overall View

T222- Trunk Base

R Retain T Transplant F Fell D Dead

T223- Overall View

T223- Trunk Base

T224- Overall View

T224- Trunk Base

R Retain T Transplant F Fell D Dead

T225- Overall View

T225- Trunk Base

T226- Overall View

T226- Trunk Base

R Retain T Transplant F Fell D Dead

T228- Overall View

T228- Trunk Base

T229- Overall View

T229- Trunk Base

R Retain T Transplant F Fell D Dead

F

T230- Overall View

T230- Trunk Base

F

T231- Overall View

T231- Trunk Base

R Retain T Transplant F Fell D Dead

T233- Overall View

T233- Trunk Base

T234- Overall View

T234- Trunk Base

R Retain T Transplant F Fell D Dead

T235- Overall View

T235- Trunk Base

T236- Overall View

T236- Trunk Base

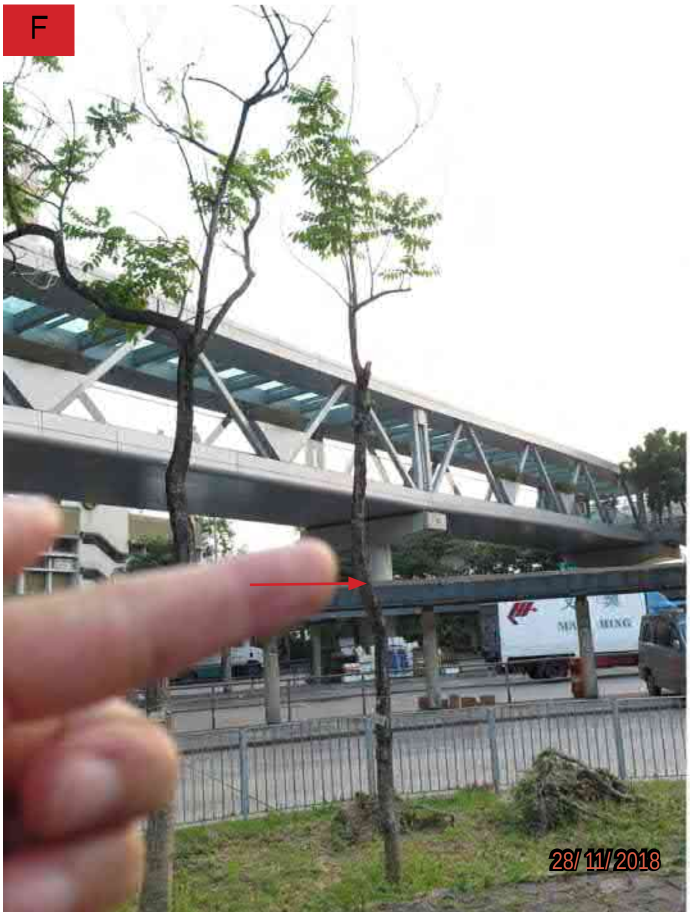
R Retain | T Transplant | F Fell | D Dead

F

T237- Overall View

T237- Trunk Base

F



T238- Overall View

T238- Trunk Base

R Retain T Transplant F Fell D Dead

F

T239- Overall View

T239- Trunk Base

F

T240- Overall View

T240- Trunk Base

R Retain | T Transplant | F Fell | D Dead

F

T241 Overall View

T241- Trunk Base

F

T242- Overall View

T242- Trunk Base

R Retain T Transplant F Fell D Dead

T243- Overall View

T243- Trunk Base

T244- Overall View

T244- Trunk Base

R Retain T Transplant F Fell D Dead

F

T245 Overall View

T245- Trunk Base

F

T246- Overall View

T246- Trunk Base

R Retain T Transplant F Fell D Dead

Appendix 5

Compensatory Planting Plan

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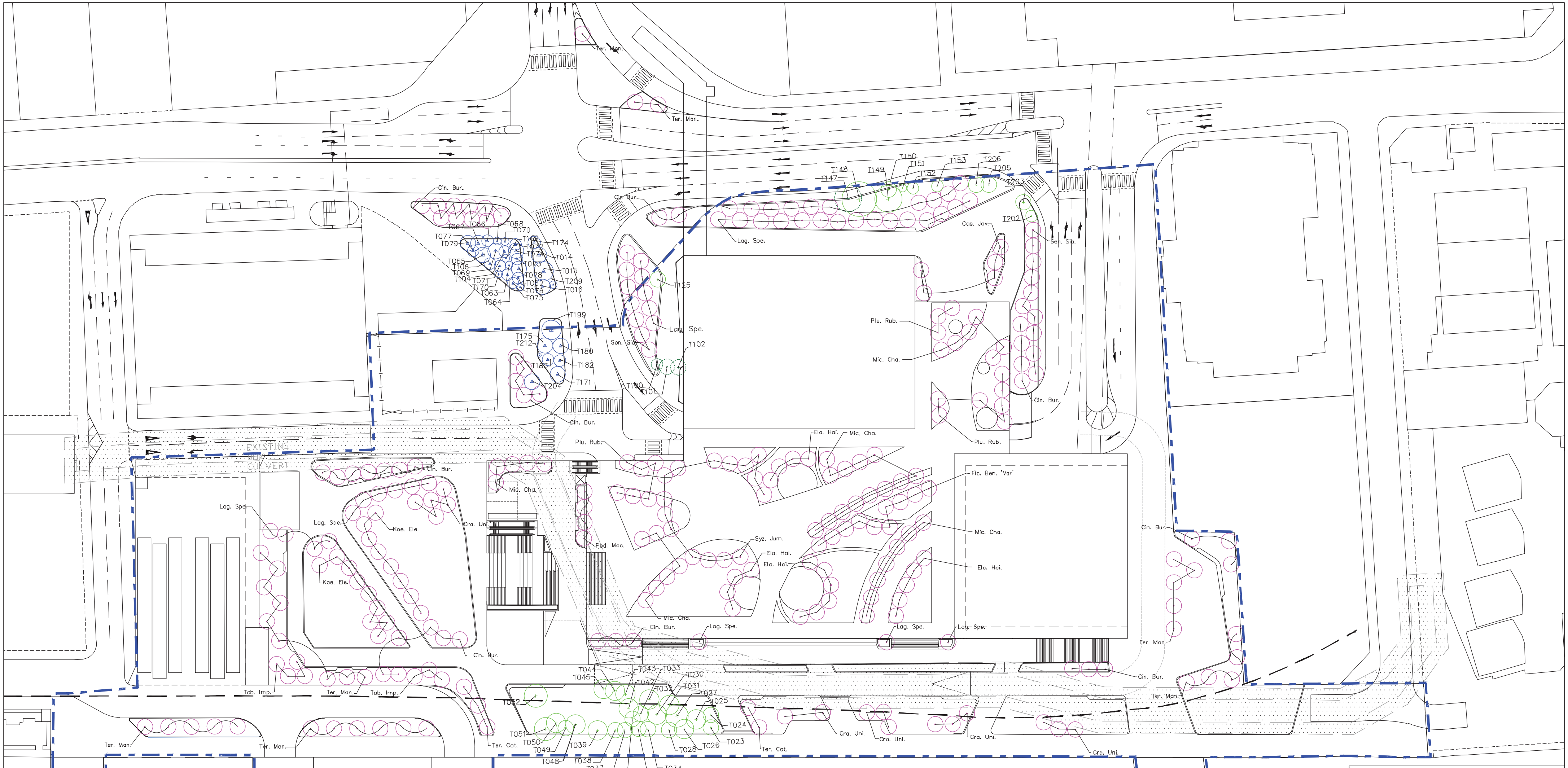

Proposed Compensatory Tree Planting Schedule

Code	Botanical Name	Chinese Name	Size: Crown Spread (m)	Size: Overall Height (m)	Size: DBH (mm)	Spacing (m)	QTY
Cas. Jav	*Cassia javonica*	爪哇決明	3.0-4.0	5.0-6.0	150	4.0	5
Cin. Bur.	*Cinnamomum burmannii*	陰香	2.5-3.0	5.0-6.0	150	4.0	53
Cra. Unl.	*Crateva unilocularis*	樹頭菜	3.0-4.0	5.0-6.0	150	4.0	16
Ela. Hai.	*Elaeocarpus hainanensis*	水石榕	3.0-4.0	5.0-6.0	150	4.0	19
Fic. Ben. 'Var'	*Ficus benjamina 'Variegata'*	花葉垂榕	3.0-4.0	5.0-6.0	150	4.0	10
Koe. Ele.	*Koelreuteria elegans*	欒樹	3.0-4.0	5.0-6.0	150	4.0	17
Lag. Spe.	*Lagerstroemia speciosa*	大花紫薇	3.0-4.0	4.0-5.0	150	4.0	33
Mic. Cha.	*Michelia chapensis*	樂昌含笑	3.0-4.0	6.0-7.0	150	4.0	37
Plu. Rub	*Plumeria rubra*	雞蛋花	3.0-4.0	4.0-5.0	100	4.0	16
Pod. Mac.	*Podocarpus macrophyllus*	羅漢松	3.0-4.0	4.0-5.0	150	4.0	4
Sen. Sia.	*Senna siamea*	鐵刀木	2.5-3.0	6.0-7.0	150	4.0	17
Syz. Jam.	*Syzygium jambos*	蒲桃	3.0-4.0	6.0-7.0	150	4.0	15
Tab. Imp.	*Tabebuia impetiginosa*	風鈴木	3.0-4.0	4.0-5.0	150	4.0	7
Ter. Man.	*Terminalia mantaly*	細葉欖仁	3.0-4.0	6.0-7.0	150	6.0	33
Ter. Cat.	*Terminalia catappa*	大葉欖仁樹	3.0-4.0	6.0-7.0	150	6.0-8.0	5
Total							287

LEGEND

- Site Boundary
- Retained Tree
- Retained Tree (Subject to Detail Design)
- Compensatory Tree
- Transplanted Tree
- Existing Box Culvert and Associated Reserved Area

Project:

Agreement No. CE 61/2015 (TP)
Planning and Engineering Study on
Kwun Tong Action Area – Feasibility Study

Title:

COMPENSATORY PLANTING PLAN

N

Date: NOV 2020

Scale: 1:1000

AECOM

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Annex A

Specification for Tree preservation, felling, transplanting

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TREE PRESERVATION AND FELLING

1.01 TREE FELLING

Prior to starting any tree felling works all trees to be retained shall be identified and the necessary tree protection fencing installed. (See 1.03)

Felling of trees to be removed shall involve the complete removal of trees indicated, including stumps, by one of the following methods to be approved by the Engineer before work commences:

(a) Bulldozer

A bulldozer shall be used to push over the whole tree which shall then be cut by chain saw and removed from Site. The method shall only be used where no trees are to be retained.

(b) Winches

Power mounted or hand winches shall be used for pulling over the whole tree, the main support roots having first being severed either by mechanical means or by hand grubbing. Preserved trees shall not be used as anchor points for winching without approved adequate protection.

(c) Chain Saws

Felling by this method shall be in accordance with BS 3998 (1989), either felling the whole tree at once or in sections. The stump shall be removed by hand grubbing and winching, stump cutting machine, hydraulic lifting or another method approved by the Engineer before work commences.

1.02 WORKS NEAR EXISTING TREES

(a) Where excavation is required near existing trees for construction of works, the following precautions shall be taken to protect the roots:-

(i) Roots temporarily exposed during excavation shall be wrapped with damp straw or hessian during construction of the works. Cutting of the roots shall be kept to a minimum;

(ii) Before backfilling, roots shall be cut cleanly back to undamaged tissue and treated with an approved fungicidal gel.

(iii) Excavated trenches around tree roots shall be backfilled with topsoil mixed with an approved conditioner as specified, including sufficient slow release fertilizer to assure a rate of application of 500 g/m.

(b) Trench excavation for services, including drainage and sewage, should not come within the spread of the tree crown. Detailed location of services shall be agreed with the Engineer before excavation commences if this minimum cannot be achieved. Large roots (i.e. greater than 75mm in diameter), exposed in trench excavations and above the final line of the installation shall be preserved, and excavation close to trees shall be carried out with particular care to ensure this. Following installation of the services, severed roots shall be cut back cleanly to undamaged tissue and treated with an approved fungicidal gel. Trenches shall be backfilled with topsoil as required, including approved soil conditioner and slow release fertilizer to achieve a rate of application of 500 g/m^3.

(c) Trees and woodland areas to be retained shall be protected during the contract work by sturdy, impenetrable fencing, as specified in Clause 1.03 (d).

1.03 PROTECTION OF EXISTING TREES AND WOODLAND AREAS

(a) In respect of all existing trees and woodland the Contractor shall ensure, for the whole duration of the Contract, the following:-

- no unnecessary intrusion into areas of woodland or shrubland is made;
- all access routes to construction areas which need to pass through woodland or scrub shall be approved by the Engineer;
- the limits of site clearance are to be agreed by the Engineer on site before site clearance commences. All trees to be cleared shall be marked by the Contractor and approved by the Engineer before felling;
- no nails or other fixings shall be driven into trees;
- no fencing or signs shall be attached to trees;
- no materials or machinery shall be stored within the area of a tree's crown diameter.
- no workshop, canteens, or similar shall be installed beneath trees, nor shall equipment maintenance etc. be carried out under trees;
- no trees shall be used as anchors for ropes or chains used in guying, pulling and the like.

(b) The Contractor shall exercise the greatest care during the progress of the work to avoid damage to any tree which the contract does not require to be cleared.

As soon as the site or any part thereof becomes available the Contractor shall erect Temporary Protective Fencing around each such tree or group of trees, preferably to protect the whole area within the spread of the tree's crown, but no closer than 2m from the trunk of any such tree. The Contractor shall inform the Engineer if works are to be carried out within such fenced areas and, save with the express permission of the Engineer or on his order, all such work shall be executed using only hand-held tools. The rates in the Contract shall include for this restriction.

(c) The Contractor shall maintain the Temporary Protective Fencing in good repair and subsequently remove it. Removal shall be subject to the permission of the Engineer which shall not normally be given earlier than the substantial completion of an adjacent part of the Works other than Landscape Softworks.

The Contractor may seek permission to remove the fencing temporarily if its removal is necessary for the satisfactory execution of the Works. The

Contractor shall reinstate the temporary protective fencing as soon as possible.

(d) Temporary Protective Fencing shall be 1500-2000mm high, and shall ideally be constructed of strong, impenetrable material such as steel sheet or wooden board (See Fig. 1.1).

In certain circumstances where space for tree protection is a particular problem, protection of the tree trunk with planks may be acceptable (See Fig. 1.2). In these cases, the ground within the root zone should be protected from compaction with mats and gravel or boards/tracks for vehicles. (It should be noted that these treatments should only be used temporarily so that anaerobic soil conditions do not build up in the root zone).

(e) Unless adequate proof is submitted by the contractor to demonstrate that death or damage of existing vegetation was caused by circumstances beyond his control, replacement of dead or damaged plants of similar sizes of the same species will be required as instructed by the Engineer. When instructed by the Engineer, slow release fertilizer shall be applied to existing mature trees in a feeding band 1.5m either side of the branch spread as and when required. Holes shall be drilled at an angle at 450-600mm centres in the feeding bands, they shall be 300-600mm deep and approximately 37-50mm in diameter.

Slow release fertilizer shall be inserted in the holes, bulked up if necessary with sand or fine peat, at the rate of 1kg/25mm of trunk diameter at a height of 1.2 metres from ground level.

The fertilizer shall be applied between March and June or as directed by the Engineer.

1.04 PRUNING OF EXISTING TREES

(a) Existing trees which are to be retained shall be pruned to remove dead or dangerous branches and to produce a balanced crown. For tree surgery work involving extensive crown, limb or root pruning that significantly affect the tree form, the justification, extent and supervision requirements of pruning works should be approved by the Project Director of the landscape consultants.

(b) Detailed pruning proposal and method statements submitted by contractor should be approved by project officer before implementation, and monitored throughout the duration of the contract. All work shall be carried out in accordance with good horticultural practice and ANSI300 Part 1 and shall be directed by the Engineer. Tree pruning and surgery should be undertaken by a fully qualified arboriculturalist. Safety precautions shall be taken to protect those engaged in operations as well as people and property in the vicinity. Pruning and removal of branches shall be done using sharp, clean implements to give a single flat, sloping face (See Fig. 1.3). Ragged edges of bark or wood are to be trimmed with a sharp knife. Large branches shall be removed in stages beginning with removal of the main weight of the branch, with the final cut on a line outside the "branch bark ridge" and "branch collar". All cuts shall be made to avoid splintering or tearing of bark which would catch water and encourage rot. Twigs less than

15mm diameter may be cut with sharp secateurs. Cleanly cut boughs on healthy trees will not normally require a bituminous sealant to close the wound. Instead an application of an approved fungicidal gel formula is recommended. ('ARBREX' or similar approved)

(c) If the extent of pruning is small and the engagement of a landscape professional is not practical, the works should be carried out by a specialist contractor on ETWB's "List of Approved Suppliers of Materials and Specialist Contractors for Public Works", under the Category of "Landscaping Class I – General Landscape Works". The contractor should appoint a competent person with arboriculture knowledge to supervise the works.

(d) For emergency situations such as where public safety is at stake, the requirement in 1.04 (a) to (c) are not applicable. However, under all circumstances over-pruning such as hard-pruning of the crown, pollarding or topping must be avoided. Detailed records such as photo records should be taken before and after any operation.

(e) Where cavities or rotten wood exist, all rotten or dead wood can be removed. However, cutting back to live wood is not recommended as this may cause new infection. Filling cavities is not recommended. Trees weakened by large cavities may require specialised arboricultural treatment such as bracing. The Engineer will instruct on these situations following detailed arboricultural advice.

(f) Any material pruned from trees shall be collected and removed from Site.

(g) Trees requiring pruning or thinning treatment will be categorized as follows:

(i) Hard prune

This shall include the removal of a substantial number of branches of up to 200mm in diameter. The objectives for hard pruning may include raising the crown in a street situation or preparing a tree for transplanting. The final shape of the reduced crown should be even and balanced and provide the basis for the growth of a well shaped new crown.

(ii) Light prune

This shall include the removal of a few branches up to 75mm in diameter. The same objectives are required as with the hard prune.

(iii) Thin crown

This shall include the removal of overcrowded branches up to 50mm in diameter in the crown of the tree. The overall shape of the tree should be preserved, but all weak, decaying, damaged or crossing branches should be removed. A proportion of other branches can be removed to create a balanced and attractive crown (See Fig. 1.4).

(iv) Treat for pest and/or disease attack

This shall include the application of a suitable pesticide or fungicide, approved by the Engineer, to the infected areas in accordance with the manufacturer's instructions.

(h) Where treatment of wounds is required, trim all damaged tissue and dead wood with a clean, sharp implement. Treat with an approved fungicidal gel (See Fig. 1.5).

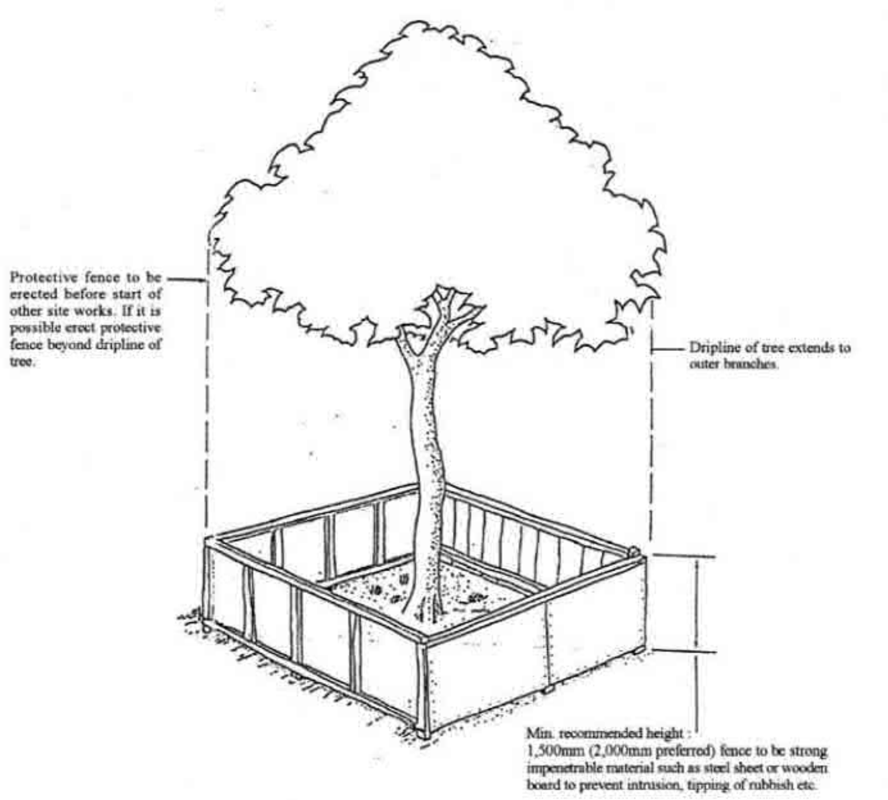


Fig.1.1 Temporary Protective Fencing

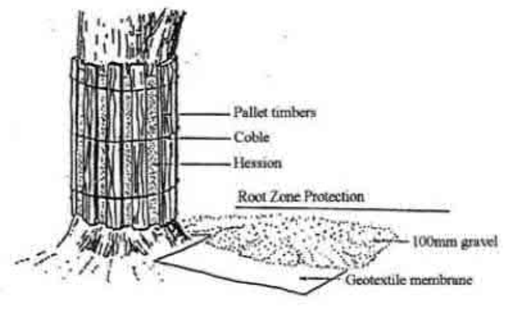


Fig. 1.2 Trunk and Rootzone Protection

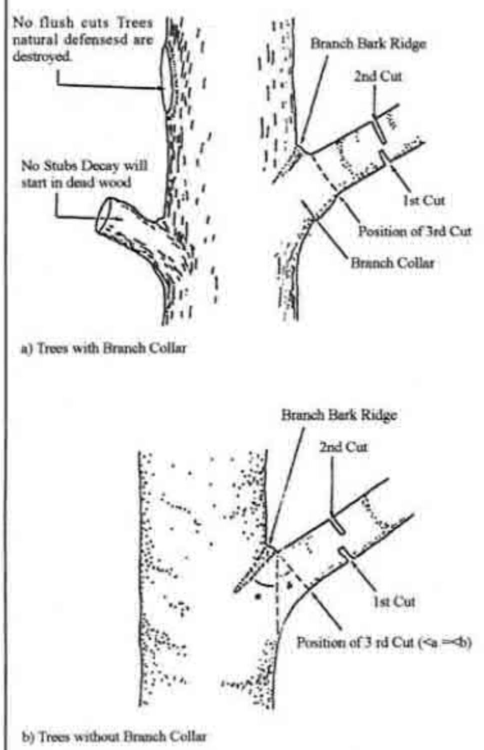


Fig.1.3 Correct Pruning Positions

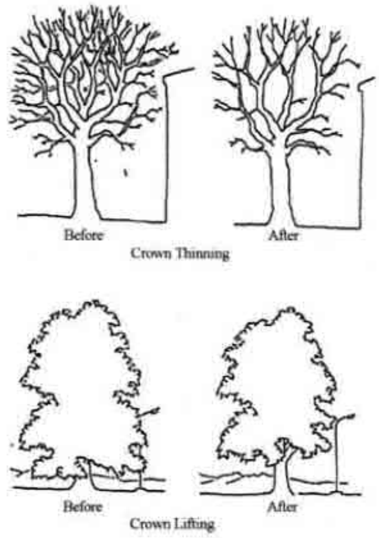


Fig.1.4 Crown Pruning

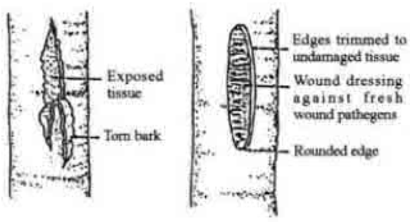


Fig.1.5 Wound Treatment

TREE TRANSPLANTING

1.05 TRANSPLANTING OF EXISTING TREES

All transplanting works should ideally be undertaken in early spring (March to October) to increase the chances of the trees' successful re-establishment. Transplanting operation should be timed so as to avoid strong sun or drying winds. The new position or storage facilities should be prepared before the tree is moved, so that the tree can be repositioned within two hours of lifting. The trunk and major boughs should be wrapped in damp hessian to protect from damage in transport and to reduce transpiration. Anti-transpiration spray can also be used on foliage. Crown thinning before transplanting is recommended. All stages of transplanting should be supervised or preferably undertaken by qualified arboriculturalists. The method to be adopted by the Contract shall be submitted for approval of the Engineer prior to work execution.

1.06 TREE SURGERY WORKS

Tree pruning and thinning should be carried out as instructed by the Engineer during the preparation period before transplanting. All tree surgery work should be in accordance with British Standard 3998 (1989) "Recommendations For Tree Work". Minor pruning of additional limbs may be required after replanting.

1.07 SEQUENCE OF TRANSPLANTING OPERATIONS

Transplanting operations should be in accordance with British Standard 4043 (1989) "Transplanting Root-balled Trees". Preparation for moving should ideally begin several months before the transplanting operation is required (See Fig. 2.1).

(a) A root ball area which incorporates at least half of the area of the tree crown should be marked out and later a trench is dug around this area. Roots should be carefully pruned and treated with an approved fungicidal gel. Ideally this operation should be completed at least 6 months before moving so that the tree can establish new fibrous root within the rootzone. The root zone should be watered. A root feed with an approved slow release fertiliser is recommended.

(b) Crown thinning and shaping should be undertaken during this period.

(c) The root ball diameter to tree diameter ranges from 8:1 to 10:1 according to international standards (except for a palm which may require a smaller root ball). The root ball sizes should be of a diameter and depth to encompass enough of the root system as necessary for establishment. Normally the diameter of a root ball is larger than its depth which seldom exceeds 1 metre.

(d) Precautions against desiccation can include hessian wrapping or anti-transpiration paints and these should be applied before transplanting operations begin.

(e) The rootball should be kept intact with all soil. At lifting, a spade or specialised lifting bucket can be slipped under the rootball and a strip of hessian or geotextile fabric pulled around the rootmass. The rootball and tree should be kept moist at all times.

(f) The whole tree should be lifted, using specialised equipment if necessary, and moved to its new position within 2 hours. The new planting position should be prepared as for any new tree, using fertiliser in the backfill material and soil conditioner as necessary. The tree should be orientated to best suit the new position and thoroughly watered in.

(g) The tree should be firmly secured using either well anchored guys, with ratchet turnbuckles for adjustment, or a sturdy bamboo tripod arrangement (with poles of a minimum diameter of 75mm), as instructed by the Engineer. Ties should be adjustable and should include wrapping to prevent chafing.

(h) Watering should be thorough and regular (at least twice a week) for the first months of establishment.

(i) Any damaged or additional branches should be pruned after planting.

(J) The contractor should keep an accurate photographic record (dated), of all stages of the transplanting operation for submission to the Engineer.

(K) Transplant trees of special conditions such as over-mature size, Leaning growing form, etc. to be subject to special requirements as listed below and method statement for Engineer prior approval is a must:

i) Over-Mature Size (DBH over 500mm)

- at least 6 months of time or more shall there be for root-ball preparation works before transplanting operations to be carried out;
- size of prepared root ball shall conform to clause 1.03 (a) and with the minimum size not below 2500mm width and 1000mm depth;
- due to weight of the tree exceeding normal situation, the anchor point for tree lifting during transplanting might not on the tree main trunk on the opinion of the Engineer and/or depend on situation (i.e. tree species);
- extensive pruning shall be avoided and pruning works shall be under Engineer supervision;

ii) Leaning Tree

- adequate temporary support shall be provided to severe leaning tree during preparation period, at where anchor roots are severed for root ball preparation;
- after transplanting, tree shall be positioned in manner of up-straight and without suffocation of the root zone;
- tree pruning to be carried out as necessary to encourage balance and symmetric tree form.

(L) For transplanting of tree at vicinity of residents or public road etc., the Contractor shall be responsible to the public safety and exercise maximum effort to avoid causing any damage and disturbance to the mentioned; unless solid proof is provided by the Contractor that the situation is out of their control, the Contractor shall assume any cost and liability incurred.

1.08 MAINTENANCE WORKS

(a) Maintenance in Temporary Position

When transplanted plants cannot be immediately re-planted in the intended final position, a secure, sheltered and otherwise suitable storage nursery should be designated by the Contractor for approval by the Engineer. Keeping transplanted trees in the temp position within this period will be the same as for the Establishment Works, (see below), but will not constitute part of the Establishment Period. The length of temporary off-site maintenance will vary from contract to contract.

(b) Establishment Works

Establishment Works are those works to establish the transplanted tree and to be carried out during the Establishment Period. These works are treated as outstanding works when the transplanting tree is replaced.

(c) Establishment Period

The Establishment Period should extend through at least one growing season from the date of the completion of the replanting works certified by the Engineer. This would normally correspond to a period of 12 months or 24 months as required.

(d) Dead Plants

The contractor will replace, at own expense, any plant which in the opinion of the Engineer dies, is seen to be dying, or fails to thrive, during this period as a result of bad workmanship, poor quality maintenance or neglect.

(e) Replacement Planting

Replace dead or ailing plants as Clause 1.04(d) within two (2) weeks of being identified, the largest available good quality nursery stock, but at least Mature size, of similar species unless otherwise instructed by the Engineer.

(f) Mature Trees

Mature Trees to have all the following characteristics:

i) a sturdy, straight stem, not less than 2000mm in height from soil level to the lowest branch,
ii) a stem diameter, greater than 300mm when measured at a point one metre above the root collar.
iii) a well balanced branching head, or a well defined straight and upright leader with branches growing out from the stem with good symmetry, and a minimum length of 1500mm,
iv) a total height above soil level greater than 7000mm,
v) "grown on" in China,
vi) a root ball not less 1200mm in diameter and 1000mm in depth,
vii) a root system previously under cut a minimum of one year prior to lifting, to encourage compact fibrous growth.

(g) Damaged Plants due to Vandalism

The contractor is not responsible for replacing dead or damaged stock resulting from proven vandalism. The onus is at all times on the Contractor to prove that death or damage was so caused by circumstances beyond his control and in any event, no claim shall be considered unless submitted in writing to the Engineer within three working days of the event happening.

(h) Damaged Plants due to Typhoons

Within 48 hours of Typhoon signal No. 8 or above being lowered, replant all plants blown over, firm up all other plants, provide the Engineer with a photographic record of the Site, and prepare a detailed report of all plants which have suffered structural damage. As soon as practical thereafter remove dead plants and clear the Site of all debris providing the replanting works are carried out each day. "The Employer" will accept responsibility for dead or dying plants recorded one month after the typhoon, excepting those plants recorded as being dead or dying prior to the typhoon. Thereafter responsibility reverts to the contractor. Should the replanting not be carried out within the time period, or the works not carried out satisfactorily, than the Contractor shall be held responsible for all plant re-placements.

(i) Records

Ensure that the Approved Foreman reports to the Engineer's office before and after carrying out the day's maintenance work and make a countersigned record of the work carried out available for inspection at that office. These reports shall contain operations undertaken or specific tree locations and materials used. Provide monthly photo record showing the condition of the plants.

(j) Water

The Contractor is required to provide non-toxic water throughout the establishment period.

(k) Weeding

Keep all planted areas weed-free. Undertake a weeding operation at least once a month. Replace any aggregate or soil disturbed or removed during this process.

(l) Weed Disposal

Collect all weeds and rubbish during these operations and remove from the Site to a properly designated tip.

(m) Firming Up

Undertake firming-up of plants from time to time during the period and particularly after heavy rain and/or wind.

(n) Tree Ties

Tighten, or slacken tree ties as necessary for the healthy growth of the tree, and adjust or replace the protective pad as necessary to prevent chafing of the bark.

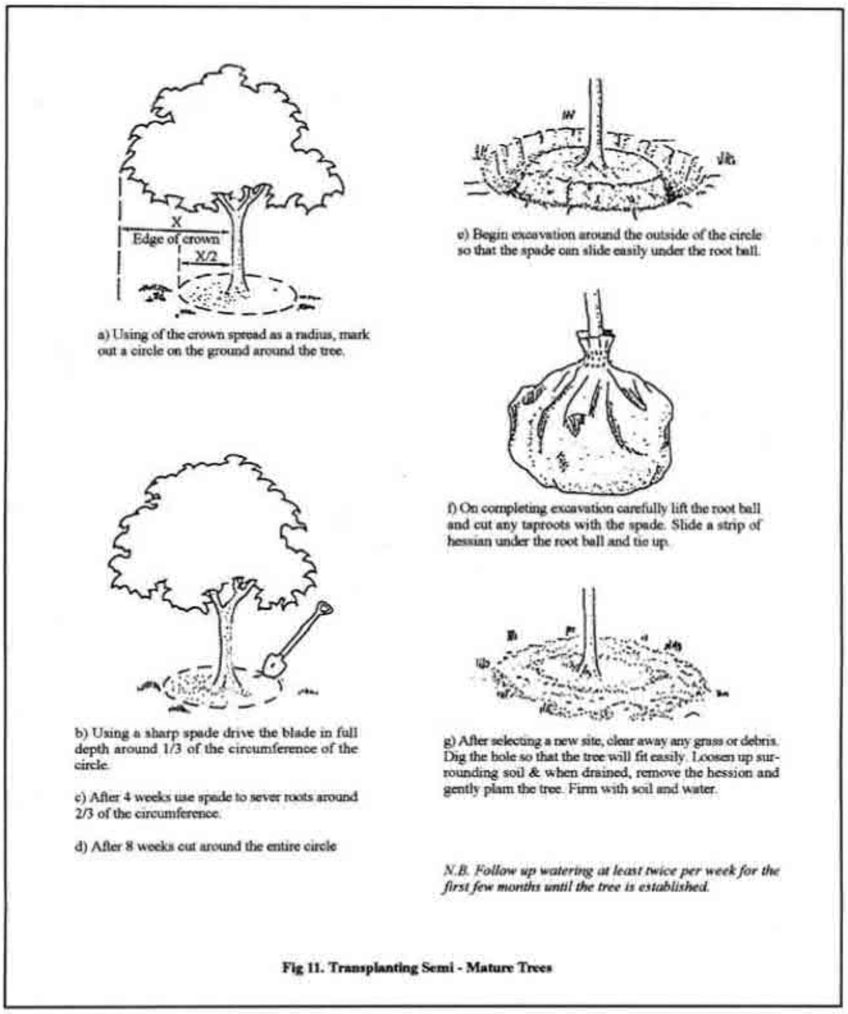
(o) Pruning

Carry out pruning when instructed during the Establishment Period, to encourage bushy growth good form. Remove dead, damaged or crossing branches.

(p) Pests and Fungal Growth

Regularly check for any insect attack or fungus infestation particularly during known periods of activity. Report to the Engineer any such occurrence and carry out remedial measures by use of sprayed effective approved insecticide or fungicide in strict accordance with the manufacturer's instruction. Take due care and have regard to the safety and convenience of the general public and carefully control the spraying to avoid unnecessary dispersion.

(q) Final Handover
Carry out an inspection and formal check of the Works at the end of the Establishment Period, with the Engineer. Carry out the final visit for all regular operations included in the specification, immediately prior to the final handover of the transplanted trees.



a) Using of the crown spread as a radius, mark out a circle on the ground around the tree.

b) Using a sharp spade drive the blade in full depth around 1/3 of the circumference of the circle.

c) After 4 weeks use spade to sever roots around 2/3 of the circumference.

d) After 8 weeks cut around the entire circle

e) Begin excavation around the outside of the circle so that the spade can slide easily under the root ball.

f) On completing excavation carefully lift the root ball and cut any taproots with the spade. Slide a strip of hessian under the root ball and tie up.

g) After selecting a new site, clear away any grass or debris. Dig the hole so that the tree will fit easily. Loosen up surrounding soil & when drained, remove the hession and gently plam the tree. Firm with soil and water.

N.B. Follow up watering at least twice per week for the first few months until the tree is established.

Fig 11. Transplanting Semi - Mature Trees

Fig.2.1 Transplanting Stages

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Attachment Vd of
MPC Paper No. 2/21

超Energizing動 Kowloon East 九龍東

Agreement No. CE 61/2015 (TP)
Planning and Engineering Study on

Kwun Tong Action Area

TR8 - Air Ventilation Assessment
(Final)

November 2019

AECOM

發展局起動九龍東辦事處
Energizing Kowloon East Office
Development Bureau

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Kowloon East Office
九龍東辦事處

Development Bureau
Government Secretariat
Energizing Kowloon East Office

Agreement No. CE 61/2015 (TP)

Planning and Engineering Study on Kwun Tong Action Area – Feasibility Study

TR8 – Air Ventilation Assessment (Final)

26 November 2019

Prepared:	Simon Wong	(26 November 2019)
Reviewed:	Karl An	(26 November 2019)
Approved for Issue:	Pearl Hui	(26 November 2019)

AECOM Asia Company Ltd.

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1 INTRODUCTION

1.1 Background

1.1.1 In the 2013 Policy Address, the Chief Executive announced the proposal of setting up a recreational landmark – "Kai Tak Fantasy" (KTF) on the site of the former runway tip in Kai Tak Development Area (KTDA), Kwun Tong Action Area (KTAA) and the Enclosed Waterbody between the Kai Tak Runway Tip (KTRT) and KTAA which was identified of having excellent potential to be developed into a destination that will be attractive to both local residents and overseas visitors. In order to encourage creative design ideas and visions for the development of this prominent site, the "Kai Tak Fantasy – International Ideas Competition on Urban Planning and Design" (the Competition) was launched by the Energizing Kowloon East Office (EKEO) in November 2013 and results of the Competition was announced in November 2014.

1.1.2 To further develop the KTF, the EKEO has initiated this study: ***Agreement No. CE 61/2015 (TP) – Planning and Engineering Study on Kwun Tong Action Area – Feasibility Study*** (herein referred as "the Study"), and another study "Agreement No. CE 73/2014 (TP) – Planning and Urban Design Review for Developments at Kai Tak Runway Tip – Feasibility Study" which was commenced in December 2015. Both studies will make reference to the winning scheme of the Competition, together with the good ideas and elements of other shortlisted entries.

1.1.3 AECOM Asia Co Ltd (AECOM) has been commissioned by EKEO to undertake the Study. The Agreement commenced on 22 March 2016 and is anticipated to be completed in 2019.

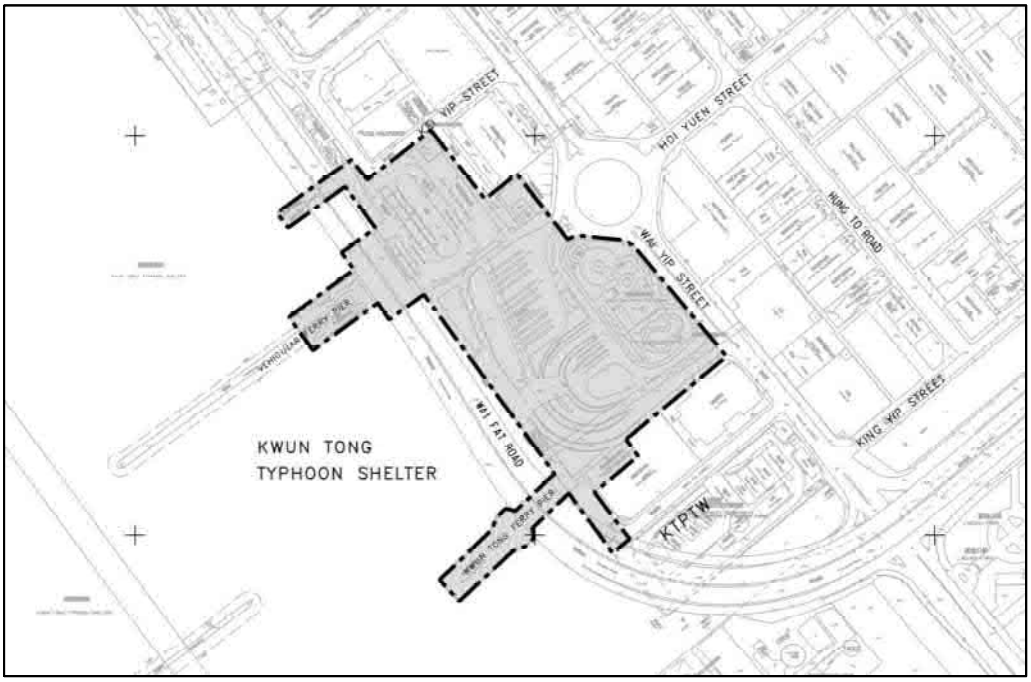


Figure 1.1 Project Area of Kwun Tong Action Area

1.2 Objectives of the AVA Study

1.2.1 Kwun Tong Action Area (KTAA) is planned for comprehensive mixed-use development that are complementary to the tourism and entertainment uses at the KTRT, create synergy effect for the transformation of Kowloon East (KE) into another Core Business District (CBD).

1.2.2 The overall objective of the Study is to take into due consideration, the findings and recommendations of the previous and on-going planning and engineering studies carried out for Kwun Tong Business Area (KTBA) and the ideas of the winning design and the shortlisted entries of the Competition to rationalise the existing and required government uses and to derive a robust, flexible and practical development scheme for KTAA with due regards to planning, urban design, air ventilation, visual consideration, while ensuring that the scheme would be acceptable in environmental, traffic and transport, engineering, business viability terms as well as to provide recommendations on phasing and implementation mechanisms.

1.2.3 The future development of KTAA will hold significance to the area, as KTAA is envisioned to form the creative industry hub of KTF, complementing the tourism/entertainment development at KTRT and the water body of Kwun Tong Typhoon Shelter (KTTS). Looking at a wider context, the future development of KTAA, together with Kowloon Bay Action Area (KBAA) will be two focal core areas of KE as future premier business/commercial areas showcasing the branding and identity of our CBD2.

1.2.4 AECOM Asia Company Limited (AECOM) was commissioned for the Consultancy and one of the scopes of works is to carry out Air Ventilation Assessment (AVA) for the proposed developments.

1.3 Contents of the report

1.3.1 Section 1 is the introduction section. The remainder of the report is organized as follows:

- Section 2 on the preliminary evaluation of the environ surrounding the site;
- Section 3 on comparison between the Base Scheme and Proposed Scheme;
- Section 4 on assessment methodology
- Section 5 on key findings of AVA study; and
- Section 6 with a summary and conclusion.

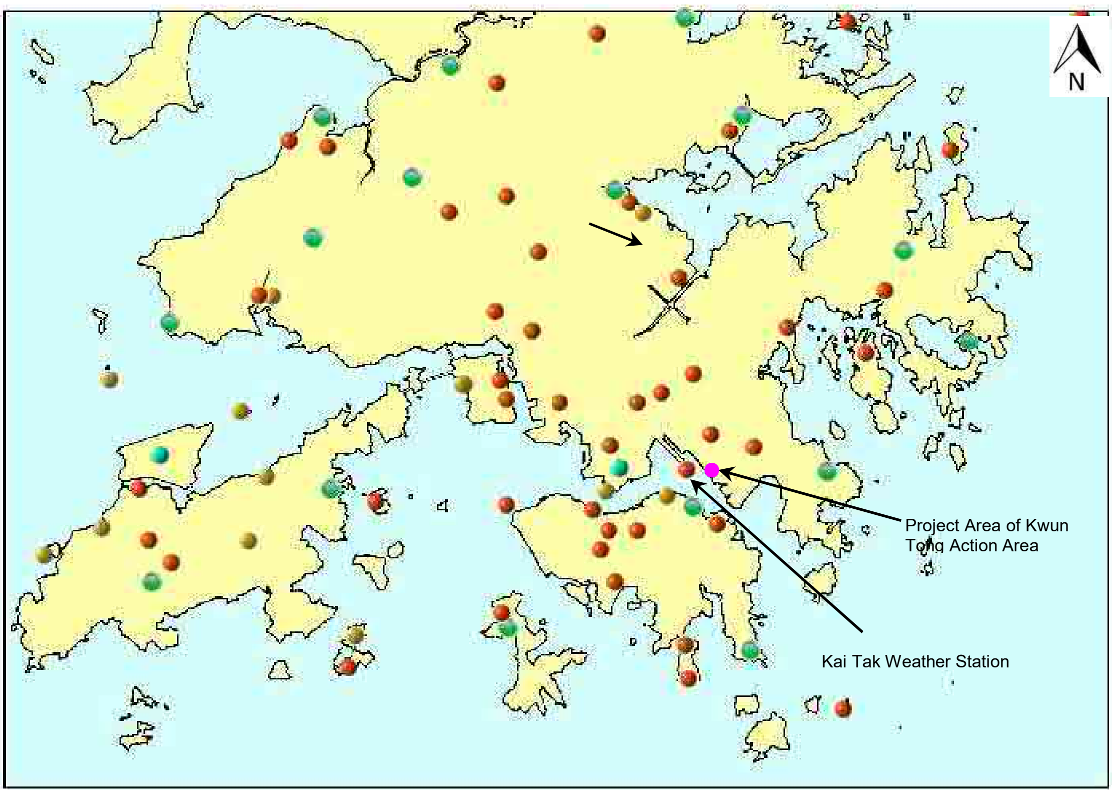
2 SITE ENVIRONMENT (KWUN TONG ACTION AREA)

2.1 Wind Availability

2.1.1 The local wind availability is crucial for the assessment of air ventilation performance for any given location. In the current study, the Project Area of Kwun Tong Action Area is covering the existing Bus Terminal / Kwun Tong Driving School, Kwun Tong Ferry Pier and Square, in the East Kowloon District, to the fronting the Kwun Tong Typhoon Shelter, Kai Tak Runway and the Victoria Harbour to its southwest and south while backing the highly dense urban region of Kwun Tong to its north. The wind availability data at the Project Areas are listed as follows:

<u>Prevailing winds measured by the Hong Kong Observatory</u>

2.1.2 Closest Hong Kong Observatory (HKO from hereafter) weather station to the Study Areas of this project, the Kai Tak Station, is located at 10mPD height and is around 700m from the sites. The related locations of the Study Areas and the weather station are shown in **Figure 2.1** below. While the wind roses for annual winds averaged in the year 2013 to 2017 are shown in **Figure 2.2.**



The approximate locations of the Study Areas

Figure 2.1 Relative location of the HKO Kai Tak Weather Station and the Study Areas

2.1.3 Based on the Wind Roses at HKO Kai Tak Weather Station from 2013 to 2017, the annual prevailing winds at the region close to the Study Areas mainly come from E, ESE and SSE directions, while a portion of annual prevailing would also approach the site via the west-south westerly direction.

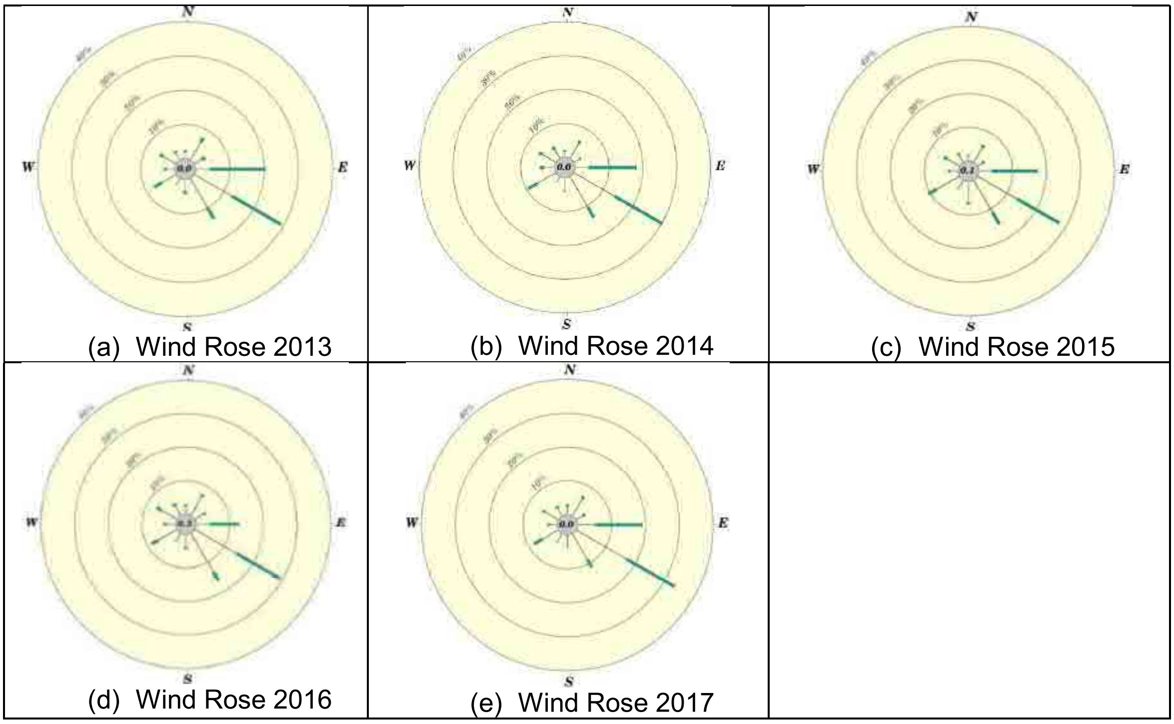
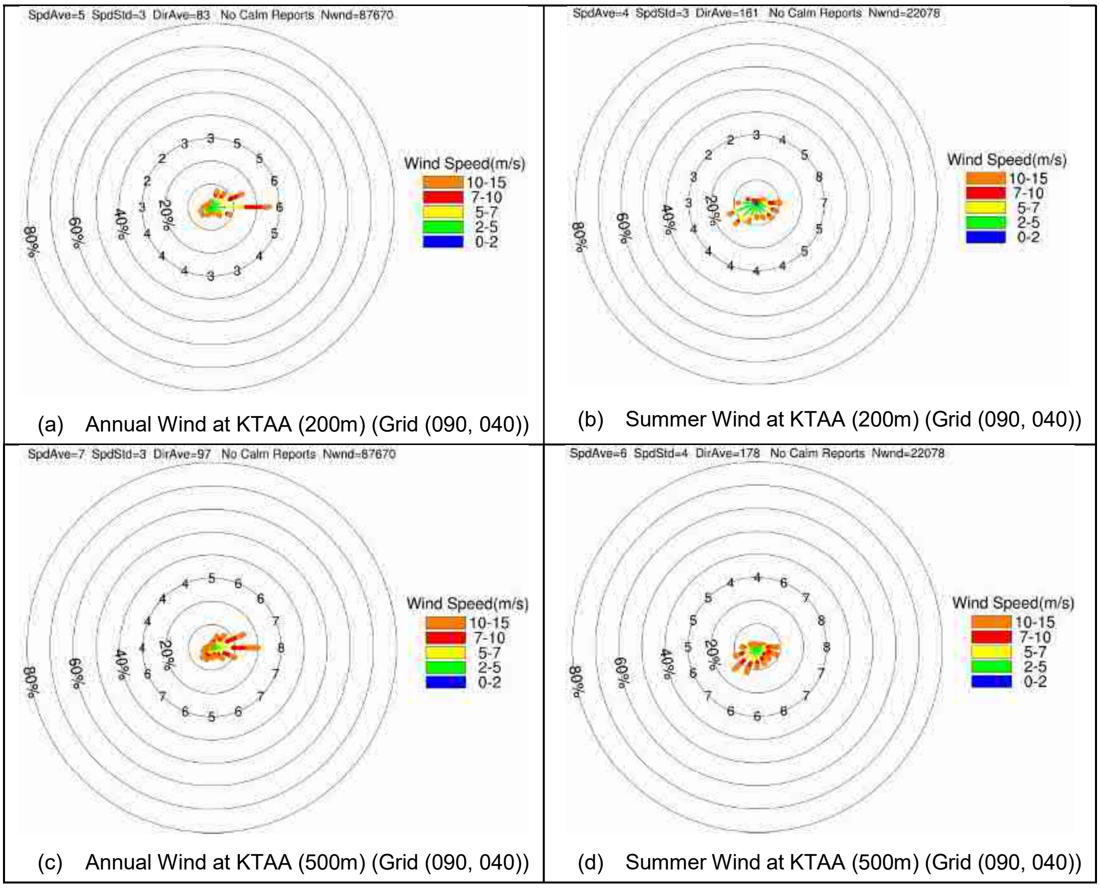


Figure 2.2 Annual Wind Rose and Wind Rose in summer months from HKO Kai Tak Weather Station

<u>Prevailing winds simulated by the RAMS model</u>

2.1.4 Hong Kong Planning Department has released a set of wind availability data by simulation of RAMS model. The relevant data from grid (090, 040) is used for the analysis in wind availability of Project Area of KTAA.



(a) Annual Wind at KTAA (200m) (Grid (090, 040))

(b) Summer Wind at KTAA (200m) (Grid (090, 040))

(c) Annual Wind at KTAA (500m) (Grid (090, 040))

(d) Summer Wind at KTAA (500m) (Grid (090, 040))

Figure 2.3 Wind Rose from PlanD website obtained from RAMS model

2.1.5 From the wind data obtained from the Planning Department's website (see **Table 2.1**), it is noticed that the occurrence of wind from E, ESE and ENE directions at 200m height occupy a total of more than 40% of the time over a year in KTAA region, which are thus identified as the major annual prevailing.

2.1.6 During summer seasons, the winds from easterly (E wind) and south westerly quadrant (i.e. the WSW and SW directions) are the dominating winds at KTAA since these winds obtained the highest occurrence in summer, and the occurrence of each of these winds being no less than 9.4%.

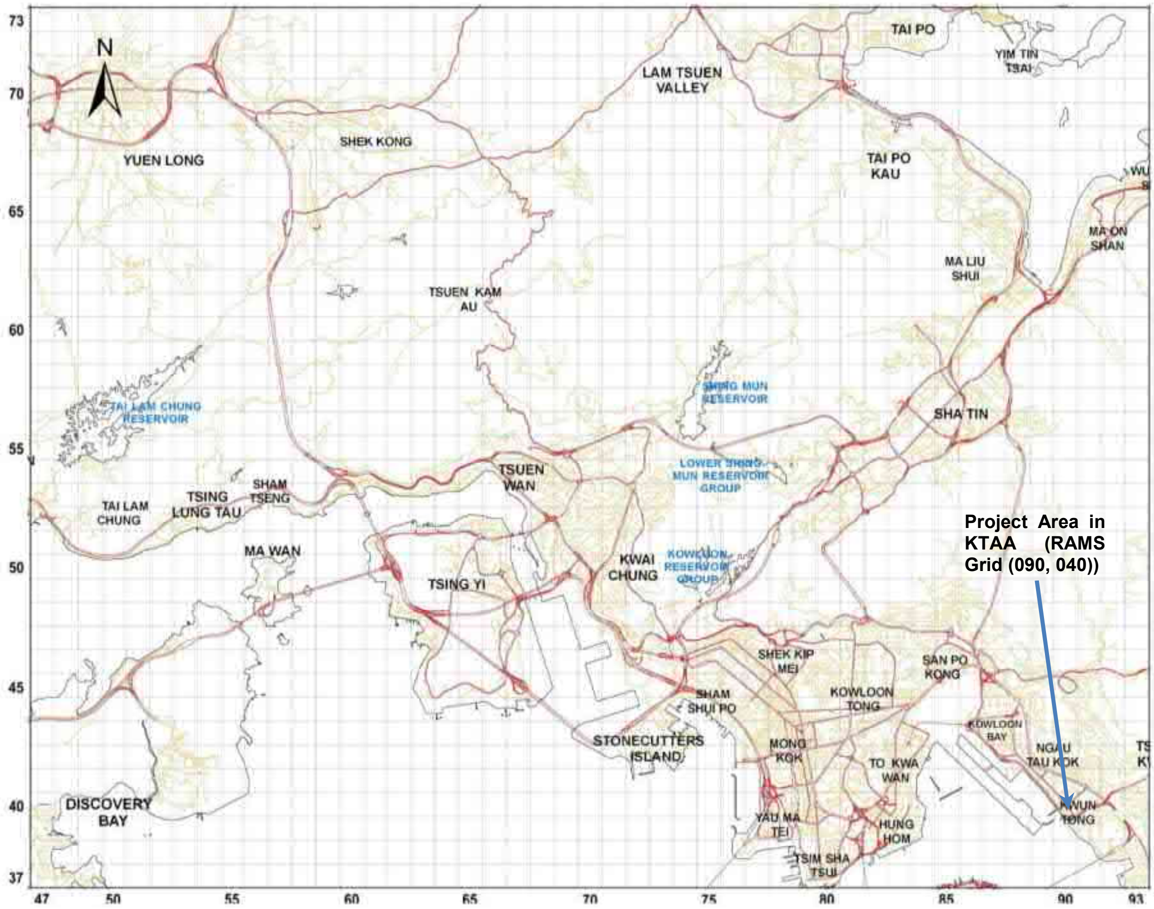


Figure 2.4 Location of the Project Areas in reference to the RAMS grids

Table 2.1 Major Prevailing Winds from RAMS model at Kai Tak (200m height)

Annual Prevailing Wind Directions	% of Annual Occurrence^	Summer Prevailing Wind Directions	% of Summer Occurrence^
ENE	15.0%	E	10.7%
E	25.5%	SW	13.0%
ESE	9.0%	WSW	12.9%

^ Percentage of occurrence directly extracted from wind probability table

Prevailing winds tested by the Wind Tunnel Experiment

2.1.7 In addition to the simulated wind data published by PlanD, "Detailed Air Ventilation Study by Wind Tunnel Tests for the Proposed Kai Tak Development – Investigation Report WWTF013-2009" which was conducted in 2009 and completed in early 2010 for Kai Tak area under Agreement No. CE 35/2006 (CE) Kai Tak Development Engineering Study cum Design and Construction of Advance Works – Investigation, Design and Construction. The wind availability data determined using large scale topographical model (1:2000) tested in a boundary layer wind tunnel could be adopted as reference in identifying the prevailing wind directions. The location of this study is shown as in **Figure 2.5**.

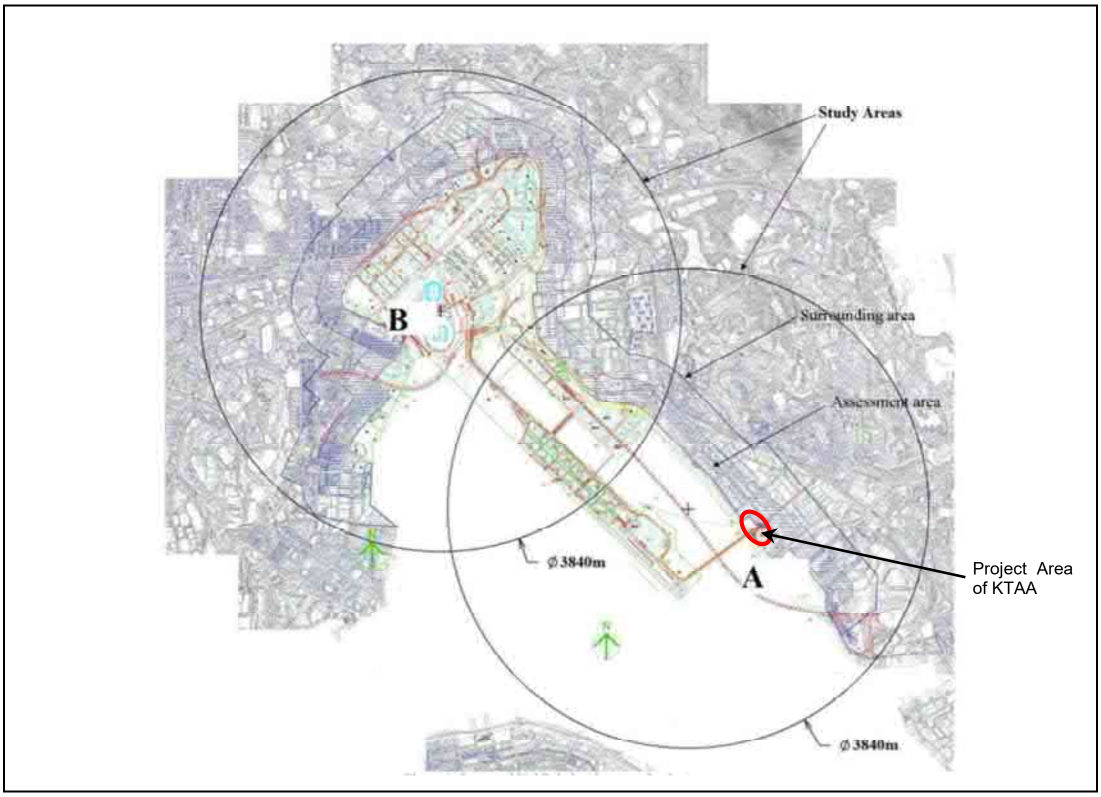
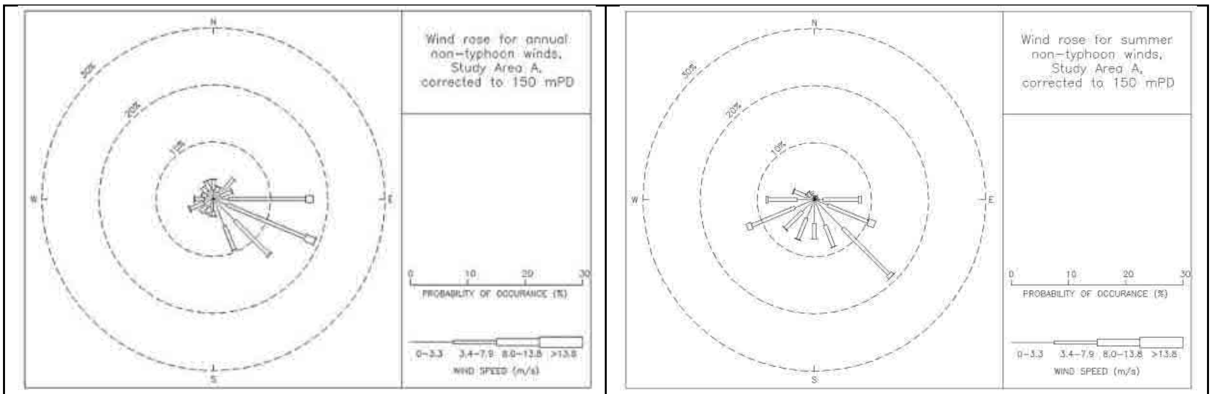


Figure 2.5 Study area in the Wind Tunnel Experiment and Project Area

2.1.8 Based on the data extracted from the wind tunnel study, it is observed that the major annual prevailing winds at the KTAA are approaching from the ESE, E, and SE directions. Meanwhile, the wind environment at the area in summer seasons would be dominated by ESE, SE and WSW winds. The wind roses at 200m for annual / summer winds and the wind occurrence frequencies for the major prevailing winds are **Figure 2.6**.



(a) Annual Wind (b) Summer Wind

Figure 2.6 Wind Roses from the Wind Tunnel Experiment

<u>Summarize of the prevailing winds from different sources</u>

2.1.9 By summarizing the wind data from different sources, a table concluding the prevailing winds identified by HKO weather station, RAMS model and Wind Tunnel Experiment are provided, see **Table 2.4** below.

Table 2.2 The summary of prevailing winds from difference sources

	HKO Kai Tak Weather Station	RAMS model	Wind Tunnel Experiment
Annual Winds	E, ESE, SSE	ENE, E, ESE	E, ESE, SE
Summer Winds	-	E, SW, WSW	ESE, SE, WSW

2.1.10 Since the HKO Weather Station at Kai Tak is relatively far from the Project Area and located at almost sea level, the winds measured might deviate from those in the region due to the effect of local buildings such as the Kai Tak Cruise Terminal and the densely located buildings in Kwun Tong. Meanwhile, the wind tunnel experiment and the RAMS grid (090, 040) covering the majority of the Project Areas KTAA, and the data extraction location are higher than the majority of the nearby buildings. Owing to the above reasons, it is determined that the RAMS data and Wind tunnel experiment would be more relevant in this study. Thus, the annual and summer prevailing winds at KTAA are summarized to be ENE, E, ESE and SE winds while the E, ESE, SE, SW, WSW winds contributes the most for the summer wind environment.

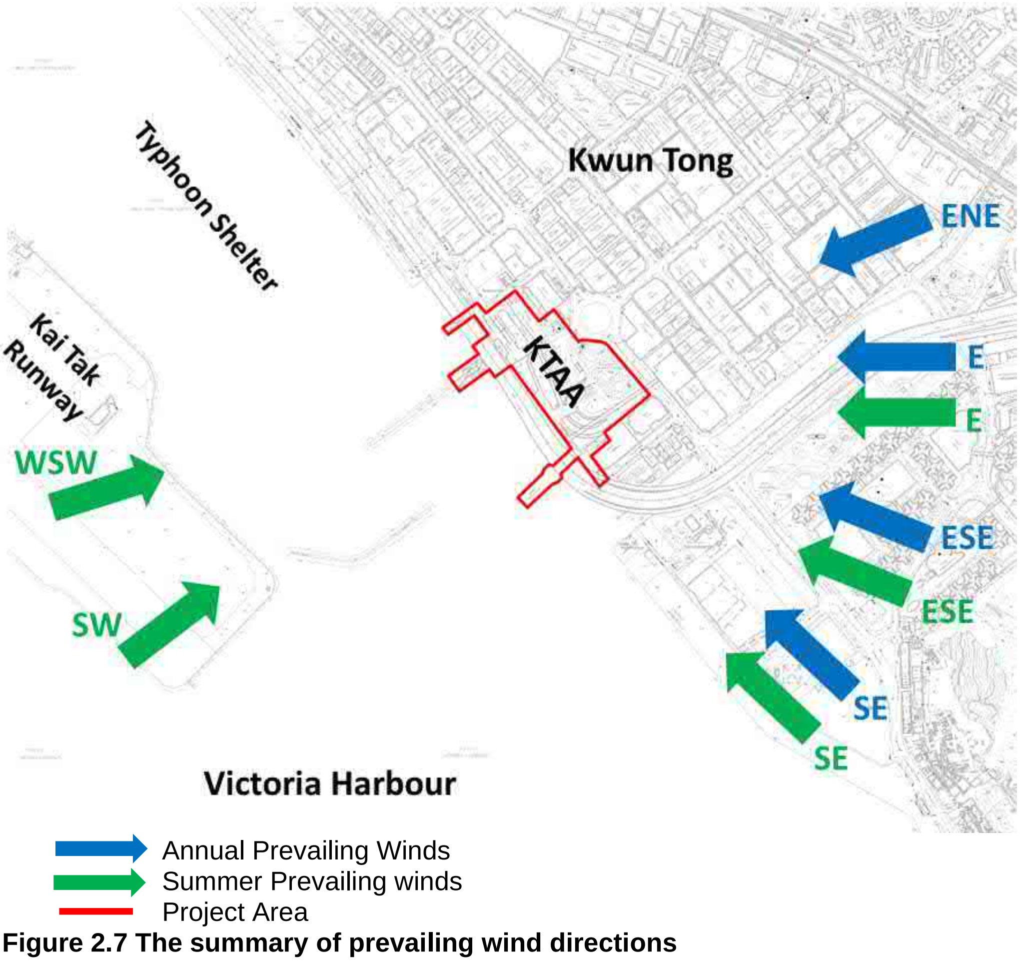


Figure 2.7 The summary of prevailing wind directions

2.2 Land Uses of the Project Areas and Surroundings

2.2.1 The land uses of the Project Areas of KTAA are dictated by both S/K14S/22 – Kwun Tong (South) and the S/K22/6 - Kai Tak, since the KTAA falls on the boundary of these two regions with the majority of the lands located within the Kwun Tong (South) and the promenade and ferry pier sits in the area belong to Kai Tak region. **Figure 2.8** shows land use of the subject area and its surroundings while **Figure 3.3** is the aerial photo of the study area and its surroundings.

- The regions coloured in red, are “Commercial” uses lands.
- The regions zoned in dark brown and brown are “Residential Group A” (R(A)) and “Residential Group (B)” (R(B)) areas respectively.
- The regions zoned in green and light green are “Open Space” (O) and “Green Belt” (GB) respectively.
- The regions zoned in orange are “Other Specified Uses” lands.
- The regions zoned in light blue are “Government, Institute or Community” lands (G/IC), while those zoned in grey are “Undetermined”.

2.2.2 It is noticed that currently the Project Area comprises “G/IC” lands, “Open Space” and “Other Specified Uses” land regions.

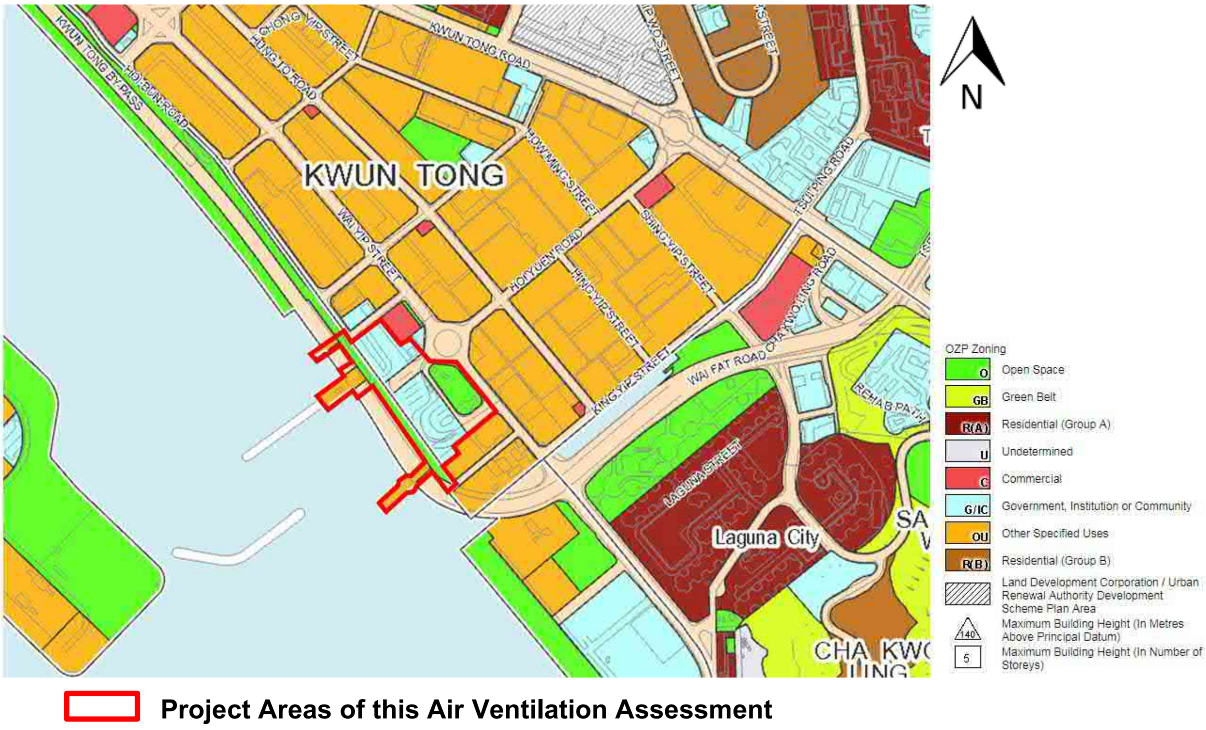


Figure 2.8 Land use of the Project Area (KTAA) and the vicinity

2.3 Topography and Building Morphology features within Project Area and Surroundings

2.3.1 The Project Areas of KTAA, are located in the Eastern Kowloon District, to the north of Victoria Harbour. The terrain within the vicinity of the Project Areas are rather flat as topographical height of the Kwun Tong regions to the north and northeast of KTAA are generally no more than 200mPD in height, while to the south of the Project Area is the open sea.

2.3.2 The Project Area is located at the shore of Kowloon Bay and Kwun Tong Typhoon Shelter. As dictated by the OZP, the lands of Project Areas are currently Open Spaces and G/IC. Meanwhile, the regions in vicinity of the sites are mainly zoned as “Other Specified Uses” (OU) and are mainly occupied by industrial and commercial buildings. The major buildings near the Project Areas are indicated in Figure 2.8 and 2.9. Land use of the Project Area (KTAA) and the vicinity, and their possible influence against the prevailing winds are discussed in the paragraphs below. Figure 2.8 and 2.9 explains the land use and possible development of the project area and the vicinity. Their possible influence against the prevailing winds are discussed in the paragraphs below.

1. Project Area (KTAA)	2. Hoi Bun Industrial Building (49mPD) / Kwun Tong Preliminary Treatment Works (14mPD) / Lu Plaza (83.5mPD)	3. Manulife Finance Centre (100mPD)	4. Mai Tak Industrial Building (51.8mPD)	5. Westerly Square, Lee On Industrial Building, Berson Tower (51.4 – 81.4mPD)
6. No. 90 Hung To Road (36mPD) / Ray Centre, Dorsett Regency Hotel Kwun Tong Hotel, New Media Tower, Joint Venture Factory Building (41 – 100mPD)	7. Hoi Yuen Road Substation (15mPD), Kwun Tong Harbaour Plaza (51.6mPD)	8. Kwun Tong Intermediate Sewage Pumping Station (12mPD) / One Harbour Square, Two Harbour Square (97 – 100mPD)	9. D.J Building, Sea Power Industrial Centre, Kin Tak Fung Industrial Building, Karlin Building (46 – 51mPD)	10. Godown, 163 Hoi Bun Road, Tak Shun Industrial Building, Wah Hong Industrial Building (31 – 53mPD)
11. Tak Keung Godown, Textwood Plaze, Kln Flour Mills Enterprises Ltd. (33 – 52mPD)	12. No. 30 Hung To Road (25mPD) / Newtown Place Hotel, Wai Yip Industrial Building, Kai Centre, Wing Hing Lee Industrial Building (29 – 120mPD)	13. Morfite Building, Treasure Centre, Tak Lung Industrial Building (39 – 109mPD)	14. Heng Sang Industrial Building, Century Centre, Assun Pacific Centre (42 – 73mPD)	15. Paul Y. Centre, Wang Kwong Industrial Building, Spectrum Tower (40 – 99mPD)
16. Mow Hing Factory Building, Catic Building, Sun Wing Building, HKI Building (22 – 51mPD)	17. Fu Hop Factory Building, Pioneer Place, Sunciti Building, Career & Kenson Industrial Mansion (23 – 53mPD)	18. Lucky Factory Building, Pang Kwong Building, High Win Factory Building, APEC Plaza (46 - 53mPD)	19. Nan Yang Plaza, Winner Factory Building, Cos Centre (50 – 160mPD)	20. Wider Industrial Building, South Asia Commercial Centre, Hing Win Factory Building, Speedy Industrial Building (47 – 54mPD)
21. Hoi Luen Industrial Centre, Aitken Vanson Centre, Manning Industrial Building (49 – 123mPD)	22. Wing Tai Centre, Kian Dai Industrial Building, Lemmi Centre, Genplus Factory Building (47 – 78mPD)	23. Milkyway Building, Conpempo Place, EGL Tower, King Palace Plaza, Mai Hing Industrial Building (33 – 130mPD)	24. Gravity, Liven House, New East Sun Industrial Building, East Sun Industrial Centre, Chung Mei Centre (47 – 130mPD)	25. Canel Paint Centre, Canel Paint Building, Yen Sheng Centre, Tg Place (30 – 130mPD)

26. Laguna City (80 – 88mPD), and Laguna Park	27. Kwun Tong Pumping Stations at Wai Lok Street (7mPD)	28. Kwun Tong Industrial Centre, Kwun Tong Plaza, Sunbeam Centre, Legend Tower (49.3 – 130.1mPD)	29. Po Shau Centre, Future Plaza, One Pacific Centre, APM Millennium City 5 (29.7 – 194.9mPD)	30. Tsun Yip Cooked Food Market, AIA Kowloon Tower, AXA Tower (14.3 – 196.4mPD), No.98 Howming Street Commercial Development (~160mPD)
31. Easy-Pack Industrial Building, Mai Tower, China Aerospace Centre, C-Bons International Centre, MG Tower (24.8 – 100.3mPD)				

Figure 2.9 Major developments of the Project Area (KTAA) and its Surrounding Area

2.3.3 As discussed above, the KTAA Project Area is located at the Kwun Tong Ferry Pier as well as its vicinity Bus Terminal, Driving School and Square. The area to its south and southwest are mainly the open sea of Kwun Tong Typhoon Shelter and Victoria Harbour. There exists no building obstacles in its vicinity in this direction, as the nearest building structure to the southwest of the Project Area being the Kai Tak Cruise Terminal which located more than 500m away.

2.3.4 On the other hand, the urban morphology semi-encircling the Project Area from northerly, north-easterly and easterly directions are mainly industrial / commercial building clusters. The closet buildings to the KTAA includes the Hoi Bun Industrial Buildings / Lu Plaza, Manulife Finance Centre, Mai Tak Industrial Building, Westerly Square, Pioneer Place, Kwun Tong Harbour Plaza, One Harbour Square and Two Harbour Square, etc.. The buildings in the regions are mainly mid-to-high rise and with large footprint or had incorporated podium structures, forming a high-density and high-rise urban morphology. Such morphology extended over the MTR Kwun Tong Line in the north and north-easterly direction from the area near KTAA, which would heavily limited the route of wind flow through the region near the Project Area under north-eastern quadrant winds. Meanwhile, a stripe of major open space existed in the near east of KTAA, which is composed by the Nullah and Laguna Park. This open space would separate the residential clusters of Laguna City from the high-density urban area near the KTAA, allowing an air ventilation "breathing room" in the vicinity of the Project Area.

2.4 Evaluation of existing wind environment in local region

2.4.1 In accordance with the wind availability data, over the whole year the KTAA Project Area rely on east-north easterly, east-south easterly, and easterly winds to maintain air ventilation performance. In summer seasons, the prevailing winds are mainly coming from the south-western and south-easterly directions. Therefore, any blockage to these prevailing winds should be avoided as far as possible.

2.4.2 Under the prevailing annual winds from the ENE and E directions, the air flow approaching the KTAA area would be blocked by the urban morphology, and be limited / redirected by the buildings along King Yip Street to flow along the open space of the Nullah and Laguna Park towards the open sea to the southwest. While the annual / summer winds from SE and ESE become dominate, the air flow at pedestrian level would flow along the open area of Kwun Tong Typhoon Shelter as well as the major roads (i.e. Wai Yip Street and Hung To Road) to penetrate through the area near the KTAA.

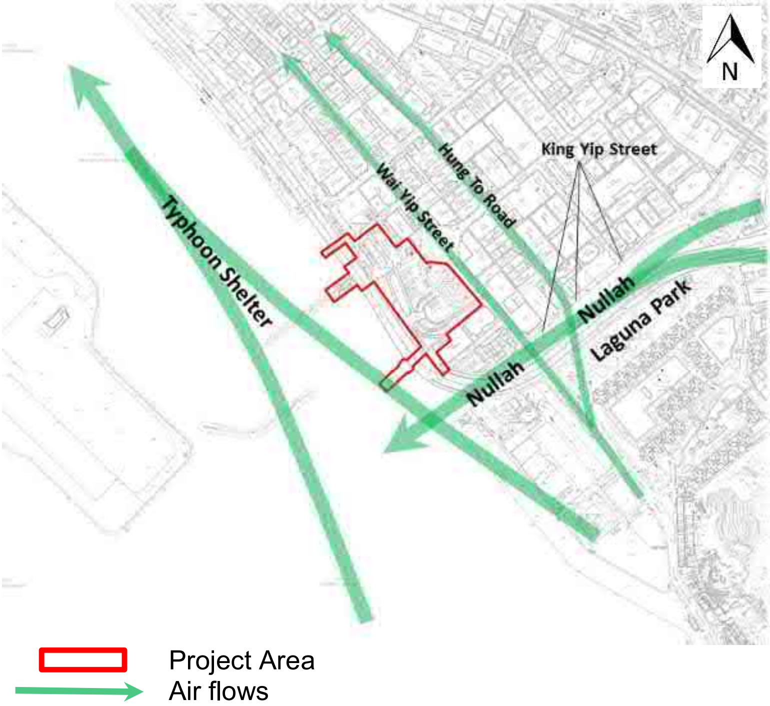


Figure 2.10 Air flows under the ENE, E, ESE and SE winds

2.4.3 Under the prevailing summer winds from the WSW and SW directions, the air flow approaching the KTAA area would reach the Project Area after flowing over the open sea without major obstacles. The KTAA area with its current site condition can be considered a wind entry location for the air flow to enter the Hoi Yuen Road and penetrating the urban area to reach the region near MTR line. The air flow under SW and WSW prevailing winds would also flow into the open space of the Nullah – Laguna Park and reach the region to the northeast of the Project Area, while a portion of pedestrian winds may also penetrate the urban are via the Tsun Yip Street northwest to the KTAA.

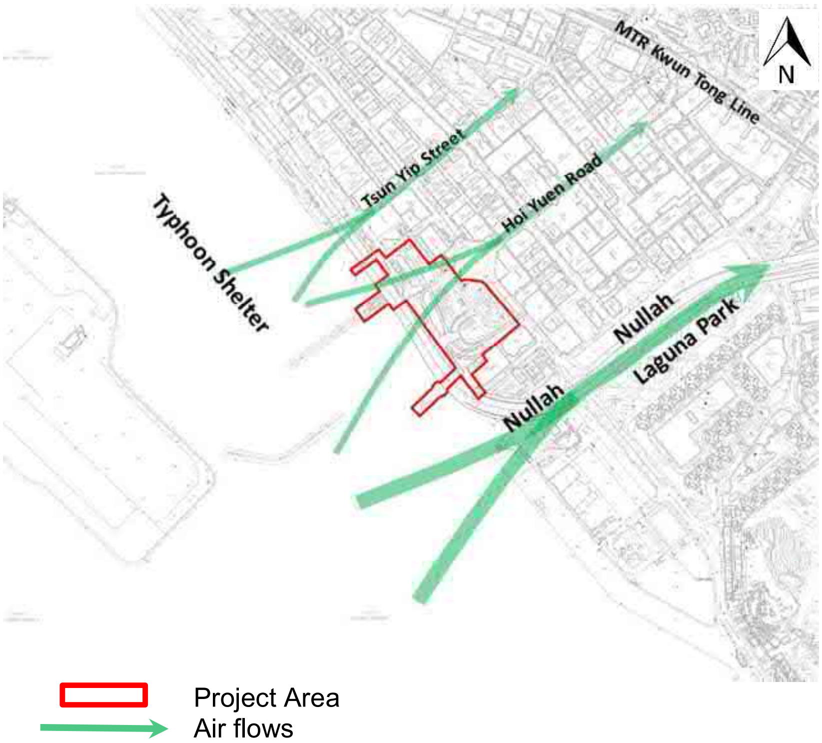


Figure 2.11 Air flows under the SW and WSW winds

3 BASE SCHEME AND PROPOSED SCHEME

3.1 Background

3.1.1 The Study Area of Kwun Tong Action Area (KTAA) is shown in **Figure 3.1**. It covers an overall area of approximately 4.2 ha. The existing facilities in KTAA includes Kwun Tong Ferry Pier Square and Pet Garden at Wai Yip Street, Kei Yip Street Public Toilet and Refuse Collection Point (RCP), Food and Environmental Hygiene Department's (FEHD's) storage area, Kwun Tong Ferry Pier Public Transport Interchange (PTI), Cooked Food Market (CFM), and Dangerous Goods Vehicular (DGV) queuing area cum temporary Kwun Tong Driving School (KTDS). Ferry pier facilities include Kwun Tong Public Pier, Kwun Tong Ferry Pier and Kwun Tong Vehicular Ferry Pier (KTVFP).

3.1.2 As announced by the CE in the 2016 Policy Address and reiterated in 2017 Policy Address, the commercial floor area to be provided by the two action areas in Kowloon East (KE) (Kowloon Bay Action Area (KBAA) and KTAA) is about 560,000sqm. KTAA is therefore envisioned to provide series of commercial and office uses.

3.1.3 The preferred development option of KTAA was presented in the working paper on Broad Cost Assessment, Preliminary Outline Development Plan (PODP), Preliminary Master Urban Design Plan and Master Landscape Plan (Final) **(WP2 (Final))** circulated on 28 March 2018 and incorporated in TR8 Air Ventilation Assessment (Draft) **(TR8 AVA (Draft))** circulated on 23 October 2018. Under the preferred option, two building towers are proposed in the commercial site with an elevated landscape deck and at-grade PTI. In addition, three basement floors was proposed to accommodate ancillary transport facilities and public parking facilities.

3.1.4 Taking into account of the comments received from relevant Government Bureaux and Department (B/Ds) and major findings from the technical assessments, Recommended Outline Development Plan (RODP) was formulated, which was presented in the working paper on RODP, Recommended Master Urban Design Plan and Master Landscape Plan (Draft-R2) **(WP5 (Draft - R2))** circulated on 22 October 2018. Subsequent to the submission of WP5 (Draft – R2) and Steering Committee Meeting No. 2 on 29 October 2018, the RODP was further revised and presented in the paper for Committee on Planning and Land Development (CPLD) discussion on 4 March 2019.

3.1.5 After obtaining CPLD members' agreement on the revised RODP (RODP – Revision 1), consultation with Kwun Tong Development and Renewal Task Force of Kwun Tong District Council, Land and Development Advisory Committee, Task Force on Kai Tak Harbourfront Development of Harbourfront Commission, and Housing and Infrastructure Committee of Kowloon City District Council on the RODP – Revision 1 were carried out on 2 April 2019, 16 April 2019, 15 May 2019 and 18 July 2019 respectively.

3.1.6 The RODP – Revision 1 was further amended taking account of the public comments received during consultation. As compared with the preferred development option presented in TR5 SIA (Draft - R1), the following arrangement for the updated RODP (RODP – Revision 2) as shown in **Figure 3.2**, which was also submitted to CPLD as Matter Arising on 25 July 2019 (CPLD NO. 33/19 refers), remains unchanged:

Commercial Development

- Two building towers in the commercial site with an elevated landscape deck and at-grade PTI; and
- Three basement floors are proposed to accommodate ancillary transport facilities and public parking facilities.

<u>*Government Facilities*</u>

- The RCP is proposed to remain in-situ;
- A new three-storey structure is proposed at RCP's open area for temporary use as storage area and potential space for other uses after the cease of the temporary use;
- The dangerous goods vehicular (DGV) queuing area is proposed to be optimized and rearranged along Kei Yip Street upon the relocation of KTDS; and
- The existing pier facilities will be retained and the operation of piers would be maintained.

3.1.7 The major revisions to the preferred option involve the conversion of the existing CFM to regional open space, refinement of the site area for DGV Queuing Area, reservation of GFA for "Government, Institution or Community" ("G/IC") uses within the "Commercial" ("C") site, refinement of the alignment of the proposed footbridges and minor revision to the junction layout.

3.1.8 The notional scheme presented in the CPLD Paper No. 33/19, which complies with the requirement of the RODP - Revision 2, is used as the basis for the conduction of technical assessments including this AVA, is presented in **Figure 3.2** and the development parameters are summarized in **Table 3.1**.

3.1.9 Subsequent to the CPLD meeting on 25 July 2019, a building height restriction (BHR) of +14.5mPD is proposed to be imposed to the western portion of the commercial site, i.e. the west side of the building setback line along Hoi Yuen Road as demarcated in the Kwun Tong Outline Development Plan (ODP) No. D/K14A/2 as shown in **Appendix E**. The proposed BHR revision do not only address the site constraint posed by the underground trunk sewer and maintain the visual corridor along Hoi Yuen Road but also avoid a cluster of bulky low-rise buildings in the site.

3.1.10 With the proposed amendment to the BHR (+100mPD for the entire site to partially +14.5mPD and partially +100mPD), the GFA would be accommodated in the high-rise tower at the eastern portion. As such, the air ventilation performance especially the wind flow along Hoi Yuen Road wind corridor is anticipated to be enhanced. As the proposed notional scheme complies the requirement in RODP – Revision 2 as well as the proposed revision to the BHR, amendments to the BHR would not have implications to the assessment result.

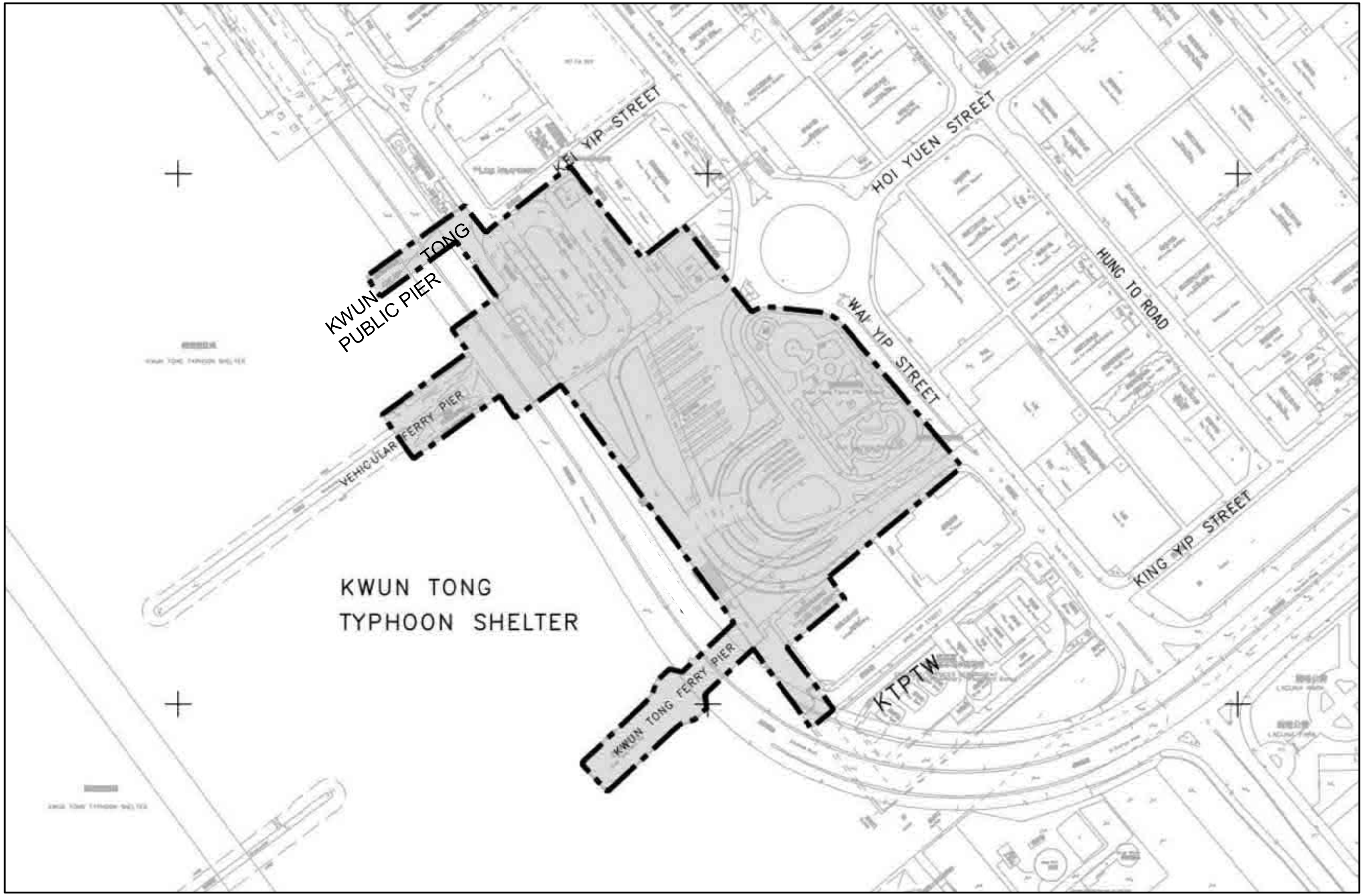


Figure 3.1 Study Area of Kwun Tong Action Area

Figure 3.2 Recommended Outline Development Plan

3.2 Proposed Base Scheme and Proposed Scheme

3.2.1 As aforementioned, the notional scheme under RODP – Revision 2, which was formulated taken into account the comments received from relevant government departments and public engagement exercises, is proposed to be the proposed scheme for this AVA study. The Outline Zoning Plan (OZP) compliant scheme, which complies with all the development parameters as stipulated in the OZP and Explanatory Statement (ES) for the study area, is proposed to be adopted as the base scheme to assess the potential air ventilation impacts created by the proposed developments. The general descriptions of the base scheme and the proposed scheme are summarized in the following sections.

Base Scheme

3.2.2 The existing predominant uses within the study area under the current Kwun Tong (South) Outline Zoning Plan (OZP) (No.: S/K14S/22) and Kai Tak OZP (No. S/K22/6) are government uses zoned “Government, Institution or Community” (“G/IC”) and “Other Specified Uses” annotated “Pier” (“OU(Pier)”) with 15mPD building height restriction (BHR) as well as open spaces (“O”) (Error! Reference source not found. (Extract of OZP)).

3.2.3 The building mass for the “G/IC” sites under the base scheme would follow the development parameters as stipulated in the OZP, which is 15mPD in height, with an assumption of 100% site coverage. As there is no proposed change in uses for the piers, the existing structures of the piers, Kwun Tong Public Pier, KTVFP and Kwun Tong Ferry Pier would be remain in both base scheme and proposed scheme.

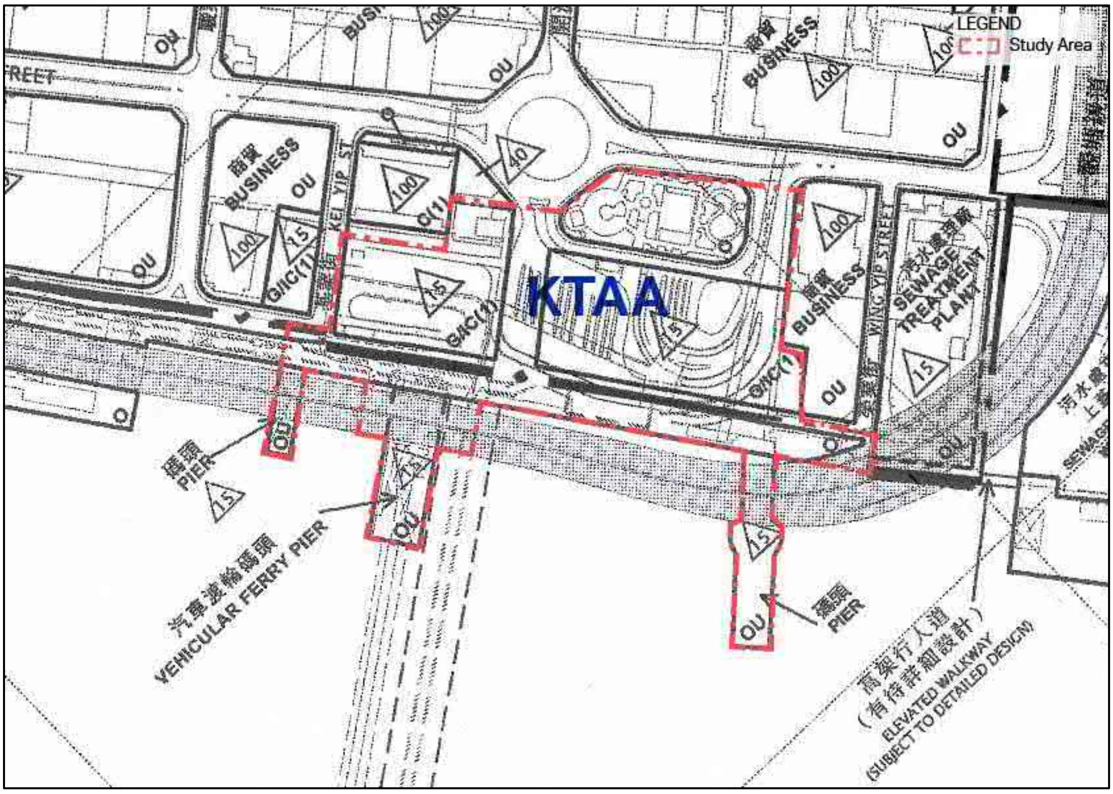


Figure 3.3 Extract of OZP

Proposed Scheme

3.2.4 The key objective of the KTAA Study is to rationalize the existing government uses and provide comprehensive mixed-use development. The major land use components of KTAA proposed under the proposed scheme, i.e. the RODP – Revision 2, as shown in **Figure 3.2,** are listed as follow:

- ***Commercial / Mixed-Use Development (zoned "Commercial" ("C")) –*** about 89,350sqm of commercial GFA including a PTI of about 7,050sqm was proposed. The proposed BHR of this site is 100mPD to respect and correspond to the existing urban context. Reservation of 2,700sqm for G/IC uses was also proposed, subject to further review by EKEO or relevant B/Ds prior to formulation of the land sale conditions. Commercial components would include office, retail and food & beverage (F&B) to facilitate vibrancy and diversity. The new PTI shall replace the existing facility and integrate within the commercial development;

- ***Existing Government Uses (zoned "G/IC") –*** existing government uses including existing PTI, DGV queuing area, FEHD's storage area were proposed to be reorganized while the RCP was proposed to remain in-situ and the CFM site was proposed to convert to open space;

- ***Open Spaces (Zoned "O") –*** to compensate for the existing Kwun Tong Ferry Pier Square, new open spaces were proposed along and interconnected with the waterfront promenade to ensure a pleasant and environmental friendly waterfront destination; and

- ***Existing Piers (zoned "G/IC" and "OU(Pier)") –*** existing piers including Kwun Tong Public Pier, KTVFP and Kwun Tong Ferry Pier were proposed to be maintained.

3.2.5 The development parameters of the proposed scheme is shown in **Table 3.1**.

Table 3.1 Proposed Development Parameters under Proposed Scheme

Proposed/ Existing Land Use Zoning	"C"	"G" (DGV Queuing Area)	"G" (RCP & Storage Area)	"OU(Pier) 1" (KTPFP) (in situ)	"OU (Vehicular Ferry Pier)" (KTVFP) (in situ)	"OU(Pier)" (KTPP) (in situ)	"O"
Site Area (approx. m²)	***13,700***	***1,880***	***690***	***2,600***	***4,000***	***740***	***15,180***
Max. Building Height (mPD)	100	15	15	15	15	15	-
Plot Ratio (approx.)	6.52	0.05	1.53	In situ	In situ	In situ	-
GFA Distribution (approx. m²)							
- Office	62,600	-	-	-	-	-	-
- Retail / F&B	17,000	-	-	-	-	-	-
- Arts and Cultural/Institutional	-	-	-	1,700	-	-	-
- GIC	2,700	90	780* + 275	-	-	-	-
- PTI	7,050	-	-	-	-	-	-
- Pier	-	-	-	2,390*	845*	-	-
Total GFA (m²)	**89,350**	**90**	**1,055**	**4,090**	**845**	**-**	**-**

Note: * Existing provision to be maintained

3.2.6 Under the proposed scheme, two buildings (T1 and T2) are proposed. T1, the tower along Wai Yip Street, with 19 storeys (including at-grade lobby level), shall provide about 11,100sqm of retail/F&B GFA at the lower levels and about 37,000sqm of office and G/IC GFA at the higher levels. The at-grade lobby of T1 shall have direct street-side access along Wai Yip Street, as well as direct connection to the taxi stands and drop-off area integrated with the PTI at the grade level beneath the elevated Green Deck.

3.2.7 T2 shall also have direct at-grade access from the pedestrian area along the existing CFM building façade with convenient access to the Kwun Tong Ferry Pier. As a 17-storey building (including at-grade lobby level), T2 shall provide about 5,900sqm of retail/F&B GFA at the lower levels as well as about 28,300sqm office GFA at the higher levels. Retail/F&B space at the lower levels is envisioned to add vibrancy to both the at-grade and elevated Green Deck level.

3.2.8 With a footprint size of 2,700sqm (T1) and 2,160sqm (T2), the proposed building mass for both towers are comparable to the new commercial towers in adjoining areas[1], contributing to a coherent urban form and emerging identity of Kwun Tong as a new Core Business District (CBD), especially along the major roads. The proposed disposition of the towers aims to maximize harbourview above Kwun Tong Bypass as well as facilitate views towards the surrounding open spaces.

3.2.9 Building height for T1 and T2 are proposed at +99.25mPD and +88.75mPD respectively to provide a stepped height profile towards the waterfront (**Figure 3.4**). To ensure coherence with the urban context and no intrusion to the 20% building free zone of the ridgeline, the proposed maximum building height restriction for the Study Area is therefore proposed at +100mPD.

3.2.10 A series of open spaces could be interconnected to form an extensive green network, forming an at-grade "Green Carpet" surrounding and connecting to the proposed elevated green deck above the PTI at the future commercial development. With access from both at-grade and elevated green deck levels, both towers would provide retail/F&B uses on the lower floors to activate public realm. A sizeable open area would also be formed at the elevated green deck to form a "Creative Plaza" open space node to synergise with surrounding uses as well as providing diverse open spaces for public use.

3.2.11 The proposed level of the elevated green deck is +12.25mPD under the proposed scheme, which provides sufficient clearance headroom for the at-grade PTI. Although the design control to be stipulated in the lease requirement for the level of the elevated deck is "not higher than +14.5mPD", the proposed level in the notional scheme demonstrate a feasible scheme that could comply with the requirement while maintaining the minimum clear headroom for the PTI. As it is anticipated that the air ventilation performance for the elevated deck with level of +12.25 and +14.5mPD would not be varied significantly, the notional scheme is adopted in the assessment. To further maximise the vista towards Victoria Harbour, a stepped-down viewing deck towards the harbour at the green deck level and the landscaped Grand Steps shall be provided.

3.2.12 Beside the commercial buildings, a 3-storey building structure with total area of about 275sqm is proposed at the open area right next to the existing RCP for the reprovisioning of FEHD's storage area. The building height of the storage area is proposed to be the same as the adjoining RCP, i.e. 14mPD. Also, a 1-storey building with an area of about 90sqm is proposed for the office (KTVFP Office) of the DGV queuing area.

[1]Manulife Financial Centre adjacent to the Study Area across Wai Yip Street , is a twin tower structure connected at the top levels with a total footprint size of about 7,100sqm. Each tower structure is about 55mx50m.One Harbour Square along at the corner of Tsun Yip Street and Hoi Bun Road is a new office tower with a building footprint size of about 2,000sqm. One Bay East along Hoi Bun Road and Shun Yip Street is twin tower development with each building footprint size about 2,500sqm.

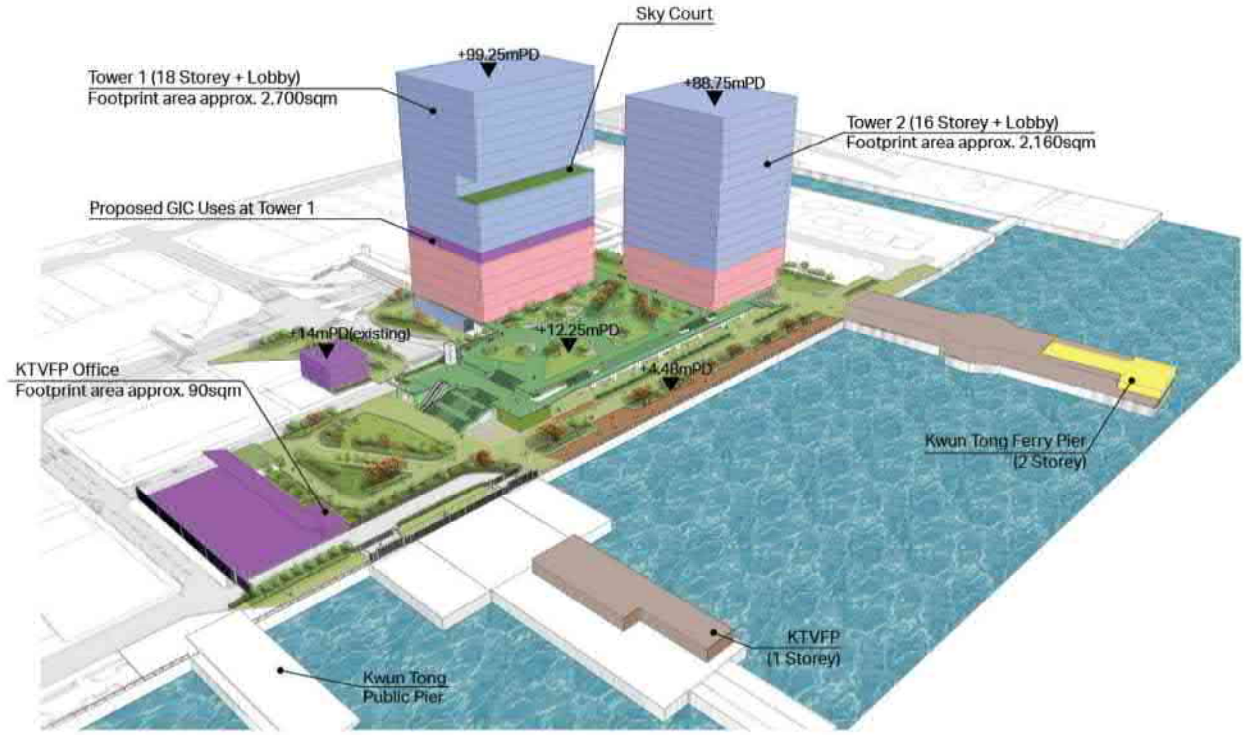


Figure 3.4 Proposed Building Mass of the Proposed Scheme

4 METHODOLOGY FOR AVA INITIAL STUDY

4.1 General

4.1.1 This AVA study was carried out in accordance with the guidelines stipulated in the Technical Guide for AVA for Developments in Hong Kong with regard to Computational Fluid Dynamics (CFD) modelling. Reference was also made to the “Recommendations on the use of CFD in Predicting Pedestrian Wind Environment” issued by a working group of the COST action C14 “Impact of Wind and Storms on City Life and Built Environment” (COST stands for the European Cooperation in the field of Scientific and Technical Research). COST action C14 is developed by European Laboratories/Institutes dealing with wind and/or structural engineering, whose cumulative skills, expertise and facilities have an internationally leading position. Thus, it is considered that the COST action C14 is a valid and good reference for CFD modelling in AVA study.

4.2 Modelling Tool and Model Setup

4.2.1 The quantitative assessment will be conducted by means of 3-dimensional CFD model. The well-recognised commercial CFD package FLUENT was used in this exercise. FLUENT model had been widely applied for various AVA research and studies worldwide. The accuracy level of the FLUENT model was very much accepted by the industry for AVA application.

4.2.2 Wind Directions: In the CFD model, the prevailing wind directions and the average wind speed of individual prevailing winds identified for the Project Area are adopted from the RAMS model (**Table 4.1** refers) wind data from Grid (090, 040), extracted at 500m. Wind environment surrounding the Project Area would simulated using CFD under the 8 most prevailing wind directions (which represent occurrence of more than 75% of time) to illustrate the change in microclimate due to the proposed development. As indicated below, the NNE, NE, ENE, E, ESE, SE, SSW and SW wind directions are identified as the eight annual prevailing winds for the Project Area, which has a total occurrence of 78.1% throughout a year. Meanwhile, the summer winds are identified as E, ESE, SE, SSE, S, SSW, SW and WSW, which maintained a total occurrence of 80.4% during summer season.

Table 4.1 The Winds chosen for simulation of the KTAA (RAMS Grid (090,040))

Annual Wind Direction (Frequency)	Summer Wind Direction (Frequency)
NNE (5.4%)	E (9.3%)
NE (7.7%)	ESE (9.2%)
ENE (15.2%)	SE (7.4%)
E (20.6%)	SSE (8.2%)
ESE (10.9%)	S (9.4%)
SE (6.7%)	SSW (12.4%)
SSW (5.6%)	SW (14.3%)
SW (6.0%)	WSW (10.2%)
Total (78.1%)	**Total (80.4%)**

4.2.3 Vertical Wind Profile: Wind environment under different wind directions is defined in the CFD environment. Vertical wind profile at the inflow location in each CFD simulation cases is adopted from the RAMS model wind profiles at the height of above 20m, and wind velocity below 20m is assumed to follow the log-law.

4.2.4 Vertical wind profile at height below 20m and roughness lengths are determined accordingly as follows:

$$\text{Log Law} \quad U_z = \frac{u^*}{\sigma} \ln\left(\frac{Z}{Z_0}\right)$$

Where U_Z : wind speed at height z from ground

u^* : friction velocity

σ : von Karman constant = 0.4 for fully rough surface

Z : height z from ground

Z_0 : roughness length

4.2.5 The roughness length for determining vertical wind profiles under different wind direction is tabulated in **Table 4.2**. In this study, the land further away from the surrounding area to the north, northeast, east and southeast are urban areas with mid to high-rise developments or the hill slope of the Cha Kwo Ling, as a result, a roughness length with Z_0=3 is adopted for the inflow wind profiles under NNE, NE, ENE, E, ESE and SE winds. On the other hand, the area towards the south-south easterly, southerly and south-westerly are open sea of the Kwun Tong Typhoon Shelter and Victoria Harbour, hence the Z_0=0.1 is adopted for wind profiles when simulating the winds coming from SSE, S, SSW, SW and WSW directions.

Table 4.2 Roughness Length for Determining Vertical Wind Profiles under Different Wind Directions

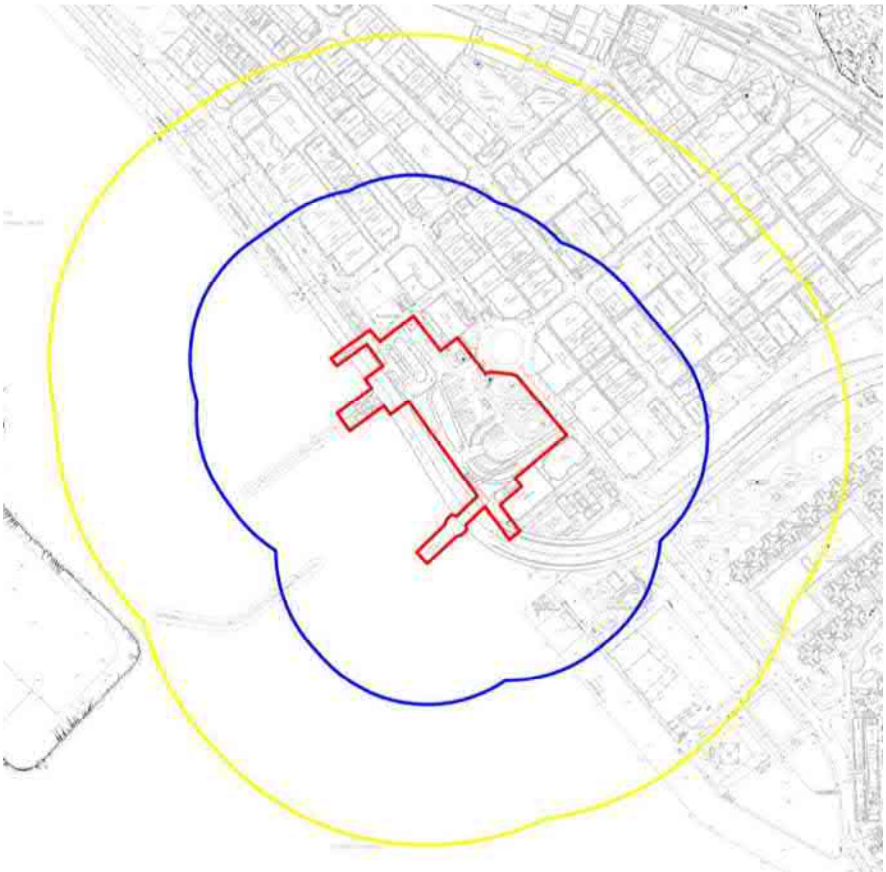
Land Type of Upwind Area(1)	Roughness Length(2), Z_O
Urban area with mid and high-rise developments	3
Sea or open space	0.1

Notes:

(1) The land type refers to the area upwind of the model domain further away from the Surrounding Area

(2) With reference to Feasibility Study for Establishment of Air Ventilation Assessment System (CUHK, 2005)

4.2.6 Computational Domain: Two 3-dimensional CFD model including topographical features for areas covering the computational domain, and building morphology which would likely affect the wind flow were constructed for KTAA Base Scheme and Proposed Scheme respectively. The methodology described in the Technical Guide was adopted for this assessment. According to the Technical Guide, the Assessment Area should include the project's surrounding up to a perpendicular distance of 1H while the Surrounding Area should at least include the project's surrounding up to a perpendicular distance of 2H calculating from the project boundary, with H being the height of the tallest building on site (i.e. 100m for this study). In this study, the area of the Assessment Area is being set as 200m away from the Project Area in order to include interested breezeways into the assessment, thus the Surrounding Area would also be expanded to 400m from the project boundary. The computational domains size is set to be 7000 m (L) x 7000 m (W) x 1500 m (H) and at least 15H away from the Project Areas. In addition, the blockage ratio would be maintained at no greater than 3%. The coverage of Project Area, Assessment Area and Surrounding Area is shown in **Figure 4.1** below:



Project Areas (KTAA)
Assessment Area
Surrounding Area

Figure 4.1 The Project Area, Assessment Area and Surrounding Area

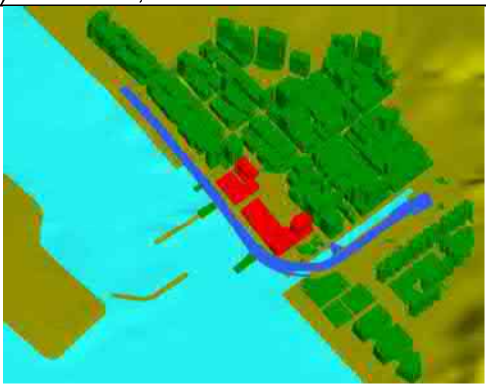
4.2.7 Major Boundary Condition setting: The boundary face located at the upstream of the computational domain is set as the velocity inlet condition and the outflow face is set as the zero gradient condition. For the two lateral and top faces, symmetric boundary condition is used. Lastly for the ground and building walls, no slip condition is employed.

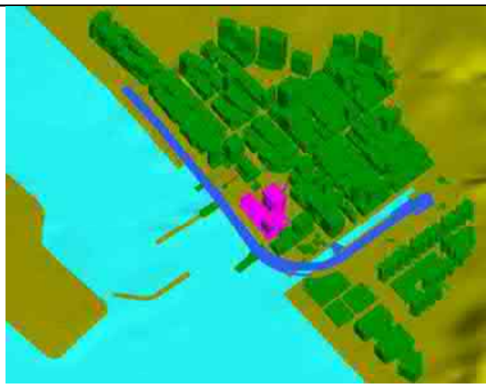
4.2.8 Major characteristic of Computation Mesh: The total number of cells for this study would be anticipated to be in the range of around 3,000,000 cells in polyhedral mesh. As polyhedral mesh cells counts can often be smaller than comparable tetrahedral meshes with equivalent accuracy as well as improve mesh quality and manner of convergence (Franklyn, 2006). Grids may be converted to polyhedral mesh, if necessary. The horizontal grid size employed in the CFD model in the vicinity of the Project Area will be taken as a global minimum size of about 2m (smaller grid size was also employed for specific fine details) and increased for the grid cells further away from the Project Areas, with expansion ratio maintained at around 1.2 wherever possible. The maximum mesh size within the whole computational domain would be about 60m at the far field. Besides, four layers of prism cells (each layer of 0.5m thick) were employed above the terrain.

4.2.9 The physical models from four different views, meshes and prism layers for simulation of KTAA are presented in **Figure 4.2**.


(a) East view, Base Scheme


(b) East view, Proposed Scheme

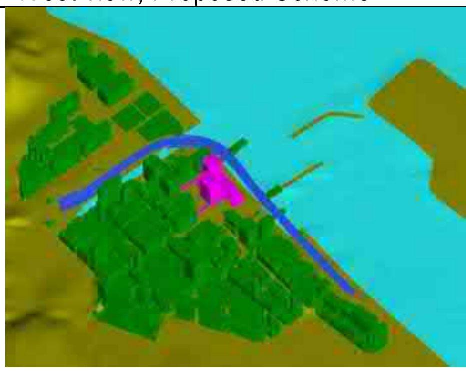

(c) South view, Base Scheme

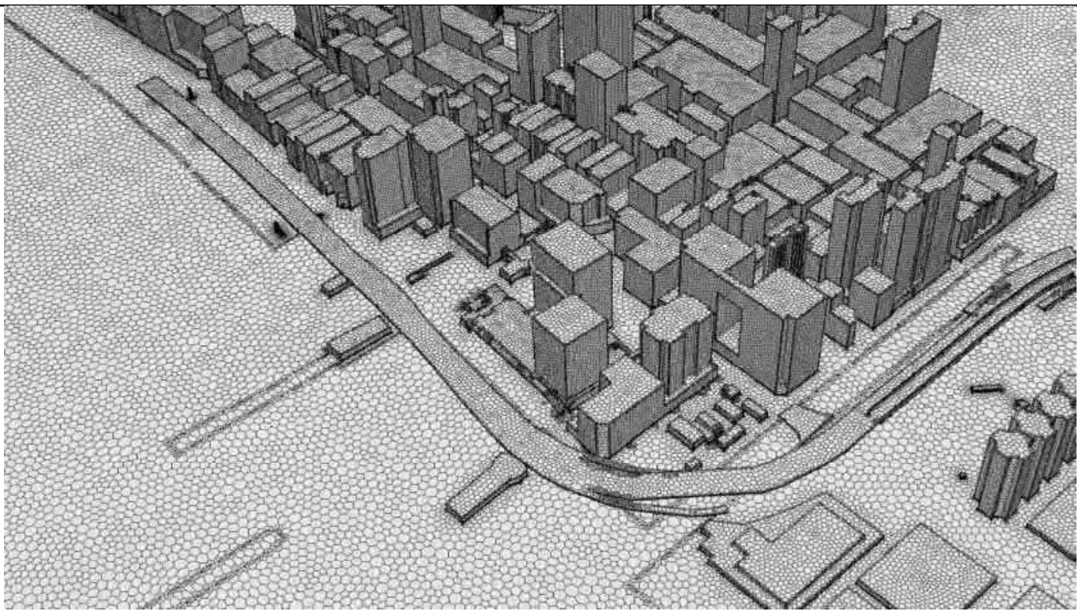

(d) South view, Proposed Scheme


(e) West view, Base Scheme

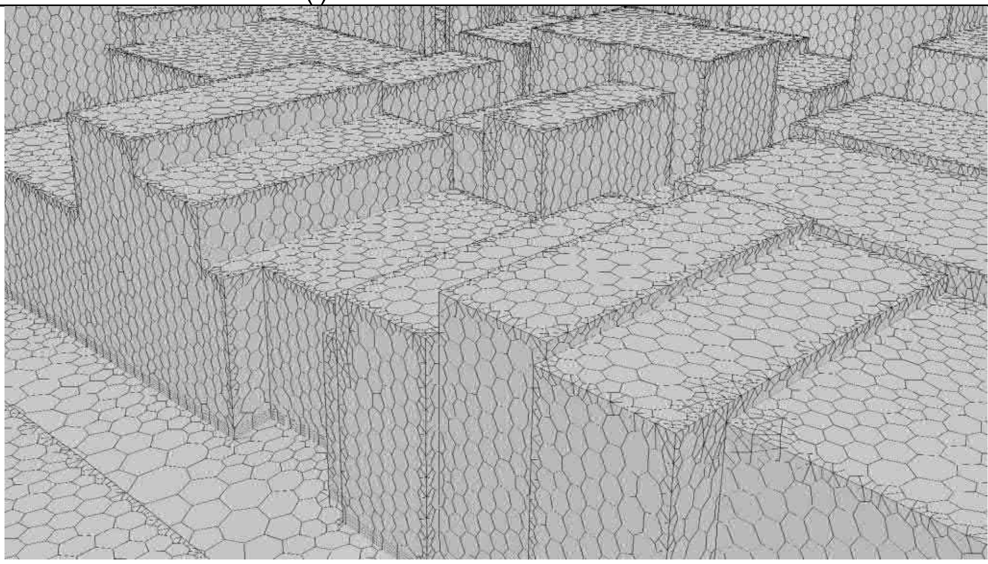

(f) West view, Proposed Scheme


(g) North view, Base Scheme


(h) North view Proposed Scheme



(i) Mesh for the simulation of KTAA



(j) Illustration of 4 prism layer of the mesh

Figure 4.2 Illustration of models, mesh and prism layer for the simulation at KTAA

4.2.10 Turbulence Model: As recommended in COST action C14, realizable K-epsilon turbulence model was adopted, as the closure of Reynold Averaged Navier Stokes Equation to simulate the real life problems, obtaining a robust wind field result under the constraint of limited computational resources.

4.2.11 Variables including fluid velocities and pressure were calculated throughout the domain. The CFD code captures, simulates and determines the air flow characteristics inside the domain based on viscous fluid mechanics governing equations. Solutions were obtained by iterations.

4.2.12 Numerical Scheme of the Simulation and Convergence Criteria: The advection terms of the momentum and viscous terms are resolved with the second order numerical schemes, as shown in the table below. The scaled residuals are converged to an order of magnitude of 1 x 10^{-4} as recommended in COST action C14.

Table 4.3 Numerical set up for the simulation of the AVA Study

Pressure velocity coupling	Coupled Scheme
Pressure Term	Second Order Scheme
Discretization - Momentum	Second Order upwind Scheme
Discretization – Turbulent Kinetic Energy	Second Order upwind Scheme
Discretization – Turbulent Dissipation rate	Second Order upwind Scheme
Wall Treatment	Standard Wall Function

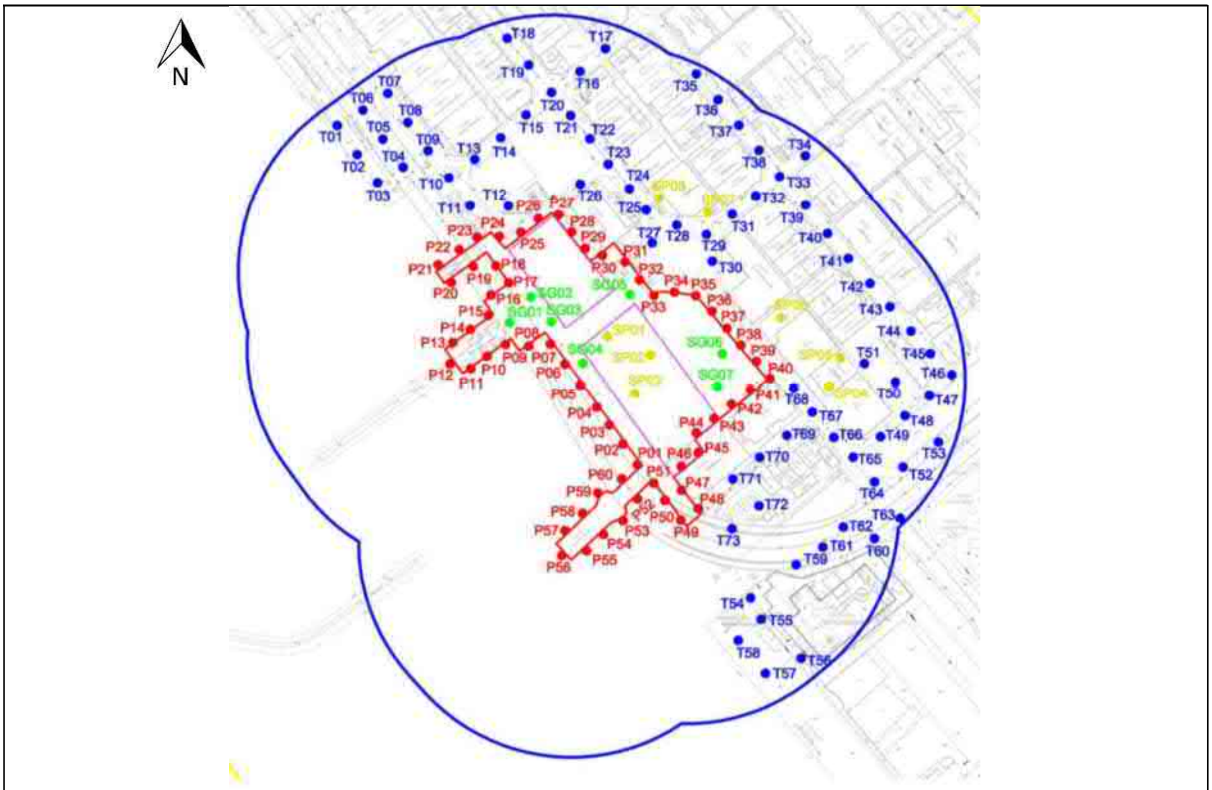
4.3 Assessment Criteria

4.3.1 Wind Velocity Ratio (VR): VRs, per aforesaid technical circular (HPLB and ETWB, 2006), are defined as VR = V_P / V_{INF} where V_{INF} is the wind velocity at the top of the wind boundary layer and it would not be affected by the ground roughness and local site features and V_P is the wind velocity at the 2m pedestrian level. VRs will be adopted as the indicator of the wind performance at pedestrian level, taking into account of surrounding buildings, topography and the project site. Per the velocity ratio method (CUHK, 2008), the analyzed CFD results will determine the extent to which the proposed development impacts over the wind environment of its immediately vicinity and local areas.

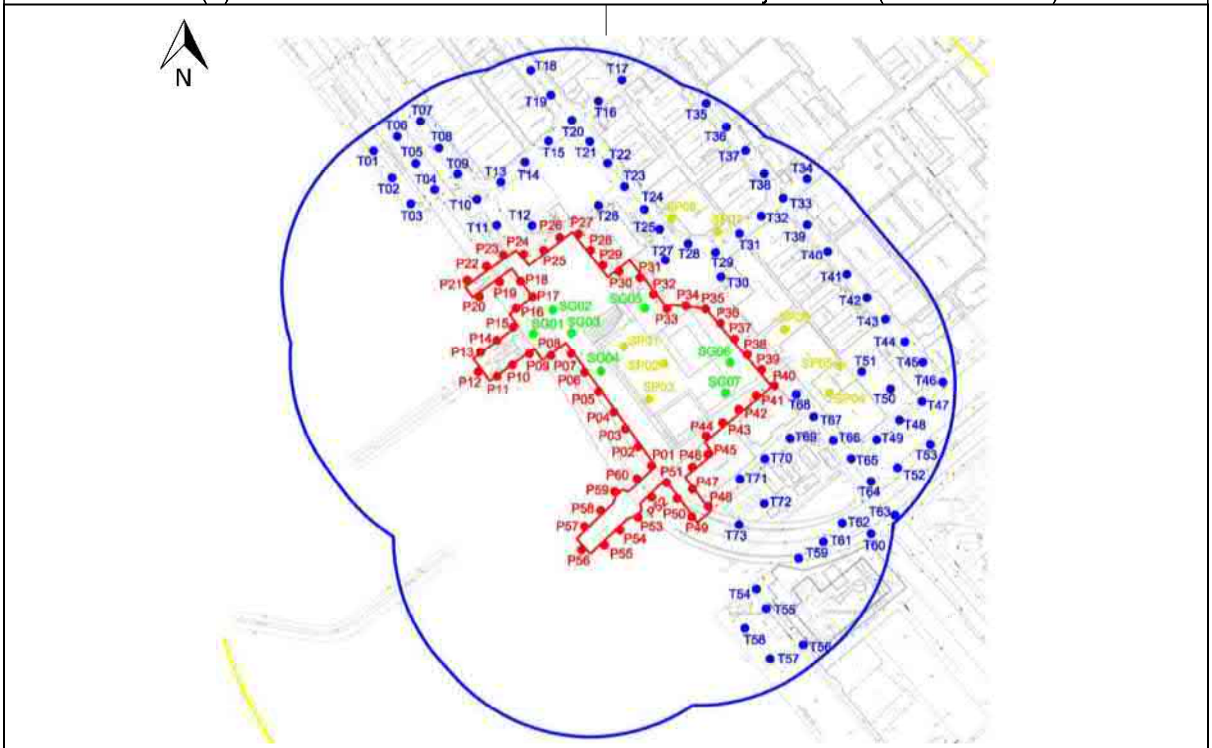
4.3.2 The SVR and LVR are worked out so as to understand the overall impact of air ventilation on the immediate and further surroundings of the Project Areas. SVR is the average of VR of all perimeter test points while the LVR is the average of all overall test points and perimeter test points.

4.3.3 Test Points: Both perimeter test points and overall test points will be selected within the Assessment Area in order to assess the impact on the immediate surroundings and local areas respectively. Overall test points will be evenly distributed over surrounding open spaces, streets and other parts of the Assessment Area where pedestrian can or will mostly access. Detailed selection of test points and grouping of test points into different focus areas, including major streets, for subsequent analysis and comparison of the ventilation performance of different options of development schemes will be provided and agreed with PlanD upon the obtainment of different development scenarios. The selected test points will be evenly and randomly distributed within the Assessment Areas for the purpose of the AVA studies. All test points are elevated at 2m above ground.

4.3.4 There will be a total of 60 Perimeter Test Points along the boundary of the Project Area and 73 Overall Test Points within the Assessment Area. The location of test points, along with the Assessment Areas and Surrounding Areas are shown in **Figure 4.2** below. Meanwhile, special test points are also chosen to represent wind environment of certain pedestrian frequent areas, i.e. the podium roof top of buildings, as well as the location near special features of the Base Scheme and Proposed Scheme such as the location near the openings on ground level. There are a total of 7 special test points chosen for the Project Area at ground level, and 8 special test points being placed upon the podium located within Project Area and Assessment Area.



(a) Indication of the Test Points location for Project Area (Base Scheme)



(b) Indication of the Test Points location for Project Area (Proposed Scheme)

- Perimeter Test Points (P)
- Overall Test Points (T)
- Special Test Points on ground level within Project Area (SG)
- Special Test Points on podium level (SP)
- Project Area (KTAA)
- Assessment Area
- Surrounding Area

Figure 4.3 Perimeter, Overall and Special Test Points selected for the AVA Study

5 CFD SIMULATION RESULT AND DISCUSSION

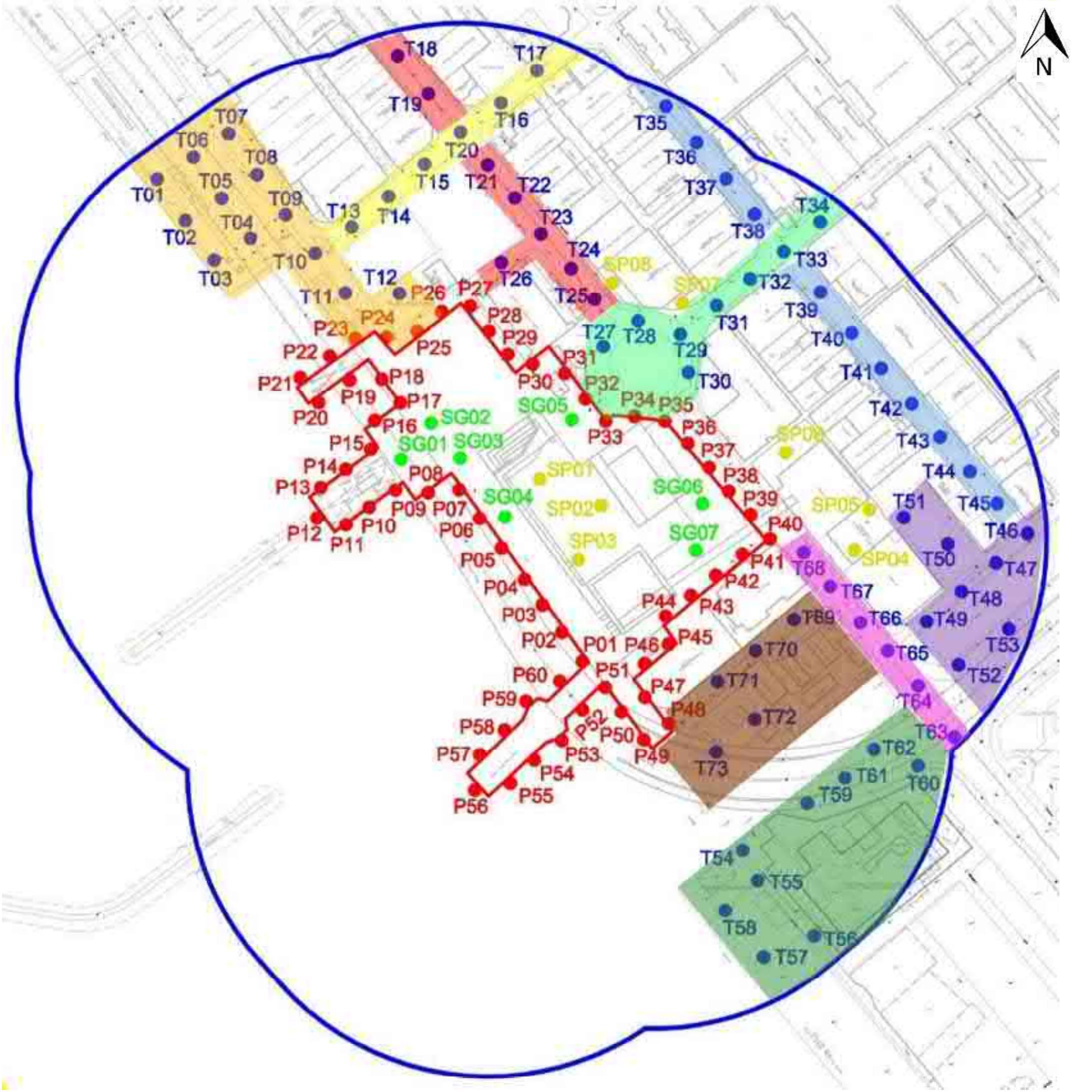
5.1 Wind Velocity Ratio Result

5.1.1 A summary of the predicted wind velocity ratios for the Perimeter Test Points and the Overall Test Points i.e. SVRW and LVRW under both annual and summer prevailing winds are presented in **Table 5.1** below. Details of the predicted wind velocity ratios are presented in Appendix B2.

Table 5.1 Summary of Wind Velocity Ratio

	Annual Winds		**Summer Winds**	
	Base Scheme	Proposed Scheme	Base Scheme	Proposed Scheme
SVR_W	0.10	0.11	0.16	0.17
LVR_W	0.15	0.16	0.20	0.20
Averaged VR at Special Test Points	0.11	0.13	0.16	0.19

5.1.2 For the ease of discussion on the wind environment performance of specific regions, the Test Points in the study is further subsumed into different Test Point Groups, the locations each group covered and the test points included can be referred to **Figure 5.1** below. While the results of VR_W for different groups of test points are summarized in **Table 5.2** below.



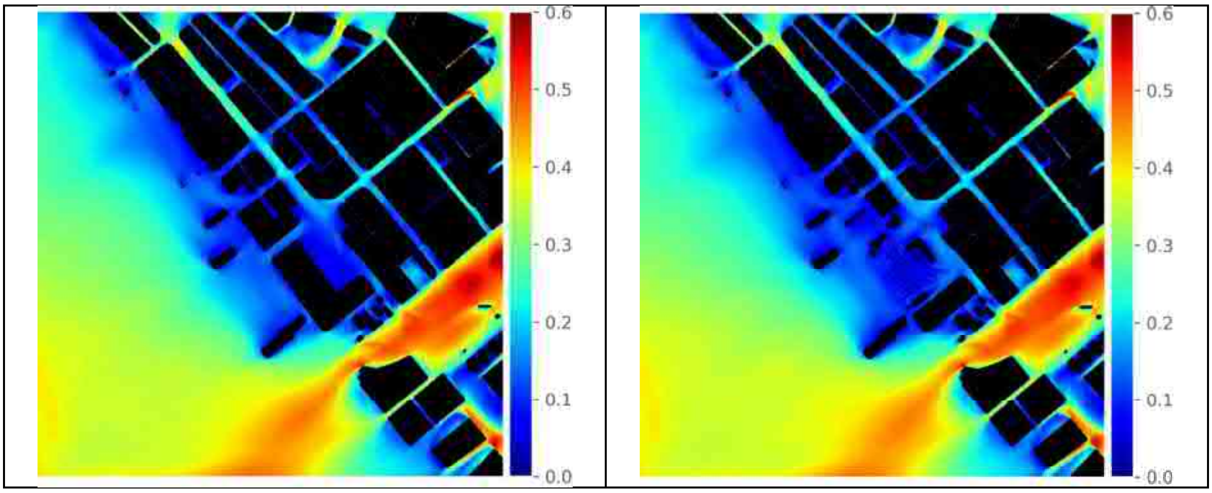
Group	Description	Test Points	Average VR_w (annual winds)		Average VR_w (summer winds)	
			Base Scheme	Proposed Scheme	Base Scheme	Proposed Scheme
G1 (Orange Zone)	Kwun Tong Promenade, Hoi Bun Road, Pumping Station	T01 – T12	0.11	0.10	0.19	0.17
G2 (Yellow Zone)	Tsun Yip Street	T13 - T17, T20	0.14	0.14	0.21	0.21
G3 (Red Zone)	Wai Yip Street West to the roundabout, Kei Yip Street	T18 – T19, T21 – T26	0.21	0.19	0.19	0.16
G4 (Light Green Zone)	Hoi Yuen Road and the roundabout	T27 – T34	0.17	0.17	0.19	0.20

Group	Description	Test Points	Average VR_w (annual winds)		Average VR_w (summer winds)	
			Base Scheme	Proposed Scheme	Base Scheme	Proposed Scheme
G5 (Light Blue Zone)	Hung To Road	T35 – T45	0.14	0.15	0.14	0.19
G6 (Purple Zone)	King Yip Street, Wai Fat Road and the vacant site near Manulife Financial Centre	T46 – T53	0.34	0.34	0.25	0.25
G7 (Pink Zone)	Wai Yip Street near the Nullah	T63 – T68	0.28	0.28	0.25	0.26
G8 (Dark Green Zone)	DSD Kwun Tong Pumping Station	T54 – T62	0.35	0.35	0.33	0.33
G9 (Dark Brown Zone)	DSD Kwun Tong Preliminary Treatment Works	T69 – T73	0.17	0.17	0.21	0.21
G10	Special Test Points within Project Area at ground	SG01 – SG07	0.10	0.12	0.16	0.19
G11	Special Test Points within Project Area at podium	SP01 – SP03	0.07	0.10	0.11	0.18
G12	Special Test Points on podium within Assessment Area	SP04 – SP08	0.14	0.14	0.17	0.18

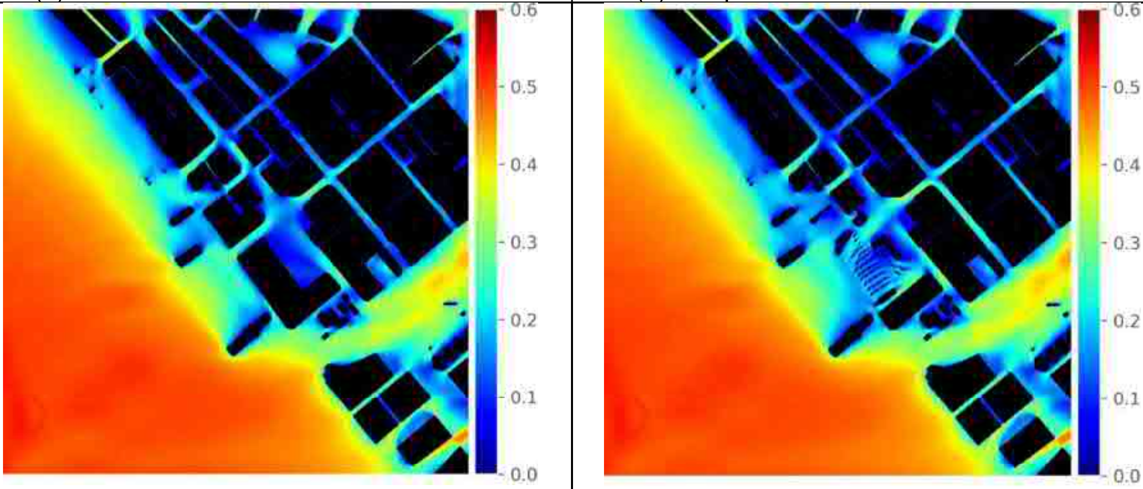
Figure 5.1 Grouping of Test Points and summary of Wind Velocity Ratio for Different Test Point Groups

5.1.3 The averaged VRW plot for the KTAA is presented in the in **Figure 5.2**.

5.1.4 Contour plots of wind velocity ratio and wind velocity vector plots at 2m above the pedestrian level of assessment area under different wind directions are shown in Appendix C and Appendix D.



(a) Base Scheme Annual Wind | (b) Proposed Scheme Annual Wind



(c) Base Scheme Summer Wind | (d) Proposed Scheme Summer Wind

Figure 5.2 Frequency Weighted Wind Velocity Ratio Contour Plot at 2m above Ground

5.2 Site Ventilation Assessment

5.2.1 The SVR indicates how the lower portion of the buildings within the Study Area affecting the wind environment of its immediate vicinity. Under annual winds, the average of predicted SVRw over these prevailing winds for the Base Scheme and Proposed Scheme are 0.10 and 0.11 respectively. While in summer, the SVRw are maintained at 0.16 and 0.17 Base Scheme and Proposed Scheme. The result indicates that compared to the Base Scheme, the Proposed Scheme would likely to result in a relatively better wind environment to their immediate vicinity. Such improvement maybe mainly due to the fact that the Proposed Scheme has a relatively higher permeability at ground level since provision of opening under the main buildings as a result of reserving the PTI, as well as the open area incorporated west to the main building.

5.2.2 Test points P35 to P40 located along the Wai Yip Street near the Manulife Finance Centre. In this study, the Base Scheme and Proposed Scheme would maintain an average SVRw of 0.10 (annual winds) / 0.15 (summer winds) and 0.15 (annual winds) / 0.15 (summer winds) respectively. The result indicating presence of Proposed Scheme would allow a better wind availability in the Wai Yip Street between the Project Area and Manulife Finance Centre under the annual prevailing wind while a comparable result is obtained during summer seasons.

5.2.3 Test Points P01 to P23 along with P49 to P60 indicated the wind environment near at the shore and the ferry piers. Under the annual prevailing winds, the averaged VR of these test points are 0.12 for both the Base Scheme and Proposed Scheme. While during summer, the Proposed Scheme and Base Scheme both obtained a 0.18 in VRw, which indicates that a comparable wind environment has been achieved.

5.3 Local Air Ventilation Assessment

5.3.1 The LVRw indicates the overall wind environment within the Assessment Area of the two schemes under the annual and summer winds. The LVRw for the Base Scheme and Proposed Scheme are 0.15 and 0.16 respectively under the annual prevailing winds. While during the summer seasons, the LVRw are maintained at 0.20 for both Base and Proposed Scheme. The results indicate that the Proposed Scheme, despite having a relatively taller building height, achieved a slight improvement air ventilation performance with the Base Scheme in the nearby high-density urban regions.

5.3.2 It is noticed that out of the 9 Test Point Groups, G2, G6, G7, G8 and G9 areas have maintained an overall comparable wind environment between the Base and Proposed Scheme under both annual and summer prevailing winds. The reason of the occurrence of such similarity in air ventilation performance for these regions maybe due to the fact that these regions are either being shielded from the Project Area by high-rise bulky existing buildings (i.e. the G2 region), or are located at the upwind / sideway of the Project Area under the majority of annual and summer prevailing winds.

5.3.3 Group G1 Test Points located mainly at the Kwun Tong Promenade area and Hoi Bun Road. The VRw obtained indicated the pedestrian wind environment there. It is noticed that the averaged velocity ratio in the summer condition obtained by Proposed Scheme and Base Scheme at this area are 0.17 and 0.19 respectively, while in annual condition the region would maintain a VR value of at 0.11 and 0.10 for Base and Proposed Schemes. The slight decline in VR for the Proposed Scheme might be that under the south-easterly winds the enhanced permeability of the Project Area under Proposed Scheme would induce a portion of wind to flow into the inland area instead of flowing along the shoreline and reaching G1 area.

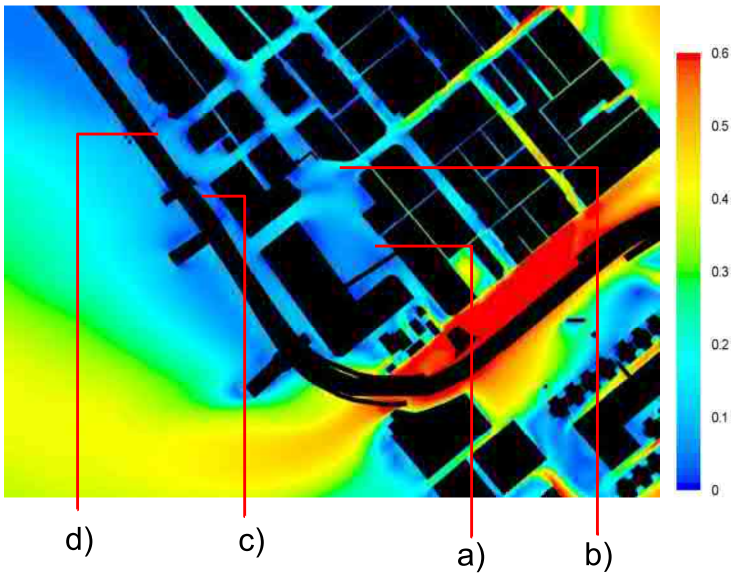
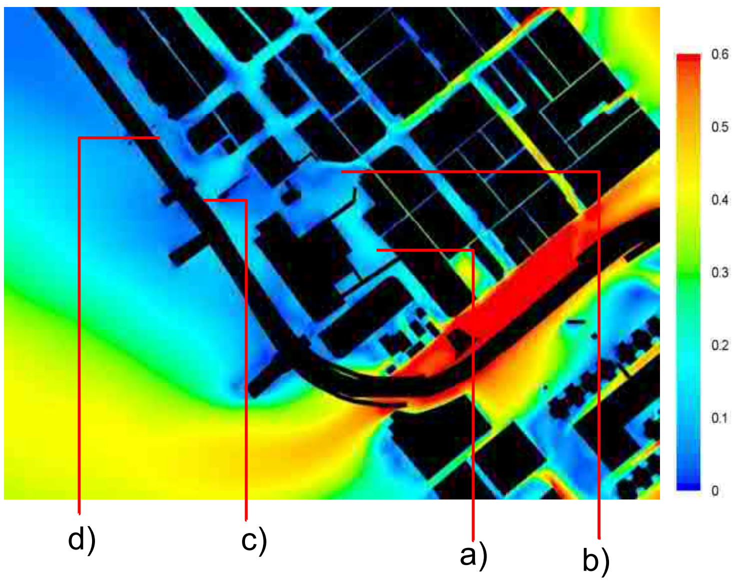
5.3.4 The VR values of Group G3 Test Points indicate the air ventilation performance at the Wai Yip Street northwest to the Project Area. Under both the annual and summer prevailing winds, the wind environment under Proposed Scheme in this region is declined compare to that in the Base Scheme. The drawback maybe mainly due to the fact that the morphology of the Proposed Scheme would redirect more winds at pedestrian level to flow into Hoi Yuen Road instead of dispersing into both the Wai Yip Street and Hoi Yuen Road, hence resulting in a decline in wind availability at the western sector of Wai Yip Street.

5.3.5 On the other hand, the Group G4 Test Points located at the roundabout and Hoi Yuen Road has maintained an improvement in wind environment under the summer wind conditions. As discussed above, the design of the Proposed Scheme had channelled more air flow into the Hoi Yuen Road, which results in an enhance of pedestrian wind environment.

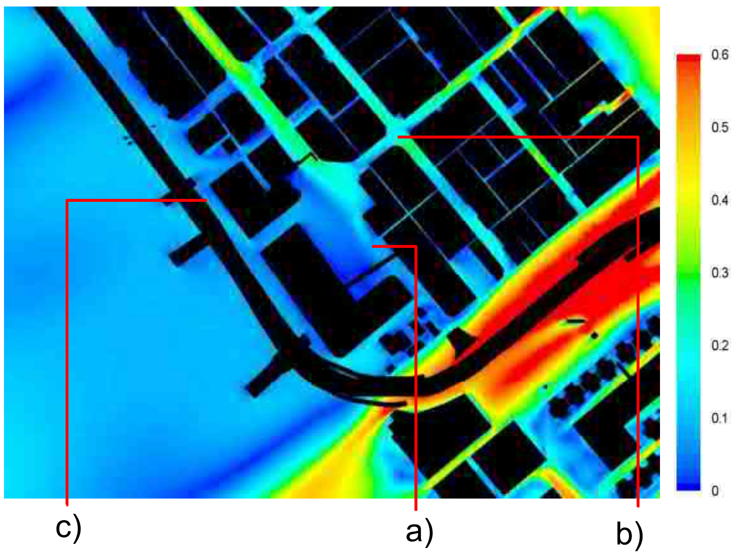
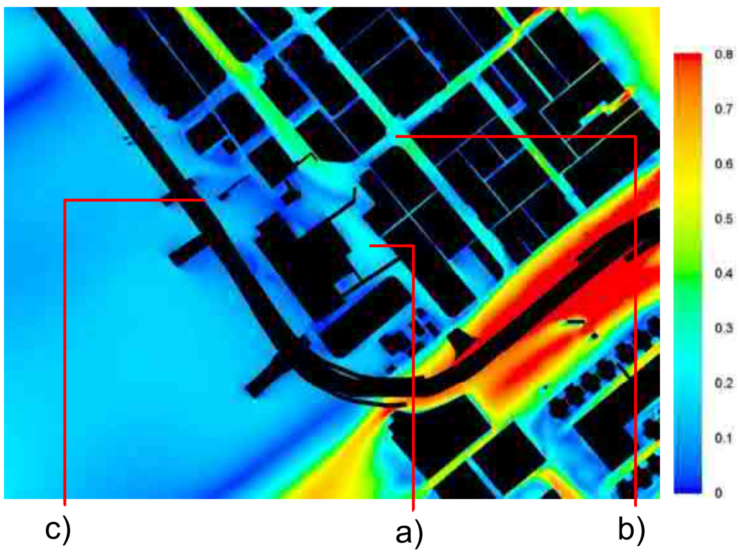
5.3.6 Consequently, the Proposed Scheme has also resulted in an increment of VR at the G5 area (along Hung To Road) under both the annual and summer wind condition, since the enhancement of air flow along the Hoi Yuen Road under south-westerly (when the Project Area and Hoi Yuen Road would be the upwind region of Hung To Road) wind would also likely to facilitate the pedestrian wind at the Hung To Road.

Directional Analysis

5.3.7 **E: (Annual: 20.6%; Summer: 9.3%)**

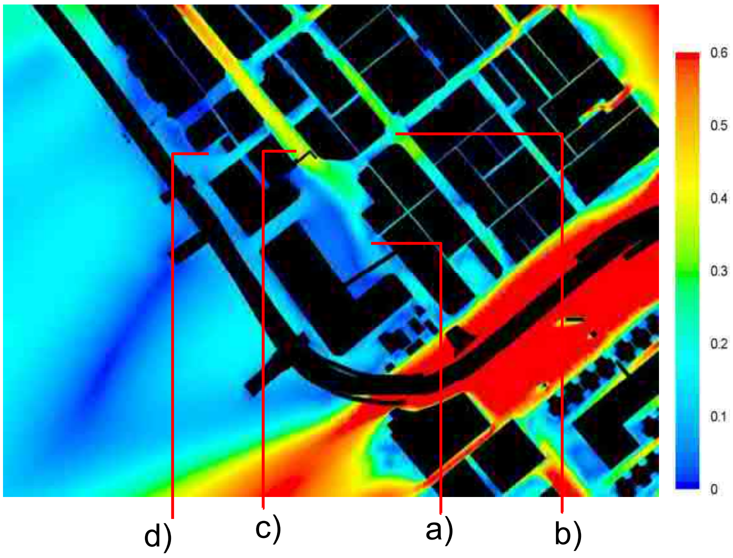
<table>
<tr>
<td>Base Scheme
</td>
<td>a) Slight enhancement of wind under the Proposed Scheme is observed at the Wai Yip Street between the Project Area and the Mai Tak Industrial Building / Manulife Finance Centre. The increased building height of the major development in Proposed Scheme induced downwash air flow and facilitate the pedestrian wind environment at this region.
b) Consequently, a more significant stagnation zone occurred at the region close to Pioneer Place under the Proposed Scheme. The air flow generated by the downwash wind collided with the wind flowing along Hoi Yuen Road near the Pioneer Place, thus the wind flow is slowed down.</td>
</tr>
<tr>
<td>Proposed Scheme
</td>
<td>c) A slight improvement of wind is also observed at the area near the Kwun Tong Vehicular Ferry Pier and Kwun Tong Public Pier under the Proposed Scheme. The removal of large footprint Base Scheme building at the northwest portion of the site would likely reduced the blockage of wind at ground level against this area, which leads to better wind availability.
d) As a result of the improvement mentioned in c), the promenade and Hoi Bun Road also obtained a slight improvement in pedestrian wind environment, since these areas are located at the local downwind of the Project Area and the ferry piers.</td>
</tr>
</table>

5.3.8 **ENE: (Annual 15.2%)**

Base Scheme  	a) Similar to that under the E wind, a slight enhancement of the air flow is observed near the Mai Tak Industrial Building under the Proposed Scheme, since the major buildings of the Proposed Scheme generated downwash wind to facilitate the air flow at lower level. b) On the other hand, the enhanced air flow near the Mai Tak Industrial Building occurred under the Proposed Scheme would collide with pedestrian winds infiltrating through the Hoi Yuen Road, which in turn generate lowered the wind flow near the Sunciti Building and the crossing of Hoi Yuen Road and Hung To Road.
Proposed Scheme  	c) Similar to the situation occurred under east wind, the removal of large footprint building in the Base Scheme has reduced the blockage of wind against the vehicular ferry pier and public pier. Hence, an improvement in wind is observed at the region near these piers under the Proposed Scheme.

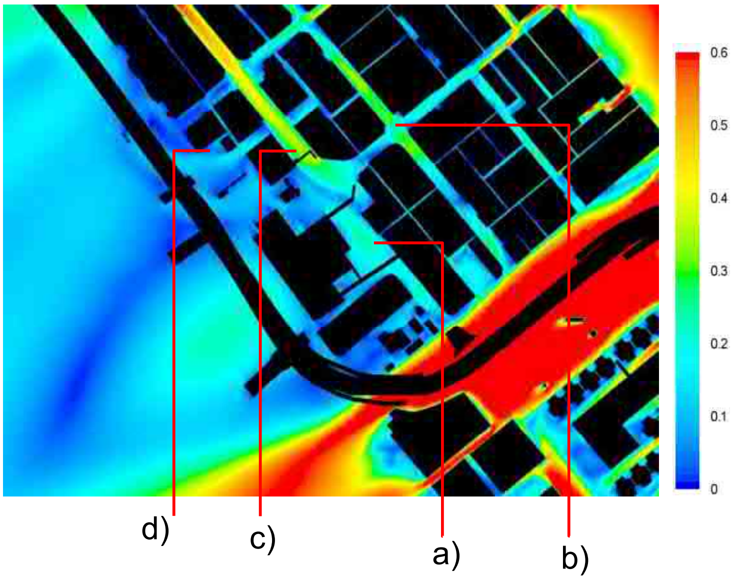
5.3.9 **NE: (Annual 7.7%)**

Base Scheme



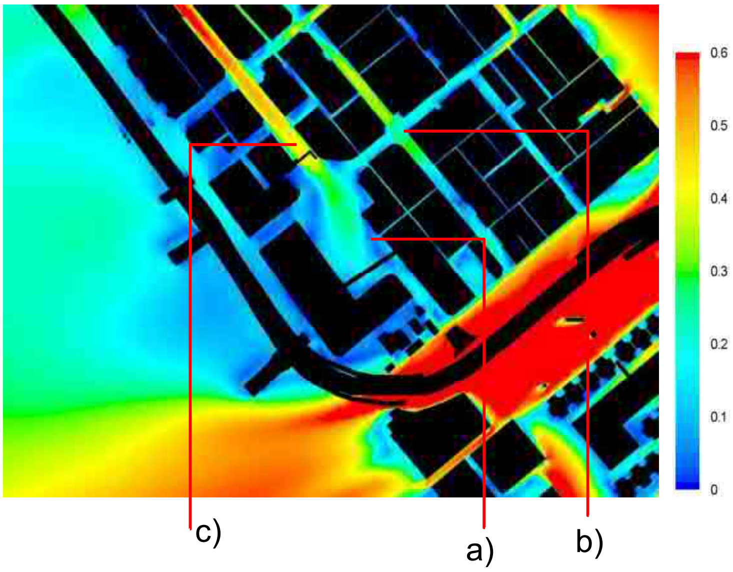
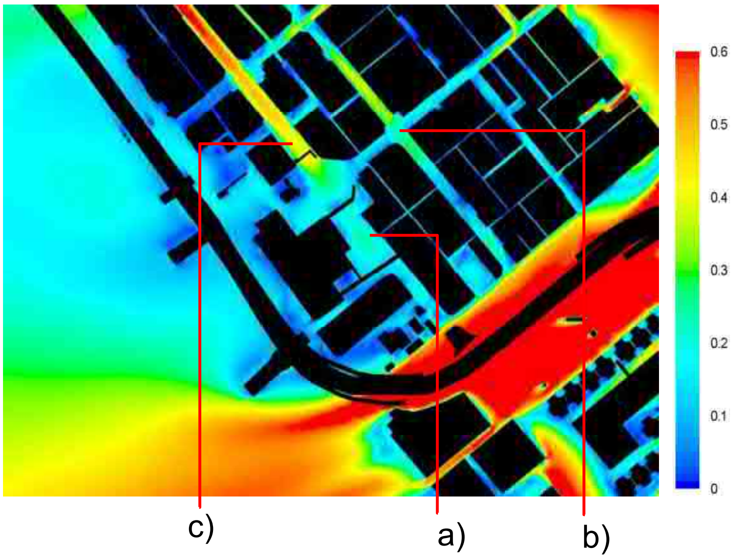
a) Improvement in VR value is observed between the Project Area and Manulife Finance Centre under the Proposed Scheme. The improvement is mainly due the downwash air flow generated by the main towers of the Proposed Scheme.
b) Slight decline of winds is observed at the crossing of Hoi Yuen Road and Hung To Road under the Proposed Scheme. Similar to that under the ENE wind, the drawback is mainly due to the collision of pedestrian wind from the Project Area and the air flow from the Hoi Yuen Road.

Proposed Scheme



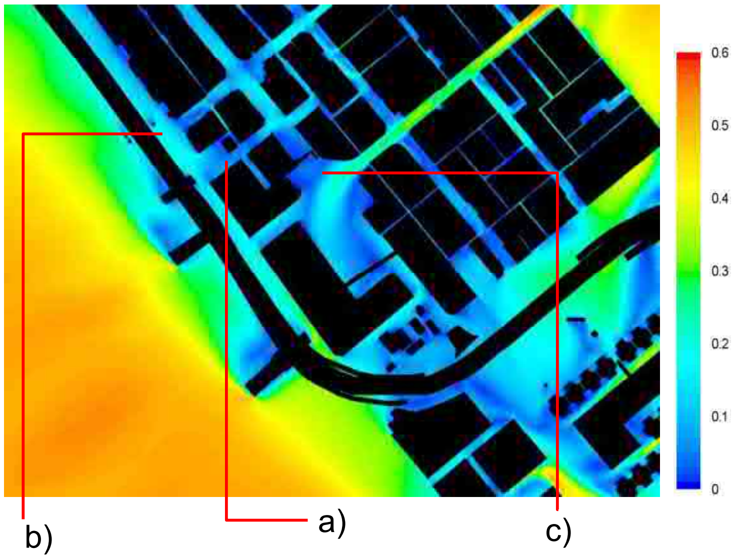
c) It can be observed that the decline in VR occurred at the Wai Yip Street near Kwun Tong Harbour Plaza under the Proposed Scheme, as a portion downwash wind generated by the Proposed Scheme would flow towards the west and collide with the pedestrian wind flowing from the Wai Yip Street from the northwest, forming a stagnation zone and in turn lowered the wind availability near the Kwun Tong Harbour Plaza.
d) A slight improvement in wind environment is observed at the pumping station near One Harbour Square under the Proposed Scheme, since the removal of large coverage building in the Base Scheme results in the reduction of wind blockage at pedestrian level.

5.3.10 **NNE: (Annual 5.4%)**

Base Scheme 	a) Slight enhancement of wind at is observed at the region near the Mai Tak Industrial Building under the Proposed Scheme. The increased building height of major development in the Proposed Scheme induced downwash wind, which facilitate the air flow at pedestrian level. b) On the other hand, a drawback of the wind environment is observed at the crossing of Hoi Yuen Road and Hung To Road under the Proposed Scheme, since the enhanced pedestrian wind would flow towards the northeast in the locality, hence would slow down the wind in the Hoi Yuen Road which flowing in the opposite direction.
Proposed Scheme 	c) A drawback is also observed at the Wai Yip Street near Kwun Tong Harbour Plaza in the Proposed Scheme. Similar to that under the NE wind, the downwash wind generated by the Proposed Scheme would flow towards the west and collide with the pedestrian wind flowing from the Wai Yip Street from the northwest, forming a stagnation zone.

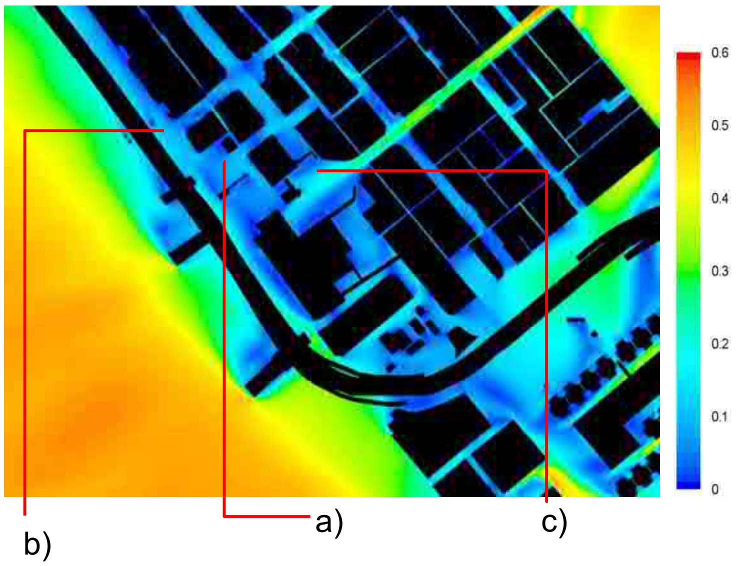
5.3.11 **ESE: (Annual 10.9%; Summer: 9.2%)**

Base Scheme



a) Slight enhancement of winds is observed at the pumping station near One Harbour Square under the Proposed Scheme. The improvement is mainly due to the reduction of large footprint building in the north-western portion of the Project Area.
b) On the other hand, a decline in VR is observed near the Hoi Bun Road and Kwun Tong Promenade under the Proposed Scheme. In the Base Scheme, the south-western frontage of buildings in Project Area would direct the air flow towards the Hoi Bun Road and Promenade, while in the Proposed Scheme, such effect is reduced with the removal of the building located in the northwest portion of Project Area. Hence the wind availability is reduced.

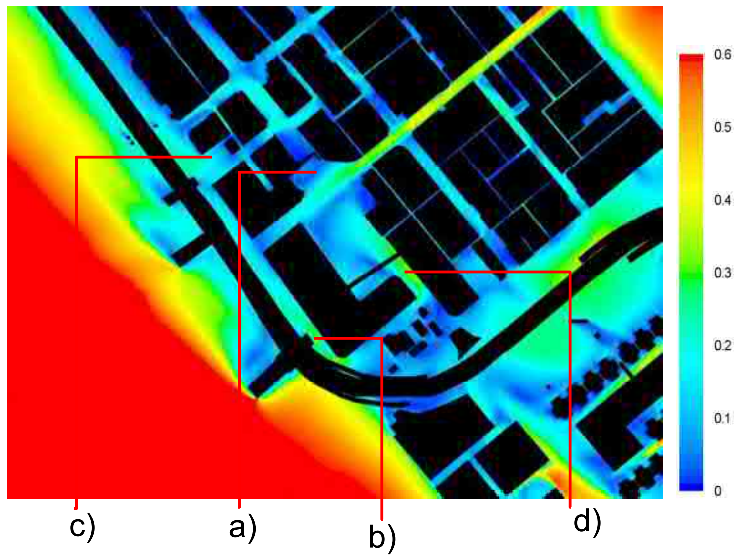
Proposed Scheme



c) A slight wind enhancement for the Proposed Scheme is observed at the roundabout near the Kwun Tong Harbour Plaza. In the Base Scheme, the air flow would infiltrated through the separation between the two buildings in Project Area from the typhoon shelter and collided with the pedestrian wind flowing from Hoi Yuen Road, thus forming a stagnation zone. While in the Proposed Scheme, the change of morphology redirected the air flow from the open sea. Thus reduced the stagnation zone at the roundabout.

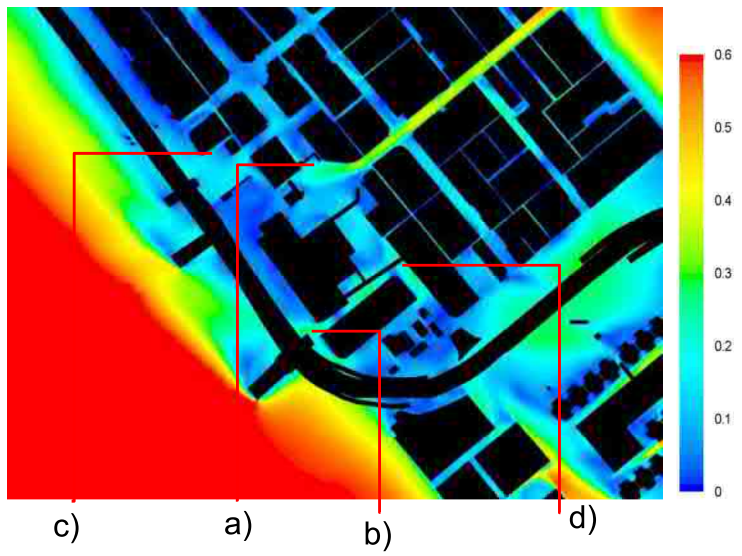
5.3.12 **SE: (Annual 6.7%; Summer 7.4%)**

Base Scheme



a) The construction of the Proposed Scheme would lead to a slight improvement at the area near Kwun Tong harbour Plaza compare to the Base Scheme. A stagnation zone is observed under the Base Scheme at the location which is generated by the downwash air flow from the plaza and the pedestrian wind flowing along the Hoi Yuen Road. While in the Proposed Scheme, main building would shield a portion of air flow at higher level from the Kwun Tong Harbour Plaza, which would reduce the downwash air movement and in turn alleviate the stagnation at ground level.

Proposed Scheme

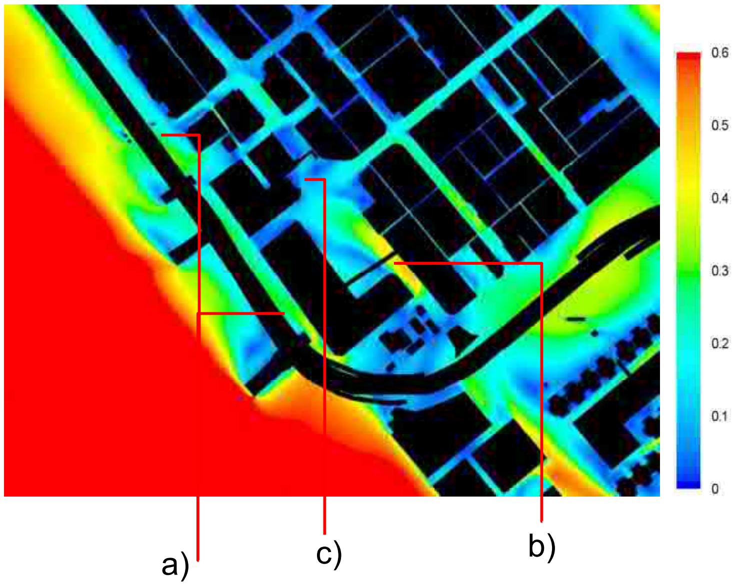
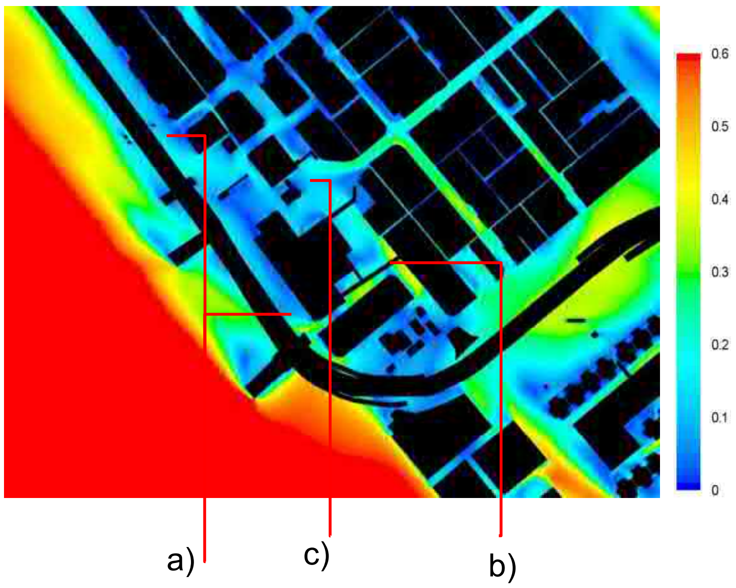


b) It is noticed that a drawback in wind environment occurred near the Kwun Tong Ferry Pier and Kwun Tong Vehicular Ferry Pier under the Proposed Scheme. Since the channelling effect between the Base Scheme developments and the ferry pier structures is reduced in the Proposed Scheme.

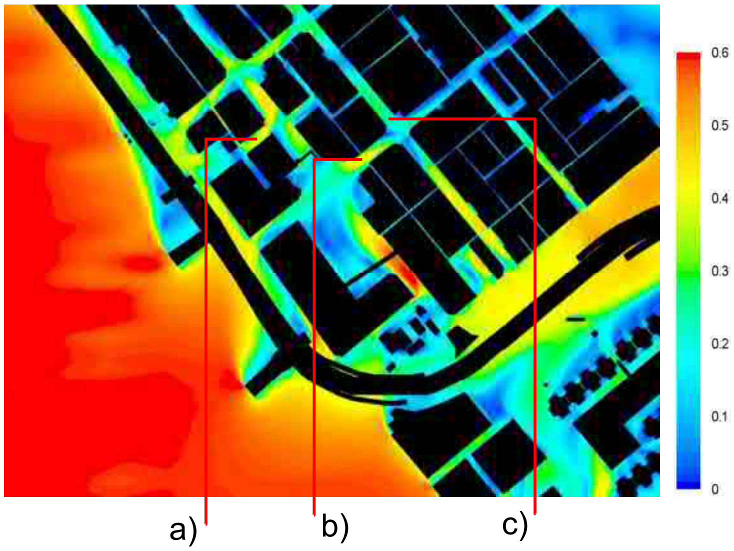
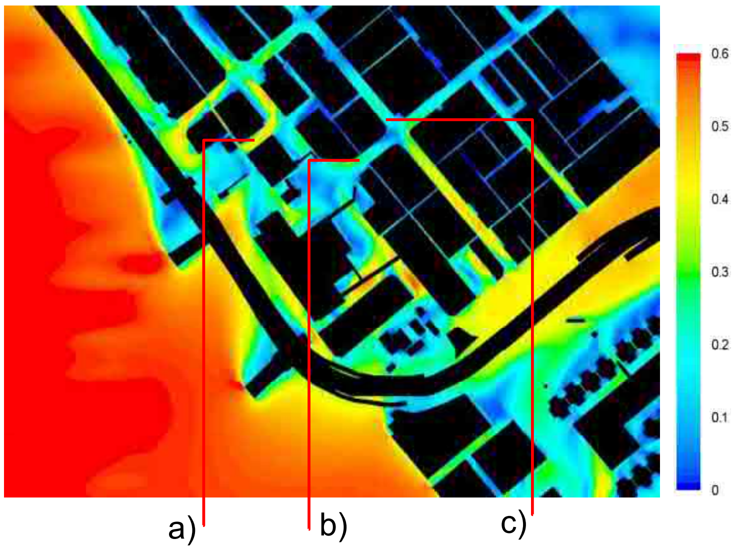
c) On the other hand, the air ventilation at the pumping station near One Harbour Square is enhanced for the Proposed Scheme, since the blockage of wind from the building in the northwest portion of the Project Area under the Base Scheme is reduced in the Proposed Scheme.

d) Slight decline in wind environment is also observed at the Wai Yip Street close to Manulife Finance Centre, since the Proposed Scheme allows infiltration of air flow through the site between the proposed development and Hoi Bun Industrial Building, which would in turn form a stagnation zone with the pedestrian wind flowing into the Wai Yip Street near Manulife Centre.

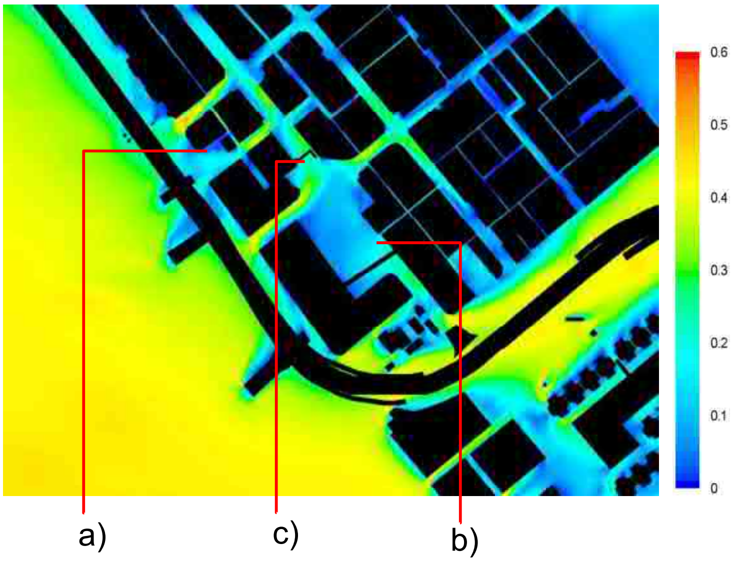
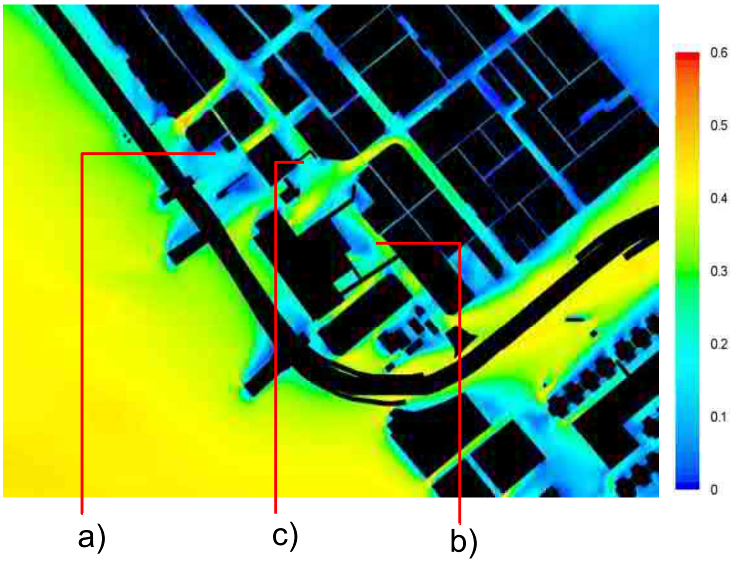
5.3.13 **SSE: (Summer 8.2%)**

<table>
<tr>
<td>Base Scheme
</td>
<td>a) Similar to that under the SE wind, the change of morphology for the Proposed Scheme has reduced the wind channelling between the development in Project Area and the ferry piers structure. This feature would lowered the VR along the shore in general for the Proposed Scheme. It is also noticed that such feature would also lower the wind availability in the region of Hoi Bun Road and the promenade.
b) It is also noticed that a lowered wind availability occurred at the Wai Yip Street near Manulife under the Proposed Scheme, since the infiltration of air flow from the Project Area would generate a wind flow stagnation at the location with the winds flowing from the east of Lu Plaza, similar to that under the SE wind.</td>
</tr>
<tr>
<td>Proposed Scheme
</td>
<td>c) On the contrary, the lowered VR near Manulife would result in a reduction of recirculation zone generated by the air flow from Wai Yip Street and Hoi Yuen Road. Hence the wind environment near the Kwun Tong Harbour Plaza is improved under the Proposed Scheme.</td>
</tr>
</table>

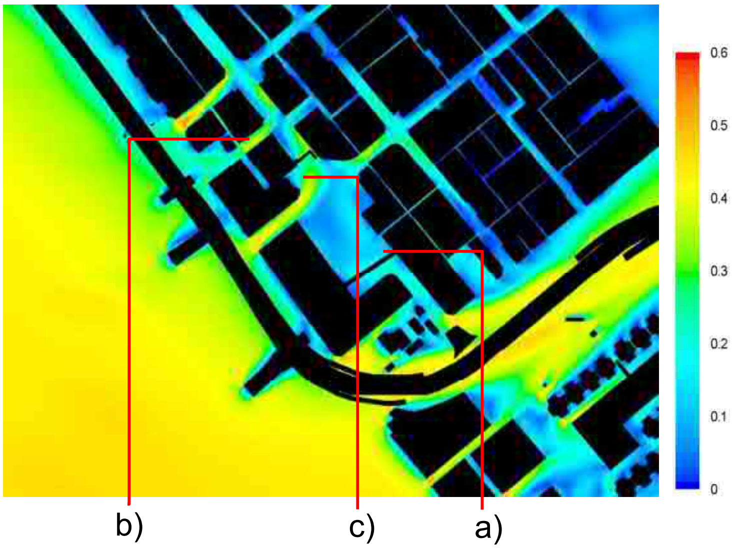
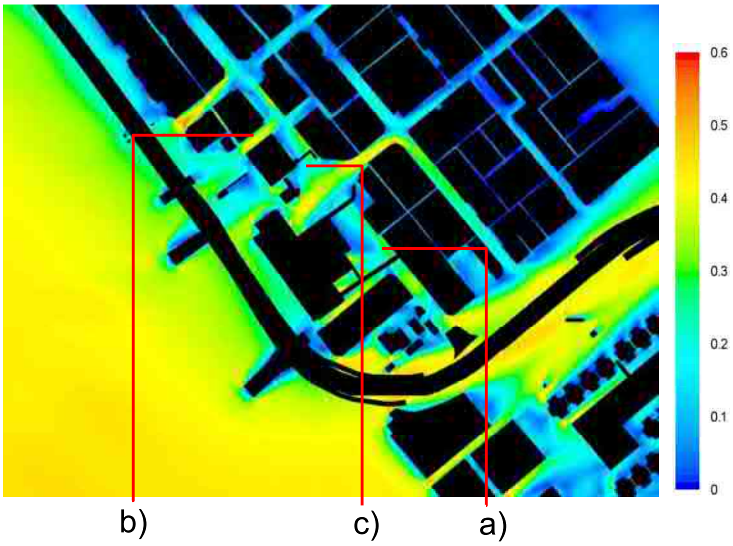
5.3.14 **S: (Summer 9.4%)**

Base Scheme 	a) Under the Proposed Scheme, a slight enhancement of wind is observed at the Kei Yip Street between Two Harbour Square and Kwun Tong Harbour Plaza. The removal of the building in the northwest portion of the Project Area may reduce the blockage of wind under S wind, thus allowing a better wind entry to this location. b) A decline in VR is observed at the Hoi Yuen Road under the Proposed Scheme. Since the change of morphology for the Proposed Scheme would reduce the air flow being redirected to this region.
Proposed Scheme 	c) Consequently, a decline of VR is also observed at Hung To Road near the crossing with Hoi Yuen Road, since the decline in wind availability discussed above occurred at its upwind side.

5.3.15 **SSW: (Annual: 5.6%; Summer 12.4%)**

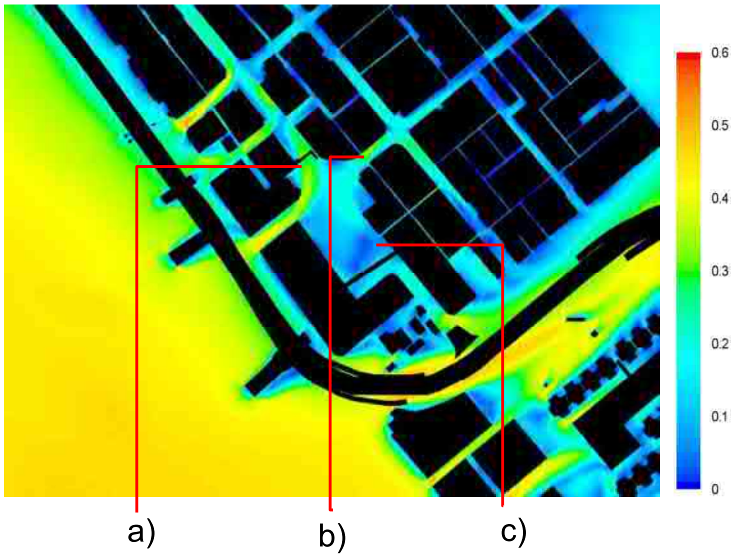
Base Scheme  	a) An enhancement of wind is observed at the pumping station near One Harbour Square under the Proposed Scheme. The removal of the building in northwest portion of Project Area leads to the alleviation of the partial wind blockage against this location. b) Enhancement of air flow for the Proposed Scheme is also observed at Wai Yip Street near Manulife and Mai Tak Industrial Building, since the Proposed Scheme maintains separation from the Hoi Bun Industrial Building, and incorporated opening at ground level. Such features allow the infiltration of wind through the site and reach the Wai Yip Street.
Proposed Scheme  	c) On the other hand, a slight drawback occurred at the region near the Kwun Tong Harbour Plaza under the Proposed Scheme. In the Base Scheme, a portion of wind that infiltrated through the site would be directed towards the Wai Yip Street. However, the morphology of the Proposed Scheme would induce the pedestrian winds flowing towards the Hoi Yuen Road after penetrating through the site, hence the wind availability in the area near Kwun Tong Harbour Plaza would be lowered.

5.3.16 **SW: (Annual: 6.0%; Summer 14.3%)**

Base Scheme 	a) Similar to that under the SSW wind, a slight enhancement is observed near the Manulife and Mai Tak Industrial Building, due to the infiltration of pedestrian wind through the separation and openings provided in the Proposed Scheme. b) Slight improvement for the Proposed Scheme is also observed at the region between Two Harbour Square and Kwun Tong Harbour Plaza. The removal of the northwest building of the Base Scheme would allow a better wind entry into the Kei Yip Street under SW prevailing wind.
Proposed Scheme 	c) Similar to that under the SSW wind, a drawback in pedestrian wind environment is observed at the west portion of roundabout (near the Kwun Tong Harbour Plaza). The reduction of wind availability is mainly due to the morphology of the Proposed Scheme directing more wind flowing towards the Hoi Yuen Road instead of flowing to the Wai Yip Street.

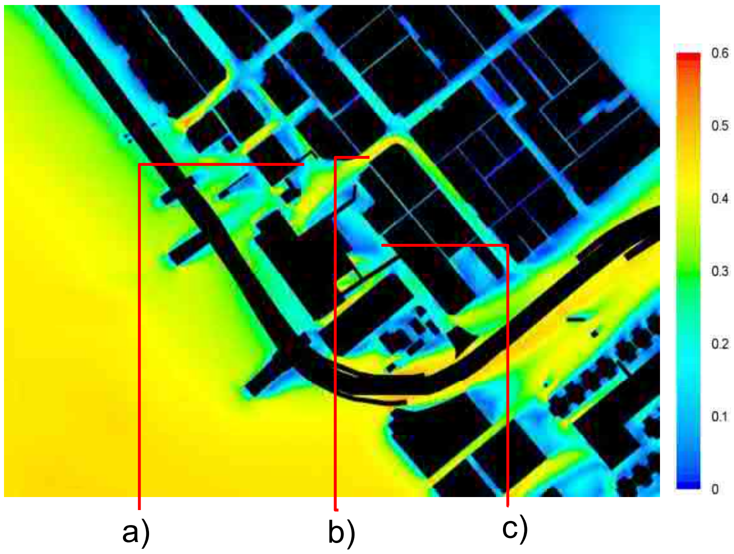
5.3.17 **WSW: (Summer 10.2%)**

Base Scheme



a) Similar to that under the SW wind, the morphology of the Proposed Scheme would reduce the pedestrian wind flowing towards Wai Yip Street near the Kwun Tong Harbour Plaza compared to the Base Scheme, resulting in a slight drawback of local wind environment.
b) On the contrary, the wind environment at the Hoi Yuen Road between the roundabout and Hung To Road had obtained an improvement in the Proposed Scheme. Since the building morphology of the Proposed Scheme directed more air flow at pedestrian level towards the Hoi Yuen Road under WSW wind.

Proposed Scheme



c) Comparing to that under the Base Scheme, the Wai Yip Street near Mai Tak Industrial Building and Manulife has obtained an enhancement under the Proposed Scheme, since the opening and separation of the Proposed Scheme developments allows better penetration of wind.

5.4 Merit Features for the Proposed Scheme and Recommendation

5.4.1 Based on the analysis of the simulation result presented in **Section 5.1 to 5.3** above, the Proposed Scheme has maintained an overall comparable wind environment to that of the Base Scheme despite the developments are designed to have a higher profile. A few merit features are observed in the design of the Proposed Scheme compared to the Base Scheme, which includes the reservation of open space in the northwest portion of the Project Area, as well as the openings provided at ground level under the main podium. Such features reduced the blockage of wind at pedestrian level, allowing better wind penetration through the site. Furthermore, a building height restriction (BHR) of 14.5mPD would be implemented on the west portion of the site (i.e. the portion in line with Hoi Yuen Road), which would allow the winds from the open sea to skim over the podium and flow into this major wind corridor and facilitate the wind environment in the Kwun Tong area.

5.4.2 In attempting to further improve the air ventilation performance, a few measures, should it be feasible, can be considered in the future design stage:

- The coverage of podium structure can be considered to minimize, especially at the area elongating Hoi Yuen Road, in attempting to allow better wind entry into the Hoi Yuen Road and Wai Yip Street.
- A further increase of the permeability at ground level maybe considered, if feasible. Such measure can be achieved by reducing the footprint of the lobby at ground.

6 SUMMARY AND CONCLUSIONS

6.1.1 An AVA Initial Study has been conducted to assess the air ventilation performance of the Base Scheme and Proposed Scheme at KTAA through Computational Fluid Dynamics (CFD) modelling.

6.1.2 In accordance with the Joint HPLB and ETWB Technical Circular No. 1/06 on AVA, the wind direction of more than 75% of the time in a year should be covered for the AVA study. For the KTAA development in this AVA Study, 8 annual wind directions and 8 summer wind directions, which contribute for more than 75% time in annual and summer conditions respectively, were simulated for to determine the SVR and LVR before and after the existence of the proposed development.

6.1.3 The predicted SVRw for Base Scheme and Proposed Scheme under annual condition are 0.10 and 0.11 respectively, while under summer condition are 0.16 and 0.17. The averaged LVRw for Base Scheme and Proposed Scheme under annual condition are 0.15 and 0.16 respectively, while under summer condition the LVRw are maintained at 0.20 for both schemes. It can be summarized that the Proposed Scheme has achieved a generally comparable air ventilation performance to that of the Base Scheme.

6.1.4 The Proposed Scheme has incorporated certain merit designs, such as the opening at ground level and the open spaces at the northwest portion of the Project Area. In attempting to further facilitate the air ventilation in the vicinity of the site, improvement measures, such as the reduction of podium coverage and further increase of the permeability at ground level.

6.1.5 To conclude, this study analysed the air ventilation performance of two schemes at Kwun Tong Action Area. The Proposed Scheme has incorporated a number of merit design and the CFD simulation shown that under the annual and summer prevailing winds, it is able to maintain a comparable wind performance to that of the Base Scheme at pedestrian level in the vicinity of Project Area.

- End –

Appendices

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Appendix A - Wind Availability from RAMS Grid (090, 040)
Annual Wind

e_01595	Wind_direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
V_infinity(m/s)	Sum	0.023	0.054	0.077	0.152	0.206	0.109	0.067	0.042	0.043	0.056	0.06	0.04	0.029	0.015	0.012	0.012
00_to_01	0.019	0.001	0.001	0.001	0.001	0.003	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.001	0.001	0.001
01_to_02	0.049	0.003	0.004	0.004	0.004	0.006	0.003	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002
02_to_03	0.077	0.004	0.007	0.008	0.007	0.009	0.006	0.004	0.004	0.005	0.005	0.005	0.004	0.004	0.002	0.002	0.002
03_to_04	0.093	0.003	0.006	0.008	0.009	0.012	0.008	0.006	0.005	0.007	0.007	0.006	0.005	0.005	0.003	0.002	0.002
04_to_05	0.108	0.002	0.005	0.009	0.013	0.016	0.012	0.008	0.006	0.006	0.008	0.006	0.005	0.005	0.003	0.002	0.002
05_to_06	0.121	0.002	0.005	0.01	0.017	0.022	0.015	0.011	0.006	0.005	0.007	0.007	0.005	0.004	0.002	0.002	0.001
06_to_07	0.119	0.002	0.005	0.009	0.02	0.025	0.015	0.009	0.005	0.006	0.006	0.007	0.005	0.003	0.001	0.001	0.001
07_to_08	0.109	0.002	0.004	0.008	0.02	0.025	0.014	0.008	0.004	0.004	0.006	0.006	0.004	0.001	0.001	0.001	0
08_to_09	0.088	0.001	0.004	0.006	0.018	0.023	0.01	0.006	0.003	0.003	0.004	0.005	0.003	0.001	0	0	0
09_to_10	0.069	0.001	0.003	0.004	0.015	0.019	0.009	0.004	0.002	0.001	0.004	0.004	0.002	0	0	0	0
10_to_11	0.052	0.001	0.003	0.003	0.011	0.016	0.006	0.003	0.001	0.001	0.003	0.003	0.001	0	0	0	0
11_to_12	0.035	0	0.002	0.002	0.006	0.012	0.004	0.002	0.001	0	0.002	0.003	0.001	0	0	0	0
12_to_13	0.022	0	0.001	0.001	0.004	0.007	0.002	0.001	0	0	0.001	0.002	0.001	0	0	0	0
13_to_14	0.013	0	0.001	0.001	0.002	0.004	0.002	0.001	0	0	0.001	0.001	0	0	0	0	0
14_to_15	0.008	0	0.001	0.001	0.002	0.003	0.001	0	0	0	0	0	0	0	0	0	0
15_to_16	0.006	0	0.001	0	0.001	0.002	0	0	0	0	0	0	0	0	0	0	0
16_to_17	0.003	0	0	0	0.001	0.001	0	0	0	0	0	0	0	0	0	0	0
17_to_18	0.002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18_to_19	0.001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19_to_20	0.001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20_to_21	0.001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21_to_22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22_to_23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23_to_24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Averaged V_500			6.12	5.88	7.27	7.44	6.72	6.25			6.30	6.33					

Appendix A - Wind Availability from RAMS Grid (090,040)
Summer Wind

e_01595	Wind_direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
V_infinity(m/s)	Sum	0.007	0.01	0.015	0.031	0.093	0.092	0.074	0.082	0.094	0.124	0.143	0.102	0.067	0.031	0.022	0.011
00_to_01	0.022	0.001	0.001	0.001	0.001	0.003	0.001	0.002	0.002	0.001	0.002	0.002	0.001	0.003	0.001	0.001	0.001
01_to_02	0.055	0.001	0.002	0.002	0.003	0.004	0.003	0.003	0.005	0.005	0.006	0.006	0.004	0.006	0.002	0.002	0.001
02_to_03	0.091	0.002	0.002	0.002	0.003	0.006	0.006	0.006	0.007	0.01	0.011	0.012	0.009	0.01	0.002	0.002	0.002
03_to_04	0.108	0.001	0.001	0.001	0.002	0.006	0.007	0.007	0.008	0.012	0.014	0.015	0.014	0.011	0.004	0.002	0.002
04_to_05	0.121	0	0	0.002	0.003	0.008	0.011	0.009	0.01	0.013	0.016	0.014	0.013	0.011	0.006	0.004	0.002
05_to_06	0.121	0	0.001	0.001	0.003	0.009	0.012	0.009	0.01	0.012	0.015	0.017	0.013	0.009	0.005	0.004	0.001
06_to_07	0.105	0	0	0.001	0.001	0.01	0.011	0.007	0.009	0.012	0.012	0.015	0.013	0.006	0.004	0.002	0.001
07_to_08	0.101	0	0	0.001	0.002	0.009	0.011	0.008	0.01	0.01	0.014	0.014	0.011	0.004	0.003	0.002	0.001
08_to_09	0.071	0	0	0	0.002	0.008	0.007	0.006	0.006	0.007	0.01	0.011	0.007	0.002	0.002	0.001	0
09_to_10	0.053	0	0.001	0	0.002	0.006	0.005	0.005	0.004	0.004	0.008	0.009	0.005	0.001	0.001	0	0
10_to_11	0.042	0	0.001	0.001	0.002	0.006	0.004	0.004	0.004	0.002	0.006	0.007	0.004	0.001	0.001	0	0
11_to_12	0.033	0	0	0.001	0.001	0.005	0.003	0.003	0.003	0.001	0.003	0.008	0.003	0.001	0	0	0
12_to_13	0.022	0	0	0	0.002	0.003	0.003	0.002	0.001	0.001	0.003	0.005	0.002	0.001	0	0	0
13_to_14	0.018	0	0	0.001	0.001	0.003	0.003	0.002	0	0	0.003	0.003	0.001	0	0	0	0
14_to_15	0.01	0	0	0.001	0	0.002	0.001	0.001	0	0.001	0.001	0.001	0.001	0	0	0	0
15_to_16	0.009	0	0	0	0.001	0.002	0.001	0.001	0	0.001	0	0.001	0	0	0	0	0
16_to_17	0.005	0	0	0	0.001	0.001	0	0	0	0	0	0.001	0	0	0	0	0
17_to_18	0.002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18_to_19	0.002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19_to_20	0.001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20_to_21	0.001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21_to_22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22_to_23	0.001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23_to_24	0.001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Averaged V_500						7.11	6.58	6.72	5.68	5.59	6.25	6.61	6.00				

Appendix B - Details of the Predicted Wind Velocity Ratio (VR_W)
Annual Winds

	Base Scheme								
Test Point	**NNE**	**NE**	**ENE**	**E**	**ESE**	**SE**	**SSW**	**SW**	
Wind speed at infinity	**6.12**	**5.88**	**7.27**	**7.44**	**6.72**	**6.25**	**6.30**	**6.33**	**VR_w**
Wind probability	**0.054**	**0.077**	**0.152**	**0.206**	**0.109**	**0.067**	**0.056**	**0.060**	**0.781**
P1	0.07	0.12	0.08	0.07	0.09	0.12	0.05	0.10	0.09
P2	0.09	0.15	0.08	0.09	0.15	0.22	0.18	0.28	0.14
P3	0.09	0.15	0.08	0.09	0.19	0.23	0.27	0.27	0.15
P4	0.08	0.13	0.08	0.08	0.20	0.21	0.28	0.27	0.15
P5	0.08	0.12	0.07	0.07	0.19	0.18	0.28	0.27	0.14
P6	0.08	0.10	0.06	0.06	0.16	0.16	0.31	0.31	0.13
P7	0.11	0.08	0.06	0.07	0.14	0.17	0.32	0.33	0.13
P8	0.12	0.08	0.06	0.09	0.12	0.18	0.30	0.30	0.13
P9	0.08	0.09	0.05	0.11	0.18	0.13	0.28	0.26	0.13
P10	0.05	0.04	0.05	0.06	0.12	0.13	0.32	0.31	0.11
P11	0.07	0.02	0.06	0.02	0.16	0.19	0.34	0.38	0.12
P12	0.16	0.02	0.09	0.11	0.34	0.37	0.21	0.19	0.17
P13	0.09	0.01	0.06	0.04	0.06	0.08	0.11	0.07	0.06
P14	0.08	0.03	0.09	0.04	0.10	0.19	0.13	0.03	0.08
P15	0.02	0.04	0.11	0.03	0.14	0.19	0.07	0.07	0.09
P16	0.22	0.07	0.11	0.03	0.14	0.19	0.04	0.23	0.11
P17	0.18	0.08	0.09	0.04	0.13	0.16	0.07	0.21	0.10
P18	0.18	0.09	0.07	0.05	0.12	0.13	0.16	0.29	0.11
P19	0.10	0.06	0.06	0.07	0.06	0.10	0.26	0.25	0.10
P20	0.14	0.05	0.08	0.05	0.12	0.14	0.27	0.30	0.12
P21	0.08	0.04	0.08	0.07	0.04	0.04	0.15	0.20	0.08
P22	0.06	0.02	0.11	0.02	0.04	0.08	0.05	0.09	0.06
P23	0.03	0.05	0.12	0.02	0.10	0.21	0.12	0.19	0.09
P24	0.19	0.06	0.05	0.08	0.09	0.15	0.12	0.15	0.10
P25	0.04	0.11	0.06	0.10	0.08	0.14	0.13	0.21	0.11
P26	0.04	0.14	0.06	0.12	0.06	0.09	0.16	0.22	0.11
P27	0.07	0.06	0.06	0.11	0.06	0.12	0.07	0.11	0.09
P28	0.11	0.05	0.05	0.11	0.08	0.16	0.04	0.07	0.09
P29	0.05	0.02	0.04	0.05	0.06	0.12	0.08	0.10	0.06
P30	0.09	0.05	0.04	0.10	0.06	0.03	0.18	0.20	0.09
P31	0.03	0.02	0.06	0.12	0.07	0.04	0.30	0.35	0.11
P32	0.10	0.11	0.08	0.14	0.09	0.19	0.36	0.39	0.16
P33	0.07	0.04	0.07	0.09	0.08	0.10	0.05	0.08	0.08
P34	0.13	0.04	0.06	0.10	0.16	0.05	0.09	0.06	0.09
P35	0.27	0.03	0.05	0.10	0.10	0.12	0.09	0.11	0.10
P36	0.25	0.09	0.07	0.08	0.04	0.17	0.10	0.14	0.11
P37	0.18	0.14	0.08	0.07	0.04	0.19	0.11	0.14	0.11
P38	0.09	0.11	0.07	0.05	0.03	0.19	0.15	0.12	0.09
P39	0.08	0.12	0.06	0.03	0.03	0.19	0.21	0.17	0.09
P40	0.13	0.09	0.07	0.09	0.02	0.08	0.20	0.26	0.10
P41	0.08	0.01	0.03	0.07	0.07	0.10	0.11	0.15	0.07
P42	0.05	0.02	0.01	0.03	0.06	0.08	0.07	0.08	0.05
P43	0.02	0.05	0.05	0.10	0.04	0.08	0.10	0.07	0.07
P44	0.03	0.05	0.04	0.06	0.07	0.08	0.10	0.05	0.06
P45	0.02	0.04	0.03	0.01	0.03	0.06	0.10	0.12	0.04
P46	0.02	0.03	0.03	0.03	0.03	0.05	0.18	0.18	0.06
P47	0.08	0.10	0.04	0.10	0.24	0.15	0.05	0.04	0.11
P48	0.03	0.14	0.14	0.27	0.22	0.27	0.33	0.42	0.23
P49	0.07	0.08	0.11	0.31	0.30	0.26	0.26	0.32	0.23
P50	0.02	0.10	0.08	0.06	0.31	0.28	0.21	0.21	0.14
P51	0.14	0.03	0.04	0.08	0.25	0.23	0.21	0.09	0.12
P52	0.14	0.06	0.05	0.10	0.16	0.19	0.10	0.03	0.10
P53	0.14	0.14	0.09	0.04	0.12	0.14	0.26	0.13	0.11
P54	0.07	0.12	0.08	0.05	0.10	0.14	0.28	0.16	0.11
P55	0.11	0.08	0.07	0.12	0.15	0.21	0.32	0.26	0.15
P56	0.11	0.06	0.07	0.05	0.43	0.59	0.22	0.22	0.19
P57	0.07	0.09	0.08	0.06	0.09	0.08	0.11	0.22	0.09
P58	0.06	0.12	0.09	0.05	0.06	0.05	0.04	0.16	0.08
P59	0.09	0.15	0.09	0.07	0.05	0.12	0.07	0.19	0.10
P60	0.08	0.10	0.07	0.07	0.05	0.10	0.06	0.06	0.08
Average SVR	**0.09**	**0.07**	**0.06**	**0.07**	**0.11**	**0.15**	**0.16**	**0.18**	**0.10**
P_{Min}	0.02	0.01	0.01	0.01	0.02	0.03	0.04	0.03	0.04
P_{Max}	0.27	0.15	0.14	0.31	0.43	0.59	0.36	0.42	0.23

Appendix B - Details of the Predicted Wind Velocity Ratio (VR_W)
Annual Winds

	Base Scheme								
Test Point	**NNE**	**NE**	**ENE**	**E**	**ESE**	**SE**	**SSW**	**SW**	
Wind speed at infinity	**6.12**	**5.88**	**7.27**	**7.44**	**6.72**	**6.25**	**6.30**	**6.33**	**VR_w**
Wind probability	**0.054**	**0.077**	**0.152**	**0.206**	**0.109**	**0.067**	**0.056**	**0.060**	**0.781**
SG01	0.20	0.03	0.03	0.03	0.18	0.24	0.07	0.05	0.09
SG02	0.17	0.06	0.09	0.02	0.16	0.16	0.11	0.05	0.09
SG03	0.14	0.05	0.10	0.04	0.17	0.14	0.18	0.18	0.11
SG04	0.10	0.07	0.05	0.04	0.20	0.11	0.21	0.18	0.10
SG05	0.09	0.10	0.08	0.15	0.10	0.17	0.28	0.37	0.15
SG06	0.19	0.03	0.02	0.05	0.05	0.06	0.12	0.12	0.07
SG07	0.12	0.03	0.01	0.05	0.07	0.13	0.09	0.13	0.07
SP01	0.15	0.06	0.07	0.05	0.08	0.03	0.06	0.10	0.07
SP02	0.11	0.05	0.07	0.05	0.03	0.07	0.15	0.12	0.07
SP03	0.06	0.05	0.06	0.08	0.04	0.02	0.14	0.13	0.08
SP04	0.23	0.25	0.17	0.06	0.06	0.05	0.17	0.26	0.14
SP05	0.20	0.25	0.20	0.30	0.04	0.05	0.30	0.29	0.21
SP06	0.14	0.19	0.16	0.03	0.01	0.03	0.18	0.20	0.11
SP07	0.10	0.09	0.06	0.11	0.03	0.04	0.25	0.25	0.11
SP08	0.20	0.20	0.13	0.06	0.03	0.03	0.20	0.24	0.12
Average Special VR	**0.15**	**0.10**	**0.09**	**0.08**	**0.09**	**0.09**	**0.17**	**0.18**	**0.11**
P_{Min}	0.06	0.03	0.01	0.02	0.01	0.02	0.06	0.05	0.07
P_{Max}	0.23	0.25	0.20	0.30	0.20	0.24	0.30	0.37	0.21
T1	0.14	0.14	0.08	0.05	0.23	0.22	0.27	0.26	0.14
T2	0.15	0.11	0.10	0.07	0.24	0.22	0.28	0.28	0.15
T3	0.17	0.10	0.10	0.10	0.24	0.19	0.27	0.26	0.16
T4	0.11	0.05	0.11	0.06	0.19	0.23	0.12	0.07	0.11
T5	0.10	0.06	0.10	0.06	0.17	0.20	0.21	0.21	0.12
T6	0.12	0.12	0.07	0.05	0.15	0.15	0.23	0.21	0.12
T7	0.11	0.07	0.04	0.05	0.11	0.08	0.20	0.15	0.08
T8	0.09	0.02	0.05	0.05	0.12	0.10	0.10	0.12	0.07
T9	0.10	0.05	0.09	0.05	0.13	0.13	0.09	0.05	0.08
T10	0.14	0.03	0.08	0.07	0.16	0.16	0.26	0.27	0.12
T11	0.17	0.05	0.09	0.09	0.17	0.21	0.14	0.20	0.13
T12	0.08	0.05	0.04	0.07	0.07	0.14	0.07	0.11	0.07
T13	0.06	0.01	0.02	0.03	0.04	0.05	0.50	0.52	0.10
T14	0.05	0.01	0.02	0.09	0.11	0.18	0.38	0.40	0.12
T15	0.05	0.06	0.06	0.13	0.12	0.17	0.31	0.34	0.13
T16	0.12	0.16	0.12	0.22	0.06	0.08	0.10	0.11	0.13
T17	0.18	0.23	0.04	0.20	0.17	0.13	0.15	0.15	0.15
T18	0.59	0.51	0.35	0.24	0.11	0.09	0.18	0.20	0.27
T19	0.56	0.49	0.34	0.16	0.13	0.13	0.22	0.22	0.25
T20	0.49	0.43	0.30	0.08	0.09	0.10	0.18	0.17	0.20
T21	0.51	0.42	0.27	0.13	0.14	0.19	0.22	0.23	0.23
T22	0.50	0.41	0.28	0.11	0.14	0.19	0.27	0.26	0.23
T23	0.47	0.40	0.27	0.14	0.14	0.19	0.14	0.10	0.21
T24	0.43	0.38	0.26	0.06	0.03	0.03	0.24	0.24	0.17
T25	0.44	0.39	0.27	0.08	0.02	0.01	0.27	0.30	0.19
T26	0.03	0.10	0.04	0.03	0.07	0.09	0.36	0.37	0.09
T27	0.10	0.08	0.06	0.07	0.03	0.07	0.29	0.33	0.10
T28	0.25	0.31	0.23	0.15	0.05	0.11	0.14	0.13	0.16
T29	0.15	0.23	0.19	0.04	0.24	0.28	0.16	0.15	0.16
T30	0.19	0.26	0.18	0.07	0.04	0.06	0.09	0.12	0.11
T31	0.17	0.11	0.10	0.13	0.26	0.31	0.34	0.32	0.18
T32	0.15	0.14	0.14	0.17	0.28	0.35	0.31	0.27	0.20
T33	0.25	0.27	0.21	0.17	0.28	0.33	0.22	0.20	0.22
T34	0.16	0.21	0.19	0.29	0.32	0.40	0.13	0.15	0.24
T35	0.33	0.29	0.19	0.09	0.09	0.08	0.05	0.04	0.13
T36	0.38	0.35	0.21	0.15	0.16	0.17	0.18	0.15	0.20
T37	0.35	0.30	0.21	0.09	0.04	0.02	0.26	0.22	0.16
T38	0.36	0.32	0.24	0.07	0.04	0.04	0.28	0.23	0.16
T39	0.29	0.32	0.27	0.09	0.03	0.12	0.29	0.27	0.18
T40	0.15	0.19	0.13	0.10	0.04	0.13	0.20	0.20	0.12
T41	0.11	0.13	0.09	0.15	0.08	0.15	0.11	0.11	0.11
T42	0.06	0.08	0.10	0.15	0.09	0.15	0.04	0.03	0.10
T43	0.14	0.19	0.18	0.11	0.07	0.14	0.05	0.05	0.12
T44	0.23	0.26	0.20	0.12	0.03	0.06	0.09	0.01	0.12
T45	0.18	0.18	0.17	0.08	0.04	0.01	0.05	0.06	0.09
T46	0.42	0.44	0.34	0.68	0.20	0.22	0.12	0.13	0.38
T47	0.45	0.45	0.33	0.65	0.16	0.07	0.12	0.10	0.35
T48	0.44	0.36	0.25	0.59	0.12	0.14	0.21	0.17	0.32
T49	0.47	0.33	0.18	0.64	0.05	0.08	0.37	0.38	0.33
T50	0.16	0.18	0.09	0.34	0.12	0.10	0.13	0.17	0.18
T51	0.09	0.10	0.07	0.32	0.05	0.06	0.09	0.11	0.14
T52	0.67	0.76	0.61	0.64	0.10	0.18	0.34	0.33	0.48
T53	0.68	0.77	0.63	0.64	0.16	0.21	0.38	0.38	0.51
T54	0.17	0.36	0.39	0.30	0.31	0.33	0.38	0.39	0.33

Appendix B - Details of the Predicted Wind Velocity Ratio (VR_W)
Annual Winds

	Base Scheme								
Test Point	**NNE**	**NE**	**ENE**	**E**	**ESE**	**SE**	**SSW**	**SW**	
Wind speed at infinity	**6.12**	**5.88**	**7.27**	**7.44**	**6.72**	**6.25**	**6.30**	**6.33**	**VR_w**
Wind probability	**0.054**	**0.077**	**0.152**	**0.206**	**0.109**	**0.067**	**0.056**	**0.060**	**0.781**
T55	0.13	0.15	0.19	0.08	0.33	0.38	0.32	0.32	0.20
T56	0.21	0.13	0.08	0.13	0.28	0.33	0.22	0.22	0.17
T57	0.46	0.34	0.17	0.18	0.33	0.52	0.41	0.42	0.29
T58	0.30	0.28	0.30	0.25	0.34	0.49	0.40	0.42	0.32
T59	0.71	0.65	0.53	0.55	0.03	0.02	0.26	0.32	0.40
T60	0.78	0.72	0.52	0.58	0.03	0.13	0.32	0.39	0.44
T61	0.77	0.74	0.61	0.64	0.07	0.03	0.35	0.41	0.48
T62	0.73	0.74	0.61	0.64	0.08	0.12	0.38	0.44	0.49
T63	0.74	0.70	0.55	0.61	0.09	0.11	0.36	0.43	0.46
T64	0.70	0.78	0.60	0.67	0.10	0.15	0.33	0.32	0.49
T65	0.53	0.38	0.21	0.68	0.07	0.05	0.32	0.32	0.35
T66	0.04	0.08	0.04	0.08	0.07	0.01	0.17	0.19	0.07
T67	0.19	0.22	0.09	0.15	0.15	0.19	0.18	0.17	0.15
T68	0.16	0.16	0.06	0.14	0.10	0.29	0.27	0.19	0.14
T69	0.05	0.05	0.10	0.19	0.17	0.11	0.25	0.25	0.14
T70	0.04	0.08	0.12	0.11	0.17	0.08	0.29	0.30	0.13
T71	0.07	0.10	0.12	0.05	0.15	0.06	0.31	0.30	0.12
T72	0.24	0.06	0.08	0.35	0.07	0.05	0.33	0.36	0.19
T73	0.32	0.03	0.08	0.50	0.20	0.03	0.35	0.40	0.25
Average LVR	**0.19**	**0.17**	**0.14**	**0.15**	**0.12**	**0.15**	**0.20**	**0.21**	0.15
T_{Min}	0.03	0.01	0.02	0.03	0.02	0.01	0.04	0.01	0.02
T_{Max}	0.78	0.78	0.63	0.68	0.34	0.52	0.50	0.52	0.51

Appendix B - Details of the Predicted Wind Velocity Ratio (VR_W)
Annual Winds

Test Point	Proposed Scheme								VR_w
	NNE	NE	ENE	E	ESE	SE	SSW	SW	
Wind speed at infinity	6.12	5.88	7.27	7.44	6.72	6.25	6.30	6.33	
Wind probability	0.054	0.077	0.152	0.206	0.109	0.067	0.056	0.060	0.781
P1	0.03	0.10	0.08	0.06	0.13	0.16	0.03	0.09	0.09
P2	0.04	0.16	0.07	0.03	0.23	0.12	0.12	0.23	0.12
P3	0.12	0.19	0.07	0.02	0.20	0.05	0.20	0.27	0.12
P4	0.13	0.20	0.07	0.05	0.15	0.07	0.30	0.29	0.13
P5	0.12	0.18	0.04	0.09	0.13	0.07	0.32	0.30	0.14
P6	0.11	0.14	0.02	0.12	0.13	0.06	0.32	0.31	0.13
P7	0.10	0.09	0.03	0.14	0.16	0.05	0.34	0.33	0.14
P8	0.11	0.06	0.03	0.12	0.20	0.03	0.31	0.32	0.13
P9	0.11	0.05	0.02	0.12	0.15	0.19	0.29	0.29	0.14
P10	0.07	0.05	0.03	0.13	0.13	0.13	0.31	0.31	0.13
P11	0.05	0.06	0.04	0.10	0.16	0.17	0.33	0.37	0.14
P12	0.12	0.02	0.12	0.08	0.34	0.33	0.22	0.20	0.17
P13	0.03	0.01	0.06	0.04	0.06	0.08	0.09	0.07	0.06
P14	0.04	0.02	0.08	0.04	0.08	0.19	0.08	0.06	0.07
P15	0.03	0.02	0.11	0.05	0.10	0.16	0.09	0.14	0.09
P16	0.17	0.09	0.11	0.06	0.15	0.06	0.12	0.27	0.12
P17	0.19	0.12	0.09	0.10	0.19	0.02	0.15	0.27	0.13
P18	0.18	0.10	0.06	0.10	0.17	0.11	0.22	0.32	0.14
P19	0.12	0.10	0.05	0.01	0.07	0.05	0.27	0.26	0.09
P20	0.12	0.09	0.07	0.04	0.09	0.07	0.27	0.29	0.11
P21	0.08	0.03	0.06	0.05	0.03	0.04	0.18	0.23	0.08
P22	0.07	0.03	0.11	0.02	0.05	0.11	0.05	0.08	0.06
P23	0.02	0.05	0.11	0.04	0.08	0.16	0.11	0.17	0.09
P24	0.18	0.08	0.05	0.10	0.05	0.14	0.12	0.14	0.10
P25	0.07	0.08	0.08	0.15	0.07	0.14	0.16	0.22	0.12
P26	0.06	0.13	0.02	0.16	0.09	0.14	0.18	0.21	0.12
P27	0.07	0.04	0.08	0.06	0.11	0.15	0.13	0.17	0.10
P28	0.15	0.09	0.08	0.03	0.10	0.11	0.10	0.13	0.09
P29	0.15	0.06	0.06	0.03	0.09	0.07	0.13	0.21	0.08
P30	0.14	0.10	0.02	0.05	0.03	0.12	0.28	0.28	0.10
P31	0.08	0.08	0.02	0.03	0.02	0.08	0.38	0.41	0.10
P32	0.10	0.06	0.04	0.06	0.14	0.12	0.33	0.37	0.12
P33	0.20	0.07	0.05	0.06	0.02	0.05	0.31	0.26	0.10
P34	0.17	0.08	0.07	0.05	0.02	0.08	0.15	0.15	0.08
P35	0.16	0.19	0.16	0.15	0.03	0.12	0.16	0.14	0.14
P36	0.21	0.22	0.17	0.16	0.06	0.14	0.16	0.14	0.16
P37	0.24	0.25	0.19	0.17	0.08	0.14	0.09	0.10	0.17
P38	0.22	0.23	0.18	0.16	0.09	0.09	0.10	0.08	0.15
P39	0.15	0.18	0.15	0.12	0.06	0.12	0.27	0.20	0.15
P40	0.13	0.18	0.15	0.15	0.01	0.02	0.03	0.03	0.11
P41	0.06	0.07	0.05	0.09	0.10	0.19	0.31	0.27	0.12
P42	0.05	0.05	0.02	0.07	0.13	0.27	0.35	0.34	0.13
P43	0.08	0.11	0.02	0.04	0.10	0.21	0.32	0.32	0.12
P44	0.17	0.13	0.03	0.08	0.06	0.12	0.32	0.35	0.13
P45	0.02	0.06	0.02	0.04	0.06	0.12	0.09	0.09	0.06
P46	0.04	0.03	0.03	0.02	0.07	0.14	0.13	0.13	0.06
P47	0.08	0.09	0.02	0.05	0.18	0.03	0.03	0.07	0.07
P48	0.06	0.06	0.11	0.23	0.21	0.22	0.35	0.41	0.20
P49	0.08	0.05	0.09	0.27	0.30	0.27	0.26	0.32	0.21
P50	0.02	0.06	0.06	0.03	0.30	0.25	0.19	0.13	0.12
P51	0.10	0.01	0.03	0.03	0.24	0.21	0.15	0.04	0.09
P52	0.11	0.04	0.03	0.04	0.15	0.17	0.05	0.03	0.07
P53	0.15	0.12	0.06	0.05	0.10	0.12	0.23	0.04	0.10
P54	0.09	0.11	0.06	0.05	0.10	0.15	0.26	0.10	0.10
P55	0.10	0.08	0.04	0.10	0.14	0.19	0.30	0.18	0.13
P56	0.14	0.08	0.09	0.08	0.43	0.54	0.20	0.21	0.20
P57	0.13	0.08	0.09	0.05	0.08	0.08	0.13	0.19	0.10
P58	0.10	0.11	0.10	0.03	0.05	0.10	0.05	0.13	0.08
P59	0.11	0.13	0.09	0.02	0.07	0.21	0.02	0.16	0.09
P60	0.05	0.07	0.07	0.07	0.09	0.24	0.04	0.04	0.08
Average SVR	**0.10**	**0.09**	**0.07**	**0.07**	**0.12**	**0.13**	**0.19**	**0.20**	**0.11**
P_{Min}	0.02	0.01	0.02	0.01	0.01	0.02	0.02	0.03	0.06
P_{Max}	0.24	0.25	0.19	0.27	0.43	0.54	0.38	0.41	0.21

Appendix B - Details of the Predicted Wind Velocity Ratio (VR_W)
Annual Winds

	Proposed Scheme								
Test Point	**NNE**	**NE**	**ENE**	**E**	**ESE**	**SE**	**SSW**	**SW**	
Wind speed at infinity	**6.12**	**5.88**	**7.27**	**7.44**	**6.72**	**6.25**	**6.30**	**6.33**	**VR_w**
Wind probability	**0.054**	**0.077**	**0.152**	**0.206**	**0.109**	**0.067**	**0.056**	**0.060**	**0.781**
SG01	0.12	0.01	0.04	0.05	0.18	0.06	0.07	0.07	0.08
SG02	0.14	0.07	0.11	0.11	0.14	0.04	0.14	0.18	0.12
SG03	0.09	0.06	0.10	0.14	0.10	0.03	0.35	0.34	0.14
SG04	0.06	0.12	0.04	0.11	0.03	0.04	0.29	0.28	0.11
SG05	0.13	0.06	0.02	0.06	0.12	0.09	0.32	0.32	0.11
SG06	0.16	0.17	0.14	0.11	0.05	0.06	0.16	0.20	0.13
SG07	0.07	0.10	0.07	0.10	0.08	0.14	0.22	0.27	0.12
SP01	0.05	0.04	0.04	0.08	0.06	0.07	0.28	0.25	0.09
SP02	0.11	0.02	0.08	0.13	0.08	0.03	0.11	0.05	0.09
SP03	0.05	0.11	0.04	0.11	0.08	0.13	0.36	0.32	0.13
SP04	0.24	0.25	0.17	0.09	0.04	0.07	0.12	0.20	0.14
SP05	0.20	0.25	0.20	0.29	0.03	0.03	0.35	0.34	0.22
SP06	0.17	0.21	0.15	0.06	0.02	0.06	0.15	0.15	0.11
SP07	0.16	0.09	0.05	0.13	0.04	0.05	0.30	0.33	0.13
SP08	0.16	0.17	0.11	0.05	0.04	0.03	0.26	0.30	0.12
Average Special VR	**0.13**	**0.12**	**0.10**	**0.11**	**0.08**	**0.07**	**0.24**	**0.24**	**0.13**
P_{Min}	0.05	0.01	0.02	0.05	0.02	0.03	0.07	0.05	0.08
P_{Max}	0.24	0.25	0.20	0.29	0.18	0.14	0.36	0.34	0.22
T1	0.15	0.14	0.08	0.06	0.23	0.12	0.27	0.26	0.14
T2	0.15	0.10	0.10	0.06	0.23	0.14	0.29	0.28	0.14
T3	0.16	0.08	0.10	0.07	0.23	0.11	0.27	0.26	0.14
T4	0.12	0.08	0.11	0.05	0.15	0.10	0.13	0.07	0.10
T5	0.10	0.07	0.10	0.07	0.14	0.05	0.21	0.21	0.11
T6	0.12	0.12	0.07	0.07	0.13	0.02	0.23	0.21	0.10
T7	0.12	0.06	0.04	0.07	0.07	0.03	0.20	0.15	0.08
T8	0.10	0.04	0.06	0.07	0.07	0.03	0.11	0.12	0.07
T9	0.11	0.04	0.09	0.06	0.07	0.05	0.09	0.05	0.07
T10	0.15	0.02	0.08	0.06	0.10	0.08	0.27	0.27	0.10
T11	0.17	0.04	0.09	0.03	0.11	0.11	0.13	0.20	0.09
T12	0.04	0.04	0.03	0.06	0.05	0.10	0.08	0.13	0.06
T13	0.02	0.01	0.02	0.02	0.04	0.03	0.50	0.52	0.10
T14	0.04	0.04	0.03	0.11	0.08	0.13	0.37	0.40	0.13
T15	0.05	0.01	0.05	0.13	0.09	0.09	0.30	0.33	0.12
T16	0.12	0.15	0.06	0.21	0.05	0.08	0.12	0.07	0.12
T17	0.15	0.21	0.05	0.19	0.17	0.11	0.17	0.13	0.15
T18	0.58	0.50	0.35	0.23	0.08	0.03	0.10	0.16	0.25
T19	0.55	0.48	0.34	0.11	0.10	0.06	0.16	0.19	0.22
T20	0.50	0.43	0.30	0.07	0.06	0.06	0.14	0.15	0.19
T21	0.49	0.39	0.27	0.14	0.10	0.10	0.14	0.11	0.20
T22	0.48	0.37	0.28	0.11	0.09	0.11	0.15	0.13	0.19
T23	0.45	0.37	0.27	0.14	0.11	0.12	0.22	0.24	0.21
T24	0.42	0.35	0.26	0.07	0.05	0.03	0.23	0.23	0.17
T25	0.47	0.38	0.28	0.08	0.04	0.03	0.27	0.27	0.19
T26	0.06	0.10	0.04	0.05	0.04	0.05	0.39	0.41	0.10
T27	0.21	0.11	0.07	0.04	0.12	0.19	0.21	0.25	0.11
T28	0.28	0.28	0.22	0.08	0.11	0.26	0.15	0.15	0.16
T29	0.15	0.21	0.16	0.07	0.18	0.13	0.32	0.36	0.16
T30	0.14	0.18	0.12	0.11	0.05	0.02	0.04	0.03	0.09
T31	0.12	0.07	0.07	0.09	0.25	0.31	0.40	0.44	0.17
T32	0.12	0.11	0.13	0.15	0.27	0.35	0.36	0.41	0.20
T33	0.24	0.26	0.21	0.13	0.28	0.33	0.18	0.16	0.21
T34	0.13	0.18	0.15	0.28	0.32	0.39	0.13	0.16	0.23
T35	0.33	0.31	0.20	0.11	0.08	0.09	0.05	0.06	0.14
T36	0.38	0.35	0.22	0.12	0.15	0.14	0.16	0.15	0.18
T37	0.35	0.30	0.22	0.04	0.04	0.05	0.23	0.20	0.14
T38	0.35	0.32	0.25	0.09	0.04	0.05	0.24	0.20	0.16
T39	0.28	0.31	0.27	0.08	0.05	0.13	0.30	0.32	0.18
T40	0.14	0.18	0.13	0.09	0.06	0.14	0.28	0.29	0.13
T41	0.11	0.12	0.09	0.14	0.08	0.15	0.29	0.29	0.14
T42	0.06	0.08	0.10	0.15	0.08	0.16	0.26	0.26	0.13
T43	0.13	0.18	0.18	0.11	0.06	0.15	0.23	0.25	0.15
T44	0.24	0.26	0.20	0.11	0.02	0.08	0.17	0.22	0.14
T45	0.20	0.19	0.16	0.10	0.04	0.05	0.14	0.20	0.12
T46	0.41	0.42	0.33	0.67	0.20	0.09	0.18	0.20	0.37
T47	0.44	0.43	0.33	0.65	0.14	0.15	0.12	0.09	0.36
T48	0.40	0.31	0.24	0.59	0.12	0.15	0.22	0.23	0.33
T49	0.44	0.28	0.16	0.64	0.04	0.08	0.36	0.39	0.33
T50	0.16	0.18	0.09	0.34	0.12	0.10	0.11	0.12	0.18
T51	0.08	0.09	0.07	0.32	0.05	0.07	0.07	0.07	0.14
T52	0.67	0.75	0.61	0.63	0.11	0.17	0.33	0.32	0.48
T53	0.68	0.76	0.63	0.63	0.14	0.24	0.37	0.35	0.50
T54	0.16	0.37	0.41	0.31	0.30	0.32	0.37	0.39	0.33

Appendix B - Details of the Predicted Wind Velocity Ratio (VR_W)
Annual Winds

Test Point	NNE	NE	ENE	E	ESE	SE	SSW	SW	
	Proposed Scheme								
Wind speed at infinity	**6.12**	**5.88**	**7.27**	**7.44**	**6.72**	**6.25**	**6.30**	**6.33**	**VR_w**
Wind probability	**0.054**	**0.077**	**0.152**	**0.206**	**0.109**	**0.067**	**0.056**	**0.060**	**0.781**
T55	0.14	0.14	0.21	0.08	0.32	0.37	0.32	0.32	0.20
T56	0.21	0.13	0.08	0.12	0.27	0.32	0.21	0.21	0.17
T57	0.46	0.32	0.19	0.18	0.32	0.50	0.41	0.42	0.29
T58	0.30	0.29	0.32	0.26	0.34	0.48	0.40	0.42	0.33
T59	0.71	0.64	0.52	0.54	0.02	0.03	0.28	0.36	0.40
T60	0.77	0.70	0.50	0.58	0.04	0.19	0.33	0.39	0.44
T61	0.77	0.74	0.61	0.64	0.05	0.04	0.37	0.43	0.48
T62	0.72	0.75	0.60	0.64	0.09	0.04	0.39	0.45	0.48
T63	0.74	0.69	0.55	0.61	0.07	0.15	0.37	0.43	0.46
T64	0.70	0.76	0.59	0.67	0.11	0.14	0.35	0.37	0.49
T65	0.51	0.31	0.17	0.67	0.08	0.04	0.30	0.30	0.33
T66	0.05	0.08	0.07	0.08	0.07	0.01	0.17	0.18	0.08
T67	0.21	0.23	0.12	0.17	0.13	0.16	0.24	0.28	0.17
T68	0.12	0.16	0.14	0.18	0.09	0.22	0.34	0.33	0.17
T69	0.10	0.11	0.10	0.16	0.16	0.09	0.22	0.09	0.14
T70	0.11	0.09	0.11	0.07	0.16	0.09	0.27	0.14	0.12
T71	0.06	0.05	0.10	0.05	0.14	0.07	0.29	0.11	0.10
T72	0.22	0.07	0.07	0.37	0.07	0.05	0.34	0.38	0.20
T73	0.29	0.05	0.07	0.48	0.19	0.07	0.39	0.47	0.27
Average LVR	**0.20**	**0.18**	**0.14**	**0.15**	**0.12**	**0.13**	**0.22**	**0.23**	**0.16**
T_{Min}	0.02	0.01	0.02	0.02	0.02	0.01	0.04	0.03	0.06
T_{Max}	0.77	0.76	0.63	0.67	0.34	0.50	0.50	0.52	0.50

Appendix B - Details of the Predicted Wind Velocity Ratio (VR_W)
Summer Winds

	Base Scheme								
Test Point	**E**	**ESE**	**SE**	**SSE**	**S**	**SSW**	**SW**	**WSW**	
Wind speed at infinity	**7.11**	**6.58**	**6.72**	**5.68**	**5.59**	**6.25**	**6.61**	**6.00**	**VR_w**
Wind probability	**0.093**	**0.092**	**0.074**	**0.082**	**0.094**	**0.124**	**0.143**	**0.102**	**0.804**
P1	0.07	0.09	0.11	0.13	0.06	0.06	0.10	0.20	0.11
P2	0.10	0.15	0.21	0.26	0.17	0.18	0.26	0.27	0.21
P3	0.10	0.20	0.21	0.29	0.28	0.27	0.26	0.27	0.24
P4	0.09	0.20	0.19	0.29	0.31	0.29	0.26	0.27	0.25
P5	0.07	0.19	0.17	0.28	0.35	0.28	0.26	0.28	0.25
P6	0.07	0.17	0.15	0.27	0.42	0.31	0.30	0.32	0.26
P7	0.07	0.14	0.16	0.28	0.46	0.32	0.32	0.35	0.28
P8	0.09	0.12	0.16	0.25	0.48	0.30	0.29	0.29	0.26
P9	0.12	0.18	0.12	0.15	0.36	0.28	0.25	0.13	0.21
P10	0.06	0.12	0.12	0.14	0.31	0.32	0.30	0.14	0.21
P11	0.02	0.16	0.18	0.21	0.27	0.35	0.37	0.31	0.25
P12	0.11	0.35	0.34	0.42	0.54	0.21	0.18	0.20	0.29
P13	0.04	0.06	0.07	0.08	0.15	0.12	0.07	0.32	0.12
P14	0.04	0.10	0.18	0.20	0.16	0.13	0.03	0.28	0.14
P15	0.04	0.15	0.18	0.22	0.17	0.07	0.07	0.28	0.14
P16	0.04	0.15	0.17	0.28	0.08	0.04	0.22	0.31	0.17
P17	0.04	0.13	0.15	0.26	0.37	0.07	0.21	0.28	0.19
P18	0.05	0.12	0.12	0.22	0.28	0.16	0.27	0.27	0.20
P19	0.07	0.06	0.10	0.15	0.10	0.26	0.23	0.14	0.16
P20	0.05	0.12	0.13	0.21	0.10	0.27	0.28	0.25	0.19
P21	0.07	0.04	0.04	0.07	0.05	0.15	0.19	0.27	0.13
P22	0.02	0.04	0.08	0.14	0.08	0.05	0.09	0.23	0.09
P23	0.02	0.10	0.19	0.25	0.14	0.12	0.18	0.29	0.17
P24	0.09	0.09	0.14	0.16	0.18	0.12	0.14	0.18	0.14
P25	0.11	0.08	0.13	0.15	0.22	0.14	0.20	0.25	0.17
P26	0.13	0.06	0.08	0.06	0.13	0.17	0.21	0.25	0.15
P27	0.12	0.06	0.11	0.14	0.10	0.07	0.11	0.19	0.12
P28	0.11	0.08	0.14	0.17	0.04	0.04	0.07	0.06	0.09
P29	0.05	0.06	0.11	0.13	0.04	0.08	0.10	0.09	0.09
P30	0.10	0.06	0.03	0.02	0.17	0.18	0.19	0.20	0.13
P31	0.13	0.07	0.04	0.01	0.25	0.31	0.33	0.35	0.21
P32	0.15	0.09	0.18	0.09	0.26	0.36	0.38	0.34	0.25
P33	0.10	0.08	0.09	0.17	0.16	0.05	0.07	0.09	0.10
P34	0.10	0.17	0.05	0.21	0.10	0.09	0.06	0.11	0.11
P35	0.10	0.11	0.12	0.26	0.14	0.10	0.10	0.16	0.14
P36	0.09	0.04	0.16	0.30	0.27	0.10	0.13	0.14	0.15
P37	0.07	0.05	0.18	0.33	0.36	0.11	0.14	0.05	0.16
P38	0.05	0.03	0.18	0.30	0.38	0.16	0.11	0.05	0.16
P39	0.03	0.04	0.18	0.30	0.43	0.21	0.16	0.14	0.19
P40	0.09	0.02	0.08	0.13	0.19	0.20	0.24	0.10	0.15
P41	0.07	0.07	0.10	0.11	0.11	0.11	0.14	0.16	0.12
P42	0.04	0.06	0.07	0.10	0.08	0.07	0.08	0.15	0.09
P43	0.10	0.04	0.07	0.08	0.17	0.10	0.07	0.09	0.10
P44	0.06	0.07	0.07	0.10	0.15	0.10	0.05	0.10	0.09
P45	0.01	0.03	0.05	0.06	0.05	0.10	0.11	0.12	0.08
P46	0.03	0.03	0.05	0.09	0.14	0.18	0.17	0.12	0.12
P47	0.10	0.24	0.14	0.20	0.40	0.05	0.04	0.17	0.16
P48	0.28	0.22	0.25	0.33	0.26	0.33	0.40	0.32	0.31
P49	0.32	0.31	0.24	0.34	0.37	0.26	0.31	0.21	0.30
P50	0.06	0.31	0.26	0.35	0.44	0.22	0.20	0.10	0.24
P51	0.08	0.25	0.21	0.31	0.39	0.21	0.08	0.05	0.19
P52	0.10	0.16	0.18	0.24	0.22	0.10	0.03	0.07	0.13
P53	0.05	0.12	0.13	0.21	0.22	0.26	0.12	0.06	0.15
P54	0.05	0.10	0.13	0.15	0.28	0.28	0.15	0.08	0.16
P55	0.12	0.15	0.20	0.21	0.29	0.33	0.25	0.14	0.22
P56	0.06	0.44	0.55	0.65	0.51	0.22	0.21	0.24	0.34
P57	0.06	0.09	0.08	0.10	0.17	0.11	0.21	0.32	0.16
P58	0.05	0.06	0.05	0.07	0.15	0.04	0.16	0.29	0.12
P59	0.07	0.05	0.11	0.08	0.14	0.07	0.18	0.29	0.13
P60	0.07	0.05	0.09	0.07	0.14	0.06	0.06	0.13	0.09
Average SVR	**0.08**	**0.12**	**0.14**	**0.19**	**0.23**	**0.17**	**0.17**	**0.19**	**0.17**
P_{Min}	0.01	0.02	0.03	0.01	0.04	0.04	0.03	0.05	0.08
P_{Max}	0.32	0.44	0.55	0.65	0.54	0.36	0.40	0.35	0.34

Appendix B - Details of the Predicted Wind Velocity Ratio (VR_W)
Summer Winds

	Base Scheme								
Test Point	**E**	**ESE**	**SE**	**SSE**	**S**	**SSW**	**SW**	**WSW**	
Wind speed at infinity	**7.11**	**6.58**	**6.72**	**5.68**	**5.59**	**6.25**	**6.61**	**6.00**	**VR_w**
Wind probability	**0.093**	**0.092**	**0.074**	**0.082**	**0.094**	**0.124**	**0.143**	**0.102**	**0.804**
SG01	0.03	0.18	0.22	0.33	0.20	0.07	0.05	0.05	0.13
SG02	0.02	0.16	0.15	0.26	0.42	0.11	0.05	0.20	0.17
SG03	0.04	0.18	0.13	0.24	0.36	0.18	0.18	0.12	0.18
SG04	0.04	0.20	0.10	0.20	0.27	0.21	0.18	0.16	0.18
SG05	0.16	0.10	0.16	0.12	0.24	0.28	0.36	0.35	0.24
SG06	0.06	0.05	0.06	0.06	0.11	0.12	0.12	0.04	0.09
SG07	0.05	0.07	0.12	0.18	0.14	0.09	0.13	0.08	0.11
SP01	0.05	0.08	0.03	0.05	0.19	0.06	0.10	0.26	0.11
SP02	0.05	0.03	0.07	0.10	0.19	0.15	0.11	0.03	0.10
SP03	0.08	0.04	0.02	0.03	0.33	0.14	0.13	0.11	0.12
SP04	0.06	0.06	0.05	0.07	0.21	0.17	0.25	0.30	0.16
SP05	0.31	0.04	0.05	0.08	0.47	0.31	0.28	0.23	0.24
SP06	0.03	0.01	0.03	0.03	0.10	0.18	0.19	0.24	0.12
SP07	0.11	0.03	0.04	0.04	0.33	0.25	0.24	0.20	0.17
SP08	0.06	0.03	0.03	0.03	0.19	0.20	0.23	0.24	0.15
Average Special VR	**0.08**	**0.08**	**0.09**	**0.12**	**0.26**	**0.17**	**0.18**	**0.18**	**0.16**
P_{Min}	0.02	0.01	0.02	0.03	0.10	0.06	0.05	0.03	0.09
P_{Max}	0.31	0.20	0.22	0.33	0.47	0.31	0.36	0.35	0.24
T1	0.05	0.24	0.20	0.29	0.53	0.27	0.25	0.26	0.26
T2	0.07	0.24	0.20	0.28	0.53	0.29	0.26	0.28	0.27
T3	0.10	0.25	0.18	0.24	0.52	0.27	0.25	0.27	0.26
T4	0.06	0.19	0.22	0.31	0.30	0.13	0.07	0.20	0.17
T5	0.06	0.18	0.18	0.27	0.32	0.21	0.20	0.21	0.21
T6	0.06	0.16	0.14	0.23	0.33	0.23	0.20	0.20	0.20
T7	0.05	0.11	0.08	0.16	0.32	0.20	0.14	0.12	0.15
T8	0.05	0.12	0.09	0.17	0.32	0.10	0.11	0.12	0.13
T9	0.05	0.14	0.12	0.18	0.25	0.09	0.05	0.19	0.13
T10	0.08	0.16	0.15	0.20	0.29	0.27	0.25	0.26	0.21
T11	0.09	0.18	0.20	0.26	0.36	0.14	0.19	0.22	0.20
T12	0.08	0.07	0.13	0.17	0.22	0.07	0.11	0.11	0.12
T13	0.04	0.04	0.04	0.07	0.43	0.50	0.50	0.50	0.29
T14	0.10	0.11	0.16	0.20	0.29	0.38	0.38	0.41	0.27
T15	0.13	0.12	0.16	0.18	0.31	0.32	0.33	0.38	0.25
T16	0.23	0.06	0.08	0.10	0.35	0.11	0.10	0.12	0.14
T17	0.21	0.18	0.12	0.06	0.34	0.15	0.14	0.13	0.16
T18	0.25	0.11	0.08	0.07	0.15	0.18	0.20	0.25	0.16
T19	0.16	0.13	0.12	0.14	0.32	0.22	0.21	0.26	0.20
T20	0.08	0.10	0.09	0.14	0.26	0.18	0.16	0.18	0.15
T21	0.13	0.14	0.18	0.21	0.38	0.22	0.22	0.23	0.21
T22	0.11	0.14	0.18	0.23	0.45	0.28	0.25	0.27	0.24
T23	0.15	0.15	0.18	0.19	0.23	0.14	0.10	0.11	0.14
T24	0.06	0.03	0.02	0.05	0.32	0.24	0.23	0.26	0.16
T25	0.09	0.02	0.01	0.09	0.29	0.28	0.29	0.32	0.19
T26	0.03	0.07	0.09	0.15	0.40	0.36	0.35	0.32	0.24
T27	0.08	0.04	0.06	0.07	0.15	0.29	0.32	0.34	0.18
T28	0.16	0.05	0.10	0.05	0.17	0.14	0.13	0.12	0.11
T29	0.04	0.24	0.26	0.20	0.30	0.16	0.14	0.19	0.18
T30	0.07	0.04	0.05	0.07	0.15	0.09	0.12	0.15	0.09
T31	0.14	0.26	0.29	0.23	0.43	0.34	0.30	0.29	0.28
T32	0.18	0.28	0.32	0.24	0.32	0.31	0.26	0.22	0.26
T33	0.17	0.29	0.31	0.18	0.13	0.23	0.20	0.18	0.20
T34	0.30	0.33	0.37	0.25	0.20	0.13	0.14	0.20	0.22
T35	0.09	0.09	0.08	0.05	0.08	0.05	0.04	0.12	0.07
T36	0.16	0.17	0.15	0.12	0.20	0.18	0.14	0.16	0.16
T37	0.10	0.04	0.02	0.04	0.27	0.27	0.21	0.20	0.15
T38	0.08	0.04	0.03	0.05	0.27	0.28	0.22	0.20	0.16
T39	0.09	0.03	0.11	0.25	0.10	0.29	0.26	0.28	0.18
T40	0.10	0.04	0.12	0.26	0.35	0.20	0.19	0.21	0.18
T41	0.16	0.08	0.14	0.30	0.41	0.11	0.11	0.14	0.17
T42	0.16	0.09	0.14	0.33	0.46	0.04	0.03	0.04	0.14
T43	0.11	0.07	0.13	0.33	0.47	0.05	0.05	0.06	0.14
T44	0.13	0.03	0.05	0.23	0.42	0.09	0.01	0.01	0.11
T45	0.08	0.04	0.01	0.17	0.35	0.05	0.06	0.08	0.10
T46	0.71	0.21	0.20	0.21	0.35	0.12	0.12	0.11	0.24
T47	0.68	0.16	0.07	0.26	0.43	0.12	0.10	0.10	0.22
T48	0.62	0.13	0.13	0.26	0.42	0.21	0.17	0.05	0.24
T49	0.67	0.05	0.07	0.15	0.36	0.37	0.37	0.28	0.30
T50	0.35	0.12	0.10	0.19	0.22	0.13	0.16	0.18	0.18
T51	0.33	0.05	0.06	0.10	0.17	0.09	0.11	0.13	0.12
T52	0.67	0.10	0.17	0.21	0.39	0.34	0.32	0.31	0.31
T53	0.67	0.16	0.20	0.29	0.41	0.39	0.36	0.31	0.35
T54	0.32	0.31	0.31	0.43	0.51	0.38	0.37	0.38	0.37

Appendix B - Details of the Predicted Wind Velocity Ratio (VR_W)
Summer Winds

Test Point	Base Scheme								
	E	ESE	SE	SSE	S	SSW	SW	WSW	
Wind speed at infinity	7.11	6.58	6.72	5.68	5.59	6.25	6.61	6.00	VR_w
Wind probability	0.093	0.092	0.074	0.082	0.094	0.124	0.143	0.102	0.804
T55	0.08	0.33	0.36	0.52	0.52	0.33	0.31	0.32	0.34
T56	0.13	0.28	0.31	0.44	0.48	0.23	0.21	0.24	0.27
T57	0.19	0.33	0.48	0.62	0.57	0.41	0.40	0.43	0.42
T58	0.26	0.35	0.46	0.60	0.55	0.41	0.40	0.42	0.42
T59	0.57	0.03	0.02	0.10	0.10	0.26	0.30	0.38	0.23
T60	0.61	0.03	0.13	0.25	0.26	0.32	0.37	0.45	0.31
T61	0.67	0.07	0.03	0.03	0.10	0.35	0.39	0.46	0.28
T62	0.67	0.08	0.12	0.13	0.18	0.39	0.42	0.47	0.32
T63	0.64	0.09	0.10	0.23	0.33	0.37	0.41	0.47	0.34
T64	0.71	0.11	0.14	0.20	0.31	0.33	0.31	0.28	0.30
T65	0.71	0.07	0.05	0.04	0.28	0.32	0.31	0.31	0.27
T66	0.09	0.07	0.01	0.12	0.11	0.17	0.19	0.25	0.13
T67	0.15	0.15	0.18	0.28	0.36	0.18	0.16	0.18	0.20
T68	0.15	0.10	0.27	0.45	0.60	0.27	0.18	0.23	0.27
T69	0.20	0.17	0.10	0.04	0.23	0.25	0.24	0.11	0.17
T70	0.11	0.17	0.08	0.09	0.21	0.29	0.29	0.03	0.17
T71	0.06	0.15	0.06	0.11	0.26	0.31	0.28	0.10	0.18
T72	0.36	0.07	0.05	0.07	0.28	0.33	0.35	0.35	0.25
T73	0.52	0.20	0.02	0.04	0.36	0.36	0.38	0.41	0.30
Average LVR	**0.16**	**0.12**	**0.14**	**0.19**	**0.27**	**0.20**	**0.20**	**0.21**	**0.20**
T_{Min}	0.03	0.02	0.01	0.03	0.08	0.04	0.01	0.01	0.07
T_{Max}	0.71	0.35	0.48	0.62	0.60	0.50	0.50	0.50	0.42

Appendix B - Details of the Predicted Wind Velocity Ratio (VR_W)
Summer Winds

	Proposed Scheme								
Test Point	**E**	**ESE**	**SE**	**SSE**	**S**	**SSW**	**SW**	**WSW**	
Wind speed at infinity	**7.11**	**6.58**	**6.72**	**5.68**	**5.59**	**6.25**	**6.61**	**6.00**	**VR_w**
Wind probability	**0.093**	**0.092**	**0.074**	**0.082**	**0.094**	**0.124**	**0.143**	**0.102**	**0.804**
P1	0.06	0.14	0.15	0.20	0.06	0.03	0.09	0.20	0.12
P2	0.04	0.24	0.11	0.13	0.19	0.12	0.22	0.23	0.17
P3	0.02	0.21	0.05	0.07	0.25	0.20	0.26	0.25	0.18
P4	0.05	0.16	0.06	0.09	0.32	0.30	0.28	0.27	0.21
P5	0.10	0.14	0.06	0.12	0.36	0.32	0.29	0.29	0.23
P6	0.13	0.13	0.06	0.12	0.39	0.32	0.30	0.31	0.24
P7	0.15	0.17	0.04	0.13	0.47	0.34	0.32	0.33	0.26
P8	0.12	0.20	0.03	0.09	0.49	0.31	0.30	0.31	0.25
P9	0.13	0.16	0.18	0.20	0.36	0.29	0.28	0.20	0.24
P10	0.13	0.13	0.12	0.14	0.31	0.31	0.30	0.19	0.22
P11	0.11	0.16	0.16	0.21	0.27	0.33	0.36	0.34	0.26
P12	0.08	0.35	0.30	0.35	0.55	0.23	0.19	0.19	0.28
P13	0.04	0.06	0.08	0.10	0.16	0.09	0.07	0.32	0.12
P14	0.04	0.08	0.18	0.24	0.17	0.09	0.06	0.27	0.14
P15	0.05	0.11	0.15	0.20	0.18	0.09	0.13	0.29	0.15
P16	0.06	0.15	0.06	0.13	0.09	0.13	0.26	0.33	0.17
P17	0.11	0.19	0.02	0.10	0.15	0.15	0.26	0.34	0.18
P18	0.10	0.17	0.11	0.10	0.12	0.22	0.31	0.32	0.20
P19	0.01	0.08	0.05	0.09	0.08	0.27	0.25	0.18	0.15
P20	0.05	0.09	0.06	0.10	0.03	0.27	0.28	0.26	0.16
P21	0.05	0.03	0.04	0.04	0.06	0.18	0.22	0.29	0.13
P22	0.02	0.05	0.10	0.08	0.08	0.05	0.08	0.23	0.09
P23	0.04	0.09	0.15	0.18	0.14	0.11	0.16	0.29	0.15
P24	0.11	0.05	0.13	0.15	0.20	0.12	0.13	0.15	0.13
P25	0.16	0.07	0.13	0.15	0.15	0.16	0.21	0.25	0.17
P26	0.16	0.09	0.13	0.10	0.15	0.18	0.20	0.25	0.17
P27	0.07	0.11	0.14	0.17	0.13	0.13	0.16	0.20	0.15
P28	0.03	0.10	0.10	0.15	0.17	0.10	0.12	0.11	0.12
P29	0.03	0.09	0.06	0.13	0.17	0.13	0.20	0.20	0.14
P30	0.06	0.03	0.11	0.09	0.23	0.28	0.27	0.30	0.19
P31	0.03	0.02	0.08	0.08	0.32	0.39	0.39	0.42	0.25
P32	0.06	0.15	0.11	0.14	0.13	0.33	0.35	0.37	0.23
P33	0.06	0.03	0.05	0.05	0.24	0.31	0.25	0.25	0.18
P34	0.05	0.02	0.08	0.09	0.10	0.15	0.14	0.14	0.11
P35	0.16	0.03	0.11	0.14	0.08	0.16	0.13	0.14	0.13
P36	0.17	0.06	0.13	0.17	0.14	0.16	0.13	0.12	0.14
P37	0.17	0.08	0.13	0.17	0.11	0.10	0.09	0.10	0.12
P38	0.17	0.09	0.08	0.08	0.26	0.10	0.08	0.05	0.12
P39	0.13	0.06	0.11	0.17	0.35	0.27	0.19	0.14	0.19
P40	0.16	0.02	0.02	0.04	0.07	0.03	0.03	0.03	0.05
P41	0.09	0.10	0.18	0.24	0.39	0.31	0.26	0.27	0.24
P42	0.07	0.13	0.25	0.34	0.47	0.36	0.33	0.34	0.30
P43	0.04	0.11	0.20	0.27	0.46	0.32	0.30	0.35	0.27
P44	0.08	0.06	0.11	0.15	0.29	0.32	0.34	0.39	0.24
P45	0.04	0.06	0.11	0.15	0.13	0.09	0.09	0.09	0.10
P46	0.03	0.07	0.13	0.18	0.24	0.13	0.12	0.23	0.15
P47	0.05	0.18	0.03	0.04	0.32	0.03	0.07	0.24	0.12
P48	0.24	0.22	0.21	0.29	0.24	0.35	0.39	0.40	0.31
P49	0.28	0.30	0.26	0.31	0.34	0.26	0.31	0.25	0.29
P50	0.03	0.30	0.24	0.30	0.40	0.19	0.12	0.13	0.21
P51	0.03	0.24	0.19	0.25	0.36	0.15	0.04	0.15	0.17
P52	0.05	0.16	0.16	0.22	0.20	0.05	0.03	0.14	0.12
P53	0.06	0.11	0.11	0.19	0.19	0.23	0.03	0.06	0.13
P54	0.05	0.11	0.14	0.15	0.26	0.26	0.09	0.07	0.15
P55	0.11	0.14	0.18	0.20	0.27	0.30	0.18	0.14	0.20
P56	0.08	0.44	0.50	0.63	0.50	0.20	0.20	0.23	0.33
P57	0.06	0.08	0.07	0.10	0.17	0.13	0.18	0.30	0.15
P58	0.03	0.05	0.09	0.10	0.11	0.05	0.13	0.27	0.11
P59	0.02	0.07	0.20	0.22	0.10	0.02	0.16	0.26	0.13
P60	0.07	0.10	0.22	0.29	0.05	0.04	0.04	0.12	0.11
Average SVR	**0.08**	**0.12**	**0.12**	**0.16**	**0.22**	**0.19**	**0.19**	**0.23**	**0.17**
P_{Min}	0.01	0.02	0.02	0.04	0.03	0.02	0.03	0.03	0.05
P_{Max}	0.28	0.44	0.50	0.63	0.55	0.39	0.39	0.42	0.33

Appendix B - Details of the Predicted Wind Velocity Ratio (VR_W)
Summer Winds

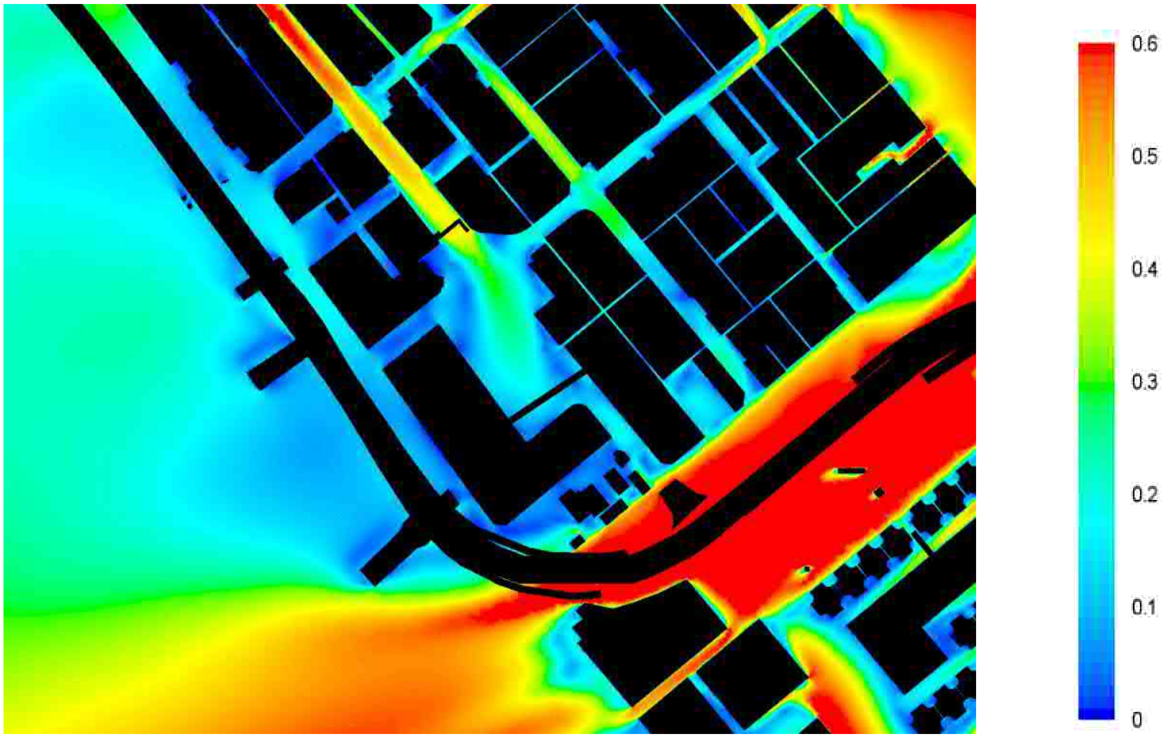
	Proposed Scheme								
Test Point	**E**	**ESE**	**SE**	**SSE**	**S**	**SSW**	**SW**	**WSW**	
Wind speed at infinity	**7.11**	**6.58**	**6.72**	**5.68**	**5.59**	**6.25**	**6.61**	**6.00**	VR_w
Wind probability	**0.093**	**0.092**	**0.074**	**0.082**	**0.094**	**0.124**	**0.143**	**0.102**	**0.804**
SG01	0.05	0.19	0.05	0.14	0.16	0.07	0.07	0.06	0.10
SG02	0.12	0.15	0.04	0.12	0.50	0.15	0.17	0.25	0.19
SG03	0.15	0.10	0.03	0.11	0.48	0.35	0.33	0.31	0.26
SG04	0.11	0.03	0.04	0.07	0.33	0.30	0.26	0.27	0.20
SG05	0.06	0.12	0.09	0.12	0.36	0.32	0.30	0.29	0.23
SG06	0.12	0.06	0.05	0.05	0.10	0.16	0.19	0.16	0.13
SG07	0.10	0.08	0.13	0.20	0.40	0.22	0.26	0.27	0.22
SP01	0.08	0.06	0.06	0.09	0.52	0.28	0.24	0.23	0.21
SP02	0.14	0.08	0.03	0.04	0.15	0.11	0.05	0.04	0.08
SP03	0.12	0.08	0.12	0.14	0.45	0.37	0.31	0.26	0.25
SP04	0.09	0.04	0.07	0.06	0.19	0.12	0.19	0.19	0.13
SP05	0.31	0.03	0.03	0.17	0.49	0.36	0.32	0.25	0.27
SP06	0.06	0.02	0.06	0.12	0.11	0.16	0.14	0.10	0.11
SP07	0.14	0.05	0.05	0.06	0.21	0.31	0.32	0.32	0.21
SP08	0.05	0.04	0.03	0.04	0.19	0.27	0.29	0.28	0.17
Average Special VR	**0.11**	**0.07**	**0.06**	**0.11**	**0.31**	**0.24**	**0.23**	**0.22**	**0.19**
P_{Min}	0.05	0.02	0.03	0.04	0.10	0.07	0.05	0.04	0.08
P_{Max}	0.31	0.19	0.13	0.20	0.52	0.37	0.33	0.32	0.27
T1	0.06	0.23	0.11	0.22	0.54	0.28	0.25	0.26	0.25
T2	0.06	0.24	0.13	0.24	0.54	0.29	0.27	0.28	0.26
T3	0.07	0.23	0.10	0.19	0.54	0.28	0.25	0.26	0.25
T4	0.05	0.15	0.09	0.14	0.27	0.13	0.07	0.19	0.13
T5	0.08	0.14	0.05	0.12	0.30	0.21	0.20	0.21	0.17
T6	0.07	0.13	0.02	0.10	0.33	0.23	0.20	0.20	0.17
T7	0.08	0.07	0.03	0.10	0.32	0.20	0.14	0.12	0.14
T8	0.07	0.07	0.03	0.10	0.33	0.11	0.12	0.11	0.12
T9	0.07	0.07	0.04	0.08	0.29	0.09	0.05	0.18	0.11
T10	0.06	0.10	0.07	0.08	0.34	0.27	0.25	0.26	0.19
T11	0.04	0.11	0.11	0.13	0.38	0.14	0.19	0.21	0.17
T12	0.06	0.05	0.09	0.13	0.18	0.08	0.12	0.12	0.10
T13	0.03	0.05	0.03	0.04	0.46	0.51	0.50	0.51	0.31
T14	0.12	0.08	0.12	0.16	0.33	0.38	0.39	0.41	0.27
T15	0.14	0.09	0.09	0.10	0.32	0.30	0.32	0.36	0.24
T16	0.22	0.06	0.08	0.04	0.30	0.12	0.07	0.14	0.13
T17	0.20	0.17	0.11	0.05	0.28	0.17	0.12	0.15	0.16
T18	0.24	0.08	0.03	0.04	0.09	0.11	0.15	0.20	0.12
T19	0.12	0.10	0.06	0.05	0.26	0.16	0.18	0.19	0.14
T20	0.08	0.06	0.05	0.05	0.26	0.14	0.15	0.11	0.12
T21	0.14	0.10	0.09	0.09	0.35	0.14	0.11	0.09	0.14
T22	0.11	0.10	0.10	0.11	0.39	0.16	0.13	0.10	0.14
T23	0.14	0.11	0.11	0.15	0.24	0.23	0.23	0.26	0.19
T24	0.07	0.05	0.03	0.03	0.23	0.23	0.22	0.12	0.13
T25	0.08	0.04	0.03	0.06	0.21	0.27	0.26	0.23	0.16
T26	0.05	0.04	0.05	0.07	0.44	0.39	0.39	0.42	0.25
T27	0.04	0.13	0.18	0.12	0.04	0.22	0.24	0.27	0.16
T28	0.08	0.11	0.24	0.22	0.22	0.16	0.15	0.18	0.16
T29	0.07	0.19	0.12	0.09	0.18	0.33	0.34	0.34	0.22
T30	0.12	0.05	0.02	0.04	0.11	0.04	0.03	0.03	0.05
T31	0.10	0.25	0.29	0.24	0.26	0.40	0.42	0.45	0.31
T32	0.15	0.28	0.33	0.27	0.16	0.37	0.39	0.43	0.30
T33	0.14	0.28	0.31	0.19	0.09	0.18	0.15	0.18	0.18
T34	0.29	0.33	0.37	0.26	0.27	0.13	0.16	0.24	0.24
T35	0.12	0.09	0.09	0.07	0.07	0.05	0.06	0.14	0.08
T36	0.12	0.15	0.13	0.11	0.17	0.16	0.14	0.17	0.14
T37	0.04	0.04	0.05	0.05	0.22	0.23	0.20	0.21	0.14
T38	0.09	0.04	0.05	0.06	0.20	0.24	0.19	0.20	0.14
T39	0.09	0.05	0.12	0.28	0.36	0.31	0.31	0.35	0.24
T40	0.10	0.06	0.13	0.29	0.41	0.28	0.27	0.30	0.23
T41	0.15	0.08	0.14	0.32	0.44	0.29	0.28	0.30	0.25
T42	0.16	0.09	0.14	0.35	0.47	0.26	0.25	0.27	0.25
T43	0.12	0.07	0.14	0.35	0.49	0.24	0.24	0.26	0.23
T44	0.11	0.02	0.07	0.25	0.44	0.17	0.21	0.23	0.19
T45	0.10	0.04	0.04	0.19	0.36	0.14	0.19	0.21	0.16
T46	0.70	0.20	0.08	0.21	0.35	0.18	0.19	0.20	0.26
T47	0.68	0.15	0.14	0.27	0.44	0.12	0.09	0.10	0.23
T48	0.62	0.12	0.14	0.27	0.43	0.22	0.22	0.23	0.27
T49	0.67	0.04	0.08	0.16	0.36	0.37	0.37	0.34	0.31
T50	0.35	0.12	0.09	0.20	0.23	0.12	0.12	0.11	0.16
T51	0.34	0.05	0.07	0.10	0.16	0.07	0.07	0.07	0.11
T52	0.66	0.11	0.16	0.23	0.40	0.33	0.30	0.29	0.31
T53	0.66	0.14	0.22	0.29	0.42	0.37	0.34	0.31	0.34
T54	0.32	0.31	0.30	0.42	0.50	0.38	0.37	0.39	0.37

Appendix B - Details of the Predicted Wind Velocity Ratio (VR_W)
Summer Winds

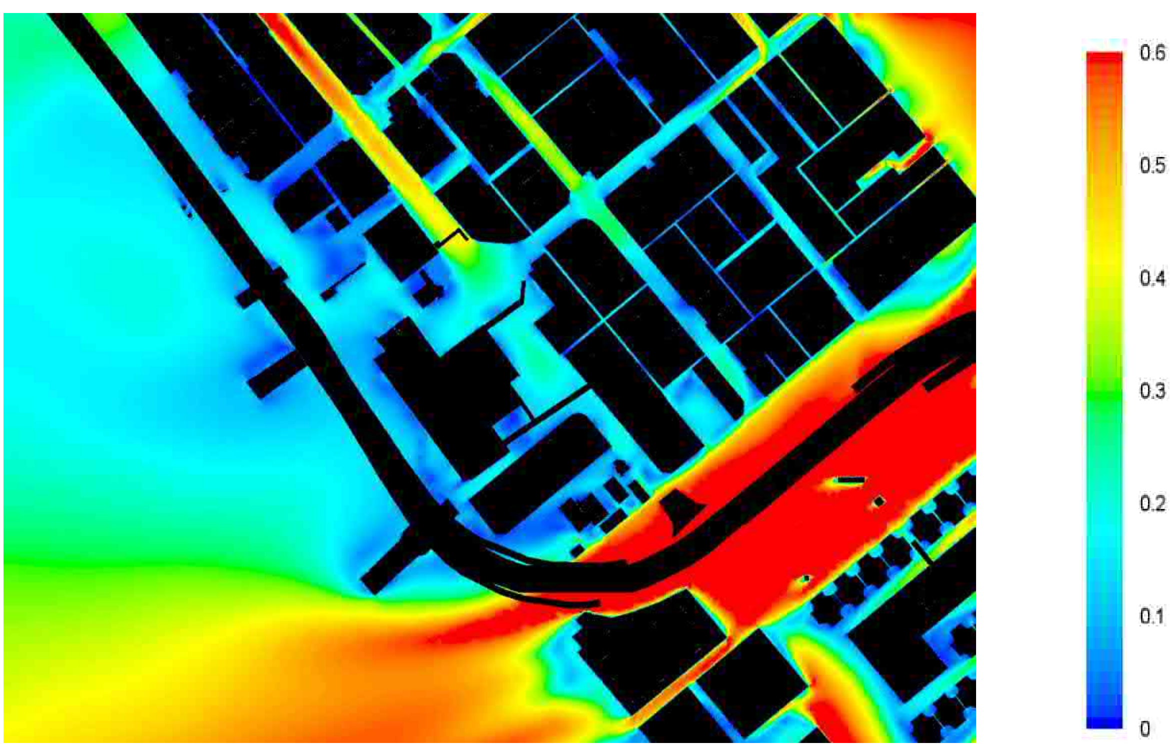
Test Point	Proposed Scheme								VR_w
	E	ESE	SE	SSE	S	SSW	SW	WSW	
Wind speed at infinity	**7.11**	**6.58**	**6.72**	**5.68**	**5.59**	**6.25**	**6.61**	**6.00**	
Wind probability	**0.093**	**0.092**	**0.074**	**0.082**	**0.094**	**0.124**	**0.143**	**0.102**	**0.804**
T55	0.09	0.33	0.34	0.51	0.51	0.32	0.30	0.32	0.33
T56	0.13	0.28	0.29	0.43	0.47	0.22	0.20	0.23	0.27
T57	0.19	0.33	0.47	0.61	0.56	0.41	0.40	0.43	0.42
T58	0.28	0.35	0.44	0.59	0.54	0.40	0.40	0.43	0.42
T59	0.57	0.02	0.03	0.11	0.11	0.28	0.35	0.42	0.25
T60	0.61	0.04	0.17	0.24	0.26	0.33	0.38	0.44	0.31
T61	0.67	0.05	0.04	0.03	0.11	0.37	0.41	0.48	0.29
T62	0.67	0.09	0.04	0.10	0.18	0.39	0.43	0.48	0.31
T63	0.64	0.08	0.14	0.25	0.34	0.37	0.41	0.47	0.34
T64	0.70	0.11	0.13	0.20	0.32	0.35	0.36	0.38	0.32
T65	0.70	0.08	0.04	0.02	0.29	0.31	0.29	0.24	0.25
T66	0.09	0.07	0.01	0.11	0.11	0.17	0.18	0.17	0.12
T67	0.18	0.13	0.15	0.26	0.34	0.24	0.27	0.24	0.22
T68	0.19	0.09	0.21	0.36	0.53	0.34	0.32	0.25	0.29
T69	0.16	0.15	0.08	0.03	0.22	0.22	0.08	0.16	0.15
T70	0.07	0.16	0.08	0.08	0.22	0.27	0.13	0.06	0.15
T71	0.06	0.14	0.06	0.10	0.26	0.29	0.10	0.07	0.14
T72	0.39	0.07	0.04	0.06	0.30	0.34	0.37	0.37	0.27
T73	0.51	0.20	0.06	0.04	0.34	0.36	0.40	0.43	0.32
Average LVR	**0.16**	**0.12**	**0.12**	**0.16**	**0.27**	**0.22**	**0.21**	**0.24**	**0.20**
T_{Min}	0.03	0.02	0.01	0.02	0.04	0.04	0.03	0.03	0.05
T_{Max}	0.70	0.35	0.47	0.61	0.56	0.51	0.50	0.51	0.42

Appendix C – Wind Velocity Ratio Contour Plots for Annual Wind

NNE at 2mAG (Base Scheme)

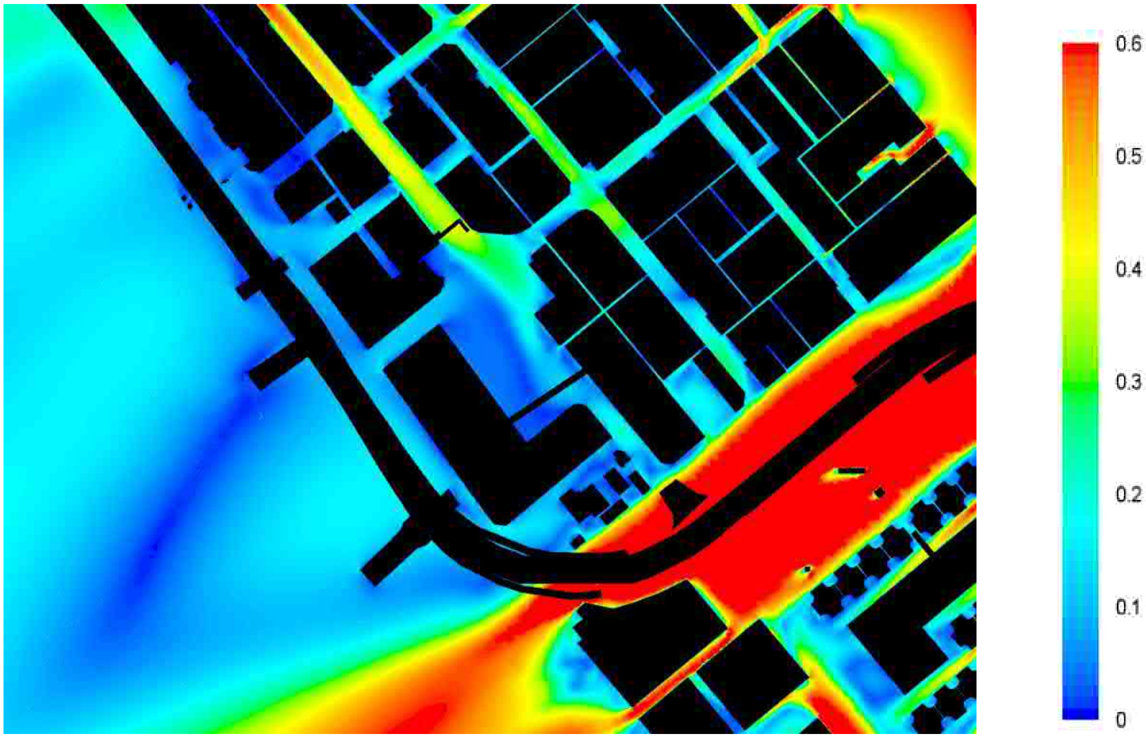


NNE at 2mAG (Proposed Scheme)

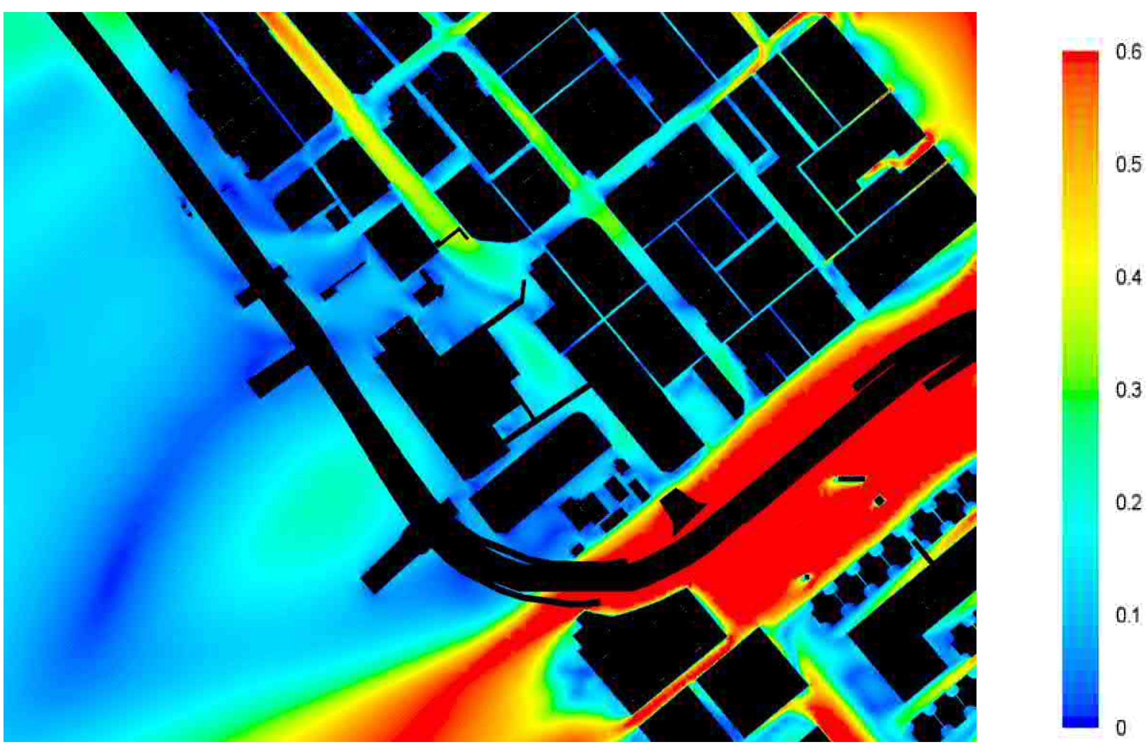


Appendix C – Wind Velocity Ratio Contour Plots for Annual Wind

NE at 2mAG (Base Scheme)

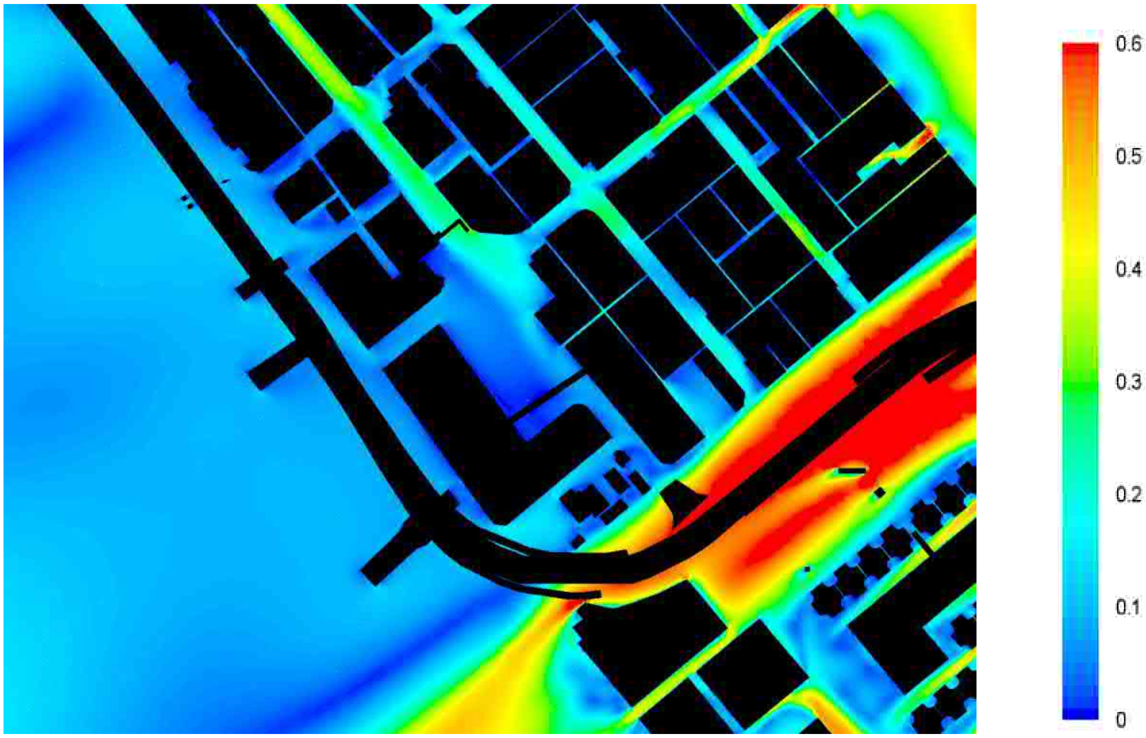


NE at 2mAG (Proposed Scheme)

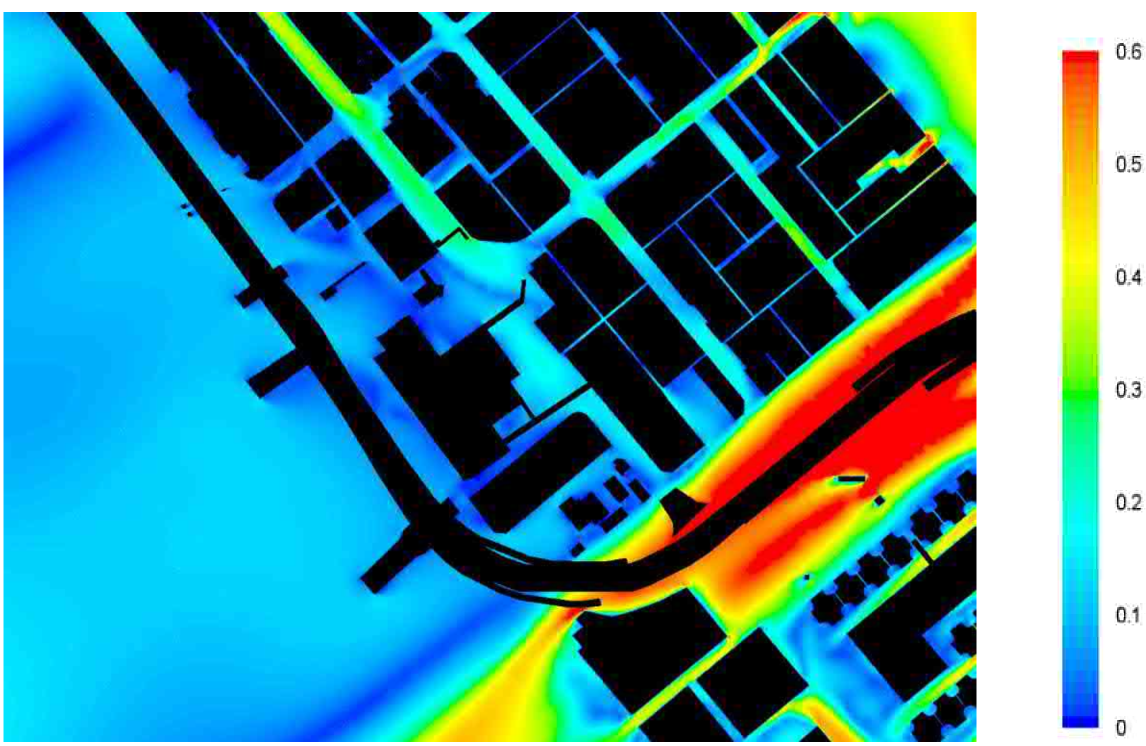


Appendix C – Wind Velocity Ratio Contour Plots for Annual Wind

ENE at 2mAG (Base Scheme)

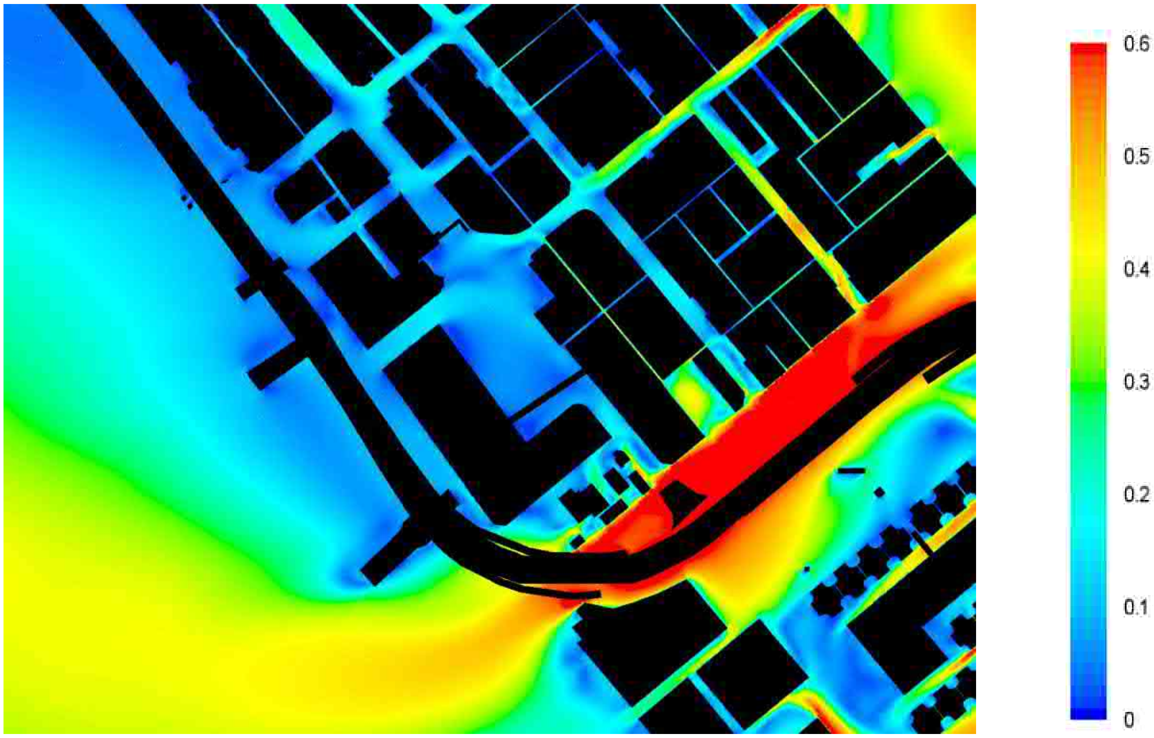


ENE at 2mAG (Proposed Scheme)

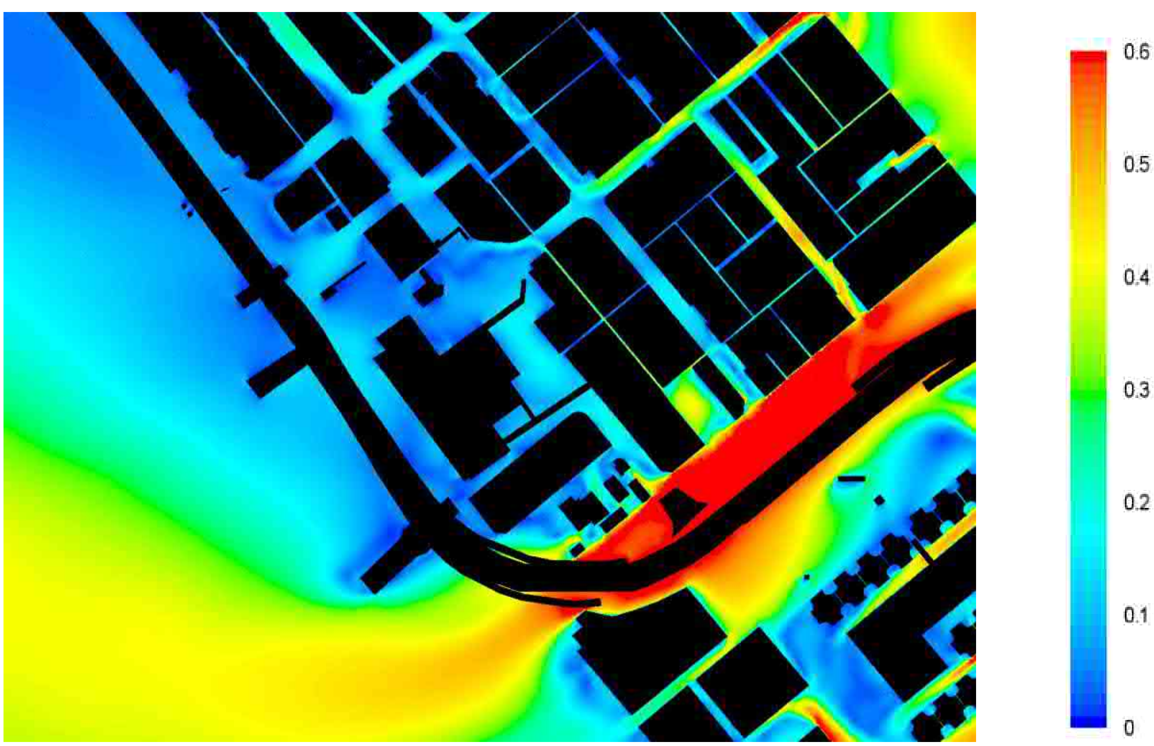


Appendix C – Wind Velocity Ratio Contour Plots for Annual Wind

E at 2mAG (Base Scheme)

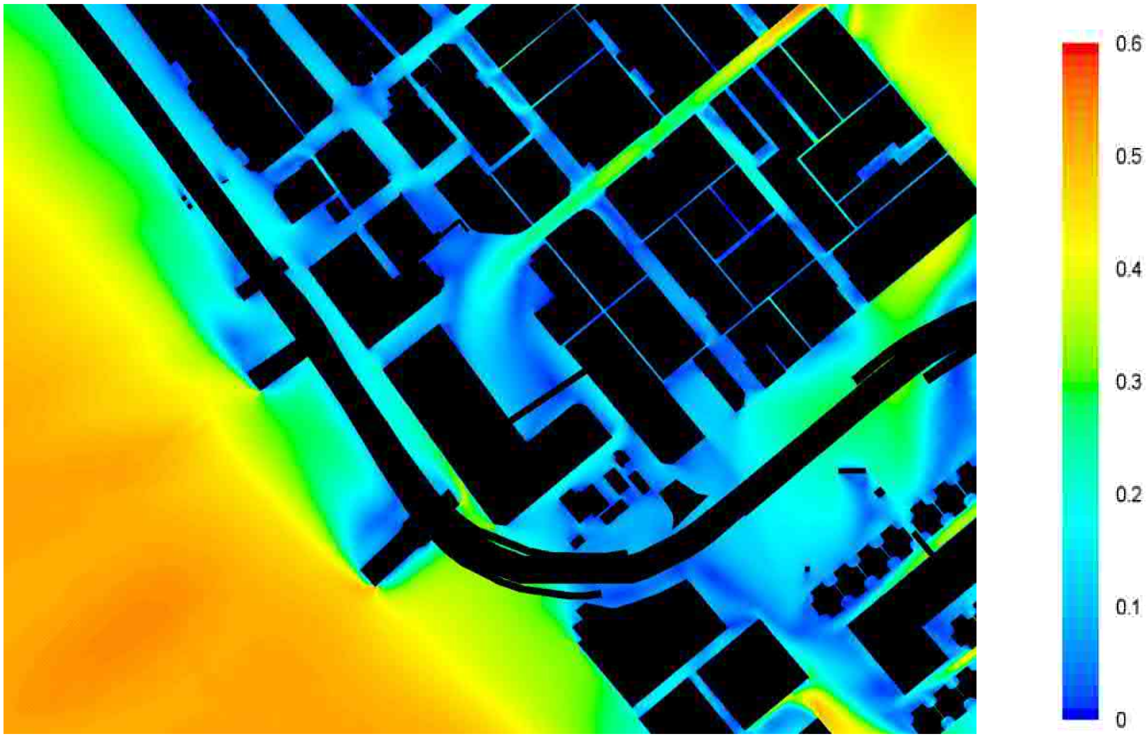


E at 2mAG (Proposed Scheme)



Appendix C – Wind Velocity Ratio Contour Plots for Annual Wind

ESE at 2mAG (Base Scheme)



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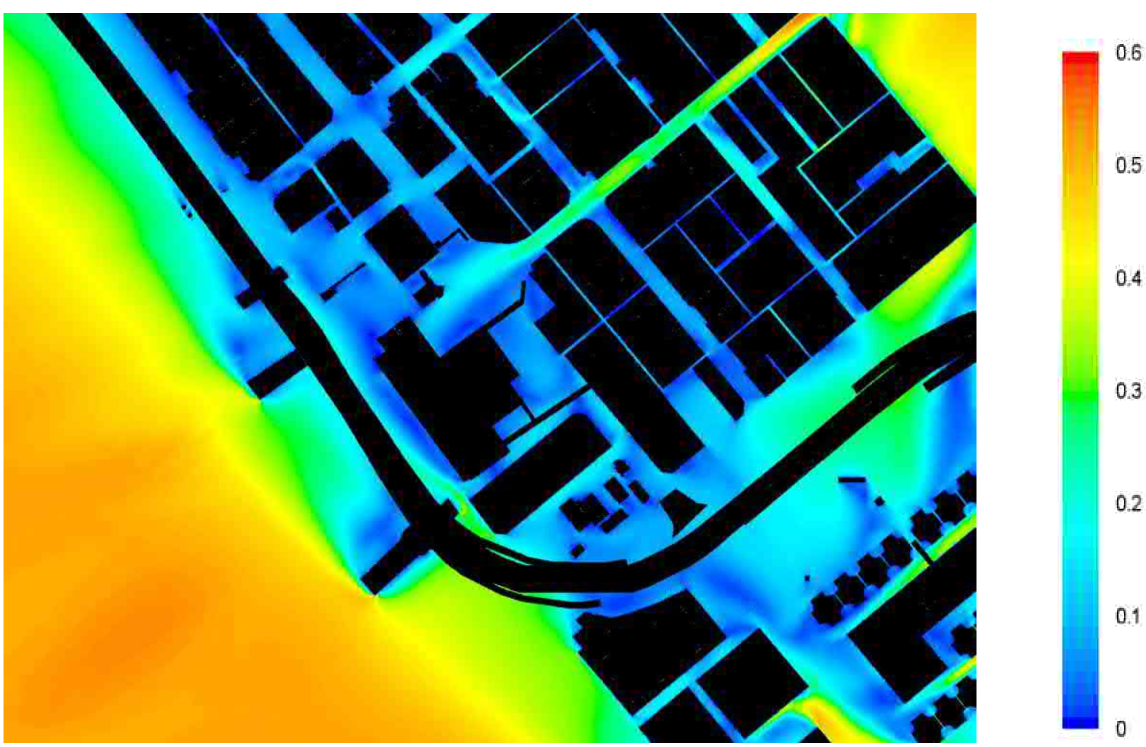

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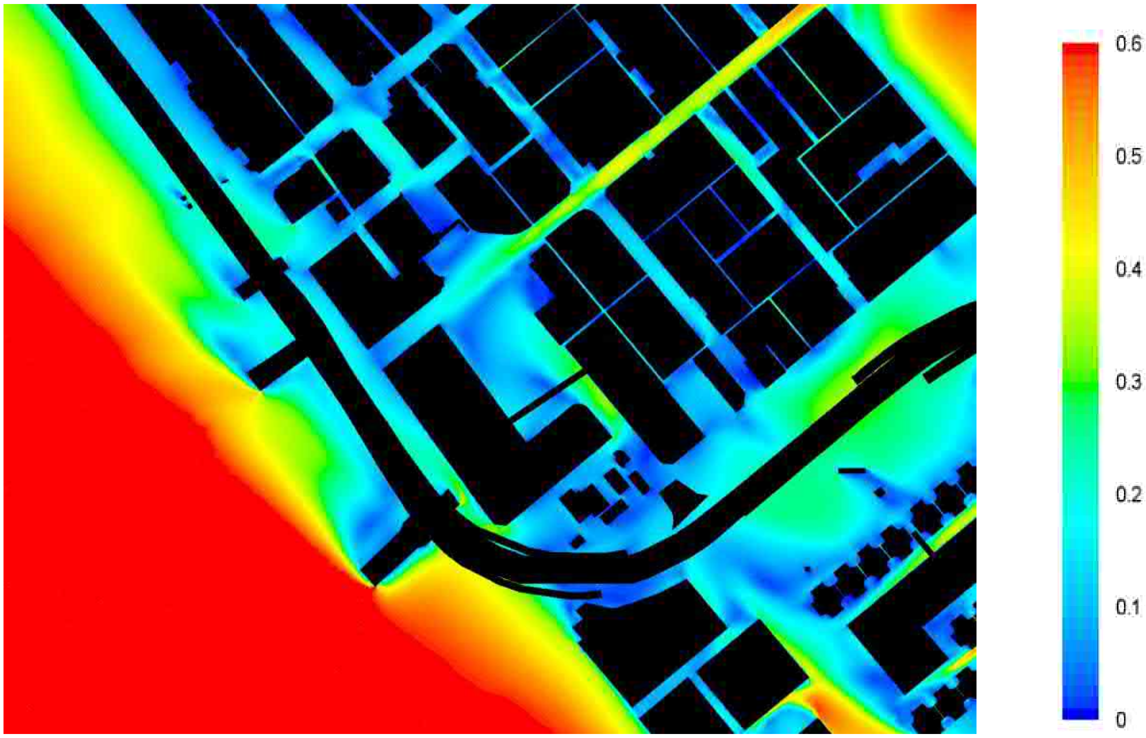
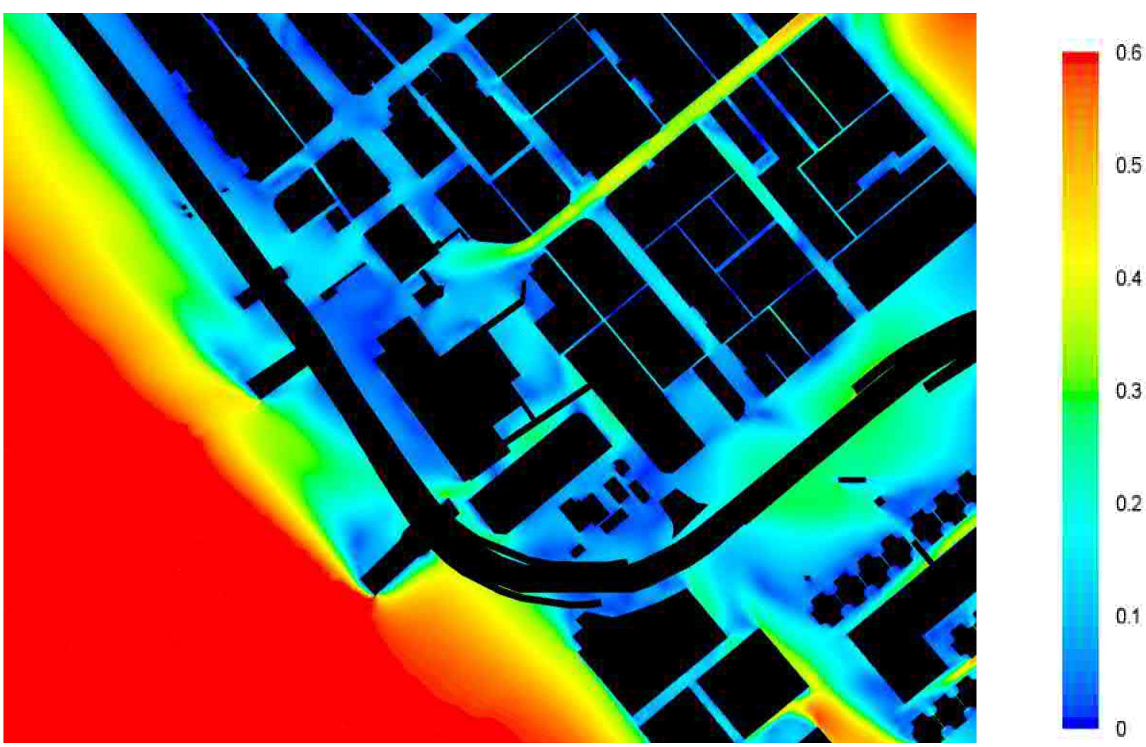
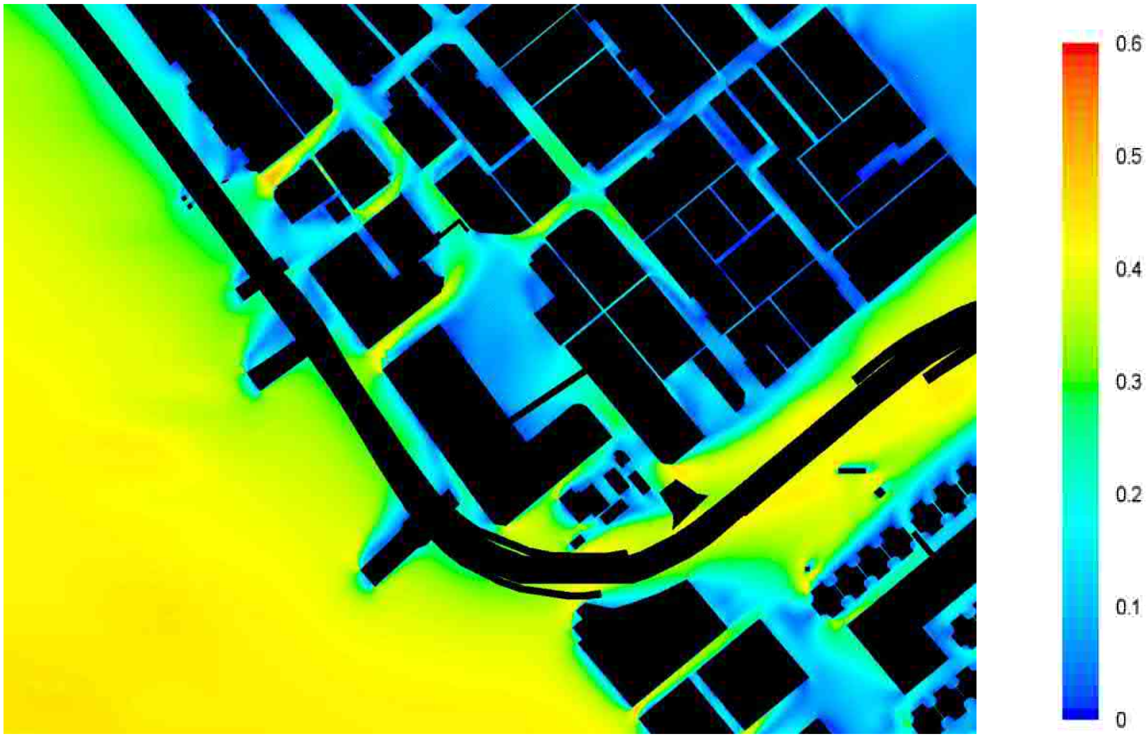


SE at 2mAG (Proposed Scheme)



Appendix C – Wind Velocity Ratio Contour Plots for Annual Wind

SSW at 2mAG (Base Scheme)



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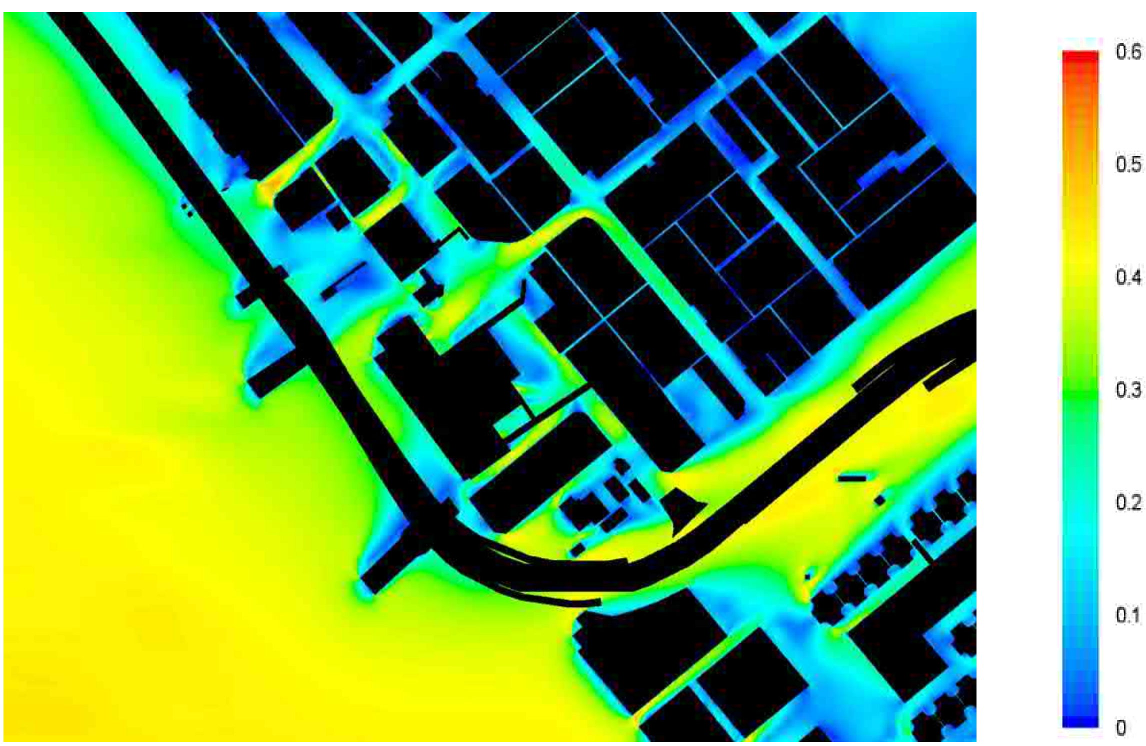

Appendix C – Wind Velocity Ratio Contour Plots for Annual Wind

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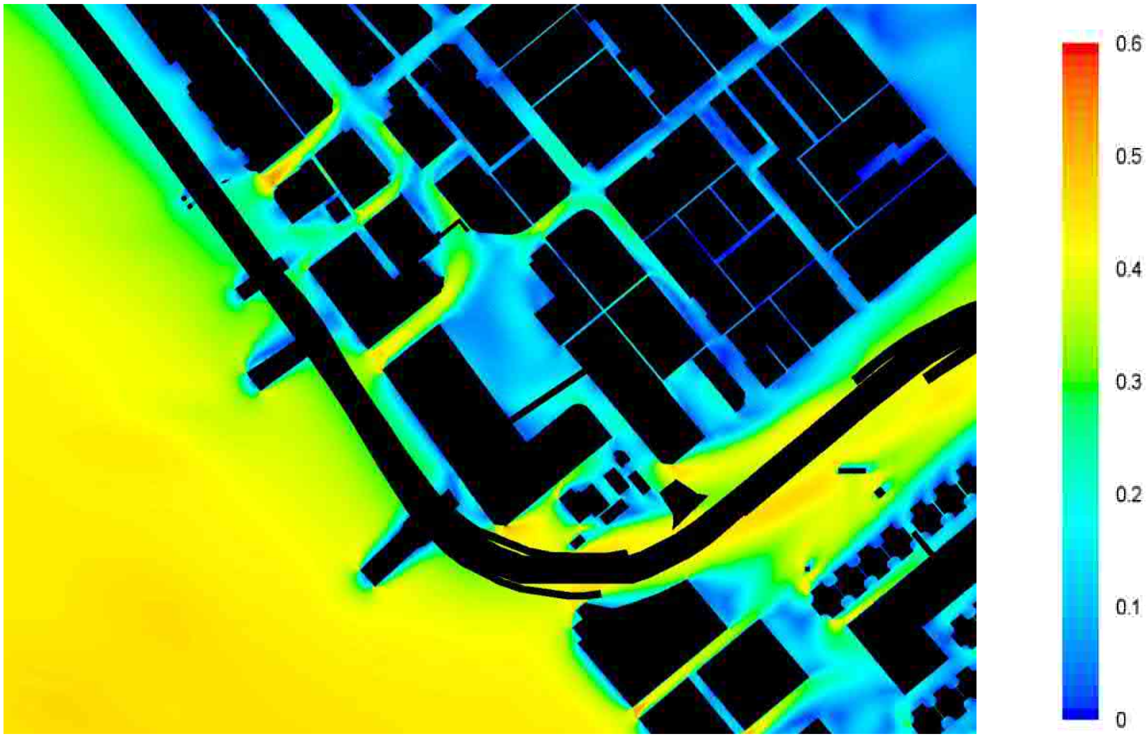

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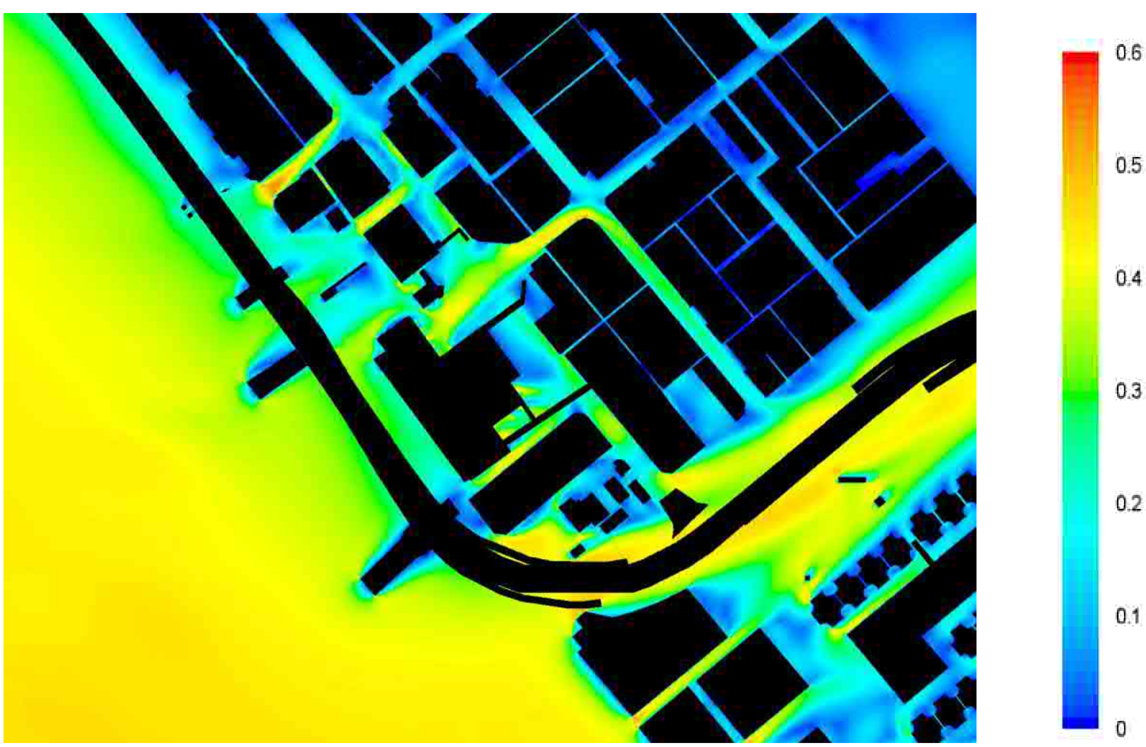
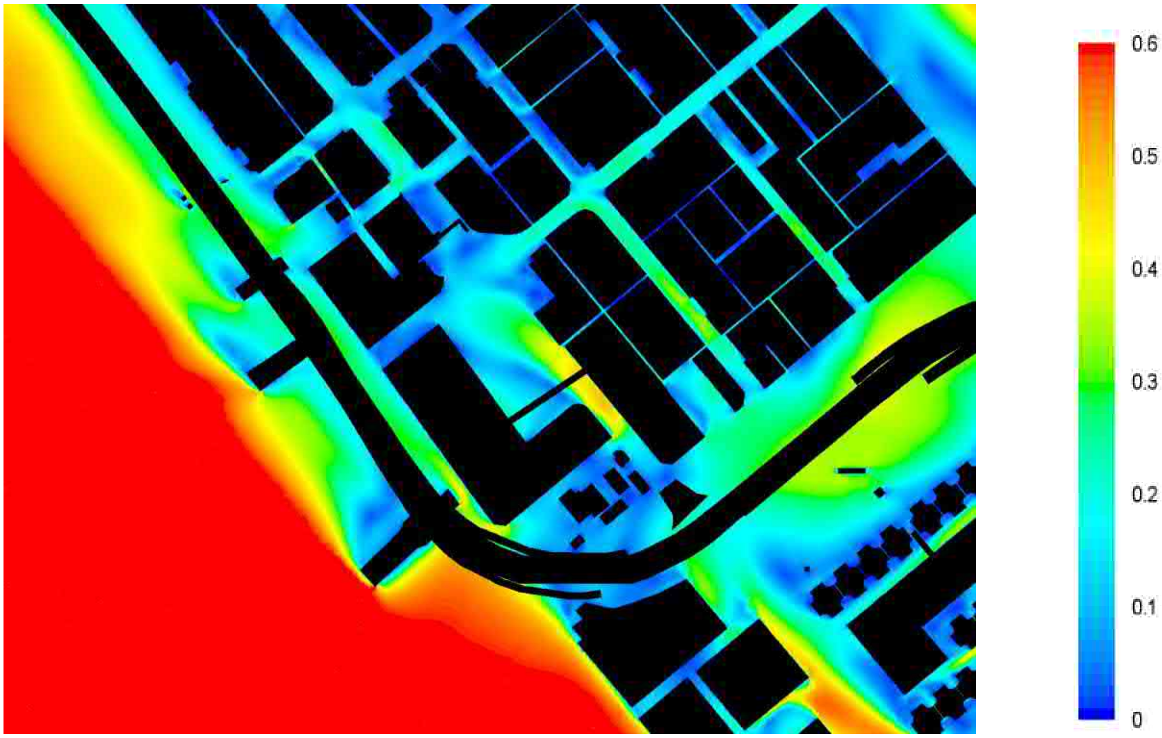


Appendix C – Wind Velocity Ratio Contour Plots for Summer Wind

SSE at 2mAG (Base Scheme)



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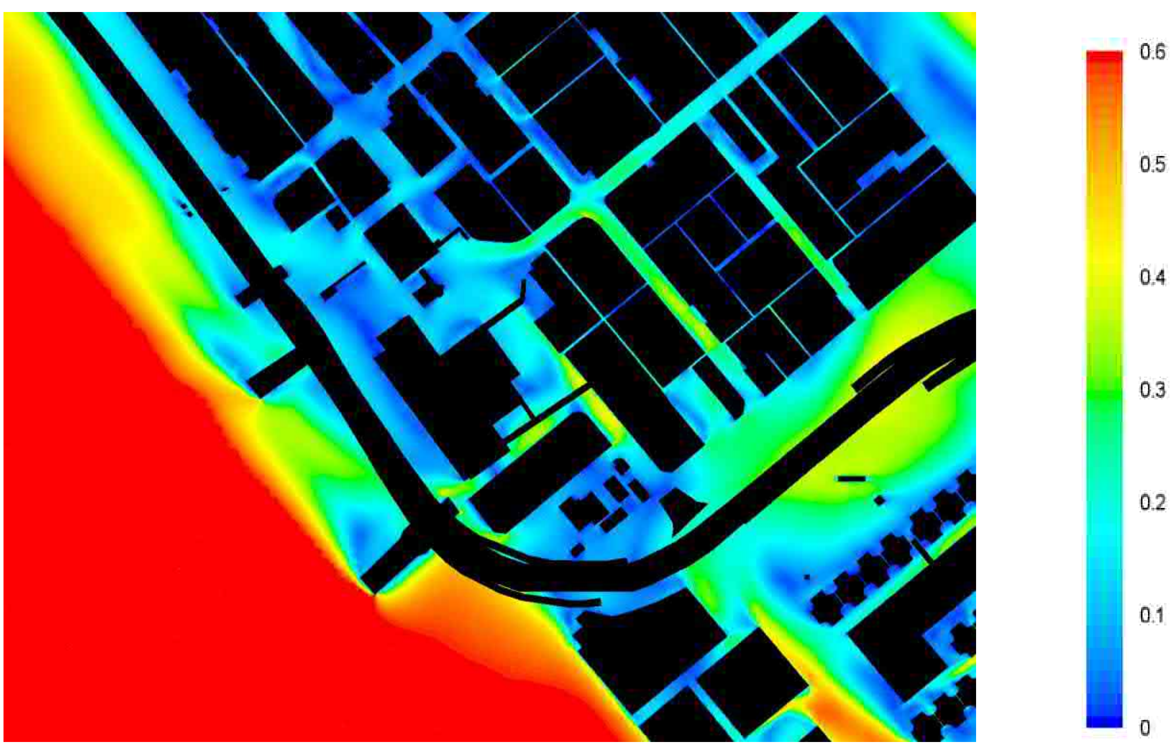

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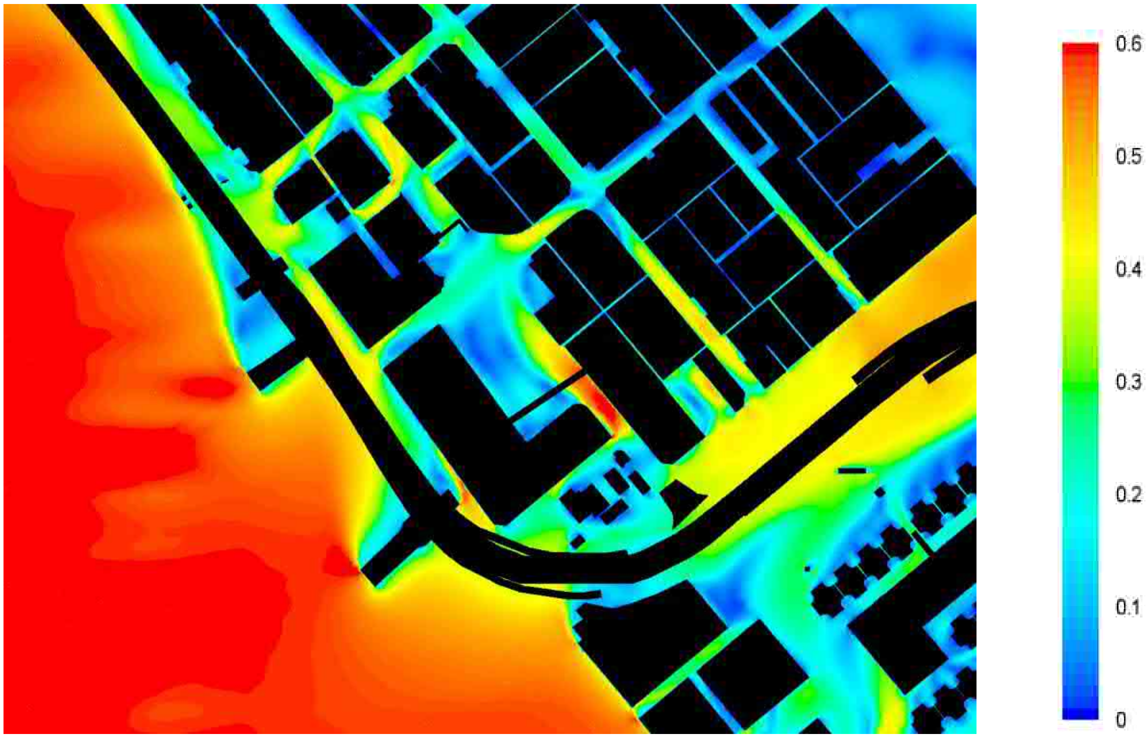

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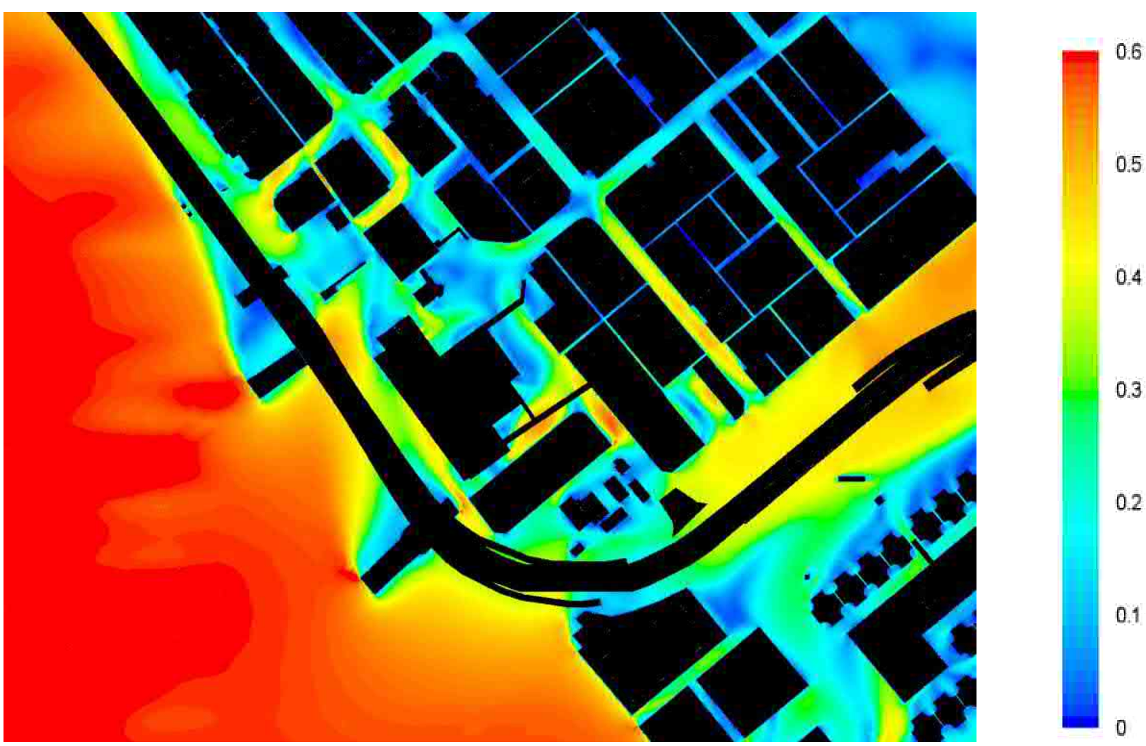

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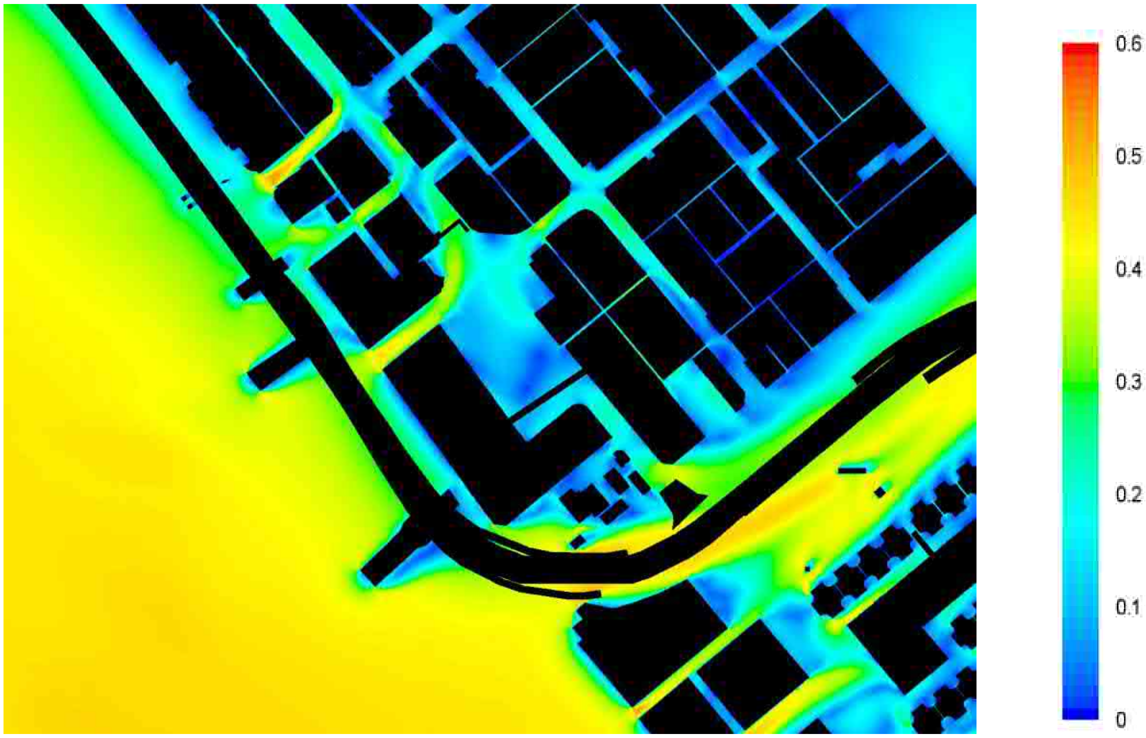

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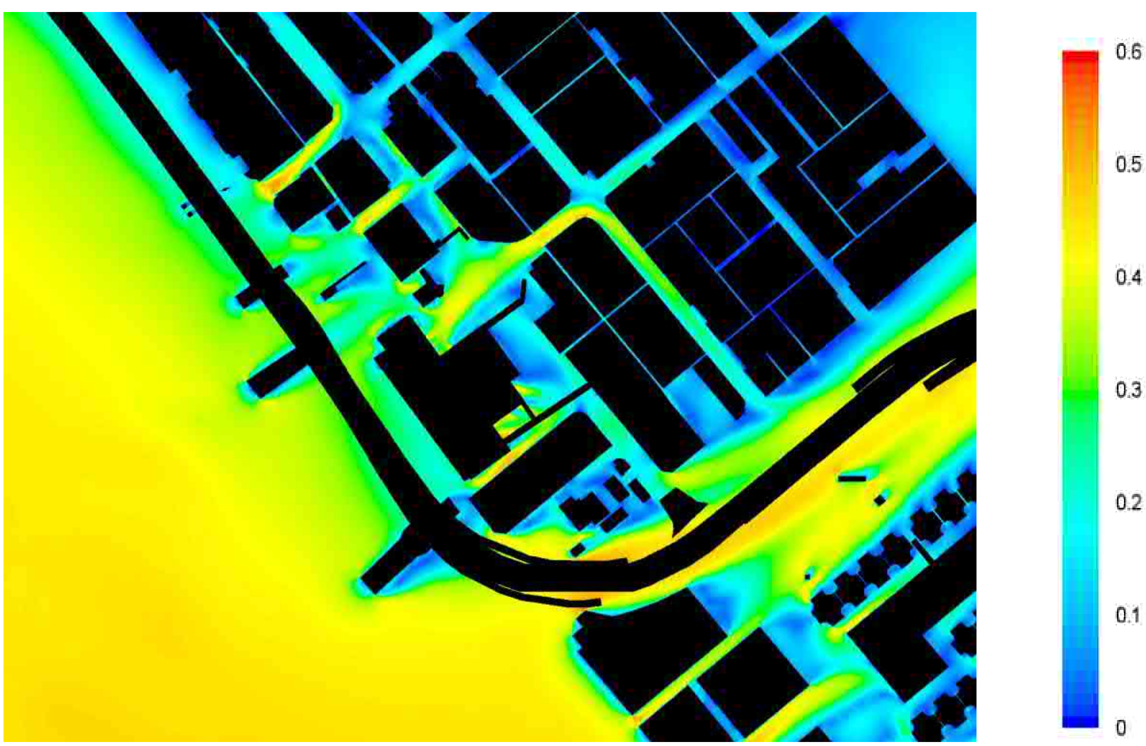
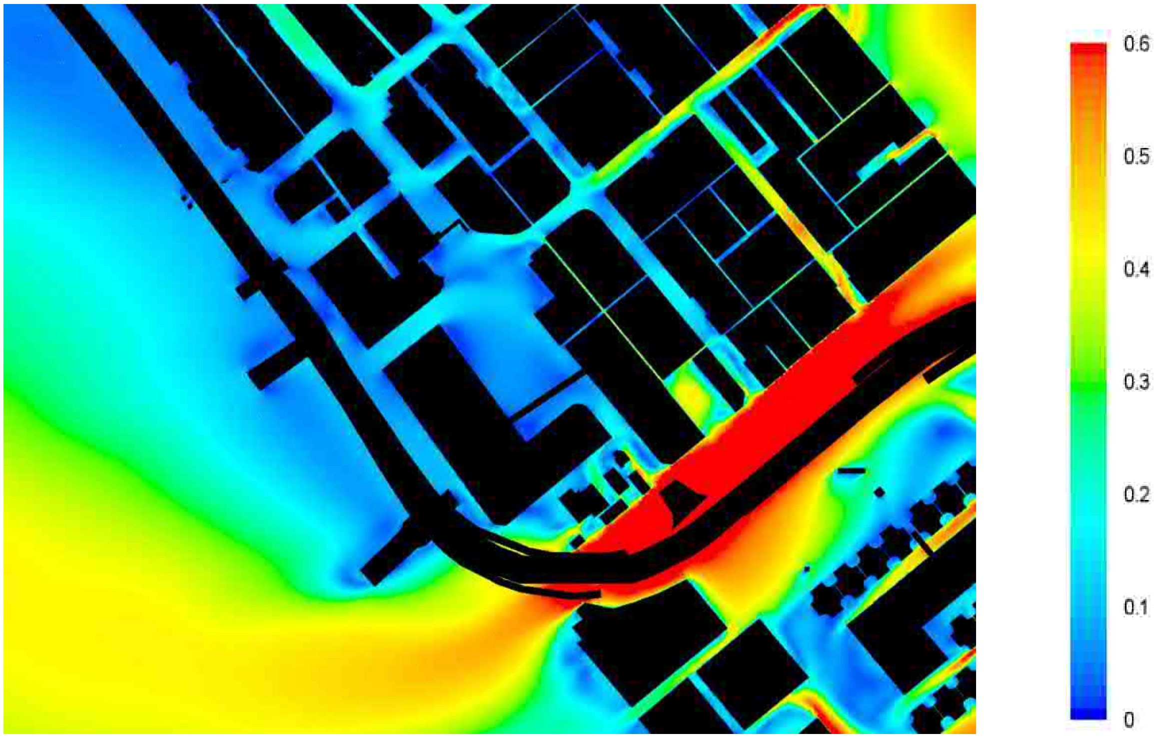
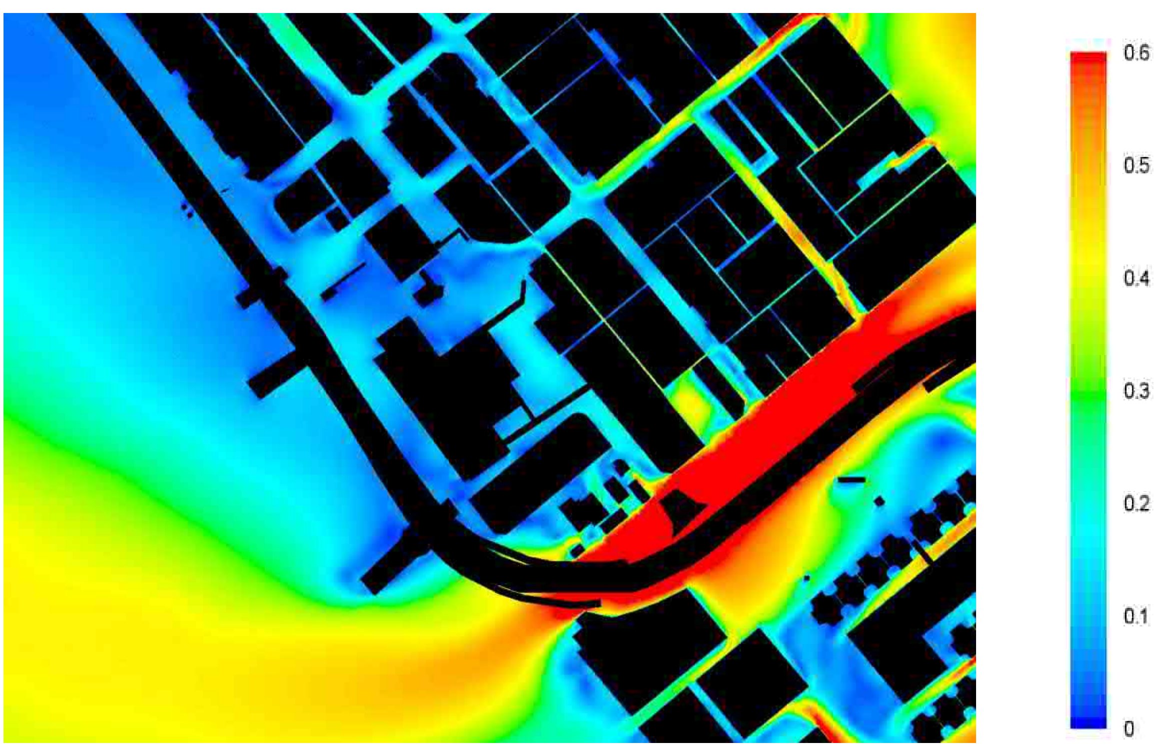


Appendix C – Wind Velocity Ratio Contour Plots for Summer Wind

E at 2mAG (Base Scheme)



E at 2mAG (Proposed Scheme)



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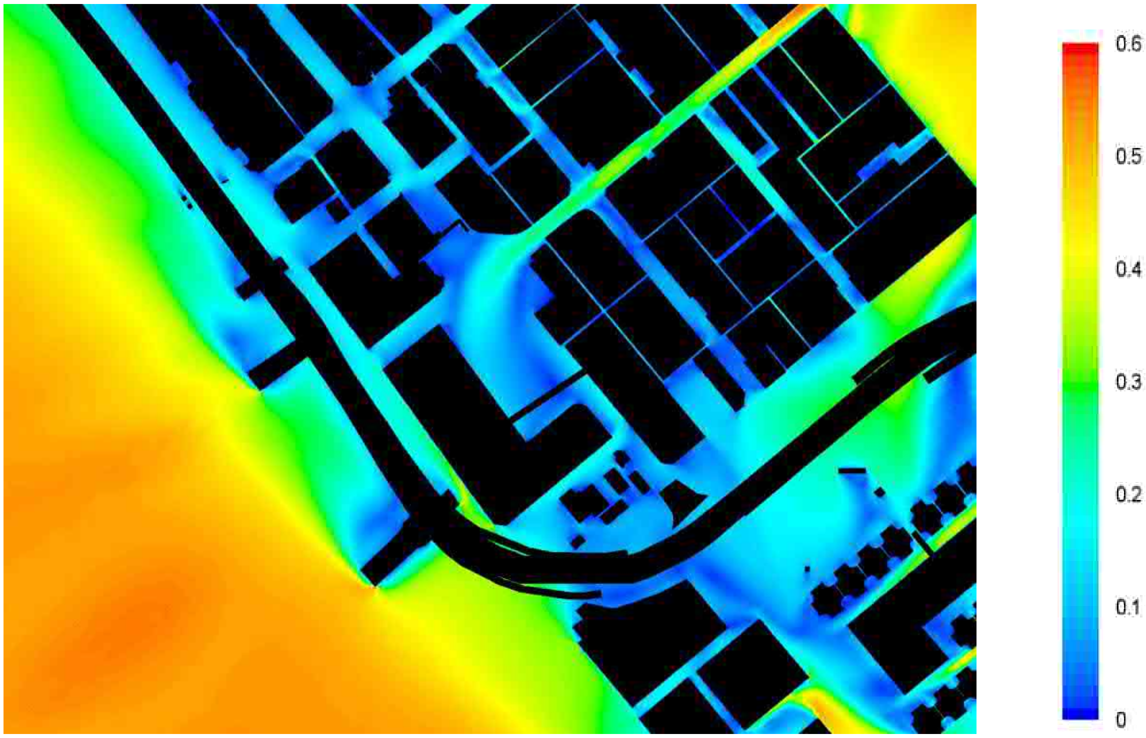
ESE at 2mAG (Base Scheme)



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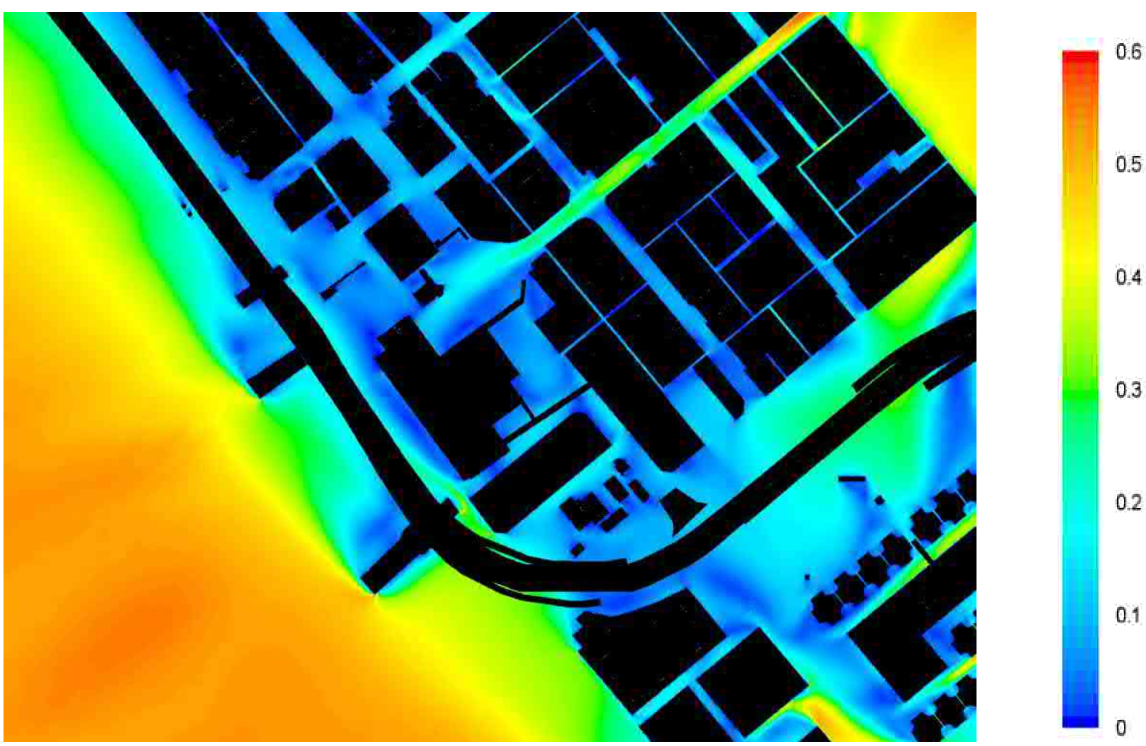

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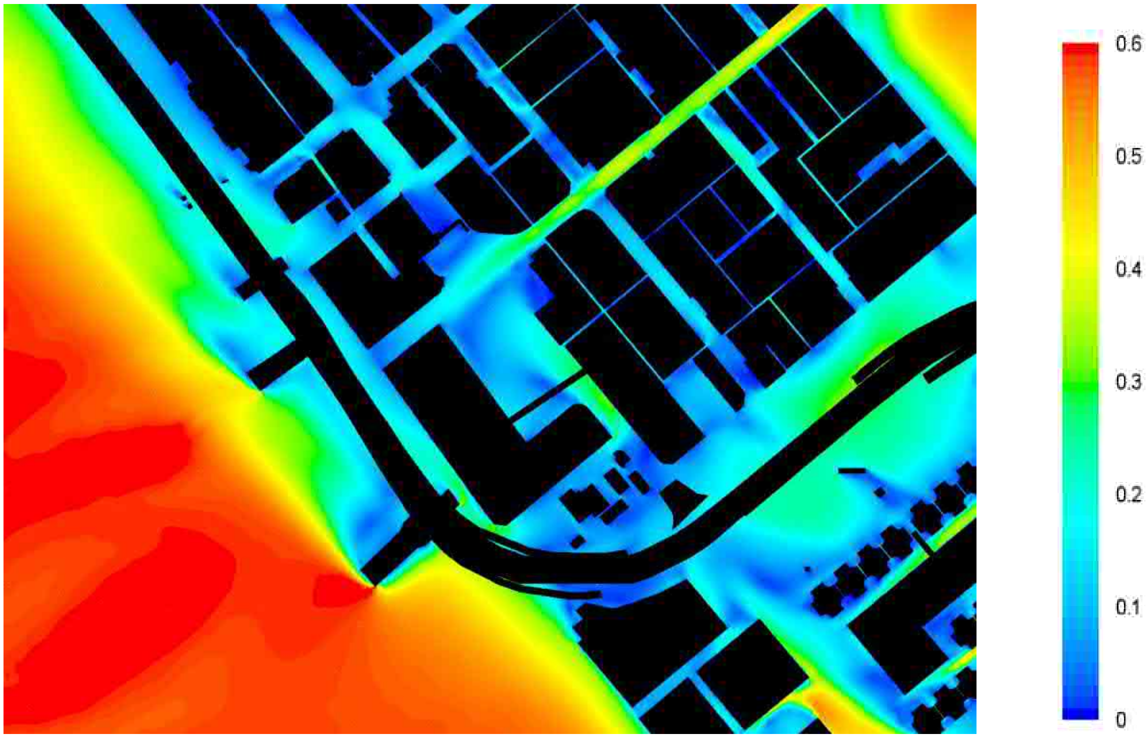
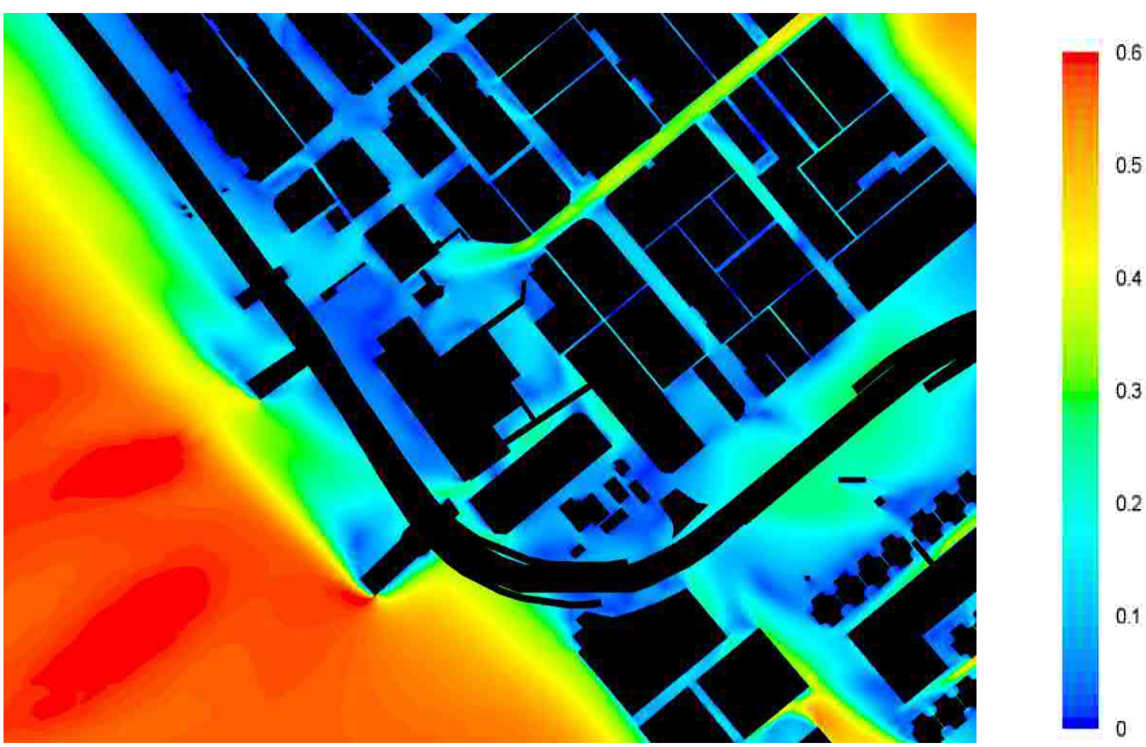


SE at 2mAG (Proposed Scheme)



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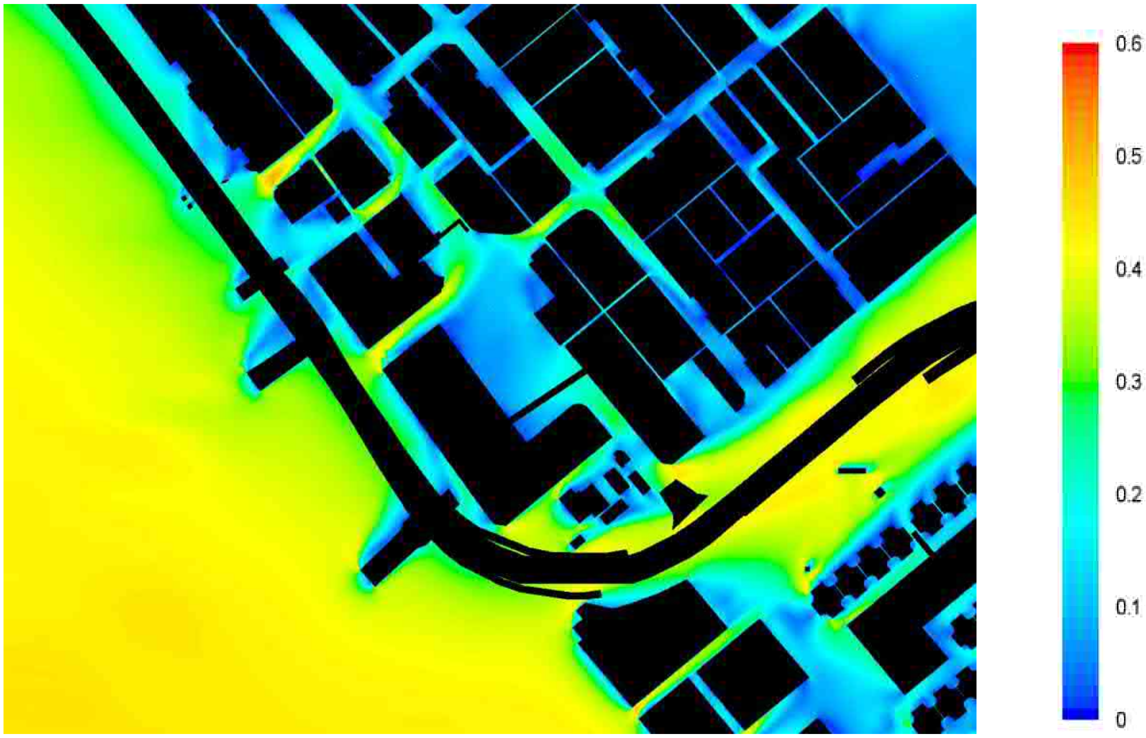
SSW at 2mAG (Base Scheme)



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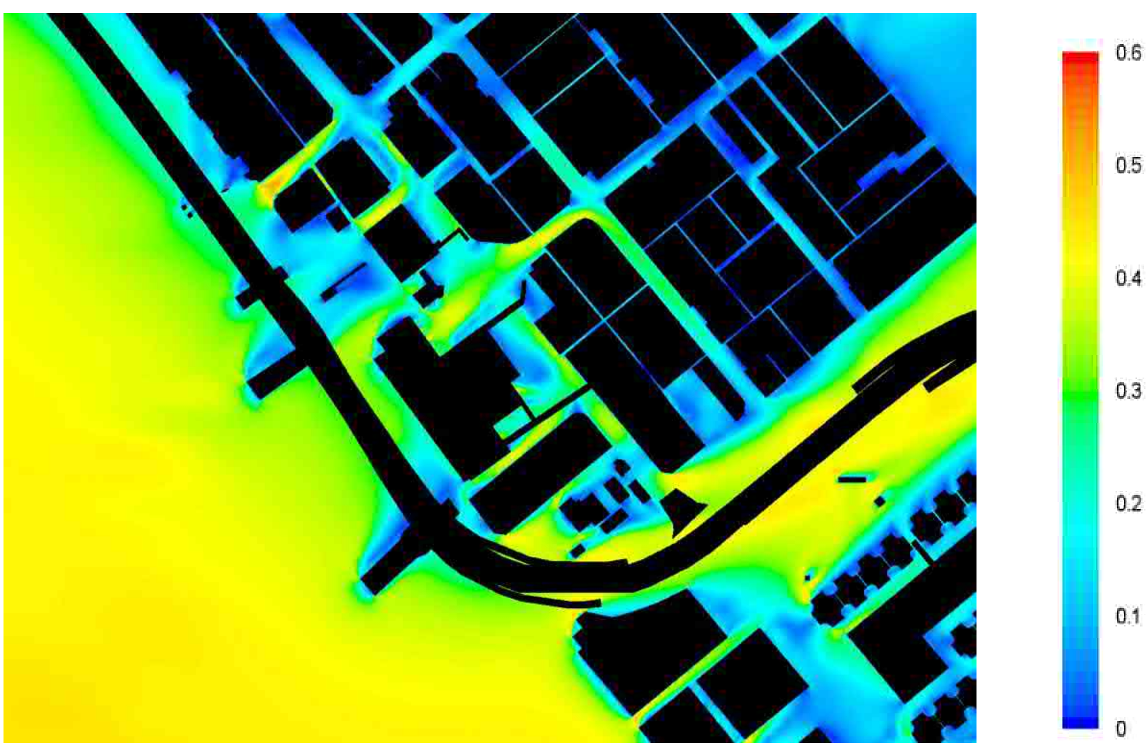

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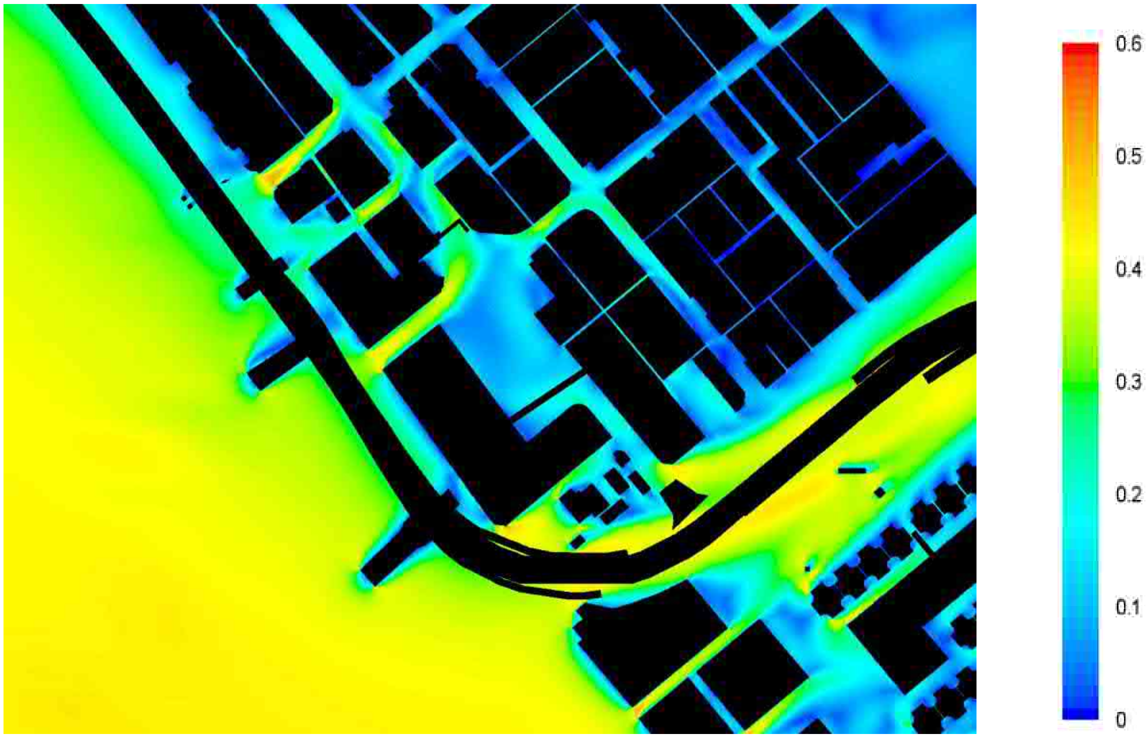
SW at 2mAG (Base Scheme)



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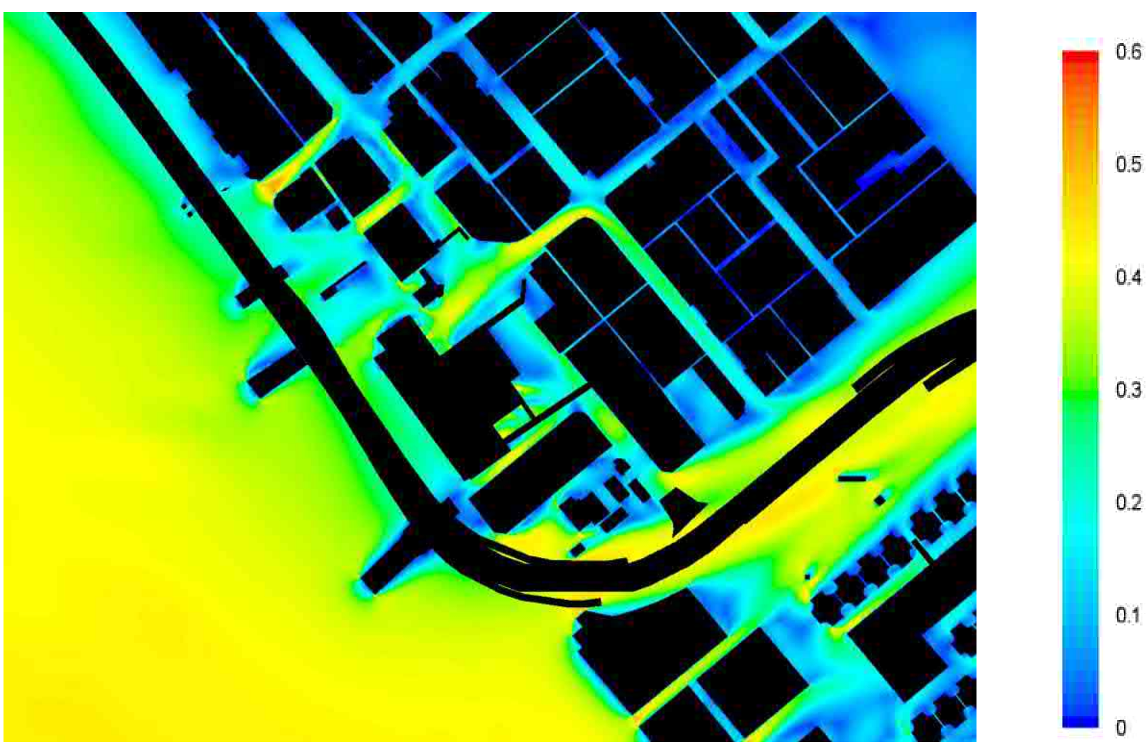
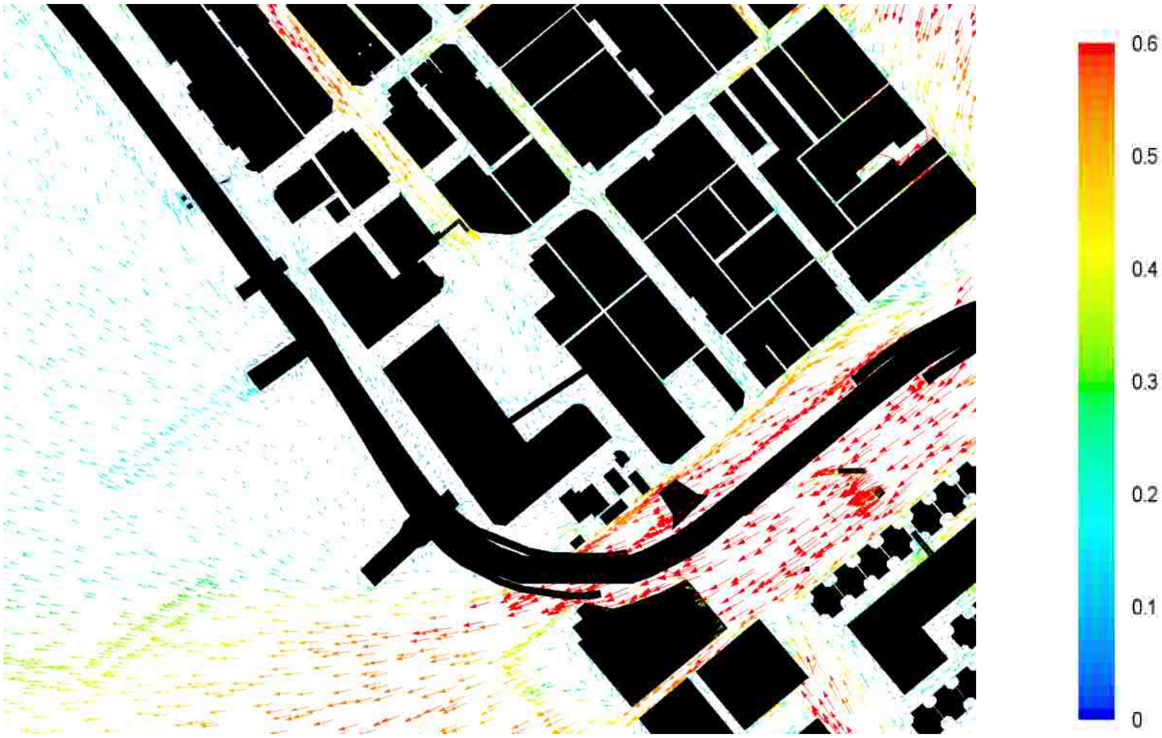


Appendix D – Wind Velocity Ratio Vector Plots for Annual Wind

NNE at 2mAG (Base Scheme)



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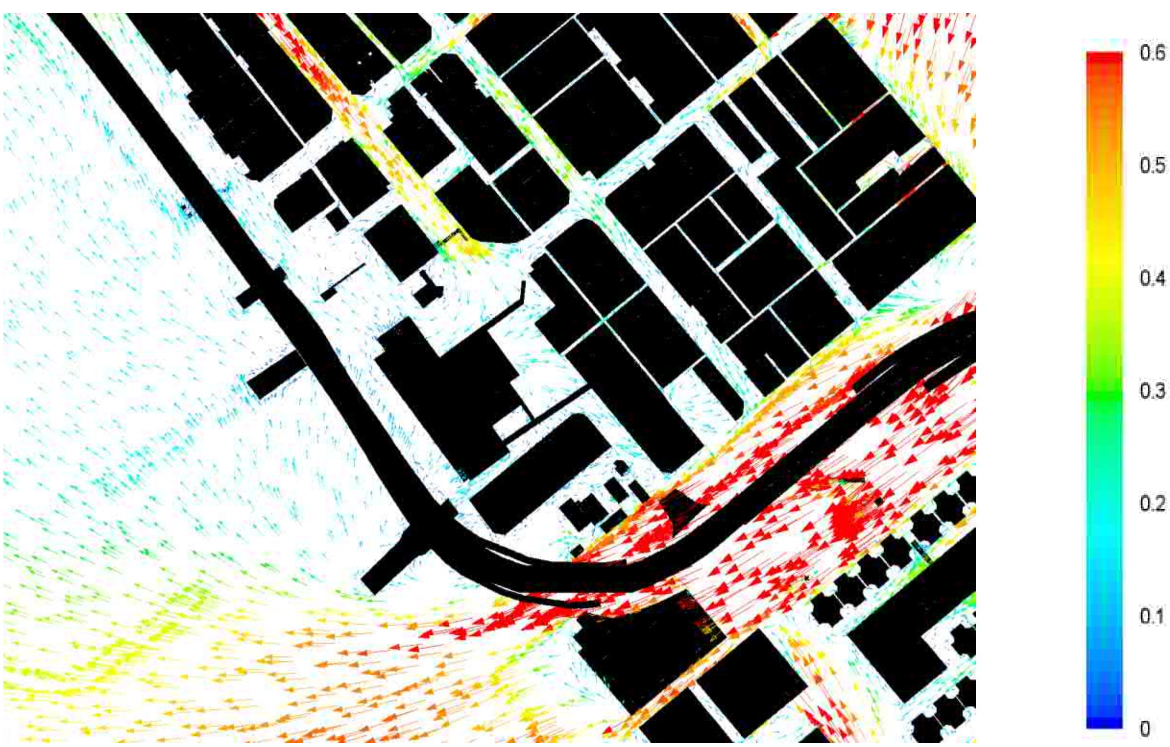

Appendix D – Wind Velocity Ratio Vector Plots for Annual Wind

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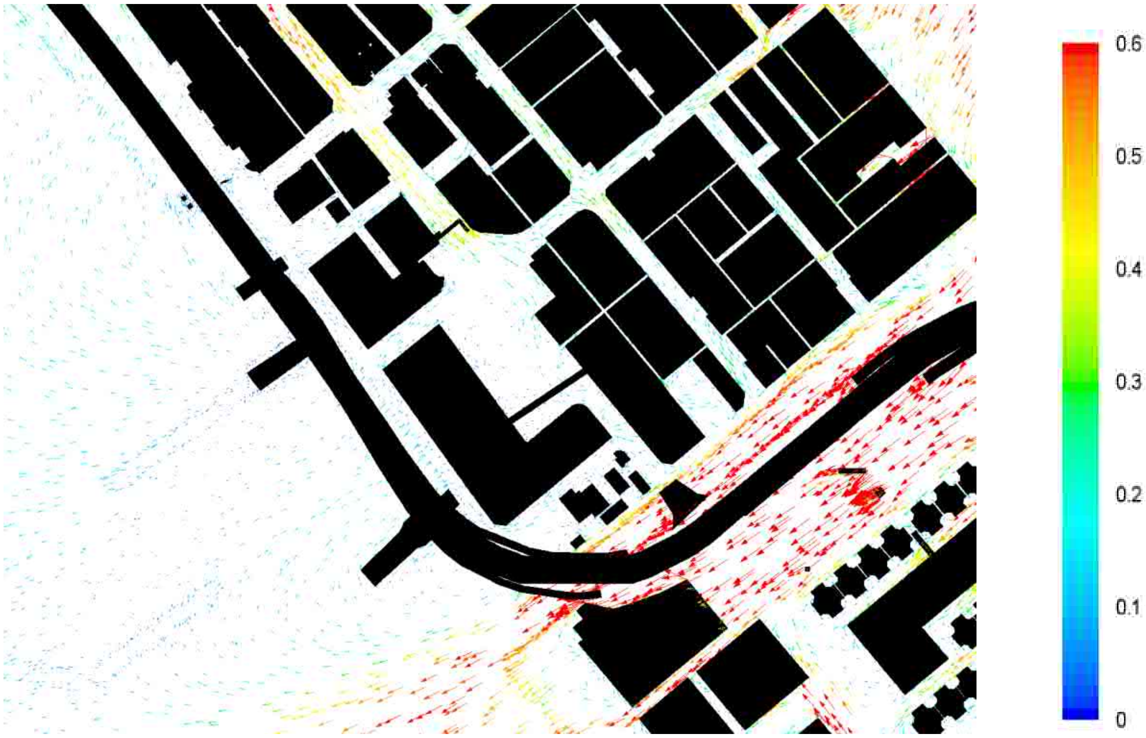

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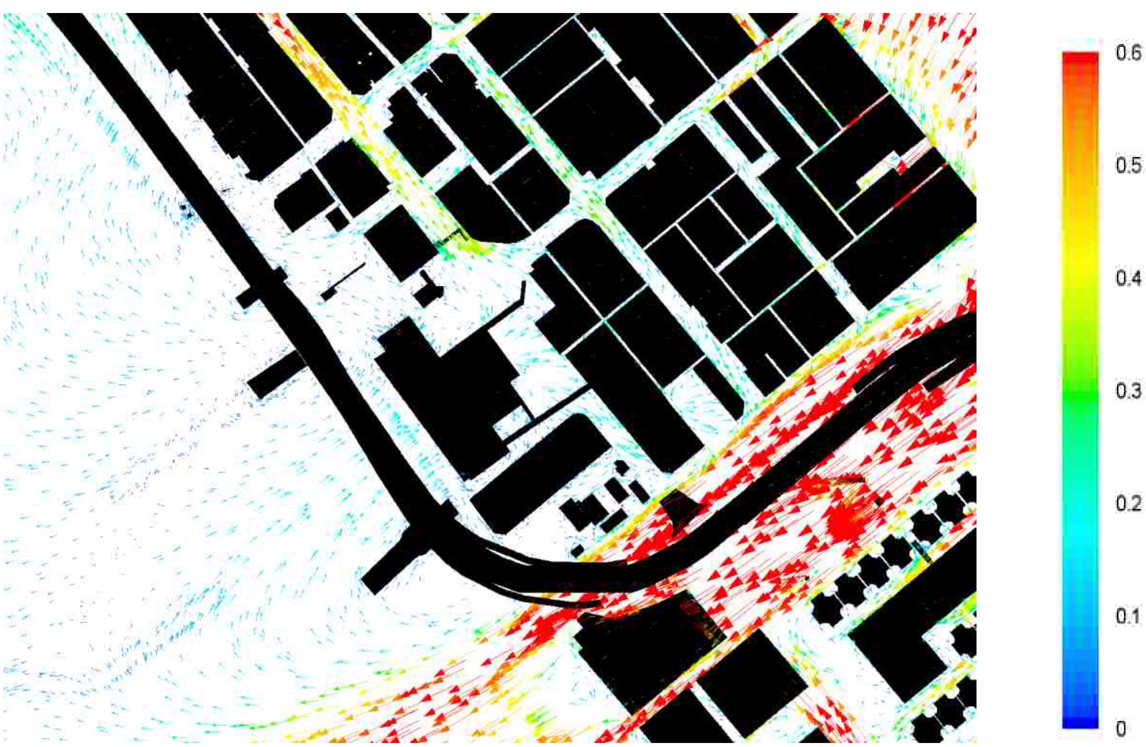

Appendix D – Wind Velocity Ratio Vector Plots for Annual Wind

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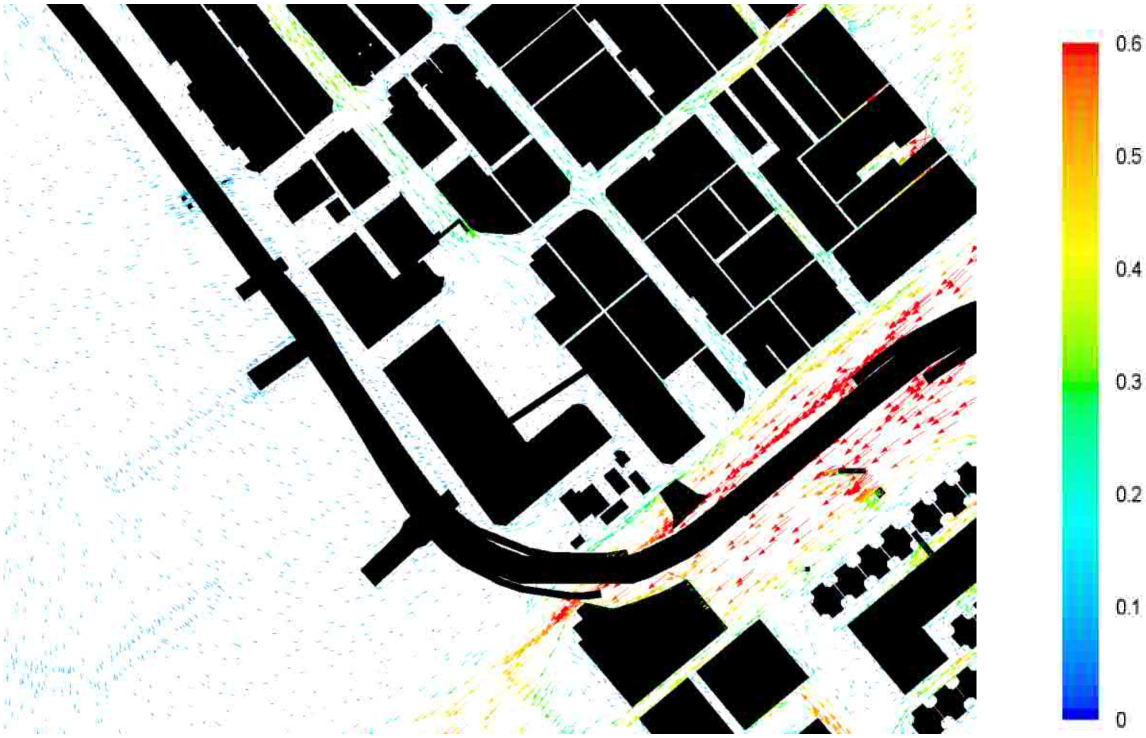

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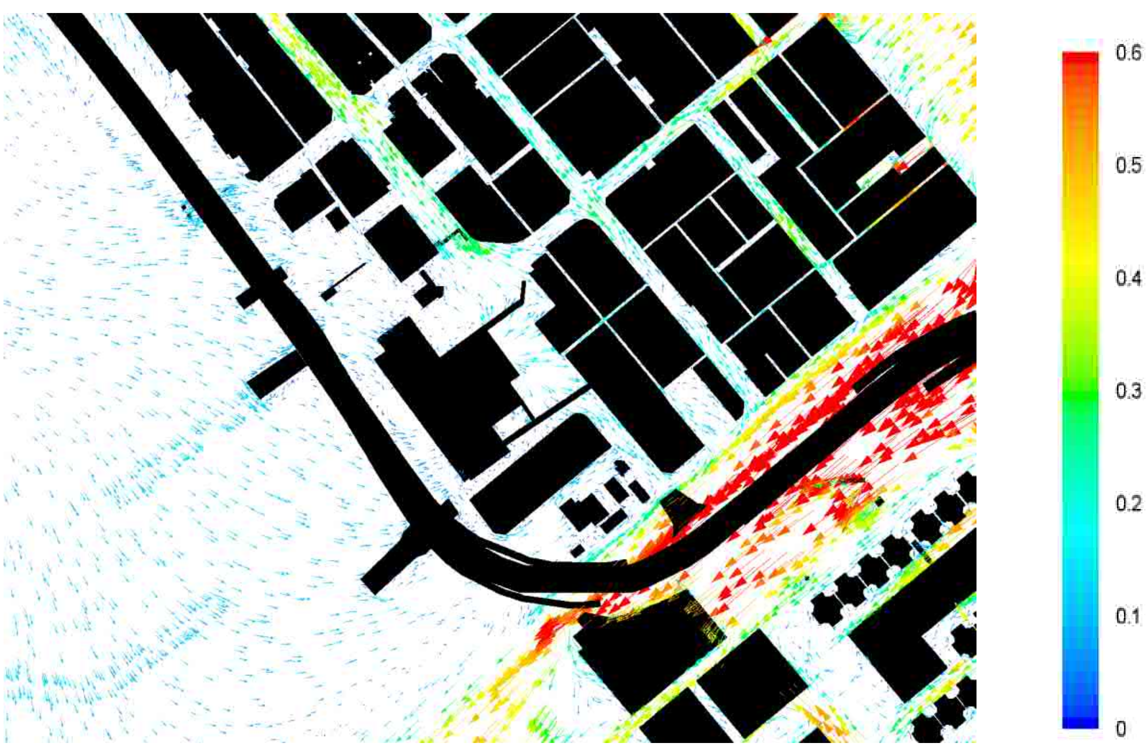
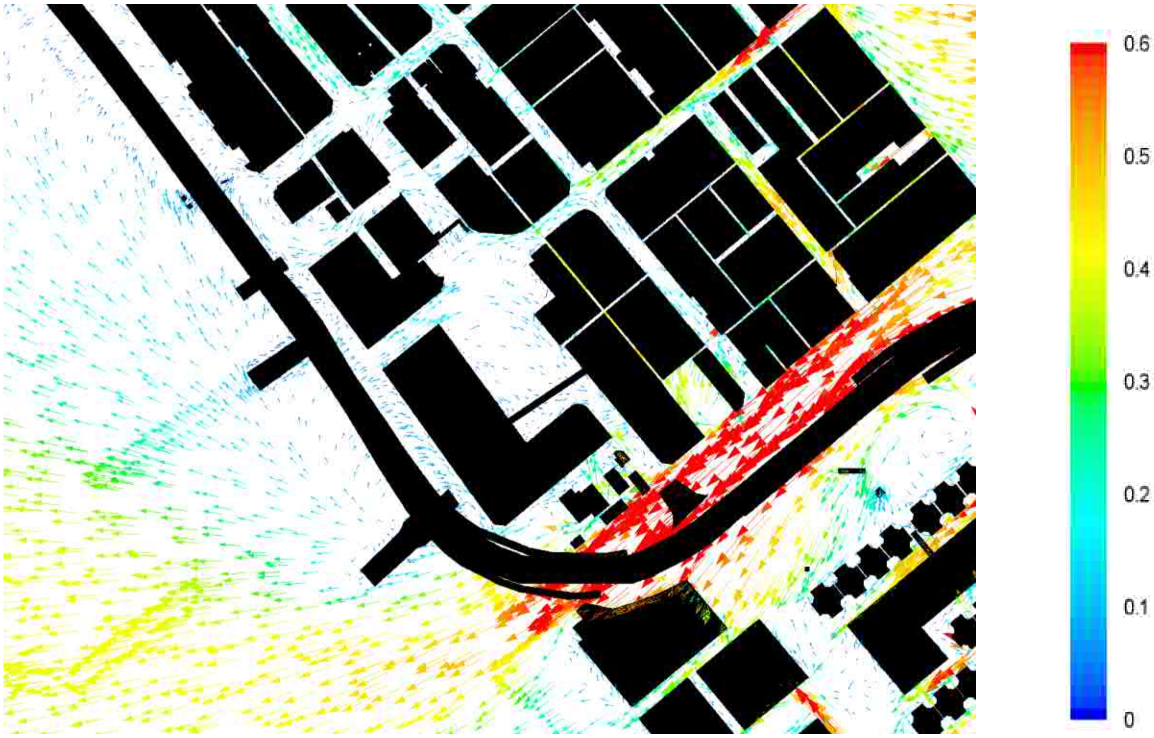


Appendix D – Wind Velocity Ratio Vector Plots for Annual Wind

E at 2mAG (Base Scheme)



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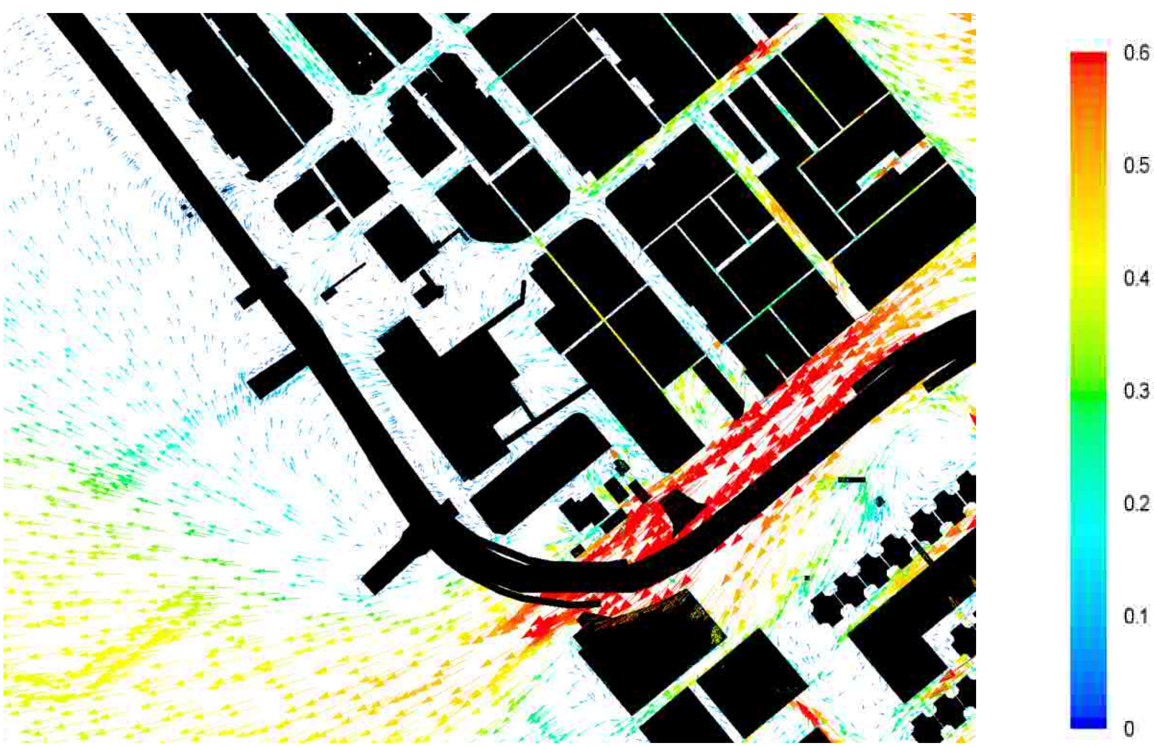

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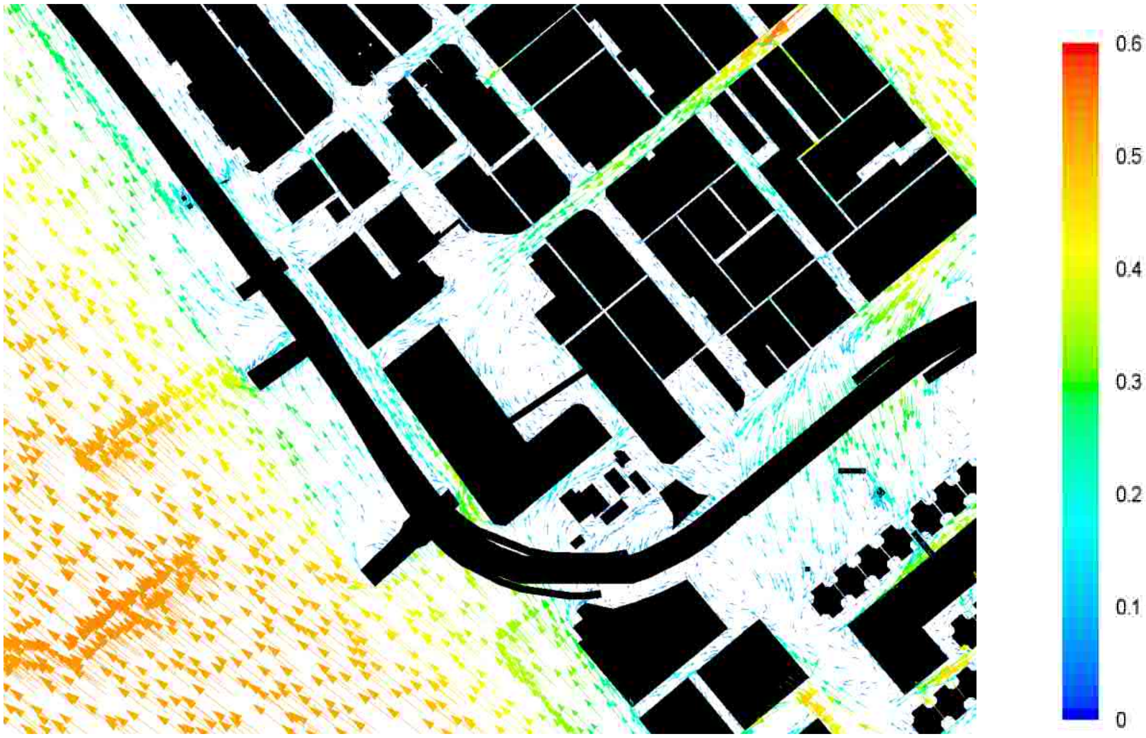

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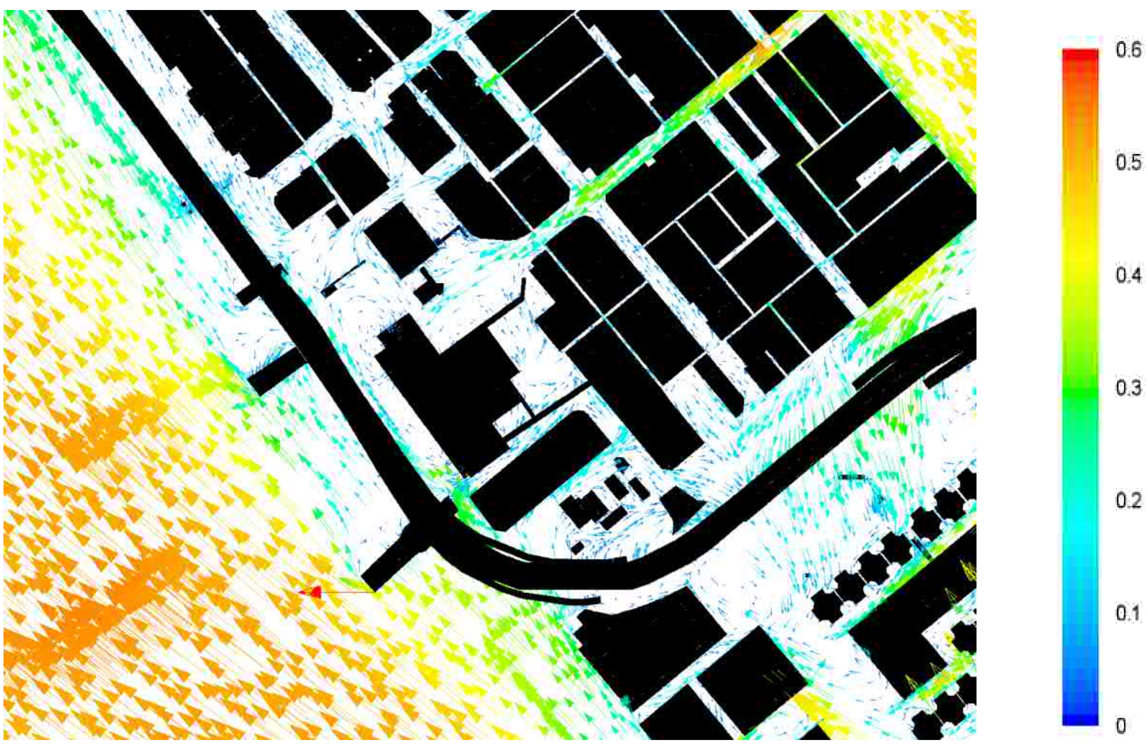

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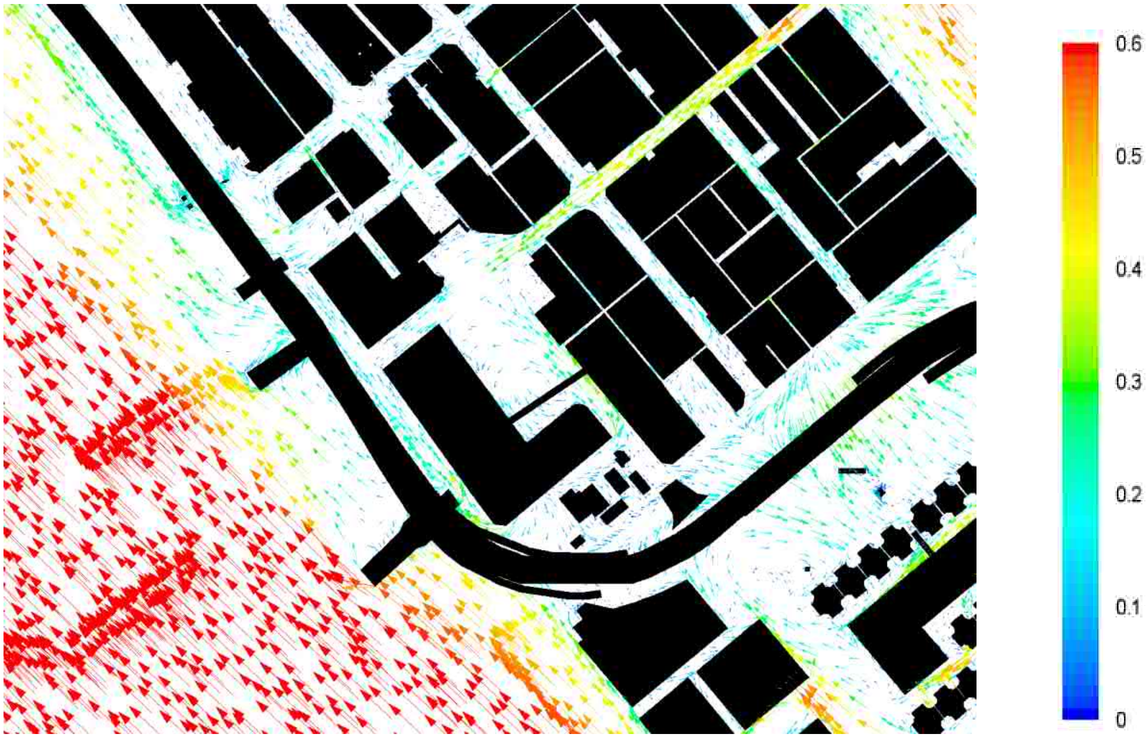

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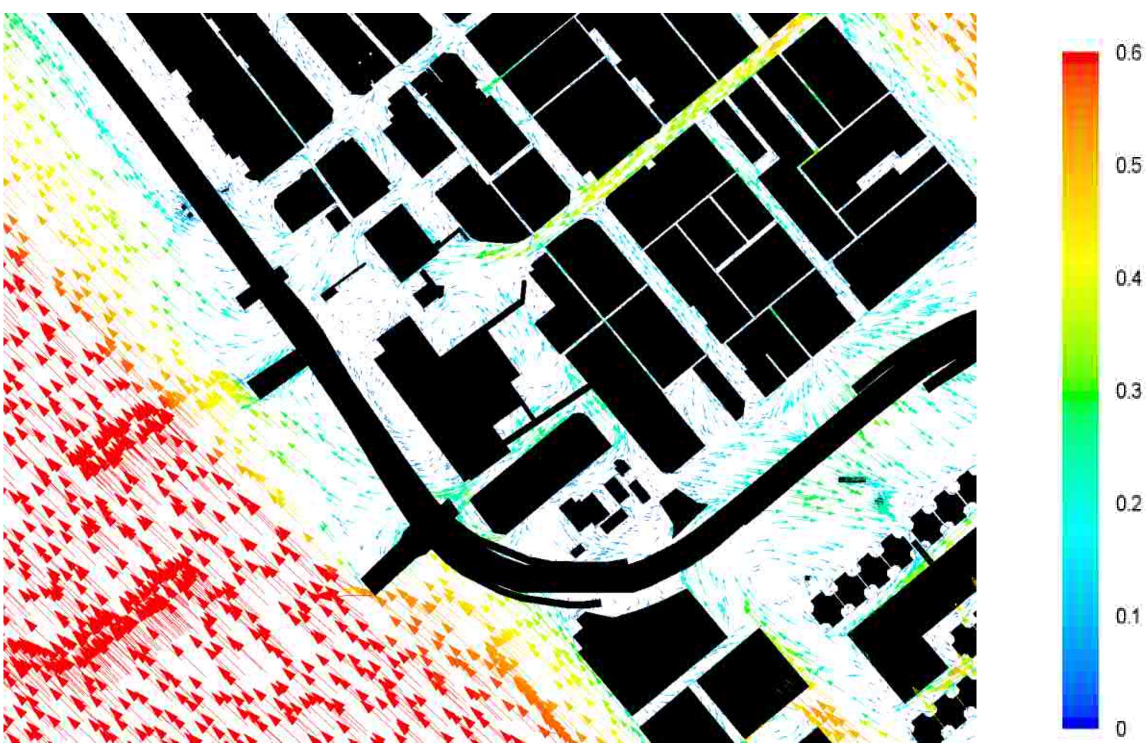
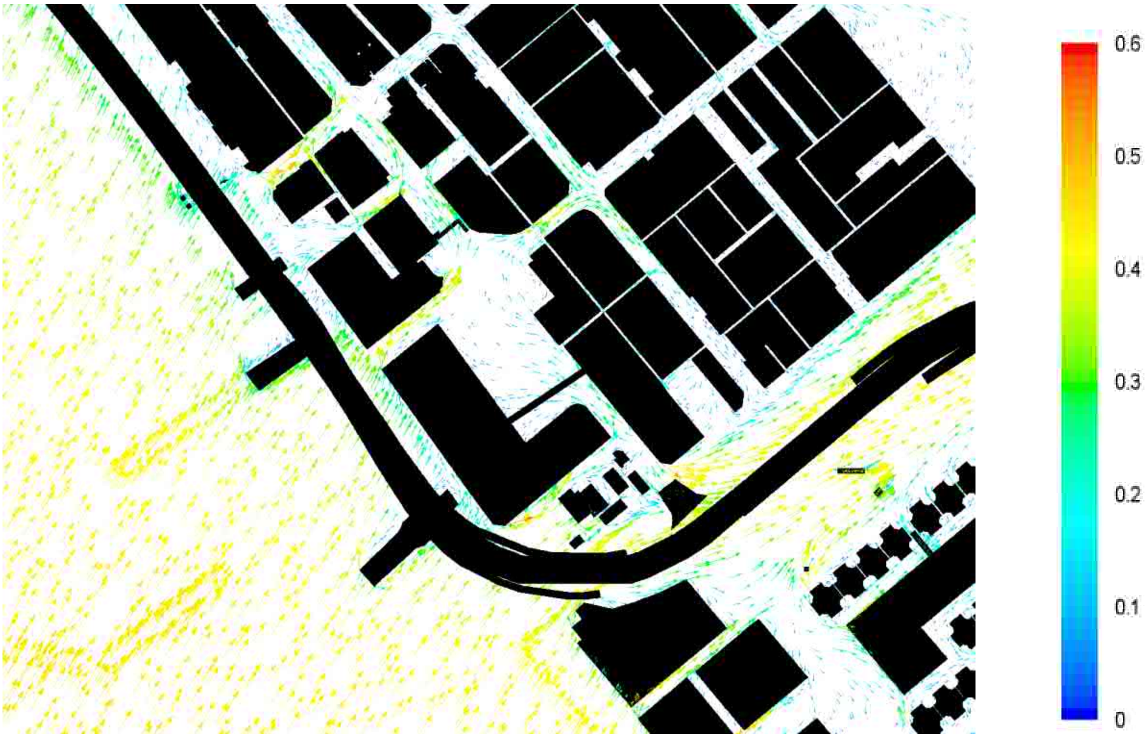


Appendix D – Wind Velocity Ratio Vector Plots for Annual Wind

SSW at 2mAG (Base Scheme)



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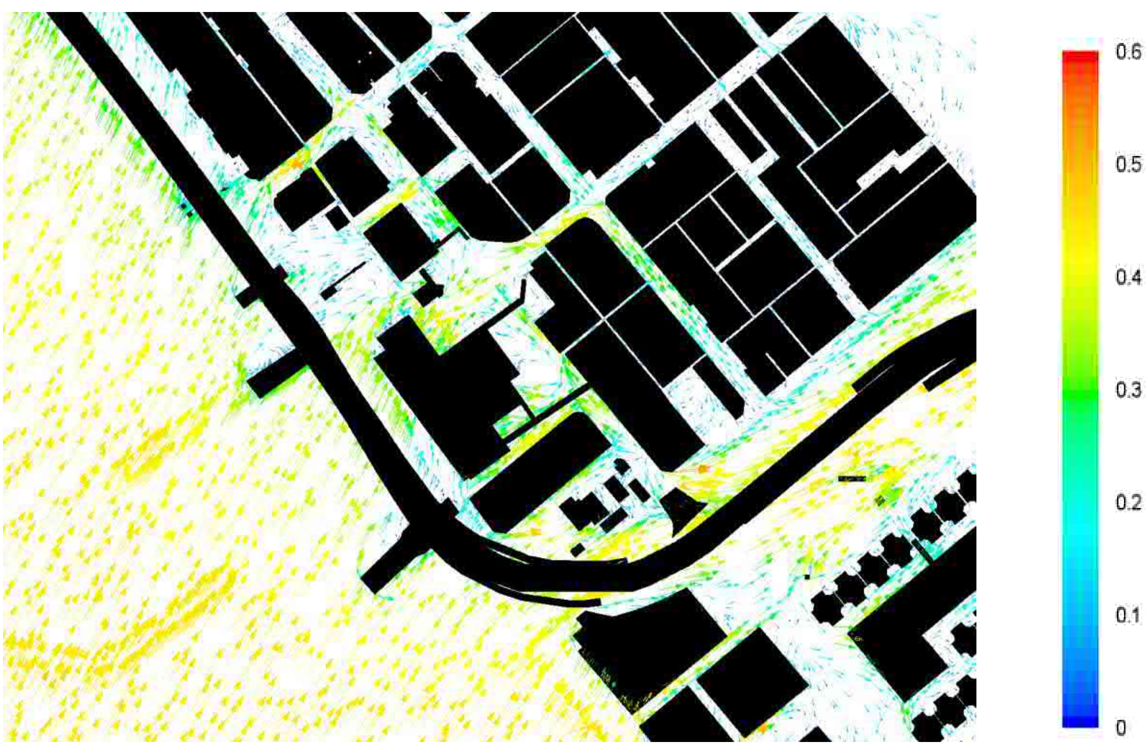

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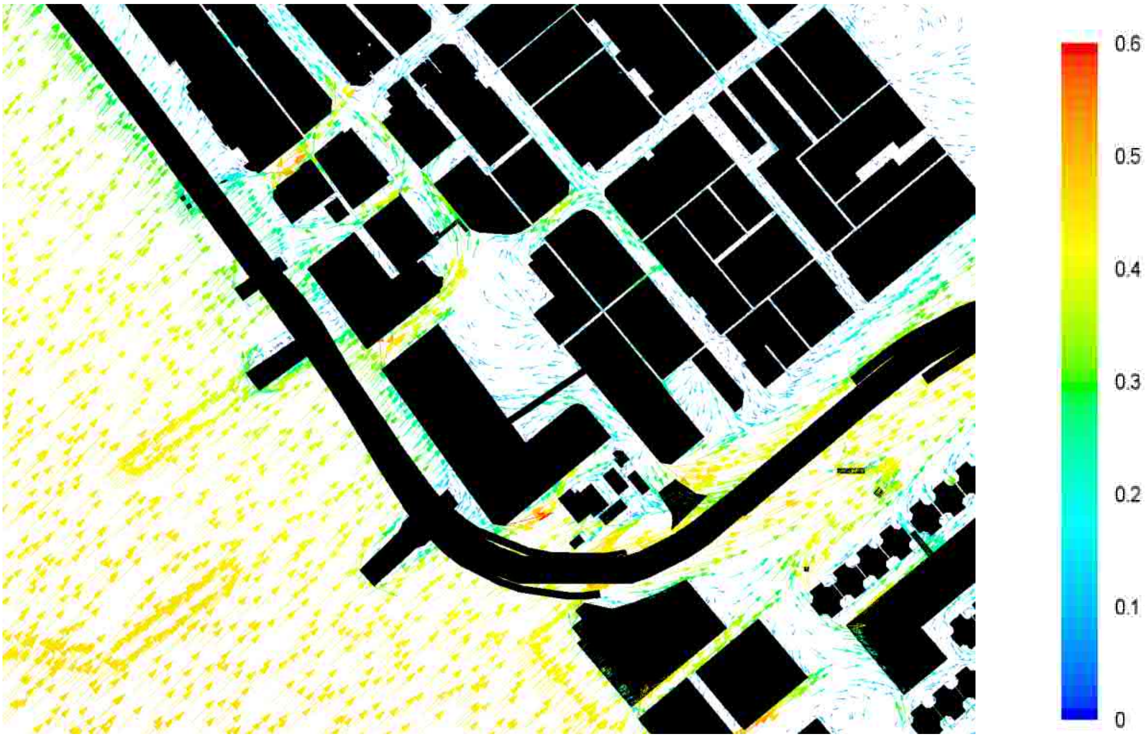
SW at 2mAG (Base Scheme)



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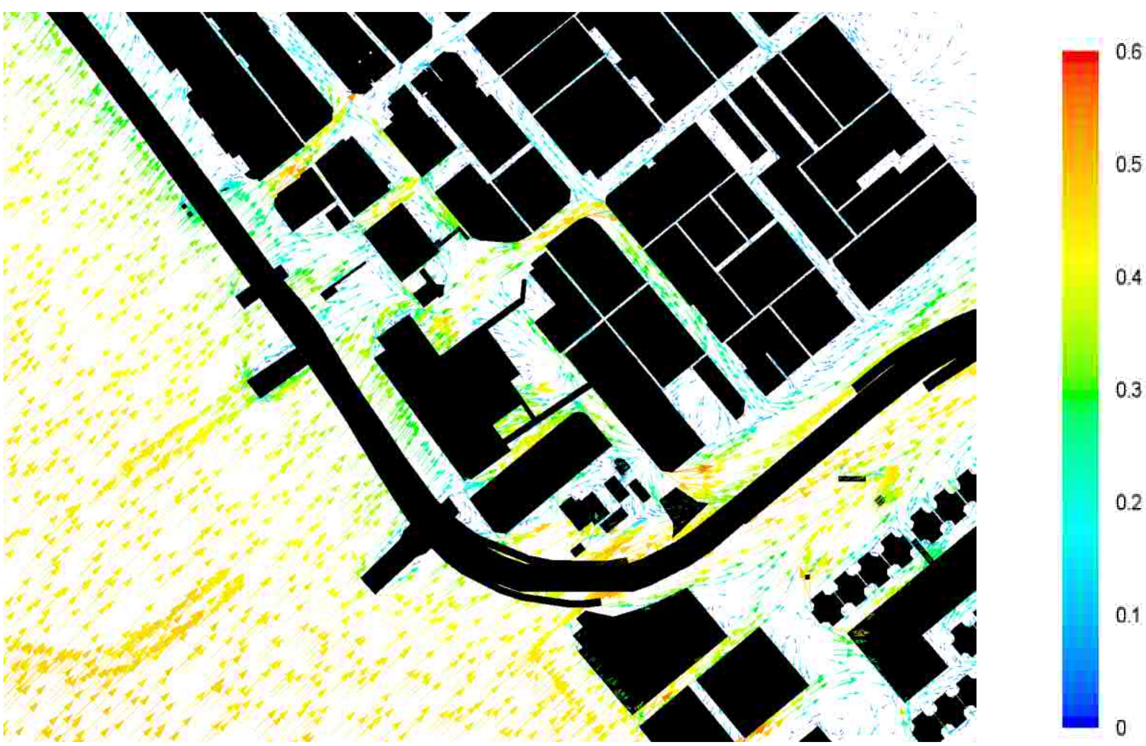
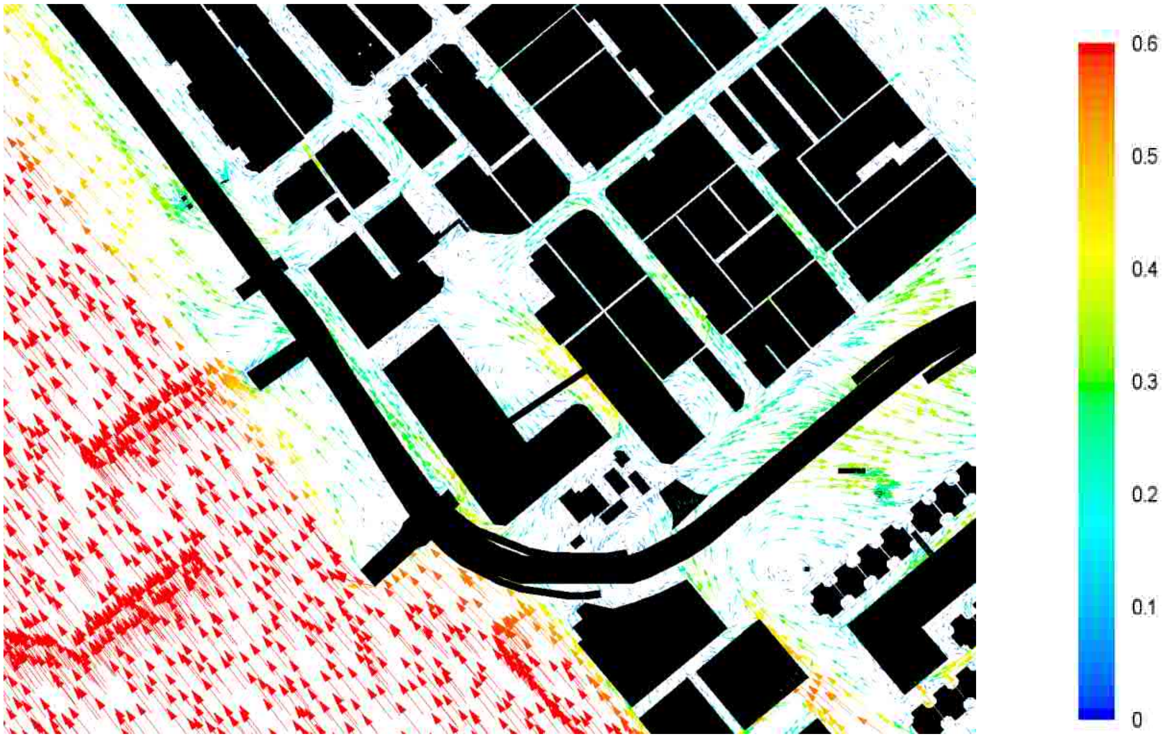


Appendix D – Wind Velocity Ratio Vector Plots for Summer Wind

SSE at 2mAG (Base Scheme)



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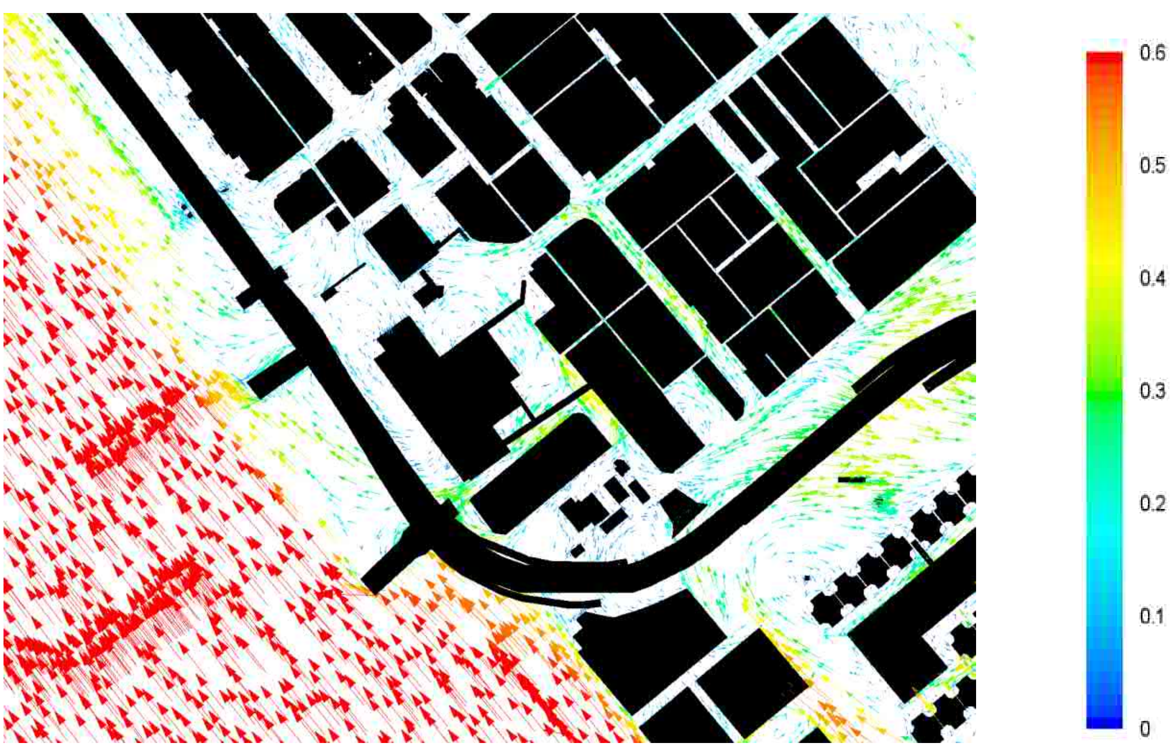

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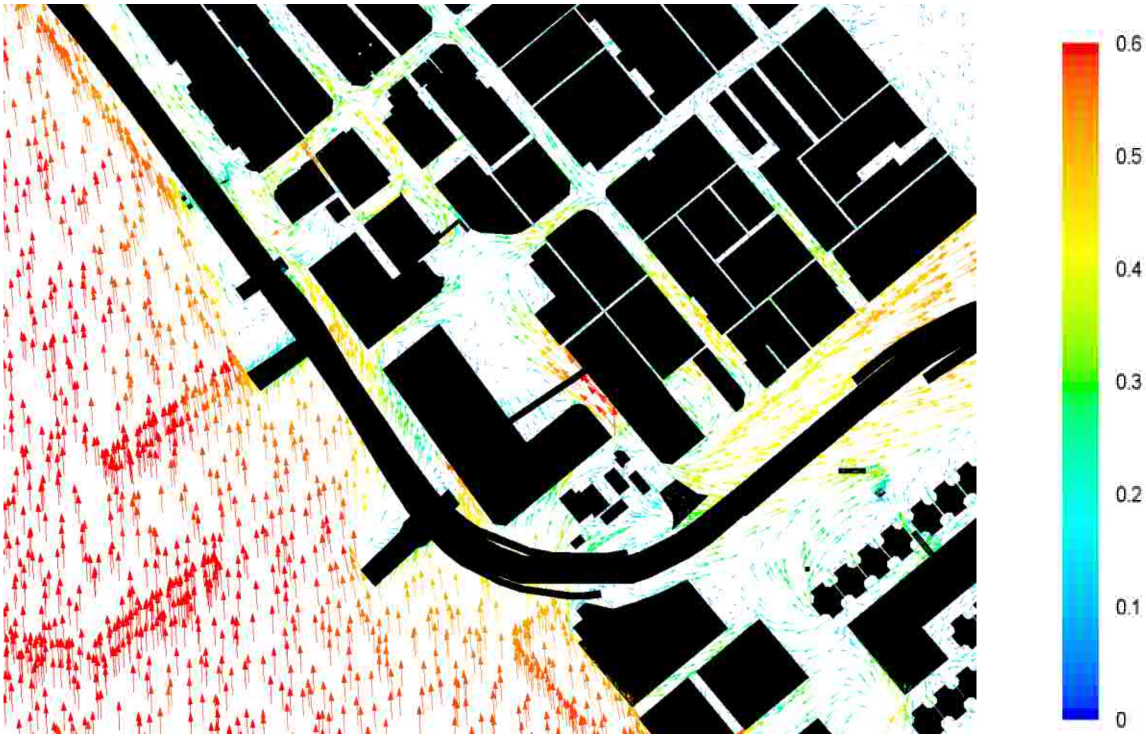
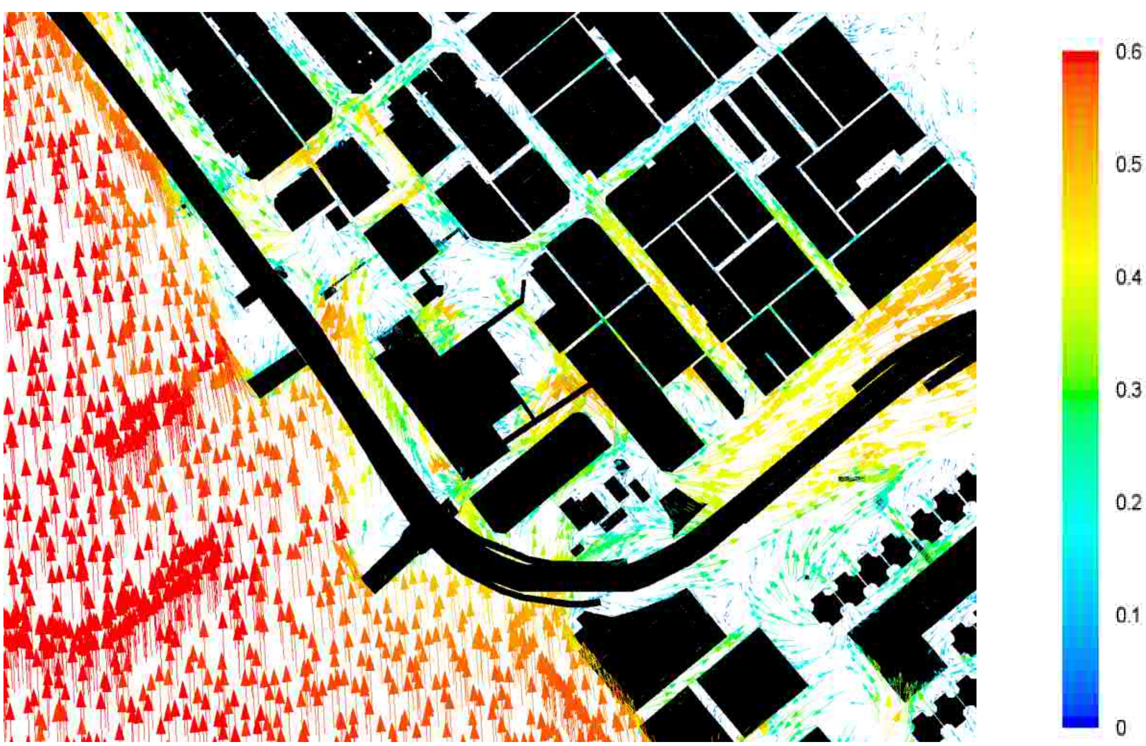


S at 2mAG (Proposed Scheme)



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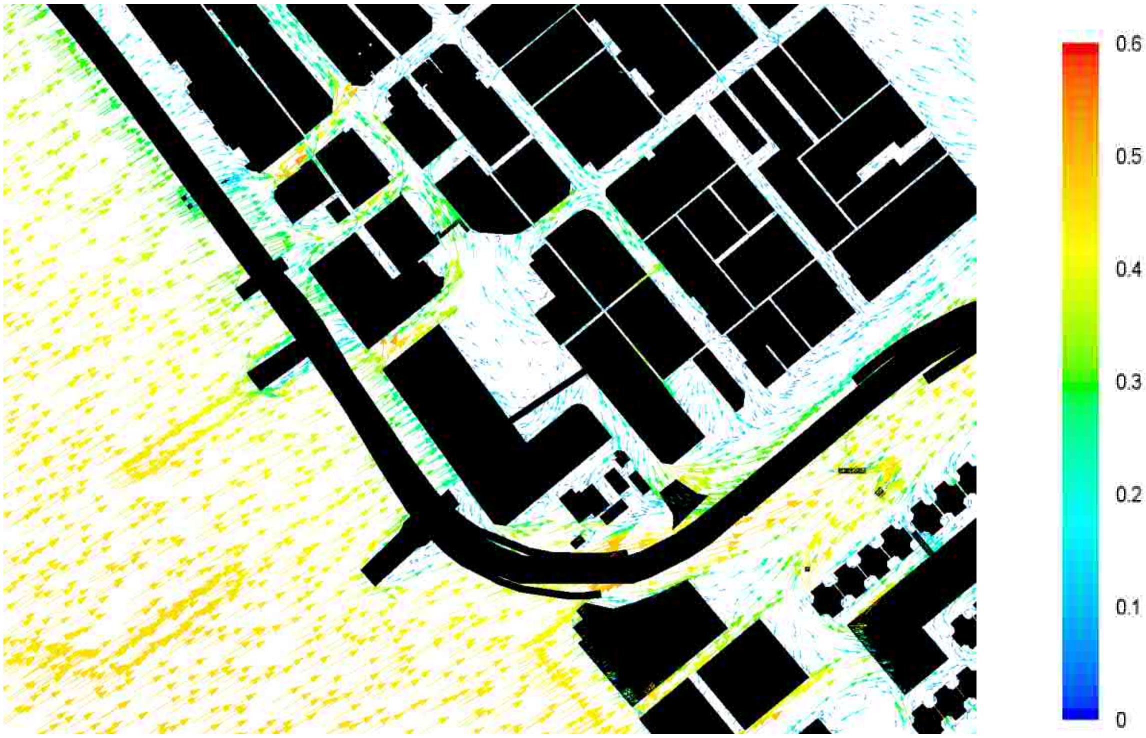

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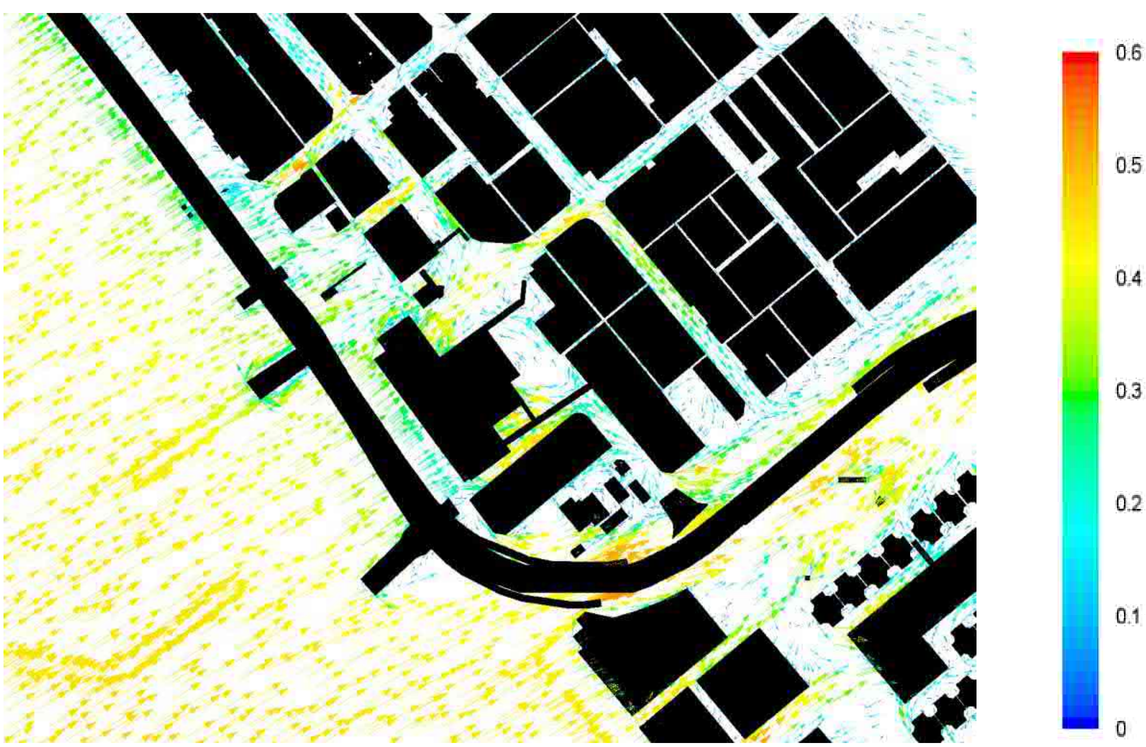

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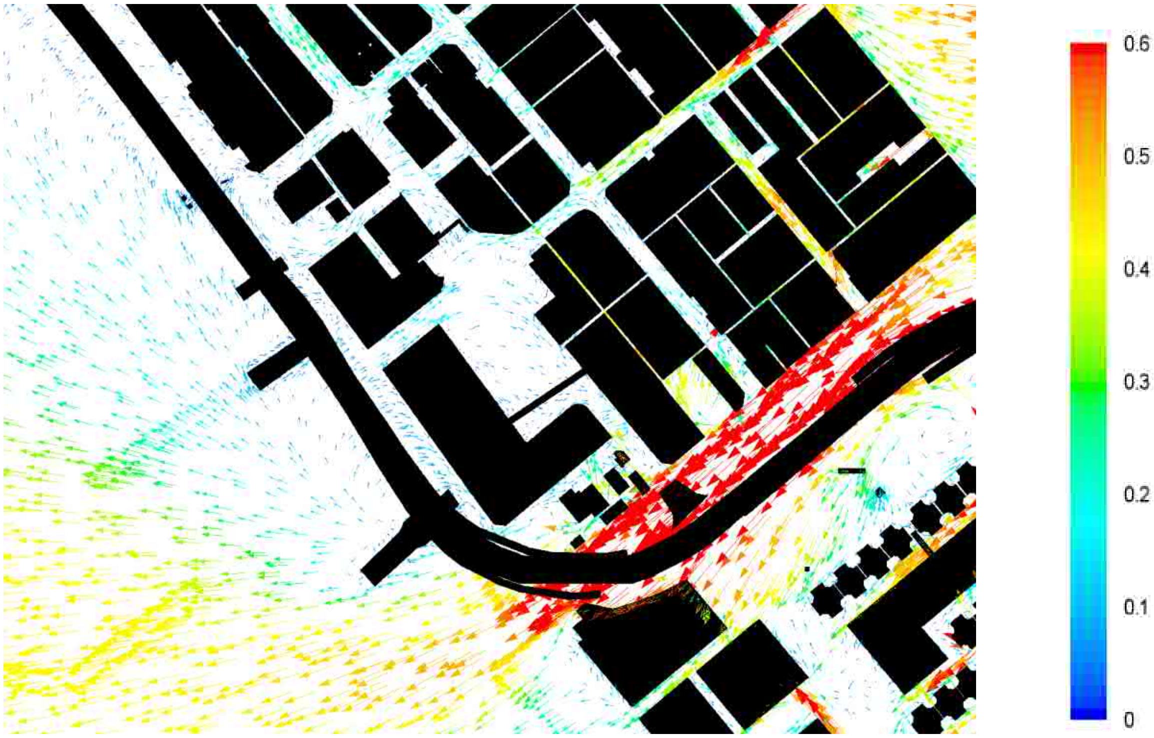
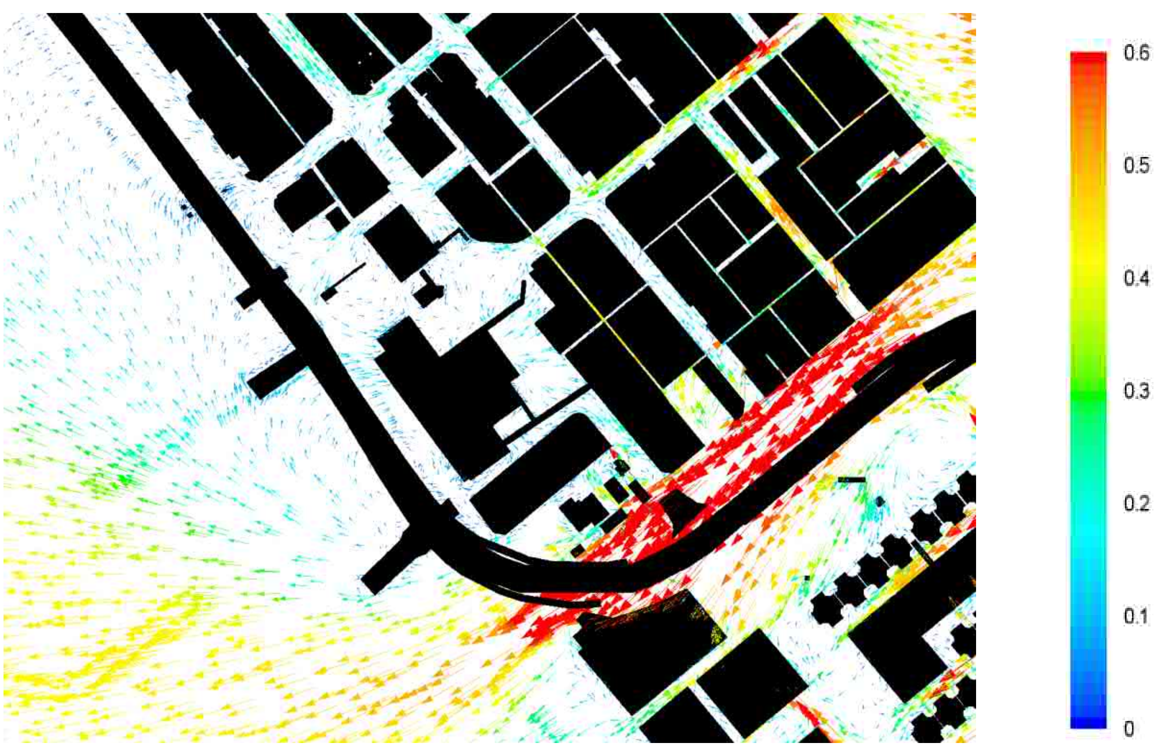


E at 2mAG (Proposed Scheme)



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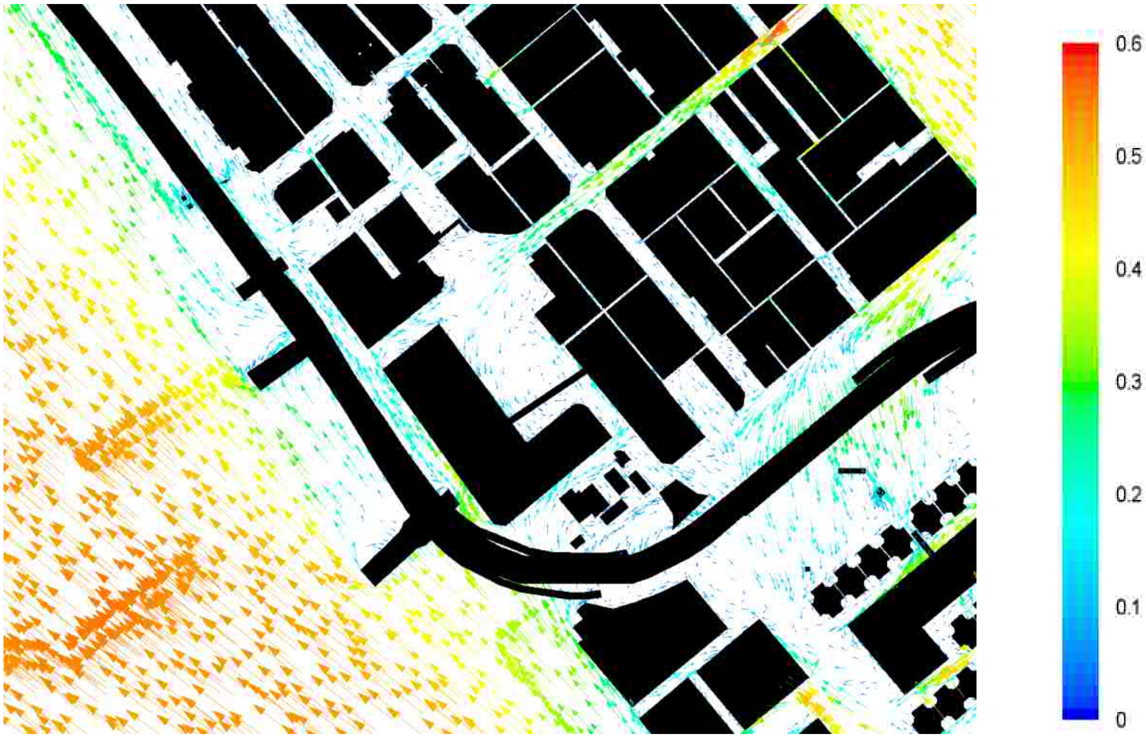

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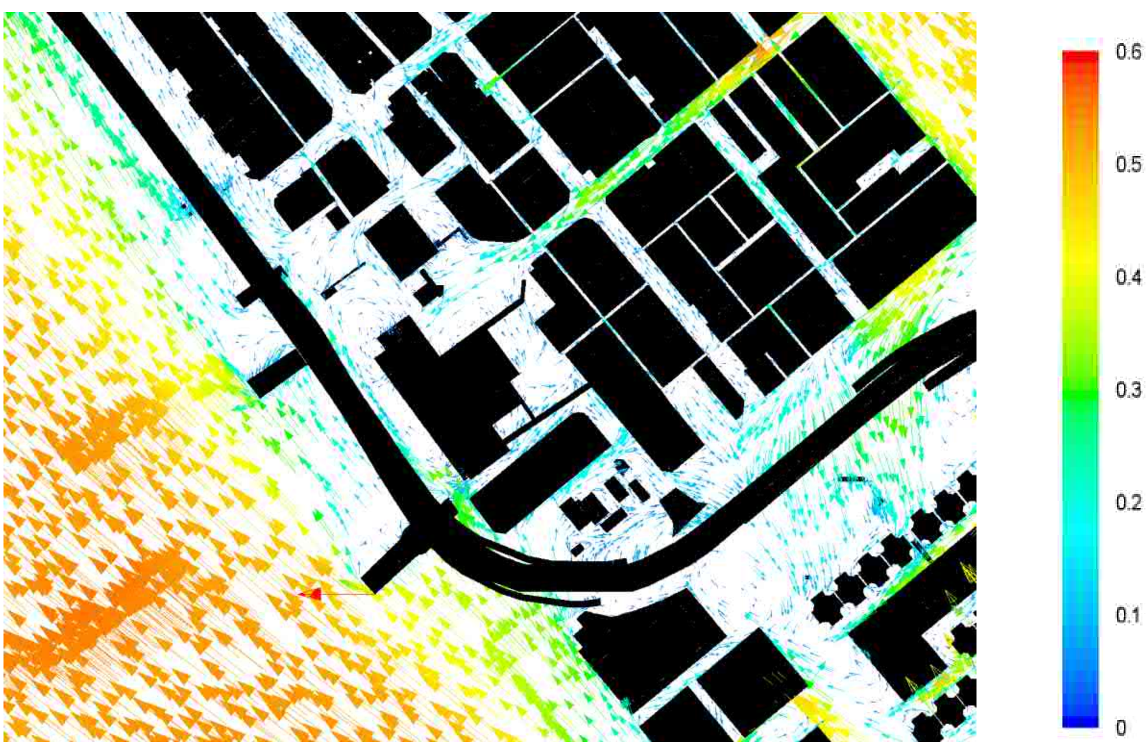

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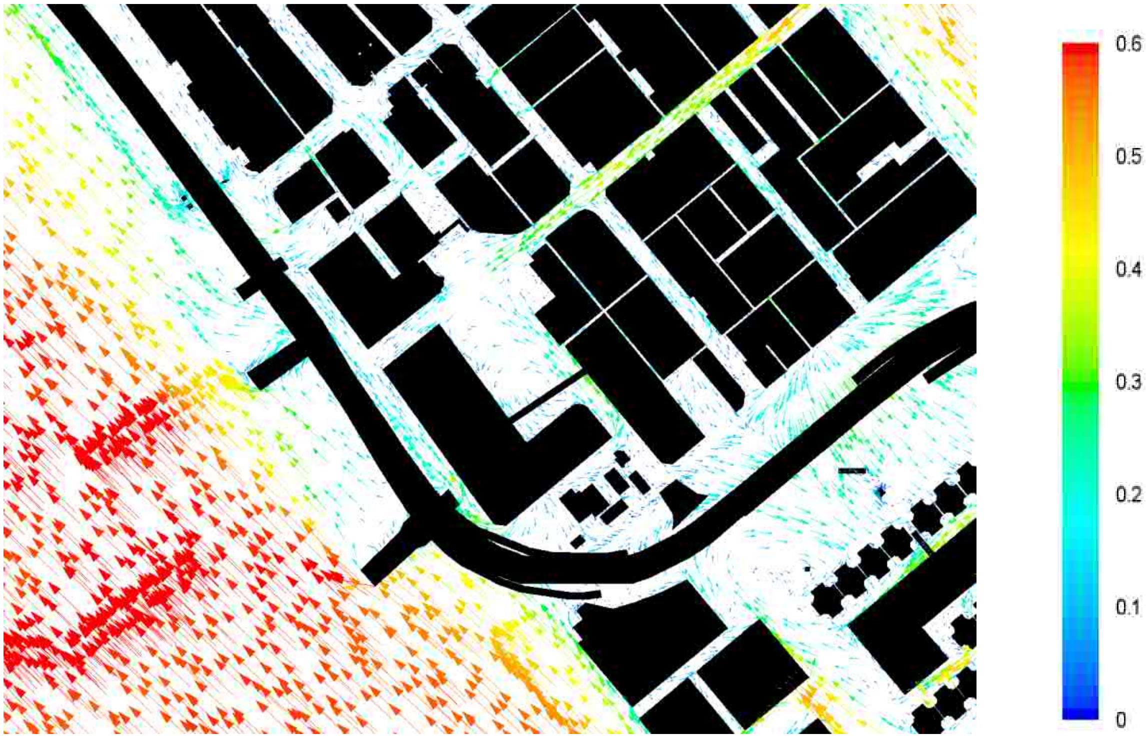
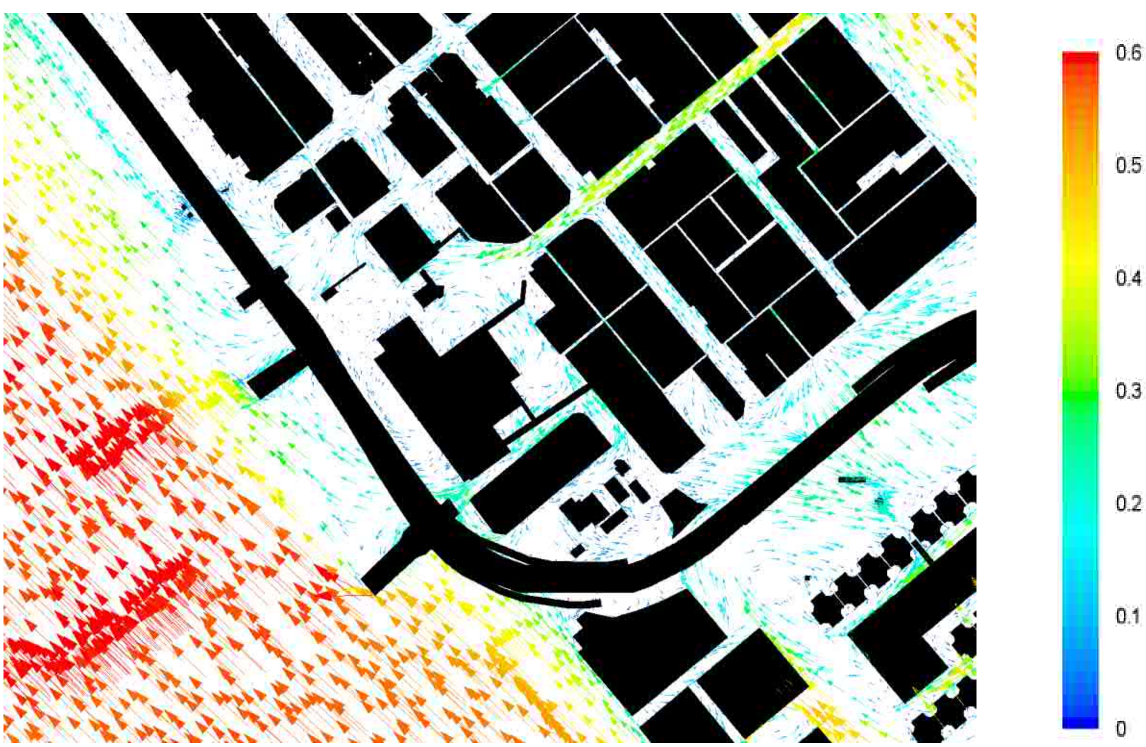


SE at 2mAG (Proposed Scheme)



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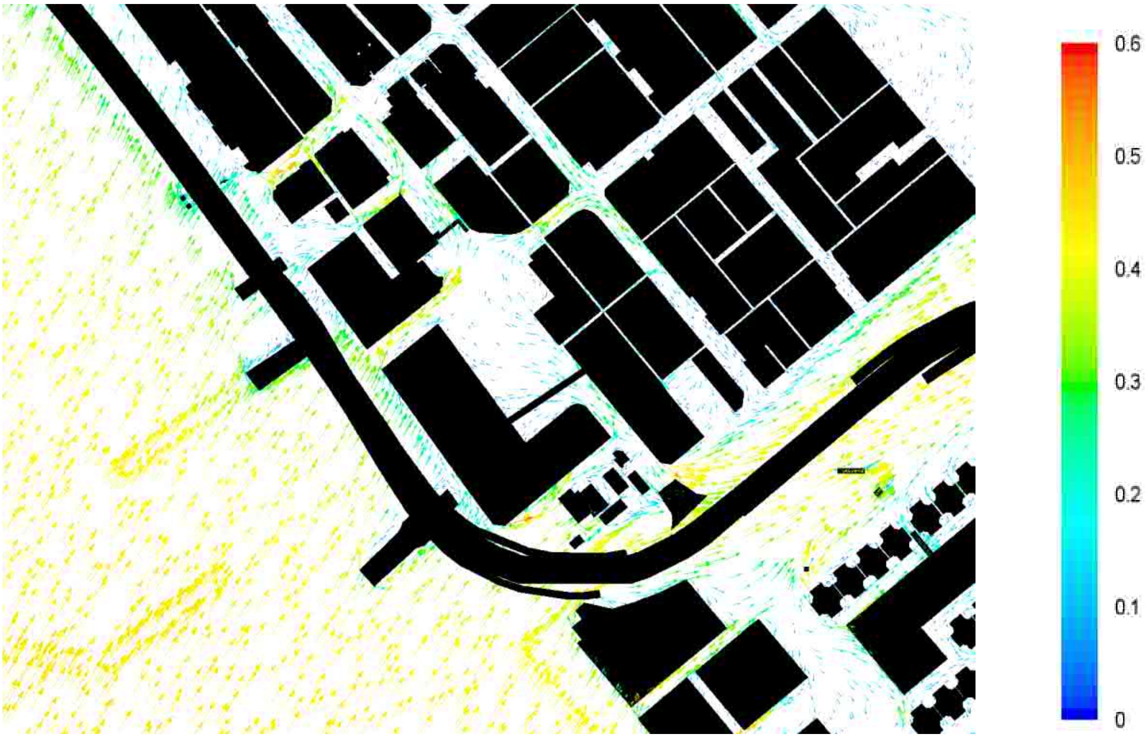

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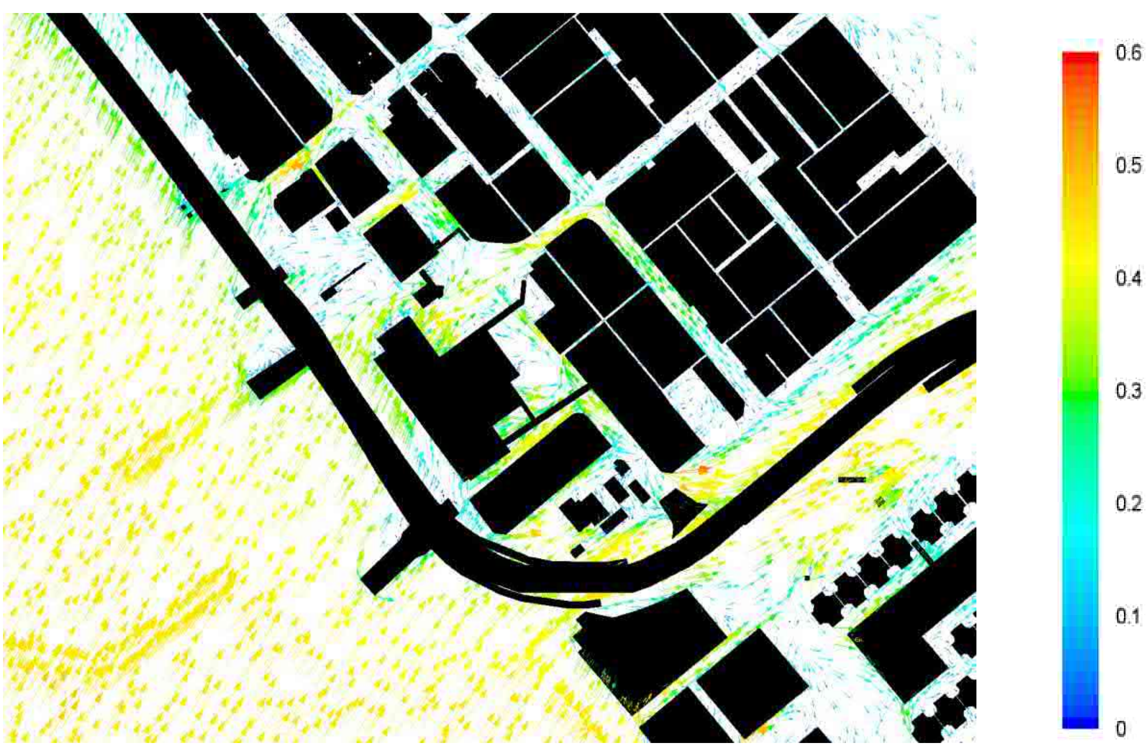

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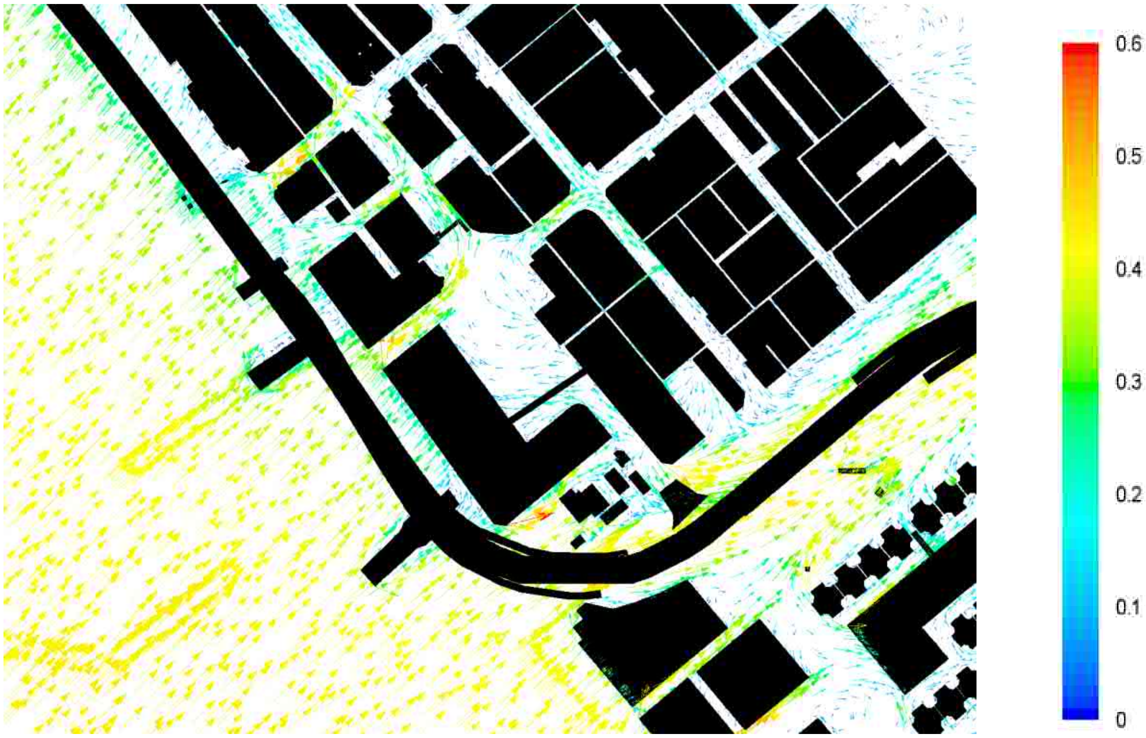

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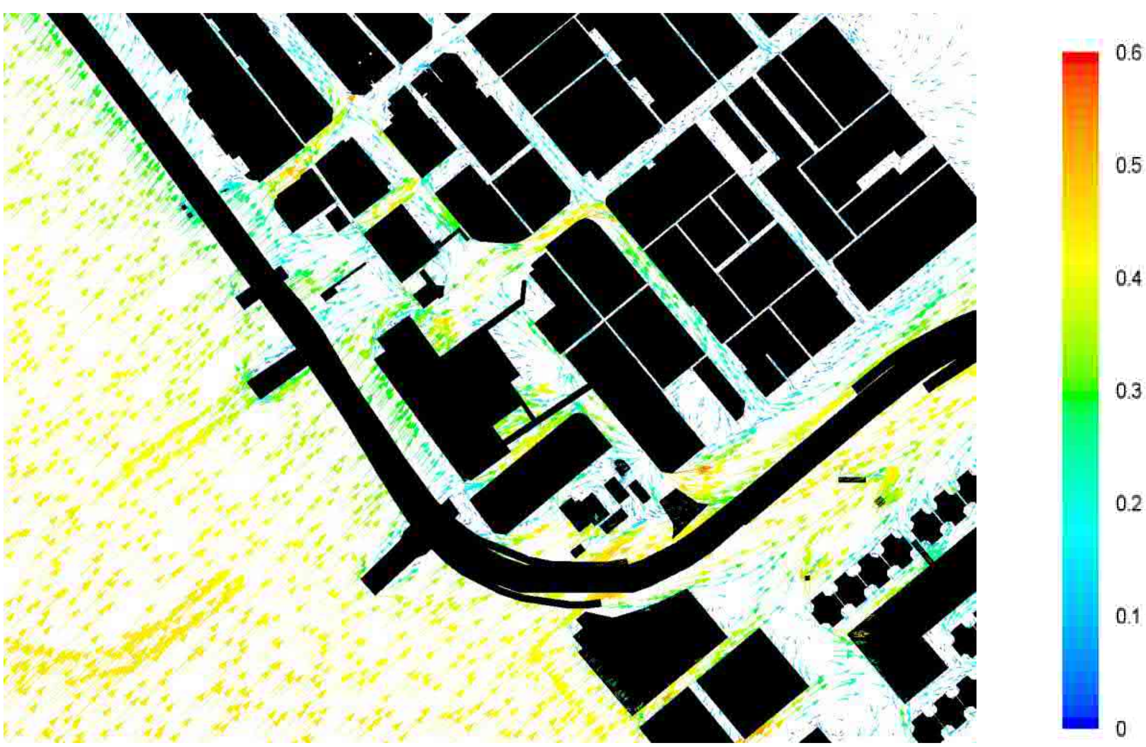

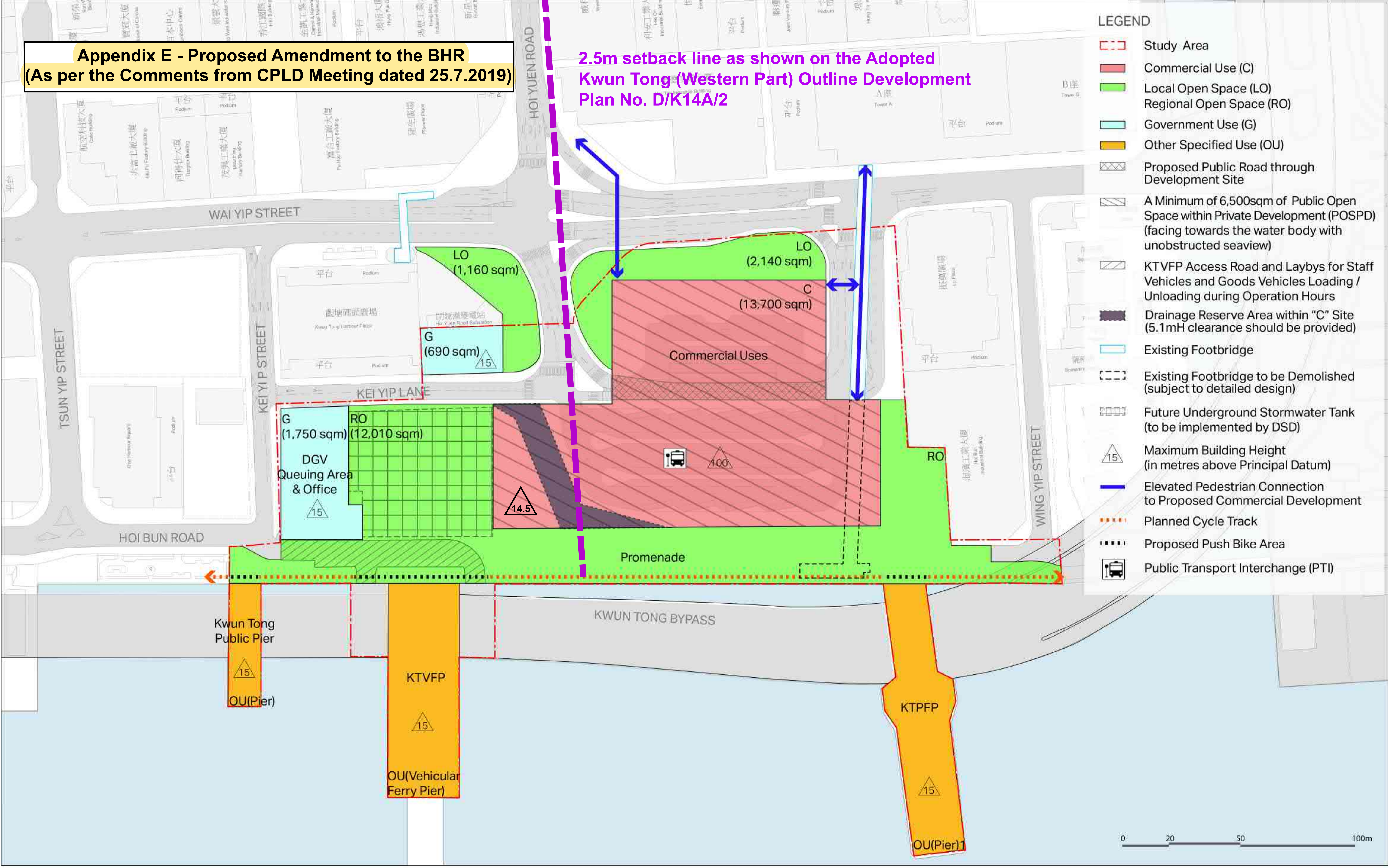

Project:
Agreement No. CE 61/2015 (TP)
Planning and Engineering Study on
Kwun Tong Action Area – Feasibility Study

Title:
RODP

Date: Jul 2019
Scale: As Shown

Plan 8

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Provision of Major Community Facilities and Open Space in Kwun Tong South (K14S)

Type of Facilities	Hong Kong Planning Standards and Guidelines (HKPSG)	HKPSG Requirement (based on planned population)	Provision		Surplus/ Shortfall (against planned provision)
			Existing Provision	Planned Provision (including Existing Provision)	
District Open Space	10 ha per 100,000 persons#	30.44 ha	17.78	29.77	-0.67
Local Open Space	10 ha per 100,000 persons#	30.44 ha	57.38	58.35	+27.91
Secondary School	1 whole-day classroom for 40 persons aged 12-17	382 classrooms	555	555	+173
Primary School	1 whole-day classroom for 25.5 persons aged 6-11	422 classrooms	473	473	+51
Kindergarten/ Nursery	34 classrooms for 1,000 children aged 3 to under 6	138 classrooms	166	166	+28
District Police Station	1 per 200,000 to 500,000 persons	0	2	2	+2
Divisional Police Station	1 per 100,000 to 200,000 persons	1	2	2	+1
Hospital	5.5 beds per 1,000 persons^	1,751 beds	1,499	2,559	+808
Clinic/Health Centre	1 per 100,000 persons	3	3	3	0
Magistracy (with 8 courtrooms)	1 per 660,000 persons	0	0	0	0
Child Care Centre	100 aided places per 25,000 persons#@	1218	263	423	-795
Integrated Children and Youth Services Centre	1 for 12,000 persons aged 6-24#	4	7	7	+3
Integrated Family Services Centre	1 for 100,000 to 150,000 persons#	2	3	3	+1

Type of Facilities	Hong Kong Planning Standards and Guidelines (HKPSG)	HKPSG Requirement (based on planned population)	Provision		Surplus/ Shortfall (against planned provision)
			Existing Provision	Planned Provision (including Existing Provision)	
District Elderly Community Centres	One in each new development area with a population of around 170,000 or above#	N.A.	1	1	N.A.
Neighbourhood Elderly Centres	One in a cluster of new and redeveloped housing areas with a population of 15,000 to 20,000 persons, including both public and private housing#	N.A.	8	8	N.A.
Community Care Services (CCS) Facilities	17.2 subsidised places per 1,000 elderly persons aged 65 or above#*@	1,738 places	795	933	-805
Residential Care Homes for the Elderly	21.3 subsidised beds per 1,000 elderly persons aged 65 or above#@	2,152 beds	831	931	-1,221
Library	1 district library for every 200,000 personsπ	1	4	4	+3
Sports Centre	1 per 50,000 to 65,000 persons#	4	4	4	0
Sports Ground/ Sport Complex	1 per 200,000 to 250,000 persons#	1	0	0	-1
Swimming Pool Complex – standard	1 complex per 287,000 persons#	1	1	1	0

Note:
Facilities and open space figures of OZP No. S/K14S/22 are included.
The planned resident population is about 304,500. If including transients, the overall planned population is about 318,400. All population figures have been adjusted to the nearest hundred.

- # The requirements exclude planned population of transients.
- ^ The provision of hospital beds is to be assessed by the Hospital Authority on a regional basis.
- * Consisting of 40% centre-based CCS and 60% home-based CCS.
- @ This is a long-term goal and the actual provision would be subject to the consideration of the Social Welfare Department in the planning and development process as appropriate.
- π Small libraries are counted towards meeting the HKPSG requirement.

November 2020

第五屆觀塘區議會屬下
觀塘區發展及重建專責小組
<u>第十九次會議記錄</u>

日期： 2019年4月2日(星期二)
時間： 下午3時正
地點： 九龍觀塘觀塘道392號創紀之城6期20樓05-07室
觀塘民政事務處會議室

出席者：

黎樹濠議員，BBS，MH，JP(主席)	陳俊傑議員(副主席)
陳振彬議員，GBS，JP	簡銘東議員
陳華裕議員，MH，JP	呂東孩議員，MH
鄭景陽議員	莫建成議員
鄭強峰議員	顏汶羽議員
張琪騰議員	蘇冠聰議員
張培剛議員	蘇麗珍議員，MH，JP
張順華議員，MH	譚肇卓議員
張姚彬議員	謝淑珍議員
徐海山議員	黃子健議員
洪錦鉉議員，MH	黃春平議員，MH
金　堅議員	葉興國議員，BBS，MH，JP

<u>出席會議的政府部門代表</u>

趙廣堅先生	觀塘民政事務助理專員(2)
李賢斌先生	觀塘民政事務處高級行政主任(區議會)

<u>協助討論的機構/政府部門代表</u>

梁錦秋先生	市區重建局收購及遷置高級經理	)	議項 II
汪偉強先生	市區重建局工程及合約高級經理	)	
蘇毅朗先生	市區重建局社區發展高級經理	)	

區潔英女士	起動九龍東辦事處起動九龍東專員	)	議項 III 及 IV
黃國揚先生	起動九龍東辦事處起動九龍東副專員	)	
陳巧賢女士	起動九龍東辦事處 高級地方營造經理(規劃)	))	
黃翠盈女士	起動九龍東辦事處 地方營造經理(規劃)1	))	議項 IV
馮建業先生	運輸署交通工程(九龍)部 高級工程師/九龍東(南)	))	
梁偉傑先生	運輸署交通控制部工程師/九龍西	)	
許嘉霖女士	艾奕康有限公司城市規劃總監	)	
張敏兒女士	艾奕康有限公司城市規劃副總監	)	
黃岱暉先生	艾奕康有限公司交通及運輸規劃顧問	)	

<u>秘書</u>

李蕙雯女士　　觀塘民政事務處行政主任(區議會)3

缺席者：

歐陽均諾議員	柯創盛議員，MH
陳耀雄議員	潘任惠珍議員，MH
何啟明議員	

<u>開會辭</u>

<u>主席</u>歡迎與會人士出席第五屆觀塘區議會屬下觀塘區發展及重建專責小組第十九次會議。

I.　<u>通過上次會議記錄</u>

2.　委員會通過上次會議記錄。

10.2 土木工程拓展署正就環保連接系統進行詳細可行性研究，而處方在相關的規劃項目中亦留有彈性；

10.3 處方會在下一個議項一併回應有關開源道迴旋處的問題；

10.4 就泊車位方面，處方會按《香港規劃標準與準則》規劃適當的泊車位數目，而啟德道路網絡亦會陸續完善。此外，「反轉天橋底四號場」的泊車位工程將於今年內工程完成；

10.5 為提倡電動車發展，處方表示已在新地契內列明發展商須為三成泊車位提供電動車充電設施，而其餘七成亦須預留空間以便日後加設電動車充電設施。處方亦指新落成的交通交匯處將提供設施供小巴和巴士充電；

10.6 就加建深層行人隧道連接觀塘市中心及前機場跑道末端的建議，處方指出在工程技術層面上挑戰極大，現時發展稠密的開源道一帶並沒有足夠空間可用作工地配合大型鑽掘工程，而且很多大廈業權分散難作重建，令在開源道加設必須的地下出入口造成困難；及

10.7 有關康寧道公園入口的意見，處方會與建築署跟進。

[會後備註：近康寧道通往優化後的兒童遊樂場的入口已於 2019 年 4 月 24 日重新開放予市民使用。]

11. 委員備悉文件。

IV. 觀塘行動區建議發展大綱圖
(觀塘區議會觀塘區發展及重建專責小組文件第 7/2019 號)

12. 處方介紹文件。

13. 委員提出意見及查詢如下：

13.1 數名委員關注設於觀塘行動區的泊車位數目，尤其是貨車及旅遊巴的泊車位數目，並建議處方按比例增加該等車輛的泊車位數目。亦有委員提醒處方在設計車輛出入口時應盡量把車輛分流，避免輪候車輛堵塞主要道路；

13.2 有關處方計劃將開源道迴旋處改為交通燈控制十字路口的計劃，有委員查詢此舉可否有效解決現時偉業街至開源道路段的擠塞問題。就控制車流而言，有委員認為迴旋處較交通燈控制路口有效；

13.3 有委員建議興建開源道南北走廊，方便行人直達行動區；

13.4 有委員建議處方將接駁開源道及觀塘行動區之間的天橋與港鐵觀塘站連接，並可考慮將該天橋接駁敬業街，避免人流集中於開源道地面；

13.5 有委員關注公共運輸交匯處的空間是否足夠，並建議設立公共洗手間；

13.6 就擬議興建的兩座大樓，有委員建議應避免使用屏風式設計，以免阻礙通風及影響景觀；

13.7 有委員認為水體區域位於末端，位置偏僻，擔心晚上人流較少，建議處方考慮發展水上的士或較有特色的活動。有委員則建議水體區域範圍不應停泊船隻，以免影響景觀；

13.8 對於處方建議保留現有垃圾收集站，有委員認為可考慮將垃圾收集站改建成多層式建築，並預留空間作熟食市場及創意產業用途。有委員亦建議處方於現有觀塘碼頭熟食市場清拆後，安排熟食市場商戶遷至行動區內的商業發展內繼續經營；

13.9 有委員建議打通基業里以接駁觀塘行動區；

13.10 有委員查詢危險品車輛等候處搬遷後，其原本位置有

何用途；及

13.11 雖然有關單軌列車的工程仍未落實，但有委員查詢處方建議的規劃會否影響單軌列車未來發展。

14. 處方的綜合回覆如下：

14.1 處方認為擬建泊車位數目足夠應付需求及已預留地庫一整層作停泊大型車輛之用。處方表示將有大型公共運輸交匯處，可鼓勵市民多使用公共交通工具。處方亦會盡量改善車輛出入口的設計；

14.2 處方認為六號幹線的落成可分流交通，有效改善觀塘道以至開源道一帶的擠塞情況。處方亦建議運輸署將部分巴士路線改經偉業街，作為疏導觀塘道車流的短期方案。處方亦表示開源道迴旋處現時已經飽和，改以交通燈控制效果會較佳。運輸署現時正就智慧型路口進行試驗，處方期望此類技術可因應車流作即時調節，使燈號管制路口將來可更為暢順；

14.3 處方表示因須附合消防緊急通道要求及由於空間限制，於開源道興建高架行人走廊的難度很高；

14.4 就興建接駁敬業街的行人天橋建議，處方表示翠屏河計劃將擴闊行人步道，此舉亦可達到相同效果；

14.5 處方表示公共運輸交匯處將有八個巴士上落客位置以及供巴士停泊的空間，而運輸署亦表示足夠。在現時的規劃上，公共運輸交匯處內只有職員洗手間，但處方可研究在乘客等候處提供公共洗手間；

14.6 處方指賣地條款內將列明對建築物的設計要求，需顧及通風及景觀方面的考慮；

14.7 對於有委員提議發展水上的士服務，處方表示運輸署及旅遊事務署正在研究其可行性。處方並指出避風塘周邊一帶將會發展成水體區域，而處方一直與海事處及警方保持緊密聯繫，期望可完善避風塘的管理，以

釋放更多空間作水上活動設施之用。現時沿觀塘海濱花園的通航區已由 50 米增至 100 米闊；

14.8 處方表示基業街垃圾收集站有需要維持運作，因此未能將其拆卸，但將騰出剩餘空地供食物及環境衞生署作存放物品之用。處方亦指在未來的商業發展有空間作創意產業及零售餐飲用途，處方不排除熟食市場的商戶將來或會在商業發展內經營；

14.9 處方回應指現有規劃上將會打通基業里作行車道路；

14.10 處方說明危險品車輛等候處只作重整而非搬遷，而重整後將可開放更多海濱空間；及

14.11 就環保連接系統可能需要的空間，處方表示現有規劃已留有彈性。

15. 主席總結，指委員關心觀塘的持續發展會對交通造成嚴重負荷，期望處方可與本專責小組定期交流，在專責小組會議上匯報進度，讓委員充分反映意見。

16. 處方樂意定期與委員交流。

17. 委員備悉文件。

V. 觀塘區發展及重建專責小組 2019 至 2020 年度活動大綱建議
(觀塘區議會觀塘區發展及重建專責小組文件第 8/2019 號)

18. 秘書介紹文件。

19. 委員通過文件。

第五屆觀塘區議會屬下
觀塘區發展及重建專責小組
第二十二次會議記錄

日期： **2019年9月24日(星期二)**
時間： **下午2時45分**
地點： **九龍觀塘觀塘道392號創紀之城6期20樓05-07室**
觀塘民政事務處會議室

出席者：

黎樹濠議員，BBS，MH，JP(主席)	陳俊傑議員(副主席)
歐陽均諾議員	洪錦鉉議員，MH
陳振彬議員，GBS，JP	簡銘東議員，MH
陳華裕議員，MH，JP	莫建成議員
鄭景陽議員	柯創盛議員，MH
鄭強峰議員	潘任惠珍議員，BBS，MH
張琪騰議員	蘇冠聰議員
張培剛議員	蘇麗珍議員，MH，JP
張順華議員，MH	譚肇卓議員
張姚彬議員	謝淑珍議員
何啟明議員	黃春平議員，MH
徐海山議員	葉興國議員，BBS，MH，JP

出席會議的政府部門代表

黃昇鴻先生	觀塘民政事務助理專員(2)
高楚翹先生	觀塘民政事務處署理高級行政主任(區議會)

協助討論的機構/政府部門代表

~~港鐵於會前回函表示沒有新資料補充，但會與市建局保持緊密合作，待研究報告完成後再作跟進，因此港鐵未有委派代表出席是次會議。~~

~~8. 委員備悉文件。~~

III. <u>觀塘行動區規劃及工程可行性研究 － 經改善的建議發展大綱圖</u>

(觀塘區議會觀塘區發展及重建專責小組文件第16/2019號)

9. 起動九龍東辦事處（下稱「處方」）介紹文件。

10. 有委員指隨著觀塘區工作人口增加，現時很多道路在午飯或上下班時間也非常擠迫。雖然開源道行人路已擴闊約半米，但仍未能解決現時問題。委員表示只依靠擴闊地面行人路對改善行人環境擠迫問題成效不大，建議處方考慮使用開源道地下空間。

11. 處方回應指，開源道道路狹窄及地底藏有不少基建及管道設施，如需發展地下空間建造行人隧道，缺少大面積的路面工作空間配合使用鑽掘機器。此外，開源道兩旁建築物業權分散，重建機會較微，對開闢逃生途徑接駁行人隧道較為困難，因此發展開源道地下空間在技術上並不適合。若要將開源道連接到啟德發展區，亦需考慮會否涉及填海與《保護海港條例》的因素。經評估後，處方認為有效的路面改善工程亦可達到相同目標。另一方面，翠屏河活化工程現正等待提交立法會工務小組委員會，期望工程可於2020年年初動工，活化工程在完成後將有效加強區內連繫、改善行人環境並起分流作用。

12. 委員備悉文件。

Task Force on Kai Tak Harbourfront Development

Minutes of Thirty-fourth Meeting

Date	:	15 May 2019 (Wednesday)
Time	:	3:00 p.m.
Venue	:	Conference Room, 15/F, North Point Government Offices, 333 Java Road, Hong Kong

Present

Mr Vincent NG	Chairman

Organization Members

Mr Andy LEWIS	Representing Business Environment Council
Mr LEUNG Kong-yui	Representing Chartered Institute of Logistics and Transport in Hong Kong
Mrs Karen BARRETTO	Representing Friends of the Earth (HK) Charity Limited
Mr Freddie HAI	Representing Hong Kong Institute of Architects
Ms Connie CHEUNG Mei-ngor	Representing Hong Kong Institute of Landscape Architects
Sr Raymond CHAN Yuk-ming	Representing Hong Kong Institute of Surveyors
Mr Ivan HO Man-yiu	Representing Hong Kong Institute of Urban Design
Ir Raymond CHAN Kin-sek	Representing Hong Kong Institution of Engineers
Mr Winston CHU	Representing Society for Protection of the Harbour
Mr Ken SO Kwok-yin	Representing the Conservancy Association

Individual Members

Ms Kelly CHAN	Individual Member

Mr NGAN Man-yu	Individual Member
Prof Wallace CHANG	Co-opted Member
Mr Derek SUN	Co-opted Member

Official Members

Ms Doris HO	Deputy Secretary (Planning & Lands) 1, DEVB
Mr Victor CHAN	Principal Assistant Secretary (Works) 2, DEVB
Miss Rosalind CHEUNG	Principal Assistant Secretary (Harbour), DEVB
Miss Ellen CHENG	Senior Manager (Tourism)41, Tourism Commission (TC)
Mr David NGU	Chief Traffic Engineer/Kowloon, Transport Department (TD)
Mr Michael LEUNG	Project Manager (East), Civil Engineering and Development Department (CEDD)
Mrs Doris FOK	Assistant Director (Leisure Services) 1, Leisure and Cultural Services Department (LCSD)
Ms Johanna CHENG	District Planning Officer/Kowloon, Planning Department (PlanD)
Mr Gavin YEUNG	Secretary

Absent with Apologies

Prof TANG Bo-sin	Representing Hong Kong Institute of Planners
Mr Terence LEE	Representing Real Estate Developers Association of Hong Kong
Mr CHAN Ka-kui	Individual Member
Mr Hans Joachim ISLER	Individual Member
Ms Christina LEE	Individual Member
Ms Vivian LEE	Individual Member
Hon Tony TSE Wai-chuen	Individual Member
Mr HE Hua-han	Co-opted Member

<u>For Item 3</u>

Mr Aaron LIU	Deputy Commissioner for Tourism, TC
Miss Carol OR	Assistant Commissioner for Tourism (1), TC
Mr Michael LAW	Assistant Commissioner/Urban, TD
Mr CHAN Chung-hin	Senior Engineer/Housing & Planning/Kowloon, TD
Miss Alison TSE	Assistant District Officer (Kowloon City), HAD
Mr George MAK	Chief Engineer/East 5, CEDD

<u>For Item 4</u>

Ms Brenda AU	Head, EKEO
Mr Edwin WONG	Deputy Head, EKEO
Ms Margaret CHAN	Senior Place Making Manager (Planning), EKEO
Ms Yoko CHEUNG	Associate Director, Urban Planning, AECOM

on the co-use of the pier by different activities, e.g. the proposed water taxi services.

3.11 **Mr Frankie NGAN** enquired about the impact brought by this proposal on the existing licensed ferry service operating between North Point and Kwun Tong via the Runway Park Pier. In response, **Mr Michael LAW** said that this proposal would not affect the said ferry service and the Transport Department would continue to monitor the patronage of that route.

Way Forward

3.12 **The Chair** concluded that Members were generally supportive of this proposal as it would not only alleviate the problem of coach congestion in the Kowloon City District, but also add vibrancy to and bring more tourists to the Kai Tak harbourfront. It was considered a win-win solution.

Item 4 Recommended Outline Development Plan on Kwun Tong Action Area (TFKT/06/2019)

4.1 **The Chair** informed Members that the Secretariat received on 15 May 2019 a letter from the Hong Kong Boating Industry Association (HKBIA), which expressed in-principle support for the Recommended Outline Development Plan (RODP) for the Kwun Tong Action Area (KTAA) and suggested promoting water sports activities in the Kwun Tong Typhoon Shelter (KTTS). It also recommended relocating a portion of the anchoring and mooring spaces from KTTS to the To Kwa Wan Typhoon Shelter to allow more room for water sports activities. HKBIA's letter was tabled for Members' information.

Briefing by the project team

4.2 **Ms Yoko CHEUNG** briefed Members on the RODP prepared under the Planning and Engineering Feasibility Study on KTAA.

Discussion

Visibility

4.3 **Mr Freddie HAI** opined that the public transport interchange (PTI) proposed at the waterfront location would pose visual impact. **Mr Ivan HO** concurred and asked if the PTI could be relocated. In response, **Ms Brenda AU** said that the proposed PTI had been reduced in size considerably as compared to that proposed on the Preliminary Outline Development Plan by adopting a sawtooth layout to address Members' previous concern. The other major road enhancement works would be essential to alleviate the existing congestion at the Hoi Yuen Road/Wai Yip Street roundabout, and hence there was not much scope to change the PTI location.

4.4 **Ms Connie CHEUNG**, **Mr Derek SUN** and **Mr Ivan HO** considered the building profile and massing massive. **Ms Brenda AU**, in response, said the building profile and massing were indicative only. The future developers would have design flexibility while having regard to the key design requirements to be stipulated in the lease conditions.

4.5 **Ms Connie CHEUNG** and **Mr Derek SUN** expressed concerns over the blockage of seaview by the planting strip on the ground level and Kwun Tong Bypass. In response, **Ms Brenda AU** said that the project team would further consider possible ways to maximize the vista towards the harbour and the cityscape.

Vibrancy

4.6 **Mr Freddie HAI** suggested introducing retail facilities on the ground level and at the elevated green deck to improve the vibrancy of the waterfront area. **Ms Brenda AU** said that the suggestion would be considered.

4.7 **Prof Wallace CHANG** and **Mr Derek SUN** suggested making use of the rooftop of the Kwun Tong Passenger Ferry Pier (KTPFP) to allow room for a variety of uses. In response, **Ms Brenda AU** said that the project team would follow up and examine the loading capacity of the pier to see if it would be feasible.

Connectivity

4.8 As regards **Mr Wallace CHANG**'s query on the existing footbridge connecting Manulife Financial Centre and the waterfront, **Ms Brenda AU** said that the alignment of the footbridge would be reviewed and an additional section might be considered to provide a more direct connection to the podium of the future commercial development.

4.9 Noting the 8-metre height level difference between the at-grade Public Open Space (POS) and the elevated green deck, **Mr Wallace CHANG**, **Mr Freddie HAI** and **Mr Ivan HO** raised concerns over the vertical connection. In response, **Ms Brenda AU** said that there would be design flexibility for the podium. Terraced platforms with barrier-free facilities and other vertical connections such as staircases and escalators could be put in place to improve vertical connection.

Dangerous Goods Vehicle queuing area

4.10 Noting that the Dangerous Goods Vehicle (DGV) queuing area and office abutting the at-grade POS, **Mr Freddie HAI** suggested separating the DGV queuing area and the at-grade POS by building a single-storey retail or food and beverage (F&B) outlet in between. **Ms Brenda AU** responded that, due to potential public safety risk, the DGV queuing area and the at-grade POS should be duly separated and provision of retail or F&B uses that would draw high patronage was not feasible.

4.11 **Ir Raymond CHAN Kin-sek** opined that the design of the DGV queuing area was not coherent with other areas in KTAA and asked if it would be reprovisioned elsewhere. **Ms Brenda AU** said that as road transportation could not be used out of safety consideration, there remained an operational need to transport the dangerous goods across the harbour by ferry, and thus there was no plan for reprovisioning the DGV queuing area and office away from the present location.

Other Comments

4.12 **Mr Freddie HAI** and **Mr Ivan HO** queried the possibility of achieving greenery coverage of 30%. **Ms Brenda AU** explained that the 30% greenery coverage requirement was proposed under the Kai Tak Development Urban Design Guidelines and Manual and had already been proven achievable in other developments.

4.13 In response to **Mr Ivan HO**'s query on the resilience measures against extreme weather, **Ms Brenda AU** said that an underground stormwater tank would be constructed to collect the stormwater runoff during heavy rainstorm, thereby relieving the discharge load of the downstream drainage system.

4.14 **Mr Winston CHU** queried the coverage of the study area. **Ms Brenda AU** explained that the study area mainly included KTAA, KTTS and part of the Kai Tak Approach Channel. She added that a very small portion of the area beneath Kwun Tong Bypass also fell within the study area.

4.15 In response to **Mr Ivan HO**'s query on the capacity and design of the basement carpark, **Ms Brenda AU** said that the assumed three-storey basement carpark could provide around 400 parking spaces and the proposed run-in and out of the commercial development had been carefully planned.

4.16 **Mr Ivan HO** further suggested integrating the local open space with the regional open space. **Ms Brenda AU** responded that the local and regional open spaces had been holistically designed in the formulation of the landscape master plan, and more details to ensure integration would be worked out when preparing the schematic design drawings at a later stage.

4.17 **Mr Wallace CHANG** suggested incorporating Government, Institution or Community (GIC) facilities into the action area. In response, **Ms Brenda AU** said that some floor spaces in the commercial development could be allocated for GIC uses.

Way Forward

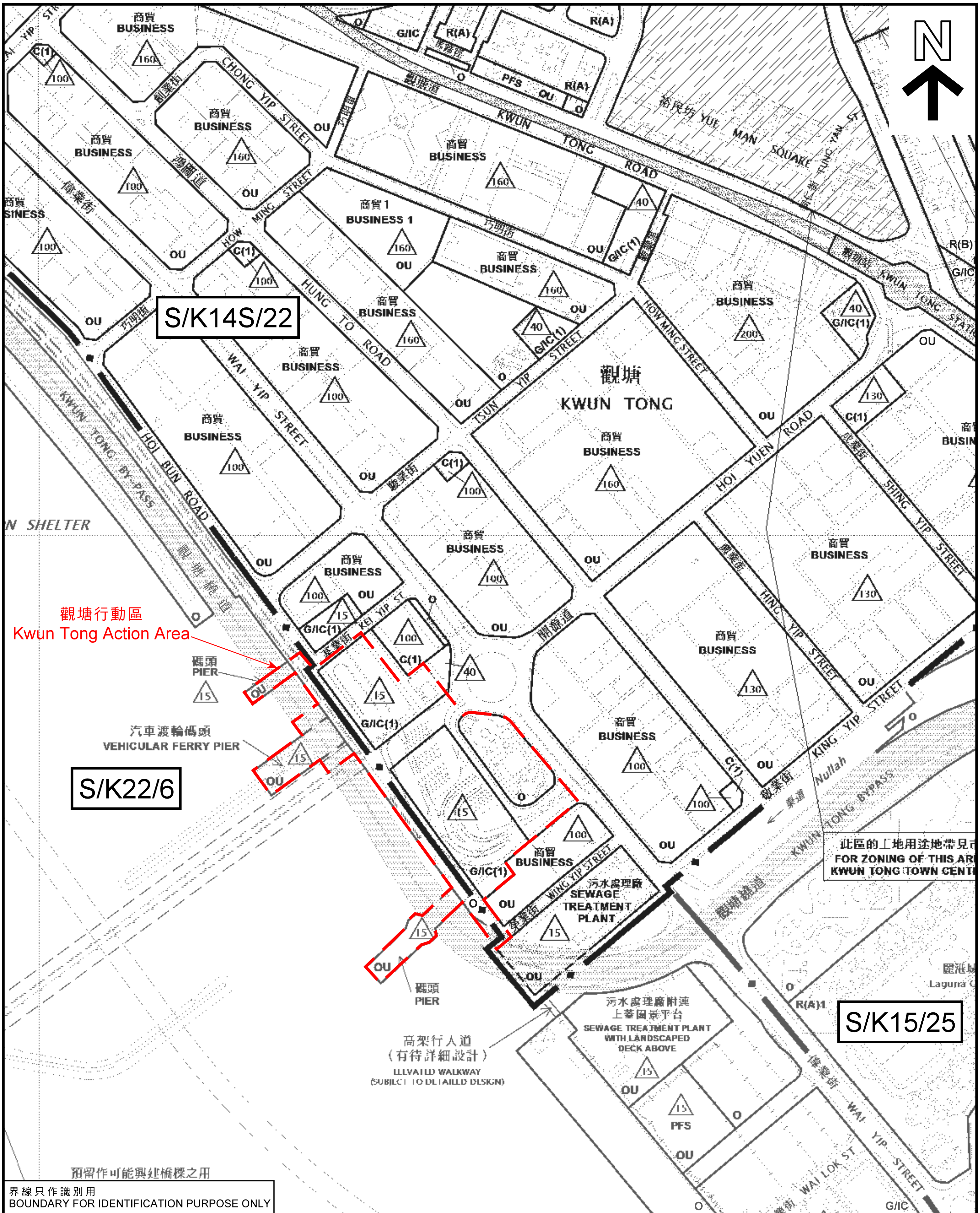
4.18 **The Chair** shared the importance of providing vertical connection in view of the 8-metre height difference between the elevated landscape deck and the at-grade POS, and concurred with the suggestion of providing additional retail spaces on the ground level and the elevated green deck. He invited the project team to take into account Members' comments in taking forward the project.

Item 5 Any Other Business

5.1 **The Chair** informed Members that the next meeting was being scheduled in co-ordination with the meetings of other Task Forces. The Secretariat would inform Members of the meeting date in due course.

5.2 There being no other comments, the meeting was adjourned at 5 pm.

Secretariat
Task Force on Kai Tak Harbourfront Development
August 2019



本摘要圖於2021年1月7日擬備，所根據的資料為：於2018年10月30日核准的分區計劃大綱圖編號S/K14S/22，於2017年4月11日核准的分區計劃大綱圖編號S/K15/25，以及於2018年5月15日核准的分區計劃大綱圖編號S/K22/6

EXTRACT PLAN PREPARED ON 7.1.2021 BASED ON OUTLINE ZONING PLANS No. S/K14S/22 APPROVED ON 30.10.2018, S/K15/25 APPROVED ON 11.4.2017 AND S/K22/6 APPROVED ON 15.5.2018

位置圖 LOCATION PLAN

觀塘（南部）分區計劃大綱核准圖
編號S/K14S/22
觀塘行動區
THE APPROVED KWUN TONG (SOUTH)
OUTLINE ZONING PLAN No. S/K14S/22
KWUN TONG ACTION AREA

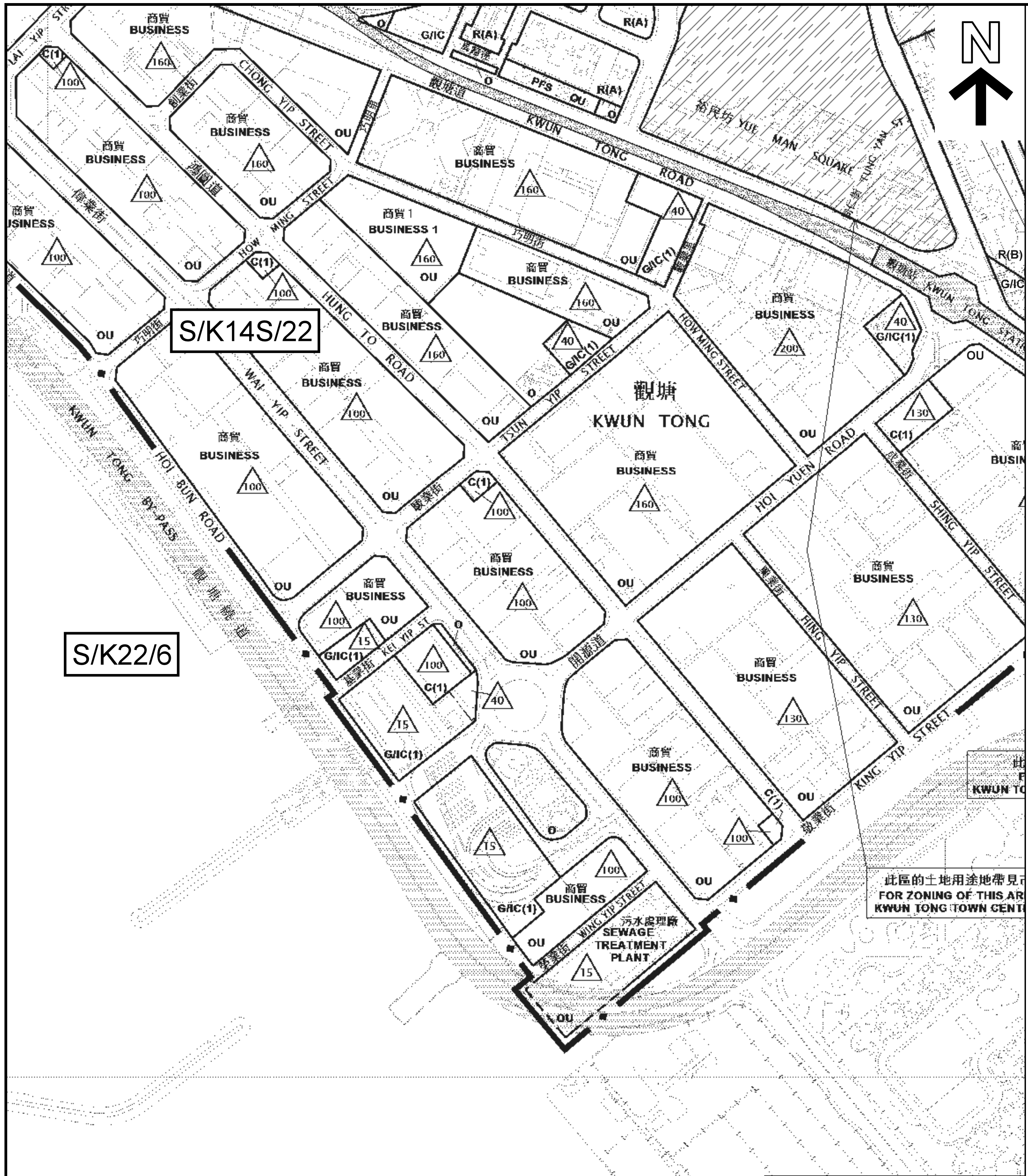
SCALE 1 : 5 000 比例尺

米 METRES 100 0 100 200 米 METRES

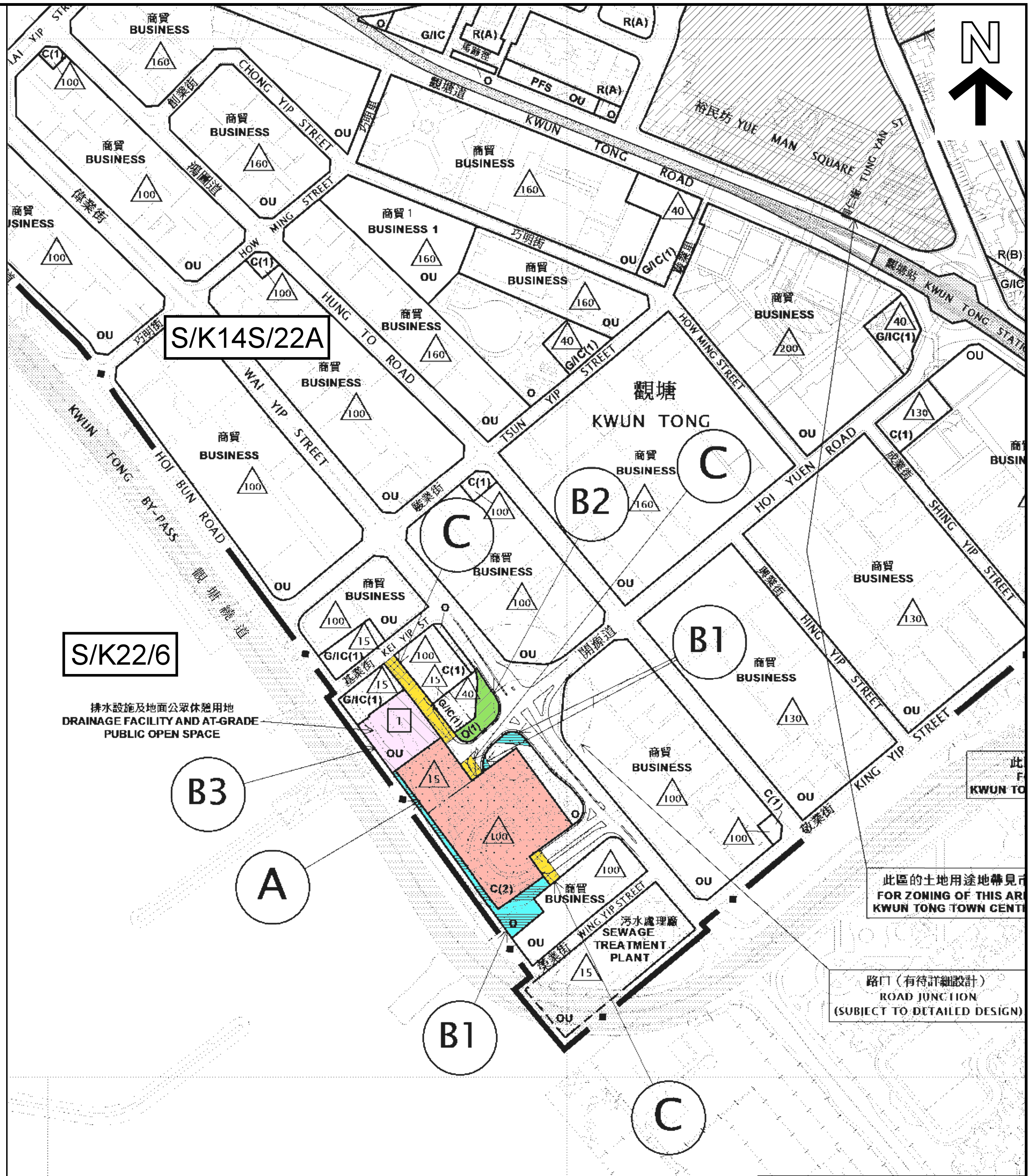
規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/K14S/20/49

圖 PLAN
1



S/K14S/22 的摘要圖
EXTRACT PLAN OF S/K14S/22



S/K14S/22A 的摘要圖
EXTRACT PLAN OF S/K14S/22A

本摘要圖於2021年2月17日擬備，
所根據的資料為於2018年10月30日
核准的分區計劃大綱圖編號S/K14S/22
EXTRACT PLAN PREPARED ON 17.2.2021
BASED ON OUTLINE ZONING PLAN No.
S/K14S/22 APPROVED ON 30.10.2018

分區計劃大綱圖上現有與擬議用途地帶的比較 COMPARISON OF EXISTING AND PROPOSED ZONINGS ON THE OZP

觀塘（南部）分區計劃大綱核准圖編號 S/K14S/22 的擬議修訂
（A、B1、B2、B3 及 C 項）
PROPOSED AMENDMENTS TO THE APPROVED KWUN TONG (SOUTH)
OUTLINE ZONING PLAN No. S/K14S/22
(ITEMS A, B1, B2, B3 AND C)

SCALE 1 : 5 000 比例尺
米 METRES 100 0 100 200 300 400 米 METRES

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/K14S/20/49

圖 PLAN
2

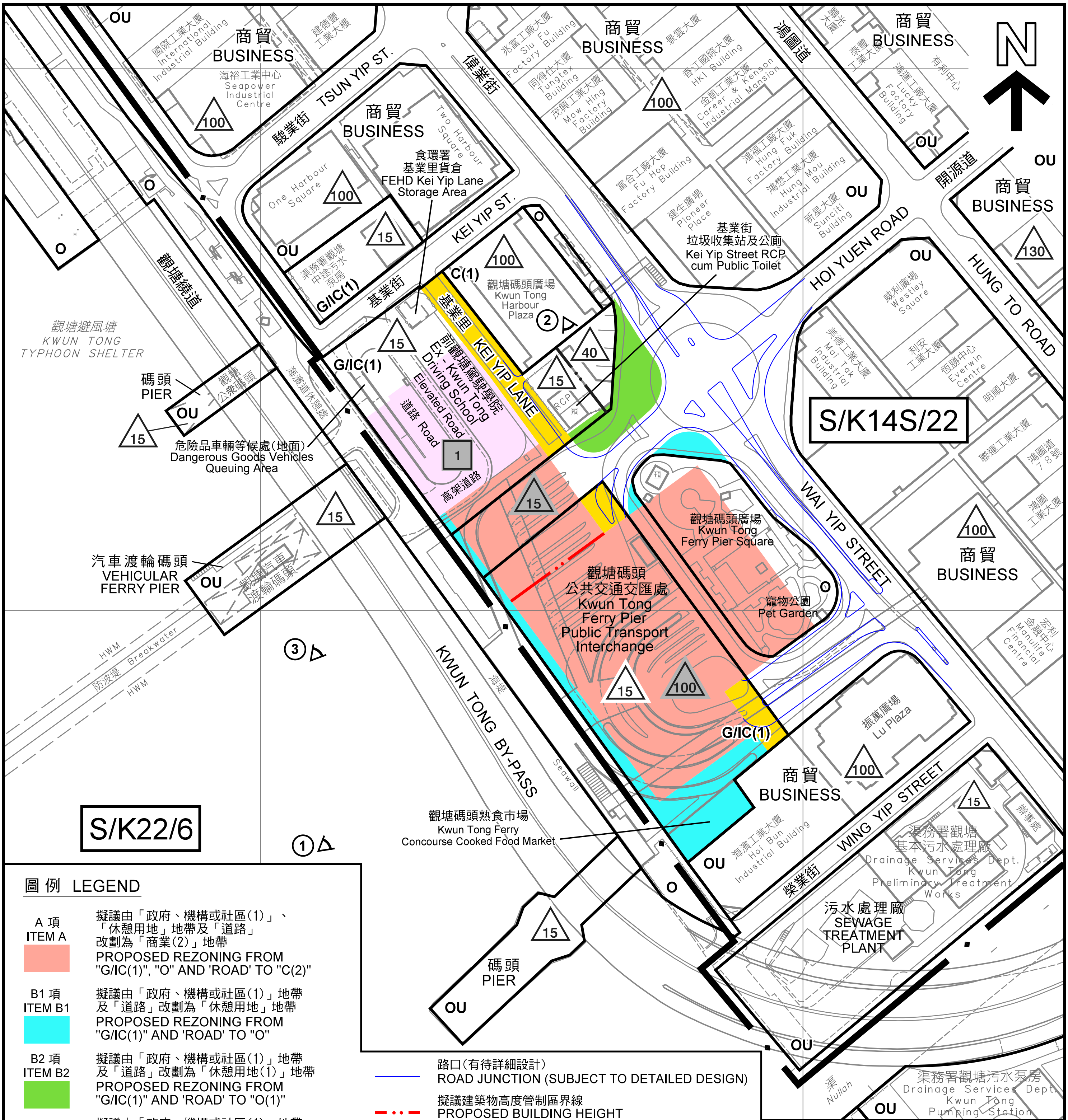


圖 例 LEGEND

A 項 ITEM A	擬議由「政府、機構或社區(1)」、「休憩用地」地帶及「道路」改劃為「商業(2)」地帶 PROPOSED REZONING FROM "G/IC(1)", "O" AND 'ROAD' TO "C(2)"
B1 項 ITEM B1	擬議由「政府、機構或社區(1)」地帶及「道路」改劃為「休憩用地」地帶 PROPOSED REZONING FROM "G/IC(1)" AND 'ROAD' TO "O"
B2 項 ITEM B2	擬議由「政府、機構或社區(1)」地帶及「道路」改劃為「休憩用地(1)」地帶 PROPOSED REZONING FROM "G/IC(1)" AND 'ROAD' TO "O(1)"
B3 項 ITEM B3	擬議由「政府、機構或社區(1)」地帶改劃為「其他指定用途」註明「排水設施及地面公眾休憩用地」地帶 PROPOSED REZONING FROM "G/IC(1)" TO "OU(DRAINAGE FACILITY AND AT-GRADE PUBLIC OPEN SPACE)"
C 項 ITEM C	擬議由「政府、機構或社區(1)」地帶改劃為「道路」 PROPOSED REZONING FROM "G/IC(1)" TO 'ROAD'

界線只作識別用
BOUNDARY FOR IDENTIFICATION PURPOSE ONLY

路口(有待詳細設計)
ROAD JUNCTION (SUBJECT TO DETAILED DESIGN)

擬議建築物高度管制區界線
PROPOSED BUILDING HEIGHT CONTROL ZONE BOUNDARY

建築物高度管制區界線
BUILDING HEIGHT CONTROL ZONE BOUNDARY

100 擬議最高建築物高度(在主水平基準上若干米)
PROPOSED MAXIMUM BUILDING HEIGHT
(IN METRES ABOVE PRINCIPAL DATUM)

15 最高建築物高度(在主水平基準上若干米)
MAXIMUM BUILDING HEIGHT
(IN METRES ABOVE PRINCIPAL DATUM)

1 擬議最高建築物高度(樓層數目)
PROPOSED MAXIMUM BUILDING HEIGHT
(IN NUMBER OF STOREYS)

C	商業 COMMERCIAL
G/IC	政府、機構或社區 GOVERNMENT, INSTITUTION OR COMMUNITY
O	休憩用地 OPEN SPACE
OU	其他指定用途 OTHER SPECIFIED USES
①	實地照片的觀景點 VIEWING POINT OF SITE PHOTO

本摘要圖於2021年2月18日擬備，
所根據的資料為測量圖編號
11-NE-23A及23C

EXTRACT PLAN PREPARED ON 18.2.2021
BASED ON SURVEY SHEETS No.
11-NE-23A AND 23C

平面圖 SITE PLAN

觀塘(南部)分區計劃大綱核准圖
編號S/K14S/22的擬議修訂
(A、B1、B2、B3及C項)
PROPOSED AMENDMENTS TO THE APPROVED
KWUN TONG (SOUTH)
OUTLINE ZONING PLAN No. S/K14S/22
(ITEMS A, B1, B2, B3 AND C)

SCALE 1 : 2 500 比例尺

米 METRES 50 0 50 100 米 METRES

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/K14S/20/49

圖 PLAN
3

本摘要圖於2021年2月9日擬備，所根據的資料為地政總署於2018年10月5日拍攝的航攝照片編號E046756C

EXTRACT PLAN PREPARED ON 9.2.2021 BASED ON AERIAL PHOTO No. E046756C TAKEN ON 5.10.2018 BY LANDS DEPARTMENT

航攝照片 AERIAL PHOTO

觀塘（南部）分區計劃大綱核准圖
編號Ｓ/Ｋ１４Ｓ/２２的擬議修訂
（Ａ、Ｂ１、Ｂ２、Ｂ３及Ｃ項）

PROPOSED AMENDMENTS TO THE APPROVED
KWUN TONG (SOUTH)
OUTLINE ZONING PLAN No. S/K14S/22
(ITEMS A, B1, B2, B3 AND C)

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/K14S/20/49

圖 PLAN
4

界線只作識別用
BOUNDARY FOR IDENTIFICATION PURPOSE ONLY

本圖於2021年2月9日擬備，所根據的
資料為攝於2020年7月17日的實地照片
PLAN PREPARED ON 9.2.2021
BASED ON SITE PHOTO
TAKEN ON 17.7.2020

實地照片 SITE PHOTO

觀塘（南部）分區計劃大綱核准圖編號Ｓ/Ｋ１４Ｓ/２２的擬議修訂
（Ａ、Ｂ１、Ｂ２、Ｂ３及Ｃ項）
PROPOSED AMENDMENTS TO THE APPROVED KWUN TONG (SOUTH)
OUTLINE ZONING PLAN No. S/K14S/22
(ITEMS A, B1, B2, B3 AND C)

規劃署
PLANNING
DEPARTMENT

參考編號
REFERENCE No.
M/K14S/20/49

圖 PLAN
5a

界線只作識別用
BOUNDARY FOR IDENTIFICATION PURPOSE ONLY

本圖於2021年2月9日擬備，所根據的
資料為攝於2019年2月26日的實地照片
PLAN PREPARED ON 9.2.2021
BASED ON SITE PHOTO
TAKEN ON 26.2.2019

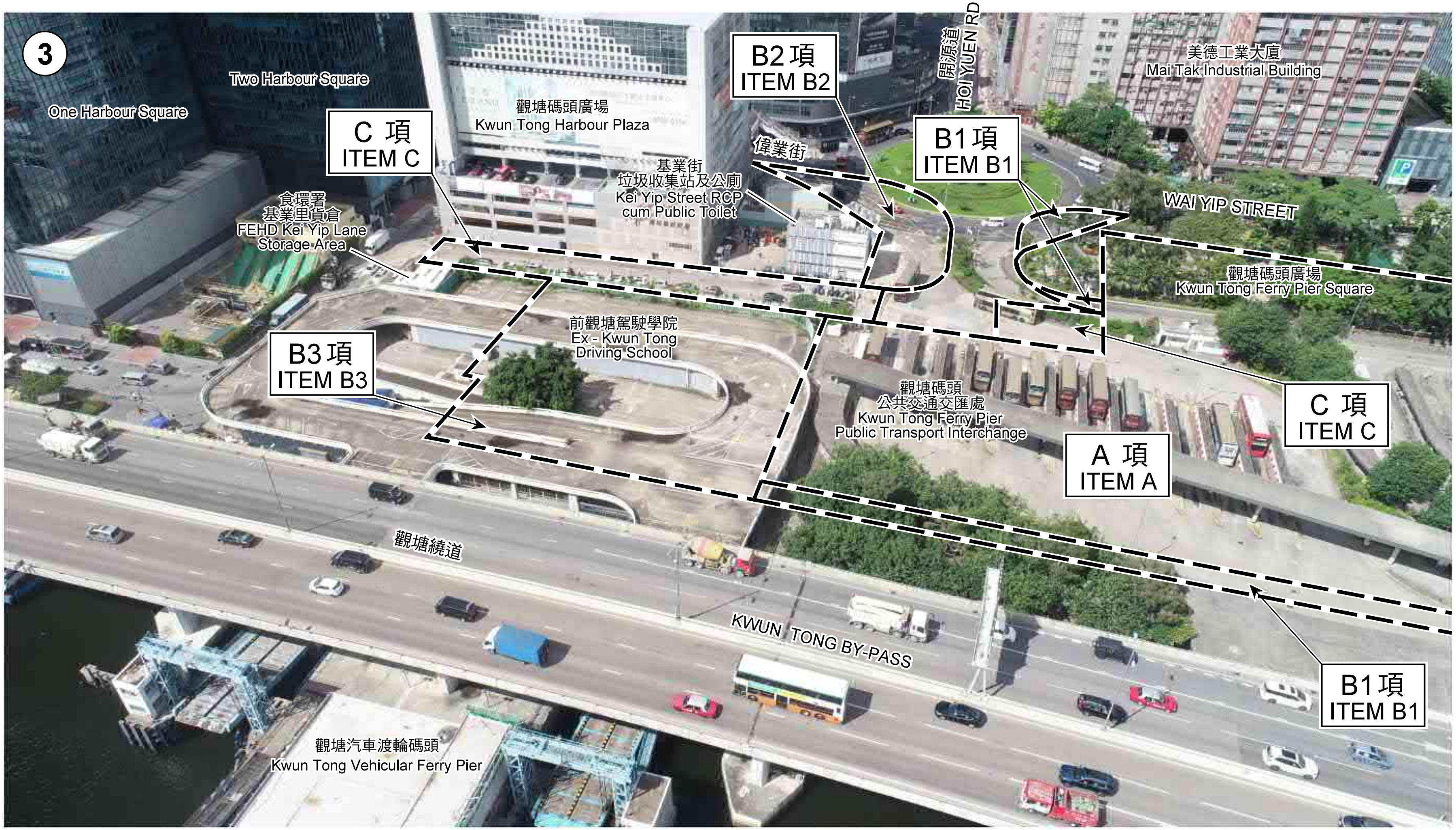
實地照片 SITE PHOTO

觀塘（南部）分區計劃大綱核准圖編號Ｓ／Ｋ１４Ｓ／２２的擬議修訂
（Ａ、Ｂ１及Ｃ項）
PROPOSED AMENDMENTS TO THE APPROVED KWUN TONG (SOUTH)
OUTLINE ZONING PLAN No. S/K14S/22
(ITEMS A, B1 AND C)

規劃署
PLANNING
DEPARTMENT

參考編號
REFERENCE No.
M/K14S/20/49

圖 PLAN
5b



界線只作識別用
BOUNDARY FOR IDENTIFICATION PURPOSE ONLY

本圖於2021年2月17日擬備，所根據的
資料為攝於2020年7月17日的實地照片
PLAN PREPARED ON 17.2.2021
BASED ON SITE PHOTO
TAKEN ON 17.7.2020

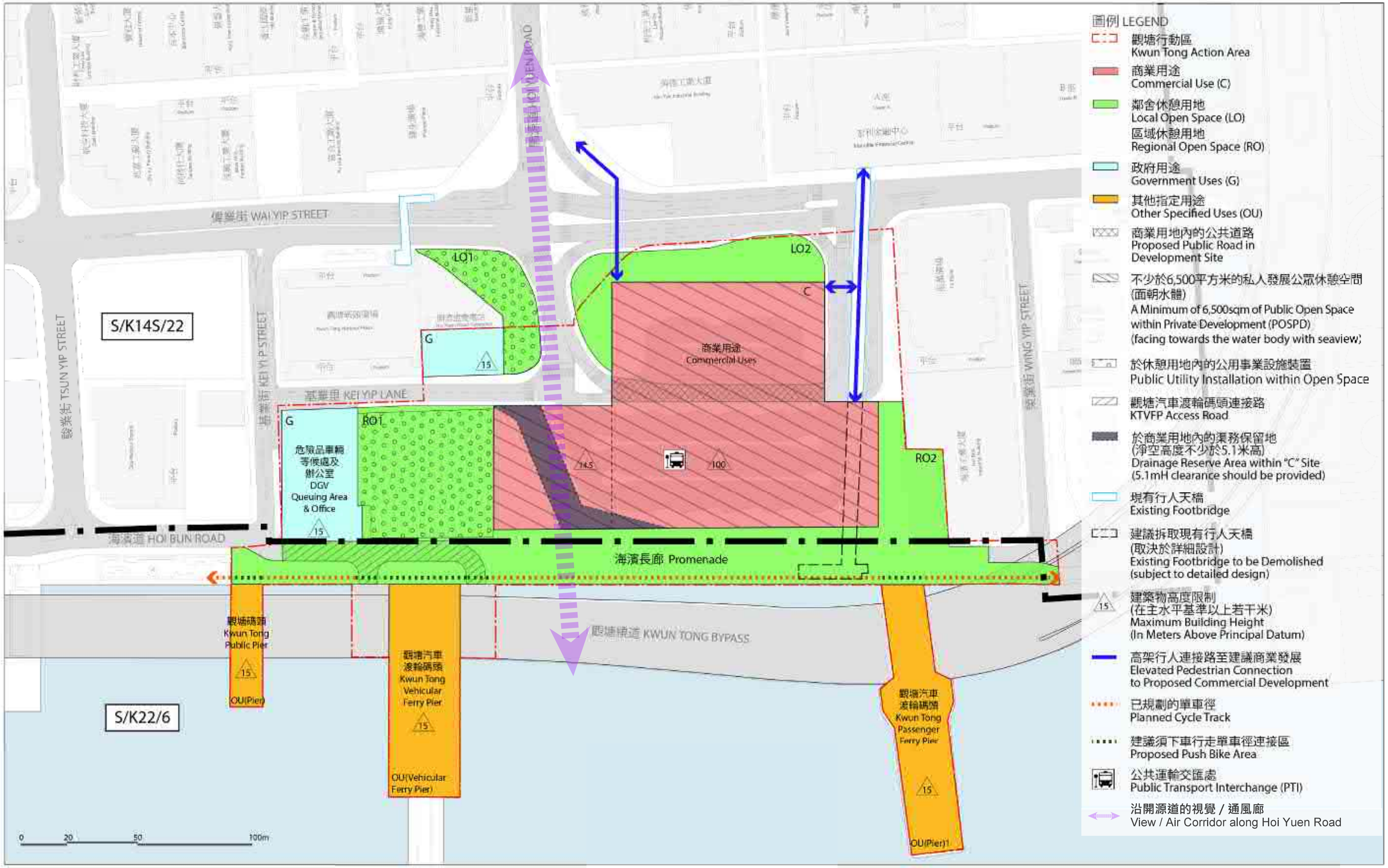
實地照片 SITE PHOTO

觀塘（南部）分區計劃大綱核准圖編號Ｓ/Ｋ１４Ｓ/２２的擬議修訂
（Ａ、Ｂ１、Ｂ２、Ｂ３及Ｃ項）
PROPOSED AMENDMENTS TO THE APPROVED KWUN TONG (SOUTH)
OUTLINE ZONING PLAN No. S/K14S/22
(ITEMS A, B1, B2, B3 AND C)

規劃署
PLANNING
DEPARTMENT

參考編號
REFERENCE No.
M/K14S/20/49

圖 PLAN
5c



（資料來源：由起動九龍東辦事處提供）
(Source: Provided by Energizing Kowloon East Office)

本摘要圖於2021年2月5日擬備
EXTRACT PLAN PREPARED ON 5.2.2021

建議發展大綱圖
RECOMMENDED OUTLINE DEVELOPMENT PLAN

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/K14S/20/49

圖 PLAN
6a

(資料來源：由起動九龍東辦事處提供)
(Source: Provided by Energizing Kowloon East Office)

本摘要圖於2021年2月18日擬備
EXTRACT PLAN PREPARED ON 18.2.2021

行人環境及暢達設計圖
PEDESTRIAN ACCESSIBILITY PLAN

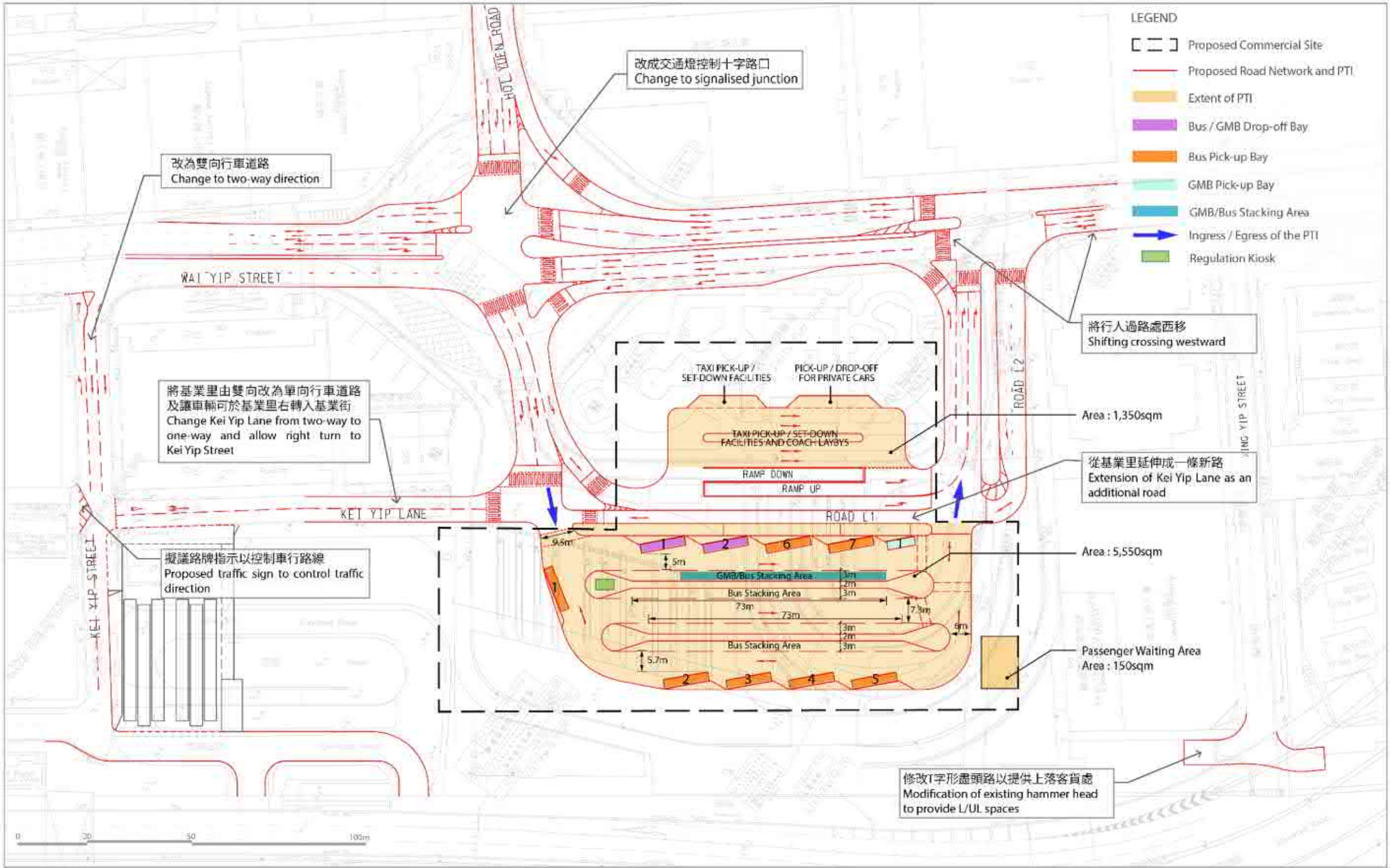
規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/K14S/20/49

圖 PLAN
6b

(資料來源：立法會文件編號CB(1)447120-21(05)九龍東環保連接系統詳細可行性研究的結果和建議)
(Source: LegCo Paper LC Paper No. CB(1)447120-21(05) on Findings and Recommendations of Detailed Feasibility Study for Environmentally Friendly Linkage System for Kowloon East)

本摘要圖於2021年2月10日擬備 EXTRACT PLAN PREPARED ON 10.2.2021	發展自動行人道網絡串連啟德前跑道區、九龍灣行動區和觀塘行動區 DEVELOPING A TRAVELLATORS NETWORK LINKING UP THE FORMER RUNWAY OF KAI TAK, KOWLOON BAY ACTION AREA AND KWUN TONG ACTION AREA	規劃署 PLANNING DEPARTMENT 參考編號 REFERENCE No. M/K14S/20/49	圖 PLAN 6c



(資料來源：由起動九龍東辦事處提供)(備註：擬議道路改善措施將依據土木工程拓展署勘查研究、設計及建造的詳細設計作出調整)
(Source: Provided by Energizing Kowloon East Office) (Remark: The junction improvement works as indicated are subject to detailed design under Investigation, Design and Construction Study by the CEDD)

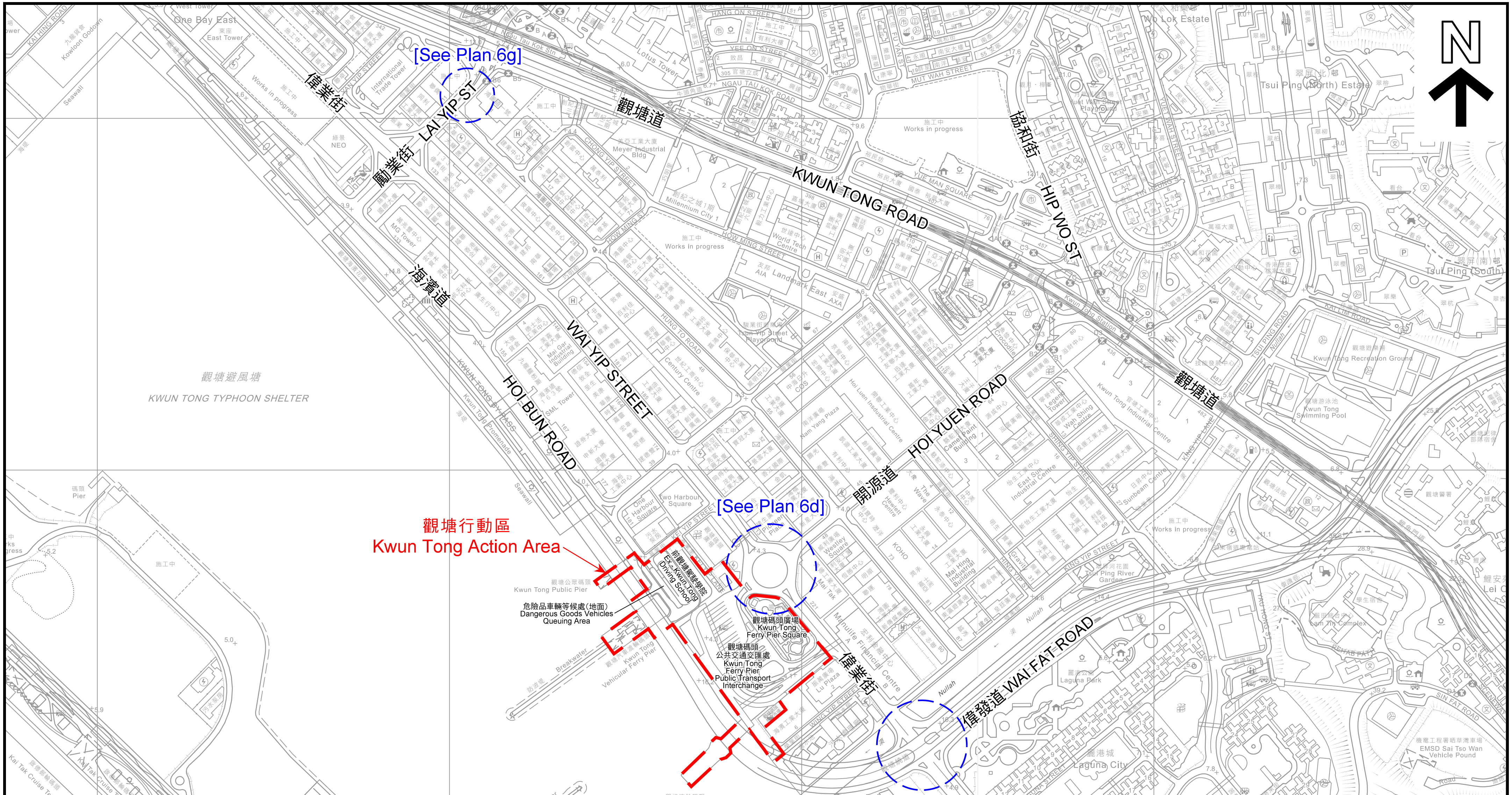
本摘要圖於2021年2月10日擬備
EXTRACT PLAN PREPARED ON 10.2.2021

擬議路口改善，地區路網及重置觀塘碼頭公共運輸交匯處改善措施
PROPOSED IMPROVEMENT MEASURES FOR JUNCTION IMPROVEMENT AND LOCAL ROAD NETWORK AND REPROVISIONING OF KWUN TONG FERRY PIER PUBLIC TRANSPORT INTERCHANGE

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/K14S/20/49

圖 PLAN
6d



（資料來源：由起動九龍東辦事處提供）
(Source: Provided by Energizing Kowloon East Office)

本摘要圖於2021年2月10日擬備，
所根據的資料為測量圖編號
11-NE-C和D

EXTRACT PLAN PREPARED ON 10.2.2021
BASED ON SURVEY SHEETS No.
11-NE-C & D

位置圖 LOCATION PLAN

擬議路口改善措施
JUNCTIONS WITH PROPOSED IMPROVEMENT MEASURES

SCALE 1 : 7 500 比例尺

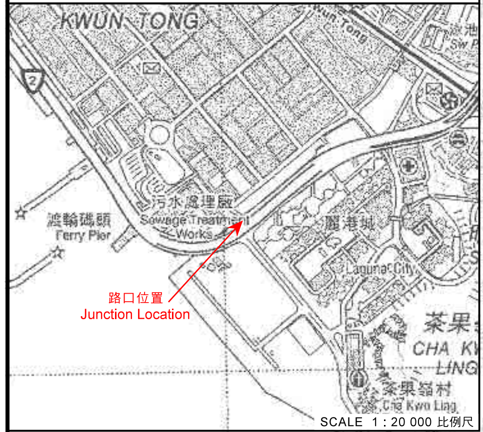
米 METRES 100 0 100 200 300 米 METRES

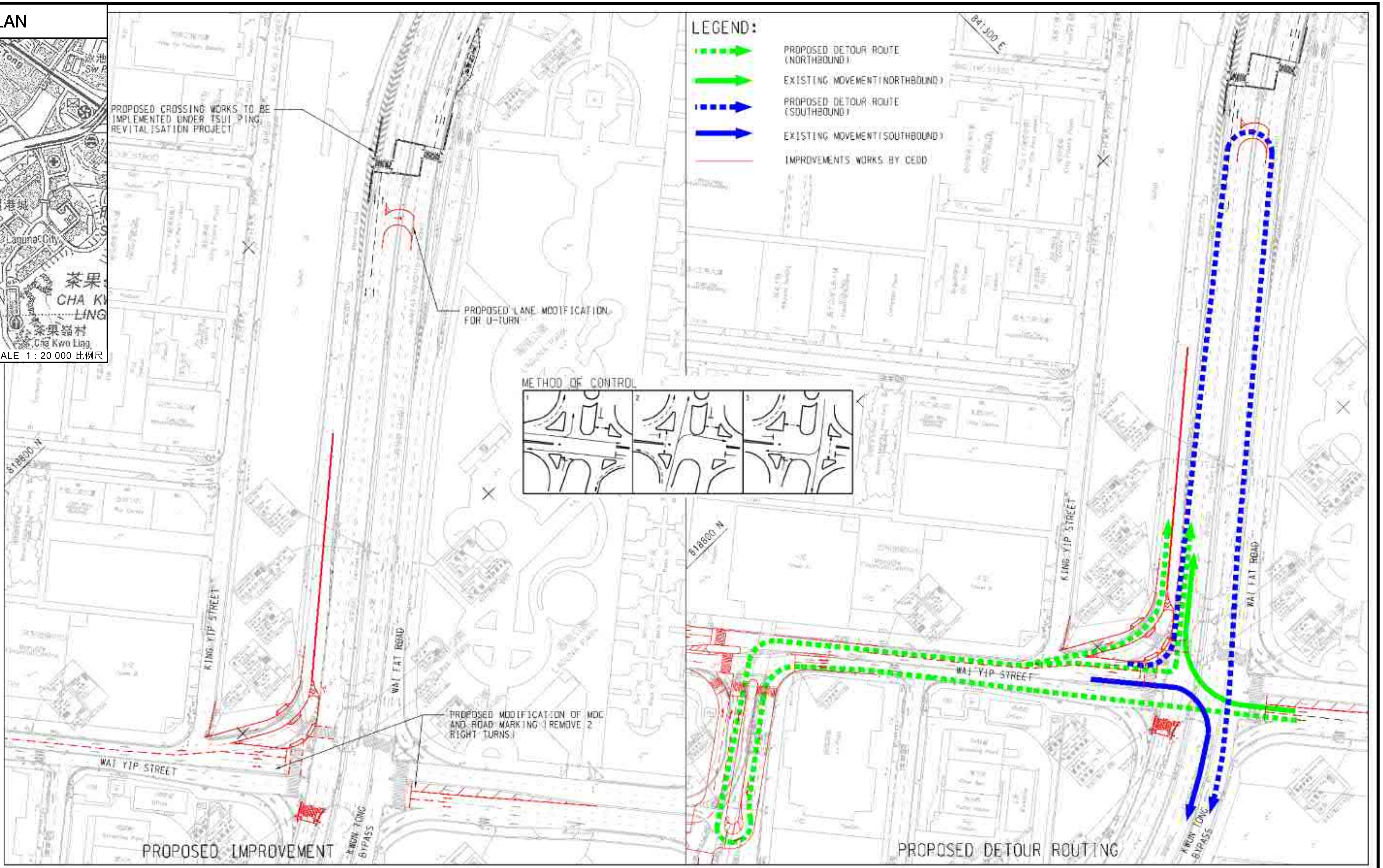
規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/K14S/20/49

圖 PLAN
6e

位置圖 LOCATION PLAN





(資料來源：由起動九龍東辦事處提供)(備註：擬議道路改善措施將依據土木工程拓展署勘查研究、設計及建造的詳細設計作出調整)
(Source: Provided by Energizing Kowloon East Office) (Remark: The junction improvement works as indicated are subject to detailed design under Investigation, Design and Construction Study by the CEDD)

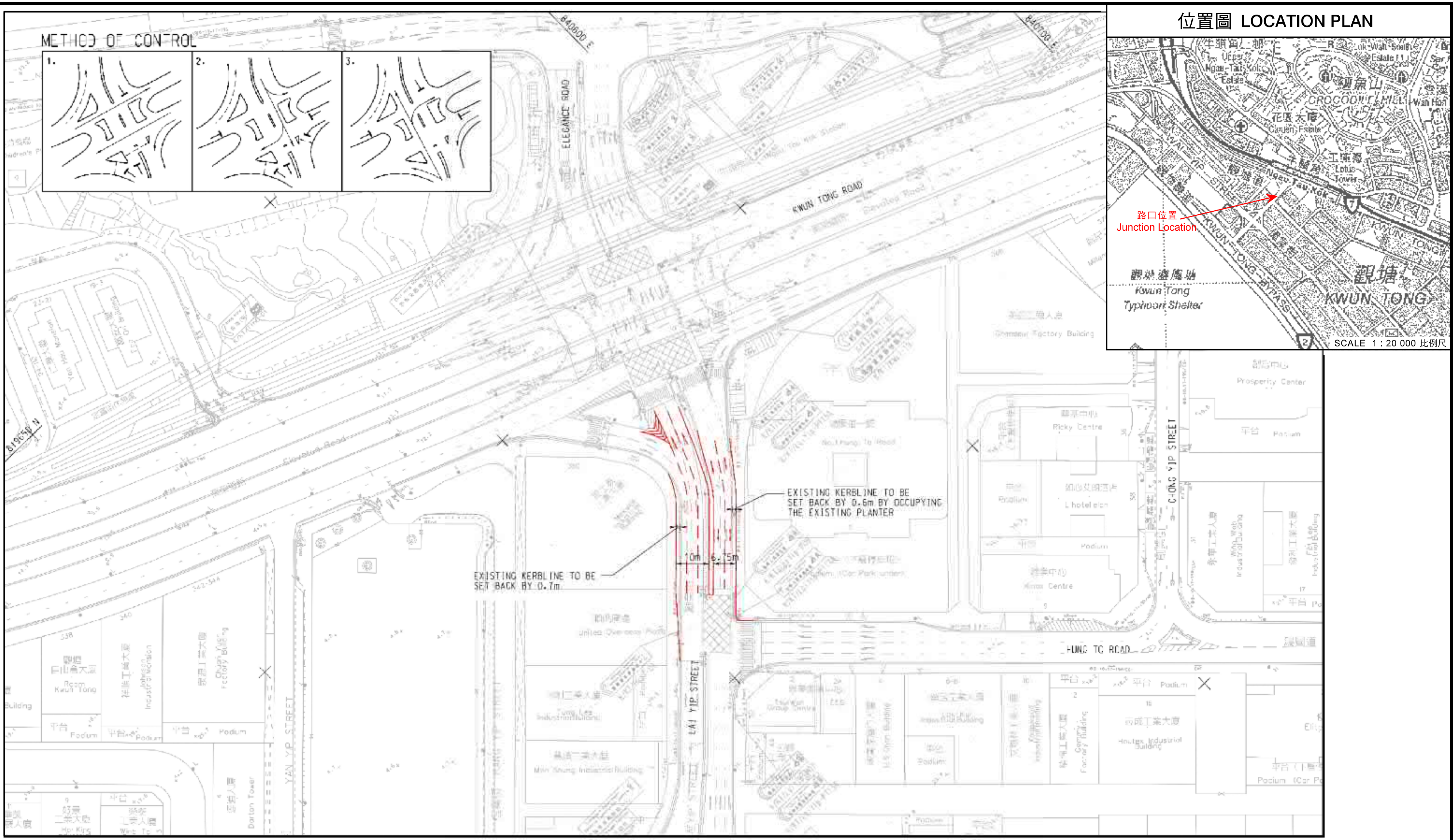
本摘要圖於2021年2月10日擬備
EXTRACT PLAN PREPARED ON 10.2.2021

擬議偉發道、偉業街改善計劃
PROPOSED IMPROVEMENT SCHEME AT WAI FAT ROAD / WAI YIP STREET

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/K14S/20/49

圖 PLAN
6f



（資料來源：由起動九龍東辦事處提供）（備註：擬議道路改善措施將依據土木工程拓展署勘查研究、設計及建造的詳細設計作出調整）

(Source: Provided by Energizing Kowloon East Office) (Remark: The junction improvement works as indicated are subject to detailed design under Investigation, Design and Construction Study by the CEDD)

本摘要圖於2021年2月10日擬備

EXTRACT PLAN PREPARED ON 10.2.2021

擬議勵業街、觀塘道改善計劃

PROPOSED IMPROVEMENT SCHEME AT LAI YIP STREET / KWUN TONG ROAD

規劃署

PLANNING DEPARTMENT

參考編號

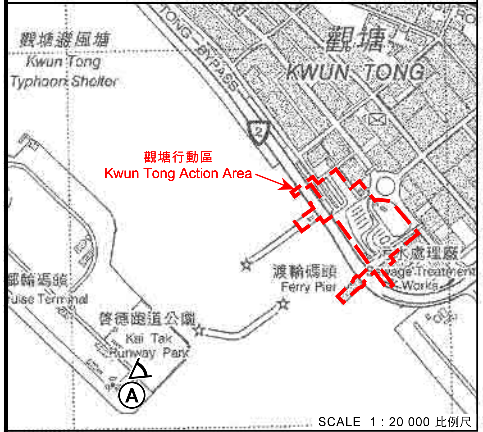
REFERENCE No.

M/K14S/20/49

圖 PLAN

6g

位置圖 LOCATION PLAN



觀景點
VIEWING POINT A

現有景觀 EXISTING VIEW

合成照片 PHOTOMONTAGE

（資料來源：由起動九龍東辦事處提供）
(Source: Provided by Energizing Kowloon East Office)

本摘要圖於2021年2月9日擬備
EXTRACT PLAN PREPARED ON 9.2.2021

合成照片 PHOTOMONTAGE

由啟德郵輪碼頭大樓園景平台眺望
VIEW FROM LANDSCAPE DECK OF KAI TAK CRUISE TERMINAL BUILDING

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/K14S/20/49

圖 PLAN
6h

位置圖 LOCATION PLAN

觀景點
VIEWING POINT B

現有景觀 EXISTING VIEW

合成照片 PHOTOMONTAGE

(資料來源：由起動九龍東辦事處提供)
(Source: Provided by Energizing Kowloon East Office)

本摘要圖於2021年2月9日擬備
EXTRACT PLAN PREPARED ON 9.2.2021

合成照片 PHOTOMONTAGE

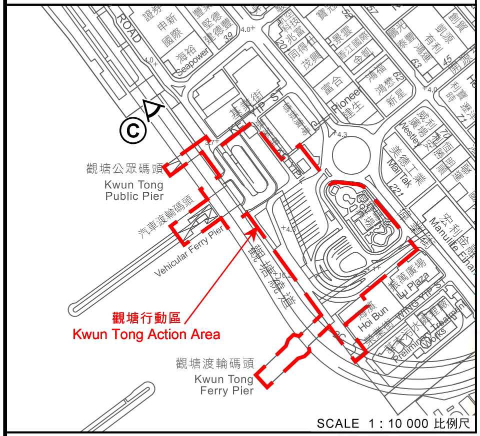
由鰂魚涌公園眺望
VIEW FROM QUARRY BAY PARK

規劃署
PLANNING DEPARTMENT

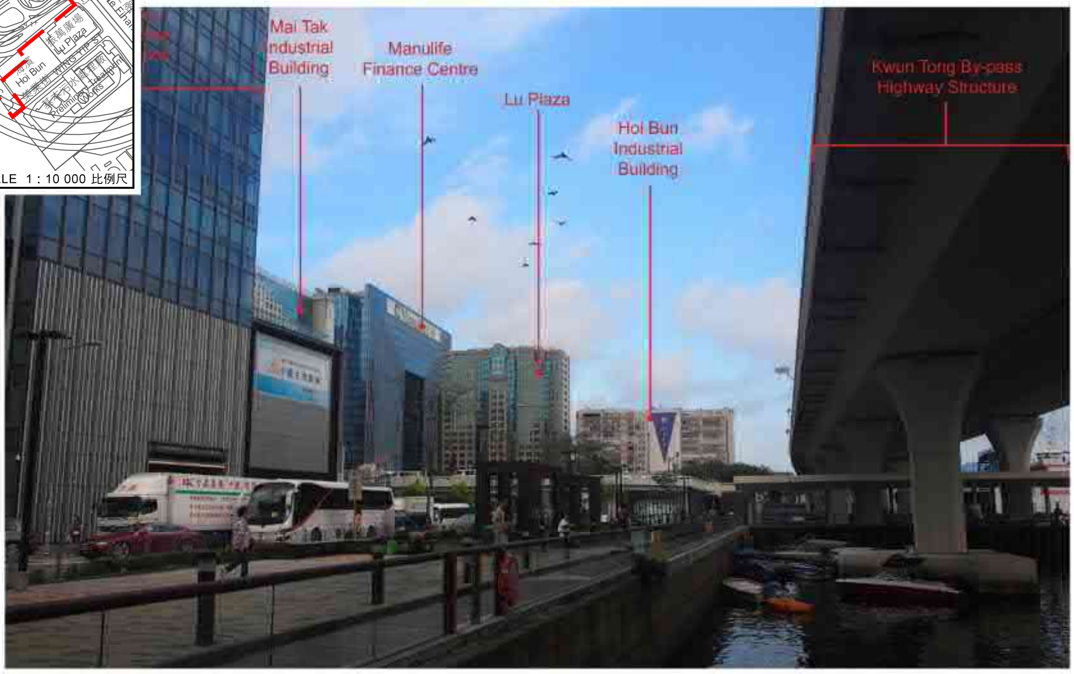
參考編號
REFERENCE No.
M/K14S/20/49

圖 PLAN
6i

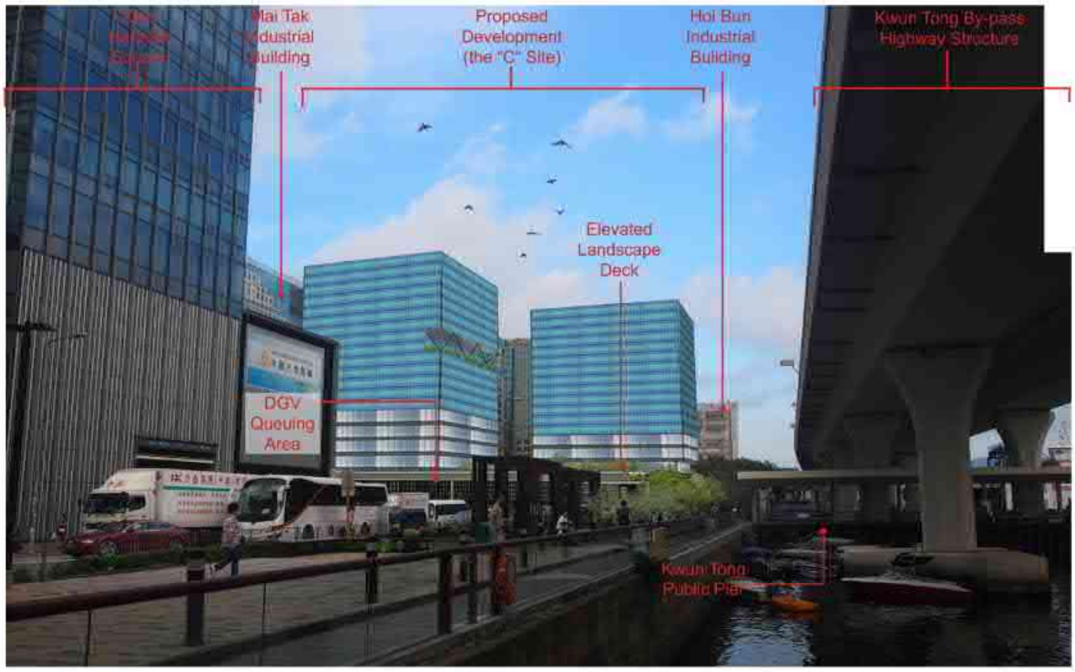
位置圖 LOCATION PLAN



觀景點
VIEWING POINT C



現有景觀 EXISTING VIEW



合成照片 PHOTOMONTAGE

（資料來源：由起動九龍東辦事處提供）
(Source: Provided by Energizing Kowloon East Office)

本摘要圖於2021年2月16日擬備
EXTRACT PLAN PREPARED ON 16.2.2021

合成照片 PHOTOMONTAGE

由觀塘海濱花園眺望
VIEW FROM KWUN TONG PROMENADE

規劃署
PLANNING DEPARTMENT

參考編號
REFERENCE No.
M/K14S/20/49

圖 PLAN
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